**Updated** 05/15/2020

# FEDERAL PROJECT

## BIDDING INSTRUCTIONS

FOR ALL PROJECTS:

1. Use pen and ink to complete all paper Bids.
2. As a minimum, the following must be received prior to the time of Bid opening:

For a Paper Bid:

a) a copy of the Notice to Contractors, b) the completed Acknowledgement of Bid Amendments form, c) the completed Schedule of Items, d) two copies of the completed and signed Contract Offer, Agreement & Award form, e) a Bid Guaranty, (if required), and f) any other certifications or Bid requirements listed in the Bid Documents as due by Bid opening.

For an Electronic Bid:

**NOTE: Not all projects accept Electronic Bids. Please review the Notice to Contractors and see if it specifically states that Electronic Bids will be accepted.**

a) a completed Bid using Expedite® software and submitted via the Bid Express™ web-based service, b) an electronic Bid Guaranty (if required) or a faxed copy of a Bid Bond (with original to be delivered within 72 hours), and c) any other Certifications or Bid requirements listed in the Bid Documents as due by Bid opening.

3. Include prices for all items in the Schedule of Items (excluding non-selected alternates).
4. Bid Guaranty acceptable forms are:
   a) a properly completed and signed Bid Bond on the Department's prescribed form (or on a form that does not contain any significant variations from the Department's form as determined by the Department) for 5% of the Bid Amount or
   b) an Official Bank Check, Cashier's Check, Certified Check, U.S. Postal Money Order or Negotiable Certificate of Deposit in the amount stated in the Notice to Contractors or
   c) an electronic bid bond submitted with an electronic bid.

5. If a paper Bid is to be sent, "FedEx First Overnight" delivery is suggested as the package is delivered directly to the DOT Headquarters Building located at 16 Child Street in Augusta. Other means, such as U.S. Postal Service's Express Mail has proven not to be reliable.

IN ADDITION, FOR FEDERAL AID PROJECTS:

6. Complete the DBE Proposed Utilization form, and submit with your bid. If you are submitting your bid electronically, you must FAX the form to (207) 624-3431. This is a curable defect.

*If you need further information regarding Bid preparation, call the DOT Contracts Section at (207) 624-3410.*

*For complete bidding requirements, refer to Section 102 of the Maine Department of Transportation, Standard Specifications, March 2020 Edition.*

April 28, 2017
Supersedes November 05, 2014

# NOTICE

**The Maine Department of Transportation is attempting to improve the way Bid Amendments/Addendums are handled and allow for an electronic downloading of bid packages from our website, while continuing to maintain an optional plan holders list.**

**Prospective bidders, subcontractors or suppliers who wish to download a copy of the bid package and receive a courtesy notification of project specific bid amendments must fill out the on-line plan holder registration form and provide an email address to the MDOT Contracts mailbox at: MDOT.contracts@maine.gov. Each bid package will require a separate request.**

**Additionally, interested parties will be responsible for reviewing and retrieving the Bid Amendments from our web site, and acknowledging receipt and incorporating those Bid Amendments in their bids using the Acknowledgement of Bid Amendment Form.**

**The downloading of bid packages from the MDOT website is not the same as providing an electronic bid to the Department. Electronic bids must be submitted via http://www.BIDX.com. For information on electronic bidding contact Rebecca Snowden at rebecca.snowden@maine.gov or Diane Barnes at diane.barnes@maine.gov.**

# NOTICE

For security and other reasons, all Bid Packages which are mailed, shall be provided in double (one envelope inside the other) envelopes. The *Inner Envelope* shall have the following information provided on it:

Bid Enclosed - Do Not Open
PIN:
Town:
Date of Bid Opening:
Name of Contractor with mailing address and telephone number:

In Addition to the usual address information, the *Outer Envelope* should have written or typed on it:

Double Envelope: Bid Enclosed
PIN:
Town:
Date of Bid Opening:
Name of Contractor:
*This should not be much of a change for those of you who use Federal Express or similar services.*

Hand-carried Bids may be in one envelope as before, and should be marked with the following information:

Bid Enclosed: Do Not Open
PIN:
Town:
Name of Contractor:

October 16, 2001

# STATE OF MAINE DEPARTMENT OF TRANSPORTATION

Bid Guaranty-Bid Bond Form

**KNOW ALL MEN BY THESE PRESENTS THAT**_____

_____, of the City/Town of_____and State of_____

as Principal, and_____as Surety, a

Corporation duly organized under the laws of the State of_____and having a usual place of

Business in_____and hereby held and firmly bound unto the Treasurer of

the State of Maine in the sum of_____,for payment which Principal and Surety bind

themselves, their heirs, executers, administrators, successors and assigns, jointly and severally.

The condition of this obligation is that the Principal has submitted to the Maine Department of

Transportation, hereafter Department, a certain bid, attached hereto and incorporated as a

part herein, to enter into a written contract for the construction of _____

_____

_____and if the Department shall accept said bid

and the Principal shall execute and deliver a contract in the form attached hereto (properly

completed in accordance with said bid) and shall furnish bonds for this faithful performance of

said contract, and for the payment of all persons performing labor or furnishing material in

connection therewith, and shall in all other respects perform the agreement created by the

acceptance of said bid, then this obligation shall be null and void; otherwise it shall remain in full

force, and effect.

Signed and sealed this_____day of_____20_____

WITNESS:

_____

_____

_____

WITNESS

_____

_____

_____

PRINCIPAL:

By_____

By:_____

By:_____

SURETY:

By_____

By:_____

Name of Local Agency: _____

SAMPLE

# NOTICE

Bidders:

Please use the attached "Request for Information" form when submitting questions concerning specific Contracts that have been advertised for Bid, include additional numbered pages as required. RFI's may be faxed to 207-624-3431, submitted electronically through the Departments web page of advertised projects by selecting the RFI tab on the project details page or via e-mail to RFI-Contracts.MDOT@maine.gov.

These are the only allowable mechanisms for answering Project specific questions. Maine DOT will not be bound to any answers to Project specific questions received during the Bidding phase through other processes.

When submitting RFIs by Email please follow the same guidelines as stated on the "Request for Information" form and include the word "RFI" along with the Project name and Identification number in the subject line.

State of Maine
Department of Transportation

**RFI No: _____**

# REQUEST FOR INFORMATION

**Date _____ Time _____**

---

**Information Requested for:**

**WIN(S): _____ Town(s):_____Bid Date: _____**

**Question(s)**:_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Request by:

**Company Name**:_____**Phone:(_____)_____**

**Email:**_____**Fax: (_____)_____**

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**Complete this form and fax to 207-624-3431, Attn: Project Manager (name listed on the "Notice to Contractors"), or Email questions to RFI-Contracts.MDOT@maine.gov, Please include the word "RFI" along with the Project Name and Identification Number in the Subject line, or electronically by using the RFI Tab located on the Individual Projects Detail page.**

**Maine Department of Transportation Civil Rights Office**

**Directory of Certified Disadvantaged Business Enterprises**

**Listing can be found at:**

https://www.maine.gov/mdot/civilrights/dbe/

**For additional information and guidance contact:**

**Civil Rights Office at (207) 624-3066**

***It is the responsibility of the Contractor to access the DBE Directory at this site in order to have the most current listing.***

## Vendor Registration

Prospective Bidders must register as a vendor with the Department of Administrative & Financial Services if the vendor is awarded a contract. Vendors will not be able to receive payment without first being registered. Vendors/Contractors will find information and register through the following link –
http://www.maine.gov/purchases/venbid/index.shtml

March 26, 2020

# NOTICE

## (COVID-19 Pandemic)

The Department considers the COVID-19 Pandemic an Uncontrollable Event as defined in Section 101.2 of the Department's Standard Specifications.

Accordingly, any documented delay to the project's Critical Path due to COVID-19 related issues, such as impacted workforce, subcontracts, or material supply, will be considered an Excusable Delay as defined in Section 109.5(A)(3) of the Department's Supplemental Specifications.

As an Excusable Delay, the Contractor is entitled to an extension of time provided that other associated notification, documentation, and procedural requirements set forth in the Contract are met.

# STATE OF MAINE DEPARTMENT OF TRANSPORTATION
# NOTICE TO CONTRACTORS

Sealed Bids addressed to the Maine Department of Transportation, Augusta, Maine 04333 and endorsed on the wrapper "Bids for **Reconstruction, Marking, Lighting and Signing a Portion of Taxiway 'C' (Approx.1,200 x 35 LF); Reconstruction, Marking, Lighting and Signing a Portion of Taxiway E (Approx. 545 x 35 LF); Reconstruct the Non-Movement area of the Terminal Apron (Approx. 1595 SY); and Reconstruction, Marking, Lighting and Signing TW 'C' Bypass Taxiway (Approx. 1,800 SY)** in the City/Town of **AUGUSTA**" will be received from contractors at the Reception Desk, MaineDOT Building, Capitol Street, Augusta, Maine, until 11:00 o'clock A.M. (prevailing time) on April 28, 2021 and at that time and place, publicly opened and read. Bids will be accepted from all bidders. The lowest responsive bidder must demonstrate successful completion of projects of similar size and scope to be considered for award of this contract. **We now accept electronic bids for bid packages posted on the bidx.com website. Electronic bids do not have to be accompanied by paper bids. Please note: The Department will accept a facsimile of the bid bond; however, the original bid bond must then be received at the MDOT Contract Section within 72 hours of the bid opening. Until further notice, dual bids (one paper, one electronic) will be accepted, with the paper copy taking precedence.**

Description: FAA Airport Improvement Project (AIP) No. 3-23-0003-xx-2021 , WIN 020655.03

Location: In Kennebec County, project is located at the Augusta State Airport.

Outline of Work: Reconstruction of airfield pavements in portions of Taxiway C, Taxiway E, Taxiway C Runup area, and the non-movement area of the terminal apron and other incidental work.

**A non-mandatory Pre-Bid meeting will take place at the Augusta State Airport on April 21, 2021 from 11am to 1pm. All questions shall be received by April 22, 2021.**

For general information regarding Bidding and Contracting procedures, contact George Macdougall at (207) 624-3410. Our webpage at http://www.maine.gov/mdot/contractors/ contains a copy of the Schedule of Items, Plan Holders List, written portions of bid amendments, drawings, bid results and an electronic form for RFI submittal. For Project-specific information fax all questions to **Tim LeSiege** at (207) 624-3431, use electronic RFI form or email questions to RFI-Contracts.MDOT@maine.gov, project name and identification number should be in the subject line. Questions received after 12:00 noon of Monday (or if that Monday is a state holiday, Friday) prior to bid date will not be answered. Bidders shall not contact any other Departmental staff for clarification of Contract provisions, and the Department will not be responsible for any interpretations so obtained. TTY users call Maine Relay 711.

Plans, specifications and bid forms may be seen at the MaineDOT Building in Augusta, Maine. They may be purchased from the Department between the hours of 8:00 a.m. to 4:30 p.m. by cash, credit card (Visa/Mastercard) or check payable to Treasurer, State of Maine sent to Maine Department of Transportation, Attn.: Mailroom, 16 State House Station, Augusta, Maine 04333-0016. They also may be purchased by telephone at (207) 624-3536 between the hours of 8:00 a.m. to 4:30 p.m. Full size plans **$59.00 ($64.50** by mail). Half size plans **$29.50 ($32.75)** by mail), Bid Book $10 ($13 by mail), Single Sheets $2, payment in advance, all non-refundable.

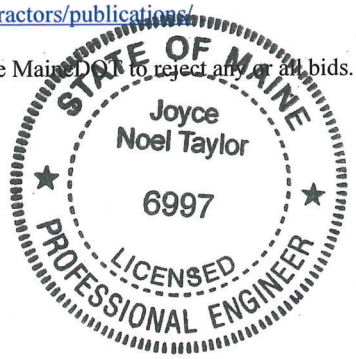
Each Bid must be made upon blank forms provided by the Department and must be accompanied by a bid bond at 5% of the bid amount or an official bank check, cashier's check, certified check, certificate of deposit, or United States postal money order in the amount of **$60,000.00** payable to Treasurer, State of Maine as a Bid guarantee. A Contract Performance Surety Bond and a Contract Payment Surety Bond, each in the amount of 100 percent of the Contract price, will be required of the successful Bidder.

This Contract is subject to all applicable Federal Laws. This contract is subject to compliance with the Disadvantaged Business Enterprise program requirements as set forth by the Maine Department of Transportation.

All work shall be governed *by State of Maine, Department of Transportation, Standard Specifications, March 2020 Edition,* price $10 [$15 by mail], and *Standard Details, March 2020 Edition*, price $10 [$15 by mail]. They also may be purchased by telephone at (207) 624-3536 between the hours of 8:00 a.m. to 4:30 p.m. *Standard Detail* updates can be found at http://www.maine.gov/mdot/contractors/publications/

The right is hereby reserved to the MaineDOT to reject any or all bids.

Augusta, Maine
April 14, 2021




Joyce Noel Taylor

JOYCE NOEL TAYLOR, P. E.
CHIEF ENGINEER

Augusta
20655.03
April 14, 2011
Supersedes August 3, 2004

**SPECIAL PROVISION 102.7.3**
**ACKNOWLEDGMENT OF BID AMENDMENTS**

With this form, the Bidder acknowledges its responsibility to check for all Amendments to the Bid Package. For each Project under Advertisement, Amendments are located at http://www.maine.gov/mdot/contractors/ . It is the responsibility of the Bidder to determine if there are Amendments to the Project, to download them, to incorporate them into their Bid Package, and to reference the Amendment number and the date on the form below. The Maine DOT will not post Bid Amendments any later than noon the day before Bid opening without individually notifying all the planholders.

| Amendment Number | Date |
|---|---|
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| | |

The Contractor, for itself, its successors and assigns, hereby acknowledges that it has received all of the above referenced Amendments to the Bid Package.

CONTRACTOR

_____ _____
Date Signature of authorized representative

_____
(Name and Title Printed)

Maine Department of Transportation

Proposal Schedule of Items



Proposal ID: 020655.03 Project(s): 020655.03

SECTION: 1 FAA ITEMS

Alt Set ID: Alt Mbr ID:

Contractor: _____

| Proposal Line Number | Item ID<br>Description | Approximate Quantity and Units | Unit Price<br>Dollars Cents | Bid Amount<br>Dollars Cents |
|---|---|---|---|---|
| 0010 | C-100<br>CONTRACTOR QUALITY CONTROL PROGRAM (CQCP) | LUMP SUM | LUMP SUM | _____.____ |
| 0020 | C-102-5.1a<br>TEMPORARY SEEDING AND MULCHING | 1,500.000<br>SY | _____.____ | _____.____ |
| 0030 | C-102-5.1b<br>INSTALLATION AND REMOVAL OF INLET PROTECTION | 21.000<br>EA | _____.____ | _____.____ |
| 0040 | C-102-5.1c<br>STABILIZED CONSTRUCTION ENTRANCE | 1.000<br>EA | _____.____ | _____.____ |
| 0050 | C-102-5.1e<br>INSTALLATION AND REMOVAL OF SILTFENCE | 2,300.000<br>LF | _____.____ | _____.____ |
| 0060 | C-105<br>MOBILIZATION (Limited to 5%) | LUMP SUM | LUMP SUM | _____.____ |
| 0070 | D-700-1<br>DRAINAGE SYSTEM REPAIRS | 1.000<br>LS | _____.____ | _____.____ |
| 0080 | D-700-2<br>INLET ADJUSTMENT | 2.000<br>EA | _____.____ | _____.____ |
| 0090 | D-700-3<br>FRAME AND GRATE | 2.000<br>EA | _____.____ | _____.____ |
| 0100 | D-701-5.1<br>12" REINFORCED CONCRETE PIPE | 160.000<br>LF | _____.____ | _____.____ |
| 0110 | D-705-5.1<br>6" UNDERDRAIN PIPE COMPLETE, INCLUDING POROUS BACKFILL AND FILTER FABRIC | 3,650.000<br>LF | _____.____ | _____.____ |

Proposal ID: 020655.03 Project(s): 020655.03

SECTION: 1 FAA ITEMS

Alt Set ID: Alt Mbr ID:

Contractor: _____

| Proposal Line Number | Item ID<br>Description | Approximate Quantity and Units | Unit Price<br>Dollars | <br>Cents | Bid Amount<br>Dollars | <br>Cents |
|---|---|---|---|---|---|---|
| 0120 | D-751-5.4<br>INSPECTION HOLE | 20.000<br>EA | | | | |
| 0130 | L-108-5.2<br>NO. 8 AWG, 5KV, L-824, TYPE C CABLE, INSTALLED IN TRENCH, DUCT BANK OR CONDUIT | 7,400.000<br>LF | | | | |
| 0140 | L-108-5.3<br>NO. 6 AWG, SOLID, BARE COPPER COUNTERPOISE WIRE, INSTALLED IN TRENCH, INCUDING CONNECTIONS/TERMINATIONS | 4,900.000<br>LF | | | | |
| 0150 | L-109-7.2<br>INSTALLATION OF AIRPORT TRANSFORMER VAULT EQUIPMENT IN PLACE | 1.000<br>LS | | | | |
| 0160 | L-110-5.1<br>NON-ENCASED ELECTRICAL DUCT BANK, 1-WAY 2 INCH | 4,600.000<br>LF | | | | |
| 0170 | L-110-5.2<br>CONCRETE ENCASED ELECTRICAL DUCT BANK, 4-WAY 4 INCH | 300.000<br>LF | | | | |
| 0180 | L-110-5.3<br>CONCRETE ENCASED ELECTRICAL DUCT BANK, 4-WAY 4 INCH, 48" MINIMUM COVERAGE | 40.000<br>LF | | | | |
| 0190 | L-115-5.2<br>ELECTRICAL JUNCTION STRUCTURE 4'X4' | 7.000<br>EA | | | | |
| 0200 | L-115-5.3<br>EXISTING ELECTRICAL MANHOLE/JUNCTION STRUCTURE ELEVATION ADJUSTMENT | 6.000<br>EA | | | | |

Proposal ID: 020655.03 Project(s): 020655.03

SECTION: 1 FAA ITEMS

Alt Set ID: Alt Mbr ID:

Contractor: _____

| Proposal Line Number | Item ID<br>Description | Approximate Quantity and Units | Unit Price<br>Dollars | <br>Cents | Bid Amount<br>Dollars | <br>Cents |
|---|---|---|---|---|---|---|
| 0210 | L-125-5.1<br>L-861 BASE MOUNTED LED ELEVATED TAXIWAY EDGE LIGHT | 75.000<br>EA | | | | |
| 0230 | L-125-5.2<br>L-861 STAKE MOUNTED LED ELEVATED TAXIWAY EDGE LIGHT | 17.000<br>EA | | | | |
| 0240 | L-125-5.4<br>AIRFIELD GUIDANCE SIGN ON FOUNDATION - 1 MOD | 1.000<br>EA | | | | |
| 0250 | L-125-5.5<br>AIRFIELD GUIDANCE SIGN ON FOUNDATION - 3 MOD | 9.000<br>EA | | | | |
| 0260 | M-120-1<br>MAINTENANCE AND PROTECTION OF TRAFFIC | LUMP SUM | LUMP SUM | | | |
| 0270 | M-150-1<br>PROJECT SURVEY AND STAKEOUT | LUMP SUM | LUMP SUM | | | |
| 0280 | P-101-5.6<br>COLD MILLING | 900.000<br>SY | | | | |
| 0290 | P-101-5.7<br>REMOVAL OF PIPE AND OTHER BURIED STRUCTURES | LUMP SUM | LUMP SUM | | | |
| 0300 | P-152-4.1a<br>UNCLASSIFIED EXCAVATION | 2,331.000<br>CY | | | | |
| 0320 | P-152-4.1c<br>MUCK EXCAVATION | 250.000<br>CY | | | | |
| 0330 | P-207-5.1<br>IN-PLACE FULL DEPTH RECYCLED (FDR) ASPHALT AGGREGATE BASE COURSE | 12,100.000<br>SY | | | | |

Proposal ID: 020655.03 Project(s): 020655.03

SECTION: 1 FAA ITEMS

Alt Set ID: Alt Mbr ID:

Contractor: _____

| Proposal Line Number | Item ID<br>Description | Approximate Quantity and Units | Unit Price<br>Dollars | <br>Cents | Bid Amount<br>Dollars | <br>Cents |
|---|---|---|---|---|---|---|
| 0350 | P-207-5.2<br>CORRECTIVE AGGREGATE MATERIAL | 1,900.000<br>T | | | | |
| 0370 | P-401-8.1<br>ASPHALT SURFACE COURSE | 3,600.000<br>T | | | | |
| 0390 | P-603-5.1<br>EMULSIFIED ASPHALT TACK COAT | 1,300.000<br>G | | | | |
| 0410 | P-605-5.1<br>JOINT SEALANT FOR PAVEMENTS | 1,400.000<br>LF | | | | |
| 0420 | P-620-5.1a<br>SURFACE PREPERATION (MARKING REMOVAL) | 1,400.000<br>SF | | | | |
| 0430 | P-620-5.2b<br>SURFACE PAVEMENT MARKINGS | 7,500.000<br>SF | | | | |
| 0450 | P-620-5.3c<br>REFLECTIVE MEDIA | 450.000<br>LB | | | | |
| 0460 | T-901-5.1<br>SEEDING | 116.000<br>1KSF | | | | |
| 0480 | T-905-5.1<br>TOPSOIL (OBTAINED ON SITE) | 750.000<br>CY | | | | |
| 0500 | T-905-5.2<br>TOPSOIL (OBTAINED OFF SITE) | 750.000<br>CY | | | | |
| 0520 | T-908-5.1<br>MULCHING | 13,500.000<br>SY | | | | |

Section: 1 Total: _____.____

Proposal ID: 020655.03 Project(s): 020655.03

SECTION: 2 STATE FUNDED ITEMS

Alt Set ID: Alt Mbr ID:

Contractor: _____

| Proposal Line Number | Item ID<br>Description | Approximate Quantity and Units | Unit Price<br>Dollars | <br>Cents | Bid Amount<br>Dollars | <br>Cents |
|---|---|---|---|---|---|---|
| 0220 | L-125-5.1<br>L-861 BASE MOUNTED LED ELEVATED TAXIWAY EDGE LIGHT | 6.000<br>EA | | | | |
| 0310 | P-152-4.1a<br>UNCLASSIFIED EXCAVATION | 50.000<br>CY | | | | |
| 0340 | P-207-5.1<br>IN-PLACE FULL DEPTH RECYCLED (FDR) ASPHALT AGGREGATE BASE COURSE | 1,800.000<br>SY | | | | |
| 0360 | P-207-5.2<br>CORRECTIVE AGGREGATE MATERIAL | 300.000<br>T | | | | |
| 0380 | P-401-8.1<br>ASPHALT SURFACE COURSE | 600.000<br>T | | | | |
| 0400 | P-603-5.1<br>EMULSIFIED ASPHALT TACK COAT | 200.000<br>G | | | | |
| 0440 | P-620-5.2b<br>SURFACE PAVEMENT MARKINGS | 1,100.000<br>SF | | | | |
| | Section: 2 | | Total: | | | |
| | | | Total Bid: | | | |

# CONTRACT AGREEMENT, OFFER & AWARD

AGREEMENT made on the date last signed below, by and between the State of Maine, acting through and by its Department of Transportation (Department), an agency of state government with its principal administrative offices located at Child Street, Augusta, Maine, with a mailing address at 16 State House Station, Augusta, Maine 04333-0016, and

_____

a corporation or other legal entity organized under the laws of the State of _____, with its principal place of business located at _____

_____

The Department and the Contractor, in consideration of the mutual promises set forth in this Agreement (the "Contract"), hereby agree as follows:

**A. The Work.**

The Contractor agrees to complete all Work as specified or indicated in the Contract including Extra Work in conformity with the Contract, **WIN. 020655.03** for **Reconstruction, Markings, Lighting, and Signing** in the city of **Augusta**, County of **Kennebec** Maine. The Work includes construction, maintenance during construction, warranty as provided in the Contract, and other incidental work.

The Contractor shall be responsible for furnishing all supervision, labor, equipment, tools supplies, permanent materials and temporary materials required to perform the Work including construction quality control including inspection, testing and documentation, all required documentation at the conclusion of the project, warranting its work and performing all other work indicated in the Contract.

The Department shall have the right to alter the nature and extent of the Work as provided in the Contract; payment to be made as provided in the same.

**B. Time.**

The Contractor agrees to complete all Work, except warranty work, on or before **June 10, 2023.** Further, the Department may deduct from moneys otherwise due the Contractor, not as a penalty, but as Liquidated Damages in accordance with Sections 107.7 and 107.8 of the *State of Maine Department of Transportation Standard Specifications, March 2020 Edition* and related Special Provisions.

**C. Price.**

The quantities given in the Schedule of Items of the Bid Package will be used as the basis for determining the original Contract amount and for determining the amounts of the required Performance Surety Bond and Payment Surety Bond, and that the amount of this offer is _____

_____

**$**_____ Performance Bond and Payment Bond each being 100% of the amount of this Contract.

**D. Contract.**

This Contract, which may be amended, modified, or supplemented in writing only, consists of the Contract documents as defined in the Plans, *Standard Specifications, March 2020 Edition, Standard Details March 2020 Edition* as updated through advertisement, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds. It is agreed and understood that this Contract will be governed by the documents listed above.

**E. Certifications.**

By signing below, the Contractor hereby certifies that to the best of the Contractor's knowledge and belief:

1. All of the statements, representations, covenants, and/or certifications required or set forth in the Bid and the Bid Documents, including those in the FAA Contract Provisions Supplement, and the Contract are still complete and accurate as of the date of this Agreement.

2. The Contractor knows of no legal, contractual, or financial impediment to entering into this Contract.

3. The person signing below is legally authorized by the Contractor to sign this Contract on behalf of the Contractor and to legally bind the Contractor to the terms of the Contract.

**F. Offer.**

The undersigned, having carefully examined the site of work, the Plans, *Standard Specifications March 2020 Edition, Standard Details March 2020 Edition* as updated through advertisement, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds contained herein for construction of:

**WIN. 020655.03- Reconstruction, Markings, Lighting, and Signing - in the city of Augusta**

State of Maine, on which bids will be received until the time specified in the "Notice to Contractors" do(es) hereby bid and offer to enter into this contract to supply all the materials, tools, equipment and labor to construct the whole of the Work in strict accordance with the terms and conditions of this Contract at the unit prices in the attached "Schedule of Items."

The Offeror agrees to perform the work required at the price specified above and in accordance with the bids provided in the attached "Schedule of Items" in strict accordance with the terms of this solicitation, and to provide the appropriate insurance and bonds if this offer is accepted by the Government in writing.

As Offeror also agrees:

First: To do any extra work, not covered by the attached "Schedule of Items," which may be ordered by the Resident, and to accept as full compensation the amount determined upon a "Force Account" basis as provided in the *Standard Specifications, March 2020 Edition*, and as addressed in the contract documents.

Second: That the bid bond at 5% of the bid amount or the official bank check, cashier's check, certificate of deposit or U. S. Postal Money Order in the amount given in the "Notice to Contractors", payable to the Treasurer of the State of Maine and accompanying this bid, shall be forfeited, as liquidated damages, if in case this bid is accepted, and the undersigned shall fail to abide by the terms and conditions of the offer and fail to furnish satisfactory insurance and Contract bonds under the conditions stipulated in the Specifications within 15 days of notice of intent to award the contract.

Third: To begin the Work as stated in Section 107.2 of the *Standard Specifications March 2020 Edition* and complete the Work within the time limits given in the Special Provisions of this Contract.

Fourth: The Contractor will be bound to the Disadvantaged Business Enterprise (DBE) Requirements contained in the attached Notice (Additional Instructions to Bidders) and submit a completed Contractor's Disadvantaged Business Enterprise Utilization Plan with their bid.

Fifth: That this offer shall remain open for 150 calendar days after the date of opening of bids.

Sixth: The Bidder hereby certifies, to the best of its knowledge and belief that: the Bidder has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of competitive bidding in connection with its bid, and its subsequent contract with the Department.

IN WITNESS WHEREOF, the Contractor, for itself, its successors and assigns, hereby execute two duplicate originals of this Agreement and thereby binds itself to all covenants, terms, and obligations contained in the Contract Documents.

CONTRACTOR

| | |
|---|---|
| _____ | _____ |
| Date | (Signature of Legally Authorized Representative of the Contractor) |
| _____ | _____ |
| Witness | (Name and Title Printed) |

**G. Award.**

Your offer is hereby accepted. This award consummates the Contract, and the documents referenced herein.

MAINE DEPARTMENT OF TRANSPORTATION

| | |
|---|---|
| _____ | _____ |
| Date | By: Bruce A. Van Note, Commissioner |
| _____ | |
| Witness | |

# CONTRACT AGREEMENT, OFFER & AWARD

AGREEMENT made on the date last signed below, by and between the State of Maine, acting through and by its Department of Transportation (Department), an agency of state government with its principal administrative offices located at Child Street, Augusta, Maine, with a mailing address at 16 State House Station, Augusta, Maine 04333-0016, and

_____

a corporation or other legal entity organized under the laws of the State of _____, with its principal place of business located at _____

_____

The Department and the Contractor, in consideration of the mutual promises set forth in this Agreement (the "Contract"), hereby agree as follows:

**A. The Work.**

The Contractor agrees to complete all Work as specified or indicated in the Contract including Extra Work in conformity with the Contract, **WIN. 020655.03** for **Reconstruction, Markings, Lighting, and Signing** in the city of **Augusta**, County of **Kennebec** Maine. The Work includes construction, maintenance during construction, warranty as provided in the Contract, and other incidental work.

The Contractor shall be responsible for furnishing all supervision, labor, equipment, tools supplies, permanent materials and temporary materials required to perform the Work including construction quality control including inspection, testing and documentation, all required documentation at the conclusion of the project, warranting its work and performing all other work indicated in the Contract.

The Department shall have the right to alter the nature and extent of the Work as provided in the Contract; payment to be made as provided in the same.

**B. Time.**

The Contractor agrees to complete all Work, except warranty work, on or before **June 10, 2023.** Further, the Department may deduct from moneys otherwise due the Contractor, not as a penalty, but as Liquidated Damages in accordance with Sections 107.7 and 107.8 of the *State of Maine Department of Transportation Standard Specifications, March 2020 Edition* and related Special Provisions.

**C. Price.**

The quantities given in the Schedule of Items of the Bid Package will be used as the basis for determining the original Contract amount and for determining the amounts of the required Performance Surety Bond and Payment Surety Bond, and that the amount of this offer is _____

_____

**$**_____ Performance Bond and Payment Bond each being 100% of the amount of this Contract.

**D. Contract.**

This Contract, which may be amended, modified, or supplemented in writing only, consists of the Contract documents as defined in the Plans, *Standard Specifications, March 2020 Edition, Standard Details March 2020 Edition* as updated through advertisement, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds. It is agreed and understood that this Contract will be governed by the documents listed above.

**E. Certifications.**

By signing below, the Contractor hereby certifies that to the best of the Contractor's knowledge and belief:

1. All of the statements, representations, covenants, and/or certifications required or set forth in the Bid and the Bid Documents, including those in the FAA Contract Provisions Supplement, and the Contract are still complete and accurate as of the date of this Agreement.

2. The Contractor knows of no legal, contractual, or financial impediment to entering into this Contract.

3. The person signing below is legally authorized by the Contractor to sign this Contract on behalf of the Contractor and to legally bind the Contractor to the terms of the Contract.

**F. Offer.**

The undersigned, having carefully examined the site of work, the Plans, *Standard Specifications March 2020 Edition, Standard Details March 2020 Edition* as updated through advertisement, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds contained herein for construction of:

**WIN. 020655.03- Reconstruction, Markings, Lighting, and Signing - in the city of Augusta**

State of Maine, on which bids will be received until the time specified in the "Notice to Contractors" do(es) hereby bid and offer to enter into this contract to supply all the materials, tools, equipment and labor to construct the whole of the Work in strict accordance with the terms and conditions of this Contract at the unit prices in the attached "Schedule of Items."

The Offeror agrees to perform the work required at the price specified above and in accordance with the bids provided in the attached "Schedule of Items" in strict accordance with the terms of this solicitation, and to provide the appropriate insurance and bonds if this offer is accepted by the Government in writing.

As Offeror also agrees:

First: To do any extra work, not covered by the attached "Schedule of Items," which may be ordered by the Resident, and to accept as full compensation the amount determined upon a "Force Account" basis as provided in the *Standard Specifications, March 2020 Edition*, and as addressed in the contract documents.

Second: That the bid bond at 5% of the bid amount or the official bank check, cashier's check, certificate of deposit or U. S. Postal Money Order in the amount given in the "Notice to Contractors", payable to the Treasurer of the State of Maine and accompanying this bid, shall be forfeited, as liquidated damages, if in case this bid is accepted, and the undersigned shall fail to abide by the terms and conditions of the offer and fail to furnish satisfactory insurance and Contract bonds under the conditions stipulated in the Specifications within 15 days of notice of intent to award the contract.

Third: To begin the Work as stated in Section 107.2 of the *Standard Specifications March 2020 Edition* and complete the Work within the time limits given in the Special Provisions of this Contract.

Fourth: The Contractor will be bound to the Disadvantaged Business Enterprise (DBE) Requirements contained in the attached Notice (Additional Instructions to Bidders) and submit a completed Contractor's Disadvantaged Business Enterprise Utilization Plan with their bid.

Fifth: That this offer shall remain open for 30 calendar days after the date of opening of bids.

Sixth: The Bidder hereby certifies, to the best of its knowledge and belief that: the Bidder has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of competitive bidding in connection with its bid, and its subsequent contract with the Department.

IN WITNESS WHEREOF, the Contractor, for itself, its successors and assigns, hereby execute two duplicate originals of this Agreement and thereby binds itself to all covenants, terms, and obligations contained in the Contract Documents.

CONTRACTOR

| | |
|---|---|
| _____ | _____ |
| Date | (Signature of Legally Authorized Representative of the Contractor) |
| _____ | _____ |
| Witness | (Name and Title Printed) |

**G. Award.**

Your offer is hereby accepted. This award consummates the Contract, and the documents referenced herein.

MAINE DEPARTMENT OF TRANSPORTATION

| | |
|---|---|
| _____ | _____ |
| Date | By: Bruce A. Van Note, Commissioner |
| _____ | |
| Witness | |

# CONTRACT AGREEMENT, OFFER & AWARD

AGREEMENT made on the date last signed below, by and between the State of Maine, acting through and by its Department of Transportation (Department), an agency of state government with its principal administrative offices located at Child Street Augusta, Maine, with a mailing address at 16 State House Station, Augusta, Maine 04333-0016, and **(Name of the firm bidding the job)** a corporation or other legal entity organized under the laws of the State of Maine, with its principal place of business located at **(address of the firm bidding the job)**

The Department and the Contractor, in consideration of the mutual promises set forth in this Agreement (the "Contract"), hereby agree as follows:

SAMPLE

**A. The Work.**

The Contractor agrees to complete all Work as specified or indicated in the Contract including Extra Work in conformity with the Contract, PIN No.01**12345.00**, for the **Hot Mix Asphalt Overlay** in the town/city of **South Nowhere,** County of **Washington**, Maine. The Work includes construction, maintenance during construction, warranty as provided in the Contract, and other incidental work.

The Contractor shall be responsible for furnishing all supervision, labor, equipment, tools supplies, permanent materials and temporary materials required to perform the Work including construction quality control including inspection, testing and documentation, all required documentation at the conclusion of the project, warranting its work and performing all other work indicated in the Contract.

The Department shall have the right to alter the nature and extent of the Work as provided in the Contract; payment to be made as provided in the same.

**B. Time.**

The Contractor agrees to complete all Work, except warranty work, on or before **November 15, 2006.** Further, the Department may deduct from moneys otherwise due the Contractor, not as a penalty, but as Liquidated Damages in accordance with Sections 107.7 and 107.8 of the *State of Maine Department of Transportation Standard Specifications, March 2020 Edition* and related Special Provisions.

**C. Price.**

The quantities given in the Schedule of Items of the Bid Package will be used as the basis for determining the original Contract amount and for determining the amounts of the required Performance Surety Bond and Payment Surety Bond, and that the amount of this offer is **(Place bid here in alphabetical form such as One Hundred and Two dollars and 10 cents)** **$ (repeat bid here in numerical terms, such as $102.10)** Performance Bond and Payment Bond each being 100% of the amount of this Contract.

**D. Contract.**

This Contract, which may be amended, modified, or supplemented in writing only, consists of the Contract documents as defined in the Plans, *Standard Specifications, March 2020 Edition, Standard Details March 2020 Edition*, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds. It is agreed and understood that this Contract will be governed by the documents listed above.

**E. Certifications.**

By signing below, the Contractor hereby certifies that to the best of the Contractor's knowledge and belief:

1. All of the statements, representations, covenants, and/or certifications required or set forth in the Bid and the Bid Documents, including those in Appendix A to Division 100 of the *Standard Specifications March 2020 Edition* (Federal Contract Provisions Supplement), and the Contract are still complete and accurate as of the date of this Agreement.

2. The Contractor knows of no legal, contractual, or financial impediment to entering into this Contract.

3. The person signing below is legally authorized by the Contractor to sign this Contract on behalf of the Contractor and to legally bind the Contractor to the terms of the Contract.

SAMPLE

**F. Offer.**

The undersigned, having carefully examined the site of work, the Plans, *Standard Specifications, March 2020 Edition, Standard Details March 2020 Edition*, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds contained herein for construction of:

**PIN 012345.00 South Nowhere, Hot Mix Asphalt Overlay ,**

State of Maine, on which bids will be received until the time specified in the "Notice to Contractors" do(es) hereby bid and offer to enter into this contract to supply all the materials, tools, equipment and labor to construct the whole of the Work in strict accordance with the terms and conditions of this Contract at the unit prices in the attached "Schedule of Items."

The Offeror agrees to perform the work required at the price specified above and in accordance with the bids provided in the attached "Schedule of Items" in strict accordance with the terms of this solicitation, and to provide the appropriate insurance and bonds if this offer is accepted by the Government in writing.

SAMPLE

As Offeror also agrees:

First: To do any extra work, not covered by the attached "Schedule of Items," which may be ordered by the Resident, and to accept as full compensation the amount determined upon a "Force Account" basis as provided in the *Standard Specifications, March 2020 Edition*, and as addressed in the contract documents.

Second: That the bid bond at 5% of the bid amount or the official bank check, cashier's check, certificate of deposit or U. S. Postal Money Order in the amount given in the "Notice to Contractors", payable to the Treasurer of the State of Maine and accompanying this bid, shall be forfeited, as liquidated damages, if in case this bid is accepted, and the undersigned shall fail to abide by the terms and conditions of the offer and fail to furnish satisfactory insurance and Contract bonds under the conditions stipulated in the Specifications within 15 days of notice of intent to award the contract.

Third: To begin the Work as stated in Section 107.2 of the *Standard Specifications March 2020 Edition* and complete the Work within the time limits given in the Special Provisions of this Contract.

Fourth: The Contractor will be bound to the Disadvantaged Business Enterprise (DBE) Requirements contained in the attached Notice (Additional Instructions to Bidders) and submit a completed Contractor's Disadvantaged Business Enterprise Utilization Plan with their bid.

Fifth: That this offer shall remain open for 30 calendar days after the date of opening of bids.

Sixth: The Bidder hereby certifies, to the best of its knowledge and belief that: the Bidder has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of competitive bidding in connection with its bid, and its subsequent contract with the Department.

IN WITNESS WHEREOF, the Contractor, for itself, its successors and assigns, hereby execute two duplicate originals of this Agreement and thereby binds itself to all covenants, terms, and obligations contained in the Contract Documents.

CONTRACTOR

| | |
|---|---|
| _____ | **(Sign Here)** |
| Date | (Signature of Legally Authorized Representative of the Contractor) |
| **(Witness Sign Here)** | **(Print Name Here)** |
| Witness | (Name and Title Printed) |

SAMPLE

**G. Award.**

Your offer is hereby accepted. This award consummates the Contract, and the documents referenced herein.

MAINE DEPARTMENT OF TRANSPORTATION

| | |
|---|---|
| _____ | _____ |
| Date | By: Bruce A. Van Note, Commissioner |
| _____ | |
| (Witness) | |

BOND # _____

CONTRACT PERFORMANCE BOND
(Surety Company Form)

KNOW ALL MEN BY THESE PRESENTS: That _____ _____ **in the State of** _____, as principal, and……..., a corporation duly organized under the laws of the State of ..... and having a usual place of business ..... ....., as Surety, are held and firmly bound unto the Treasurer of the State of Maine in the sum of _____ **and 00/100 Dollars ($ ),** to be paid said Treasurer of the State of Maine or his successors in office, for which payment well and truly to be made, Principal and Surety bind themselves, their heirs, executors and administrators, successors and assigns, jointly and severally by these presents.

The condition of this obligation is such that if the Principal designated as Contractor in the Contract to construct Project Number _____ in the Municipality of _____ promptly and faithfully performs the Contract, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

The Surety hereby waives notice of any alteration or extension of time made by the State of Maine.

Signed and sealed this ..... day of ....., 20….. .

| WITNESSES: | SIGNATURES: |
|---|---|
| | CONTRACTOR: |
| Signature..... | .....…..... |
| Print Name Legibly ..... | Print Name Legibly ...…….... |
| | SURETY: |
| Signature ..... | ....…….... |
| Print Name Legibly ..... | Print Name Legibly ..... |
| SURETY ADDRESS: | NAME OF LOCAL AGENCY: |
| ..... | ADDRESS ..... |
| ..... | ..…….... |
| ..... | .....……..... |
| TELEPHONE..... | .....……..... |

SAMPLE

BOND # _____

CONTRACT PAYMENT BOND
(Surety Company Form)

KNOW ALL MEN BY THESE PRESENTS: That _____
_____ **in the State of** _____, as principal, and.....
a corporation duly organized under the laws of the State of ..... and having a usual place of business in .....,
as Surety, are held and firmly bound unto the Treasurer of the State of Maine for the use and benefit of claimants as herein below defined, in the sum of _____ **and 00/100 Dollars ($ )** for the payment whereof Principal and Surety bind themselves, their heirs, executors and administrators, successors and assigns, jointly and severally by these presents.

The condition of this obligation is such that if the Principal designated as Contractor in the Contract to construct Project Number _____ in the Municipality of _____ promptly satisfies all claims and demands incurred for all labor and material, used or required by him in connection with the work contemplated by said Contract, and fully reimburses the obligee for all outlay and expense which the obligee may incur in making good any default of said Principal, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

A claimant is defined as one having a direct contract with the Principal or with a Subcontractor of the Principal for labor, material or both, used or reasonably required for use in the performance of the contract.

Signed and sealed this ..... day of ....., 20 ... .

| | |
|---|---|
| WITNESS: | SIGNATURES: |
| | CONTRACTOR: |
| Signature……..... | .....…..... |
| Print Name Legibly .....…….. | Print Name Legibly ….... |
| | SURETY: |
| Signature..... | ...…..... |
| Print Name Legibly ..... | Print Name Legibly ….... |
| SURETY ADDRESS: | NAME OF LOCAL AGENCY: |
| ...…..... | ADDRESS …..... |
| ..... | …….... |
| TELEPHONE ..... | …….... |

SAMPLE

STATE OF MAINE

# MaineDOT

## Department of Transportation

# Standard Specifications

March 2020

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# DIVISION 100 - GENERAL CONDITIONS

100.1 Replacement of Former Standard Specifications and Standard Details This 2020 edition of the Maine Department of Transportation's Standard Specifications and Standard Details for Construction ("Standard Specifications") was drafted and adopted by the Department pursuant to the authority granted to it by 23 MRSA § 4243. These Standard Specifications replace and supersede all previous Standard Specifications and Standard Details. The Standard Specifications are Contract provisions issued by the Department that govern the relationship between the Department and the Department's Contractors. By virtue of submitting a Bid on a project, each Bidder is bound by the terms of these Standard Specifications.

## SECTION 101 - CONTRACT INTERPRETATION

Scope of Section This Section consists of abbreviations, definitions, and general rules of interpretation.

101.1 Abbreviations Abbreviations are defined in the following list. Abbreviations not defined in this Section or otherwise in the Contract shall have the meaning that is commonly accepted in the engineering and construction industry.

| | |
|---|---|
| AAN | American Association of Nurserymen, Incorporated |
| AAR | Association of American Railroads |
| AASHTO | American Association of State Highway and Transportation Officials |
| ACI | American Concrete Institute |
| ADA | Americans with Disabilities Act |
| AGC | Associated General Contractors of America |
| AIA | American Institute of Architects |
| AISC | American Institute of Steel Construction |
| ANLA | American Nursery & Landscape Association |
| ANSI | American National Standards Institute |
| ARA | American Railway Association |
| AREMA | American Railway Engineering and Maintenance-of-way Association |
| ARTBA | American Road & Transportation Builders Association |
| ASCE | American Society of Civil Engineers |
| ASD | Allowable Stress Design |
| ASLA | American Society of Landscape Architects |
| ASME | American Society of Mechanical Engineers |
| ASTM | American Society for Testing and Materials |
| ATSSA | American Traffic Safety Services Association |
| AWWA | American Water Works Association |
| AWPA | American Wood Protection Association |
| AWS | American Welding Society |

| | |
|---|---|
| BMP | The Department's "Best Management Practices for Erosion and Sediment Control" |
| CFR | Code of Federal Regulations |
| DBE | Disadvantaged Business Enterprise |
| DREW | Daily Reports of Extra Work |
| DRB | Dispute Review Board |
| EIA | Electronic Industries Association |
| EEO | Equal Employment Opportunity |
| EMS | Emergency Medical Service |
| FAA | Federal Aviation Administration |
| FHWA | Federal Highway Administration |
| FRA | Federal Railroad Administration |
| FSS | Federal Specifications and Standards, General Services Administration |
| IES | Illuminating Engineering Society |
| IMSA | International Municipal Signal Association |
| IPCEA | Insulated Power Cable Engineers Association |
| ISEE | International Society of Explosives Engineers |
| ISO | Insurance Services Office |
| ITE | Institute of Transportation Engineers |
| LFD | Load Factor Design |
| LRFD | Load and Resistance Factor Design |
| LUPC | Land Use Planning Commission - Maine |
| MCTCB | Maine Concrete Technician Certification Board |
| MDEP | Maine Department of Environmental Protection |
| MaineDOT | Maine Department of Transportation |
| MIL | Military Specifications |
| MRSA | Maine Revised Statutes Annotated |
| MUTCD | Manual on Uniform Traffic Control Devices |
| NBS | National Bureau of Standards |
| NEC | National Electrical Code |
| NEMA | National Electrical Manufacturers Association |
| NEPCOAT | Northeast Protective Coating Committee |
| NESC | National Electric Safety Code |
| NETTCP | New England Transportation Technician Certification Program |
| NHS | National Highway System |
| NICET | National Institute for Certification in Engineering Technologies |
| OJT | On-The-Job Training |
| OSHA | Occupational Safety and Health Administration |
| PCI | Precast/Prestressed Concrete Institute |
| PIN | Project Identification Numbers |
| QA | Quality Assurance |
| QC | Quality Control |
| QCP | Quality Control Plan |
| QPL | Qualified Products List |
| RFI | Request for Information |
| SAE | Society of Automotive Engineers |

| | |
|---|---|
| SEWPCP | Soil Erosion and Water Pollution Control Plan |
| SHA | State Highway Agency (as used by FHWA, referring to the Department) |
| SPCCP | Spill Prevention Control and Countermeasure Plan |
| SSPC | The Society for Protective Coatings |
| TAPPI | Technical Association of Pulp and Paper Industry |
| TCP | Traffic Control Plan |
| USC | United States Code |
| USDA | United States Department of Agriculture |
| UL | Underwriter's Laboratory |
| VECP | Value Engineering Change Proposal |

101.2 Definitions Certain words, terms, and phrases are defined below. Capitalized words in this Standard Specifications book are defined under this Section. Words, terms, or phrases that are not defined in this Section 101.2 or otherwise in the Contract shall have the meaning commonly accepted in the engineering and construction industry.

Acceptable Work Work that Conforms or Substantially Conforms to the Contract and is satisfactory to the Department.

Acceptance Consideration of operations, inspections, samples, tests, certifications, proper QCP implementation, and end product properties to determine whether the product will be accepted for payment, including any adjustments to compensation as provided in the Contract.

Acceptance Test Test utilized by the Department to evaluate the quality of a Material or product.

Actual Costs Direct, Project-specific, costs actually incurred by the Contractor in the performance of Work. Actual Costs consist of labor, Material, Equipment, and administrative overhead. For related provisions, see Section 109.7, Equitable Adjustments to Compensation and Time and Section 109.7.2 – Basis of Payment.

Addendum See Bid Amendment.

Aggregate Inert Material such as sand, gravel, broken stone, crushed stone, or a combination of any of these Materials.

Agreement Agreement means Contract Agreement.

Apparent Low Bidder A Bidder that submits the lowest apparently responsive Bid. The Apparent Low Bidder may not be Awarded the Contract if a) the Bid is later found to be non-responsive in accordance with Section 102.11, b) the Bidder is found to be not responsible, c) the Bidder fails to comply with all applicable pre-Award Conditions or other pre-execution requirements of the Contract, or d) the Department chooses not to Award a Contract.

Apparent Successful Bidder The Bidder with the lowest responsive Bid as determined by the Department. A responsive responsible Bidder, usually the Apparent Low Bidder, that is Awarded the Contract. The Department may not execute the Contract with the Apparent Successful Bidder if a) the Apparent Successful Bidder fails to comply with all applicable pre-Award conditions or other pre-execution requirements of the Contract or b) if the Department chooses not to Award a Contract.

Award The execution of the Contract by the Department, conditioned upon the Successful Bidder's performance of all pre-execution requirements of the Bid Documents.

Award Conditions Pre-Award or pre-execution requirements that the Contractor must meet before Contract Execution, including bonding and insurance. For a related provision, see Section 103.5 - Award Conditions.

Best Value Procurement Process Using a Request for Proposals A process for procuring contractual services in which price is only one of several factors used in determining the successful Proposer. See Proposer, Request for Proposals, and Design-Build Contract.

Bid The offer by a Bidder on forms prescribed by the Department to perform the Work in Conformity with all provisions of the Bid Documents for the price(s) set forth.

Bid Amendment A written change to the Bid Documents issued by the Department after advertisement and before the Bid Opening.

Bid Bond A bond furnished with a Bid by a Bidder and its Surety in the amount set forth in the Notice to Contractors or elsewhere in the Bid Documents. The Bid Bond is forfeited if the Apparent Low Bidder refuses to enter into a Contract with the Department.

Bid Contact Person The person identified in the advertised Notice to Contractors, usually the Project Manager, as the person to whom the Bidder must refer technical or Engineering questions from the time of advertisement through Contract Execution, said person being duly authorized by the Commissioner. The Contracts Engineer may be contacted regarding Bidding and contracting procedures. If no one is so identified, the Bidder must refer questions to the Contracts Engineer. All technical or project specific questions must be submitted as described in the Notice to Contractors.

Bidder An individual, firm, corporation, limited liability company, partnership, joint venture, sole proprietorship, or other entity that submits a Bid. Upon Contract Execution, the successful Bidder becomes the Contractor.

Bid Documents Documents issued by the Department to solicit Bids from Contractors. Bid Documents generally include the Project Specific Bid Book, Notice to Contractors, Plans and Specifications (including these Standard Specifications), Standard Details, Special Provisions, Bidding instructions, and any Bid Amendments issued by the Department. Documents attached to or referenced in the Bid Documents are part of the Bid Documents.

Contrast “Bid Documents” with “Bid Escrow Documentation” as may be defined by Special Provision.

Bid Escrow Documentation All writings, working papers, computer printouts, charts, schedules of prices, and data compilation that contain or reflect information, quantities, unit costs, data, or calculations used by the Bidder to determine the Bid price, or technical and price proposal in the case of a Design-Build or Best Value Procurement type of Contract, shall be submitted, including but not limited to material relating to the determination and application of:

Design Costs
Equipment rates
Overhead rates and related time schedules
Labor rates
Arithmetic extensions
Subcontractor and Material Supplier Quotations

Any manuals standard to the industry used by the Bidder in determining the Bid are also considered Bid Escrow Documentation. These manuals may be included in the Bid Escrow Documentation by reference and shall show the name and date of the publication and the publisher. Bid Escrow Documentation need not include Bid Documents provided by the Department to all Bidders.

Bid Guaranty A bond or other acceptable security specified in the Notice to Contractors or elsewhere in the Bid Documents that is forfeited if the Apparent Low Bidder refuses to enter into a Contract with the Department. For a related provision, see Section 102.6 - Bid Guaranty.

Bid Opening The date and precise time by which the Bidder must Deliver its Bid to be publicly opened and read as specified in the Notice to Contractors or any applicable Bid Amendment. For related provisions, see Sections 102.7 - Delivery of Bids and 102.9 - Bid Opening.

Blue Book The edition of publications entitled “Rental Rate Blue Book for Construction Equipment” or “Rental Rate Blue Book for Older Construction Equipment,” as applicable, published by Primedia Information Inc., that was current when the Work being priced was performed.

Bridge A structure that is erected over a depression or an obstruction, such as water, a highway or a railway, and has an opening measured along the centerline of the Roadway of more than 20 feet between: the faces of abutments; spring line of arches; extreme ends of openings of box culverts, pipes or pipe arches; or the extreme ends of openings for multiple box culverts, pipes, or pipe arches.

A. Length The length of a Bridge structure is the overall length measured along the construction centerline back to back of backwalls of abutments, if present; otherwise end to end of the Bridge floor; but in no case less than the total opening of the structure.

B. Roadway Width The width measured at right angles to the longitudinal centerline of the Bridge between the bottom of curbs or guard timbers or in case of multiple heights of curbs, between the bottoms of the lower risers.

Business Day Every Calendar Day other than Saturdays, Sundays, and Holidays.

Calendar Day Every day shown on the calendar, beginning at 12:01 a.m. and ending at midnight.

Change Order See Contract Modification

Chief Engineer The Chief Engineer of the Department.

Closeout Documentation All documentation required by the Department to finish the Project in accordance with State, federal, and other requirements. These documents include:

Letter "All Bills Paid" on Contractor's letterhead
Request for Final Payment on Contractor's letterhead
"Buy America" Statement
Certificate of Materials
DBE Goal Attainment Verification Form
Agreement with Final Quantities on Contractor's letterhead
Testing Compliance Letter

The Department reserves the right to amend this list of required Closeout Documentation

Commissioner The Commissioner of Transportation established by 23 MRSA § 4205.

Compensable Delay See Section 109.5.1 - Definitions - Types of Delays.

Completion Completion occurs when the Contractor has finished all Work pursuant to the Contract, including Delivery of all Closeout Documentation. Completion does not mean substantial Completion. Unless the context indicates otherwise, Completion also does not mean Completion of Physical Work.

Completion of Physical Work Completion of Physical Work occurs when the Work is complete and has undergone a successful final inspection.

Conduit A pipe used for receiving and protecting wires or cable.

Conform or Conformity The performance of an item of Work in strict compliance with all applicable provisions of the Contract. For a related definition, see Substantially Conform.

Construction Easement A right acquired by the Department to use or control property, outside of the established Right-of-Way.

Construction Limit Line A line, usually outside of the Right-of-Way, within which the Contractor may Work and outside of which Work may not be performed without authorization by the Department.

Contract All documents affecting the respective rights and responsibilities of the Department and the Contractor. These documents include, but are not limited to, the Contract Agreement, Project Specific Bid Book, the Notice to Contractors, Plans, the Department's Standard Specifications and Standard Details, Special Provisions, Bid Amendments, Contract Modifications, Geotechnical Information, Permits, Bid Escrow Documentation (if any), the Contractor's Bid prices (as corrected mathematically pursuant to Section 103.1.1 - Unit Prices Govern, if necessary), and all documents incorporated by reference.

Contract Bonds The forms of security approved by the Department, executed by the Contractor and its Surety or Sureties, guaranteeing performance of the Work, and the payment of all obligations pertaining to the Work. For related provisions, see the definitions of Bid Guaranty, Performance Bond, and Payment Bond.

Contract Completion Time Length of time allowed under the Contract to complete the Work pursuant to the terms of the Contract.

Contract Completion Date The required completion date of all Work pursuant to the Contract, except the landscape establishment period and warranty work. The Contract Completion Date is usually included in Special Provision 107 and on the Contract Agreement, Offer, & Award form.

Contract Documents Contract Documents are all documents, whether physically attached or incorporated by reference, which make up the Contract.

Contract Execution Execution of the Contract by the Commissioner or his or her authorized agent by signing the Contract Agreement, Offer, & Award form, which action, upon written notification to the Contractor, forms a Contract as provided in Section 103.8 - Execution of Contract by Department.

Contract Modification A general term describing a formal change to a Contract. Types of Contract Modifications include; change orders, extra work orders, resident work orders, and supplemental agreements. For a related provision, see Section 109.8 - Contract Modification

Contract Time See Contract Completion Time and Section 107.1 - Contract Time and Completion Date.

Contractor After the Department has executed the Contract by cosigning the Contract Agreement, Offer, & Award form provided in the Bid Documents, previously signed by the successful bidder, the Successful Bidder in a low Bid process or the successful Proposer in a best value type of Contract becomes the Contractor. The Contractor will be the single point of responsibility for all Contract obligations to the Department. The Contractor shall be an independent Contractor with respect to the Department and shall not be an employee, agent, or representative of the Department. Alternatively, "contractor," with a lower case "c," may mean a firm engaged in construction Work.

Critical Path The sequence of activities from the Project start to its Completion having the greatest cumulative elapsed time, thereby determining the minimum time duration of the entire Project. The Critical Path is identified by the sequence of those activities with the least float.

Critical Rock Slopes Critical rock slopes shall be rock slopes higher than 6 feet with an overburden slope steeper than 3H:1V and all rock slopes greater than 10 feet high.

Culvert Any structure not defined as a Large Culvert, Bridge, or Minor Span that provides a Drainage opening less than 5 feet, under the Roadway or approaches to the Roadway.

Days Calendar Days.

Default See Section 112.1 - Default.

Defects or Defective Work Work that is unsatisfactory, faulty, or deficient in that it is not in Conformity with the Contract or with prevailing industry standards applicable to the Work at the time of submission of the Bid as determined by the Department or its agents. For related provisions, see the definition of Acceptable Work and Section - 101.3.1 Meaning of "Approved," Etc.

Delay To cause to be late. See Section 109.5 - Adjustments for Delay.

Deliver To cause Receipt by a means set forth in the definition of Received or Receipt.

Department The Department of Transportation of the State of Maine, as established by 23 MRSA § 4205, et seq., for the administration of Highway, Bridge, and other public Works, acting through the Commissioner and his/her duly authorized representatives. For related provisions, see definitions of Project Manager and Resident.

Design-Build Contract A contract in which the Contractor is responsible for both design and construction requirements under the contract. In a Design-Build Contract, the Contractor maybe procured through a Best-Value Procurement process using a Request for

Proposals and evaluation of submitted Proposals using price as one of several evaluation factors as outlined in 23 MRSA § 4244.

Differing Site Conditions See Section 109.4 - Differing Site Conditions.

Disadvantaged Business Enterprise A business that is at least 51% owned and controlled by a woman, minority, or economically disadvantaged person and certified as such by the Department.

Disputes Disagreements, claims, counterclaims, matters in question, and differences of opinion between the Department and the Contractor and those Working for or through the Contractor regarding matters related to the Work that arise after Contract Execution. These include, but are not limited to, interpretation of the Contract, compensation and costs, time for performance, and quality.

Drainage The system of pipes, Drainage ways, ditches, and Structures by which surface or subsurface waters are collected and conducted from the Highway area.

Drawings See Plans.

Dredge Material (Dredge Spoils) Sand, silt, mud, gravel, rock or other sediment or material removed from beneath any surface water. The term, "beneath any surface water," has been interpreted by the MDEP to mean that area that falls beneath the plane bounded by the normal high water line of any stream, river, brook, pond, lake, vernal pool, etc. Note that the entire area of Dredge Material removal could be dry at the time of excavation.

Environmental Information Hazardous waste assessments, dredge material test results, boring logs, geophysical studies, and other records and reports of the environmental conditions. For a related provision, see Section 104.3.14 - Interpretation and Interpolation.

Equipment All machinery, supplies for repair and maintenance of such machinery, tools, and other apparatus necessary or appropriate for Completion of the Work in Conformity with the Contract.

Equitable Adjustment An adjustment to compensation and time due to a change in the nature or scope of the Work made a part of a Contract by a formal Contract Modification. For a related provision, see Section 109.7 - Equitable Adjustments to Compensation and Time.

Excusable Delay See Section 109.5.1 - Definitions - Types of Delays.

Extra Work Work that is outside the scope of the Contract and that the Department determines is necessary.

Extra Work Order See Contract Modification.

Fabrication Engineer The Department's representative responsible for Quality Assurance of pre-fabricated products that are produced off-site.

Federal Contract Provisions Supplement Appendix A of the Standard Specifications and the Project Specific Bid Book, which sets forth additional provisions that apply to federally funded Contracts.

Final Acceptance Acceptance by the Department for all Work and responsibility for the Project from the Contractor, except for any Contractor warranty obligations.

Force Account Work Prescribed Work paid on the basis of Actual Costs and additives as set forth in Section 109.7.5 - Force Account Work.

Geometrics The physical location (horizontally and vertically) and shape of the object under consideration.

Geotechnical Information Boring logs, soil reports, geotechnical design reports, ground penetrating radar evaluations, seismic refraction studies, and other records of subsurface conditions. For a related provision, see Section 104.3.14 - Interpretation and Interpolation.

Haul Road A private way leading to a public way that is used by the Contractor to move Equipment and Materials related to the Work.

Hearing Unless otherwise specified by the Department in writing, a Hearing is a review of a decision that includes a review of existing documentation on file with the Department and any additional documentation, including written arguments and supporting exhibits that may be submitted by any interested party. Unless the context clearly indicates otherwise, a Hearing need not include an evidentiary Hearing for the oral presentation of evidence if such an evidentiary Hearing is not requested or if the Department reasonably determines that such an evidentiary Hearing is not necessary to adequately review the matter at issue. Unless the context clearly indicates otherwise, a Hearing shall not be construed as an adjudicatory proceeding within the meaning of the Maine Administrative Procedure Act.

Highway A general term denoting a public way for purposes of vehicular travel, including the entire area within the Right-of-Way.

Holidays New Years Day, Martin Luther King Day, Presidents Day, Patriots Day, Memorial Day, Independence Day, Labor Day, Indigenous Peoples Day, Veterans Day, Thanksgiving Day, the Friday after Thanksgiving Day, and Christmas Day. For a related provision, see Section 107.3.3 - Sundays and Holidays.

Incentive/Disincentive Payment An adjustment to the contract price of a predetermined amount for each day the Work is completed ahead of or behind the Contract Time, Contract Completion Date, or some specified intermediary milestone. A disincentive is not a penalty, but an estimate of user and other costs incurred by the people of the State of Maine.

Incidentals The terms "Incidentals" and "Incidental to the Contract" mean items that are accessory to or incorporated into the Work and that have no separate Pay Item. Unless otherwise provided in the Contract, the cost of Incidentals shall be included in the Contractor's prices for the Pay Items. There will be no separate payment for Incidentals.

Incomplete Not complete, as defined above by Completion.

Independent Assurance (IA) Independent assessment of the reliability of test results obtained from Acceptance Testing.

Inexcusable Delay See Section 109.5.1 - Definitions - Types of Delays.

Inspector An authorized representative of the Resident assigned to make detailed inspections of the Work to determine compliance with the Contract.

In Stream Work Any activities conducted in the water (see permits in individual contract documents.)

Laboratory Unless the context indicates otherwise, the testing laboratory of the Department or its designee.

Landscape Establishment Period The period of time commencing at initial Acceptance of each planting and extending for two years, unless otherwise provided in the Contract. For a related provision, see Section 621 - Landscaping.

Landscape Establishment Period Obligations The obligations of the Landscape Subcontractor during the Landscape Establishment Period. Unless otherwise provided in the Contract, these obligations consist of monthly inspection and reporting from March through November of the condition of all plants installed and replacing plants that are not in a healthy, vigorous growing condition. For a related provision, see Section 621 - Landscaping.

Landscape Items Items starting with the number "621" in the Schedule of Items.

Landscape Subcontractor The individual or firm performing Landscape Items, generally a Subcontractor.

Lane A strip of Roadway intended to accommodate a single line of vehicles.

Large Culvert Any structure not defined as a Culvert or Bridge that provides a drainage or non-drainage opening under the Roadway or Approaches to the Roadway, with an opening that is at least 5 feet but less than 10 feet.

Liquidated Damages An amount due and payable to the Department by the Contractor, normally realized through a reduction of amounts to be paid to the Contractor. Liquidated Damages are calculated by multiplying a daily amount set forth in the Contract by the

number of Days the Work remains Incomplete after the Contract Completion Time has expired.

Major Item An individual Pay Item that constitutes 10% or more of the amount of the Awarded Contract, calculated using the Contractor's Bid prices and the estimated quantities contained in the Bid Documents.

Material Any substance specified for use in the construction of the Project and related approaches.

Minor Item All Pay Items that are not Major Items.

Minor Span Same definition as Bridge, except having an opening of between 10 feet and 20 feet, inclusive.

Modification See Contract Modification.

National Highway System (NHS) A system of Interstate Highways and major collectors specifically designated by the Federal Highway Administration. It includes the Interstate System, other urban and rural principal arterials, highways that provide motor vehicle access between the NHS and major intermodal transportation facilities, the defense strategic highway network, and strategic highway network connectors.

Non-conforming Work All Defective, Unauthorized, or Uninspected Work.

Notice of Award A written notice to the Contractor stating that the Contract has been executed.

Notice of Intent to Award A written notice to the Successful Bidder stating that the Department has conditionally accepted its offer and upon receipt of a payment bond, performance bond, insurance certificate and the fulfillment of any other pre-award conditions, the contract will be signed (executed) by the Department. For a related provision, see Section 103.4 - Notice of Award.

Notice to Contractors The advertisement or invitation for Bids published in accordance with Maine law, including electronic advertising, applicable to the Department.

Offer A response to a solicitation that, if accepted, would bind the offeror to perform the resultant Contract. Submission of a Bid constitutes an Offer by the Bidder.

Order A directive from the Department requiring compliance by the Contractor.

Owner The legal or record Owner of the building or Premises on which the Project is to be constructed, generally the State of Maine acting by and through the Department.

Partnering See Section 104.4.1 - Partnering.

Pavement Structure The combination of subbase, base course, and surface course placed on a subgrade to support the traffic load and distribute it to the roadbed.

A. Base Course One or more layers of specified Material thickness placed on a subbase or a subgrade to support a surface course.

B. Subbase Layers of specified Material thickness placed on a subgrade to support a base course.

C. Surface Course The top layer(s) of a Pavement Structure designed to accommodate the traffic load, resist skidding, traffic abrasion, and the disintegrating effects of climate. This layer is sometimes called the "Wearing Course."

Pay Item An item of Work set forth in the Schedule of Items for which the Contractor must provide a price.

Payment Bond The security furnished by the Contractor and its Surety to guarantee payment of all obligations incurred by the Contractor related to the Contract. For a related provision, see Section 110.2.1 - Bonds.

Performance Bond The security furnished by the Contractor and its Surety to guarantee performance of the Work in Conformity with the Contract. For a related provision, see Section 110.2.1 - Bonds.

Permits Permits granted to the Department for the Project. Permits often required include (a) environmental Permits, including Natural Resources Protection Act (NRPA) Permits from MDEP and the Army Corps of Engineers and (b) a U.S. Coast Guard Permit.

Physical Work All Work specified in the Contract that affects the physical environment, including all Work within the Project Limits, final cleaning up and finishing, and Completion of Punch List Items as provided in Section 107.9 - Project Closeout, and removal of traffic control devices.

Plans When the context so indicates, "Plans" mean applicable construction drawings, including plan, profile, typical cross sections, Working Drawings, Standard Details, Supplemental Standard Details, and supplemental Drawings or exact reproductions thereof or electronically displayed equivalents, that show the location, character, dimensions, and details of the Work. Where the context so indicates, "Plan" may also mean a detailed process, program, or method worked out beforehand for the accomplishment of an objective. Examples include QCP, the SEWPCP, the TCP, Safety Plan, and Project specific emergency planning.

Premises Land of the Owner on which the building or buildings now stand or to which they are to be moved.

Prequalification Application The Contractor's Prequalification Application form submitted by the Contractor, which is to be used to request prequalification and provide information that the Department will rely upon to determine the responsibility and qualifications of a Contractor. Said form is available through the Department's Contracts Section and the Departmental webpage.

Prequalification Procedure The current procedure and requirements contained in the Contractor's Prequalification Procedure first adopted by the Department in April 1998 and administered through the Department's Contracts Section.

Process Control Test Test performed at the source of supply of Material to determine whether the Material meets the Specification prior to Delivery.

Profile Grade The trace of a vertical plane intersecting the top of the wearing surface, usually along the longitudinal centerline of the roadbed. Profile Grade means either elevation or gradient of such trace, according to the context.

Program The specific working unit within the Department's Bureaus of Project Development and Maintenance & Operations within which a particular Department project is developed, designed, constructed and administered. Such Programs include the Highway Program, Bridge Program, Multimodal Program and other similar Units.

Progress Meeting See Section 104.4.3 - Progress Meetings.

Project The Bridge, Highway, railroad, pier, airport, building, bike path, pedestrian path, or other infrastructure improvement being constructed, rehabilitated, or repaired, together with all appurtenances and Incidentals.

Project Limits Areas within the Right-of-Way or Construction Limit Lines shown on the Plans or otherwise indicated in the Contract. If no Project Limits are indicated in the Contract, the Project Limits shall be the area actually occupied by the Bridge, Highway, or other infrastructure before construction extending to and including (A) the area outside the Shoulders and ditch lines and within any landmarks or historic features such as fences, fence posts, tree rows, stone walls, corner stones, or other monuments indicating the boundary line, or (B) in the absence of any landmarks or historic features, Sidewalks, Shoulders, and ditch lines to the top of cuts or toe of fills. For a related Maine statute, see 23 MRSA § 653.

Project Manager The Department's duly authorized representative for overall coordination of the Project.

Project Records Records or data of any type on any media, including those produced by the Contractor or its consultants, Subcontractors, suppliers, or manufacturers that are related to the Project. Project Records include, but are not limited to, Plans, Working Drawings, Specifications, manufacturer's recommendations, catalog cuts, daily time reports, records of Force Account Work, schedules and scheduled updates or revisions, quality control Plans and related documentation, inspectors' reports, traffic control Plans and log, safety program and incident reports, soil erosion and water pollution control Plans and log, employment

records, payrolls, internal accounting records, equal opportunity and affirmative action records, on-the-job and Disadvantaged Business Enterprise reports, preconstruction conference records, Progress Meeting records, Partnering records, correspondence, e-mails, and any other documents related to the Work.

Proposal The response to a Request for Proposals. Proposals will normally be requested for anticipated Best Value procurements. See Design-Build, Request for Proposal and Best Value Procurement. In another context, sometimes the Department's solicitation for bids is called a Bid Proposal.

Proposer The entity submitting a Proposal.

Punch List See Sections 107.9.2 - Notice/Inspection/Punch List and 107.9.3 - Notices/ Final Inspections / Physical Work Completion.

Quality Assurance (QA) All planned and systematic operations to ensure that the operation, material, and/or end product meets Specifications. Quality Assurance includes (A) approval and oversight of the Contractor's Quality Control Plan, (B) review of inspector, sampler, tester, and Laboratory qualifications, (C) inspection for Conformity with Contract requirements, (D) Contractor Quality Control, (E) Acceptance Testing, and (F) Independent Assurance.

Quality Control (QC) Planned and specified actions or operations necessary to produce an end product that Conforms to the quality requirements of the Contract. Unless otherwise specified, QC includes inspection and testing for process control to the extent determined necessary by the Contractor. Quality Control is also referred to as Process Control.

Quality Control Plan (QCP) The program and documentation of that program, approved by the Department, which specify the actions, inspection, sampling, and testing necessary to keep production and placement operations within Specifications, including provisions to quickly determine when an operation becomes out of control and those actions that the Contractor will take to restore compliance.

Receipted Bill Written Evidence provided by the Contractor that the cost of materials has actually been paid by the Contractor. This could take the form of a copy of a cancelled check, a copy of an invoice with written verification from the Subcontractor that the bill has been paid, or a written declaration from the Subcontractor, on its letterhead, that the bill has been paid.

Received or Receipt When considering documents, unless the context indicates otherwise, Receipt by regular US mail, overnight courier, service in hand, or by fax or electronic transmission with confirmation of Receipt originating from the recipient (which may be a telephone confirmation). If Delivered by regular US mail, notices that are properly addressed will be deemed Received three Days after mailing, unless the recipient admits earlier Receipt, in which case Receipt will be the date admitted.

Reference Stake A stake set beyond the proposed grading areas for use as a control for the new construction.

Related Entities All general partners, joint venturers, parent firms, subsidiaries, or sister firms that are owned or controlled by the Bidder or other entity under consideration.

Request for Proposal The Department's solicitation in a Best Value Procurement Process for Proposals, such as when soliciting for an anticipated Design-Build Contract. See Proposal and Best Value Procurement Process.

Resident The Department's on-site representative.

Resident Work Order See Contract Modification.

Right-of-Way A general term denoting land, property, or interest therein, usually in the form of a strip, acquired for or devoted to the Project or other purposes.

Road A general term denoting a public way for purposes of vehicular travel, including the entire area within the Right-of-Way.

Roadbed The graded portion of a Highway within top and side slopes, prepared as a foundation for the Pavement Structure and Shoulders.

Roadside A general term denoting the area adjoining the outer edge of the Roadway. Extensive areas between the Roadways of a divided Highway may also be considered Roadside.

Roadside Development Those items necessary to complete the Highway that provide for the preservation of landscape Materials and features; the rehabilitation and protection against erosion of all areas disturbed by construction through seeding, sodding, mulching, and the placing of other ground covers; and such suitable planting and other improvements as may increase the effectiveness and enhance the appearance of the Highway.

Roadway The portion of a Highway, including Shoulders, for vehicular use. A divided Highway has two or more Roadways.

Schedule of Items A document containing the list of items of Work provided in the Bid Documents on which the Contractor provides prices. The Schedule of Items is a Special Provision.

Schedule of Work A written Work schedule submitted and maintained by the Contractor by which the Contractor Plans and prosecutes the Work. The Schedule of Work contains dates of commencement and Completion of various items of Work within the Contract Time and all authorized extensions. For a related provision, see Section 107.4.2 - Schedule of Work Required.

Shop Drawings See Working Drawings.

Shoulder The portion of the Road or Roadway that is contiguous with the traveled Way and that is provided for accommodation of stopped vehicles, emergency use, and lateral support of base and surface courses.

Sidewalk A way constructed primarily for the use of pedestrians.

Skew or Skew Angle The acute angle formed by the intersection of the line normal to the centerline of the Roadway or the Working line of the Superstructure with a line parallel to the face of the Substructure or, in the case of structural plate units and Culverts, with the centerline of the structural plate units and Culverts.

Special Provision Revisions to the Standard and/or Supplemental Specifications applicable to an individual Project or Contract.

Specifications A written or electronic textual compilation of provisions and requirements for the performance of the Work, including incorporations by reference.

Standard Details Detailed Drawings published and approved by the Department for general application and repetitive use.

Standard Specifications Maine Department of Transportation Standard Specifications and Standard Details for Construction Revision of 2020, which were published and approved by the Department pursuant to 23 MRSA § 4243 for general application and repetitive use on Projects.

State The State of Maine acting through its authorized agencies and representatives.

Street A general term denoting a public way for purposes of vehicular travel, including the entire area within the Right-of-Way.

Structures Bridges, Culverts, catch basins, drop inlets, retaining walls, cribbing, manholes, endwalls, buildings, sewers, services pipes, underdrains, foundation drains, and other manufactured features.

Strut See Large Culvert.

Subcontractor An individual, firm, corporation, limited liability company, partnership, joint venture, sole proprietorship, or any other entity to whom the Contractor subcontracts a portion of the Work. A subcontracting arrangement shall be considered to exist when a person or firm assumes obligation through a written contract with the Contractor for performing part of the Work using its own Equipment and workers, procuring its own Materials and supplies, and furnishing its own supervision with only general overall supervision being exercised by the Contractor or higher tier Subcontractors. Unless the

context indicates otherwise, Subcontractors include suppliers, vendors, fabricators, and any other entities with which the Contractor contracts to perform any portion of the Work.

Subgrade The top surface of a Roadbed upon which the Pavement Structure, Shoulders, and curbs are constructed.

Subgrade Treatment Modification of Roadbed Material by stabilization.

Substantially Conform or Substantial Conformity Substantially Conform or Substantial Conformity means that the Work at issue, though not in strict accordance with the Plans, Specifications, or other Contract requirements, Conforms sufficiently to the applicable standard such that it may be acceptable to the Department (possibly with a credit to the Department) and not require removal, as determined by the Department. For a related definition, see Conformity. For a related provision, see Section 106.8.1 - Substantially Conforming Work.

Substructure All of that part of the Structure below the bearings of simple and continuous spans, skewbacks of arches, and tops of footings of rigid frames, together with the backwalls, parapets, and wingwalls of abutments.

Successful Bidder The low, responsive, responsible bidder to whom the Department intends to award the Contract. This status is evidenced by a "Notice of Intent to Award" Letter sent to the Successful Bidder.

Superintendent The Contractor's authorized on-site representative who is in charge of and responsible for the Work.

Superstructure Excluding backwalls, wingwalls, and wing protection railing, the portion of the Structure above the bearings of simple and continuous spans, the skewbacks of arches, and the top of footings of rigid frames.

Supplemental Liquidated Damages Liquidated Damages for additional costs resulting from Contractor's failure to complete a specific Work item, phase, or milestone within the time specified in the Contract for that item. Supplemental Liquidated Damages are in addition to and separate and distinct from Liquidated Damages.

Supplemental Specifications Approved additions or modifications to the Standard Specifications.

Supplemental Standard Details Approved additions or modifications to the Standard Details.

Surety The corporation, limited liability company, partnership, or individual, or other entity, other than the Contractor, that executes or is obligated under a Contract Bond or Bid Bond.

Traveled Way The portion of the Roadway that is intended for the movement of vehicles, exclusive of Shoulders and auxiliary Lanes.

Unacceptable Work All Work that does not Substantially Conform to the Contract as determined by the Department.

Unauthorized Work Work performed without providing the Resident with reasonable notice of the date and time that the Work is to be performed, Work performed contrary to the instructions of the Department, or any Extra Work performed without written Contract Modification or Agreement. For a related provision, see Section 106.8.3 - Unauthorized Work.

Uncontrollable Events Events or acts that were unforeseeable at the time of Bid submission and that were beyond the Contractor's control in that the risk of the event or act could not have been prevented or managed by the Contractor with proper planning, coordination, Subcontractor management, insurance, bonding, maintenance, erosion control, traffic control, security precautions, workers or Equipment. Uncontrollable Events are of two types: (A) severe weather events that meet the requirements of the first sentence of this definition and/or (B) non-weather events that meet the requirements of the first sentence of this definition which might include acts by foreign enemy, quarantine restrictions, strikes not involving the Contractor, action or inaction by governmental authorities, action or inaction by Utility Companies or other third parties (not Subcontractors) working on Project related Work within the Project Limits, and freight embargoes. Uncontrollable Events specifically do not include: fires (unless caused by a weather event described in this definition above), acts by other third parties, including vandals and members of the traveling public, non-performance of Subcontractors (except in cases of unforeseeable, permanent, and complete cessation of all operations by the Subcontractor for reasons unrelated to the Contractor), and difficult, but foreseeable weather for the location and time of the Work, including but not limited to cold, snow, and ice in the winter, flooding caused by snow melt and rain in the spring, rain in the fall, and thunderstorms in the summer.

Uninspected Work Work that was performed without inspection by the Department.

Unit Price The price for one unit of Work submitted by the Bidder in its Bid.

Utility Companies All persons or entities set forth in 35-A MRSA § 2501(2).

Utility Facilities All Structures, facilities, Equipment, and all appurtenances thereto used by Utility Companies, including, but not limited to, poles, wires, support poles, guys, anchors, water pipelines, sewer pipelines, gas pipelines, all other pipelines, fire alarms, service connections, meter boxes, valve boxes, light standards, cableways, Conduits, signals, and manholes.

Value Engineering Change Proposal See Section 109.6 - Value Engineering.

Wetlands Areas inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas.

Winter Suspensions See Section 107.5.1 - Winter Suspensions.

Work All labor, services, personnel, Materials, Equipment, tools, supplies, and Incidentals required or indicated by the Contract in Conformity with the same. For a related provision, see Section 105.1 - Intent of the Contract.

Working Day:

Weather Event Any precipitation, such as rain, sleet, snow, or fog that causes wet pavement that prevents the contractor from completing work within the Construction Limits as determined by the Department. This excludes ambient air temperatures below Specification.

Weather Dependent Activities Contractor scheduled work that cannot be completed should a Weather Event occur. Paving or other activities as determined by the Department will be considered Weather Dependent Activities.

Working Day Any Calendar Day except:

- Identified non-work days in the Contract Special Provision 107
- Saturdays, Sundays and Holidays – as outlined in Section 107.3.3
- The period from November 15th to April 15th, inclusive
- Any day a Weather Event prevents the Contractor from performing at least seven hours of weather dependent activities, as determined by the Department. Up to a three-hour hold prior to the start of work may be required if weather conditions are uncertain.

The Contractor may request, in writing, a non-working day due to a Weather Event up to 16 hours in advance of the normal start time. The Department may approve this request depending on the certainty of the forecast.

If the Contractor elects to work a Saturday, an allowable holiday, or receives approval to work Sunday, the same process will be utilized to determine if it is a Working Day.

If the Contractor requests approval to work Saturday and does not cancel their request by Thursday at the end of shift, that Saturday will be considered a Working Day regardless of the actual weather conditions and whether work occurred.

Working Drawings Plans, sketches, or Drawings provided by the Contractor, or its Subcontractors, vendors, or fabricators for the purpose of supplementing the Plans provided in the Bid Documents and being necessary to demonstrate that the Work will comply with the Contract and meet the intent of the Contract. Working Drawings shall be of sufficient

detail to meet the purpose set forth in the preceding sentence. Examples include Shop drawings, erection Plans, falsework Plans, cofferdam Plans, and bending diagrams for reinforcing steel.

Work Order See Contract Modification.

101.3 General Rules of Interpretation

101.3.1 Meaning of "Approved," Etc. Unless the Contract clearly indicates otherwise, whenever anything is to be done or is not to be done unless "approved," "accepted," "authorized," "ordered," "required," "determined," "directed," "specified," "designated," "established," "suitable," "satisfactory," "sufficient," "unacceptable," or a similar word or phrase, the word or phrase shall be interpreted as if it were followed by the words "by the Department" or "to the Department" as applicable.

101.3.2 Referenced Publications The Contractor is responsible for obtaining all manuals, Specifications, reference guides, or other publications referenced or indicated by the Contract and performing the Work in Conformity with the same. Unless a specific date or version is specified, the Contractor shall use the most recent version of such publication that existed at the time the Bid was submitted.

101.3.3 Cross References Cross-references are sometimes provided in the Contract. (Example: "For a related provision, see Section __"). These cross-references are provided for convenience only and are not a comprehensive listing of related Sections. The lack of a cross- reference or an incorrect reference shall not be interpreted as indicating that there are no related provisions and does not relieve the parties of the obligation to read the Contract as a whole.

101.3.4 Headings and Tables of Contents All headings, indices, titles, and tables of contents are for convenience only. They do not control interpretation and do not relieve the parties of the obligation to read the Bid Documents or Contract as a whole.

101.3.5 Calculated Dimensions Control In the case of discrepancy between calculated dimensions and scaled dimensions, calculated dimensions shall control.

101.3.6 Priority of Conflicting Contract Documents If the Contractor discovers any ambiguity, error, omission, conflict, or discrepancy ("ambiguity, etc.") related to the Contract Documents that may significantly affect the cost, quality, Conformity, or timeliness of the Work, The Contractor must comply with Section 104.3.3 - Duty to Notify Department If Ambiguities Discovered. In the case of ambiguity, etc., the following components of the Contract Documents shall control in the following descending order of priority:

Bid Amendments (most recent to least recent)
Project Specific Permit Requirements
Special Provisions
Notes on Plans

Plans
Supplemental Specifications
Supplemental Standard Details
Standard Specifications
Standard Details

101.3.7 Multiple Pay Items When there is more than one Pay Item for similar Work governed by one Specification, the item number in the Specification may be appended with additional digits to differentiate such multiple Pay Items. For example, Specification item 900.06 also covers Pay Items 900.061, 900.062, 900.0601, and 900.0602, etc. unless the context clearly indicates otherwise.

## SECTION 102 - BIDDING

Scope of Section This Section includes requirements related to eligibility to Bid and the Bidding process from advertisement for Bids, through Bid Opening, to the analysis of Bids.

### 102.1 Eligibility to Bid

102.1.1 Basic Requirements To be eligible to Bid, prospective Bidders must (A) not have been debarred or suspended from Bidding, and (B) not be in Default with respect to any outstanding Contract with the Department, unless the Department grants written permission to Bid despite such Default. For related provisions, see Sections 102.9 - Bid Opening and 103.3 - Post-Bid Qualification.

102.1.2 Suspension From Bidding The Department may suspend the right of a Contractor to submit Bids as the general Contractor on construction Projects being developed by the Department's Bureau of Project Development for up to two years pursuant to Department's "Rules Regarding Suspension From Bidding."

102.1.3 Debarment The Department may debar a Contractor from Bidding, subcontracting, or being employed in any capacity regarding any Project administered by the Department pursuant to "Rules Regarding Debarment of Contractors," Department Register 17-229, Chapter 102 (October 2, 1985).

102.2 Advertisement - Notice to Contractors A Notice to Contractors will provide a solicitation or an invitation to bid and be advertised in printed or electronic media pursuant to Maine law. Such Notice will contain a brief and general description of the nature and location of the Work and information about how to Bid and how to provide any prequalification requirements.

102.3 Examinations of Documents, Site and Other Information Before submitting a Bid, the Bidder is responsible for: (A) obtaining and examining the Plans, Specifications, all Bid Amendments, and all other Bid Documents; (B) examining the Geotechnical Information and all other information provided or referenced in the Bid Documents; (C)

examining the site(s) of Work and making other examinations and investigations that are needed to Make the Bidder fully aware of the conditions that would be encountered in performing the Work, and (D) communicating with the Department as provided in Section 102.5 - Communication Before Bid Opening. For a related provision, see Section 102.7.2 - Effects of Signing and Delivery of Bid.

102.3.1 Geotechnical Information Bidders and Contractors are obligated to examine and, if necessary, obtain any additional available geotechnical information. If one is available, the project geotechnical report may be accessed at the Department's web site.

The Department shall not be responsible for the Bidders' and Contractors' interpretations of or estimates or conclusions drawn from the Geotechnical Information. Data provided may not be representative of the subsurface conditions between the boring locations.

This section does not diminish the duties imposed upon parties in Section 102 or in any other sections.

102.4 Estimated Quantities Quantities shown in the Bid Documents are estimates, only to be used for the preparation and comparison of Bids. For related provisions, see Sections 109.1- Changes in Quantities and 109.2 - Elimination of Items.

102.5 Communication Before Bid Opening

102.5.1 Questions From Bidders Bidders shall direct all technical or engineering questions, including requests for explanations or interpretation, in writing to the Bid Contact Person noted in the Notice to Contractors, typically the Project Manager. All questions must be transmitted as described in the Notice to Contractors and must be received by the Department at least 48 hours before Bid Opening. General questions relating to the Bidding process may be referred to the Department's Contracts Section. For a related provision, see Section 102.5.3 - Bid Amendments.

102.5.2 Bidder's Duty To Notify Department If Ambiguities Discovered Bidders shall not take advantage of any ambiguity, error, omission, conflict, or discrepancy ("ambiguity, etc.") relating to the Bid Documents, Geotechnical Information, site conditions, or any other information that may significantly affect the cost, quality, Conformity, or timeliness of the Work. If a Bidder discovers any such ambiguity, etc., it must notify the Bid Contact Person immediately in writing. Failure to provide such notice constitutes a waiver of any claim for entitlement for additional compensation or time related to such ambiguity, etc.

102.5.3 Bid Amendment The Department will interpret or modify the Bid Documents only by written Bid Amendment or other writing issued by the Department's Contracts Section. The Department is not bound by any other oral or written representations, including information exchanged verbally at pre-Bid meetings. The Department will issue written Bid Amendment in response to questions from Bidders when

the answers: (A) relate to ambiguous, incorrect, or missing information in the Bid Documents; (B) are not apparent to Contractors experienced in the type of Work covered by the potential Contract; and (C) could have a significant impact on the cost, quality, Conformity or timeliness of the Work. For a related provision, see Section 102.5.1 - Questions From Bidders.

102.6 Bid Guaranty Bids must be accompanied by a Bid Guaranty that complies with all the requirements of this Section, unless noted otherwise in the Notice to Contractors and the Bid Documents.

The Bid Guaranty must be: (A) in the amount specified in the Notice to Contractors and the Bid Documents; (B) made payable to the "Treasurer - State of Maine"; and (C) one of the following types: a Bid Bond Conforming to the next paragraph, a cashier's check, a certified check, or a United States Postal money order.

Bid Bonds must be: (A) issued by an insurance company licensed or approved by the State of Maine, Department of Business Regulation, Bureau of Insurance, to do business in the State of Maine; (B) properly signed by the Bidder (as Principal) and a duly authorized representative of the insurance company referenced above, and (C) on the Department's Bid Bond form (or an exact copy thereof) OR must not contain any significant variations from said form as determined in the sole discretion of the Department.

Bid Bonds for electronic Bids must be delivered, received, or faxed to the number in the Notice to Contractors before the Bid Opening time. Original Bid Bonds must be received within 72 hours for faxed submittals. Electronic Bid Bonds that accompany electronic Bids are acceptable.

102.7 Delivery of Bids

102.7.1 Location and Time The Bidder must Deliver its Bid and Bid Guaranty in a sealed envelope to the exact location and before the precise time (as determined by the Department) specified in the Notice to Contractors or any applicable Bid Amendment. The Bid and Bid Guaranty must be signed by duly authorized individuals. The sealed envelope must be labeled with the Bidder's name, the Project location, WIN, and the words "Bid Enclosed." As a minimum, the Bidder will submit a Bid Package consisting of the Notice to Contractors, the completed Acknowledgement of Bid Amendments form, the completed Schedule of Items, 2 copies of the completed Agreement, Offer, & Award form, a Bid Bond or Bid Guarantee, and any other Certifications or Bid Requirements listed in the Project Specific Bid Book. For a related provision, see Section 102.11 – "Bid Responsiveness."

Electronic Bids must be submitted to the appropriate electronic bid system before the precise time (as determined by the Department) specified in the Notice to Contractors or any applicable Bid Amendment.

102.7.2 Effects of Signing and Delivery of Bids

A. Offer and Agreement to Pre-execution Terms The signing and Delivery of a Bid represents: (1) an offer by the Bidder to perform the Work for the price(s) submitted within the time(s) specified and in Conformity with all provisions of the Bid Documents; and (2) the Bidder's Agreement to all the provisions of the Bid Documents governing requirements and procedures applicable before Contract Execution. The Bidder's offer shall be irrevocable until the expiration of the time for Contract Execution by the Department set forth in Section 103.8, except as provided in Sections 102.8 and 102.10 regarding withdrawal of Bids.

B. Bidder Representations By signing and Delivering a Bid, the Bidder represents that: (1) the Bidder has performed the examinations required by Section 102.3 - Examinations of Documents, Site and Other Information; (2) the Bidder has given the Department written notice of all ambiguities, etc. discovered by the Bidder as required by Section 102.5.2 - Bidder's Duty to Notify Department if Ambiguities Discovered; and (3) the Bidder has sufficient knowledge of the Bid Documents, Geotechnical Information, the site, and other conditions to properly price, schedule, plan, and perform the Work.

C. Certifications By signing and Delivering a Bid on federally funded or partially federally funded Contract, the Bidder certifies as provided in all federal certifications set forth in the Project Specific Bid Book, including those set forth in Section 1 thereof. By signing and Delivering a Bid, the Bidder further certifies as provided in Section 105.10.2(F) - Certification of Continuing EEO Efforts.

102.8 Withdrawal of Bids Before the Time Specified for Bid Opening A Bidder may withdraw a Bid after Delivery, provided the request for such withdrawal is made in writing or in person before the time set for Bid Opening in the Notice to Contractors. The Bidder may revise and resubmit a Bid so withdrawn before the time specified for Bid Opening.

102.9 Bid Opening Bids will be opened and publicly read at the time and place specified in the Notice to Contractors or any applicable Bid Amendments. The Department will normally read publicly only the total Bid Price of each Bid. Unit and lump sum prices are available for inspection by the Bidders immediately after the Bid Opening process.

The public reading of a Bid does not constitute a determination by the Department of whether the Bid is responsive or of whether the Bidder is responsible, though the Department may refuse to read Bids that are obviously non-responsive. Accordingly, the Department may reject a Bid as non-responsive and/or determine a Bidder is not responsible or ineligible to Bid even if that Bidder's Bid is read at Bid Opening.

102.10 Withdrawal of Bids in Multiple Bid Context Bids may not be withdrawn after the time of Bid Opening, except under the limited circumstance set forth in this Section 102.10.

If a Bidder has submitted Bids on multiple Projects that have the same Bid Opening time, and if after the reading of Bids the Bidder has submitted the apparent low Bid on one Project, then the Bidder may withdraw any Bids on other Projects for which no Bids have

yet been read. Such a request for withdrawal must be made in person or in writing. Bids withdrawn will not be considered. The Bidder assumes sole responsibility for the risk that the Bidder's apparent low Bid is rejected as non-responsive or that the Bidder is determined to be not responsible.

102.11 Bid Responsiveness

102.11.1 Non-curable Bid Defects The Department **WILL REJECT** Bids as non-responsive if ANY ONE of the following occurs:

The Bid and Bid Guaranty are not Delivered to the precise location and by the precise time set forth in the Notice to Contractors or any applicable Bid Amendment.

The Bidder is not eligible to Bid as set forth in Section 102.1 - Eligibility to Bid.

The Bid is not signed by a duly authorized representative of the Bidder.

A Bid Guaranty Conforming to Section 102.6 - Bid Guaranty is not submitted.

The unit price and bid amount is not provided or a lump sum price is not provided or is illegible as determined by the Department.

The Bidder fails to indicate the Bidder's choice where the Bid Documents clearly require a choice.

The Bid contains any conditional or alternate Bidding language, including the right to accept or reject an Award of the Contract.

The Bidder submits more than one Bid for the same Contract, or the Bidder and any Related Entity each submit a Bid for the same Contract.

The Department has substantial evidence of collusion by the Bidder.

The Bidder fails to comply with any provision in the Bid Documents that expressly indicates that such non-compliance will cause Bid rejection.

When A plus B bidding is specified, the bid does not contain the number of Calendar Days bid to complete the work

The Bid is not submitted on the most current forms provided by the Department or identical copies thereof.

The Bidder will have no opportunity to cure the above Non-curable Bid Defects.

102.11.2 Curable Bid Defects Unless the Department waives a curable Bid defect, the Bidder must cure, within the time stated in the written notice by the Department, but not

less than 24 hours, all other Bid Defects not listed in Section 102.11.1 - Non-curable Bid Defects that are identified by the Department. Failure to cure such Defects within said time may result in forfeiture of the Bidder's Bid Guaranty. Upon such failure, the Department may take any action in the best interests of the Department, including those set forth in Section 103.6 - Failure to Fulfill Award Conditions.

Such curable Bid Defects include, but are not limited to, the following.

The Bidder signs only one of the Contract Agreement Offer & Award forms.

Missing total sum of the items provided in the Schedule of Items.

The prices or signatures on the Bid or Bid Guaranty are not in ink or other non-erasable substance.

Failure to acknowledge Receipt and consideration of all Bid Amendments.

All other Defects that do not create a significant question as to the Bidder's total Bid amount or the Bidder's ability to complete the Work within the Contract Time or by the Contract Completion Date as determined by the Department.

Materially unbalanced Bids may create a significant question as to the Bidder's ability or will to complete the Work within the Contract Time in accordance with the requirements of the Contract; see Section 103.1.2 - Unbalanced Bids.

Contractors prequalified for the general category stated in the Notice to Contractors may be determined non-responsive by the Department based on recent or new data provided since the last determination of prequalification for that Contractor.

## SECTION 103 - AWARD AND CONTRACTING

Scope of Section This Section includes requirements related to the final determination of Bid responsiveness and Award and execution of the Contract.

### 103.1 Analysis of Bids

103.1a Tie Bids - In the case where two responsive bids from responsible bidders are equal monetarily, the Department shall determine the apparent low bidder by flipping a coin. The coin shall have sides clearly marked as heads and tails. The contractor whose first letter in its official company name that comes first in the alphabet shall be heads.

If there are three bids, each bidder will flip the coin and the bidder with the odd toss will be the winner. (i.e. if the results are two heads and a tails, the bidder who had tails is the winner). For a three way tie, bidders may flip their own coin or have the Contracts Engineer flip for them.

The coin flip will occur at the next bid opening by the Contracts and Specifications Engineer or a designee. The tied bidders may attend the coin flip in person or watch on the internet as they choose.

103.1.1 Unit Prices Govern After Bid Opening, the Department will review the mathematics of all apparently responsive Bids. In the event of a discrepancy between (A) unit and lump prices and (B) extensions and/or the total Bid Price, the unit and lumps sum prices shall govern and the total Bid Price will be adjusted accordingly.

103.1.2 Unbalanced Bids

A. Definitions An Unbalanced Bid is a Bid that is Mathematically Unbalanced and that may also be Materially Unbalanced. Mathematically Unbalanced means a Bid containing lump sum or Unit Prices that do not reflect reasonable direct costs plus a reasonable proportionate share of the Bidder's anticipated profit, overhead costs, and other indirect costs. Materially Unbalanced means a Mathematically Unbalanced Bid that generates a reasonable doubt that said Bid will represent the lowest ultimate cost to the Department.

B. Comparison and Possible Bid Rejection The Department will compare the price of items contained in the Bid of the Apparent Successful Bidder with the estimate prepared by the Department. If the Bid is Mathematically Unbalanced, the Department may, in its discretion, notify the Apparent Successful Bidder and request an explanation. There shall be no negotiation or changes in prices. If the Bidder fails to provide a reasonable explanation, and if the Department finds the Bid is Materially Unbalanced, the Department may reject the Bid as non-responsive and may take any action that is in the best interests of the Department, including those set forth in Section 103.6 - Failure to Fulfill Award Conditions.

103.1.3 Waiver of Defects and Technicalities; Right to Reject Bids The Department reserves the right to reject any or all Bids and to advertise for new Bids if doing so is in the best interest of the Department. The Department reserves the right to waive curable Bid Defects and other technicalities without notice to any party. Refer to section 102.11.2 for Curable Bid Defects.

103.2 Return of Bid Guaranty Bid Bonds will not be returned unless so requested. Bid Guaranties other than bonds will be returned within 7 Days following Bid Opening, except that the Bid Guaranties from two lowest responsive Bids from responsible Bidders will be retained until Contract Execution or rejection of all Bids.

103.3 Post-Bid Qualification

103.3.1 Pre-Qualification Requirement for Award If the Notice to Contractors lists a Pre-Qualification requirement, the Apparent Successful Bidder must successfully complete the prequalification process as a condition of Award.

103.3.1.1 Notice and Information Gathering  After Bid Opening and as a condition for Award of a Contract, the Department may require an Apparent Successful Bidder to demonstrate to the Department's satisfaction that the Bidder is responsible and qualified to perform the Work.

If such qualification is required, the Department will provide the Bidder with written notice to that effect.  Such notice will include a brief description of the reasons why such qualifications is required, and may require the Bidder to provide any information requested in the "Contractor's Prequalification Application" form adopted by the Department.

If requested by the Bidder, the Department shall provide an opportunity for the Bidder to present evidence of qualifications at a reasonable time and place.

103.3.2 Notice of Determination  After the Bidder's presentation of evidence of qualifications (if required), the Department will notify the Bidder of its determination in writing.  If a determination of "Not Qualified" is rendered, the Department's Chief Engineer will send the notice, which will set forth the specific reasons therefore to the extent practical.  Such reasons include the following.

(A) Default(s) or termination(s) on past or current Contracts.

(B) Failure on past or current Contracts to pay or settle all bills for labor, Materials or services; to comply with directives of the Department, to fulfill warranty obligations, or to provide Closeout Documentation.

(C) "Below Standard" performance as determined from the Department's Contractor's Performance Rating process.

(D) Insufficient bonding capability or Inability of the Contractor to obtain or retain Performance or Payment Bonds meeting Department requirements, or a pattern of unsupported Claims.

(E) Failure to accept an Award of a Contract made by the Department.

(F) Failure to provide information requested by the Department in a timely manner.

(G) Debarment, suspension or a denial of prequalification or "award of contract" by any federal, State, or local governmental procurement agency or the Contractor's Agreement to refrain from Bidding as part of the settlement with any such agencies or any of the reasons contained in Section 102.02 of the "Rules Regarding Debarment of Contractors," Maine Department of Transportation Register 17-229, Chapter 102 (October 2, 1985).

(H) Failure to demonstrate ability to do work to the satisfaction and at the sole discretion of the Department.

(I) Number of personnel working directly for the Contractor with applicable knowledge and experience is significantly below industry standards.

(J) Safety Record, Environmental Record, Civil Rights, or Equal Opportunity Record significantly below industry standards.

(K) Serious misconduct that the Department reasonably determines will substantially and adversely affect the cost, quality, or timeliness of Work, or the safety of workers or the public, any deceptive, evasive, or fraudulent statements or omissions contained in the Application, made or omitted at any interview or hearing, or otherwise made to or omitted from the Department; or any other substantial deficiencies in experience or conduct that are clearly below industry standards and that clearly demonstrate in the sole discretion of the Department that the Contractor is "Not Qualified."

103.3.3 Appeal To appeal a "Not Qualified" determination, the Bidder must Deliver a written "Request for Appeal of Qualification Determination" to the Commissioner within 48 hours of Receipt of such determination. The Commissioner or the Commissioner's designee will grant such Requests for Appeal unless the Department reasonably determines that Delay of Award pending appeal is likely to cause substantial harm to the interests of the Department. If the Request for Appeal is denied, the determination of "Not Qualified" is upheld and the Award process will proceed without the unqualified Bidder.

If the Request for Appeal is granted, the Bidder and the Chief Engineer must Deliver to the Commissioner or the Commissioner's designee any information or arguments that the parties want considered within 14 Days of Receipt of a "Not Qualified" determination.

Within 14 Days of Receipt of such information and arguments, the Commissioner or the Commissioner's designee will notify the Bidder in writing as to whether: (A) the determination of "Not Qualified" is upheld, modified or reversed; or (B) the Commissioner or the Commissioner's designee elects to submit the issue to binding or non-binding alternative Dispute resolution.

After a final determination of "Not Qualified," the Bidder's Bid Guaranty will be returned and the Bidder will be ineligible for Award of future Department Contracts until the Bidder is prequalified pursuant to the Department's Prequalification Procedure.

103.4 Notice of Intent to Award The Department has 30 Days following Bid Opening to Deliver a written Notice of Intent to Award and request a Payment Bond, Performance Bond, insurance bond, special certifications, and other information from the Apparent Low Bidder. If a notice of Intent to Award is not sent within 30 days of receipt of the Bid Opening, the Apparent Successful Bidder may withdraw its Bid without forfeiture of its Bid Guaranty or Bidding eligibility. If the Department and the Apparent Successful Bidder agree, an extension beyond the 30 days of the Bid and Bid prices may occur and the Bid remains viable. For a related provision, see Section 103.5 - Award Conditions.

103.5 Award Conditions  The Apparent Successful Bidder must provide and/or perform all of the items listed in this Section 103.5 within 14 Days of Receipt of the Notice of Intent to Award.  Unless indicated otherwise, all items must be Delivered to the Department's Contracts Engineer.

103.5.1 Performance and Payment Bonds  Performance and Payment Bonds complying with Section 110.2.1 - Bonds.

103.5.2 Insurance Certificates  Certificates of Insurance complying with Section 110.3 - Insurance.

103.5.3 Non-Resident Contractor Requirements

A. Definition  A Non-Resident Contractor is defined as a Contractor that is: (A) any individual who is not a resident of the State of Maine, or (B) any firm, corporation, limited liability company, partnership, joint venture, sole proprietorship, or other entity that (i) is not licensed to do business within the State of Maine, or (ii) does not have a principal place of business within the State of Maine.

B. Requirements  If a Non-Resident Contractor, the Apparent Successful Bidder must file with the Department a copy of a written appointment of an attorney admitted to practice in the State of Maine having a place of business within the State.  The appointment must: (A) set forth the attorney's business and personal addresses, and business telephone and fax numbers, (B) name said attorney to be the true and lawful attorney of the Non-Resident Contractor, (C) set forth that the Contractor agrees that any lawful process that is served on said attorney shall have the same legal force and validity as if served on the Contractor, (D) set forth that the appointment shall continue in force as long as any potential liability in any way related to the Work or the Contract remains or until the Department receives written notice of a change of appointment Conforming to this paragraph, (E) provide that service of such process may be made by leaving a copy of the process in the hands or in the office of the Resident attorney and that such service will be effective upon the Non-Resident Contractor, as if service were made in accordance with Rule 4 of the Maine Rules of Civil Procedure, and (F) provide that the Contractor expressly waives any and all defenses regarding service of process under Rule 12 of said Civil Rules or otherwise. The appointment shall be filed in the office of the Maine Secretary of State.

103.5.4 Execution of Contract By Bidder  The properly completed and signed Contract Agreement, Offer, & Award form provided with the Bid constitutes the Bidder's offer.  Once the Department has received the bonds, insurance, and any other pre-award items required, the Department will sign the Contract Agreement, Offer, & Award form and execute the Contract.  The point of Contract execution is when the Contractor receives the written Notice of Award.

103.5.5 Bid Escrow  If required by Special Provision, the Apparent Successful Bidder must provide a legible copy of Bid Escrow Documentation and a related Affidavit Conforming to said Special Provision.  Failure to provide Conforming Bid Escrow

Documentation or the Affidavit constitutes a refusal to enter into the Contract and will result in the Bidder's forfeiture of its Bid Guaranty.

103.5.6 Other Conditions The Apparent Successful Bidder must comply with all other conditions set forth or referenced in the Notice of Intent to Award.

103.6 Failure to Fulfill Award Conditions Failure of the Apparent Successful Bidder to fulfill all conditions of Award within the time provided or to otherwise accept Award will result in forfeiture of the Award to the Apparent Successful Bidder and the forfeiture of the Bid Guaranty. Such Bidder will be prohibited from submitting a Bid for the Work in the event that the Work is re-advertised. Further, the Department may refuse to accept any Bid from the Bidder on any Project for a period of two years from the date of such refusal.

The Department may then take any action that the Department determines is in the best interest of the Department, including Awarding the Contract to the responsible Bidder with the next lowest responsive Bid, rejecting all Bids, and/or re-advertising the Work.

103.7 Forfeiture of Award The Department reserves the right to stop the Award of any Contract at any time before the Contract Execution without liability if doing so is in the best interest of the Department. Any costs incurred by the Bidder before Contract Execution shall be the sole responsibility of the Bidder.

103.8 Award of Contract by Department Once the Contractor has met the requirements of the Notice of Intent to Award letter, the Department has 14 days to execute the Contract and notify the Contractor of the award with a written Notice of Award. If a Notice of Award is not sent within 14 days, the Apparent Successful Bidder may withdraw its Bid without forfeiture of its Bid Guaranty or Bidding eligibility. For a related provision, see Section 107.2 - Commencement of Contract Time.

103.9 Computation and Extension of Time In the event that a time period provided in this Section 103 concludes on a Holiday, Saturday, or Sunday, said time period shall be extended to the next Business Day.

The Department and Apparent Successful Bidder may extend the time for the Award process, fulfillment of Award Conditions, or execution of the Contract by mutual Agreement. Unless specifically and mutually agreed to in writing, such extensions shall not extend the Contract Time or the Contract Completion Date.

## SECTION 104 - GENERAL RIGHTS AND RESPONSIBILITIES

Scope of Section This Section sets forth certain rights and responsibilities of the Department and the Contractor that are generally applicable to all Contracts. This Section is not all inclusive, and additional rights and responsibilities are set forth elsewhere in the Contract.

104.1 General

104.1.1 Basic Roles of the Parties The Contractor has the authority and responsibility to perform all Work in Conformity with the Contract. The Department has the authority and responsibility to assure that the Contractor does so.

104.1.2 Joint Covenants of Good Faith and Fairness This Contract imposes an obligation of good faith and fair dealing on both parties in the execution, performance, interpretation, and enforcement of the Contract. With a positive commitment to honesty and integrity, the Contractor and the Department agree to do the following: function within all applicable laws, statutes, regulations, and Contract provisions; avoid hindering each other's performance; fulfill all Contract obligations diligently; and cooperate in achievement of the terms of the Contract. Nothing in this subsection nullifies or supersedes the express provisions of the Contract and the Standard Specifications.

104.2 Department's General Authority and Responsibilities

104.2.1 Furnishing of Right-of-Way The Department will secure all necessary rights to real property within the Project Limits shown on the Right-of-Way Plans that are provided with the Bid Documents. For related provisions, see Sections 104.3.2 - Furnishing of Other Property Rights, Licenses and Permits and 105.4.5 - Special Detours.

104.2.2 Furnishing of Permits Except as provided otherwise in the Contract, the Department will furnish Permits required to perform the Work within the Project Limits. For related provisions, see Sections 101.2, Definition of Permits, 104.3.2 - Furnishing of Other Property Rights, Licenses, and Permits and 105.8.2 - Permit Requirements.

104.2.3 Authority of the Resident After Contract Execution, the Resident has the authority to take all actions needed to assure that the Contractor is performing the Work in Conformity with the Contract. Except as provided elsewhere in the Contract, the Resident will decide all questions regarding the quality and acceptability of Materials furnished, Work performed, suspension of Work, and the interpretation of the Contract. The Resident has the authority to reject Unacceptable or Unauthorized Work and refuse to approve Progress and Final Payments until the Unacceptable or Unauthorized Work is corrected. For related provisions, see Sections 106.8 - Non-conforming Work and 109.8 - Contract Modification.

104.2.4 Authority of Residents and Inspectors Residents, inspectors, and other Departmental employees or representatives working for the Department have the authority to make initial determinations regarding the Conformity of the Work. Unless authorized by the Program Manager, Residents or inspectors are not authorized to alter or waive the provisions of the Contract or to issue instructions contrary to the Contract. They may not act as a supervisor for the Contractor.

104.2.5 Right to Inspect Work The Department has the authority to inspect all Materials and every detail of the Work. For a related provision, see Section 104.3.5 - Duties Regarding Inspection of Work.

104.2.6 Right to Suspend Work The Department has the right to suspend any or all Work at any time for any reason. For related provisions, see Sections 105.4.4 - Maintenance During Suspension of Work and 107.5 - Suspension of Work.

104.2.7 Damage to Project Caused by Uncontrollable Events All repairs or temporary Structures that are required because of property damage that is directly caused by an Uncontrollable Event may entitle the Contractor to an Equitable Adjustment if the Contractor complies with the notification, documentation and procedural requirements set forth in the Contract. Delays resulting from an Uncontrollable Event will be analyzed in accordance with Section 109.5 - Adjustments for Delay. For related provisions, see Sections 101.2 - Definition of Uncontrollable Event, 104.3.10 - Responsibility for Damage to Work, 109.3 - Extra Work, 109.5 - Adjustments for Delay, 109.7 - Equitable Adjustments to Compensation and Time, and 109.8 - Contract Modification.

104.2.8 No Personal Liability The Department's employees and other representatives act solely as representatives of the Department when conducting and exercising authority granted to them under the Contract. Such persons have no liability to the Contractor or any Subcontractor either personally or as Department employees.

104.3 Contractor's General Authority and Responsibilities

104.3.1 General Duty to Cooperate The Contractor shall cooperate with the Departmental personnel, Utility Companies, railroad personnel, marine traffic personnel, regulating agencies with jurisdiction, other Contractors, municipalities, and the public in every reasonable way possible. For a related provision, see Section 104.4 - Communication and Coordination.

104.3.2 Furnishing of Other Property Rights, Licenses, and Permits The Contractor shall acquire, at its sole expense, all property rights outside the Project Limits needed for construction staging, yarding, construction, waste disposal, or other Project-related purpose. The Contractor shall also acquire, at its sole expense, all licenses and Permits necessary to perform the Work that are not furnished by the Department. For related provisions, see Sections 104.2.1 - Furnishing of Right-of-Way, 104.2.2 - Furnishing of Permits, 104.3.11 - Responsibility for Property of Others, and 105.8.2(B) - Permit Requirements, All Other Permits.

104.3.3 Duty to Notify Department If Ambiguities Discovered The Contractor shall not take advantage of any ambiguity, error, omission, conflict, or discrepancy contained in the Contract. If the Contractor discovers any such ambiguity, etc. for which the Contractor may seek adjustments to compensation, time, or other Contract requirements, the Contractor shall provide a written notice within 48 hours and before performing any Work related to the ambiguity, etc., as provided in Section 104.4.5 - Early Negotiation. Failure to provide such notice in compliance with the Contract shall constitute a waiver of all claims related to the ambiguity, etc.

104.3.4 Workers and Equipment The Contractor shall at all times provide all superintendents, forepersons, laborers, inspectors, Subcontractors, subconsultants, Equipment, Materials, and Incidentals needed to perform the Work in Conformance with the Contractor's Schedule of Work and within the Contract Time.

Any person employed by the Contractor or by any Subcontractor or any officer or representative or agent of the Subcontractor, who, in the opinion of the Resident, is intemperate or disorderly, shall be removed immediately by the Contractor or Subcontractor employing such person. The employee shall not be employed again in any portion of the Work without prior approval from the Resident.

Should the Contractor fail to remove such person or persons as required above or fail to furnish suitable and sufficient personnel for the proper prosecution of the Work, the Resident may suspend the Work by written notice until such orders are complied with.

During all hours of on-site activity, the Contractor shall provide an on-site, competent, English-speaking Superintendent experienced in the type of Work being performed. The Superintendent shall be capable of reading and understanding the Plans and Specifications, providing and receiving communications, and scheduling and coordinating the Work. The Superintendent shall have full authority to manage the Work in accordance with the Contract. Such superintendence must be provided regardless of the amount of Work being done by the Contractor or any of its Subcontractors.

All persons employed by or through the Contractor, except for registered trainees, shall have sufficient skill and experience to perform the Work properly. The Department may require that the Contractor discharge any such person who the Department determines jeopardizes the safety of any person or the Project, without cost or liability to the Department. If the Department determines that such person's performance jeopardizes the intent of the Contract otherwise, the Department may, but is not required, to notify the Contractor of such a determination. Such notice, or lack thereof, does not affect the Contractor's duties regarding workers. Upon receipt of such notice, the Contractor shall take any action it determines necessary to fulfill its obligations under the Contract. For related provisions, see Sections 104.5.4 - Discharge of Subcontractors, 105.1 - Intent of the Contract, and 105.2 Health and Safety.

104.3.5 Duties Regarding Inspection of Work

A. Safe Access The Contractor shall provide the Department with safe access to all portions of the Work in Conformity with all applicable OSHA requirements. The Contractor shall furnish the Department with all information and assistance required to make a detailed inspection. For a related provision, see Section 104.2.5 - Right to Inspect Work.

B. Inspection By Others If any other governmental entity, Utility Company, or railroad is to pay for a portion of the Work or is otherwise authorized to inspect Work, then the Contractor must provide its representatives with safe access that Conforms to this Section 104.3.5.

104.3.6 Project Records Upon request by the Department, the Contractor or any other person Working for the Contractor possessing Project Records must provide the Department with copies of Project Records at all reasonable times without cost or liability to the Department. Unless the context clearly indicates otherwise, Project Records are the property of the Department. The Contractor must retain Project Records for at least three years after Final Acceptance or for any applicable warrantee period, whichever is longer. For related provisions, see Sections 101.2 - Definition of Project Records and 111.1.6 - Contractor's Obligation to Keep Records.

104.3.7 Laws To Be Observed The Contractor shall keep itself informed of and comply with all applicable laws, rules, regulations, orders, and decrees ("Law") affecting the Work, including all environmental, wage, labor, equal opportunity, safety, patent, copyright, or trademark laws. The Contractor agrees to indemnify, defend, and hold harmless the Department against any and all claims or liabilities arising from or based upon the violation or alleged violation of any such Law caused directly or indirectly by or through the Contractor.

104.3.8 Wage Rates and Labor Laws

A. Federal Wage Rates and Labor Laws Federal wage rates apply, unless expressly stated otherwise by Special Provision. The classification of construction type and related wage rates by the U.S. Department of Labor will be provided by Special Provision. If not provided, the Contractor must contact the Department before Bidding to determine the applicable wage rates in accordance with Section 102.5.2 - Bidder's Duty to Notify Department if Ambiguities Discovered. The Contractor must pay according to said rates and must otherwise comply with all applicable federal and State labor laws, rules, and regulations. Persons registered with the Department as trainees must be paid at least at the prevailing wage for laborer, and upon completion of their program, trainees shall by paid the prevailing wage for the skill and classification trained.

B. State Wage Rates and Labor Laws Maine State wage rates apply only if provided expressly by Special Provision. If so provided, the classification of construction type and related wage rates established by the Maine Department of Labor will be set forth by Special Provision. If not so set forth, the Contractor shall contact the Department before Bidding to determine the applicable wage rates in accordance with Section 102.5.2 - Bidder's Duty to Notify Department if Ambiguities Discovered. The Contractor shall pay according to said rates and shall otherwise comply with all applicable federal and State labor laws, rules, and regulations. Title 26 MRSA § 1303 set forth various requirements about preference to Maine workers that apply to State funded Contracts. However, if a Contract is Federally funded or partially Federally funded, Federal law governs and Title 26 MRSA § 1303 does not apply. For a related provision, see 23 CFR § 635.117.

104.3.8.1 Electronic Payroll Submission On federally funded Projects the Contractor, all Subcontractors, and lower-tier Subcontractors will submit their certified payrolls electronically utilizing the Elations system. There is no charge to the contracting

community for the use of this service. The submission of paper payrolls will not be allowed or accepted. Additional information can be found at http://www.maine.gov/mainedot/contractors/ under the "Bidder Info" go to "Electronic Payroll System."

104.3.8.2 Payment Tracking On federally funded projects the Contractor and all Subcontractors and lower-tier Subcontractors will track and confirm the delivery and receipt of all payments through the Elation System

104.3.9 Patents and Copyrights The Contractor must provide proof of a legal Agreement with the holder of any patent, trademark, or copyright, or the Owner, if necessary, for use of any of the following: design(s), process(es), device(s), trademark(s), Material(s), and copyright(s). The Contractor agrees to indemnify, defend, and hold harmless the Department and any affected third party or political subdivision from all claims of infringement that arise from use of any item listed in this paragraph.

104.3.10 Responsibility for Damage to Work Except as provided in Section 104.2.7 - Damage to Project Caused by Uncontrollable Events, the Contractor shall bear all risk of loss relating to the Work until Final Acceptance, regardless of cause, including completed Work, temporary Structures, and all other items or Materials not yet incorporated into the Work. For a related provision, see Section 110.3.6 - Builders Risk.

The Contractor shall, at its sole expense, rebuild, repair, restore, or replace such damaged Work or otherwise make good any losses that arise from such damage ("rebuilding, etc."). If the Contractor fails to promptly commence and continue such rebuilding, etc., the Department may, upon 48 hours advance written notice, commence rebuilding, etc. of the damaged property without liability to the Department with its own forces or with Contracted forces and all costs will be deducted from amounts otherwise due the Contractor. For the Contractor's responsibilities for the Work after Final Acceptance, see Section 106.9 - Warranty Provisions.

104.3.11 Responsibility for Property of Others The Contractor and its Subcontractors shall not enter private property outside the Project Limits without first obtaining permission from the Owners.

The Contractor shall be responsible for all damage to public or private property of any kind resulting from any act, omission, neglect, or misconduct of the Contractor and its Subcontractors. The preceding sentence includes damage to vehicles passing through the Work area.

The Contractor shall, at its sole expense, rebuild, repair, restore, or replace such damaged property and otherwise make good any losses that arise from such damage. If the Contractor fails to completely remedy the damage in a timely manner, the Department may, upon 48 hours advance written notice, rebuild, repair, restore or replace the damaged property without liability to the Department with its own forces or with contracted forces. All costs will be deducted from amounts otherwise due the Contractor.

104.3.12 Forest Protection and Laws The Contractor shall obey all laws and regulations that govern Work within or adjacent to State or National Forests, keep the Project site orderly and clean, obtain all required Permits, prevent and assist with the suppression of forest fires, and cooperate with authorized forestry officials.

Pursuant to State law, the sale of harvested forest products must be reported to the Maine Forest Service at the end of each year. The Contractor is hereby designated as the Department's agent for reporting of any such harvesting.

104.3.13 Materials and Items Found On the Project With the Department's approval, the Contractor may use suitable excavated Material in the Work and be paid for both the excavation and the placement of such Materials at the corresponding Contract Unit Prices. Except for Material used for riprap, stone ditch protection, and loam, the Contractor shall replace such excavated Material with other approved Material and properly compact it at no cost to the Department. The Contractor shall obtain written permission from the Department before performing any excavation outside the Project Limits.

Unless expressly provided otherwise, the Contractor shall remove and assume Ownership of all Incidental Structures and Materials to be removed such as guardrail, drainage pipe, culverts, curbing, bridges, and other manufactured Materials. Utility Facilities, traffic control devices, and lights, together with all supporting Structures, are excluded from the provisions of this Section 104.3.13. The cost of removal of such Structures and Materials is Incidental to the Contract unless expressly provided otherwise.

104.3.14 Interpretation and Interpolation The Contractor is responsible for all interpretations and interpolations made from information provided in the Bid Documents and Contract, including data and test results related to location, survey, hydrology, hydraulics, soils, ledge quality, existing Structures, Environmental Information, and Geotechnical Information. For related provisions, see Sections 102.3 - Examination of Documents, Site, and Other Information; 102.5.2 - Bidder's Duty To Notify Department If Ambiguities Discovered; 104.3.3 - Duty to Notify Department If Ambiguities Discovered; and 105.6 - Construction Surveying.

104.4 Communication and Coordination

104.4.1 Partnering

A. Definition, Purpose, and Applicability Partnering is a process of voluntary structured communication between the Department, the Contractor, its principal Subcontractors and suppliers, and other Project stakeholders for the purpose of improving efficiency and minimizing Disputes. Partnering, including the establishment of a partnership charter, does not in any way waive, alter, or otherwise affect any provision of the Contract. For a related provision, see Section 111.1.3 - Relationship to Partnering.

Participation in Partnering is voluntary; either party may elect to not participate in Partnering for any reason. The associated costs of Partnering will be agreed to mutually and shared equally.

B. Initial Partnering Workshop If the Contractor and the Department elect to participate in Partnering, representatives of both parties will arrange a facilitated initial Partnering Workshop, which should be held before the start of on-site construction. The Project Manager, Resident or both and the superintendent will determine Workshop attendees, the facilitator, agenda, duration, and location. Key Project level supervisory personnel, corporate/State level management personnel, and key Project personnel of the Contractor's principal Subcontractors and suppliers should attend. Project design Engineers, FHWA, local government representatives, environmental regulators, emergency service personnel, Utility Companies, impacted business and/or landowners, and other stakeholders may also be invited to attend. The product of the initial Partnering Workshop will be a partnership charter. This charter will include mutually agreed upon Project goals and communication escalation procedures.

C. Follow-Up Workshops The Contractor and the Department may agree to hold follow-up Partnering Workshops periodically throughout the duration of the Contract.

104.4.2 Preconstruction Meeting

After the Contract has been executed and before the start of on-site construction by the Contractor, the Resident will schedule a Preconstruction Meeting that must be attended by the Contractor's Project Manager and Superintendent. Notification of the meeting shall be sent to the following personnel, agencies, and organizations as required by the Contract and deemed essential to the Work outlined in the Contract.

Project Manager, Program Manager, and Area Construction Manager
Engineer of Record and Project Designer Engineers
Utility Coordinator and Utility Companies
Property Officer, Town Representatives, and Major Stakeholders
Environmental Officer and Agencies
Safety Officer, Fire Department, and Police Department
Civil Rights Officer
Communications Representative
FHWA Representative
Regional Office including Manager, Engineer, and Maintenance

The agenda of the Preconstruction Meeting, at a minimum, shall include the following items that pertain to the Contract.

Attendee List with contact information
Project Description
Contract

Bid Amendments
Project Specific Permit Requirements
Review of Special Provisions
Contractor's General Authority and Responsibilities – 104.3
Utility Coordination – 104.4.6
Road/Bridge Closure/Restriction Notifications – 104.4.10
Traffic Management – 105.3
Environmental Requirements – 105.8
Time – 107
Additional Special Provisions as required by the Contract
Review of Plans
Review of Submittals
Review of Requirements prior to Start of Work
Communications

The Resident will prepare minutes of the Preconstruction Meeting and distribute them to all attendees and invitees. Any requests to revise the minutes must be made to the preparer within 7 Days of Receipt. These minutes will constitute the final record of the Preconstruction Meeting.

The Resident will prepare minutes of the Preconstruction Meeting and distribute them to all attendees and invitees. Any requests to revise the minutes must be made to the preparer within 7 Days of Receipt. These minutes will constitute the final record of the Preconstruction Meeting.

For related provisions, see Sections 104.4.6(A) - Preconstruction Utility Meeting; 652 - Implementation of Traffic Control Plan, Preconstruction Field Review (if required); 656.4.1 - Temporary Soil Erosion and Water Pollution Control, Preconstruction Field Review; and 106.4 - Quality Control.

104.4.3 Progress Meetings

Except as provided otherwise in this Section 104.4.3 - Progress Meetings shall be held at regular intervals, but at least monthly, throughout the duration of the Contract. All personnel of the Department and the Contractor who have significant information relevant to agenda items shall attend. Additional personnel, as included in the invitee list of the Pre-construction Meeting and as merited, may be invited to attend.

The agenda for each Progress Meeting at a minimum, shall include the following items that pertain to the Contract:

Review and Approval of Previous Progress Meeting Minutes
Review of Action Items from Previous Meeting
Review of Progress from Last Progress Meeting
Review of Work Planned to Prior to Next Progress Meeting
Contractor's Schedule of Work
Material Testing and Work Inspection Schedule

Progress Payments
Civil Rights
Contractor's Quality Control
Contractor's Safety Practices
Contractor's Environmental Control
Contractor's Traffic Control
Onsite Utility Coordination
Review of Outstanding Submittals and Long Lead Items
Request for Information
Contract Modifications
Material and Equipment Deliveries
Issues, Disputes, Claims, and Resolutions
Review of New Action Items

The Resident will prepare minutes of these meetings and distribute them to all attendees. Any requests to revise the minutes must be made to the Resident within 7 Days of Receipt. These minutes will constitute the final record of the Progress Meeting.

In lieu of a Progress Meeting, the Resident and the Superintendent may exchange written communication before or on the scheduled Progress Meeting date that indicates there is no need for the meeting because the Work is on schedule, compensation is current, communication is ongoing, and there are no significant outstanding or anticipated issues, Disputes or claims. The Superintendent's written communication shall also contain a description of (A) progress of the Project since the last Progress Meeting or communication in lieu thereof and (B) expected activities before the next scheduled Progress Meeting. All invitees to the Progress Meeting must be notified of canceled or postponed meetings.

104.4.4 Requests for Information Either the Department or the Contractor may request that the other party provide information that the requesting party needs to fulfill its Contract obligations by Delivering a written Request for Information (RFI). The Department may require that RFIs be on forms and media approved by the Department. The request must (A) be of reasonable scope, (B) explain why such information is necessary to fulfill Contract obligations, and (C) provide a requested response time, which must be reasonable in relation to its scope (at least 72 hours). The party receiving an RFI shall use its best effort to respond to the RFI within the time requested. The response shall be in writing. The status of outstanding RFIs shall be discussed at each Progress Meeting.

104.4.5 Early Negotiation

A. Notice Required When the Contractor becomes aware of facts or circumstances that may cause the Contractor to seek additional compensation, time, or any other change in Contract requirements ("Issue"), then the Contractor shall notify the Resident within 48 hours and before commencing any part of the Work relating to the Issue. The notice must describe the basic nature and extent of the Issue.

Such notice may be verbal only if confirmed in writing in one of the two following ways: (A) if a Progress Meeting is held within 14 Days of the date that the Issue became known, such Notice may be confirmed with an entry in the Progress Meeting minutes. Such entry must describe the basic nature and extent of the Issue. (B) Otherwise, the Contractor shall confirm a verbal notice by Delivering to the Resident, within 14 Days of the date the Issue arose, a written notice that describes the basic nature and extent of the Issue.

The written notice or confirmation will be known as a "Notice of Issue for Consideration." The Contractor will not be entitled to any additional compensation, time, or any other change to Contract requirements without a timely Notice of Issue for Consideration.

B. Negotiation When the Resident receives the Notice of an Issue for Consideration Conforming to Section 104.4.5(A) - Notice Required, the Resident and the Contractor will negotiate to attempt to resolve the Issue. Any resolution will be noted in the Progress Meeting minutes or confirmed otherwise in writing by the Department. Any changes to the Contract that affect compensation, time, quality, or other Contract requirements shall be by written Contract Modification as provided by Section 109.8 - Contract Modifications.

For related provisions, see Sections 109.5 - Adjustments for Delay and 109.7 - Equitable Adjustments to Compensation and Time.

C. Additional Consideration If negotiation fails to resolve the Issue within 45 Days of the date the Resident receives the Notice of Issue for Consideration, and if the Contractor desires additional consideration by the Department, then the Contractor must comply with Section 111.2 - Detailed Notice of Dispute and all other requirements of Section 111 - Resolution of Disputes.

104.4.6 Utility Coordination

A. Pre-construction Utility Meeting A Pre-construction Utility Meeting will be held to coordinate the Work of the Contractor and the Work of affected Utility Companies. Usually this meeting will be held on the same day as and immediately before the Pre-construction Meeting provided by Section 104.4.2 - Pre-construction Meeting but, in any event, will be held before the start of on-site construction by the Contractor that affects Utility Facilities. The Department's Utility Coordinator, the Project Manager, Resident, the Contractor's Superintendent, and a representative of each affected Utility Company will attend. The Department's Utility Coordinator will prepare minutes of the Pre-construction Utility meeting and distribute them to all attendees. Any requests to revise the minutes must be made to the Department's Utility Coordinator within 7 Days of distribution. These minutes will constitute the final record of the meeting. For a related provision, see Section 104.4.2 - Pre-construction Meeting(s).

B. Utilities Within Right-of-Way Except as provided otherwise in the Contract, including subsection E - Temporary Relocations below, all Utility Facilities of all Utility Companies within the Right-of-Way will be relocated and adjusted as provided in the

Contract by and at the expense of the affected Utility Company, provided, however, that the Contractor is responsible for scheduling its Work in accordance with the time allowed for utility relocation as provided in the Contract. Utility relocation Work may not proceed without authorization from the Department.

C. Contractor's Responsibilities

1) Utility Coordination - The Contractor has primary responsibility for coordinating its work with utilities after contract award. The Contractor shall communicate directly with the utilities regarding any utility work necessary to maintain the Contractor's schedule and prevent project construction delays. The Contractor shall notify the Resident of any issues. The Contractor shall plan and conduct its work accordingly.

2) The Contractor must exercise every reasonable precaution to prevent damage to Utility Facilities or interruption to utility services known to or discovered by the Contractor, whether or not shown on the Plans. Such precautions must include notice to Utility Companies before undertaking Work that could damage Utility Facilities. The Contractor must provide each Utility Company with notice at least three Business Days before the date a Utility Company will have to support any pole.

3) The Contractor must take all reasonable precautions to determine the presence of underground Utility Facilities before commencing any excavation Work and must provide all affected Utility Companies with at least 72-hour prior notice of the proposed excavation. The Contractor must comply with 23 MRSA § 3360-A, entitled "Protection of Underground Facilities," Maine's "Dig Safe" statute, and also contact the non-member underground facility operators in the Maine Public Utilities Commission's **"OK-TO-DIG"** directory.

4) The Contractor must maintain initial markings (spray paint, stakes, etc.) made by the authorized representative of a Utility Company to indicate the location of underground Utility Facilities and otherwise comply with 23 MRSA § 3360-A(4).

5) The Contractor must cooperate with Utility Companies in its relocation or operations so that these operations proceed in a logical sequence, minimize duplication of Work, and avoid unnecessary interruptions to utility service.

6) If utility services are interrupted as a result of the Contractor's Work, the Contractor must promptly notify the appropriate Utility Company and must cooperate fully in the restoration of service. If service is interrupted, repair Work will be continuous until the service is restored. No Work can be undertaken around fire hydrants until the local fire authority has approved provisions for continued services.

7) The Contractor must schedule its Work so as to provide for all Utility Company Work and to complete the Work within the Contract Time. The estimated number of workdays required by each Utility Company to perform its relocation Work contained in the Contract is provided by the Utility Companies and are estimates only. Such Utility Facility relocation times assume normal Working times (Monday through Friday, 8 hours per day), and are dependent upon normal weather, normal Working conditions, and freedom from emergencies. The Department is not responsible for the accuracy of these estimates. If a Utility Company fails to perform its Work within the time frames set forth in the Contract or in the minutes of the Pre-construction Utility Meeting, and such failure affects the Contractor's Critical Path, the Contractor may request a suspension of Work pursuant to

Section 107.5.2 and such Delay will be analyzed in accordance with Section 109.5 - Adjustments for Delay.

8) Any clearing and tree removal that is a part of the Contract and that must be done in areas where Utility Companies are involved must be completed by the Contractor before the Utility Company can relocate its Utility Facilities. Any clearing, cutting of single trees, or limbing required for the temporary or permanent Utility Facility location must be approved by the Department. The Contractor must provide the Department with prior notice of at least 4 Days before removing or trimming any trees or other vegetation.

9) If blasting occurs on the Project, the Contractor must provide each Utility Company having Utility Facilities that could be damaged by the blast with at least 24-hour prior notice that includes the anticipated time of the initial blast.

10) If the Contractor observes a Utility Company Working within the Project Limits in a manner that (A) violates the MUTCD, the Contractor's Traffic Control Plan, or an applicable OSHA requirement or commonly accepted safety practices, and (B) represents a clear and immediate risk of significant bodily injury to any person within the Project Limits, then the Contractor must notify the Resident and the Utility Company immediately.

11) The Contractor agrees to indemnify, defend, and hold harmless the Department from and against any and all claims or causes of action arising from any act or omission of the Contractor, the Subcontractors, or their respective agents, representatives, or employees for failure to comply with this Section 104.4.6.

D. Temporary Relocations The Contractor may request temporary changes of location of Utility Facilities for the Contractor's convenience. The Contractor must satisfy the Department that the proposed temporary change will not interfere with the Work, the Work of Utility Companies, or the Work of other Contractors and will not impede the free and safe flow of traffic. If acceptable to the Department, the Contractor may make its own request to the Utility Company or other party affected by such temporary changes. The expense and risk of temporary changes will be borne solely by the Contractor; no changes to compensation or time will be made.

E. Unforeseeable Utility Relocations The Department may order utility adjustments in accordance with Section 109.4 - Differing Site Conditions.

F. Cost The cost of all Work related to utility coordination is Incidental to the Contract.

104.4.7 Cooperation with Other Contractors The Department reserves the right to Contract for, perform, or allow other Work to be performed within or near the Project Limits. The Contractor must take all reasonable steps to avoid interfering or hindering such other Work. The Contractor must cooperate with Contractors or others performing such other Work as directed by the Department.

If the basic nature and scope of such other Work are provided or referenced in the Bid Documents or are otherwise known or foreseeable to the Contractor, then the Contractor assumes all risks and liability associated with such other Work and agrees to indemnify, defend, and hold harmless the Department from all claims related to such other Work that arise from the Contractor's acts or omissions.

104.4.8 Coordination with Railroads The Contractor shall (A) perform Work within a railroad Right-of-Way without interfering with trains or railroad company traffic and (B) coordinate all Work crews and the Contractor's Schedule of Work to accommodate the railroad company Work. If the Bid Documents show that Materials must be hauled across railroad tracks, the Department will make preliminary arrangements with the railroad to permit such hauling. The Contractor shall, at its expense, negotiate and enter into any other Agreements with the railroad.

Special Provision will provide any additional conditions or requirements regarding railroad coordination.

104.4.9 Coordination with Marine Traffic The Contractor shall not interfere with free and safe navigation of navigable waters except as provided by permit issued by the US Coast Guard and other applicable regulatory agencies. All Work must comply with all US Coast Guard permit conditions and all applicable Federal regulations affecting navigation.

When the basic nature and scope of marine traffic requirements are provided or referenced in the Bid Documents or are otherwise known or foreseeable to the Contractor, then the Contractor assumes all risks and liability associated with said requirements, and the Contractor shall indemnify, defend, and hold harmless the Department from all claims related to the maintenance or obstruction of marine traffic that arise from the Contractor's acts or omissions.

104.4.10 Coordination of Road Closure/Bridge Closure/Bridge Width Restriction Notification When a road closure, bridge closure, or width restriction is allowed by the Contract, prior to a closure or a width restriction to a single lane of less than 15 ft., the Contractor shall notify affected public officials, agencies, other entities, and the public of the date on which the closure/width restriction will begin and the anticipated duration of the closure/restriction, as indicated below.

The closure shall be announced on a minimum of two portable/changeable message signs, placed in approved locations, beginning at least ten Days prior to the closure. A public notice shall also be published in a local newspaper ten Days prior to the closure.

Advance warning signs shall be placed so the traveling public is aware of the restrictions in place. They shall be placed at enough distance from the restriction so vehicular traffic can be rerouted to an alternate route.

The Contractor shall notify the following public officials, agencies, and organizations ten Days prior to, and again the Day before, the date that the closure/restriction begins and the anticipated length of the closure/restriction. When the road/bridge is reopened/unrestricted to traffic, the following list will again be notified. The Contractor shall provide the Department with documentation that the listed public officials, agencies, and organizations received the notification at least 10 Days prior to the

closure/restriction or with proof that the notification was mailed 15 Days prior to the closure/restriction.

Town Officials (Manager or First Selectperson)
Representative or County Commissioners (If Unorganized Townships)
County Sheriff's Department
Fire Department
Police Department
State Police
Emergency Service
School Department
Post Office
Chamber of Commerce
Any Large Employers
Mobile Home Movers, Manufacturers and Dealers
Bureau of Maine Vehicles – Over Size/Over Weight Permits
MaineDOT Radio Room

Maine DOT Regional Office

All notifications will be subject to the approval of the Resident. All costs not covered by Pay Items will be considered incidental to the Contract.

104.5 Subcontracting

104.5.1 Limits on Subcontracting The Contractor shall perform at least 30% of the value of the Work with its own Work force, excluding any specialty items as designated in the contract documents by the Department.

The Contractor shall not carry the workers of another recognized Contractor or firm on its payroll or a Subcontractor's payroll. The Contractor shall not use any Subcontractors that are debarred from Bidding by the Federal Government or any agency of the State of Maine.

104.5.2 Contractor's Duties Regarding Subcontractors Subcontractors are solely the responsibility of the Contractor. The Contractor is responsible for assuring that its Subcontractors have sufficient skill and experience to perform the Work properly and for coordinating and managing its Subcontractors to achieve the intent of the Contract. The Contractor agrees to indemnify, defend, and hold harmless the Department from and against all claims and causes of action arising out of any act or omission of Subcontractors, their agents, representatives, and employees. The Contractor agrees to indemnify, defend, and hold harmless the Department from any claims asserted by its Subcontractors, including any claims to recover losses allegedly suffered by a Subcontractor. Subcontracting does not alter or diminish the Contractor's obligations under the Contract. For a related provision, see Section 105.1 - Intent of the Contract.

104.5.3 Documentation Regarding Subcontracting Before any Work is performed by a Subcontractor, the Contractor shall provide the Department a Subcontract approval package which shall include:

A list of all Subcontractors that the Contractor anticipates will be providing Work within the Project Limits. .

If requested by the Department, the Contractor shall provide the Department with copies of any subcontract or other document that establishes the relationship of the Contractor and any Subcontractors.

104.5.4 Discharge of Subcontractors The Department, upon written notice to the Contractor, may require that the Contractor discharge any Subcontractor without cost or liability to the Department. If the Department determines that a Subcontractor's performance jeopardizes the intent of the Contract otherwise, the Department may, but is not required, to notify the Contractor of such a determination. Such notice, or lack thereof, does not affect the Contractor's duties regarding Subcontractors. Upon Receipt of such notice, the Contractor shall take any action it determines is necessary to fulfill its obligations under the Contract. For related provisions, see Sections 104.3.4 - Workers and Equipment, 104.5.2 - Contractor's Duties Regarding Subcontractors, 105.1 - Intent of the Contract, and 105.2 - Health and Safety.

Prompt Payment of Subcontractors

Pay When Paid The Contractor shall pay Subcontractors in full for all Work satisfactorily performed and Invoiced by the Subcontractor no later than 30 Days from the date the Contractor receives payment from the Department for such Subcontractor's Work. Contractor will insure that its Subcontractors pay all Sub-Subcontractors, including suppliers and materialmen, no later than 30 days from the date that they receive payment from the Contractor.

Retainage The Contractor shall return to the Subcontractor all retainage withheld from the Subcontractor within 30 Days after the date the Subcontractor's Work is satisfactorily completed. If there is a Delay in such return of retainage, the Subcontractor may pursue all rights it may have under the claims procedure referenced in Section 104.5.6 - Subcontractor Claims for Payment.

Payment Tracking Federal Projects On federally funded projects, the Contractor, Subcontractors, and lower-tier Subcontractors will track and confirm the delivery and receipt of all payments through the Elation System. They will be responsible for entering all payments to all Subcontractors and lower-tier Subcontractors. The Department will run a query monthly to ensure that Contractors are complying and generate an e-mail to Contractors who have not responded to confirm receipt of Department payment or Contractor payment to Subcontractors and lower-tier Subcontractors.

104.5.6 Subcontractor Claims for Payment The Contractor agrees to notify all Subcontractors of the claim filing procedure of Payment and Performance Bonds required by 110.2.1. The Department may use retainage and other remaining project funds to pay outstanding claims for Accepted Work.

104.5.7 Flow Down All subcontracts of the Contractor, and all lower tier subcontracts, shall contain or reference all applicable provisions of the Contract, including all safety, wage, Prompt payment, labor, environmental, and equal opportunity provisions. The Contractor shall indemnify, defend, and hold harmless the Department against any and all claims or liabilities arising from the failure to include such flow down provisions and agrees that any such claims and liabilities may be paid by the Department using retainage on other Project funds.

104.5.8 No Third Party Beneficiaries The Contractor and the Department agree that this Contract is not intended to create any third-party beneficiaries or to authorize anyone not a party to the Contract to maintain an action under Contract provisions.

104.5.10 Warranty and Maintenance Bonds Warranty and Maintenance Bonds may be required of the Contractor or the Subcontractor for specified items that the Department deems appropriate. Specific requirements will be given via Special Provision. These bonds may be for specified items in the Contract Schedule of Items. The Bond must name the "Treasurer-State of Maine" as an obligee. The Contractor shall provide a copy of said bond to the Department before the performance of any affected on-site Work. Should the subcontractor be required by special provision to provide a Warranty or Maintenance Bond, the Contractor hereby authorizes the Department to directly contact the Landscape Subcontractor and/or its Surety in the event of a failure of the bonded item to perform as specified.

## SECTION 105 - GENERAL SCOPE OF WORK

Scope of Section This Section contains Work requirements that are generally within the scope of all Projects. These include provisions related to health and safety, traffic control, maintenance of Work, hauling of Materials and Equipment, construction surveying, Working Drawings, the environment, historic and archeological considerations, equal opportunity and civil rights, and other federal requirements. This Section is not all-inclusive. The scope of these items is often described more specifically and fully elsewhere in the Contract and in other specific items that appear elsewhere.

This Contract is federally funded, unless expressly provided otherwise in the Bid Documents. As a federally funded Contract, it includes all federal requirements set forth in the Project Specific Bid Book.

105.1 Intent of the Contract The intent of the Contract is to provide for the construction and Completion of a functionally complete Project in Conformity with the Contract. The Contractor shall furnish all Work to achieve this intent, including all Work

that may be reasonably inferred to be required from the Contract or from prevailing industry or trade custom, whether or not specifically called for.

105.2 Health and Safety

105.2.1 Safety Responsibility The Contractor has the overall authority and responsibility to maintain safety of its employees and of all other persons in the work area or on the worksite. The Contractor shall provide all safeguards, safety devices, and protective Equipment and take all other action that is necessary to continuously and effectively protect the safety and health of all persons from hazards related to the Work. Such safeguards include providing a sufficient number of security guards.

105.2.2 Health and Safety Plan A copy of the Contractor's Health and Safety Plan must be on file with the Contracts Section of the Department as a condition of Prequalification to be awarded a Construction Contract. A copy of the Safety Plan will be provided to the Department's Contracts Section in an electronic media format prior to Contract award. The Contractor shall designate which portions such submissions it considers confidential business information. If such program is revised during the Contract Time, the Contractor shall provide the updated program to the Department. The Contractor shall comply with its safety program and this Section 105.2 - Health and Safety. The Contractor shall be responsible for all claims or damages arising from failure to so comply and to indemnify, defend, and hold harmless the Department from all claims and damages arising from such non-compliance.

105.2.3 Project Specific Emergency Planning Unless the Contract provides for closure of an existing facility, the Contractor shall ensure that essential police, fire, rescue, and ambulance services have reasonable and timely access to and through the Project Limits. The Contractor shall contact all emergency service providers in the area, discuss potential impacts on emergency operations (including water supply for fire suppression), and minimize any negative impacts. Fire hydrants within or adjacent to the Project Limits shall be kept accessible to fire apparatus at all times, unless the fire department agrees otherwise in writing. For a related provision, see Section 104.3.12 - Forest Protection and Laws.

If the nature of the Work involves deep trenching, confined spaces, toxic chemicals, or any other unusual hazards that could require specialized rescue, the Contractor shall inform and cooperate with the appropriate fire department, rescue service, or EMS.

The Contractor shall provide the Resident with, and post and maintain in conspicuous places within the Project Limits, a list containing (A) emergency response numbers with the names and telephone numbers (including cellular phone and pager numbers, if applicable) of local ambulance, police, fire, rescue, and hospitals, (B) emergency response numbers for hazardous Materials spills as required by Section 656.3.4(f) - Spill Prevention, (C) the Contractor's personnel with phone numbers who may be reached in case of emergency, and (D) the Department's personnel with phone numbers who may be reached in case of emergency.

105.2.4 Unsafe Conditions The Contractor will immediately eliminate all unsafe conditions brought to the Contractor's attention by the Department Resident or any other Department staff. If the Contractor or the Department actually observes any person(s) performing Work in a manner that (A) the observing party actually knows is not in compliance with the MUTCD, the Contractor's TCP, an applicable OSHA requirement, or commonly accepted safety practices, and (B) creates a clear and immediate risk of significant bodily injury to any person, then the observing party shall immediately notify such person(s) Working in an unsafe manner and the other party to the Contract. The Contractor and the Department agree to cooperate in eliminating all such unsafe conditions. For related provisions, see Sections 104.3.4 - Workers and Equipment, 104.4.6 - Utility Coordination, 105.3 - Traffic Control and Management, and 105.4 - Maintenance of Work.

105.2.5 Compliance with Health and Safety Laws The Contractor has the authority and responsibility to ensure compliance with all applicable federal, State, and local laws governing safety, health, and sanitation, including all applicable laws and regulations of OSHA. The Contractor shall comply with these laws and regulations and ensure compliance by its subcontractors. The Contractor is responsible for correcting any health and safety violations.

For related provisions, see Sections 105.2.3 – Project Specific Emergency Planning, 105.3 – Traffic Control and Management and 105.4 – Maintenance of work.

105.2.6 Convenience of the Public At all times the Contractor shall perform the Work to minimize obstructions to pedestrian, vehicular, railroad, and marine traffic. All temporary and permanent pedestrian access ways must comply with the Americans with Disabilities Act (ADA). Footways, gutters, sewers, inlets, and portions of the Highway adjacent to the Work must not be obstructed unless allowed by the Contract.

If the Contractor receives notice from the Department that the Contractor has failed to comply with the provisions of this Section 105.2 - Health and Safety, the Contractor shall remedy such non-compliance immediately. If the Contractor fails to do so, the Department may remedy such non-compliance by any means and deduct the cost of the remedy from amounts otherwise due the Contractor.

105.2.7 Use of Explosives

A. Standards When using explosives, the Contractor shall use the utmost care to protect life and property. Explosives must be transported, stored, and used in compliance with this Contract, in compliance with all applicable federal, State, and local laws, rules and regulations, and in accordance with all applicable provisions of the latest version of the Blasters' Handbook published by the International Society of Explosives Engineers (ISEE) of Cleveland, Ohio. In any case, the Contractor shall comply with the recommendations contained in Chapter 13 - "Blasting Safety" of said Blasters' Handbook, unless a qualified person conducting the blasting operations for the Contractor certifies to the Department in

writing that certain provisions of said Chapter 13 are not necessary to protect life and property.

B. Blasting Zone - Signage and Flaggers The Contractor shall define a blasting zone. When using electric detonators, the blasting zone must allow safe distances from radio transmitters based upon their power output frequency. The blasting zone must include all areas within which people could be injured or property could be damaged by the blast. The Contractor shall mark Highways conspicuously at the perimeter of the blasting zone with signs in accordance with MUTCD. If applicable, the Contractor shall place signage along railroads and appropriate notice shall be provided to marine traffic. The Contractor shall provide a sufficient number of flaggers stationed outside the blasting zone to stop all approaching traffic during blasting operations.

C. Other Requirements The Contractor shall provide to the Department general liability insurance coverage covering use of explosives in accordance with Section 110.3.2 - Commercial General Liability. Immediately after the blast, the Contractor shall remove any debris that is obstructing Highway, pedestrian, railroad, or marine traffic flow. . The Contractor shall not use perchlorate in its blasting operations. For related provisions, see Sections 104.4.6(C)(9) - Blasting Notice, 104.3.11 - Responsibility for Property of Others, and 110.1 – Indemnification , 110.3.2- Commercial General Liability andSpec 203.042 Rock Excavation and Blasting.

105.3 Traffic Control and Management The Contractor shall provide continuous and effective traffic control in compliance with Section 652 - Maintenance of Traffic.

105.3.1 Notices Required The Contractor shall plan paving operations so that the Resident will have sufficient advance notification to provide the necessary inspection and testing. Sufficient notification will be considered 48 hours. In the event that paving is suspended, the 48-hour advance notification shall be required again before restarting the paving operations unless otherwise agreed by the Resident. A verbal warning will be given before starting the offense process for paving notification.

The Contractor shall plan granular material operations so that the Resident will have sufficient advance notification to provide a proctor for the material to be placed. Sufficient notification will be considered 7 days. Changes in source will also require this notification.

Failure to provide the above notifications will result in the following actions:

First offense – verbal warning
Second offense - written warning
Third and subsequent offense - liquidated damages will be charged for one Calendar day

105.4 Maintenance of Work

105.4.1 Maintenance During Construction The Contractor shall maintain the Project and all related Work in a safe and satisfactory condition until Final Acceptance. Such maintenance requires continuous and effective Work conducted daily.

Trenches Where existing pavement carries traffic and is removed, the pavement shall be replaced daily with a temporary pavement consisting of a minimum of three inches of acceptable hot or cold bituminous mixture. Cold bituminous mixture shall contain Aggregates, asphalt cutbacks, liquefiers and wetting agents. No separate payment will be made for furnishing, placing, maintaining, and removing temporary pavement, and all cost of such work will be considered Incidental to the Contract.

Before placing any permanent pavement over backfilled trenches, the edge of the adjoining existing pavement shall be cut even and vertical, and coated with tack coat to form a tight joint between the new and the existing pavements. The permanent pavement depth and type (HMA or PCC) will match the existing roadway structure. No separate payment will be made for cutting and tack coating the joint.

If the Contractor fails to meet the conditions of Section 105.4.1, the Department will notify the Contractor of such failure. The Contractor shall remedy such failure within 4 hours after receiving such notice. If the Contractor fails to do so, this may be considered a traffic control violation in accordance with Section 652 and the Department may remedy the situation with its own or Contracted forces without liability to the Department and all costs will be deducted from amounts otherwise due the Contractor. When the Contract involves placing material on, or use of previously constructed subgrade, base course, pavement, or structure, the Contractor shall maintain such previously constructed Work in a safe and satisfactory condition until Final Acceptance.

Except as expressly provided otherwise in the Contract, the cost of complying with this Section 105.4.1 is Incidental to the Contract.

105.4.2 Use of Granular Materials The Department may authorize and pay for granular Materials that are capable of supporting traffic and necessary to maintain the specified traffic Lane widths upon the following conditions.

A. The Contractor must prepare the area where the granular Materials are to be used by eliminating objectionable Material and providing adequate temporary Drainage before the granular Material is placed.

B. Quantities of granular Materials will be determined by the most appropriate method of measurement that applies at the time the Material is placed and that is in accordance with the Specifications for the particular type of granular Material authorized for use. For a related provision, see Section 108.1 - Measurement of Quantities for Payment.

C. Payment for granular Material will be made at the Unit Price for the Material authorized for use.

D. Payment as Common Excavation will be made when Material for maintenance of traffic is removed.

105.4.3 Maintenance During Winter Construction Except as provided in the following paragraph, when the Contractor performs Work during winter weather conditions, the Contractor shall plow snow from the portions of a Project that carry vehicular or pedestrian traffic, including all Bridges and Sidewalks, so as to allow the free and safe flow of such traffic. The State or local governmental agency that would otherwise be responsible for winter maintenance will sand and salt such portions of a Project.

The State or local governmental agency responsible for winter maintenance will plow, sand, and salt such portions of a Project that (A) have been untouched or left by the Contractor in a suitable condition to carry traffic as determined by the Department and (B) are unaffected by the construction operations.

105.4.4 Maintenance During Suspension of Work

A. Work Responsibilities Prior to suspension, the Contractor must make the Project suitable for the free and safe flow of traffic as determined by the Department, including covering or removal of signs. To provide space for snow removal, all areas to be used by traffic must be clear for the entire usable Roadway, including Shoulders, or curb-to-curb, including Sidewalks.

During an approved suspension, the Department will maintain the temporary Roads and Project sections by plowing snow, controlling ice, and patching or retreating the surface. During suspension, the Contractor must (1) take precautions necessary to prevent damage to the Work and to allow the Department to provide such maintenance (such precautions include providing Drainage and erecting any necessary Structures, signs, or other facilities); (2) maintain all temporary Structures and traffic control devices; and (3) continuously maintain, in an acceptable growing condition, all living plant Material, including newly established seedings and soddings furnished under the Contract and take precautions to protect vegetative growth from damage.

After suspension, the Contractor must clean up all evidence of the snow and ice control at its expense, including removing excess sand and debris from the Roadway and replacing all base or subbase Material that was lost as a result of maintenance activity.

If a Work suspension is not approved, the Contractor will remain responsible for maintaining the Project, including plowing snow, controlling ice, and patching or retreating the surface.

B. Cost Responsibility All costs related to suspending and resuming Work related to approved suspensions will be considered Incidental to the Contract. For related provisions, see Sections 104.2.6 - Right to Suspend Work and 107.5 - Suspension of Work.

105.4.5 Maintenance of Existing Structures When a new Bridge or Minor Span is being installed on a new alignment and the existing structure is to remain in service, the Department will maintain the existing structure and the portions of the roadway required for maintaining traffic until such time that the new structure is opened to traffic and the existing structure is taken out of service. A similar situation exists when a new Bridge or Minor Span is being installed on the same alignment as the existing structure, requiring a temporary detour to be installed by the Contractor per Section 510 - Special Detours, prior to removal of the existing structure. In this case, the Department will maintain the existing structure and the portions of the existing roadway required for maintaining traffic until such time that either the temporary detour is opened to traffic or the Contractor begins any work on the existing structure, including, but not limited to, repairs, modifications, moving, demolition, or removal. In either case, once the new structure or temporary detour is opened to traffic, or the Contractor begins any work on the existing structure, the Contractor shall be solely responsible for all maintenance of the existing structure and the portions of the existing approaches that lie outside the new roadway or the temporary detour, respectively. This specification is not intended to supersede Standard Specification Section 104.3.11 - Responsibility for Property of Others.

105.5 Hauling of Materials and Equipment

105.5.1 General Requirements Except as provided otherwise and limited in this Contract, the Contractor may use any public Road or Bridge for the hauling of Materials and Equipment in legally registered vehicles that are carrying legal loads and operating otherwise in accordance with all applicable State or federal laws. If the Contractor violates such laws or the terms of this Contract relating to hauling, the Contractor shall, at its expense, repair damage to any Road or Bridge that the Department determines was caused by the Contractor to the satisfaction of the governmental entity that maintains the Road or Bridge.

The Contractor must abate any dust nuisances caused by such hauling. For a related provision, see Section 637 - Dust Control and Section 656 - Temporary Soil Erosion and Water Pollution Control.

105.5.2 Bond for Use of Municipal Roads If the Contractor wants to use Roads maintained by a municipality for hauling, the municipality may require the Contractor to purchase a bond for each mile of traveled length. The face value for such bond shall not exceed $50,000/mile. The cost of said bond shall be Incidental to the Contract.

105.5.3 Posted Roads or Bridges The Contractor must comply with all restrictions set forth pursuant to 29-A MRSA § 2395, including springtime posting of load restrictions. An overlimit movement permit pursuant to 29-A MRSA § 2382 will not relieve the Contractor of its obligation to repair damage to such posted Roads or Bridges. For a related provision, see Section 104.3.2 - Furnishing of Other Property Rights, Licenses, and Permits.

105.5.4 Narrow Roads The Contractor shall not haul on Roads having a bituminous surface width of less than 20 feet unless there is no practical alternative.

105.5.5 Overlimit Loads

A. Within Project Limits Within the Project Limits, the Contractor shall not haul over the base courses, surface course, or accepted subgrades with loads that exceed legal limits, except for Equipment used in grading operations, including the preparation of the subgrade.

B. Outside Project Limits Outside the Project Limits, the Contractor must comply with 29-A MRSA § 2382 - Overlimit Movement Permits before moving vehicles or hauling loads in excess of legal limits. The Contractor is responsible for all damage caused by the movement of loads in excess of legal limits whether under permit or not.

105.5.6 Restrictions on Movement and Storage of Heavy Loads and Equipment on Bridges The Contractor shall comply with legal load restrictions and with special restrictions required by the Contract when hauling or storing materials, including demolition debris, and moving or storing equipment on Bridges within the Project Limits that are under construction or completed but not yet open to traffic.

The Contractor shall not operate equipment mounted on crawler tracks or steel-tired wheels on or across concrete or bituminous surfaces, unless otherwise approved by the Resident. The Contract requirements may impose special restrictions on speed, load distribution, surface protection, or other precautions.

When construction operations require crossing an existing Bridge with otherwise prohibited equipment or loads, the Contractor shall use Department approved methods of load distribution or bridging, at no additional cost to the Department.

The Contractor will not be relieved of liability for damages resulting from the operation and movement of construction equipment because it has been issued a special permit, or it has adhered to any other restrictions imposed.

Unless otherwise allowed by the Contract or approved by the Department, the Contractor shall temporarily store construction materials, including demolition debris, or park equipment on a Bridge deck during construction in accordance with the following limits, which have been established to reflect typical design live loads:

Stockpiles shall not weigh more than 65,000 pounds per 1,000 square feet,

Individual stockpiles of Materials (including pallets of products, reinforcing steel bundles and Aggregate stockpiles) shall not weigh more than 25,000 pounds per 100 square feet, or

No single vehicle or piece of Equipment shall weigh more than 80,000 pounds and no combination of vehicles, Materials, and other Equipment shall weigh more than 200,000 pounds per span, for span lengths greater than 40 feet.

The Contractor may submit alternate loadings with calculations stamped by a licensed Professional Engineer, within 30 Days prior to placement of the load(s).

105.6 Construction Surveying

105.6.1 Department Provided Services The Department will provide the Contractor with the descriptions and coordinates of a sufficient number of vertical and horizontal control points, set by the Department, throughout the Project, for full construction Projects and other Projects where survey control is necessary. For Projects of 1,000 feet in length or less, the Department will provide a minimum of three points. For Projects between 1,000 and 5,000 feet in length, the Department will provide a minimum of five points. For Projects in excess of 5,000 feet in length, the Department will provide at a minimum, one set of two points at each end of the Project, plus one additional set of two points for each mile of Project length. For non-full construction Projects and other Projects where survey control is not necessary, the Department will not set any control points and, therefore, will not provide descriptions and coordinates of any control points. Upon request, the Department will provide its Survey Manual to the Contractor, or its survey Subcontractor.

105.6.2 Contractor Provided Services Using the survey information and points provided by the Department, described in Subsection 105.6.1 - Department Provided Services, the Contractor shall provide all additional survey layout necessary to complete the Work. This may include, but not be limited to, re-establishing all points provided by the Department, establishing additional control points, running axis lines, providing layout and maintenance of all other lines, grades, or points, and survey quality control to ensure conformance with the Contract. The Contractor is also responsible for providing construction centerline, or close reference points, for all Utility Facilities relocations and adjustments as necessary to complete the Work. When the Work is to connect with existing Structures, the Contractor shall verify all dimensions before proceeding with the Work. The Contractor shall employ or retain competent engineering and/or surveying personnel to fulfill these responsibilities.

The Contractor must notify the Department of any errors or inconsistencies regarding the data and layout provided by the Department as provided by Section 104.3.3 - Duty to Notify Department If Ambiguities Discovered.

105.6.2.1 Survey Quality Control and Construction Layout The Contractor is responsible for all construction survey quality control. Construction survey quality control is generally defined as, first, performing initial field survey layout of the Work and, second, performing an independent check of the initial layout using independent survey data to assure the accuracy of the initial layout; additional iterations of checks may be required if significant discrepancies are discovered in this process. Construction survey layout quality control also requires written documentation of the layout process such that the process can be followed and repeated, if necessary, by an independent survey crew.

105.6.2.2 Electronic Design Data and Digital Terrain Model (DTM) If provided by the Department, at the request of the Contractor, any electronic project design data will not be deemed a part of the contract, and is supplied as a courtesy by the Department. The Contractor shall not take advantage of any ambiguity or error contained in said data, and upon discovery of any ambiguity or error shall notify the Department before proceeding. The Contractor may convert any electronic data provided by the Department into a format

required by the Contractor's system and equipment at the Contractor's expense. Any Digital Terrain Model (DTM) to be used for construction shall be submitted to the Department in InRoads DTM or LandXML format at least 14 days prior to the pre-construction meeting; any other format shall be preapproved by the Department prior to submittal. No changes shall be made to the electronic model after submittal without prior written consent by the Project Resident. The Department will review and provide comments to the Contractor within 14 days of receipt of the DTM submittal

105.6.2.3 Survey Work Plan The Contractor shall provide a Survey Work Plan to the Department prior to, or at, the preconstruction meeting.

The Survey Work Plan shall include:

A. Make and model of equipment and software used for project layout.
B. Make and model of equipment and software used for machine guidance and control.
C. Manufacturer-stated specifications for vertical and horizontal accuracy attainable by the equipment.
D. Equipment calibration procedures and date of last calibration.
E. Narrative of methodology used to establish any additional horizontal or vertical project control points. Field notes for new vertical control shall be submitted to the Department.
F. Site Calibration (Localization) and control verification procedures, including a timetable and tolerances. A Site Calibration report shall be submitted to the Department, including the values of calculated residuals of each point used in the calibration.
G. Type and locations of base stations to be used, including methodology for establishing on-site base broadcast positions and localization procedures used for off-site bases.
H. Describe methodology used to overcome Real Time Kinematic (RTK) signal losses in a portion or portions of the project, and methodology to ensure signals for both inspection operation areas and construction operation areas (i.e. multiple bases operating simultaneously)
I. Describe procedures used to integrate vertical refinement equipment (i.e. laser); including the process of determining and verifying transmitter set-up location and communicating any necessary adjustments to the machine control equipment.
J. Name(s) and qualifications of the Contractor's designated on-site surveyor(s) or engineer(s) responsible for performing the project layout.
K. Design software and version used to develop the Digital Terrain Model (DTM).

The Department will review and provide comments to the Contractor within 7 days of receipt of the Survey Work Plan.

105.6.2.4 Department Verification The Contractor shall furnish a Global Navigation Satellite System (GNSS) or Global Positioning System (GPS) Rover and/or Robotic Total Station (RTS) equipment to the Department with the same capabilities as those used by the Contractor or other approved method, such as reference staking, to allow the Department to independently verify the accuracy of the work, as approved by the Department.

This equipment referred to above shall be compatible with the system(s) used by the Contractor and be provided to the Project Resident prior to the Contractor commences Work using electronic layout methods. This equipment shall stay in the possession of the Department for the duration of the project and shall be returned, in good condition, to the Contractor upon final acceptance of the field work. Any augmented features (such as laser refinement) used by the Contractor shall be included in the features available on the equipment provided to the Department.

The Contractor shall provide manufacturer-certified training on the use of the GNSS, GPS, and/or RTS equipment and the Contractor's systems to Department project personnel prior to beginning any Work. This training is for the purpose of providing Department project personnel with an understanding of the equipment, software, and electronic data being used by the Contractor.

105.6.2.5 Field Layout Specifications All Work accomplished through electronic layout methods and/or machine control must meet the same accuracy requirements as the conventional grading construction standards detailed in the Standard Specifications. The contractor shall not use GNSS, GPS, or RTS equipment for a construction activity that requires a greater precision than the machine's capability as per the manufacturer's recommendation.

105.6.2.6 Basis of Payment No payment shall be made by the Department for the Contractor's elected use of electronic methods of project location layout and control. Any delays arising from the operation of GNSS, GPS, or RTS layout or machine control systems will not result in adjustment to the bid price or quantity of any construction items or be justification for granting any type of contract extension. Any costs incurred through incorrect use of GNSS, GPS, or RTS layout or machine control systems or re-work necessary through their use are the sole responsibility of the Contractor. Training of Department project personnel in the use of GNSS, GPS, or RTS will be paid on a reimbursable basis based on submitted invoices, without Contractor markup.

105.6.3 Survey Quality Assurance It is the Department's prerogative to perform construction survey quality assurance. Construction survey quality assurance is generally defined as an independent check of the Contractor's construction survey quality control. The construction survey quality assurance process may involve physically checking the Contractor's construction survey layout using independent survey data, or may involve reviewing the construction survey quality control written documentation. If the Department elects to physically check the Contractor's survey layout, the Contractor's designated surveyor may be required to be present. The Department will provide a minimum notice of 48 hours to the Contractor, whenever possible, if the Contractor's designated surveyor's presence is required. Any errors discovered through the quality assurance process shall be corrected by the Contractor, at no additional cost to the Department.

105.6.4 Boundary Markers The Contractor shall preserve and protect from damage all monuments or other points that mark the boundaries of the Right-of-Way or abutting parcels

that are outside the area that must be disturbed to perform the Work. The Contractor shall indemnify, defend, and hold harmless the Department from all claims to re-establish the former location of all such monuments or points, including claims arising from 14 MRSA § 7554-A. For a related provision, see Section 104.3.11 - Responsibility for Property of Others.

105.7 Working Drawings

105.7.1 General The Contractor shall provide all necessary Working Drawings to the Department for review. The Contractor shall not allow final assembly or fabrication of structural units before the Department completes its review of the applicable Working Drawings and comments on them. The Contract price shall include the cost of furnishing and revising all Working Drawings.

The Department's review of and comment on Working Drawings may be limited to basic Contract requirements relating to design compliance and Material type(s). Such review shall not relieve the Contractor of responsibility under the Contract, including the overall correctness of Working Drawings, including Engineering and mathematical computations, shop fits, and field connections.

105.7.2 Review Times The Contractor's Schedule of Work shall allow the Department the following review and comment times prior to the start of production. For a related provision, see Section 107.4 - Scheduling of Work.

First Submission: 21 Days or 1 day per drawing, whichever is greater.

Second Submission: 10 Days or 1/2 day per drawing, whichever is greater.

Each subsequent submission: 10 Days or 1/2 day per drawing, whichever is greater.

The above review times shall be doubled for submittals that include design computations.

The Department may combine separate submissions of analytically common elements of Work and require the per-drawing review times set forth above when it determines that the Contractor has divided Working Drawings into separate submissions for the purpose of avoiding said per-drawing review times.

Delay caused by exceeding the time periods listed above will be analyzed in accordance with Section 109.5 - Adjustments for Delay.

105.7.3 Cost of Review The Department will review the first and second submission at no cost to the Contractor. For subsequent submissions, the Department will charge the

Contractor a rate of $75 per person-hour of review. Such costs will be deducted from amounts otherwise due the Contractor.

105.7.4 Submittal Requirements The Contractor shall indicate the order of preference for review and return of Working Drawings and organize all Drawings in the order of their importance.

The Contractor shall submit 3 sets of Drawings or electronic copy to the Resident.

All submittals shall use the same system of units as that used in the Department's Plans.

105.7.5 Review Standards and Procedures If the first submission does not meet accepted industry standards for Working Drawings or Engineering design Drawings and Specifications, as determined by the Department, the entire submission will be returned without review and will be recorded as the first submission. When resubmitted, the review time requirements shall be those applicable to a first submission.

One set of reviewed Working Drawings will be marked with comments and returned to the Contractor. The Contractor shall then revise its Working Drawings accordingly. Except as provided otherwise in the Contract, the Contractor shall furnish the Department with 2 reproducible copies of the final Working Drawings before construction of the element(s) depicted in the Working Drawing(s).

105.8 Environmental Requirements

105.8.1 Temporary Soil Erosion and Water Pollution Control The Contractor shall provide continuous and effective soil erosion and water pollution control in compliance with Section 656 - Temporary Soil Erosion and Water Pollution Control.

105.8.2 Permit Requirements

A. Permits Granted To Department Permits are to be included in or incorporated by reference into the Bid Documents. If Permits are not so included and the Contractor is aware the Work will affect a regulated resource such as water bodies or wetland, the Contractor shall notify the Department before Bidding. For a related provision, see Section 102.5.2 - Bidder's Duty to Notify Department If Ambiguities Discovered.

The Contractor is responsible for complying with all Permit conditions. If the Contractor desires to modify or seek interpretation of any permit granted to the Department, it must coordinate any such requests through the Department.

B. All Other Permits Except as expressly provided otherwise in the Contract, the Contractor, at its expense, shall procure all other environmental or land use Permits, licenses, or other permissions that are necessary or appropriate to perform the Work. At the time of application, the Contractor shall provide the Department with notice of all

applications for such Permits, licenses, or other permissions, and upon request, a copy of all such applications. For a related provision, see Section 104.3.2 - Furnishing of Other Property Rights, Licenses, and Permits.

105.8.3 Wetland and Waterbody Impacts

A. General Prohibition Except as specifically allowed by the Contract, there shall be no permanent or temporary impacts to water bodies or wetlands identified on the Plans or otherwise known to the Contractor. For a related provision, see Section 656.3.4 – "Water Pollution Control Requirements."

B. Wetlands Outside Project Limits If the Contractor desires to conduct an activity that can disturb the soil in an area that is outside the Project Limits, but is contiguous or in close proximity to such Limits, the area first must be examined and analyzed by a qualified wetlands specialist in order to determine whether wetlands exist, and if so, to delineate them. The Contractor must notify the Department of all such examinations and analyses and the results thereof. Wetlands so delineated must not be impacted unless properly permitted.

Any fill Material generated from this Project shall not be placed, stored, or disposed of in a wetland at an off-site location unless the Contractor provides the Department with written evidence that all Permits necessary for such use have been obtained. Such evidence must be signed by the Owner of such site and otherwise acceptable to the Department.

C. Temporary Structures Temporary or permanent impacts to wetlands are prohibited without proper permitting or modification to existing Permits. Temporary Structures in a waterbody must comply with any Contract provisions regarding Instream Work.

105.8.4 Hazardous Materials If the Contractor encounters any condition that indicates the presence of uncontrolled petroleum or hazardous Materials, the Contractor shall immediately stop Work, notify the Department, treat any such conditions with extreme caution, and secure the area of potential hazard to minimize health risks to workers and the public, and to prevent additional releases of contaminants into the environment. Such conditions include the presence of barrels, tanks, unexpected odors, discoloration of soil or water, an oily sheen on soil or water, excessively hot earth, smoke, or any other condition indicating uncontrolled petroleum or hazardous Materials. The Contractor shall continue Work in other areas of the Project unless otherwise directed by the Department. The Contractor shall utilize approved vendors and comply with all federal, State, and local laws concerning the handling, storage, treatment, and disposal of uncontrolled petroleum or hazardous Material. If the condition meets the definition of a Differing Site Condition under Section 109.4.1, the Contractor may be eligible for an Equitable Adjustment.

105.8.5 Dredge Spoils (Dredge Materials) Unless otherwise provided in the Contract, dredge spoils may not be used as fill within the Project Limits. Any use or disposal of dredge spoils must be in accordance with all applicable federal and State laws.

105.8.6 Pit or Quarry Requirements

General Pits or quarries that are sources of Material for the Project, including loam fields, shall meet the requirements of this Section 105.8.6. The Contractor must procure an Agreement from the Owners of such sources stating that the Owners will comply with these requirements. If requested by the Department, the Contractor will provide the Department with a copy of such Agreement. The Contractor shall provide the Resident with the center of the source GPS coordinate pairs (latitude and longitude) in decimal degrees (DD.DDDDDD), name, and town in which the source is located.

Excavation Requirements Surface Material stripped from the pit shall be stored to allow for restoration of the pit. The Contractor shall not excavate from pit faces that are vertical or have an overhang. The Contractor must stop excavating within a 2 horizontal to 1 vertical slope 10 feet inside of a property line of a deposit, even though the Material within the pit may have a steeper angle of repose, except when an additional Agreement is reached with an adjacent property Owner to allow the extension of a pit onto the adjacent property Owner's land. The Contractor must insure that hazards such as steep pit faces and ponds are protected by flattening slopes or by erecting suitable fencing.Rehabilitation If the pit is licensed by MDEP or LURC, the Contractor shall follow the rehabilitation provisions of said license. In the absence of such license requirements, the Contractor shall follow local Municipal Land Use Ordinances pursuant to Gravel Pit Operations. In the absence of such Ordinances, or if the Ordinances do not address rehabilitation of pits, the Contractor and Landowner shall agree, in writing, to the scope of rehabilitation of the pit. This agreement shall be signed by both parties. A copy of the agreement shall be submitted to the Resident.

105.8.7 Environmental Non-compliance - Remedies and Costs The Contractor shall be in non-compliance if it, or Subcontractors at any tier, fail to comply with the terms of this Contract or, pursuant to Section 104.3.7 - Laws To Be Observed, any applicable environmental or land use law or regulation, including Project specific permit conditions.

If the Contractor is in non-compliance, the Department may, at its discretion:

A. Withhold all Progress Payments, or any portion thereof, during the period the Contractor is in non-compliance;

B. Remedy such non-compliance using State forces or another Contractor and deduct all costs incurred by the Department from Progress Payments. Such costs include direct costs, Project Engineering costs, and Contractor costs from amounts otherwise due the Contractor, and/or

C. Suspend the Work for cause and without cost or liability to the Department. Said suspension shall continue until the Contractor has addressed all non-compliance issues as directed by the Department.

The Contractor shall be responsible for any fines and penalties assessed by environmental or land use regulatory agencies due to such non-compliance. Such penalties may be withheld from amounts otherwise due the Contractor. For related provisions, see Sections 108.5 - Right to Withhold Payments and 108.9.3 - Amounts Due the Department.

105.9 Historic and Archaeological Considerations Unless otherwise provided in the contract, the Contractor is approved to construct the project in accordance with the contract plans. This in accordance with Section 106 of the National Historic Preservation Act (16 U.S.C. § 470 f), the Regulation (36 CFR Part 800), and the 2004 Section 106 Maine Programmatic Agreement.

Changes during construction that vary from the project contract plans must be approved by the Department. These changes could have adverse effects to Historic Resources, as well as jeopardize federal funding.

If the Contractor or any subcontractor discovers any object of potential historic archaeological or other historic interest, all Work that could disturb the object will immediately cease and will not resume until investigation of the object and related deposits have been completed, and if necessary recovered. The Contractor will notify the Department immediately if any such object is discovered. (The first indications of such an object may be burial grounds or campsites of Native Americans that reveal the bones of the dead and implements. Also the exposure of marine fossils or shells found mainly in clay deposits, as well as, exposure of dumps in landfill areas, abandoned campfire sites, and building foundations.)

Any Delay of the Contractor's operations resulting from the above discoveries will be analyzed in accordance with the Department Standard Specification Section 109.5 – Adjustment for Delay, except that in no event will such Delay be a Compensable Delay.

The Contractor is notified of 27 MRSA § 371, which provides that the State owns all artifacts, specimens, and material that are found on, in, or beneath State-controlled lands.

105.10 Equal Opportunity and Civil Rights

105.10.1.1 Disadvantaged Business Enterprises Program The Department has established a Disadvantaged Business Enterprise (DBE) program in accordance with regulations of the United States Department of Transportation (USDOT), 49 CFR Part 26. The Department receives federal financial assistance from USDOT, and as a condition of receiving this assistance, the Department has signed an assurance that it will comply with 49 CFR Part 26. The Department is responsible for determining the eligibility of and certifying DBE firms in Maine.

A DBE is defined as a for-profit business that is owned and controlled by one or more socially and economically disadvantaged person(s). For the purpose of this definition:

1. "Socially and economically disadvantaged person" means an individual who is a citizen or lawful permanent resident of the United States and who is Black, Hispanic, Native American, Asian, Female; or a member of another group or an individual found to be disadvantaged by the Small Business Administration pursuant to Section 3 of the Small Business Act.
2. "Owned and controlled" means a business that is:
   a. A sole proprietorship legitimately owned and controlled by an individual who is a disadvantaged person.
   b. A partnership or limited liability company in which at least 51% of the beneficial ownership interests legitimately are held by a disadvantaged person(s).
   c. A corporation or other entity in which at least 51% of the voting interest and 51% of the beneficial ownership interests legitimately are held by a disadvantaged person(s).

The disadvantaged group owner(s) or stockholder(s) must possess control over management, interest in capital, and interest in earnings commensurate with the percentage of ownership. If the disadvantaged group ownership interests are real, substantial, and continuing and not created solely to meet the requirements of this program, a firm is considered a bona fide DBE.

105.10.1.2 Commercially Useful Function The Department will count expenditures of a DBE contractor toward the DBE Goal only if the DBE is performing a commercially useful function ("CUF") on that Contract. A DBE performs a CUF when it is responsible for execution of the Work of the Contract and is carrying out its responsibilities by actually performing, managing, and supervising the work involved. Credit will be given only when the DBE meets all conditions for a CUF. Credit for labor will be given in accordance with the responsibilities outlined in the Contract. To perform a commercially useful function, the DBE must also be responsible, with respect to materials and supplies used on the Contract, for negotiating price, determining quality and quantity, ordering the materials, and installing (where applicable) and paying for the material itself. To determine whether a DBE is performing a commercially useful function, the Department will evaluate the amount of work subcontracted, industry practices, whether the amount the DBE firm is to be paid under the Contract is commensurate with the work it is actually performing and DBE credit claimed for its performance of the work, and other relevant factors.

If, while the DBE is performing under the Contract, the DBE purchases supplies or rents equipment from the Contractor, the costs of such supplies or rentals do not count toward the DBE goal as defined in Section 105.10.1.3.

A current listing of certified DBEs that may wish to participate in the highway construction program and the scope of work for which they are certified can be found at http://www.maine.gov/mainedot/civilrights/dbe.htm. Credit will be given for the value described by a DBE performing as:

A. A Contractor; 100% of actual value of work performed by own workforces.
B. An approved subcontractor; 100% of work performed by own workforces.
C. An owner-operator of construction equipment; 100% of expenditures committed.
D. A manufacturer; 100% of expenditures committed. The manufacturer must be a firm that operates or maintains a factory or establishment that produces on the premises the materials or supplies obtained by the Contractor. Brokers and packagers shall not be regarded as manufacturers.
E. A regular dealer; 60% of expenditures committed. A regular dealer is defined as a firm that owns, operates, or maintains a store, warehouse or other establishment in which the materials or supplies required for the performance of the contract are bought, kept in stock, and regularly sold to the public. For purposes of this provision a "Broker" is a DBE that has entered into a legally binding relationship to provide goods or services delivered or performed by a third party. Brokers and packagers shall not be regarded as regular dealers.
F. A bona fide service provider; 100% of reasonable fees or commissions. Eligible services include professional, technical, consultant, or managerial, services and assistance in the procurement of essential personnel, facilities, equipment, materials, or supplies required for the performance of the contract. Eligible services also include services provided by agencies providing bonding and insurance specifically required for the performance of the contract.
G. A trucking, hauling, or delivery operation. 100% of expenditures committed when trucks are owned, operated, licensed, and insured by the DBE and used on the contract and, if applicable, includes the cost of the self-supplied materials and supplies. 100% of expenditures committed when the DBE leases trucks from another DBE firm, including an owner-operator. 100% of reasonable fees or commissions the DBE receives as a result of a lease arrangement for trucks from a non-DBE, including an owner-operator.
H. Any combination of A through G.

105.10.1.3 Race-neutral Goals The Department is required to set an annual goal (approved on a three year basis) for DBE participation in Federal-aid projects (the "DBE Goal") pursent to 49 CFR 26.53. In order to fulfill that goal, bidders are encouraged to utilize DBE businesses certified by the Department. The Department seeks to meet the established DBE goal solely through race-neutral means. *Race-neutral* DBE participation occurs when a DBE is awarded a prime contract through customary competitive procurement procedures, is awarded a subcontract on a contract that does not carry a DBE contract goal, or wins a subcontract from a Contractor that did not consider its DBE status in making the award. A DBE/subcontractor Utilization Proposed Form is required to be included in bid documents.

The Department will analyze each project and create a Project Availability Target (PAT), based on a number of factors, including project scope, available DBE firms, and firms certified in particular project work. Each bid will request that the contractor attempt to meet the PAT. This PAT is developed to assist contractors to better understand what the Department expectations are for a specific project. The PAT is not a mandate but an

assessment of what each project can bear for DBE participation. The Department anticipates that each contractor will make the best effort to reach or exceed this PAT for the project.

105.10.1.4 Race-conscious Project Goals If it is determined by the Department that the annual DBE goal will not be met through *race-neutral* means, the Department may implement *race-conscious contract goals* on some projects. Race-conscious contract goals are goals that are enforceable by the Department and require that the Contractor use good faith effort as defined in 49 CFR 26.53 ("Good Faith Efforts") to achieve the goal set by the Department for that particular project. If race-conscious means are implemented on a project, the Contractor must comply with the requirements of 49 CFR 26.51 and 26.53.

At the time of the bid opening, all Bidders shall submit with their bid a Disadvantaged Business Enterprise (DBE) Commitment Form provided by the Department. This form will list the DBE and non-DBE firms that are proposed to be used during the execution of the Work. The list shall show the name of the firm, the item/material/type of work involved, and the dollar amount of work to be performed. The dollar total of each commitment shall be totaled and a percentage determined.

If the project goal is not met, acceptable documentation showing all Good Faith Efforts ("GFE")made to obtain participation may be required in order to award the project. Failure to provide the required listing with the dollar participation total or acceptable documentation of GFE to obtain DBE participation within 3 Days after the bid opening date will be considered a lack of responsiveness on the part of the low bidder. Rejection of the low bid under these circumstances will require the low bidder to surrender the Proposal Guaranty to the Department. The submission and approval of the above forms does not constitute a formal subcontract.

If for any reason during the progress of the Work the Contractor finds that DBEs included on the list are unable to perform the proposed work, the Contractor, with written release by the committed DBE or approval of the Department, may substitute other DBE firms for those named on the list. If the Contractor is able to clearly document its inability to find qualified substitute firms to meet the project goal, the Contractor may request in writing approval to substitute the DBE with a non-DBE firm. If at any time during the life of the Contract the Department determines that the Contractor is not fulfilling the goal or commitment(s) and is not making a GFE to fulfill the DBE requirement, the Department may withhold progress payments. Fulfillment of the goal percentage shall be determined by dividing the dollars committed to the DBEs by the actual contract dollars. These requirements are in addition to all other Equal Employment Opportunity requirements on Federal-aid contracts.

105.10.1.5 Certification of DBE attainment on Contracts The Department must certify that it has conducted post-award monitoring of all contracts to ensure that DBEs have done the work for which credit was claimed. The Department will certify these contracts through review of CUF forms, Elations sub-contract payment tracking as well as occasional

on-site reviews of projects and through the project's final closeout documentation provided by our Contracts Section.

105.10.1.6 Bidders' List Survey Pursuant to 49 CFR § 26.11 the Department is required to "create and maintain" a bidders list and gather bidder information on our construction/consultant projects. Contractors are required to maintain information on all subcontract bids submitted by DBE and Non-DBE firms and provide that information to the Department. The following information is required:

Firm name
Firm address
Firm status (DBE or non-DBE)
Age of firm (years)
Annual gross receipts amount as indicated by defined brackets on the survey form, i.e., $500,000 to $800,000

This information critical in determining the availability of DBE businesses relative to other businesses that do similar work. In addition, FHWA requires that the Department obtain this information.

105.10.2 Requirements Applicable to All Contracts Unless expressly provided otherwise in the Bid Documents, the provisions contained in this Section 105.10.1 apply to this Contract.

A. Maine Code of Fair Practices and Affirmative Action The Contractor must comply with the provisions of Maine's Code of Fair Practices and Affirmative Action, 5 MRSA § 781, et seq., and all regulations promulgated thereunder. This Code, found at 5 MRSA § 784(2), reads as follows.

"During the performance of this Contract, the Contractor agrees as follows:

1) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religious creed, sex, national origin, ancestry, age, sexual orientation, physical and/or mental disability. Such action shall include, but not be limited to, the following: Employment, upgrading, demotions, transfers, recruitment or recruitment advertising; layoffs or terminations; rates of pay or other forms of compensation; and selection for training, including apprenticeship.

2) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, State that all qualified applicants will receive consideration for employment without regard to race, color, sexual orientation, religious creed, sex, national origin, ancestry, age, physical handicap, or mental handicap.

3) The Contractor will send to each labor union or representative of the workers with which he has a collective or bargaining Agreement, or other Contract or understanding, whereby he is furnished with labor for the performances of [sic] his Contract, a notice, to be

provided by the Contracting Department or agency, advising the said labor union or workers' representative of the Contractor's commitment under this Section and shall post copies of the notice in conspicuous places available to employees and to applicants for employment.

4) The Contractor will cause the foregoing provisions to be inserted in all Contracts for any Work covered by this Agreement so that such provisions will be binding upon each Subcontractor.

5) Contractors and subcontractors with contracts in excess of $50,000 will also pursue in good faith affirmative action programs."

B. Maine Human Rights Act The Contractor must comply with the provisions of Maine's Human Rights Act, 5 MRSA § 4551, et seq., and all regulations promulgated thereunder. This Act provides, among other things, that it is unlawful discrimination for any employer to fail or refuse to hire or otherwise discriminate against any applicant for employment because of race or color, sex, physical or mental disability, religion, age, ancestry or national origin, or sexual orientation except when based on a bona fide occupational qualification.

C. EEO Notice to Labor Sources Contractors and Subcontractors that are required by Maine's Code of Fair Practices and Affirmative Action or by federal law to notify a labor union or a representative of workers with whom the Contractor or the Subcontractor has a collective bargaining agreement, contract, or understanding through which labor is furnished must provide notice on the letter shown on this page below. The letter must be written on the Contractor's or Subcontractor's letterhead stationery. A list of Maine Department of Labor Career Center Job Service Centers follows the form below.

To:_____

(Union, employment agency or employee's representative)

_____

(Address)

Subject: Equal Employment Opportunities on

State Project No.: _____

FAA Project No.: _____

Location: _____

Description of Work: _____

For Work related to the construction of the above listed Project to be performed under State Contract No.: _____, I have pledged to provide equal employment opportunities without regard to race, color, religion, sex, national origin, sexual orientation, or disability. This pledge applies to all employees and applicants for employment in connection with:

- Hiring, Placement, Upgrading, Transfer or Demotion
- Recruitment, Advertising or Solicitation for Employment
- Treatment During Employment
- Rates of Pay or Other Forms of Compensation
- Selection for Training, Including Apprenticeship
- Layoff or Termination

Inquiries and complaints should be addressed to:

President's Committee on Equal Employment Opportunity
Washington, D.C. 20425

Signed: _____

_____

(Title)

For: _____

(Contractor)

_____

_____

(Address)

_____

(Dated)

**Maine Department of Labor**
**Career Centers & Job Service Centers**

Augusta Career Center
21 Enterprise Drive, Suite 2
109 State House Station
Augusta, ME 04333-0109
Toll Free Phone: 1-800-760-1573
Local Phone: (207) 624-5120
Fax No: (207) 287-6236
TTY Users Call Maine Relay 711
Email: augusta.careercenter@maine.gov

Bangor Career Center
45 Oak Street, Suite 3
Bangor, ME 04401-7902
Toll Free Phone: 1-888-828-0568
Local Phone: (207) 561-4050
Fax No: (207) 561-4066
TTY Users Call Maine Relay 711
Email: bangor.careercenter@maine.gov

Calais Career Center
1 College Drive
Calais, ME 04619-0415
Toll Free Phone: 1-800-543-0303
Local Phone: (207) 454-7551
Fax No: (207) 454-0349
TTY Users Call Maine Relay 711
Email: calais.careercenter@maine.gov

Lewiston Career Center
5 Mollison Way
Lewiston, ME 04240-5805
Toll Free Phone: 1-800-741-2991
Local Phone: (207) 753-9001
Fax No: (207) 783-5301
TTY Users Call Maine Relay 711
Email: lewiston.careercenter@maine.gov

Presque Isle Career Center
66 Spruce Street, Suite 1
Presque Isle, Maine 04769-3222
Toll Free Phone: 1-800-760-1572
Local: (207) 474-4914
Fax (207) 760-6350
TTY Users Call Maine Relay 711
Email: presqueisle.careercenter@maine.gov

Skowhegan Career Center
98 North Ave
Skowhegan, ME 04976-1923
Toll Free Phone: 1-800-760-1572
Local Phone: (207) 474-4950
Fax No: (207) 474-4914
TTY Users Call Maine Relay 711
Email:skowhegan.careercenter@maine.gov

Springvale Career Center
9 Bodwell Court
Springvale, ME 04083
Toll Free: 1-800-343-0151
Local: (207) 324-5460
Fax: (207) 324-7069
TTY Users Call Maine Relay 711
Email:springvale.careercenter@maine.gov

Wilton Career Center
865 US Route 2E
Wilton, ME 04294-6649
Toll Free Phone: 1-800-982-4311
Fax No: (207) 645-2093
TTY Users Call Maine Relay 711
Email: wilton.careercenter@maine.gov

D. Prevention of Sexual Harassment It is the policy of the Department that all parties have a right to Work in an environment free from harassment, including sexual harassment. Maine State Law and the Department prohibit any and all forms of sexual harassment in the Workplace, on the job site, or that may have an effect on the Work environment.

THEREFORE:

The Contractor hereby agrees to the following requirements in order to provide and promote a non-discriminatory Workplace free of sexual harassment.

1. No Contractor, supervisor, or employee shall allow repeated, objectionable, or unwanted verbal or physical advances, sexually explicit derogatory statements, or sexually discriminatory remarks that cause discomfort, humiliation, or are in any way offensive to the recipient, or that interfere with the quality of any employee's Work environment in any way. Furthermore, no one on any job shall threaten or insinuate either explicitly or implicitly that any employee's submission to or rejection of sexual advances will have any effect on that person's employment, job assignment, training, evaluation, promotion, wages, or any other term or condition of employment or future job opportunity. Under Maine State Law, Contractors are responsible for ensuring and maintaining a Work environment that is free from sexual harassment.

2. Any Contractor whose employee sexually harasses another employee shall be subject to disciplinary action. Contractors that fail to adequately and expeditiously investigate sexual harassment claims will be subject to enforcement proceedings and such sanctions as are authorized by law. Contractors are required to provide detailed written reports to the Department when so requested that shall describe the investigation and corrective actions taken by Contractors in all instances of sexual harassment allegations.

Contractors shall also be responsible for ensuring that no retaliation, reprisal, or intimidation be directed against any complainant or other employee who provides information to any person or agency investigating an allegation or complaint of sexual harassment.

E. Certification of Continuing EEO Efforts The Contractor must certify, to the best of its knowledge and belief, that the Contractor has made and will continue to make a good-faith effort to comply with all applicable State requirements on equal employment opportunity, non-discrimination, and affirmative action, including employment of women, minorities, and disadvantaged as journeyed trade workers. Contractors not having achieved company-wide trade employment goals of 6.9% for females and 0.5% for minorities will, where indicated by Contract and to the maximum extent practical, comply with Section 660 - On-the-Job Training.

105.11 Other Federal Requirements Prior to payment by the Department, the Contractor shall provide a certification from the producer of steel or iron, or any product containing steel or iron as a component, stating that all steel or iron furnished or incorporated into the furnished product was manufactured in the United States in accordance with the requirements of the Buy America provisions of 23 CFR § 635.410, as amended. Such certification shall also include (1) a statement that the iron or steel product or component was produced entirely within the United States, or (2) a statement that the iron or steel product or component was produced within the United States, except for minimal quantities of foreign steel and iron valued at $ (actual value).

All manufacturing processes must take place within the United States. Manufacturing begins with the initial melting and mixing, and continues through the coating stage. Any process that modifies the chemical content, the physical size and shape, or the final finish is considered a manufacturing process, including rolling, extruding, machining, bending, grinding, drilling, and coating. "Coating" includes epoxy coating, galvanizing, painting, or any other coating that protects or enhances the value of the material.

A "Buy America" Certification is required from each manufacturer, fabricator, supplier, subcontractor that engages in "manufacturing" as defined above.

"Buy America" does not apply to raw materials (iron ore and alloys), scrap, pig iron, or processed, pelletized, and reduced iron ore.

## SECTION 106 - QUALITY

Scope of Section This section contains general provisions related to the Quality of Work, including roles, standards, Materials, Quality Control, Acceptance, Non-conforming Work, and warranties. When specified in the contract, the Department will use the quality level analysis in this Section to determine quality-based pay adjustments.

### 106.1 Roles Regarding Quality

106.1.1 Cooperation The Contractor and the Department shall work cooperatively within their respective Quality Assurance (QA) responsibilities to produce and document a high quality project, meeting or exceeding the quality requirements of the Contract.

106.1.2 Role of the Contractor The Contractor is responsible for all aspects of the quality of construction, including labor, equipment, materials, incidentals, processes, construction methods, and QC. When required by the Contract, the Contractor shall develop, submit for approval, implement, and adjust if necessary a QCP for the Work specified.

106.1.3 Role of the Department The Department is responsible for providing a quality design, approving the QCP, and assuring that the Contractor is following the QCP. The Department will perform acceptance sampling, testing, and inspection for any element of the

Work to ensure compliance with the QCP and contract requirements. The Department may also perform IA and Verification sampling and testing at any time.

106.2 Quality Standards

106.2.1 Conformity with Contract The Contractor shall comply with all Contract requirements in performance of the Work. Any required plans such as QCP, the TCP, and the SEWPCP, as approved by the Department, are binding upon the Contractor as Contract requirements.

106.2.2 Conformity with Other Standards Unless otherwise provided in the Contract, all Work shall conform to the following standards, as applicable.

A. Department
B. AASHTO
C. ASTM
D. AREMA
E. Standard conditions and special conditions contained in any permit
F. MUTCD
G. American with Disabilities Act (ADA)

106.2.3 Industry Standards If there is no applicable standard set forth in this Contract for a particular item of Work, then the Contractor shall perform that item of Work in accordance with industry standards prevailing at the time of the Bid.

106.3 Material Quality

106.3.1 General Materials and manufactured products incorporated into the Work shall be new unless otherwise specified, free from defect, and in conformity with the Contract.

When Material is fabricated or treated with another Material or where any combination of Materials is assembled to form a finished product, any or all of which are covered by specifications, the Department may reject the finished product if any of the components do not comply with the specifications.

Title to all hot mix asphalt to be furnished by the Contractor shall pass to the Department immediately before installation. The preceding sentence shall not in any way affect any right or remedy the Department has relating to the quality of the material, installation, or workmanship.

106.3.2 Quality Requirements Materials shall meet the requirements of the Contract at the time they are incorporated into the work. The Contractor shall sample and test proposed sources of materials, using accepted procedures and equipment no more than 60 Days prior to use. Materials shall not be used in the Work until passing results are obtained and provided to the Department. The Contractor shall provide the Resident with a copy of the passing test results, including the source of the Material as identified in Section 105.8.6.

The Contractor shall perform QC inspection, sampling, testing, and documentation in accordance with the Contract requirements. For work without specific QC requirements, the Contractor shall perform inspection, sampling, and testing as the Contractor deems necessary to ensure adequate process control and end product quality.

The Contractor shall provide all facilities, Equipment, and Material samples required by the Department to conduct Acceptance, Verification, and IA sampling and testing.

The Contractor shall supply Materials and perform work using methods and Equipment in a manner that will not degrade the quality of the Materials. Materials with prior approval that become unfit for use or fall outside the specification limits will result in the affected product being declared Non-conforming Work. For a related provision, see Section 106.8 - Non-conforming Work.

The cost of the Contractor's QC activities and its costs for furnishing facilities, testing Equipment, and samples for the Department's Acceptance and IA activities are incidental to the related Pay Items.

106.3.3 Sources

A. General The Contractor shall furnish all materials and products required to complete the work, except as otherwise provided in the Contract. Unless otherwise specified in the Contract, the Contractor shall use only those products contained on the Department's Qualified Products List (available on the Department internet site) if a list is established for that type of product or Material. For any material on the Department qualified products list that is being considered for incorporation into the Work, it shall be the Contractor's responsibility to verify that the Material is appropriate for the use being considered.

B. Department Furnished Materials The Contract may specify that the Department will furnish certain Materials. If the Contractor reasonably believes that the Department-furnished Material is deficient in any way, the Contractor shall immediately notify the Department before accepting delivery. After acceptance of delivery, the Contractor is responsible for all risk of loss of Department-furnished Material. The cost of inspecting, handling, and storing Department-furnished Materials after delivery is incidental to the Contract. The Department may deduct from amounts otherwise due the Contractor all costs necessary to make good any shortage, damage, or deficiencies discovered after the Contractor accepts delivery, including any demurrage or car hire charges.

106.3.4 Storage The Contractor shall store Materials to preserve their quality and fitness for the work. Materials shall not be stored under or in close proximity to Aviation Structures unless the Contractor receives written permission from the Resident. If Materials fail to meet the requirements of the Contract, the Materials will be rejected. The Department may inspect stored materials at any time. The Contractor shall locate stored Materials to facilitate their prompt inspection. The Department may approve portions of land within the

Right-of-Way for storage purposes and for the placing of the Contractor's equipment, but the Contractor shall provide any additional land required without cost to the Department. The Contractor shall not use private property for storage purposes without written permission of the owner, with copies of the written permission furnished to the Department upon request. The Contractor shall restore all storage sites, whether within the Right-of-Way or on private property, to original condition at the completion of the project, without cost to the Department.

106.3.5 Handling The Contractor shall handle all Materials in a manner that preserves their quality and fitness for the work. The Contractor shall transport Aggregates in tight vehicles to avoid loss or segregation of Materials after loading and measuring.

106.3.6 Unacceptable Materials The Department may reject Materials not conforming to the Specifications at any time, and the Contractor shall remove them immediately from the project site unless otherwise instructed by the Department. The Contractor shall not store or use rejected materials on any Department project.

106.3.7 Sampling and Testing Qualified Departmental personnel may take samples of Materials for Acceptance Testing. Work in which Material is used without the Department's approval will be at the Contractor's sole risk and the work will be considered Non-conforming Work. Unless otherwise designated, the Department's testing costs will be at the expense of the Department. Materials being used are subject to inspection, testing, or rejection at any time. The Department will furnish copies of test reports to the Contractor upon request.

The Contractor is responsible for the quality of construction and materials incorporated into the work. The Contractor shall perform all necessary QC inspection, sampling, and testing in accordance with the approved QCP. If a QCP is not required, the Contractor is still responsible for all QC necessary for a high quality project. The Contractor shall not rely on the results of the Department's Acceptance Testing being available for process QC.

The Contractor may observe the Department's sampling and testing activities. If the Contractor observes a deviation from the specified sampling or testing procedures, then the Contractor shall describe the deviation to the Department immediately and document the deviation in writing within 24 hours to preserve its ability to dispute the sample.

The Department will randomly sample and test items designated for Acceptance in accordance with the procedure specified for that item. The Department may also sample and test at any time if the Material appears defective or when the Department determines that a change in the process or product has occurred. Acceptance Tests will govern in all cases for determination of pay factors without regard to QC tests, unless otherwise specified in the Contract.

When directed by the Department, 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 corrected by the Contractor. All sampling shall be in accordance with Department, AASHTO, or ASTM procedures as specified for the material being sampled.

106.4 Quality Control

106.4.1 General When required elsewhere in the Contract, the Contractor shall develop, submit, and implement a Quality Control Plan (QCP), approved by the Department, for those items of work specified that will result in work that meets or exceeds the quality requirements of this Contract. Regardless of whether a QCP is required, Quality Control for all work is the Contractor's responsibility.

A. Submittal Within 21 Days of Contract Execution or at least 30 Days before any related work is to be performed, the Contractor shall submit three copies of its QCP to the Department.

B. Approval Within 14 Days of Receipt, the Department will determine if the QCP is in accordance with the requirements of this Section 106.4 and (1) notify the Contractor that its QCP is approved or (2) return it for any needed revisions. If returned for revision, the Contractor shall resubmit three copies of its revised QCP as provided above within 7 Days and the Department will have 7 Days from receipt of the revised plan to notify the Contractor whether its QCP is approved or again requires revision. Additional iterations will occur in a like manner until the Department approves the Contractor's QCP. Failure to submit an approvable QCP shall not be cause for any adjustment to compensation or time.

C. Standard QC Plans For items included in Section 400 – Pavements, the Contractor may choose to submit a standard QCP that includes any items common to all of its plants and paving operations. Standard plans shall be submitted to the Quality Assurance Engineer by March 1 of . The standard plan will apply to all projects constructed by the Contractor until a new standard plan is approved the following year. In addition to the standard plan, the Contractor must submit a supplemental QCP for each project that includes any required items and project specific details not covered by the standard plan. Approval of both standard and Project-specific QCPs shall be as done outlined in paragraph B above, with the exception that the initial 14-Day review period for standard plans will begin on March 1, and that the supplemental Project-specific QCP shall be submitted a minimum of 14 Days prior to any related work being performed with an initial review period of 7 Days.

Upon final approval of the QCP, the Contractor shall provide 5 bound copies or an electronic version to the Department. All Contractor QC personnel shall also be issued their own copy of the approved QCP. The Contractor shall communicate the applicable contents of the approved QCP to all Contractor and Subcontractor personnel involved in completing the work items covered by the QCP.

The Contractor's QCP shall consist of plans, procedures, responsibilities, authority, and an organizational structure that demonstrates that an effective level of QC will exist and

that the finished products will comply with all Contract requirements. The Contractor shall provide all necessary QC inspection, sampling, and testing to implement the QCP. The QCP shall include an organizational structure and reporting requirements that demonstrate that QC personnel have sufficient independence to allow them to be primarily concerned with quality, as opposed to schedule and budget.

The individual administering the QCP shall be a full-time employee of or a consultant engaged by the Contractor. The individual shall have full authority to institute any and all actions necessary for the successful implementation of the QCP.

The Department will not sample or test for process control or assist in controlling the Contractor's production operations. The Contractor shall provide QC personnel and testing Equipment capable of providing a quality product that meets or exceeds the Contract requirements. Continued production of Non-conforming Work for a reduced price, instead of making adjustments to the production operations to bring work into conformance, is not allowed.

106.4.2 Quality Control Plan Requirements The QCP shall include, at a minimum, the following:

Construction items covered by the QCP, as specified in the Contract
Sampling location and techniques
Tests and test methods
Testing frequencies
Inspection frequencies
Detailed description of production and placement Equipment and methods
Documentation procedures, including:
- Inspection and test records
- Temperature measurements
- Accuracy, calibration, or recalibration checks performed on production or testing Equipment

The QCP shall identify the Contractor's QC personnel, including the company official ultimately responsible for the quality of the Work. The Department's QCP approval process may include inspection of testing Equipment and a sampling and testing demonstration by the Contractor's QC inspector(s) to assure an acceptable level of performance.

106.4.3 Testing Qualified technicians in laboratories approved by the Department shall perform all QC testing covered by the QCP. Technician qualifications shall be as described in the Contract for the corresponding item of Work.

Laboratory facilities shall be clean, and all equipment shall be maintained in proper working condition. The Department shall be permitted unrestricted access to inspect the Contractor's laboratory facility. The Department will advise the Contractor in writing of any noted deficiencies concerning the laboratory facility, equipment, supplies, or testing

personnel and procedures. Deficiencies shall be grounds for the Department to order an immediate stop to incorporating materials into the work until deficiencies are corrected. Work already in place affected by QC deficiencies is Non-conforming Work.

The Contractor shall maintain original documentation of all inspections, tests (including all associated data such as measurements, weights, dial readings, etc. used in the completion of the test), and calculations used to generate reports. The records shall indicate the nature, number, and type of deficiencies found, the quantities approved and rejected, and the nature of corrective actions taken. The Contractor shall maintain standard testing Equipment and qualified personnel as required by the Contract.

The QCP shall include the testing and record keeping requirements for each item as contained in the Contract. The number preceding each item refers to the item and specification number in the Standard Specifications. When testing requirements are not specified, the Contractor shall perform all testing and record keeping as recommended by the manufacturer, vendor, or supplier.

If an item is required to be in the QCP but the Contract does not specify testing requirements, the Contractor shall propose testing requirements in the QCP.

The Contractor shall maintain Control Charts in a manner and location acceptable to the Department. At a minimum, the Control Charts shall identify the project number, the Pay Item number, each test parameter, the upper and lower control limits applicable to each test parameter, and the running average of the last three Contractor test results. The Contractor shall use the Control Charts as part of a process control system for identifying production and Equipment problems and for identifying potential quality reductions before they occur. Acceptable Control Charts are part of the approved QCP.

After final records review, the Contractor will certify in writing to the Department that the project has been constructed and inspected, and all materials have been tested in accordance with the Contract. All Paving certs shall be submitted on the Paving Company's Letterhead.

106.4.4 QC Inspector Qualifications When a QCP is required, the Contractor's QC Inspectors shall hold all certifications from MCTCB or NETTCP that apply to the items included in the QCP. The Department may require the Contractor to remove Inspectors from the project who are not certified as required or who are otherwise unqualified or unable to fulfill their duties in a good and workmanlike manner.

106.4.5 Inspection Requirements The QCP shall cover all construction operations on the site and at off-site production facilities, keyed to the proposed construction materials, sequence and schedule. The QCP shall also identify QC personnel (including qualifications), procedures, controls, tests, records, and forms to be used.

The Contractor shall provide a copy of each completed QC report to the Department by 1:00 PM on the Day following each construction activity, unless other arrangements are

made with the Resident. Failure to provide this report will constitute non-compliance with the QCP and the Contract.

If an item is required to be in the QCP but QC Inspection requirements are not specified in the Contract, the Contractor shall propose inspection and record keeping requirements for such items in the QCP.

106.4.6 QCP Non-Compliance The Contractor shall comply with the approved QCP and shall take all other steps necessary to assure a high quality project.

Failure by the Contractor to comply with the approved Quality Control Plan will result in a letter describing the violation, a mandatory work suspension, and a reduction in payment as shown in Table 106.4A below. The Contractor shall submit a letter to the Department that details the corrective action made to address the violation(s) in its Quality Control Plan. Work may resume when the Department is satisfied the corrective action will result in adherence to the Quality Control Plan.

Table 106.4 A - Quality Control Pay Reduction

| Quality Control Plan Value* | | Pay Reduction | | |
|---|---|---|---|---|
| From More Than | To and Including | 1st | 2nd | 3rd & Subsequent |
| $0 | $500,000 | $1,000 | $2,000 | $4,000 |
| $500,000 | $1,000,000 | $2,000 | $4,000 | $8,000 |
| $1,000,000 | $3,000,000 | $5,000 | $10,000 | $20,000 |
| $3,000,000 | and more | $10,000 | $20,000 | $40,000 |

* The Quality Control Plan Value is the total Bid value of all items covered by a Quality Control Plan, as detailed in the applicable specification or Special Provision.

During all periods of the Contractor's failure to follow the approved QCP, no positive pay incentives will be calculated or paid if the Department accepts the Material.

Pay reductions for failure to comply with the approved QCP are cumulative, and the Department will deduct any pay reductions due from amounts otherwise due the Contractor. These pay reductions are intended to encourage the Contractor to comply with its approved QCP, and are not necessarily related to the quality of the material provided.

106.5 Quality Assurance The Department will conduct Quality Assurance by:

-Review of QC Reports provided by the Contractor.
-Monitoring Contractor compliance with the QCP.
-Random inspection of production, placement, and workmanship
-Randomly accompanying the Contractor's inspector during QC Inspections/Testing.
-Acceptance Verification and IA sampling and testing of Materials or completed Work.

The Department's objective is a high quality project through a cooperative effort with the Contractor. Items that are to be buried, covered, are of high cost, or affect the long-term durability of the Work will receive extra attention in the QA effort.

Unacceptable Work found by the Department's Inspector will be brought to the attention of the Resident, who will determine what corrective action the Contractor will need to take. The Contractor shall schedule the corrective work with the Resident, and both the QC and Department's Inspectors will witness the corrective action. Failure of the Contractor to correct unacceptable Work in a timely manner, as determined by the Department, may result in the withholding of progress payment(s) or suspension of the Work, or both. The Contractor will not be eligible for either additional monetary compensation or a time extension should they fail to correct. If necessary for protection of the Work or for public convenience, the Department may accomplish corrective Work by other means and deduct the cost from any monies due the Contractor.

The Department may review and obtain copies of all QC test reports (including original test data), inspections reports, and control charts at all reasonable times without cost to the Department.

If the Department decides to inspect the Materials or operations at the plant, then the following conditions shall be met:

A. The Department shall have the cooperation and assistance of the Contractor and the producer with whom the Contractor has arranged for the Materials.

B. The Department shall have full access at all times to the parts of the plant(s) that are involved with the manufacture and production of the Materials being furnished.

C. If required, the Contractor shall arrange for an approved testing laboratory building for the sole use of the Department. The building shall be located near the plant and conform to the requirements of Section 639 - Engineering Facilities.

D. The Contractor shall provide any needed equipment for safe access to plant stockpiles, equipment, and operations.

106.6 Acceptance The Department is responsible for determining the acceptability of the Work. Acceptance of the Material is based on the visual inspection of the construction, monitoring of the Contractor's QCP, and Acceptance Test results. Acceptance sampling and testing is the responsibility of the Department (unless alternate procedures are specified) except for furnishing facilities, testing equipment, transportation, and Material samples as required.

Acceptance of Hot Mix Asphalt Pavement will be based on Method A, B, or C Statistical Acceptance, or Method D (Small Quantity - Product Verification) as specified. The method of acceptance for each item is defined in Special Provision, Section 403, Hot Mix Asphalt Pavement. When items of Hot Mix Asphalt Pavement are not so designated,

Method A will be utilized whenever there are more than 1000 tons per Hot Mix Asphalt Pavement item, and Method B will be utilized when there are less than or equal to 1000 tons per Hot Mix Asphalt Pavement item.

Acceptance of structural concrete will be based on Method A or B Statistical Acceptance, or Method C Verification. Items to be accepted under Method A, Method B, or Method C are defined in Special Provision, Section 502, Structural Concrete Acceptance Methods. When items of cast-in-place concrete are not so designated, Method B will be used when there are more than 10 cubic yards and Method C will be used when there are 10 cubic yards or less.

The Department may reject Material that appears to be defective based on visual inspection. No payment will be made for the Materials rejected by the Department.

Prior to Contractor's knowledge of the sample location, the Contractor may remove and replace defective Material at no cost to the Department. The Department will sample, test, and evaluate new Material for acceptance.

A. Statistical Acceptance methods utilize the Quality Level Analysis and Pay Factor Specifications described in Section 106.7 - Quality Level Analysis and in Tables 106.7 A, along with specific information contained in the Divisions 400 and 500 Specifications, including Section 401 - Hot Mix Asphalt, Section 402 - Pavement Smoothness, and Section 502 - Structural Concrete.

Pay Items specified to be sampled and tested under Statistical Acceptance methods will be evaluated for acceptance in accordance with the guidelines specified for that Pay Item. All Acceptance Test results for a lot as defined in the Specification will be analyzed collectively and statistically by the Quality Level Analysis - Standard Deviation (Specification Conformance Analysis) Method using the procedures listed to determine the total estimated percent of the lot that is within specification limits. Quality Level Analysis (Specification Conformance Analysis) is a statistical procedure for estimating the percent compliance with a specification and is affected by shifts in the arithmetic mean (x) and by the sample standard deviation (s). Analysis of test results will be based on an Acceptance Quality Level (AQL) of 90.0, unless otherwise specified. AQL may be viewed as the lowest percent within the specification limits of a material that is acceptable as a process average and receive 100% pay. The Department will exclude test results on Material not incorporated in the Work from the Quality Level Analysis.

For items evaluated using Quality Level, and in the Department's sole discretion, a lot with a Quality Level of less than 50 percent within limits will be either (1) removed and replaced with acceptable Material at the Contractor's expense, or (2) accepted and paid for at a Pay Factor determined by the Department. The Department may also reject Material with a Quality Level at or above this level, but such Material will be removed and replaced by the Contractor at the Department's expense.

B. Items not designated for Statistical Acceptance will utilize Product Verification testing to validate the quality of the material incorporated into the Project. The Contractor shall provide the Department with a Certification Letter that indicates that the material supplied complies with the Specifications. Test results representative of the certified material shall be attached to the letter.

The Department will randomly sample and test the certified Material for properties noted in Table 1 of Section 502 - Structural Concrete or Table 8 of Section 401.20 - Acceptance. Material will be subject to rejection as noted in Structural Concrete Section 502.195 - Quality Assurance Method C Concrete or Hot Mix Asphalt, Section 401.204 - Quality Assurance Method D.

106.7 Quality Level Analysis

106.7.1 Standard Deviation Method Standard Deviation Method procedures are as follows:

A. Determine the arithmetic mean ( $\bar{x}$ ) of the test results:

$$\bar{x} = \frac{\sum x_i}{n}$$

Where $\sum$ = summation of

$x_i$ = individual test value

n = total number of test values

B. Compute the sample standard deviation (s):

$$s = \text{Square root of } \frac{\sum (x_i - \bar{x})^2}{n-1}$$

Where $\sum$ = summation of

$x_i$ = individual test values

$\bar{x}$ = mean test value

n = total number of test values

C. Compute the upper quality index ($Q_U$):

$$Q_U = \frac{USL-\bar{X}}{s}$$

Where USL = upper specification limit.

D. Compute the lower quality index ($Q_L$):

$$Q_L = \frac{\bar{X}\text{-LSL}}{s}$$

Where LSL = lower specification limit.

E. Determine $P_U$ (percent within the upper Specification limit which corresponds to a given $Q_U$) from Table 106.7 A.

Note: If a USL is not specified, $P_U$ will be 100. If the mean test value is equal to the USL, then PU will be 50 regardless of the computed value of s.

F. Determine $P_L$ (percent within the lower Specification limit which corresponds to a given $Q_L$) from Table 106.7 A.

If the mean test value is equal to the USL, then PU will be 50 regardless of the computed value of s.

Note: If a LSL is not specified, $P_L$ will be 100.

G. Determine the Quality Level (total percent within Specification limits).

Quality Level = $(P_U + P_L) - 100$

H. Determine the Pay Factor (PF) for the lot using the Quality Level from Step G.
For items included in Sections 401 – Hot Mix Asphalt:

Method A: PF = [55 + (Quality Level * 0.5)] * 0.01
Method B: PF = [70 + (Quality Level * 0.33)] * 0.01
Method C: PF = [55 + (Quality Level * 0.5)] * 0.01

For items included in Section 402 – Pavement Smoothness:

PF = [55 + (Quality Level * 0.5)] * 0.01

For items included in Section 502 – Structural Concrete:

Method A: PF = [55 + (Quality Level * 0.5)] * 0.01
Method B: PF = [70 + (Quality Level * 0.33)] * 0.01

I. Determine the Composite Pay Factor (CPF) for each lot.

$$CPF = \frac{[f_1(PF_1)+f_2(PF_2)+...f_J(PF_J)]}{\sum f}$$

Where $f_J$ = price adjustment factor listed in the specifications for the applicable property.

$PF_J$ = Pay Factor for the applicable property.

$\sum f$ = Sum of the "f" (price adjustment) factors.

Note: Numbers used in the above calculations shall be carried to significant figures and rounded according to AASHTO Standard Recommended Practice R-11.

106.7.2 Statistical Outliers This procedure specifies how outlying observations in sample test results will be evaluated for their statistical significance. The Department will use this procedure for only those items that are specified to be checked for outlying observations.

An outlying observation or "outlier" is one that appears to deviate markedly from other sample test values in the lot.

When specified, the procedure will determine whether any value is a statistical outlier. If a test result is found to be an outlier, the QA Engineer will investigate the outlying value to determine if it should be retained or discarded. The investigation will include but not be limited to an examination of all available test data and inspection reports relating to the questionable test result, possible additional testing, and discussions with appropriate Contractor and Department personnel. If the investigation concludes that an assignable cause cannot be determined for the outlying value, it will be discarded; otherwise, it will be retained for pay factor determination.

Procedure

A. Calculate the sample average ( $\bar{x}$ ) and standard deviation(s) of all the values in the lot.

B. Find the value "t" from Table 106.7 B corresponding to the sample size for the lot.

C. Determine D (the total allowable deviation from the average) by multiplying t by s.

D. Establish values for MAX and MIN by the following:

$MAX = \bar{x} + D$ $MIN = \bar{x} - D$

E. Any value greater than MAX or less than MIN is an outlier. The Department will investigate any outlying values before determining the Pay Factor for that lot.

Table 106.7 A - Quality Level Analysis by the Standard Deviation Method

| PU Or PL %* | Upper Quality Index QU or Lower Quality Index QL | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | n = 3 | n = 4 | n = 5 | n = 6 | n = 7 | n = 8 | n = 9 | n = 10 to n = 11 | n = 12 to n = 14 | n = 15 to n = 18 | n = 19 to n = 25 | n = 26 to n = 37 | n = 38 to n = 69 | n = 70 to n = 200 | n = 201 to n = x |
| 100 | 1.16 | 1.50 | 1.79 | 2.03 | 2.23 | 2.39 | 2.53 | 2.65 | 2.83 | 3.03 | 3.20 | 3.38 | 3.54 | 3.70 | 3.83 |
| 99 | | 1.47 | 1.67 | 1.80 | 1.89 | 1.95 | 2.00 | 2.04 | 2.09 | 2.14 | 2.18 | 2.22 | 2.26 | 2.29 | 2.31 |
| 98 | 1.15 | 1.44 | 1.60 | 1.70 | 1.76 | 1.81 | 1.84 | 1.86 | 1.91 | 1.93 | 1.96 | 1.99 | 2.01 | 2.03 | 2.05 |
| 97 | | 1.41 | 1.54 | 1.62 | 1.67 | 1.70 | 1.72 | 1.74 | 1.77 | 1.79 | 1.81 | 1.83 | 1.85 | 1.86 | 1.87 |
| 96 | 1.14 | 1.38 | 1.49 | 1.55 | 1.59 | 1.61 | 1.63 | 1.65 | 1.67 | 1.68 | 1.70 | 1.71 | 1.73 | 1.74 | 1.75 |
| 95 | | 1.35 | 1.44 | 1.49 | 1.52 | 1.54 | 1.55 | 1.56 | 1.58 | 1.59 | 1.61 | 1.62 | 1.63 | 1.63 | 1.64 |
| 94 | 1.13 | 1.32 | 1.39 | 1.43 | 1.46 | 1.47 | 1.48 | 1.49 | 1.50 | 1.51 | 1.52 | 1.53 | 1.54 | 1.55 | 1.55 |
| 93 | | 1.29 | 1.35 | 1.38 | 1.40 | 1.41 | 1.42 | 1.43 | 1.44 | 1.44 | 1.45 | 1.46 | 1.46 | 1.47 | 1.47 |
| 92 | 1.12 | 1.26 | 1.31 | 1.33 | 1.35 | 1.36 | 1.36 | 1.37 | 1.37 | 1.38 | 1.39 | 1.39 | 1.40 | 1.40 | 1.40 |
| 91 | 1.11 | 1.23 | 1.27 | 1.29 | 1.30 | 1.30 | 1.31 | 1.31 | 1.32 | 1.32 | 1.33 | 1.33 | 1.33 | 1.34 | 1.34 |
| 90 | 1.10 | 1.20 | 1.23 | 1.24 | 1.25 | 1.25 | 1.26 | 1.26 | 1.26 | 1.27 | 1.27 | 1.27 | 1.28 | 1.28 | 1.28 |
| 89 | 1.09 | 1.17 | 1.19 | 1.20 | 1.20 | 1.21 | 1.21 | 1.21 | 1.21 | 1.22 | 1.22 | 1.22 | 1.22 | 1.22 | 1.23 |
| 88 | 1.07 | 1.14 | 1.15 | 1.16 | 1.16 | 1.16 | 1.17 | 1.17 | 1.17 | 1.17 | 1.17 | 1.17 | 1.17 | 1.17 | 1.17 |
| 87 | 1.06 | 1.11 | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 | 1.13 | 1.13 |
| 86 | 1.04 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 |
| 85 | 1.03 | 1.05 | 1.05 | 1.04 | 1.04 | 1.04 | 1.04 | 1.04 | 1.04 | 1.04 | 1.04 | 1.04 | 1.04 | 1.04 | 1.04 |
| 84 | 1.01 | 1.02 | 1.01 | 1.01 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.99 | 0.99 | 0.99 |
| 83 | 1.00 | 0.99 | 0.98 | 0.97 | 0.97 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.95 | 0.95 | 0.95 |
| 82 | 0.97 | 0.96 | 0.95 | 0.94 | 0.93 | 0.93 | 0.93 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| 81 | 0.96 | 0.93 | 0.91 | 0.90 | 0.90 | 0.89 | 0.89 | 0.89 | 0.89 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| 80 | 0.93 | 0.90 | 0.88 | 0.87 | 0.86 | 0.86 | 0.86 | 0.85 | 0.85 | 0.85 | 0.85 | 0.84 | 0.84 | 0.84 | 0.84 |
| 79 | 0.91 | 0.87 | 0.85 | 0.84 | 0.83 | 0.82 | 0.82 | 0.82 | 0.82 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 |
| 78 | 0.89 | 0.84 | 0.82 | 0.80 | 0.80 | 0.79 | 0.79 | 0.79 | 0.78 | 0.78 | 0.78 | 0.78 | 0.77 | 0.77 | 0.77 |
| 77 | 0.87 | 0.81 | 0.78 | 0.77 | 0.76 | 0.76 | 0.76 | 0.75 | 0.75 | 0.75 | 0.75 | 0.74 | 0.74 | 0.74 | 0.74 |
| 76 | 0.84 | 0.78 | 0.75 | 0.74 | 0.73 | 0.73 | 0.72 | 0.72 | 0.72 | 0.71 | 0.71 | 0.71 | 0.71 | 0.71 | 0.71 |
| 75 | 0.82 | 0.75 | 0.72 | 0.71 | 0.70 | 0.70 | 0.69 | 0.69 | 0.69 | 0.68 | 0.68 | 0.68 | 0.68 | 0.68 | 0.67 |
| 74 | 0.79 | 0.72 | 0.69 | 0.68 | 0.67 | 0.66 | 0.66 | 0.66 | 0.66 | 0.65 | 0.65 | 0.65 | 0.65 | 0.64 | 0.64 |
| 73 | 0.76 | 0.69 | 0.66 | 0.65 | 0.64 | 0.63 | 0.63 | 0.63 | 0.62 | 0.62 | 0.62 | 0.62 | 0.62 | 0.61 | 0.61 |
| 72 | 0.74 | 0.66 | 0.63 | 0.62 | 0.61 | 0.60 | 0.60 | 0.60 | 0.59 | 0.59 | 0.59 | 0.59 | 0.59 | 0.58 | 0.58 |
| 71 | 0.71 | 0.63 | 0.60 | 0.59 | 0.58 | 0.57 | 0.57 | 0.57 | 0.57 | 0.56 | 0.56 | 0.56 | 0.56 | 0.55 | 0.55 |
| 70 | 0.68 | 0.60 | 0.57 | 0.56 | 0.55 | 0.55 | 0.54 | 0.54 | 0.54 | 0.53 | 0.53 | 0.53 | 0.53 | 0.53 | 0.52 |
| 69 | 0.65 | 0.57 | 0.54 | 0.53 | 0.52 | 0.52 | 0.51 | 0.51 | 0.51 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 |
| 68 | 0.62 | 0.54 | 0.51 | 0.50 | 0.49 | 0.49 | 0.48 | 0.48 | 0.48 | 0.48 | 0.47 | 0.47 | 0.47 | 0.47 | 0.47 |
| 67 | 0.59 | 0.51 | 0.47 | 0.47 | 0.46 | 0.46 | 0.46 | 0.45 | 0.45 | 0.45 | 0.45 | 0.44 | 0.44 | 0.44 | 0.44 |
| 66 | 0.56 | 0.48 | 0.45 | 0.44 | 0.44 | 0.43 | 0.43 | 0.43 | 0.42 | 0.42 | 0.42 | 0.42 | 0.41 | 0.41 | 0.41 |
| 65 | 0.52 | 0.45 | 0.43 | 0.41 | 0.41 | 0.40 | 0.40 | 0.40 | 0.40 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 |
| 64 | 0.49 | 0.42 | 0.40 | 0.39 | 0.38 | 0.38 | 0.37 | 0.37 | 0.37 | 0.37 | 0.36 | 0.36 | 0.36 | 0.36 | 0.36 |
| 63 | 0.46 | 0.39 | 0.37 | 0.36 | 0.35 | 0.35 | 0.35 | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 | 0.33 | 0.33 | 0.33 |
| 62 | 0.43 | 0.36 | 0.34 | 0.33 | 0.32 | 0.32 | 0.32 | 0.32 | 0.31 | 0.31 | 0.31 | 0.31 | 0.31 | 0.31 | 0.31 |
| 61 | 0.39 | 0.33 | 0.31 | 0.30 | 0.30 | 0.29 | 0.29 | 0.29 | 0.29 | 0.29 | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 |
| 60 | 0.36 | 0.30 | 0.28 | 0.27 | 0.27 | 0.27 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.25 | 0.25 |
| 59 | 0.32 | 0.27 | 0.25 | 0.25 | 0.24 | 0.24 | 0.24 | 0.24 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 |
| 58 | 0.29 | 0.24 | 0.23 | 0.22 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 |
| 57 | 0.25 | 0.21 | 0.20 | 0.19 | 0.19 | 0.19 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 |
| 56 | 0.22 | 0.18 | 0.17 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 |
| 55 | 0.18 | 0.15 | 0.14 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 |
| 54 | 0.14 | 0.12 | 0.11 | 0.11 | 0.11 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 |
| 53 | 0.11 | 0.09 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| 52 | 0.07 | 0.06 | 0.06 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 51 | 0.04 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.02 |
| 50 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Note: For negative values of QU or QL, PU or PL is equal to 100 minus the table value for PU or PL. If the value of QU or QL does not correspond exactly to a figure in the table, use the next higher figure.

* Within limits for positive values

Table 106.7 B - Values of t

| n | t |
|---|---|
| 3 | 1.155 |
| 4 | 1.481 |
| 5 | 1.715 |
| 6 | 1.887 |
| 7 | 2.020 |
| 8 | 2.126 |
| 9 | 2.215 |
| 10 | 2.290 |
| 11 | 2.355 |
| 12 | 2.412 |
| 13 | 2.462 |
| 14 | 2.507 |
| 15 | 2.549 |
| 16 | 2.585 |
| 17 | 2.620 |
| 18 | 2.651 |
| 19 | 2.681 |
| 20 | 2.709 |
| 21 | 2.733 |
| 22 | 2.758 |
| 23 | 2.781 |
| 24 | 2.802 |
| 25 | 2.822 |
| 26 | 2.841 |
| 27 | 2.859 |
| 28 | 2.876 |
| 29 | 2.893 |
| 30 | 2.908 |

106.7.3 Early Termination of Lots In the event a lot in progress is terminated prematurely before the Department is able to take the number of acceptance samples required by the test method specified in the Contract, the following will apply as applicable unless otherwise detailed in the specifications for the item:

A. If three or more samples have been taken, then payfactors will be generated using the available samples results for the lot.

B. If the termination was requested by the Contractor and approved by the Department prior to three samples being taken, then each property's payfactor will be set to 0.80.

C. If the termination was initiated by the Department prior to three samples being taken, then each property's payfactor will be set to 1.00 for each property.

106.8 Non-conforming Work

106.8.1 Substantially Conforming Work If the Department determines the Work substantially conforms to the Contract, the Department may accept the Non-conforming Work and may require a credit to the Department to be deducted from amounts otherwise due the Contractor. If the Department and Contractor cannot agree to the amount of the credit, the work shall be Unacceptable Work.

106.8.2 Unacceptable Work The Contractor shall remove, replace, or otherwise correct all Unacceptable Work as directed by the Department at the expense of the Contractor, without cost or liability to the Department.

106.8.3 Unauthorized Work Prior to Final Acceptance and upon written order by the Department, the Contractor shall remove or uncover Unauthorized Work. After examination, the Contractor shall rebuild the Unauthorized Work to a condition conforming to the Contract at the expense of the Contractor and without cost or liability to the Department. Any Delay arising from Unauthorized Work shall be an Inexcusable Delay.

106.8.4 Uninspected Work Prior to Final Acceptance and upon written order by the Department, the Contractor shall uncover Uninspected Work. After examination, the Contractor shall rebuild the Uninspected Work to a condition conforming to the Contract. If the Department determines that the Uninspected Work is acceptable, the uncovering, removing, and rebuilding will be paid as Extra Work, and any resulting Delay shall be an Excusable Delay. If the Department reasonably determines that the Uninspected Work is unacceptable, the uncovering, removing, and rebuilding shall be at the Contractor's expense and any resulting Delay shall be an Inexcusable Delay.

106.9 Warranty Provisions

106.9.1 Warranty By Contractor The Contractor unconditionally warrants and guarantees that the project will be free from Warranty Defects for one year from the date of Physical Work Complete. For a related provision, see Section 107.9.3 – Notices / Final Inspection / Physical Work Completion.

If the Department discovers any Warranty Defects during the warranty period, the Contractor agrees to promptly perform all remedial Work at no additional cost or liability to the Department.

For a related provision regarding obligations regarding plantings, see Section 621.0036 - Establishment Period.

106.9.2 Warranty Definitions Notwithstanding any other provision of the Contract, the following words or phrases have the following definitions for the purposes of the Contractor's warranty obligation under this Contract.

Warranty Defects Warranty Defects are conditions that result from Material, manufacture, or workmanship and that are not in conformity with the Contract or with industry standards applicable to the Work prevailing at the time of submission of the Bid.

Warranty Defects do not include (A) normal wear and tear, (B) conditions caused by occurrences clearly beyond the Contractor's control and not attributable to material, manufacture, or workmanship, and (C) Defects in landscape items that are the subject of Landscape Establishment Period Obligations. Examples of such excepted occurrences might be fires, floods, abnormally poor weather for the site of work, accidents, improper use, improper maintenance, vandalism, or acts of God.

Emergency "Emergency" means necessary for public safety or convenience, as determined by the Department.

Promptly Unless there is an Emergency, "Promptly" means in the first construction season after the Contractor has been notified of the defect(s), but always within one year of Receipt of such notice. In case of an Emergency, Promptly means within 48 hours.

Remedial Work "Remedial Work" means all Work necessary to make the item in like new condition as reasonably determined by the Department and performed in accordance with the Contract and in a good and skillful manner. Remedial Work includes all design, permitting, project management, supervision, materials, and labor, including erosion control and traffic control.

106.9.3 Remedial Work Procedure and Requirements Within 30 Days of being notified of any Warranty Defects, the Contractor shall submit to the Department for approval a Remedial Work Plan, including the scope of Work, conceptual Work methods, schedule, construction phasing, and other significant aspects of the corrective Work (the "Work Plan"). Unless otherwise provided by the Department in writing, any Work commenced prior to Department's approval of the Work Plan will be at the Contractor's sole risk. Before starting any on-site Work, the Contractor shall deliver to the Department certificates of insurance complying with Section 110.3 - Insurance. If the estimated cost of Remedial Work exceeds $100,000, the Contractor shall provide Performance and Payment Bonds complying with Section 110.2 - Performance and Payment Bonds.

If (A) the Contractor fails to submit a Remedial Work Plan, (B) the Contractor does not comply otherwise with written instructions from the Department, or (C) a State of emergency exists in which Delay would cause serious risk of loss or damage, then the Department may perform or contract for such remedial work and the Contractor will be responsible for all claims, costs, damages, losses, and expenses arising out of such work, including fees and charges of engineers, consultants, attorneys, dispute resolution professionals, and court costs.

Upon a final inspection satisfactory to the Department, the Department will issue a written acceptance of the Remedial Work. The Contractor warrants and guarantees all Remedial Work to be free from Warranty Defects for one year after such acceptance.

106.9.4 Other Warranty Provisions The Contractor hereby assigns to the Department the right to enforce all manufacturer's warranties or guarantees on all Materials,

Equipment, or products purchased for the Work that exceed the nature or duration of the warranty obligations assumed by the Contractor under this Contract.

The Performance Bond and/or Warranty Bond required by Section 110.2.1 - Bonds shall cover all warranty obligations of the Contractor provided by this Contract. Final Acceptance by the Department does not relieve the Contractor of any warranty obligations provided by this Contract.

The Contractor agrees that the warranty obligations provided by this Contract shall be reported as an outstanding obligation in the event of bankruptcy, dissolution, or the sale, merger, or cessation of operations of the Contractor.

## SECTION 107 - TIME

Scope of Section This Section contains general time-related provisions of the Contract, including the Contract Time, allowable Work times, schedule requirements, Liquidated Damages, and Project Closeout.

107.1 Contract Time and Contract Completion Date All Work must be Complete by the Contract Completion Date and within the Contract Time. Unless expressly provided otherwise by the Department in writing, the Contract Time shall be all time between the Contract Execution and the Completion date specified in the Contract, and any authorized extensions.

107.2 Commencement of Contract Time and Work Unless provided elsewhere in this Contract or in writing from the Department, the Contract Time will commence on the date of Contract Execution. For related provisions, see Sections 101.2 - Definitions of Contract Execution and 103.8 - Execution of Contract by the Department.

Unless specified otherwise, Work may commence upon Contract Execution, unless the Contractor has not secured and provided the Performance and Payment Bonds and Insurance Certificates required by Sections 103.5 - Award Conditions, 110.2 - Bonding, and 110.3 - Insurance. Any Work performed before the requirements of these sections are met is Unauthorized Work and is at the sole risk of the Contractor. Pursuant to Section 110.1 - Indemnification, the Contractor and Surety shall indemnify and hold harmless the Department from any claims arising from Work.

107.3 Allowable Work Times

107.3.1 General Work can be performed at any time except Sundays and Holidays, unless expressly specified otherwise in this Contract, including any applicable Permit conditions. If a Holiday occurs on a Sunday, the following Monday shall be considered a Holiday. Sunday or Holiday Work must be approved by the Department, except that the Contractor may work on Martin Luther King Day, President's Day, Patriot's Day, the Friday after Thanksgiving, and Indigenous Peoples Day without the Department's approval.

107.3.2 Night Work If the Contractor performs Work during periods of darkness, the Contractor shall comply with Contract requirements governing night Work. If the Contractor elects to perform Work during periods of darkness on its own initiative and without direction from the Department, then the Contractor shall also comply with all municipal ordinances affecting such Work, including noise ordinances. When pricing and scheduling the Work, the Contractor shall not assume that such non-directed night Work will be allowed. Accordingly, the Contractor shall not be entitled to any adjustment to either compensation or time due to its inability to secure any required municipal approvals.

107.3.3 Sundays and Holidays The Contractor shall not carry on construction operations on Sundays or Holidays unless (A) expressly specified otherwise in this Contract, (B) expressly authorized by the Department, or (C) necessary to avoid or eliminate a clear and immediate risk of significant bodily injury to any person.

107.3.4 Seasonal Work Restrictions The Contractor shall meet all seasonal restrictions on time of Work contained in the Contract, including all Permits.

107.4 Scheduling of Work

107.4.1 General Duty of Contractor The Contractor is solely responsible for the planning and execution of Work in order to complete the Work within the Contract Time.

107.4.2 Schedule of Work Required At least 3 days before the pre-construction meeting and before beginning any on-site activities, the Contractor shall provide the Department with its Schedule of Work in a Critical Path Method (CPM) in the form of an activity on node (AON) diagram. This CPM schedule will become the basis for claims involving Delay. The Department will waive this CPM requirement for appropriate Contracts through a special provision. The Contractor shall plan the Work, including the activity of Subcontractors, vendors, and suppliers, such that all Work will be performed in Substantial Conformity with its Schedule of Work. The Schedule must include sufficient time for the Department to perform its functions as indicated in this Contract, including QA inspection and testing, approval of the Contractor's TCP, SEWPCP, and QCP, and review of Working Drawings.

At a minimum, the Schedule of Work shall show the major Work activities, milestones, durations, submittals and approvals, and a timeline. Milestones to be included in the schedule include (A) start of Work, (B) beginning and ending of planned Work suspensions, (C) Completion of Physical Work, and (D) Completion. If the Contractor plans to complete the Work before the specified Completion date, the Schedule of Work shall so indicate.

Any restrictions that affect the Schedule of Work such as paving restrictions or In-Stream Work windows must be charted with the related activities to demonstrate that the Schedule of Work complies with the Contract.

The Department will review the Schedule of Work and provide comments to the Contractor within 20 days of receipt of the Schedule of Work. The Contractor will make the requested changes and issue the finalized version to the Department.

107.4.3 Projected Payment Schedule The Contractor shall provide the Department with a Quarterly Projected Payment Schedule that estimates the value of the Work as scheduled, including requests for payment of Delivered Materials. The Projected Payment Schedule must be in accordance with the Contractor's Schedule of Work and prices submitted by the Contractor's Bid. The Contractor shall submit the Projected Payment Schedule as a condition of Award.

107.4.4 Schedule Revisions The progress of the Work shall be compared against the Schedule of Work at each Progress Meeting. If the Department determines that the Contractor's actual progress is not in Substantial Conformity with the Schedule of Work, then the Contractor shall either increase Project resources to get back on schedule or submit a revised Schedule of Work and Projected Payment Schedule to the Department for its review.

107.4.5 No Separate Payment Unless expressly provided otherwise, the costs for providing a Schedule of Work, a Projected Payment Schedule, and all revisions and updates are Incidental to the Contract.

107.5 Suspension of Work

107.5.1 Winter Suspensions

A. Start of Winter Suspension The Contractor may request in writing that the Department approve a Winter Suspension. If the Department determines that winter weather conditions make it impossible to perform all or specified portions of the Work, the Department will approve the Contractor's request with respect to such portions and set the start date of the Winter Suspension.

B. Monitoring and Communications During the Winter Suspension, the Contractor is responsible for monitoring weather conditions and requesting approval from the Department to resume Work as soon as possible. In any case, the Contractor shall notify the Project Manager or Resident 14 Days before the end date of the Winter Suspension specified in Section 107.5.1(C), being April 15th or May 1st, as applicable.

C. End of Winter Suspension Upon request by the Contractor or upon its own initiative, the Department may determine the end date of the Winter Suspension and the Contractor is responsible for resuming Work immediately after said end date. If the end date is not determined by the Department in writing, Winter Suspensions shall end on May 1st for Zone 1 and April 15th for Zone 2. For the purposes of the preceding sentence, Zone 1 means all areas north of Route 2 from Gilead to Bangor and Route 9 from Bangor to Calais and Zone 2 means all areas south of Zone 1, including Routes 2 and 9.

D. Impact on Liquidated Damages Liquidated Damages will not be assessed for any portion of a Winter Suspension that occurs after expiration of the Contract Time. Winter Suspensions will not otherwise affect the assessment of Liquidated Damages. For a related provision, see Section 107.7 - Liquidated Damages.

107.5.2 Suspensions Due To Uncontrollable Events Upon request of the Contractor or upon its own initiative, the Department may suspend the Work due to Uncontrollable Events. Any Delay related to such a suspension will be analyzed in accordance with Section 109.5 - Adjustments for Delay. For a related provision, see Section 101.2 - Definition of Uncontrollable Event.

107.5.3 Suspensions for Cause The Department may suspend the Work if the Contractor violates any provision of the Contract that may affect the quality, cost, timeliness or Conformity of the Work. Any Delay related to such a suspension will be an Inexcusable Delay. For a related provision, see Section 109.5 - Adjustments for Delay.

107.5.4 Suspensions for Convenience The Department may suspend the Work for any other reason it determines is in the best interest of the Department. Any Delay related to such a suspension will be analyzed in accordance with Section 109.5 - Adjustments for Delay.

107.5.5 Pre-Suspension Work If Work is to be suspended for an extended period of time, the Contractor shall store all Materials in a manner that does not obstruct the free and safe flow of vehicular, pedestrian, railroad, or marine traffic and that protects the Materials from damage. The Department may direct the Contractor to install guardrail or other traffic control devices necessary to protect the traveling public. The Contractor shall take all precautions to prevent damage or deterioration of the Work already performed, provide suitable Drainage of the Roadway by opening ditches and Shoulder drains, erecting temporary Structures, and providing temporary erosion control where necessary. The cost of such pre-suspension Work will be analyzed in accordance with Section 109.5 - Adjustments for Delay.

For related provisions, see Sections 104.2.6 - Right to Suspend Work, 105.4.4 - Maintenance During Suspension of Work, 107.7 - Liquidated Damages, and 109.5 - Adjustments for Delay.

107.6 Completion Incentives and Disincentives When provided in the Contract, financial incentives for early Completion and disincentives for late Completion will be added to or deducted from amounts otherwise due the Contractor. Incentives/Disincentives are separate and distinct from Liquidated Damages and Supplemental Liquidated Damages.

107.7 Liquidated Damages

107.7.1 General The Department and the Contractor acknowledge that time is an essential element of the Contract, and that Delay in completing the Work beyond the designated completion date will result in damages, including but not limited to damages to

the State of Maine due to public inconvenience, obstruction to traffic, interference with business, as well as increased engineering, inspection, and administrative costs to the Department. The Department and the Contractor acknowledge the difficulty of making a precise determination of such damages and, as a result, they have agreed to a sum of money in the amount stipulated in the Contract that will be charged against the Contractor for each Calendar Day that the Work remains uncompleted after the expiration of the designated Completion date, not as a penalty but as Liquidated and Supplemental Liquidated Damages.

Except as expressly provided otherwise in this Contract, the Contractor or, in case of default, its Surety, shall owe the Department the per diem amount specified in Section 107.7.2 - Schedule of Liquidated Damages, as well as any per diem amount of Supplemental Liquidated Damages as specified in the Supplement Specifications, for each Calendar Day that any portion of the Work remains incomplete after the Contract Time has expired. Should the Contractor or its Surety fail to complete the Work by the Completion date, a deduction of the amount stipulated in the Contract as Liquidated and Supplemental Liquidated Damages will be made for each and every Calendar Day that such Work remains uncompleted. This amount will be deducted from any money due the Contractor or its Surety under the Contract, and the Contractor and its Surety will be liable for any Liquidated and Supplemental Liquidated Damages in excess of the amount due.

The Contractor acknowledges that the specified amounts per diem of Liquidated and Supplemental Liquidated Damages in the Standard Specifications and Supplemental Specifications, respectively (if applicable) are reasonable, and agrees to stipulate to their reasonableness in any suit for the collection of or involving the assessment of said damages. The damages referred to herein are intended to be and are cumulative, and will be in addition to every other remedy now or hereafter enforceable at law, in equity, by statute, or under the contract.

Permitting the Contractor to continue and finish the work or any part thereof after the expiration of the completion date shall in no way operate as a waiver on the part of the Department of its rights to assess and recover Liquidated and Supplemental Liquidated Damages, or any other rights, under the Contract.

For related provisions, see Sections 107.1 - Contract Time, 107.5.1(D) - Winter Suspensions - Impact on Liquidated Damages, and 109.5 - Adjustments for Delay.

107.7.2 Schedule of Liquidated Damages The specific per diem rates for Liquidated Damages are set forth below. By executing the Contract, the Contractor acknowledges that such an amount is not a penalty and that the daily amount set forth in the Contract is a reasonable per diem forecast of damages incurred by the Department due to the Contractor's failure to Complete the Work within the Contract Time.

| Original Contract Amount | | Per Diem Amount of Liquidated Damages |
|---|---|---|
| From More Than | To and Including | Calendar Day |

| | | | | |
|---|---|---|---|---|
| $ | 0 | to | $ 100,000.00 | $250.00 |
| $ | 100,000.00 | to | $ 250,000.00 | $500.00 |
| $ | 250,000.00 | to | $ 500,000.00 | $650.00 |
| $ | 500,000.00 | to | $1,000,000.00 | $800.00 |
| $1,000,000.00 | | to | $2,000,000.00 | $1,000.00 |
| $2,000,000.00 | | to | $4,000,000.00 | $1,200.00 |
| $4,000,000.00 | | and | More | $2,100.00 |

107.8 Supplemental Liquidated Damages Supplemental Liquidated Damages, if any, will be specified by Special Provision and are separate and distinct from Liquidated Damages. Supplemental Liquidated Damages will be deducted from amounts otherwise due the Contractor.

107.9 Project Closeout

107.9.1 Final Cleanup and Finishing To prepare for Final Acceptance, the Contractor shall clean the Project and all ground, lawns, streams, Structures, and other areas adjacent to the Project of all rubbish, excess Material, temporary Structures, and Equipment. The ground shall be backfilled with Material that is generally the same as the surrounding Material, graded to drain properly, and finished such that the surface matches the surrounding surface (examples - loam and seed, compacted gravel, pavement). The Contractor must leave all areas impacted by the Work in a condition that is reasonably acceptable to the Department.

107.9.2 Notice / Inspection / Punch List The Contractor shall notify the Department in writing that it considers the Project complete. As soon as practicable thereafter, the Department will inspect the Work. If incomplete or unsatisfactory Work is noted, the Department will prepare a written list of all items that must be completed or corrected before the Physical Work is Complete ("Punch List"). The Contractor shall immediately take such measures as are necessary to complete all Punch List items.

107.9.3 Notices / Final Inspections / Physical Work Completion The Contractor shall notify the Department in writing that all Punch List items have been completed and/or corrected and that the Contractor considers the Project Complete. As soon as practicable thereafter, the Department will make another inspection of the Work. The Department and the Contractor will attend this inspection jointly. If incomplete or unsatisfactory Work is noted, the Department will prepare a revised Punch List (which may include items not on previous Punch List(s)) and the Contractor shall immediately take such measures as are necessary to complete the revised Punch List items. Additional iterations will occur in a like manner until the Department finds that the Physical Work is Complete and in Conformity with the Contract. If the Contractor has not already done so, the Contractor will Promptly remove all temporary traffic control devices.

107.9.4 Closeout Documentation The Department will notify the Contractor in writing that the Physical Work is Complete and in Conformity with the Contract and that the

Project will be Finally Accepted when the 106 Memo, Buy America Certification, Materials Certification and DBE Signoff, and any other documentation as requested in the Physical Work Complete letter are received from the Contractor. The Contractor shall deliver the Closeout documentation as requested in the Physical Work Complete letter to the Department within 30 Days of the date of the notification that the Physical Work is Complete. Liquidated Damages will cease to accrue upon the Completion of Physical Work. For a related provision, see Section 101.2 - Definition of Closeout Documentation.

107.9.5 Final Acceptance Within 75 Days of Final Acceptance by the Department, the Department will advise the Contractor in writing of the Final Quantities and any damages to be assessed for the Project. The Contractor shall resolve any Project issues that remain and provide the All Bills Paid and Request for Final Payment Letters to the Department within 30 Days. The Department will make Final Payment, including the release of all remaining retainage, and release any escrowed bid documents within 20 Days of receipt of the above letters, which complete the Closeout Documentation. For a related provision, see Section 108.8 - Final Quantity Voucher.

If the Contractor fails to resolve issues and deliver Closeout Documentation within the 30 Days provided in Section 107.9.5, the Department may provide a final notice informing the Contractor in writing that unless the Contractor Delivers all Closeout Documentation within 30 Days of the date of Receipt of final notice, the Contractor shall be in Default under the Contract. The Contractor shall become ineligible to Bid on any Department Contracts. The Department may then pursue all remedies provided by the Contract or by law, including withholding Final Payment. For a related provision, see Section 102.1.1 - Eligibility to Bid - Basic Requirements.

107.9.6 No Waiver of Legal Rights Final Acceptance does not preclude the Department from correcting any measure, estimate, or certificate made. The Department may recover from the Contractor or its Surety, or both, overpayments made due to failure to fulfill Contract obligations.

A waiver on the part of the Department of any breach of any part of the Contract is not a waiver of any other or subsequent breach.

The Contractor retains liability for latent Defects, fraud (or such gross mistakes as may amount to fraud), and warranty obligations.

## SECTION 108 - PAYMENT

Scope of Section This Section contains general provisions related to payment, including measurement of quantities, progress payment, retainage, the right to withhold payment, and other payment-related terms.

108.1 Measurement of Quantities for Payment

108.1.1 Use of Plan Quantities Payment for all items labeled in the Bid Documents as "Plan Quantity" will be based upon the estimated quantity for the Work described in the Bid Documents. The Contractor shall accept such payment as full and complete compensation for that item without physical measurement. Quantities included in the Plan Quantity amount but not accomplished will be calculated by the Department using standard estimating procedures and deducted from the plan quantity. Areas not included in the Plan Quantity amount but completed will be measured and added to the Plan Quantity. Upon mutual written Agreement by the Department and the Contractor through a Contract Modification, the estimated quantity of any item of Work may be used as the final quantity for that item without physical measurement.

108.1.2 General Measurement Provisions The Department will use the U.S. Customary system for all measurements unless the Contract utilizes the International System of Units (SI). Measurement of Bid Items shall include all resources necessary to complete the Pay Item of Work under the Contract. The Department will measure items for payment in accordance with the "Method of Measurement" provisions of the applicable Specification. For all items of Work, other than those paid for by lump sum, the Department shall determine the quantities accepted as the basis for Final Payment after the Physical Work is Completed.

108.1.3 Provisions Relating to Certain Measurements Unless expressly provided otherwise, the Department and the Contractor shall use the following general measurement provisions.

Lump Sum or Each "Lump Sum" payment is total reimbursement for all resources necessary to complete the item of Work. Quantities provided for items measured and paid by Lump Sum are estimated quantities and are provided for informational purposes only. There will be no additional payment made by the Department or reduction in payment to the Contractor if the actual, final quantities for items measured and paid by Lump Sum are different than the quantities estimated by the Department. The only exception to this rule is when an item is eliminated, in which case Standard Specification Section 109.2 - Elimination of Items would take precedence.

"Each" payment is payment per complete unit.

Length "Length" is defined as linear measurement parallel to the item base or foundation. A station is 100 feet.

Area "Area" refers to the length, as defined above, multiplied by the width, which is defined as the linear measurement perpendicular to the item base or foundation. When calculating area for payment, use horizontal, longitudinal, and plan (neat) transverse measurements for surface area computations. Make no deductions for individual fixtures having an area of 1 square yard or less. For purposes of the preceding sentence, "fixtures" means small subareas that do not receive Material(s) or on which no Work is performed.

Volume Measure Structures using plan (neat) or approved Contract Modification dimensions. Use the average end area method to compute excavation volumes. Use hauling vehicles approved by the Department when transporting Materials measured by volume. Measure materials at the point of delivery. Ensure the body shape allows contents to be accurately measured. Load and level vehicles to the lesser of their water level or legal capacity. Obtain the Department's approval to convert Materials specified for measure by mass to volume. Use specified conversion factors.

Measure water to the nearest gallon with calibrated tanks, distributors, certified scale weights, or water meters.

Measure bituminous materials by the gallon or ton.

Use net certified scale weights or certified rail car volumes. Correct for bituminous Material lost, wasted, or otherwise not incorporated in the Work. Correct net certified bituminous Material weights or volumes for loss or foaming when shipped by truck or transport.

Measure timber by the board foot. Base measurement on nominal widths and thicknesses and individual maximum lengths.

Mass One ton is 2,000 pounds. Use certified scales to determine mass (weight). Accept certified "car weights" for Material shipped by rail, except for Material to be subsequently processed in mixing plants. Obtain certified haul truck tares as specified. Each haul truck shall display a legible identification mark.

Measure cement by the pound or ton.

Accept nominal mass or dimensions for standard manufactured items unless otherwise specified.

Accept industry-established manufacturing tolerances, unless otherwise specified.

Measure Aggregate mass in the saturated surface dry condition.

The Contractor shall furnish and maintain weigh systems tested and certified by the State or use certified permanently installed commercial scales. The Contractor shall provide certifications after each set-up and before use or as requested by the Department. The weigh system shall be scaled after certification and display a certification stamp. Only mechanical or electronic scales shall be used.

The beams, dials, platforms, and other scale Equipment shall be arranged for safe and convenient viewing by the operator and inspector. Scales shall be tested for accuracy before use at a new site. Platform scales shall be level and with rigid bulkheads at each end. The Department will adjust quantities of Materials received on scales found to be outside of

specified tolerances, using a correction based on the last documented test within specified tolerances.

All materials that are measured or proportioned by weight shall be weighed on approved weighing systems. When a delivery slip is required for payment of Materials measured by weight, weighing, except for automatic ticket printer systems, shall be performed on approved platform truck scales by a Licensed Public Weighmaster furnished by the Contractor, in accordance with the following requirements.

(A) Licensed Public Weighmaster A Licensed Public Weighmaster shall be any person satisfying the requirements of the State Sealer of Weights and Measures and granted a license as a Public Weighmaster. Each Licensed Public Weighmaster shall provide him/her with an impression seal as required by the State Sealer and shall impress this seal upon delivery slips issued by him/her. When completed by a Licensed Public Weighmaster, delivery slips shall be considered as the Weight Certificates required by the Maine Weights and Measures Law, MRSA Title 10. The Weighmaster shall perform all duties required of him/her by law and the specifications.

(B) Weighing Trucks Tare weights of trucks hauling stone, bituminous mixes, and similar items shall be determined twice daily, once during the forenoon and once during the afternoon. The tare weight thus found shall be used to determine the net load until the next tare weighing of the empty truck. Tare weights of trucks hauling liquid and bituminous cement materials or other items not generally hauled on a repeat basis shall be determined immediately before being loaded and the weight thus found shall be used for that load only. The tare weight of a truck shall be defined as the weight of the empty vehicle, including the driver, but with no passengers.

(C) Platform Truck Weighing Systems An approved platform truck scale meeting the following requirements shall be provided, installed and maintained, when required, by the Contractor or be available to the Contractor at an approved nearby location:

1) The weighing system shall conform to the specifications, tolerances, and regulations for commercial weighing devices of the National Institute of Standards and Technology and shall be accurate within maximum tolerances of plus or minus 2 pounds for every 1000 pounds of load.

2) No auxiliary indicators, in combination with the beams or dial of the weighing system shall be used to increase the maximum allowable load above 105 percent of the manufacturer's rated capacity, as stated in the National Institute of Standards and Technology Handbook 44 S.1.7.

3) The platform of the weighing system shall be of sufficient size to accommodate the entire vehicle or combination of vehicles. If a combination of vehicles must be divided into separate units in order to be weighed, each unit shall be entirely disconnected before weighing and a separate weight certificate, delivery slip, or ticket shall be issued for each separate unit.

4) The value of the minimum graduation on the indicator of the scale shall not be greater than 20 pounds. All weighing shall be read and recorded to the nearest 20 pounds or one-hundredth ton.

5) The weighing system shall be set on concrete or other approved foundation. The recording mechanism of the scale shall be suitably housed or protected from weather.

6) The Contractor shall have the weighing system inspected and approved by the State Sealer of Weights and Measures or by a Repairman registered and approved by the State Sealer within a period of 12 months preceding the date of any weighing and again after each change of location.

(D) Check Weighing for Platform Truck Weighing System Check weighing shall be made on the weights and on the weighing in scales during production in the following manner:

1) At least twice during 5 days of production, in the presence of a State Inspector, a loaded truck that has been weighed and issued a weigh slip shall be turned and a new weighing made of the truck and load with the truck heading in reverse direction and at the opposite end of the weighing system platform from the first weighing. The new weight will be recorded. If the variation from the first weight is 0.2 percent or less, the fact will be so noted in the project records. However, if the variation exceeds 0.2 percent, the scales may not be used until rechecked and resealed by the State Sealer of Weights and Measures.

2) At least twice during 5 days of production a loaded truck that has moved off the weighing system will be intercepted, directed back to the scales, and reweighed under the supervision of a State Inspector.

3) At least twice during 5 days of production, in the presence of a State Inspector, a truck that has been emptied will be directed to the weighing system before being loaded at a time other than the normal tare weighing and weighed again for a check on the tare weight.

4) Check weighing will be on a plant basis and, although a plant may produce material for more than one project or Contract, check weighing will not be required for each project or Contract.

At least twice during 5 days of production, additional checks will be made occasionally at the discretion of the Engineer.

Claims by the Contractor for delays or inconvenience due to check weighing will not be considered.

(E) Reciprocal Agreements Weighing of materials on weighing systems located outside the State of Maine will be permitted for materials produced or stored outside the State when requested by the Contractor and approved by the Department. In order to be

approved, out-of-State weighing must be performed by a Licensed Public Weighmaster or a person of equal authority in that state, on scales accepted in that state and meeting the requirements of this Section.

(F) Delivery Slips Serially pre-numbered delivery slips of acceptable size and format for stating the following minimum information shall be furnished by the Contractor, in as many copies as may be necessary. One copy shall be retained by the Resident or Inspector upon accepting delivery of the material.

1) Vehicle identification
2) Date loaded
3) Work identification number & location
4) Identification of Material:
    a) Item number
    b) Source location of supplier
    c) Type and grade
    d) Tank number from which loaded, if liquid
5) Quality information as necessary for bituminous liquids
    a) Specific gravity at 60°F
    b) Serial number of the Certificate of Analysis as furnished according to Division 700, General Statement
    c) The Certificate Statement as required in Division 700, General Statement
    d) Viscosity of the Material: if asphalt cement, in poises at 140°F and in centistokes at 275°F; if other bituminous liquid, the specified viscosity according to the type and grade shown in Section 702
6) Quantity information as necessary: gross, tare and net weights, volume of load if not material requiring weighing, net gallons at 60°F if bituminous liquids
7) Signatures (legible initials acceptable) of: Weighmaster (if weight measured material), Contractor's representative (if volume measured material), and Resident (Cover Slips).

If Materials are 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 Materials 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 directed. Each truck shall bear a legible identification mark.

Rail shipments of bituminous liquid shall be measured directly by volume. Correction shall be made when liquid bituminous Material has been lost from the car, wasted, or otherwise not incorporated in the work. Other shipments of bituminous liquids will be measured by the gallon or ton. Volumes will be measured at 60°F or will be corrected to the volume at 60°F using the tables in ASTM D1250.

When bituminous liquids are shipped by truck or transport, net certified weights or volume subject to correction for loss or foaming may be used for computing quantities. Net certified weight shall be determined upon loading for all bituminous liquids when shipped

by truck or transport. The net weight of each load shall be converted to net gallons at 60°F by a conversion factor expressed in pounds per gallon.

(G) Time Measure Equipment by hours in accordance with Section 631 - Equipment Rental.

108.2 Progress Payments

108.2.1 Generation of Progress Payment Estimates The Department will estimate the amount of Work performed at least monthly and make payment based upon such estimates. Estimates may be paid once every two weeks if, in the opinion of the Resident, the amount of Work performed is sufficient to warrant such payment. No such estimates or payment will be made if, in the judgment of the Resident, the Work is not proceeding in accordance with the provisions of the Contract, or when the total value of the Work performed since the last estimate amounts to less than $5,000. The Contractor agrees to waive all claims related to the timing and amount of such estimates.

If the Contract requires, the Contractor will submit an application for progress payment with a detailed written explanation of the payments requested, on forms and media approved by the Department, to the Resident for approval. The Resident may request that the Contractor submit backup documentation, including copies of receipts, invoices, and itemized payments to Subcontractors.

108.2.2 Payment The Department will make payment within 15 Days if the Contractor agrees to accept electronic transfer of payments in a manner approved by the Department, except as otherwise provided in the Contract. In other cases, the Department will make payment within 30 days, except as otherwise provided in the Contract. These payment obligations shall not apply in the event of unforeseeable circumstances such as insufficient legislative appropriations, information systems failure, and other Uncontrollable Events. All payments made are subject to correction in subsequent Progress Payments and the Final Payment. For related provisions, see Sections 108.8 - Final Payment, and 108.9.2 - No Inflation Adjustments/ Interest.

108.2.3 Mobilization Payments "Mobilization" includes the mobilization and demobilization of all resources as many times as necessary during the Work.

Upon approval of all pre-construction submittals required for approval by this Contract, including those listed in Section 104.4.2 - Preconstruction Conference, the Contractor will receive payment of 50% of the Lump Sum price for Mobilization, not to exceed 5% of the Bid less the amount bid for Mobilization. After the Department determines that the Work is 50% complete, the Contractor will receive the other 50% of the Lump Sum price for Mobilization, not to exceed 5% of the Bid less the amount bid for Mobilization. Any remaining Mobilization Payments will be paid upon Final Acceptance.

108.3 Retainage The Department will pay 100% of each approved Progress Payment until the Work is approximately 50% complete. Thereafter, the Department will

deduct 5% of the amount of each Progress Payment as retainage. In the event that the Department believes that the retainage will be insufficient to cover the Contractor's obligations under this Contract, the Department may withhold a greater percentage of the money to cover Contractor obligations.

The Department may hold, temporarily or permanently, retainage as needed to assure timely Completion of the Work and payment of all Subcontractors and Suppliers in Conformity with the Contract. The Department may also disburse retainage to Subcontractors as set forth in Section 104.5.6 - Subcontractor Claims for Payment.

Upon Final Acceptance, the Contractor may request that the Department reduce retainage. The Department may grant or deny such request as it deems desirable and prudent. Otherwise, retainage will be held until the receipt of all Closeout Documentation

108.4 Payment for Materials Obtained and Stored Acting upon a request from the Contractor and accompanied by bills or Receipted Bills, the Department will pay for all or part of the value of acceptable, non-perishable Materials that are to be incorporated in the Work, including Materials that are to be incorporated into the Work, not delivered on the Work site, and stored at places acceptable to the Department. Examples of such Materials include steel piles, stone masonry, curbing, timber and lumber, metal Culverts, stone and sand, gravel, and other Materials. The Department will not make payment on living or perishable Materials until acceptably planted in their final locations.

If payment for Materials is made to the Contractor based on bills, only, then the Contractor must provide Receipted Bills to the Department for these Materials within 14 days of the date the Contractor receives payment for the Materials. Failure of the Contractor to provide Receipted Bills for these Materials within 14 days of the date the Contractor receives payment will result in the paid amount being withheld from the subsequent progress payment, or payments, until such time the Receipted Bills are received by the Department.

Materials paid for by the Department are the property of the Department, but the risk of loss shall remain with the Contractor until the materials are installed and accepted. Payment for Materials does not constitute Acceptance of the Material. If Materials for which the Department has paid are later found to be unacceptable, then the Department may withhold amounts reflecting such unacceptable Materials from payments otherwise due the Contractor.

In the event of Default, the Department may use or cause to be used all paid-for Materials in any manner that is in the best interest of the Department.

Item 403.102 Hot Mix Asphalt – Special Areas

Hot Mix Asphalt: The quantity of hot mix asphalt will be determined from the quantity shown on the progress estimate for each pay period.

Base Price: The base price of performance graded binder to be used is the price per standard ton current with the bid opening date. This price is determined by using the average New England Selling Price (Excluding the Connecticut market area), as listed in the Asphalt Weekly Monitor.

Period Price: The period price of performance graded binder will be determined by the Department by using the average New England Selling Price (Excluding the Connecticut market area), listed in the Asphalt Weekly Monitor current with the paving date. The maximum Period Price for paving after the adjusted Contract Completion Date will be the Period Price on the adjusted Contract Completion Date.

108.5 Right to Withhold Payments The Department may withhold payments claimed by the Contractor on account of:

A. Defective Work,
B. Damages for Non-conforming Work,
C. Failure to provide the Department the opportunity to inspect the Work,
D. Damage to a third party,
E. Claims filed or reasonable evidence indicating probable filing of claims,
F. Failure of the Contractor to make payments to Subcontractors or for Materials or labor, or failure of Subcontractors to make payments to Sub-Subcontractors or for Materials or labor,

G. Substantial evidence that the Project cannot be completed for the unpaid balance,
H. Substantial evidence that the amount due the Department will exceed the unpaid balance,
I. Regulatory non-compliance or enforcement,
J. Failure to submit Closeout Documentation,
K. All other causes that the Department reasonably determines negatively affect the State's interest.

108.6 Taxes, Fees, Allowances, and Notices The Contractor shall pay all taxes, charges, fees, and allowances and give all notices necessary and incidental to the due and lawful prosecution of the Work. Except as expressly provided otherwise in this Contract, all such taxes, charges, fees, and allowances are Incidental to the Contract.

Certain items of tangible personal property purchased by the Contractor for use in the Contract may be are exempt from Maine sales tax. *See* 36 MRSA §§ 1760(2) & (61).

108.7 Damages for Non-Conforming Work If the Contractor performs Non-conforming Work that causes the Department to incur costs, including environmental costs or penalties, failure of FAA to share in certain costs, Departmental staff time related to the non-Conformity, penalties, or other damages of any nature whatsoever ("Damages"), then the Contractor shall be liable to the Department for such Damages. The Department, at its option, and without liability, may deduct such Damages from amounts otherwise due the Contractor and/or postpone disbursement of Progress Payments until the Non-conforming Work is corrected.

108.8 Final Quantity Voucher The Department will prepare a final quantity voucher reflecting final quantities of the items of Work performed. The Department may require the Contractor to provide information necessary to substantiate Pay Items, including Statements itemizing Force Account Work.

108.9 General Payment Provisions

108.9.1 Full Compensation Payments to the Contractor shall be full compensation for furnishing all labor, Equipment, Materials, services, and Incidentals used to perform all Work under the Contract in a complete and acceptable manner, and for all risk, loss, damage, or expense of any kind arising from the nature or prosecution of the Work.

108.9.2 No Inflation Adjustments / Interest No payments due the Contractor will be adjusted for inflation. No interest shall be due and payable on any payment due the Contractor, except that the Department will pay statutory interest on uncontested Final Payments for any period of time that extends beyond 60 Days of the date of Receipt of all Conforming Closeout Documentation. The preceding exception expressly does not include payments regarding pending Issues, a Dispute, or a claim.

108.9.3 Amounts Due the Department Unless expressly provided otherwise in this Contract, in cases where the Department may deduct sums from amounts otherwise due the

Contractor and where the sums to be deducted are more than the funds otherwise due the Contractor, the Contractor shall remit all amounts due the Department within 30 Days of receiving an Invoice from the Department. After such 30 Days, the Contractor shall be in Default of this Contract and shall not be entitled to any additional cure period. Statutory interest shall accrue after 60 Days of Receipt of the Invoice.

## SECTION 109 - CHANGES

Scope of Section This Section contains general provisions related to changes in quantities, scope, time, and payment.

### 109.1 Changes in Quantities

109.1.1 Changes Permitted The Department may increase or decrease Pay Item quantities from the estimated quantities shown in the Bid Documents, and such increase or decrease shall not be considered Extra Work. Except as expressly provided otherwise in this Contract, the Contractor shall be paid for actual quantities in place and accepted at the Unit Prices contained in the Contractor's Bid. The Contractor accepts such payment as full and complete compensation. There will be no adjustment to Contract Time due to an increase or decrease in quantities compared to those estimated, except as addressed through Contract Modification(s).

109.1.2 Substantial Changes to Major Items If quantities of Major Items vary from the estimated quantities contained in the Bid Documents by more than 25%, then the Department may increase or decrease the Unit Price of such item using the extra work process. For related provisions, see Section 109.3 - Extra Work and Section 109.8 - Contract Modification. If an adjustment to the Unit Price is made, it will apply only to that portion of the actual quantity that is less than 75% of the estimated quantity or more than 125% of the estimated quantity.

109.2 Elimination of Items Upon written notification to the Contractor, the Department may entirely eliminate item(s) of Work for any reason. Upon notification, the Department is entitled to a credit. For Minor Items, the credit shall be the Contractor's Bid price for the eliminated item(s). For Major Items, the amount of the credit shall be the Contractor's Bid price for the eliminated item(s), less (A) direct costs actually incurred by the Contractor after Award, including mobilization, shipping, and restocking expenses that the Contractor cannot recoup on other Projects as reasonably determined by the Department, and (B) 10% for overhead and profit. The Department may withhold said credit from amounts otherwise due the Contractor.

109.3 Extra Work The Department reserves the right to revise the Contract by adding Extra Work. Such revisions neither invalidate the Contract nor release the Surety. The Contractor and/or its Surety agree to perform all such Extra Work. The Department will compensate for Extra Work by written Contract Modification in accordance with Section 109.7.1 - General and Section 109.7.2 - Basis of Payment. Any Delay related to

Extra Work will be analyzed in accordance with Section 109.5 - Adjustments for Delay. For a related provision, see Section 109.8 - Contract Modification.

109.4 Differing Site Conditions

109.4.1 Definition "Differing Site Conditions" are subsurface or latent physical conditions that, at the time of Bid submittal, were:

(A) Materially different from conditions indicated in the Bid Documents,
(B) Not discoverable from a reasonable site investigation prior to Bid,
(C) Materially different from conditions ordinarily encountered and generallyrecognized as inherent in Work like that specified by the Contract by Contractors experienced in such Work, and
(D) Actually unknown to the party seeking relief due to such conditions, which in the case of the Contractor includes its Subcontractors.

109.4.2 Risk of Other Conditions All costs, Work, Delays, or other damages related to or arising from site conditions that are not Differing Site Conditions are the sole risk and responsibility of the Contractor.

109.4.3 Notice and Procedural Requirements If the Contractor discovers what it considers Differing Site Conditions that may cause adjustments to compensation, time, or other Contract requirements, the Contractor shall provide "Notice of Issue for Consideration" within 48 hours of discovery and before doing any Work relating to such conditions as provided in Section 104.4.5 - Early Negotiation. The Contractor shall then comply with all other requirements of Section 104.4.5 - Early Negotiation, and Section 111 - Resolution of Disputes. The Contractor will not be entitled to any change to compensation, time, or Work requirements without proper notice as specified in this Section 109.4. Failure to provide such notice or to otherwise comply with this Section 109.4 will constitute a waiver of all claims related to such conditions.

If the Department discovers what it considers Differing Site Conditions that may cause adjustments to compensation, time, or other Contract requirements, then the Department will provide the Contractor with written notice within 48 hours of discovery. If the Contractor disagrees with the Department's finding of Differing Site Conditions or the related adjustments, then the Contractor shall provide "Notice of Issue for Consideration" within 48 hours of receipt of the Department's written notice and comply with the requirements of Section 104.4.5 - Early Negotiation and Section 111 - Resolution of Disputes.

109.4.4 Investigation / Adjustment Upon notification by the Contractor or upon the Department's own initiative, the Department will investigate the conditions. If the Department determines that Differing Site Conditions exist and that the Differing Site Conditions have caused an increase in the cost or time required for the performance of the Work, then the Contractor is entitled to an Equitable Adjustment for the additional costs in accordance with Section 109.7, Equitable Adjustments to Compensation and Time - Basis of

Payment that are caused directly by the Differing Site Conditions. If the Department determines that Differing Site Conditions exist and that the Differing Site Conditions have caused a decrease in the cost or time required for the performance of the Work, then the Department is entitled to a credit in the amount of savings to compensable items in accordance with Section 109.7, Equitable Adjustments to Compensation and Time, that are caused directly by the Differing Site Conditions. Delays caused by Differing Site Conditions will be considered in accordance with Section 109.5 - Adjustments for Delay.

109.5 Adjustments for Delay

109.5.1 Definitions - Types of Delays Delays are defined as follows and may be divided into more than one type depending upon cause.

A. Excusable Delay Except as expressly provided otherwise by this Contract, an "Excusable Delay" is a Delay to the Critical Path that is directly and solely caused by (1) a weather-related Event of such an unusually severe nature that a Federal Emergency Disaster is declared. The Contractor will be entitled to an adjustment of time under this Section only if the Project falls within the geographic boundaries prescribed under the disaster declaration. or (2) a flooding event at the affected location of the Project that results in a Q25 headwater elevation, or greater, but less than a Q50 headwater elevation. Theoretical headwater elevations will be determined by the Department; actual headwater elevations will be determined by the Contractor and verified by the Department or (3) An Uncontrollable Event

B. Compensable Delay A "Compensable Delay" is a Delay to the Critical Path that is directly and solely caused by: (1) a weather-related Uncontrollable Event of such an unusually severe nature that a Federal Emergency Disaster is declared. The Contractor will be entitled to an Equitable Adjustment under this Section only if the Project falls within the geographic boundaries prescribed under the disaster declaration and receives project-specific emergency funds, and the Contractor can show proof that the Work was delayed by this weather event, (2) an Uncontrollable Event caused by a Utility Company for which the Utility Company reimburses the Department, (3) an Uncontrollable Event caused by other third party (not Subcontractors) Working on Project-related Work within the Project Limits if, and only if, the such other third party offers the Department reimbursement for such Delay, or (4) acts by the Department that are in violation of applicable laws or the Contract, or (5) a flooding event at the affected location of the Project that results in a Q50 headwater elevation, or greater. Theoretical Q50 headwater elevations will be determined by the Department; actual headwater elevations will be determined by the Contractor and verified by the Department.

C. Inexcusable Delay "Inexcusable Delays" are all Delays that are not Excusable Delays or Compensable Delays.

For a related provision, see Section 101.2 - Definition of Uncontrollable Event.

109.5.2 Entitlement to Adjustments

A. Types of Adjustments Provided the Contractor meets the requirements of Section 109.5.2(B) below and complies with the notification, documentation, and procedural requirements set forth in the Contract, the Contractor is entitled to certain adjustments to the Contract depending upon the type of Delay.

1. For an Excusable Delay, the Contractor is entitled to an extension of time, but no additional compensation.
2. For a Compensable Delay, the Contractor is entitled to an extension of time and an Equitable Adjustment as set forth in Section 109.7 - Equitable Adjustments to Compensation and Time.
3. For an Inexcusable Delay, the Contractor is entitled to neither an extension of time nor additional compensation.

For related provisions, see Sections 104.2.7 - Damage to Project Caused By Uncontrollable Events and 104.3.10 - Responsibility for the Damage to Work.

B. Requirements for Entitlement To be entitled to any adjustments for an Excusable Delay or a Compensable Delay, the Contractor must demonstrate all of the following:

1. The Contractor consistently utilized its Schedule of Work to schedule, coordinate, and manage the Work, as evidenced by documentation created as the Work progressed, including Progress Meeting minutes;
2. The Delay affected the Critical Path of the Schedule of Work; and
3. There are no concurrent Inexcusable Delays.

C. Concurrent Delays The Contractor is not entitled to a time extension for the period of time when Excusable and Inexcusable Delays are concurrent. The Contractor also is not entitled to either a time extension or an Equitable Adjustment for the period of time when Compensable and Inexcusable Delays are concurrent. In the event Compensable and Excusable Delays are concurrent, the Contractor is entitled only to a time extension, not an Equitable Adjustment, for the period of time such Delays are concurrent.

109.5.3 Early Completion Date Delay Claims For the purposes of this Section 109.5.3, a "Contractor's Early Completion Date" means a Project Completion date shown on the Contractor's initial Schedule of Work submitted in accordance with Section 107.4.2 - Schedule of Work Required that is earlier than the Contract's specified Completion date. The Department will not be liable for any claims or expenses related to the period of time between the Contractor's Early Completion Date and the Contract's specified Completion date, unless the Contractor demonstrates, by clear and convincing evidence that: (A) all requirements of Section 109.5.2(B) - Requirements for Entitlement are met, and (B) that the Contractor's Early Completion Date was reasonable at the time of Bid in light of the surrounding facts and circumstances, including the Contractor's available resources, and the requirements of the Work.

109.5.4 Notice and Procedural Requirements If the Contractor becomes aware of facts or circumstances that may cause a Delay for which the Contractor may seek adjustments to compensation, time, or other Contract requirements, the Contractor must notify the Resident of such "Issue" within 48 hours and before doing any Work relating to such facts or circumstances as provided in Section 104.4.5 - Early Negotiation. Except as otherwise provided in this Section 109.5, the Contractor shall then comply with all other requirements of Section 111 – "Resolution of Disputes." The Contractor will not be entitled to any change to compensation, time, or Work requirements without proper and timely notice. Failure to provide such notice constitutes a waiver of all claims related to such conditions.

109.5.5 Documenting the Delay and Request for Adjustments

A. Weekly Reports During Delay To be entitled to any adjustments for Delay, the Contractor must keep records as provided in Section 111.1.6 – Contractor's Obligation to Keep Records. Further, the Contractor must submit weekly written reports containing the following information.

1. Number of Days of impact to the Critical Path.
2. A summary of all operations that have been Delayed, or will be Delayed on the impact of the Contractor's Critical Path.
3. A narrative describing how the cause of the Delay meets the definition of "Excusable Delay" or "Compensable Delay" contained in Section 109.5.1(A) or (B).
4. Itemization of all extra costs being incurred, including (A) how the extra costs relate to the Delay, (B) the identification of all non-salaried Project employees for whom costs are being compiled, and (c) a summary of time charges for Equipment, identified by the manufacturer's number for which costs are being compiled.

B. Request and Report After Completion Within 14 Days of Completion of the phase of Work that the Contractor claims has been Delayed, the Contractor shall submit a written report to the Department that contains the following information:

1. A description of the operations that were Delayed and the documentation and narrative of how the cause for the Delay meets the definition of "Excusable Delay" or "Compensable Delay" contained in Sections 109.5.1(A) or (B), including all reports prepared for the Contractor by consultants, if used;
2. An as-built chart showing when Work operations were actually performed;
3. A graphic depiction of how the operations were Delayed and the impact on the Critical Path; and
4. An item-by-item request for additional time and compensation for items allowed under Section 109.7.5 – Force Account Work, including measurement and explanation.

The Department may require that all costs shown in the report be certified by an accountant, and that the Contractor provide all other information described in Section 111.2.2 - Detailed Notice of Dispute.

109.5.6 Decision by Program Manager Within 30 Days of receiving all information described in Section 109.5.5(B) - Request and Report After Completion, the Program Manager will Deliver a written decision on the request made to the Contractor. Failure to provide a decision within said 30-day period shall be considered a denial of the Contractor's request, unless the parties mutually agree to an extension of time for such decision.

109.5.7 Additional Consideration By Department If the Contractor wants additional consideration, the Contractor shall Deliver a "Notice of Unresolved Dispute" to the Department's appropriate Bureau Director within 14 Days of Receipt of the Program Manager's decision. Such Notice shall comply with Section 111.3.1 - Notice of Unresolved Dispute. The parties must then comply with all other Dispute resolution provisions of this Contract, beginning with Section 111.3 - Negotiation By Management.

109.6 Value Engineering

109.6.1 Overview - General Requirements A Value Engineering Change Proposal (VECP) is a proposal made by the Contractor after Contract Execution that is intended to produce cost savings without impairing essential characteristics of the Project, including function, serviceability, safety, durability, maintainability, and aesthetics, all as determined by the Department.

A VECP shall contain proven features that have been used under similar conditions. A proposal is not a VECP if equivalent options are already provided in the Contract.

A VECP must be approved by the Department. Unless otherwise agreed in writing, the Contractor and the Department will equally share the Net Savings generated by the VECP as provided in Section 109.6.4(C) - Contract Modification - Amount of Payment.

Unless mutually agreed otherwise, the VECP approval process will occur in three steps: (A) Conceptual VECP submission and review, (B) Detailed VECP submission and evaluation, and if approved, (C) Contract Modification, including the amount of payment due to the Contractor and credit due to the Department. When the nature and scope of a VECP warrants, the parties may agree to truncate the VECP approval process.

109.6.2 Conceptual VECP

A. Submittal To propose a VECP, the Contractor must submit a written "Conceptual VECP" to the Resident. The Conceptual VECP is not a formal and complete submittal based upon detailed technical analysis, but instead relays a conceptual idea based upon the Contractor's knowledge and experience. The Conceptual VECP should include the following information:

1. General Description A narrative that describes the proposed change in concept and includes the basic differences between the existing Contract and the proposed change.

2. Advantages and Disadvantages A listing and brief description of the comparative advantages and disadvantages of the VECP, including effects on function, serviceability, safety, durability, maintainability, aesthetics, and any other factors significantly altered by the VECP.
3. Estimate of Net Savings An estimate of the Net Savings as defined in Section 109.6.4(C) - Contract Modification - Amount of Payment.
4. Savings and Schedule Impacts An estimate of the time necessary for the Contractor to submit a Detailed VECP. Such estimate must specify the date by which the Department must approve the VECP to obtain the maximum cost reduction, and the latest date by which the Department must approve the VECP for the Contractor to avoid significant impacts on the estimated Net Savings or the Contractor's Schedule of Work. If the Department determines that the time for response is insufficient for review, the Contractor will be so notified.

B. Conceptual Review and Response The Department will use its best efforts to review a Conforming Conceptual VECP and respond to the Contractor within 14 Days of Receipt. The Department may, at its sole discretion, (1) invite the Contractor to submit a Detailed VECP, (2) reject the Conceptual VECP for reasons that will be described briefly, or (3) request additional information. The Department may also, in its sole discretion, agree to partially reimburse the Contractor for the costs to develop and submit a Detailed VECP.

109.6.3 Detailed VECP

A. Submittal If the Department invites the Contractor to submit a Detailed VECP, it shall contain the following information that is sufficient in detail to clearly define and explain the proposed change(s):

1. Updated and more complete information regarding items included in the Conceptual VECP, including the general description of the VECP, advantages and disadvantages, use, or testing performed, elsewhere, a detailed computation of the estimated Net Savings generated in accordance with Section 109.6.4(C) - Contract Modification - Amount of Payment, actual VECP development costs to date, and estimated savings and schedule impacts, including approval date(s) required. If the Department determines that the time for response is insufficient for review, the Contractor will be notified promptly.
2. A complete set of Plans and Specifications showing the proposed revisions relative to the original Contract features and requirements. All VECPs that require engineering design, computations, or analysis shall be prepared under the responsible charge of, and sealed by, a Professional Engineer licensed in the State of Maine.

B. Evaluation

1. Additional Information The Department may request any additional information that it determines is necessary to properly evaluate the VECP. Where design changes are proposed, such additional information may include results of field investigations and surveys, design computations, specifications, and field change sheets. The Contractor will promptly provide any such requested information.
2. Cost Verification The Department may require the Contractor to provide additional information to verify the Contractor's cost analyses.

C. Response The Department will evaluate a Conforming Detailed VECP and provide the Contractor with a written response within 14 Days of Receipt of all of the information it has determined is necessary to properly evaluate the VECP. Such response will include a brief description of the Department's reason(s) for its decision. The Department, at its sole discretion, will either approve the Detailed VECP, approve it with conditions, or reject it. The Department may base its decision on any reason that is in the best interest of the Department, including: (1) unacceptable impact on the function, serviceability, safety, durability, maintainability, or aesthetics of the Project, (2) insufficient testing or use of the VECP concepts elsewhere, (3) insufficient justification of cost savings, (4) unacceptable schedule impacts, (5) insufficient review time, or (6) differing engineering judgment. The Contractor may request that the Department reconsider certain portions of the decision. If requested, the Department will reconsider its decision and then issue a final decision, which is not subject to review or appeal.

D. Termination of VECP Process If the Department rejects the VECP or the Contractor does not desire to proceed with the VECP as approved by the Department, the VECP process will terminate and the Department will reimburse the Contractor for 100 percent of all VECP development costs incurred by the Contractor to date.

109.6.4 Contract Modification - Amount of Payment If the VECP is approved, or if it is approved with conditions, and the Contractor wants to proceed, a Contract Modification will be executed by the parties. In addition to the requirements of Section 109.8 - Contract Modifications, the VECP will set forth the net savings generated by the VECP, which shall be split equally between the Contractor and the Department, per the following formula:

NS = EGS - CDC - DVEC

Where:

NS = Net Savings generated by the VECP, as determined by the Department.

EGS = Estimated Gross Savings, which is the difference between the cost of performing the Work as originally specified in the Contract and the cost of performing the Work as revised by the VECP, at agreed upon or lump sum prices.

CDC = Contractor's Development Costs related to the preparation of the Detailed VECP, including costs of the Contractor's design subconsultants and Subcontractors. The Department shall reimburse the Contractor for these costs.

DVEC = Department's VE Costs related to review, approval, and implementation of the VECP, including design costs, field inspection, and the value of any Department provided property.

Once the Contract Modification is executed, the Contractor may be paid for its actual Development Costs. The Contractor's share of the Net Savings shall not be disbursed until the Work is complete and the actual Net Savings is known.

The Contract Modification shall also set forth any adjustments to Contract Time related to the Work as revised by the VECP, if any.

109.6.5 Subsequent Payment Adjustments Upon Completion of the portion of the Work revised by the VECP, the Department, on its own initiative or upon request by the Contractor, may review the actual net savings realized by the VECP. The Contractor will be afforded an opportunity to review and comment on such a review. If the actual net savings was greater than set forth in the Contract Modification, the increased savings will be shared equally by the parties. If the net savings was less than set forth in the Contract Modification, the reduction in savings will be borne equally by the parties.

109.6.6 General Conditions Regarding VECPs

A. VECPs will remain the property of the Contractor, provided that the Department will have the unrestricted right to use any approved VECP, or any VECP in which the Department has reimbursed the Contractor for any portion of the development costs, on other Department Projects without notice, cost, or liability to the Contractor.

B. Only the Contractor may submit VECPs. The Contractor shall review, be responsible for, and submit all proposals initiated by the Contractor's Subcontractors.

C. The Contractor shall not anticipate Departmental approval of a VECP when Bidding or otherwise before approval of a Detailed VECP. The Contractor is responsible for all Delays caused by the VECP that were not negotiated in the Contract Modification.

D. If a VECP is rejected, the Contractor shall perform the Work in accordance with the Contract.

E. Except as otherwise provided in this Section 109.6, the Contractor shall have no claim against the Department for additional compensation or time resulting from the Delayed review or rejection of a VECP, including, but not limited to, development costs, loss of anticipated profits, and increased Material or labor costs.

F. Cost sharing applies only to the Contract for which the VECP was submitted.

G. Because the Department has no obligation to change the terms of the original Contract, all VECP decisions by the Department are final and are not subject to the Dispute resolution provisions provided in this Contract or otherwise available at law.

109.7 Equitable Adjustments to Compensation and Time

109.7.1 General Equitable Adjustment means an adjustment to compensation due to a change in the nature or scope of Work as defined in this Section 109.

This Section 109.7 applies to all changes to the nature or scope of the Work excepting (A) changes in quantities, which are governed by Section 109.1, (B) elimination of items of Work which is governed by Section 109.2, and (C) payment for Value Engineering Change Proposals, which is governed by Section 109.6.

109.7.2 Basis of Payment Adjustments will be established by mutual Agreement based upon Unit or Lump Sum Prices that include labor, materials, equipment, mark-up, overhead, profit, and time. These agreed upon Unit or Lump Sum prices will be full compensation and no additional overhead, profit, mark-ups, or fees are allowed. If Agreement on Equitable Adjustments cannot be reached, the Contractor shall accept payment on a Force Account basis as provided in Section 109.7.5 - Force Account Work, as full and complete compensation for all Work relating to the Equitable Adjustment.

109.7.3 Reserved

109.7.4 Non-Compensable Items The Contractor is not entitled to compensation or reimbursement for any of the following items:

A. Lost profits or lost opportunity costs,

B. Labor inefficiencies,

C. Consequential damages, including but not limited to loss of bonding capacity, loss of Bidding opportunities, and insolvency,

D. Indirect costs or expenses of any nature,

E. Dispute resolution costs of any nature, including attorney's fees, claims consultant fees, expert witness fees, claims preparation expenses, and costs related to DRB proceedings, mediation, arbitration, or litigation, and

F. Interest.

109.7.5 Force Account Work Compensation for Force Account Work will be computed according to this Section.

A. Labor The Contractor will receive the actual hourly wages paid to workers actually engaged in the changed Work and the foreperson in direct charge of the changed Work as determined from certified payrolls, plus 90 percent of the sum thereof for all fringe benefits, payroll taxes, overhead, and profit.

B. Materials For Materials incorporated in the permanent Work, the Contractor will receive the Actual Cost of Materials, including freight and Delivery charges (but excluding any sale or use tax) plus a single 15 percent markup. For all Materials not incorporated in the permanent Work, the Contractor will receive the difference of actual value of such Material at the time of its use less the fair salvage value of Material when released, plus 15 percent of said difference. There shall be no markup on markups.

C. Equipment For all authorized usage of power-operated machinery, trucks, or other Equipment, the Contractor will receive the rental rates for the actual time to the nearest ¼ hour that such Equipment is in operation on the Work. Time spent moving Equipment within the Project Limits and any approved idle time may be measured for payment when authorized. Time spent servicing, maintaining, and changing attachments will not be paid for. The rental rates shall include the cost of all fuel oil, lubrication, supplies, necessary attachments, repairs and maintenance of any kind, depreciation, storage, insurance, small tools, and all other Incidentals.

The maximum Hourly Equipment rental rates (R) will be determined using the most current Blue Book rates and the following formula:

$$R = A \times B \times E + C + D$$

Where:

A = Blue Book monthly rate divided by 176
B = Blue Book regional adjustment factor for Maine
C = Blue Book estimated operating costs per hour
D = Operator's hourly payroll rate plus 90 percent
E = Factor from the Rate Adjustment Table for the year the machine was made

When the Contractor's Equipment is ordered to be available for Force Account Work, but is idle for reasons not the fault of the Contractor, standby time will be paid at 70% of the hourly Equipment rental rate excluding all operating costs.

For each piece of Equipment, the Contractor shall provide the following information: the manufacturer's name, Equipment type, year of manufacture, model number, type of fuel used, horsepower rating, attachments required, together with its size or capacity and any further information necessary to ascertain the proper rate. The Contractor shall also provide a photocopy of the appropriate pages from the Blue Book that were used to arrive at the rates and prepare a chart that fully shows all the details of the Equipment costs.

Unless otherwise specified, manufacturer's ratings and manufacturer-approved modifications will be used to classify Equipment for the determination of applicable rental rates. A unit of at least the minimum rating recommended by the manufacturer shall power equipment that has no direct power unit.

If the Department specifies Equipment not listed in the above publication, the Department will establish a reasonable rate for such Equipment. If requested by the

Department, the Contractor will produce cost data to assist the Department in the establishment of such rental rate, including all records that are relevant to the Actual Costs including rental Receipts, acquisition costs, financing documents, lease Agreements, and maintenance and operational cost records.

Equipment leased by the Contractor for Force Account Work and actually used on the Project will be paid for at the actual invoice amount plus 10% markup for administrative costs.

D. Superintendence No part of the salary or expense of anyone connected with the Contractor above the grade of foreman or having general supervision of the Work will be included in the labor items as specified above, except when the Contractor's entire on-site Workforce is occupied with Force Account Work, in which case, the salaries of the Superintendent may be included in the labor item specified above when the nature of the Work is such that their services are required, as determined by the Department.

E. Documentation Requirements All Statements shall be accompanied and supported by Receipted Invoices for all Materials used and transportation charges. If Materials used on the Force Account Work are not specifically purchased for such Work but are taken from the Contractor's stock, then instead of Invoices, the Statements shall contain or be accompanied by an affidavit of the Contractor certifying that such Materials were taken from stock, that the quantity claimed was actually used, and that the price and transportation claimed represent the Actual Cost to the Contractor, excluding storage costs.

No payment will be made for Work performed on a Force Account basis until the Contractor has furnished duplicate itemized Statements of the cost of such Force Account Work detailed to the following:

1) Name, classification, date, daily hours, total hours, rate, and amount for each foreman and laborer.
2) Designation, dates, daily hours, total hours, rental rate, and amount for each unit of Equipment.
3) Quantities of Materials, prices, and amounts.
4) Transportation charges on Materials.

F. Subcontractor Quoted Work When accomplishing Force Account Work that utilizes Subcontractors, the Contractor will be allowed a maximum markup of 5% for profit and overhead on the Subcontractor's portion of the Force Account Work. If the Department does not accept the Subcontractor quote, then the Subcontractor work will be subject to the Force Account provisions with a 5% markup for profit & overhead.

109.8 Contract Modification Excepting changes to quantities as provided in Section 109.1.1 - Changes Permitted, all changes to the Contract that affect compensation, time, or quality must be made by written Contract Modification. The Contract Modification will describe the underlying issue that resulted in the Contract Modification and will specify adjustments to compensation, time, or other Work requirements, as applicable. If

adjustments to compensation or time are not shown on the face of the Contract Modification, then there are no such adjustments.

All Contract Modifications must be signed by the Project Manager or Resident. By signing a Contract Modification, the Contractor agrees to all the terms thereof and waives any and all claims for additional compensation, time, or other Work requirement adjustments relating to the issue that is the subject of the Contract Modification. All Contract Modifications are to be noted in Progress Meeting minutes.

## SECTION 110 - INDEMNIFICATION, BONDING, AND INSURANCE

Scope of Section This Section contains general requirements for indemnification, bonding, and insurance by the Contractor.

110.1 Indemnification The Contractor agrees to indemnify, defend, and hold harmless the Department and its officers, directors, employees, agents, and consultants from and against all claims, actions, torts, costs, losses, and damages for bodily injury (including sickness, disease, or death) and property damage arising out of or relating to this Contract or the performance of Work by the Contractor, its Subcontractors, subconsultants, engineers, suppliers, any individuals or entities directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, excepting only claims directly and solely caused by the negligence of the Department. Damages covered include, but are not limited to, all Dispute resolution costs, including court costs, attorney's fees, and the fees of engineers and consultants, arbitrators, and other professionals related to Dispute defense and preparation.

This indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for the Contractor or any Subcontractor, subconsultant, engineer, supplier, or other individual or entity under Workers' Compensation acts, disability benefit acts, or other employee benefit acts.

110.2 Bonding

110.2.1 Bonds The Contractor shall provide signed, valid, and enforceable Performance and Payment Bonds complying with the Contract. The Department may also require Warranty and Maintenance Bonds for specific items using a Contract specific special provision. For a related provision, see Section 103.5 - Award Conditions.

The Contractor shall procure bonds from a company organized and operating in the United States, licensed or approved to do business in the State of Maine by the State of Maine Department of Professional and Financial Regulation, Bureau of Insurance, and listed on the latest Federal Department of the Treasury listing for "Companies Holding Certificates

of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies."

The bonds shall each be in the full Contract amount, payable to the "Treasurer - State of Maine," and on the Department's forms, on exact copies thereof, or on forms that do not contain any significant variations from the Department's forms as solely determined by the Department.

By issuing a bond, the Surety agrees to be bound by all terms of the Contract, including those related to payment, time of performance, quality, warranties, and the Department's self-help remedy provided in Section 112.1 - Default to the same extent as if all terms of the Contract are contained in the bond(s).

Regarding claims related to any obligations covered by these bonds, the Surety shall provide, within 60 Days of Receipt of written notice thereof, full payment of the entire claim or written notice of all bases upon which it is denying or contesting payment. Failure of the Surety to provide such notice within the 60-Day period constitutes the Surety's waiver of any right to deny or contest payment and the Surety's acknowledgment that the claim is valid and undisputed.

If the Surety becomes financially insolvent, ceases to be licensed or approved to do business in the State of Maine, or stops operating in the United States, the Contractor shall file new bonds complying with this Section within 10 Days of the date the Contractor is notified or becomes aware of such change.

For a related provision, see Section 106.9.4 - Other Warranty Provisions.

110.2.2 Bond for Use of Municipal Roads A bond for use of municipal Roads may be required as provided in Section 105.5 - Hauling of Materials and Equipment.

110.2.3 Bonding for Landscape Maintenance Period The Contractor shall provide a signed, valid, and enforceable Landscape Warranty Bond when specified in Special Provision 621. The Landscape Warranty Bond shall be presented to the Resident at the time of Physical Work Complete. Payment for the Landscape Warranty Bond shall be incidental to the Landscape Items. The bond shall be in the full amount for all Pay Items for work pursuant to Section 621 - Landscape, payable to the "Treasurer - State of Maine," and on the Department's forms, on exact copies thereof, or on forms that do not contain any significant variations from the Department's forms as solely determined by the Department.

The Contractor shall pay all premiums and take all other actions necessary to keep said bond in effect for the duration of the Landscape Establishment Period described in Special Provision 621.0036 - Maintenance Period. If the Surety becomes financially insolvent, ceases to be licensed or approved to do business in the State of Maine, or stops operating in the United States, the Contractor shall file new bonds complying with this Section within 10 Days of the date the Contractor is notified or becomes aware of such change.

All Bonds shall be procured from a company organized and operating in the United States, licensed or approved to do business in the State of Maine by the State of Maine Department of Business Regulation, Bureau of Insurance, and listed on the latest Federal Department of the Treasury listing for "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies."

By issuing a bond, the Surety agrees to be bound by all terms of the Contract, including those related to payment, time for performance, quality, warranties, and the Department's self-help remedy provided in Section 112.1 - Default to the same extent as if all terms of the Contract are contained in the bond(s).

Regarding claims related to any obligations covered by the bond, the Surety shall provide, within 60 Days of Receipt of written notice thereof, full payment of the entire claim or written notice of all bases upon which it is denying or contesting payment. Failure of the Surety to provide such notice within the 60-Day period constitutes the Surety's waiver of any right to deny or contest payment and the Surety's acknowledgment that the claim is valid and undisputed.

110.3 Insurance The Contractor shall provide signed, valid, and enforceable certificate(s) of insurance complying with this Section. All insurance must be procured from insurance companies licensed or approved to do business in the State of Maine by the State of Maine, Department of Business Regulation, Bureau of Insurance. The Contractor shall pay all premiums and take all other actions necessary to keep required insurances in effect for the duration of the Contract obligations, excluding warranty obligations.

110.3.1 Workers' Compensation For all operations performed by the Contractor and any Subcontractor, the Contractor and each Subcontractor shall carry Workers' Compensation Insurance or shall qualify as a self-insurer with the State of Maine Workers' Compensation Board in accordance with the requirements of the laws of the State of Maine. If maritime exposures exist, coverage shall include United States Long Shore and Harbor Workers coverage.

110.3.2 Commercial General Liability With respect to all operations performed by the Contractor and any Subcontractors, the Contractor and any Subcontractors shall carry commercial general liability insurance in an amount not less than $1,000,000.00 per occurrence and $2,000,000.00 in the aggregate. The coverage must include products, completed operations, and Contractual liability coverages, and Insurance Services Office (ISO) form #CG25031185 or equivalent. The Contractual liability insurance shall cover the Contractor's obligations to indemnify the Department as provided in this Contract, including Section 110.1 - Indemnification. The coverage shall also include protection against damage claims due to use of explosives, collapse, and underground coverage if the Work involves such exposures.

When the work to be performed entails the use of barges, tug boats, work boats, supply boats, or other watercraft, Protection and Indemnity coverage for such work shall be provided at the limits called for under Commercial General Liability insurance.

110.3.3 Automobile Liability The Contractor shall carry Automobile Liability Insurance covering the operation of all motor vehicles, including any that are rented, leased, borrowed, or otherwise used in connection with the Project. The minimum limit of liability under this Section shall be $1,000,000.00 per occurrence.

110.3.4 Professional Liability Contractors and Subcontractor(s) who engage in design Work, preliminary engineering Work, and environmental consulting Work for the Department shall maintain a Professional Liability policy for errors and omissions that provides a minimum liability of $1,000,000 per claim and annual aggregate. "Design Work" includes the design of temporary Structures and all other Work that requires design computations. This policy shall cover "Wrongful Acts," meaning negligent acts, errors, or omissions by the Contractor, or any entity for whom the Contractor is legally liable, arising out of the performance of, or failure to perform, professional services. The Department reserves the right to adjust liability coverage on a project-by project basis as it deems appropriate.

110.3.5 Owners and Contractors Protective Liability If required by Special Provision, the Contractor shall carry an Owners and Contractors Protective (OCP) Policy covering all operations performed by the Contractor and any Subcontractor in an amount not less than $1,000,000.00 per occurrence and $2,000,000.00 in the aggregate, naming the Department as the sole insured party under the policy.

110.3.6 Builders Risk Unless required by Special Provision, the Department does not require the Contractor to carry Builders Risk Insurance. However, the Contractor is advised of its risks for damage to the Work as provided in Section 104.3.10 - Responsibility for Damage to the Work. The Contractor is responsible for managing and insuring these risks as it deems appropriate.

110.3.7 Pollution Liability If required by Special Provision, the Contractor shall carry Pollution Liability insurance to cover the risk of sudden or accidental discharge of pollutants during the prosecution of the Work. The limits of liability for this coverage shall be in the amount of $1,000,000.00 per occurrence and $2,000,000.00 in the aggregate. Regardless of whether such insurance is carried by the Contractor, the Contractor is responsible for managing these risks as it deems appropriate.

110.3.8 Railroad Protective Liability When working adjacent to a railroad, the Contractor and Subcontractors shall carry Railroad Protective Liability Insurance as required by the Railroad.

110.3.9 Administrative & General Provisions

A. Additional Insured Each insurance policy, with the exception of Workers' Compensation and Professional Liability insurance, shall list the Department of Transportation as an additional insured.

B. Defense of Claims Each insurance policy shall include a provision requiring the carrier to investigate, defend, indemnify, and hold harmless all named insureds against any and all claims for death, bodily injury, or property damage, even if groundless. The Contractor's insurer shall name the Department as a released party ("Releasee") on any release or settlement agreement for settled claims.

C. Primary Insurance The insurance coverage provided by the Contractor shall be primary insurance with respect to the State, its officers, agents, and employees. Any insurance or self-insurance maintained by the State for its officers, agents, and employees is in excess of the Agent's insurance and shall not contribute with it.

D. Reporting Any failure to comply with reporting provisions of the policies shall not affect coverage provided to the State, its officers, agents, and employees.

E. Separate Application The insurance provided by the Contractor shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

Nothing in this document constitutes a waiver of any defense, immunity or limitation of liability that may be available to the Department or its officers, agents, or employees under the Maine Tort Claims Act (14 M.R.S.A. § 8101, et seq.), and shall not constitute a waiver of other privileges or immunities that may be available to the Department.

## SECTION 111 - RESOLUTION OF DISPUTES

Scope of Section This Section contains provisions for resolving Disputes early, efficiently, fairly, and as close to the Project level as possible. For related provision, see Section 104.4 - Communication and Coordination.

### 111.1 General

111.1.1 Definitions "Dispute" is defined in Section 101.2 - Definitions. "Issue" is defined in Section 104.4.5 – Early Negotiation. Additionally, an "Issue" as used in Sections 111.1 through 111.3 below, is a matter that may give rise to a Dispute.

111.1.2 Escalation Process To resolve Issues or Disputes, the Contractor and the Department may mutually agree in writing at any time to any form of Dispute resolution, including mediation, facilitated negotiation, neutral case evaluation, arbitration, or litigation.

In the absence of such written Agreement, the parties must pursue resolution of Issues or Disputes that arise after Contract Execution as follows: (A) first through negotiation at the Project level as provided in Sections 104.4.5 - Early Negotiation and 111.2 - Project Level

Negotiation, (B) next through negotiation by management as provided in Section 111.3 - Negotiation by Management, and (C) next through the Commissioner as set forth in Section 111.5 - Appeal to Commissioner. If the Dispute remains unresolved after final agency action by the Commissioner, then, and only then, may a party seek judicial review of a Dispute as provided in Section 111.6 - Judicial Review.

111.1.3 Relationship to Partnering Partnering, including the establishment of a partnership charter, does not in any way waive, alter, or otherwise affect any provision of the Contract, including those requiring notice and all other provisions governing the resolution of Issues or Disputes. For a related provision, see Section 104.4.1 - Partnering.

111.1.4 Mandatory Notice The Contractor shall comply with all notice provisions of this Contract relating to Issues or Disputes, including those contained in Sections 104.3.3 - Duty to Notify If Ambiguities Discovered; 104.4.5(A) - Early Negotiation, Notice Required; 109.4.3 - Differing Site Conditions, Notice and Procedural Requirements; 109.5.4 - Adjustments for Delay, Notice and Procedural Requirements; and 111 - Resolution of Disputes. In order to promote the purposes of this Section 111, all notice provisions are mandatory and are to be strictly construed. Failure to provide conforming notice constitutes waiver by the Contractor of any and all claims to additional compensation, time, or modification of Contract requirements related to the Issue or Dispute.

111.1.5 Work to Proceed Despite Issue or Dispute Regardless of the status or disposition of any Issue or Dispute, the Contractor and the Department must perform their Contractual responsibilities Promptly and diligently. Unless expressly directed otherwise by the Department, the Contractor shall proceed without Delay to perform the Work or to conform to the decision or order of the Department.

111.1.6 Contractor's Obligation to Keep Records Throughout the course of any Issue or Dispute, the Contractor shall keep daily records, including supporting documentation, of extra costs and time related to the Issue or Dispute. Such records shall include all non-salaried labor, Material costs, Equipment expenses, and location for all operations that are affected by the Issue or Dispute. The Contractor will not be entitled to any change to compensation, time, or Work requirements without such records. The Contractor shall permit the Department daily access to and shall provide copies of these and any other records needed for evaluating the Dispute. The Contractor shall retain those records for the duration of the Dispute and as provided in Section 104.3.6 - Project Records.

111.1.7 Dispute Resolution Time Extensions All deadlines provided in this Section 111 may be extended only by mutual written consent signed by both parties.

111.1.8 Commissioner Communications Before Appeal Because the Commissioner may hear an Appeal and render final agency action under Section 111.5 - Appeal to Commissioner, the following persons shall not communicate with the Commissioner regarding the substance of a Dispute, except upon notice and opportunity for all parties to participate: (A) the Contractor or any agent for the Contractor and (B) Department staff, counsel, or consultants who are directly participating in Dispute resolution processes in an

advocate capacity. The preceding sentence does not prohibit the Commissioner from communicating with, or having the aid or advice of all other Department staff, counsel, or consultants. This Section does not apply where the Commissioner has delegated hearing the Appeal to other Department personnel, in which case, this Section shall apply instead to the Commissioner's delegate.

111.1.9 Contract Modification Required All changes to the Contract that regard Issues or Disputes and that affect compensation, time, quality, or other Contract requirements must be made by written Contract Modification as provided by Section 109.8 - Contract Modification.

111.2 Project Level Negotiation

111.2.1 Early Negotiation The parties must first comply with all requirements of Section 104.4.5 - Early Negotiation.

111.2.2 Detailed Notice of Dispute If Early Negotiation fails to resolve the Issue within 45 Days of the date of Receipt of the written Notice of Issue for Consideration Conforming to Section 104.4.5(A) - Early Negotiation, and if the Contractor desires additional consideration by the Department, then the Contractor must Deliver a written Detailed Notice of Dispute to the Program Manager within 14 Days of the expiration of said 45-Day period. At a minimum, the Detailed Notice of Dispute shall include all of the following information in sufficient detail to allow reasoned analysis as determined by the Program Manager:

A. A description of the background of Dispute, including the date(s) the Issue or Dispute first arose and the date the Contractor provided the Project Manager or Resident with the "Notice of Issue for Consideration" Conforming to Section 104.4.5(A) - Early Negotiation;

B. All Contract provisions that are relevant to the Dispute;

C. All facts relevant to the Dispute, including all non-Contract Documents and all non-documentary facts, including identification of all persons with knowledge of relevant facts and a synopsis of their testimony;

D. The Contractor's position as to why the Contract and facts demonstrate that the Contractor is entitled to additional compensation and/or time;

E. The estimated dollar cost, if any, of the Disputed Work and how the estimate was determined;

F. If the Contractor is asserting an Excusable or Compensable Delay occurred, an analysis of the progress schedule showing the impact on the Critical Path; and

G. A specific request for additional compensation or time, or other change to provisions of the Contract.

111.2.3 Decision by Program Manager Within 30 Days of receiving a Detailed Notice of Dispute Conforming to Section 111.2.2 - Detailed Notice of Dispute, the Program Manager will Deliver a written decision to the Contractor on the specific request made.

111.3 Negotiation by Management

111.3.1 Notice of Unresolved Dispute If the Contractor desires additional consideration, the Contractor shall Deliver a written "Notice of Unresolved Dispute" to the Department's appropriate Bureau Director (hereafter "Director" in this Section 111 - Resolution of Disputes within 14 Days of receiving the Program Manager's decision provided for in Section 111.2.3 - Decision by Program Manager.

At a minimum, the Notice of Unresolved Dispute must include the following information in sufficient detail to allow reasoned analysis as determined by the Director or the director's designee(s): (A) all documentation submitted to the Resident for Project-level negotiation, (B) all decisions rendered by the Program Manager or equivalent Bureau level manager, and (C) all additional information the Contractor desires the Department to consider.

111.3.2 Additional Documentation Within 14 Days of the receiving a Notice of Unresolved Dispute Conforming to Section 111.3.1, the Director or the Director's designee(s) may require the Contractor to provide Additional Documentation. If required, the Contractor shall completely and accurately supply all requested information in writing within 21 Days of receiving said request. Failure to provide all Additional Documentation constitutes a waiver of all claims for additional compensation or time.

Additional Documentation may include the following:

A. The date(s) on which facts arose which gave rise to the Issue or Dispute.

B. The dates the Department Received the "Notice of Issue for Consideration" Conforming to Section 104.4.5(A) - Early Negotiations - Notice Required and the "Detailed Notice of Dispute" Conforming to Section 111.2.2.

C. A list of all Contract provisions that is relevant to the Dispute and a Statement of which specific Contract provisions the Contractor believes controls or is relevant to the outcome of the Dispute.

D. A narrative setting forth the Contractor's position regarding additional compensation and time, if any, including all supporting facts, including dates, locations, and items of Work affected by the Dispute, and how the Contract provisions set forth in subparagraph C support the Contractor's position.

E. A list of and copies of all documents that are relevant to the Dispute organized chronologically. With respect to each document, the list must include its date, the author(s) (including address and telephone numbers), and the recipient(s).

F. A list of all persons who are involved in or knowledgeable of the Dispute, including addresses and telephone numbers of such persons. If such person has knowledge of oral statements upon which the Contractor is relying, the list must also include the substance of the oral statements, the date(s) they were made, and all people present at the time the statement was made.

G. If an extension of time is sought:

1. The specific Days or dates for which it is sought, including an explanation of impact on the Critical Path;
2. The specific reasons the Contractor believes a time extension should be granted; and
3. The specific provisions of the Contract under which it is sought.

H. If additional compensation is sought, the exact amount sought and a breakdown of that amount into the categories provided by Section 109.7- Equitable Adjustments to Compensation and Time.

I. An oath consisting of the following language:

"ON OATH, and under the penalty of law for perjury or falsification, the undersigned, (Name of person signing oath and title) hereby certifies that the amounts claimed by the Contractor for additional compensation and time (as applicable) set forth in the Notice of Unresolved Dispute and this additional documentation are a true and complete Statement of the Actual Costs incurred and time sought, and are fully documented and supported in accordance with the Contract."

J. Date of signature, sworn signature, and acknowledgment by notary.

The Director or the Director's designee may also retrieve and review the Bid Escrow Documentation, if any, if the Contract required submission of Bid Escrow.

111.3.3 Decision by Director Within 21 Days of receiving a Notice of Unresolved Dispute Conforming to Section 111.3.1 - Notice of Unresolved Dispute or, if requested, all Additional Documentation, whichever is later, the Director or the Director's designee(s) will Deliver a written decision. The decision will affirm, reverse, revise, or amend the decision of the Program Manager.

111.5 Appeal to Commissioner

111.5.1 Filing of Appeal If the Contractor elects, the Contractor may file an "Appeal of the Director's Decision." Such Appeal must be filed within 14 Days of the Contractor's Receipt of the Director's Decision. At a minimum, the Appeal must contain:

A. All Materials submitted to the Director and all decisions by the Director;

B. The specific findings of the Director that the appealing party claims are contrary to law and/or fact;

C. Any other pertinent new documentary evidence;

D. Any written arguments the appealing party wishes the Commissioner to consider; and

E. The specific relief sought.

Unless directed otherwise by the Commissioner, review of the Appeal will be limited to the documentation submitted.

111.5.2 Director's Response The Director may submit a written response within 14 Days of receiving notice that an Appeal was filed with the Commissioner.

111.5.3 Time and Alternatives for Commissioner Action Within 30 Days of receiving an Appeal Conforming to Section 111.5.1 or, if applicable, the Director's response, allowed by Section 111.5.2, the Commissioner will:

A. Affirm the decision of the Director, or

B. Revise, amend, or reverse the decision of the Director.

111.5.4 Final Agency Action Any affirmation, revision, amendment, or reversal by the Commissioner is final agency action as of the date of Receipt of such action by the Contractor. If the Commissioner takes no action within such 30-Day period, the decision of the Director shall be final agency action upon the expiration of said 30-Day period.

111.6 Judicial Review All Bidders and Contractors hereby agree and acknowledge that with respect to any and all Disputes and/or Issues arising from the Bid and/or the Contract, they must and will comply with all of the Notice and Dispute Resolution provisions of this Contract. For related provisions see Sections 111.1.2 – Escalation Process and 111.1.4 – Mandatory Notice. All Bidders and Contractors hereby agree and acknowledge that they must comply with, and exhaust, the Notice and Dispute Resolutions provisions of this Contract to the point of Final Agency Action prior to seeking judicial review. See Section 111.5.4 - Final Agency Action.

All Bidders and Contractors hereby agree and acknowledge that the sole and exclusive means of judicial review of final agency actions under the Contract is through a

petition for review pursuant to Maine Rule of Civil Procedure 80C and 5 MRSA § 11001, et seq., of the Maine Administrative Procedure Act, to be filed in Maine Superior Court, Kennebec County.

## SECTION 112 - DEFAULT AND TERMINATION

Scope of Section This Section contains general provisions related to Default and termination of the Contract.

### 112.1 Default

112.1.1 Grounds for Default The Contractor and the Surety are in Default of the Contract if the Contractor or the Surety violate any provision of Section 103.3.2 or the following:

A. Fails to Promptly begin the Work under the Contract after being authorized to proceed,
B. Fails to perform the Work with sufficient labor, Equipment, or Materials to assure the timely Completion of the Work,
C. Performs Defective Work, neglects or refuses to uncover, remove or rebuild Unacceptable Work, or neglects or refuses to uncover Unauthorized or Uninspected Work when directed by the Department,
D. Discontinues the prosecution of the Work without Departmental approval,
E. Continues to perform Work after the Department directs that Work be stopped,
F. Fails to resume Work that has been suspended as required by the Contract,
G. Becomes insolvent or is declared bankrupt or commits any act of bankruptcy or insolvency that could affect the Work in any way,
H. Allows any final judgment to stand against the Contractor unsatisfied for a period of ten Days,
I. Makes an assignment for the benefit of creditors without authorization by the Department, or
J. In any other manner, fails to perform the Work in Substantial Conformity with any material provision of the Contract.

112.1.2 Notice of Default / Cure Except as otherwise provided in this Contract, if Default occurs, the Department may give written Notice of Default to the Contractor and its Surety. Failure to give Notice of Default is in no way a waiver by the Department of any provision of the Contract.

If the Contractor or Surety fails to completely cure such Default within a period of 14 Days after Notice of Default, then the Department may (A) terminate the Contract for cause in accordance with Section 112.2.1 - For Cause, or (B) take prosecution of the Work away from the Contractor without violating the Contract.

112.2 Termination The Department may, by written order to the Contractor, terminate the Contract as provided in this Section 112. Termination of the Contract or

portion thereof shall not relieve the Contractor of its Contractual responsibilities for the Work completed (including warranty obligations), nor shall it relieve the Surety of its obligation for claims arising from the Work or the Contract.

112.2.1 For Cause If the Contractor fails to completely cure all Defects identified in the Notice(s) of Default provided for in Section 112.1.2 within the 14-Day cure period provided, the Department may immediately terminate the Contract for cause by written Notice of Termination For Cause. In this event, the Department may use any or all Materials and Equipment for the Work and may enter into an Agreement with another entity for the Completion of the Work, or use such other methods as in the opinion of the Department are required for the Completion of the intent of the Contract in an acceptable and timely manner.

The Department will pay for all Accepted items of Work as of the date of Termination at agreed upon prices. Items eliminated in their entirety by Termination will be paid for as provided in Section 109.2 - Elimination of Items, except that there will be no reductions in the amount of the credit to the Department. The Contractor shall make all Work records available to the Department upon request regarding payment under this Section. All costs and charges incurred by the Department, together with the cost of completing the Work specified in the Contract, will be deducted from amounts otherwise due the Contractor. If such expenses exceed the sum that would have been payable under the Contract, then the Contractor and the Surety are liable and shall pay to the Department the amount of such excess within 30 Days of the Delivery of a Statement setting forth such expenses to the Contractor and the Surety, as applicable.

If the Contractor files for bankruptcy at any time before expiration of the warranty periods provided by this Contract, then the Contractor and its Surety agree, if requested by the Department and within 30 Days of such request, to take all actions necessary or convenient to reject or accept this Contract under the executory Contract provisions of the federal bankruptcy code.

112.2.2 For Convenience The Department may terminate this Contract for convenience or for any reason that is in the best interest of the Department. Terminations caused without fault of or for reasons beyond the control of the Contractor are Terminations for Convenience. The Department will notify the Contractor of such terminations by sending a Notice of Termination for Convenience.

In case of a Termination for Convenience, the Department will pay for all Accepted items of Work as of the date of termination at agreed upon prices. Items eliminated in their entirety by Termination will be paid for as provided in Section 109.2 - Elimination of Items. The Contractor shall make all Work records available to the Department upon request regarding payment under this Section. Acceptable Materials, obtained by the Contractor for the Work but which have not been incorporated therein, may at the option of the Department be purchased from the Contractor at Actual Costs delivered to a prescribed location or otherwise disposed of as mutually agreed.

After Receipt of Notice of Termination for Convenience from the Department, the Contractor may also submit a claim for additional damages or costs not covered above or elsewhere in this Contract to the Project Manager within 60 Days of the effective Termination date. Such claim may include such cost items as idle Equipment time, Bidding and Project investigative costs, overhead expenses attributable to the Project terminated, legal and accounting charges involved in claim preparation, Subcontractor costs not otherwise paid for, idle labor cost if Work is stopped in advance of termination date, guaranteed payments for private land usage as part of the original Contract, and any other cost or damage item for which the Contractor reasonably believes reimbursement should be made. In no event, however, will loss of anticipated profits be considered as part of any settlement.

The Contractor agrees to make the Bid Escrow, Documentation, if any, and its cost records available to the extent necessary to determine the validity and amount of each item claimed.

The Department will respond in writing to such claim within 60 Days of Receipt. If the Contractor wants additional consideration, the Contractor must Deliver a written "Notice of Unresolved Dispute" to the Director as provided in Section 111.3.1 - Notice of Unresolved Dispute and comply with all other applicable Dispute resolution provisions of Section 111 - Resolution of Disputes.

# SUPPLEMENTAL SPECIFICATIONS

**(Corrections, Additions, & Revisions to Standard Specifications – March 2020)**

## SECTION 102
## BIDDING

102.11 Bid Responsiveness Revise the paragraph that states "The Bid is not signed by a duly authorized representative of the Bidder." So that it reads:

"**The Bid is not signed by a duly authorized representative of the Bidder.**

- **Properly submitted electronic bids meet this requirement.**
- **Paper bids must include at least one signed copy of the Contract Agreement Offer & Award form**."

## SECTION 104
## GENERAL RIGHTS AND RESPONSIBILITIES

104.2.1 Furnishing of Right-of-Way Revise the last sentence in the first paragraph by removing "105.4.5 – Special Detours" and replacing it with "**105.4.5 – Maintenance of Existing Structures**.".

## SECTION 106
## QUALITY

106.6 Acceptance Revise this Subsection by replacing the paragraph beginning with "Acceptance of Hot Mix Asphalt Pavement will be based" with:

> **"Acceptance of Hot Mix Asphalt Pavement will be based on Method A or C Statistical Acceptance, or Method B or D Acceptance as specified. The method of acceptance for each item is defined in Special Provision, Section 403, Hot Mix Asphalt Pavement. When items of Hot Mix Asphalt Pavement are not so designated, Method A will be utilized whenever there are more than 1000 tons per Hot Mix Asphalt Pavement item, and Method B will be utilized when there are less than or equal to 1000 tons per Hot Mix Asphalt Pavement item."**

Revise Subsection "B" by removing it and replacing it with:

> **"B. Items not designated for Statistical Acceptance will utilize Method B or D Acceptance testing to validate the quality of the material incorporated into the Project. For material paid under Item 403.209 – Method D, or designated to be visually accepted, the Contractor shall provide the Department with a Certification Letter that indicates that the material supplied complies with the Specifications. Test results representative of the certified material shall be attached to the letter.**

**The Department will randomly sample and test the certified Material for properties noted in Table 1 of Section 502 - Structural Concrete or Table 14 of Section –401.21 Acceptance Method B & D. Material will be subject to rejection as noted in Structural Concrete Section 502.195 - Quality Assurance Method C Concrete or Hot Mix Asphalt, Section 401.2022 Pay Adjustment – Method B & D."**

106.7.1 Standard Deviation Method Revise 106.7.1, subsection H by removing the following from the first paragraph:

"Method B: PF = [70 + (Quality Level * 0.33)] * 0.01"

## SECTION 110
## INDEMNIFICATION, BONDING, AND INSURANCE

110.3.9 Administrative & General Provisions Amend this subsection by adding "**Automobile Liability**" under letter A) Additional Insured to the list of exceptions.

## DEP SITE LOCATION OF DEVELOPMENT (SITE) STANDARD CONDITIONS

**STRICT CONFORMANCE WITH THE STANDARD AND SPECIAL CONDITIONS OF THIS APPROVAL IS NECESSARY FOR THE PROJECT TO MEET THE STATUTORY CRITERIA FOR APPROVAL.**

**A. Approval of Variations from Plans**. The granting of this approval is dependent upon and limited to the proposals and plans contained in the application and supporting documents submitted and affirmed to by the applicant. Any variation from these plans, proposals, and supporting documents is subject to review and approval prior to implementation. Further subdivision of proposed lots by the applicant or future owners is specifically prohibited without prior approval of the Board, and the applicant shall include deed restrictions to that effect.

**B. Compliance with All Applicable Laws**. The applicant shall secure and comply with all applicable federal, state, and local licenses, permits, authorizations, conditions, agreements, and orders prior to or during construction and operation, as appropriate.

**C. Compliance with All Terms and Conditions of Approval**. The applicant shall submit all reports and information requested by the Board or the Department demonstrating that the applicant has complied or will comply with all preconstruction terms and conditions of this approval. All preconstruction terms and conditions must be met before construction begins.

**D. Advertising**. Advertising relating to matters included in this application shall refer to this approval only if it notes that the approval has been granted WITH CONDITIONS, and indicates where copies of those conditions may be obtained.

**E. Transfer of Development**. Unless otherwise provided in this approval, the applicant shall not sell, lease, assign or otherwise transfer the development or any portion thereof without prior written approval of the Board where the purpose or consequence of the transfer is to transfer any of the obligations of the developer as incorporated in this approval. Such approval shall be granted only if the applicant or transferee demonstrates to the Board that the transferee has the technical capacity and financial ability to comply with conditions of this approval and the proposals and plans contained in the application and supporting documents submitted by the applicant.

**F. Time frame for approvals.** If the construction or operation of the activity is not begun within four years, this approval shall lapse and the applicant shall reapply to the Board for a new approval. The applicant may not begin construction or operation of the development until a new approval is granted. A reapplication for approval may include information submitted in the initial application by reference. This approval, if construction is begun within the four-year time frame, is valid for seven years. If construction is not completed within the seven-year time frame, the applicant must reapply for, and receive, approval prior to continuing construction.

**G. Approval Included in Contract Bids.** A copy of this approval must be included in or attached to all contract bid specifications for the development.

**H. Approval Shown to Contractors**. Work done by a contractor pursuant to this approval shall not begin before the contractor has been shown by the developer a copy of this approval.

**(2/81)/Revised December 27, 2011**

# DEP INFORMATION SHEET

## Appealing a Department Licensing Decision

**Dated: March 2012** **Contact: (207) 287-2811**


**SUMMARY**

There are two methods available to an aggrieved person seeking to appeal a licensing decision made by the Department of Environmental Protection's ("DEP") Commissioner: (1) in an administrative process before the Board of Environmental Protection ("Board"); or (2) in a judicial process before Maine's Superior Court. An aggrieved person seeking review of a licensing decision over which the Board had original jurisdiction may seek judicial review in Maine's Superior Court.

A judicial appeal of final action by the Commissioner or the Board regarding an application for an expedited wind energy development (35-A M.R.S.A. § 3451(4)) or a general permit for an offshore wind energy demonstration project (38 M.R.S.A. § 480-HH(1)) or a general permit for a tidal energy demonstration project (38 M.R.S.A. § 636-A) must be taken to the Supreme Judicial Court sitting as the Law Court.

This INFORMATION SHEET, in conjunction with a review of the statutory and regulatory provisions referred to herein, can help a person to understand his or her rights and obligations in filing an administrative or judicial appeal.


### I. ADMINISTRATIVE APPEALS TO THE BOARD

#### LEGAL REFERENCES

The laws concerning the DEP's *Organization and Powers*, 38 M.R.S.A. §§ 341-D(4) & 346, the *Maine Administrative Procedure Act*, 5 M.R.S.A. § 11001, and the DEP's *Rules Concerning the Processing of Applications and Other Administrative Matters* ("Chapter 2"), 06-096 CMR 2 (April 1, 2003).

#### HOW LONG YOU HAVE TO SUBMIT AN APPEAL TO THE BOARD

The Board must receive a written appeal within 30 days of the date on which the Commissioner's decision was filed with the Board. Appeals filed after 30 calendar days of the date on which the Commissioner's decision was filed with the Board will be rejected.

#### HOW TO SUBMIT AN APPEAL TO THE BOARD

Signed original appeal documents must be sent to: Chair, Board of Environmental Protection, c/o Department of Environmental Protection, 17 State House Station, Augusta, ME 04333-0017; faxes are acceptable for purposes of meeting the deadline when followed by the Board's receipt of mailed original documents within five (5) working days. Receipt on a particular day must be by 5:00 PM at DEP's offices in Augusta; materials received after 5:00 PM are not considered received until the following day. The person appealing a licensing decision must also send the DEP's Commissioner a copy of the appeal documents and if the person appealing is not the applicant in the license proceeding at issue the applicant must also be sent a copy of the appeal documents. All of the information listed in the next section must be submitted at the time the appeal is filed. Only the extraordinary circumstances described at the end of that section will justify evidence not in the DEP's record at the time of decision being added to the record for consideration by the Board as part of an appeal.

## WHAT YOUR APPEAL PAPERWORK MUST CONTAIN

Appeal materials must contain the following information at the time submitted:

1. *Aggrieved Status*. The appeal must explain how the person filing the appeal has standing to maintain an appeal. This requires an explanation of how the person filing the appeal may suffer a particularized injury as a result of the Commissioner's decision.
2. *The findings, conclusions or conditions objected to or believed to be in error.* Specific references and facts regarding the appellant's issues with the decision must be provided in the notice of appeal.
3. *The basis of the objections or challenge.* If possible, specific regulations, statutes or other facts should be referenced. This may include citing omissions of relevant requirements, and errors believed to have been made in interpretations, conclusions, and relevant requirements.
4. *The remedy sought.* This can range from reversal of the Commissioner's decision on the license or permit to changes in specific permit conditions.
5. *All the matters to be contested*. The Board will limit its consideration to those arguments specifically raised in the written notice of appeal.
6. *Request for hearing.* The Board will hear presentations on appeals at its regularly scheduled meetings, unless a public hearing on the appeal is requested and granted. A request for public hearing on an appeal must be filed as part of the notice of appeal.
7. *New or additional evidence to be offered.* The Board may allow new or additional evidence, referred to as supplemental evidence, to be considered by the Board in an appeal only when the evidence is relevant and material and that the person seeking to add information to the record can show due diligence in bringing the evidence to the DEP's attention at the earliest possible time in the licensing process or that the evidence itself is newly discovered and could not have been presented earlier in the process. Specific requirements for additional evidence are found in Chapter 2.

## OTHER CONSIDERATIONS IN APPEALING A DECISION TO THE BOARD

1. *Be familiar with all relevant material in the DEP record.* A license application file is public information, subject to any applicable statutory exceptions, made easily accessible by DEP. Upon request, the DEP will make the material available during normal working hours, provide space to review the file, and provide opportunity for photocopying materials. There is a charge for copies or copying services.
2. *Be familiar with the regulations and laws under which the application was processed, and the procedural rules governing your appeal.* DEP staff will provide this information on request and answer questions regarding applicable requirements.
3. *The filing of an appeal does not operate as a stay to any decision.* If a license has been granted and it has been appealed the license normally remains in effect pending the processing of the appeal. A license holder may proceed with a project pending the outcome of an appeal but the license holder runs the risk of the decision being reversed or modified as a result of the appeal.

## WHAT TO EXPECT ONCE YOU FILE A TIMELY APPEAL WITH THE BOARD

The Board will formally acknowledge receipt of an appeal, including the name of the DEP project manager assigned to the specific appeal. The notice of appeal, any materials accepted by the Board Chair as supplementary evidence, and any materials submitted in response to the appeal will be sent to Board members with a recommendation from DEP staff. Persons filing appeals and interested persons are notified in advance of the date set for Board consideration of an appeal or request for public hearing. With or without holding a public hearing, the Board may affirm, amend, or reverse a Commissioner decision or remand the matter to the Commissioner for further proceedings. The Board will notify the appellant, a license holder, and interested persons of its decision.

## II. JUDICIAL APPEALS

Maine law generally allows aggrieved persons to appeal final Commissioner or Board licensing decisions to Maine's Superior Court, see 38 M.R.S.A. § 346(1); 06-096 CMR 2; 5 M.R.S.A. § 11001; & M.R. Civ. P 80C. A party's appeal must be filed with the Superior Court within 30 days of receipt of notice of the Board's or the Commissioner's decision. For any other person, an appeal must be filed within 40 days of the date the decision was rendered. Failure to file a timely appeal will result in the Board's or the Commissioner's decision becoming final.

An appeal to court of a license decision regarding an expedited wind energy development, a general permit for an offshore wind energy demonstration project, or a general permit for a tidal energy demonstration project may only be taken directly to the Maine Supreme Judicial Court. See 38 M.R.S.A. § 346(4).

Maine's Administrative Procedure Act, DEP statutes governing a particular matter, and the Maine Rules of Civil Procedure must be consulted for the substantive and procedural details applicable to judicial appeals.

### ADDITIONAL INFORMATION

If you have questions or need additional information on the appeal process, for administrative appeals contact the Board's Executive Analyst at (207) 287-2452 or for judicial appeals contact the court clerk's office in which your appeal will be filed.

**Note: The DEP provides this INFORMATION SHEET for general guidance only; it is not intended for use as a legal reference. Maine law governs an appellant's rights.**

APPENDIX A TO DIVISION 100

SECTION 1 - BIDDING PROVISIONS

A. Federally Required Certifications By signing and delivering a Bid, the Bidder certifies as provided in all certifications set forth in this Appendix A - Federal Contract Provisions Supplement, including:

- Certification Regarding No Kickbacks to Procure Contract as provided on this page 1 below.
- Certification Regarding Non-collusion as provided on page 1 below.
- Certification Regarding Non-segregated Facilities as provided by FHWA Form 1273, section III set forth on page 21 below.
- "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion" as provided by FHWA Form 1273, section XI set forth on page 32 below.
- "Certification Regarding Use of Contract Funds for Lobbying" as provided by FHWA Form 1273, section XII set forth on page 35 below.

Unless otherwise provided below, the term “Bidder,”, for the purposes of these certifications, includes the Bidder, its principals, and the person(s) signing the Bid. Upon execution of the Contract, the Bidder (then called the Contractor) will again make all the certifications indicated in this paragraph above.

CERTIFICATION REGARDING NO KICKBACKS TO PROCURE CONTRACT Except expressly stated by the Bidder on sheets submitted with the Bid (if any), the Bidder hereby certifies, to the best of its knowledge and belief, that it has not:

(A) employed or retained for a commission, percentage, brokerage, contingent fee, or other consideration, any firm or person (other than a bona fide employee working solely for me) to solicit or secure this contract;

(B) agreed, as an express or implied condition for obtaining this contract, to employ or retain the services of any firm or person in connection with carrying out the contract, or;

C) paid, or agreed to pay, to any firm, organization, or person (other than a bona fide employee working solely for me) any fee, contribution, donation, or consideration of any kind for, or in connection with, procuring or carrying out the contract;

By signing and submitting a Bid, the Bidder acknowledges that this certification is to be furnished to the Maine Department of Transportation and the Federal Aviation Administration (FAA), U.S. Department of Transportation in connection with this contract in anticipation of Federal Aviation Administration funds and is subject to applicable state and federal laws, both criminal and civil.

CERTIFICATION REGARDING NONCOLLUSION Under penalty of perjury as provided by federal law (28 U.S.C. §1746), the Bidder hereby certifies, to the best of its knowledge and belief, that:

> the Bidder has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of competitive bidding in connection with the Contract.

For related provisions, see Section 102.7.2 (C) of the Standard Specifications - "Effects of Signing and Delivery of Bids" - "Certifications", Section 3 of this Appendix A entitled "Other Federal Requirements" including section XI - "Certification Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion" and section XII. - "Certification Regarding Use of Contract Funds for Lobbying."

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B. Bid Rigging Hotline To report bid rigging activities call: **1-800-424-9071**

The U.S. Department of Transportation (DOT) operates the above toll-free "hotline" Monday through Friday, 8:00 a.m. to 5:00 p.m., eastern time. Anyone with knowledge of possible bid rigging, bidder collusion, or other fraudulent activities should use the "hotline" to report such activities.

The "hotline" is part of the DOT's continuing effort to identify and investigate highway construction contract fraud and abuse and is operated under the direction of the DOT Inspector General. All information will be treated confidentially, and caller anonymity will be respected.

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Start of FEDERAL AVIATION ADMINISTRATION REQUIRED CONTRACT PROVISIONS

## REQUIRED CONTRACT PROVISIONS
## FEDERAL AVIATION ADMINISTRATION
## CONSTRUCTION CONTRACTS

I. Applicability of Provisions
II. Access to Records and Reports
III. Affirmative Action Requirement
IV. Breach of Contract Terms
V. Buy American Preference
VI. General Civil Rights Provisions
VII. Clean Air and Water Pollution Control
VIII. Contract Workhours and Safety Standards Act Requirements
IX. Copeland "Anti-Kickback" Act
X. Davis-Bacon Requirements

XI. Debarment and Suspension
XII. Disadvantaged Business Enterprise
XIII. Distracted Driving
XIV. Energy Conservation Requirements
XVI. Equal Employment Opportunity (EEO)
XVII. Federal Fair Labor Standards Act (Federal Minimum Wage)
XVIII. Lobbying and Influencing Federal Employees
XIX. Prohibition of Segregated Facilities
XX. Occupational Safety and Health Act of 1970
XXI. Procurement of Recovered Materials
XXIV. Tax Delinquency and Felony Convictions
XXV. Termination of Contract
XXVI. Trade Restriction Certification
XXVII. Veterans Preference

**Meaning of cell values**

- Info –Sponsor has discretion on whether to include clause in its contracts.
- Limited – Provision with limited applicability depending on circumstances of the procurement.
- n/a – Provision that is not applicable for that procurement type.
- NIS – Provision that does not need to be included or referenced in the solicitation document
- REF – Provision to be incorporated into the solicitation by reference.
- REQD - Provision the sponsor must incorporate into procurement documents.

**Table 1 – Applicability of Provisions**

| Provisions/Clauses | Dollar Threshold | Solicitation | Professional Services | Construction | Equipment | Property (Land) | Non-AIP Contracts |
|---|---|---|---|---|---|---|---|
| Access to Records and Reports | $ 0 | NIS | **REQD** | **REQD** | **REQD** | **REQD** | n/a |
| Affirmative Action Requirement | $10,000 | **REQD** | Limited | **REQD** | Limited | Limited | n/a |
| Breach of Contract | $150,000 | NIS | **REQD** | **REQD** | **REQD** | **REQD** | n/a |
| Buy American Preferences | $ 0 | **REF** | Limited | **REQD** | **REQD** | Limited | n/a |
| (1) Buy American Statement | $ 0 | NIS | Limited | **REQD** | **REQD** | Limited | n/a |
| (2) BA – Total Facility | $ 0 | NIS | Limited | **REQD** | **REQD** | Limited | n/a |
| (3) B.A. – Manufactured Product | $ 0 | NIS | Limited | **REQD** | **REQD** | Limited | n/a |
| Civil Rights – General | $ 0 | NIS | **REQD** | **REQD** | **REQD** | **REQD** | **REQD** |
| Civil Rights - Title VI Assurances | $ 0 | **REF** | **REQD** | **REQD** | **REQD** | **REQD** | **REQD** |
| (1) Notice - Solicitation | $ 0 | **REQD** | **REQD** | **REQD** | **REQD** | **REQD** | **REQD** |
| (2) Clause - Contracts | $ 0 | NIS | **REQD** | **REQD** | **REQD** | **REQD** | **REQD** |
| (3) Clause – Transfer of U.S. Property | $ 0 | NIS | n/a | n/a | n/a | Limited | **REQD** |
| (4) Clause – Transfer of Real Property | $ 0 | NIS | n/a | n/a | n/a | **REQD** | **REQD** |
| (5) Clause - Construct/Use/Access to Real Property | $ 0 | NIS | n/a | n/a | n/a | **REQD** | **REQD** |
| (6) List – Pertinent Authorities | $0 | NIS | **REQD** | **REQD** | **REQD** | **REQD** | **REQD** |
| Clean Air/Water Pollution Control | $150,000 | NIS | **REQD** | **REQD** | **REQD** | **REQD** | n/a |
| Contract Work Hours and Safety Standards | $100,000 | NIS | Limited | **REQD** | Limited | Limited | n/a |
| Copeland Anti-Kickback | $ 2,000 | NIS | Limited | **REQD** | Limited | Limited | n/a |
| Davis Bacon Requirements | $ 2,000 | **REF** | Limited | **REQD** | Limited | Limited | n/a |
| Debarment and Suspension | $25,000 | **REF** | **REQD** | **REQD** | **REQD** | Limited | n/a |
| Disadvantaged Business Enterprise | $ 0 | **REF** | **REQD** | **REQD** | **REQD** | **REQD** | n/a |
| Distracted Driving | $3,500 | NIS | **REQD** | **REQD** | **REQD** | **REQD** | n/a |
| Energy Conservation Requirements | $ 0 | NIS | **REQD** | **REQD** | **REQD** | **REQD** | n/a |
| Equal Employment Opportunity | $10,000 | NIS | Limited | **REQD** | Limited | Limited | n/a |
| (1) EEO Contract Clause | $10,000 | NIS | Limited | **REQD** | Limited | Limited | n/a |
| (2) EEO Specification | $10,000 | NIS | Limited | **REQD** | Limited | Limited | n/a |
| Federal Fair Labor Standards Act | $ 0 | NIS | **REQD** | **REQD** | **REQD** | **REQD** | Info |
| Foreign Trade Restriction | $ 0 | **REF** | **REQD** | **REQD** | **REQD** | **REQD** | n/a |
| Lobbying Federal Employees | $ 100,000 | **REF** | **REQD** | **REQD** | **REQD** | **REQD** | n/a |
| Occupational Safety and Health Act | $ 0 | NIS | **REQD** | **REQD** | **REQD** | **REQD** | Info |
| Prohibition of Segregated Facilities | $10,000 | NIS | Limited | **REQD** | Limited | Limited | n/a |
| Recovered Materials | $10,000 | **REF** | Limited | **REQD** | **REQD** | Limited | n/a |
| Rights to Inventions | $ 0 | NIS | Limited | Limited | Limited | n/a | n/a |
| Seismic Safety | $ 0 | NIS | Limited | Limited | Limited | n/a | n/a |
| Tax Delinquency and Felony Conviction | $ 0 | NIS | **REQD** | **REQD** | **REQD** | **REQD** | n/a |
| Termination of Contract | $10,000 | NIS | **REQD** | **REQD** | **REQD** | **REQD** | n/a |
| Veteran's Preference | $ 0 | NIS | **REQD** | **REQD** | **REQD** | **REQD** | n/a |

# APPENDIX A – CONTRACT PROVISIONS

## A1 ACCESS TO RECORDS AND REPORTS

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 AFFIRMATIVE ACTION REQUIREMENT

**NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION to ENSURE EQUAL EMPLOYMENT OPPORTUNITY**

1. The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.

2. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

**Timetables**

| | |
|---|---|
| Goals for minority participation for each trade: | **0.5%** |
| Goals for female participation in each trade: | 6.9% |

These goals are applicable to all of the Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the Contractor also is subject to the goals for both its federally involved and non-federally involved construction.

The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a) and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

3. The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs (OFCCP) within 10 working days of award of any construction subcontract in excess of $10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address, and telephone number of the subcontractor; employer identification number of the subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the subcontract is to be performed.

4. As used in this notice and in the contract resulting from this solicitation, the "covered area" is Maine, Kennebec County, Augusta**.**

## A3 BREACH OF CONTRACT TERMS

Any violation or breach of terms of this contract on the part of the *Contractor* 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 written notice that describes the nature of the breach and corrective actions the Contractor 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 must correct the breach. Owner may proceed with termination of the contract if the Contractor 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.

## A4 BUY AMERICAN PREFERENCE

### A4.1 SOURCE

Title 49 USC § 50101

### A4.2 APPLICABILITY

The Buy American Preference requirement in 49 USC § 50101 requires that all steel and manufactured goods used on AIP projects be produced in the United States. The statute gives the FAA the ability to issue a waiver to a sponsor to use non-domestic material on an AIP funded project subject to meeting certain conditions. A sponsor may request that the FAA issue a waiver from the Buy American Preference requirements if the FAA finds that:

1) Applying the provision is not in the public interest;
2) The steel or manufactured goods are not available in sufficient quantity or quality in the United States;
3) The cost of components and subcomponents produced in the United States is more than 60 percent of the total components of a facility or equipment, and final assembly has taken place in the United States. Items that have an FAA standard specification item number (such as specific airport lighting equipment) are considered the equipment.
4) Applying this provision would increase the cost of the overall project by more than 25 percent.

**Timing of Waiver Requests.** Sponsors desiring a Type 1 or Type 2 waiver must submit their waiver requests *before* issuing a solicitation for bids or a request for proposal for a project.

The sponsor must submit Type 3 or Type 4 waiver requests *prior* to executing the contract. The FAA will generally not consider waiver requests after execution of the contract except where extraordinary and extenuating circumstances exist. The FAA cannot review waiver requests with incomplete information. Sponsors must assess the adequacy of the waiver request and associated information prior to forwarding a waiver request to the FAA for action.

**Buy American Conformance List.** The FAA Office of Airports maintains a listing of equipment that has received a nationwide waiver from the Buy American Preference requirements or that fully meet the Buy American requirements. The Nationwide Buy American Waiver List is available online at www.faa.gov/airports/aip/buy_american/. Products listed on the Buy American Conformance list do not require additional submittal of domestic content information under a project specific Buy American Preference waiver.

**Contract Types** –

*Construction and Equipment* – The sponsor must meet the Buy American Preference requirements of 49 USC § 50101 for all AIP funded projects that require steel or manufactured goods. The Buy America requirements flow down from the sponsor to first tier contractors, who are responsible for ensuring that lower tier contractors and subcontractors are also in compliance.

- Projects for non-facility development (non-building construction projects such as runway or roadway construction or equipment acquisition projects) – Insert the Certificate of Compliance Based on Equipment and Materials Used on the Project.

## A4.3 SOLICITATION CLAUSE

### A4.3.1 Buy American Preference Statement

BUY AMERICAN PREFERENCE

The Contractor agrees to comply with 49 USC § 50101, which provides that Federal funds may not be obligated unless all 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 Buy America certification included herein with their bid or offer. The Owner will reject as nonresponsive any bid or offer that does not include a completed Certificate of Buy American Compliance.

### A4.3.3 Certificate of Buy American Compliance – Manufactured Product

**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.

**Required Documentation**

**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 |

## A5 CIVIL RIGHTS - GENERAL

### GENERAL CIVIL RIGHTS PROVISIONS

The Contractor agrees to comply with pertinent statutes, Executive Orders and such rules as are promulgated to ensure that no person shall, on the grounds of race, creed, color, national origin, sex, age, or disability be excluded from participating in any activity conducted with or benefiting from Federal assistance.

This provision binds the Contractor and subcontractors from the bid solicitation period through the completion of the contract. This provision is in addition to that required by Title VI of the Civil Rights Act of 1964.

### Title VI Solicitation Notice

**Title VI Solicitation Notice:**

The **Maine Department of Transportation**, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 USC §§ 2000d to 2000d-4) and the Regulations, hereby notifies all bidders or offerors 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.

**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, or national origin 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.
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.

**Title VI List of Pertinent Nondiscrimination Acts and Authorities**

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 USC § 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);
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 USC § 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 USC § 794 *et seq*.), as amended (prohibits discrimination on the basis of disability); and 49 CFR part 27;
- The Age Discrimination Act of 1975, as amended (42 USC § 6101 *et seq*.) (prohibits discrimination on the basis of age);
- Airport and Airway Improvement Act of 1982 (49 USC § 471, Section 47123), as amended (prohibits discrimination based on race, creed, color, national origin, or sex);
- The Civil Rights Restoration Act of 1987 (PL 100-209) (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, which 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 (42 USC §§ 12131 – 12189) as implemented by U.S. Department of Transportation regulations at 49 CFR parts 37 and 38;
- The Federal Aviation Administration's Nondiscrimination statute (49 USC § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures nondiscrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;
- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);
- Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 USC 1681 et seq).

## A7 CLEAN AIR AND WATER POLLUTION CONTROL

Contractor agrees to comply with all applicable standards, orders, and regulations issued pursuant to the Clean Air Act (42 USC § 740-7671q) and the Federal Water Pollution Control Act as amended (33 USC § 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.
Contractor must include this requirement in all subcontracts that exceeds $150,000.

## A8 CONTRACT WORKHOURS AND SAFETY STANDARDS ACT 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 $10 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.

## A9 COPELAND "ANTI-KICKBACK" ACT

### 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.

## A10 DAVIS-BACON REQUIREMENTS

### 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 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 Part 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, Employment Standards Administration, 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 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 that 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

*www.dol.gov/whd/forms/wh347instr.htm* 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) 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) 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) 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 5.1

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, Bureau of Apprenticeship and Training, or with a State Apprenticeship Agency recognized by the Bureau, 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 Bureau of Apprenticeship and Training 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 Bureau of Apprenticeship and Training, or a State Apprenticeship Agency recognized by the Bureau,

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 not 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.

(iii) Equal Employment Opportunity. The utilization of apprentices, trainees, and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

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 Part 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 the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR Part 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.

## A11 DEBARMENT AND SUSPENSION

### CERTIFICATION OF OFFERER/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.

### Lower Tier Contract Certification

### 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 verify 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 Offerer /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.

## A12 DISADVANTAGED BUSINESS ENTERPRISE

### A12.3.1 Solicitation Language (Solicitations that include a Project Goal)

Information Submitted as a matter of bidder 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 bid 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; and
5) 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.

Information submitted as a matter of bidder 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.

The successful Bidder or Offeror must provide written confirmation of participation from each of the DBE firms the Bidder or Offeror lists in its commitment 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; and
5) 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.

### Solicitation Language (Race/Gender Neutral Means)

The requirements of 49 CFR part 26 apply to this contract. It is the policy of the [Insert Name of Owner] to practice nondiscrimination based on race, color, sex, or national origin in the award or performance of this contract. The Owner encourages participation by all firms qualifying under this solicitation regardless of business size or ownership.

## Prime Contracts (Projects Covered by a DBE Program)

### DISADVANTAGED BUSINESS ENTERPRISES

**Contract Assurance (§ 26.13) –**

The Contractor 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 Department of Transportation-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 Owner 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 (§26.29**) – The prime contractor agrees to pay each subcontractor under this prime contract for satisfactory performance of its contract no later than 30 days from the receipt of each payment the prime contractor receives from the Maine Department of Transportation. The prime contractor agrees further to return retainage payments to each subcontractor within 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 Maine Department of Transportation. This clause applies to both DBE and non-DBE subcontractors.

## A13 DISTRACTED DRIVING

### 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 $3,500 that involve driving a motor vehicle in performance of work activities associated with the project.

## A14 ENERGY CONSERVATION REQUIREMENTS

### ENERGY CONSERVATION REQUIREMENTS

Contractor and Subcontractor agree to comply with mandatory standards and policies relating to energy efficiency as contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (42 USC 6201*et seq*).

## A16 EQUAL EMPLOYMENT OPPORTUNITY (EEO)

**EQUAL OPPORTUNITY CLAUSE**

During the performance of this contract, the Contractor agrees as follows:

(1) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, sexual orientation, gender identify, or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff, or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

(2) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive considerations for employment without regard to race, color, religion, sex, or national origin.

(3) The Contractor will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the Contractor's commitments under this section and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(4) The Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(5) The Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(6) In the event of the Contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(7) The Contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the

administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance*: Provided, however*, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

## EEO Specification

**STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONSTRUCTION CONTRACT SPECIFICATIONS**

1. As used in these specifications:

   a. "Covered area" means the geographical area described in the solicitation from which this contract resulted;

   b. "Director" means Director, Office of Federal Contract Compliance Programs (OFCCP), U.S. Department of Labor, or any person to whom the Director delegates authority;

   c. "Employer identification number" means the Federal social security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941;

   d. "Minority" includes:

      (1) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);

      (2) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin regardless of race);

      (3) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and

      (4) American Indian or Alaskan native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

2. Whenever the Contractor, or any subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of $10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.

3. If the Contractor is participating (pursuant to 41 CFR part 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors shall be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each contractor or subcontractor participating in an approved plan is individually required to comply with its obligations under the EEO clause and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other

contractors or subcontractors toward a goal in an approved Plan does not excuse any covered contractor's or subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.

4. The Contractor shall implement the specific affirmative action standards provided in paragraphs 7a through 7p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered construction contractors performing construction work in a geographical area where they do not have a Federal or federally assisted construction contract shall apply the minority and female goals established for the geographical area where the work is being performed. Goals are published periodically in the Federal Register in notice form, and such notices may be obtained from any Office of Federal Contract Compliance Programs office or from Federal procurement contracting officers. The Contractor is expected to make substantially uniform progress in meeting its goals in each craft during the period specified.

5. Neither the provisions of any collective bargaining agreement nor the failure by a union with whom the Contractor has a collective bargaining agreement to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.

6. In order for the non-working training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees shall be employed by the Contractor during the training period and the Contractor shall have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees shall be trained pursuant to training programs approved by the U.S. Department of Labor.

7. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully and shall implement affirmative action steps at least as extensive as the following:

a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other onsite supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.

c. Maintain a current file of the names, addresses, and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source, or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor

by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefore along with whatever additional actions the Contractor may have taken.

d. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or female sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.

e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under 7b above.

f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.

g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination, or other employment decisions, including specific review of these items, with onsite supervisory personnel such superintendents, general foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

h. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other contractors and subcontractors with whom the Contractor does or anticipates doing business.

i. Direct its recruitment efforts, both oral and written, to minority, female, and community organizations, to schools with minority and female students; and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations, such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer, and vacation employment to minority and female youth both on the site and in other areas of a contractor's workforce.

k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR part 60-3.

l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel, for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.

m. Ensure that seniority practices, job classifications, work assignments, and other personnel practices do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.

n. Ensure that all facilities and company activities are non-segregated except that separate or single user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.

p. Conduct a review, at least annually, of all supervisor's adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

8. Contractors are encouraged to participate in voluntary associations, which assist in fulfilling one or more of their affirmative action obligations (7a through 7p). The efforts of a contractor association, joint contractor union, contractor community, or other similar groups of which the Contractor is a member and participant may be asserted as fulfilling any one or more of its obligations under 7a through 7p of these specifications provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

9. A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, if the particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally), the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized.

10. The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

11. The Contractor shall not enter into any subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination, and cancellation of existing

subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.

13. The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR part 60-4.8.

14. The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government, and to keep records. Records shall at least include for each employee, the name, address, telephone number, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g. those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

## A17 FEDERAL FAIR LABOR STANDARDS ACT (FEDERAL MINIMUM WAGE)

### SOLICITATION CLAUSE

All contracts and subcontracts that result from this solicitation incorporate by reference the provisions of 29 CFR part 201, 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* | *Consultant*] has full responsibility to monitor compliance to the referenced statute or regulation. The [*Contractor* | *Consultant*] must address any claims or disputes that arise from this requirement directly with the U.S. Department of Labor – Wage and Hour Division.

## A18 LOBBYING AND INFLUENCING FEDERAL EMPLOYEES

### 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 section 1352, title 31, U.S. Code. 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.

## A19 PROHIBITION of SEGREGATED FACILITIES

### PROHIBITION OF SEGREGATED FACILITIES

(a) The Contractor agrees 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 Contractor agrees that a breach of this clause is a violation of the Equal Employment Opportunity clause in this contract.

(b) "Segregated facilities," as used in this clause, means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing 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.

(c) The Contractor shall include this clause in every subcontract and purchase order that is subject to the Equal Employment Opportunity clause of this contract.

## A20 OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970

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 (20 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.

## A21 PROCUREMENT OF RECOVERED MATERIALS

### PROCUREMENT OF RECOVERED MATERIALS

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.

## A24 TAX DELINQUENCY AND FELONY CONVICTIONS

### CERTIFICATION OF OFFERER/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 (✓) 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**

1) The applicant 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 the tax liability.

2) The applicant represents that it is ( ) is not ( ) is not 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 twentyfour (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.

## A25 TERMINATION OF CONTRACT

### A25.3.1 Termination for Convenience

**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 DEFAULT (CONSTRUCTION)

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

## A26 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 Section 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.

## A27 VETERAN'S PREFERENCE

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 Title 49 United States Code Section 47112. Covered veterans include Vietnam-era veterans, Persian Gulf veterans, Afghanistan-Iraq war veterans, disabled veterans, and small business concerns (as defined by 15 USC 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.

# DIVISION 1 - SPECIFICATIONS

## SPECIAL PROVISIONS

## SP-2 Supplemental General Provisions

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## SPECIAL PROVISIONS FOR ALL AVIATION PROJECTS
## FEDERALLY OBLIGATED AIRPORTS

**Part A – Project Specific Clauses**

**1.** DBE DIRECTORY. The latest edition of the DBE Directory can be obtained from the MaineDOT Civil Rights Office webpage at the following address:

http://maine.gov/mdot/civilrights/dbe/

Contractors that do not have access to the internet may obtain a copy by contacting the Engineer.

**2.** **WAGE RATES.** U.S. Department of Labor Davis-Bacon wage rates are applicable to this Contract and are included in Special Provisions Section SP-2.

**3.** **CONTACT WITH THE AIRPORT.** From the time of advertising until the actual bid opening for this Contract, the only contact with the Airport will be as described in the Invitation for Bids.

**4.** **SUSPENSION OF WORK.** The Contractor is hereby notified that in the absence of the Engineer, the Airport's Safety Officer and the Airport Operator shall each have the authority to suspend work when they determine that a serious safety or environmental violation exists on the job site. The period of time when work is suspended due to a serious safety or environmental violation will not be justification for an extension of time or the award of damages to the Contractor.

**5.** **CONTRACT DOCUMENTS.** The Contractor's attention is directed to the following documents that make up the Contract Documents and are effective for this Contract:

Table of Contents
Invitation to Bid
Instructions to Bidders
Bid Proposal
Bid Bond
Award of Contract and Execution of Contract Bonds
Contract
Performance Bond
Payment Bond
Notice of Award
Notice to Proceed
Contractor's Guaranty
Special Provisions:
Permits:
Maine Site Location of Development Act

Contact Provision Guidelines for Obligated Sponsors and Airport Improvement Program Projects
Supplemental General Provisions
US Department of Labor – Davis-Bacon Wage Rates
Reference Documents:
41 CFR – 60-4.2 & 4.3
49 CFR 26 – Title 49: Transportation
Forms MJ-200 through MJ-225
Construction Safety and Phasing Plan
AC 150/5370-2G - Operational Safety on Airports During Construction
Geotechnical Reports

General Provisions:
FAA – General Provisions
FAA – Technical Specifications
Plans
Addendums

**6.** **DAILY LIST OF WORKERS.** The Contractor shall provide a daily list of workers on the site in accordance with Section 57.1, Subsection vii of this section.

**7.** **UTILITIES.** Central Maine Power is the electric utility company that provides electric service to the Airport. No disturbance for their facilities is anticipated as part of this project.

**8.** **PERMIT AND REGULATION COMPLIANCE.** The Contractor shall comply with all project permits, general permits, state laws, and state and local regulations. Any fines assessed against the Airport and related expenses due to non-compliance with the permits, laws, rules, and regulations cited in the Contract Documents and caused by the Contractor and their personnel, Subcontractors and Vendors shall be paid for by the Contractor.

For permit requirements refer to the Special Provisions of the Contract Documents.

**9.** **WORK AREAS.** In order to enhance safety during construction and minimize the impacts on Airport operations caused by construction, a Construction Safety Phasing Plan (CSPP) has been prepared for the Project. Within the CSPP the project has been divided into Work Area(s) for safety and to minimize the impacts on Airport operations. This CSPP is to be followed explicitly by the contractor. Please refer to Special Provision Section SP-5 for the CSPP requirements.

**10.** **WORK AREA REQUIREMENTS.** A general outline of the safety precautions, pre-work requirements and administrative requirements required prior to being allowed to work in any of the specified work areas is provided within the CSPP documents in Section SP-5. The work area requirements are not intended to describe every work element or every detail of work, but rather provide the Contractor with an outline of Airport safety measures, safety protocols and operational requirements during the progression of work.

The Contractor shall propose the actual sequencing of the work in all work areas subject to the conditions indicated below and conditions specified within the CSPP. If requested, the Contractor shall make necessary changes in the sequencing in order to facilitate Airport operation and safety. All work shall be completed within the specified contract time.

Contractor calendar days as specified in Section 9 for all Work Areas need not be sequential. The coordination and scheduling of work within each work area shall be coordinated with Airport Management and the Engineer.

The contract work time for each work area is not intended to be sequential. The contractor may sequence that time, with coordination with the Airport and the Engineer as required as long as that time falls within the total contract time.

**11.** **PROJECT DURATION.** Upon execution of the Contract, the Sponsor will issue a written "Notice to Proceed" which will specify an effective date for the Contractor to begin work at the site. All work under this Contract must be completed within Total Contract Time of **Sixty (60) calendar days** of the date specified in the "Notice to Proceed." In addition, work within the designated work areas shall be completed within the following:

- **Refer to Construction Safety and Phasing Plan CSPP.**

It shall be understood that it is the Contractor's responsibility to schedule and request stoppages in contract time for each respective work area. Further, it is understood that if it is determined to be in the best interest of the Owner and the Airport, the request for a Contract time stoppage can and will be denied. During a Contract time stoppage, no work may commence in that work area until a request is made to resume work and Contract time. If work is performed without an official restart of the Contract time it is agreed that the work performed is at the Contractor's expense and is not eligible for measurement of payment. This project is assumed to have no Contract time stoppage between Phases.

It shall be clearly understood that the Contract time is contractual, and if the time is exceeded, liquidated damages will be assessed. Requests for additional Contract time will only be granted for the following reasons:

1) Additional work is authorized by change order.
2) Delays or postponements of critical path work per the approved construction schedule are requested by the Owner.
3) Material delivery delays, which are documented and are beyond the Contractor's control. Material delivery delays, which are not documented, and not accounted for or identified in the Contractor's schedule, will not be considered a valid justification to extend the Contract time.

**12.** **LIQUIDATED DAMAGES.** If the work remains incomplete after the times specified in the Project Duration Section above for the Total Contract Time or the Contract Time for a Work Area, the Contractor agrees to pay the Owner as liquidated damages the following:

- **$1,800.00** per day for each and **every calendar day** that the work remains incomplete beyond the Total Contract Time listed in the Project Duration section, above.

**13. ADDITIONAL RESIDENT ENGINEER SERVICES.** The Owner has established a Resident Engineering budget based on the work hours made available to the Contractor. If the Contractor's work schedule exceeds the Total Contract Time for the project, the Contractor agrees to pay the Owner the additional cost for the Resident Engineer in excess of the budgeted hours. The weekly Resident Engineering budget is sixteen (16) hours per week. The cost to the Contractor shall be based on the Resident Engineer's actual billing rate plus expenses and fifteen percent (15%) profit in effect at the time the services were provided. For budgeting purposes, an hourly rate of $140.00/hour is recommended. It shall be understood that these charges are in addition to any other damage claims available to the Owner (Liquidated Damages, Breach of Contract, etc., as described within the Contract Documents).

**14. MONTHLY DBE REPORTING.** The Contractor shall submit monthly Disadvantaged Business Enterprise (DBE) reports. The Contractor shall use Form MJ-216 as included within this Specification. The report shall be submitted regardless of if any DBE participation took place during the period indicated. In general, Form MJ-216 is to be submitted with the Contractor's Periodic Cost Estimate, but the form must be submitted monthly even if no Periodic Cost Estimates are submitted.

The Contractor shall continually monitor their DBE participation on the Project. If it appears that the actual DBE participation will be lower than indicated in the Contractor's DBE Letter of Intent, the Contractor shall promptly provide written notification, and indicate just reason for the change. The Contractor shall further provide additional Good Faith Effort documentation that effort was made to replace this DBE participation as outlined in the Special Provisions.

Monthly DBE reports will be required prior to the acceptance of any Periodic Cost Estimate (PCE). Retainage for the Project will not be released until all Project monthly DBE reporting documentation has been submitted to and approved by the Engineer.

**15. COORDINATION OF CONTRACT DOCUMENTS.**

(a) General. The various sections of the Contract Documents are essential parts of the Contract; a requirement occurring in one is as binding as though occurring in all. The Contract Documents are complementary and intended to describe and provide for a complete work product. In case of discrepancy, precedence of the Contract Documents will be determined in the following order:

Contract Document Precedence

1. Project Permits. In the event of a conflict between permit requirements, the more protective or stringent shall take precedence as determined by the Engineer.

2. Contract

3. Contact Provision Guidelines for Obligated Sponsors and Airport Improvement Program Projects

4. Invitation to Bid

5. Special Provisions – Supplemental General Provisions

6. Other Special Provisions documents.

7. FAA – Technical Specifications

8. FAA – General Provisions

9. Contract Plans
    a. Calculated Dimensions
    b. Scaled Dimensions

10. Cited Standards for Materials or Testing

11. Cited FAA Advisory Circulars and Orders

12. Any Other Specifications Adopted by Reference

Addendum items take on the precedence of the item they are revising or the section into which they are added.

(b) No Advantage from Errors or Omissions in Contract Documents. Neither the Contractor nor the Owner shall take advantage or be afforded any benefit as the result of apparent error(s) or omission(s) in the Contract Documents. If either party discovers error(s) or omission(s), it shall immediately notify the other. Failure of a bidder to notify the Owner or apparent error(s) or omission(s) in the Contract Documents during the bid process may result in their bid being determined to be non-responsive.

(c) Corrections to Contract Documents. The Engineer will make corrections and interpretations deemed necessary and appropriate to fulfill the intent of the Contract Documents. When there is an apparent absence or mention of a detail or an apparent omission of a detailed description in the Contract Documents, the detail or description shall be interpreted/understood/determined using the best general engineering and construction practice.

(d) Effect of Other Specifications/Standards. Other specifications (e.g. ASTM, NDS, CRSI, ACI) cited by reference shall become effective only if the work or material covered by them is not included in the Contract Documents. Specifications so referenced shall be the latest revision in effect on the date of advertisement for bids.

**16. BID VALID PERIOD.** No bids may be withdrawn by the Bidder prior to the date listed in the Invitation to Bid.

**17. SPECIALTY ITEMS.** The following items are considered “Specialty Items” in this project:

**a. None anticipated.**

**18. GENERAL SURETY REQUIREMENTS:**

The Proposal Surety shall be as specified in the Invitation to Bid; only the Bid Bond as bound within these documents or a Cashier's Check is acceptable. Upon request of the bidder, the Owner may choose to accept the AIA Bid Bond form. Each separate Proposal shall be accompanied by a Cashier's Check or Proposal Bond on the form provided herein in the amount of Five Percent (5 %) of the total amount bid, made payable to the Owner. If a Proposal Bond is provided in lieu of a Cashier's Check, it must be accompanied by a Surety's Bond Affidavit indicating that the person signing the bond on behalf of the Surety has full legal authority to do so.

If a Surety Bond is provided, the Surety Company issuing the bond shall be listed on the current United States Department of the Treasury "Department of the Treasury's listing of approved Sureties (Department Circular 570)" as authorized to do business in the State of Maine. Bids submitted without Bid Security will be rejected as nonresponsive.

100% Contract Payment and 100% Performance Bonds shall be as specified in Section 30-05 of the General Provisions, and must be accompanied by a Surety's Bond Affidavit indicating that the person signing the bond on behalf of the Surety has full legal authority to do so. The Surety Company issuing the bond shall be listed on the current United States Department of the Treasury "Department of the Treasury's listing of approved Sureties (Department Circular 570)" as authorized to do business in the State of Maine. These Bonds are required from the Contractor guaranteeing that the Contract, including the various guarantee periods thereunder, will be faithfully performed and that Contractor will promptly make payment to all persons supplying them labor, materials, supplies, and services used directly or indirectly by the Contractor in the prosecution of the work provided for in the Contract.

If, at any time after the execution of the Contract and the Contract Bonds, as above required, the Owner deems the Surety or Sureties upon such Bond or Bonds is unsatisfactory, or if, for any reasons, such Bond or Bonds cease(s) to be adequate to cover the performance of the work or prompt payment as above specified, Contractor shall, at its expense and within 15 days written notice from the Owner to do so, furnish additional Bond or Bonds in such form and amount and with such Surety and Sureties as shall be satisfactory to the Owner. In such event, no further payment to the Contractor shall be deemed due under the Agreement until such new or additional bond or bonds are furnished in a manner and form satisfactory to the Owner.

The Bidder to whom the Contract is awarded must deposit with the Owner at the date of substantial completion of the Contract a Maintenance Surety Bond in a sum equal to 15 percent of the adjusted Contract amount at completion of work, guaranteeing against defective workmanship and materials for a period of one year from the date of substantial completion. The bond shall be in the form acceptable to the Owner and the Surety Company issuing the bond shall be listed on the current United States Department of the Treasury "Department of the Treasury's listing of approved Sureties (Department Circular 570)" as authorized to do business in the State of Maine. The Contractor shall be responsible for obtaining and maintaining the Bond in force from the date of substantial completion until the expiration of the one year maintenance period.

**19. RETAINAGE.** The Retainage Percentage for this project, as defined in General Provisions, shall be 10% (ten Percent).

**20. Not Used**

**21. Not Used**

**22. Not Used**

**23. Not Used**

**24. Not Used**

**25. Not Used**

**Part B – FAA Required Clauses – Current as of June 19, 2018**

**26. through 54. NOT USED.**

**Part C – General Aviation Clauses**

## 55. FORMS

The Special Provisions Section of these Specifications contains most of the forms required for use during the project and referenced throughout the Contract Documents. Most of the forms have been assigned unique form numbers to assist the Contractor in locating the correct form. After award of the Contract, the Prime Contractor may request electronic copies of some or all the forms contained in Special Provision Section.

## 56. SHOP DRAWINGS AND SUBMITTALS

**56.1** Submittals shall include but not be limited to: shop drawings, schedules, samples, and manufacturer's literature as required by the Specifications or requested by the Resident Engineer.

No work shall be fabricated until such approval has been received. Work performed without shop drawing approval is at the Contractor's own risk.

**56.2** All submissions shall include a Form MJ-213 "CONTRACTOR SUBMITTAL FORM" as a cover sheet to the submittal information. For submittals generated from Subcontractors, two (2) submittal forms are required, one (1) Form MJ-213 from the Contractor and one (1) From MJ-214 “SUBCONTRACTOR SUBMITTAL FORM” from the Subcontractor. Submittals received without the completed submittal form(s) will be returned to the Contractor as incomplete and not reviewed. Contractor submittal forms shall be printed on colored paper of the Contractor's choice and shall remain the same color throughout the project.

Contractor submittal forms MJ-213 and MJ-214 are provided in “Forms” as referenced above.

**56.3** Submissions made directly by Subcontractors will not be accepted. All business concerning approval will be conducted through the Contractor.

The Contractor shall submit for the approval of the Resident Engineer, the following number of submittal copies:

- Four (4) copies for the Resident Engineer
- Plus the number of copies required by the Contractor/Subcontractor

The Contractor may submit Submittals via email on Adobe Acrobat (.pdf) format. In the event that Submittals are submitted via email, it shall be the Contractor’s responsibility to ensure that the Submittal is received by the Engineer.

**56.4** Submissions shall be made sufficiently in advance of construction requirements to allow ample time for checking, resubmitting and rechecking without causing delay in the work. Failure to submit shop drawings in a timely manner shall not be considered as a valid reason for a Contract time extension.

**56.5** Each submission, including the submission of Subcontractors shall be checked by the Contractor for accuracy and compliance with the Contract Documents. The certification on the submittal form shall constitute as evidence of such checking and coordination.

Submissions without this certification will not be considered for review by the Resident Engineer.

Submittal certification shall include one (1) of the following:

1. Submitted "as specified" for the product
2. Submitted "AS EQUAL" to the product specified
3. Submitted "IN SUBSTITUTION" for the product specified
4. "OTHER"

1. Submitted "as specified" shall mean the Contractor is certifying that the submittal item or system is of the same manufacture and model number, or performance standard as specified and is in all ways identical to the Contract Documents in form and function. For these items, manufacturer's data sheets shall be attached to the Contractor submittal form.

2. Submitted "AS EQUAL" to the product or system specified shall mean the Contractor is certifying the proposed submittal, although supplied by a manufacturer other than the one specified for the item meets or exceeds the physical requirements, function, specifications, quality, speed, reliability, service life, safety, and/or maintenance costs of the product specified, and is capable of being incorporated into the overall project without design revisions and will perform equally or better than the specified item. For these items, manufacturer's data sheets shall be attached to the Contractor submittal to demonstrate that the performance, durability and/or maintenance standards of the product are as specified.

3. Submitted "IN SUBSTITUTION" to the product or system specified means the Contractor is proposing an item or system of different physical requirements, specifications, quality, reliability, and/or maintenance costs, than the product specified. For a submission "IN SUBSTITUTION" of the product or system specified, the following information and procedure shall be followed to determine if the Owner's requirements will be satisfied:

    a. Design the system to meet or exceed the operational requirements, physical requirements, specifications, quality, reliability, maintenance costs, and ease of operation of the specified system.

    b. Submit full Specifications for the system and all components in the form of shop drawings for review by the Owner and the Engineer.

    c. Submit a revised design for the system, stamped by a licensed Professional Engineer within the state in which the work is to be performed.

    d. Submit revised details for any and all components of the proposed system that are different than those of the specified system. A licensed Professional

Engineer within the state in which the work is to be performed shall stamp details.

e. Demonstrate the proposed system to the satisfaction of the Owner and Engineer.

f. Reimburse the Engineer at the rate of $170.00 per hour for Project Managers and $130.00 per hour plus expenses for Project Engineers for all time spent reviewing, discussing and otherwise being involved with the substitute system. The payment shall be made based on an estimate of the time required and shall be paid in advance of the review. If the estimated amount is exceeded, additional amounts must be provided by the Contractor for the review to continue. Upon completion of the review, a summary invoice will be provided to the Contractor indicating the hours spent and amount billed. Any money not spent on the review will be returned to the Contractor.

g. Provide a credit satisfactory to the Owner for any cost savings associated with the substitution. The Contractor should anticipate providing a credit equal to one-half of the cost differential between the specified system and the system proposed for substitution.

Acceptance of any alternate item or system will be at the discretion of the Owner. Upon acceptance or rejection of a system or component thereof, the Engineer shall provide a written response to the Contractor in the form of a shop drawing review.

4. Submitted Certified as "OTHER". The Contractor shall provide information to demonstrate the proposed item or system will satisfy the design intent and provide the Owner performance, reliability and maintenance ease over its anticipated service life that exceeds that of the specified product. The final determination of suitability shall be the sole responsibility of the Owner.

**56.6** Changes on the submitted shop drawings that deviate from the Project Plans and Specifications must be brought to the Owner’s and Resident Engineer’s attention, in writing, prior to review. Changes must be clearly visible on the shop drawings in the form of written notation, ballooning, or highlighting the intended change. A written description for the proposed change must also be included and submitted on company letterhead. Changes to drawings and details not submitted in accordance with these requirements will not be recognized as an approved deviation from the Design of Record. Construction repairs, renovations, or replacements required as a result of shop drawing and submittal deviations that are not documented in accordance with these requirements are subject to removal and/or replacement by the Contractor, at the sole cost of the Contractor. The Contractor shall not be relieved of responsibility for errors or omissions in shop drawings, product data, samples or similar submittals by the Resident Engineer's actions.

**56.7** Shop drawings for pipe, fittings, and masonry items shall consist of certificates of conformance of affidavits from the manufacturer's signifying that all materials conform to the Specifications.

**56.8** The Contractor shall allow for sufficient time within the project schedule for shop drawing review and processing. Items requiring long lead times which impact the start or completion of the project shall be identified, brought to the Engineer's attention and noted on the shop drawing submission. Additional Contract time will not be provided for failure to submit shop drawings for approval in a timely manner.

**56.9** The Owner reserves the right to back charge the Contractor for expenses incurred in reviewing and returning incomplete shop drawings. Expenses shall include the costs of the Engineer at the rate of $170.00 per hour for Project Managers and $130.00 per hour plus expenses for Project Engineer's for the actual time incurred. The Contractor will be provided documentation of the expenses incurred. Contractor back charges will be deducted from payments due to the Contractor.

**56.10** The Contractor shall submit all required Buy American Preferences documentation with each shop drawing as outlined in Appendix Y of FAA Order 5100-38D (AIP Handbook) dated September 30, 2015 included in this Specification (Section SP-1 – Required Federal Contract Provisions for AIP and Obligated Sponsors) and as required by the Owner or the Resident Engineer. Delays caused by the Buy American Preferences program shall be expected and the Contractor agrees to make no monetary claim for delays, interferences or hindrances of any kind in the performance of this Contract occasioned by any act or omission to act of the Owner or any of its Representatives.

**Each shop drawing and submittal shall be accompanied by a signed copy of Form MJ-212 "Contractor / Subcontractor / Supplier Buy American Certification."** A blank copy of this form is included in the "Forms" Section referenced above.

## 57. DISADVANTAGED BUSINESS ENTERPRISE (DBE) AND SMALL BUSINESS PROGRAMS

The State of Maine, for the State of Maine-Augusta State Airport has established a DBE program in accordance with 49 CFR Part 26 (Part 26) and the U. S. Department of Transportation (USDOT) regulations.

### 57.1 DBE PROGRAM:

It is the policy of the State of Maine, to help ensure that DBEs, as defined in Part 26, have an equal opportunity to receive and participate in FAA - assisted contracts. It is also our policy:

- To help ensure nondiscrimination in the award and administration of FAA - assisted contracts;
- To create a level playing field on which DBEs can compete fairly for FAA - assisted contracts;
- To help ensure that the DBE program is narrowly tailored in accordance with applicable law. To help ensure that only firms that fully meet Part 26 eligibility standards are permitted to participate as DBE firms;
- To help remove barriers to the participation of DBEs in DOT assisted contracts;
- To assist the development of firms that can compete successfully in the marketplace outside the DBE program; and,

- To help ensure that all firms, from prime contractors to subcontractors, understand and respect their obligations relative to all aspects of the DBE program, and that deviations from the requirements of the regulation may be subject to applicable state and federal enforcement sanctions

The State of Maine, has delegated a DBE Liaison Officer. In that capacity, they are 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 State of Maine in its financial assistance agreements with the Department of Transportation. A Copy of the State of Maine, Augusta State Airport – DBE Program" is on file at the State of Maine, DOT offices.

The State of Maine has chosen to have a Race-Neutral DBE program for federal fiscal year 2021. A Race-Neutral program is one where the Airport works to create a level playing field where all firms, including DBE's and small businesses, can compete for work. A Race-Neutral DBE program does not include project specific DBE goals.

Although Contractors do not have a project specific goal for DBE participation on this project, Contractors must still comply with the requirements of 49 CFR Part 26 and the AIP Federal Contract Provisions contained in Section SP-1. Some of these requirements include:

i. Seeking Subcontractors and Suppliers: Bidders must make a good faith effort to provide notice to all firms, including small businesses and DBE's, of upcoming opportunities to supply materials or subcontract on federally funded projects. Some examples of good faith efforts would be: contacting all firms on the state DBE or minority contractor listing to notify them of opportunities; compiling lists of firms that have previously shown an interest in working on federally funded projects and contacting them when bidding projects; using services like Construction Summary to advertise for suppliers and subcontractors; and before the start of the "bidding season" place ads in newspapers and on the company web site to solicit letters of interest from firms.

   Despite the fact that there is no project specific DBE goal for this project, the Contractor must still utilize the Good Faith Effort guidelines and procedures in 49 CFR Part 26 including Appendix A.

ii. Prompt Payment: Prime Contractor can level the playing field for all Subcontractors and Suppliers by paying them promptly for satisfactory completion of their work. Contractors are encouraged to pay Subcontractors and Suppliers as quickly as possible. Contractors are required to pay all Subcontractors and Suppliers in accordance with the Prompt Payment clause in this Section 38.2.

iii. Identification of DBE and Small Business Contractors Included in the Bid: The Prime Contractor is required to provide the anticipated DBE and Small Business utilization that is included in their bid. Form MJ-205 "Proposed Disadvantages Business Enterprise (DBE) and Small Business Utilization – Race Neutral Projects" must be filled in and included with the Prime Contractor's bid. The form must include the percentage of DBE participation and Small Business participation

that the Prime Contractor anticipates achieving for the project. The form must include the name, proposed work, and dollar amount of the work that the DBE or Small Business will be providing.

For each DBE or Small Business listed on Form MJ-205, the Contractor must also submit a copy of Form MJ-206 "Prime Contractor – DBE/Small Business Reporting Information Form" (if the Prime Contractor is a DBE or Small Business) or MJ-207 "Subcontractor / Supplier DBE / Small Business Reporting Information Form" with detailed information on the firm.

Within 36 hours of the bid opening, the Contractor must submit signed copies of Form MJ-215 "Subcontractor / Supplier Disadvantaged Business Enterprise (DBE) and Small Business – Letter of Intent" for each DBE or Small Business firm listed in on Form MJ-205.

iv. DBE and Small Business Termination and Substitution: Contractors must utilize the all DBE and Small Business Subcontractors and Suppliers for the work and for the payment amount listed in their bids. The work or payment amount of DBE and Small Business Subcontractors and Suppliers may not be reduced, switched to a different contractor, or eliminated unless a written request is made to the Owner and the Owner approves the change.

If a substitution or a change in the work or payment amount of DBE and Small Business Subcontractors and Suppliers is requested, the work or payment shall be shifted to another DBE or Small Business Subcontractor or Supplier. Any change or substitution of subcontractors, suppliers, or joint venture partners requires the approval of the Owner**. The Contractor shall submit a copy of Form MJ-225 to the Engineer to request permission to change or substitution of subcontractors, suppliers, or joint venture partners.** If another DBE or Small Business Subcontractor or Supplier cannot be found by the Contractor, they must provide documentation of Good Faith Effort as outlined in 49 CFR Part 26 including Appendix A.

The DBE and Small Business termination or substitution process is complicated and time consuming. The Contractor is not entitled to any contract time extensions as a result of the process. The Contractor may not make any delay claims against the Owner nor will the Contractor be entitled to receive any additional compensation due to the termination or substitution of a Subcontractor or a Supplier.

Failure to comply with the requirements of this section may result in the Contractor's termination for cause.

v. Commercially Useful Function: DBE's and Small Businesses must perform a commercially useful function as defined by 49 CFR Part 26 to be counted in the calculation of DBE or Small Business accomplishments. In particular, DBE's and Small Businesses may not use any of the Prime Contractor's employees, equipment, or materials in the performance of their work.

vi. Calculating DBE Participation: The Contractor shall consult 49 CFR Part 26 and understand the way DBE participation is counted on FAA funded projects such as this project. Only DBE's certified by the Maine Department of Transportation shall be considered as DBE's for this project. DBE firms that are certified in other states and firms that think that they may be eligible to be certified as a DBE in this state are encouraged to contact the Maine Department of Transportation.

vii. List of Potential Subcontractors and Suppliers: All bidders shall provide information on all firms that they contacted or considered as a potential Subcontractor or Supplier on this project. The Contractor may either provide a copy of Form MJ-207 for each firm or may provide a spreadsheet or other list containing the information contained on Form MJ-207. **This information must be provided with the Contractor's bid.** Failure to provide this information with the bid may result in the Owner declaring the bid non-responsive and rejecting it.

viii. Construction Phase Information: During the on-site construction work, the Prime Contractor shall instruct all their employees as well as all employees of all subcontractors and other on-site personnel to sign in each day at the Contractor's office trailer. In addition, the Contractor shall provide the Resident Engineer with a daily list of workers and equipment on site.

**57.2 SMALL BUSINESS PROGRAM:**

It is the policy of the State of Maine, Augusta State Airport to facilitate competition by small business concerns, taking all reasonable steps to eliminate obstacles to their participation in federally funded projects, including unnecessary and unjustified bundling of contract requirements that may preclude small business participation in procurements as prime contractors or subcontractors.

A Small Business is defined in 49 CFR Part 26.5 and 13 CFR Part 121 and the average annual gross receipts can, in some cases, be over $19 million.

A DBE is typically also a Small Business and, if they qualify as both, they may be counted toward both the DBE and Small Business participation on this project.

The Contractor shall make all reasonable efforts to eliminate obstacles to small business participation in making portions of their work available to subcontractors. Methods that may be used include unbundling large tasks, using small business and DBE directories to solicit proposals from small businesses, and making all potential subcontractors and suppliers aware of prompt payment clauses contained in this project.

## 58. SUBLETTING WORK TO SUBCONTRACTORS AND SUPPLIERS OR ASSIGNMENT OF CONTRACT

**58.1 GENERAL:** The Contractor shall not sublet, assign, sell, transfer, or otherwise dispose of the Contract or any portion thereof, or of its right, title, or interest therein to any individual, firm, corporation, or other entity without the written consent of the State of Maine, Augusta State Airport. The Contractor must file with the State of Maine copies of all executed subcontracts and

other documents. An approved subcontractor shall not in turn sublet or assign any of the work pertaining to the subcontract without the Contractor obtaining further permission from the State of Maine. In no event shall the State of Maine approval release the Contractor from responsibility and liability under the Contract and bonds.

Any work or material supply that costs $10,000 or more and is included in this project that the Prime Contractor wants to sublet to another firm must be approved by the State of Maine in writing. Any Subcontractors or Suppliers that will be doing work or supplying material that is sublet and approved by the State of Maine must have a signed contract with the Prime Contractor or a lower tier Subcontractor or Supplier before they may begin work or deliver material to the project site. The State of Maine reserves the right to reject the use of any Subcontractor or Supplier that they feel is not in best interests of the State of Maine.

**The Contractor must file the Forms outlined in Section 58.5 (below) to obtain the Owner's permission to utilize subcontractors and suppliers.**

**58.2 PERFORMANCE OF THE CONTRACT WORK:** The Contractor shall perform Contract work with its own organization amounting to at least **30 percent** of the total Contract work amount, minus "Specialty Items." The Contractor's own organization includes only workers employed and paid directly by the Contractor and equipment owned, leased, or rented by it from a non-debarred individual or entity, with or without operators. The term "own organization" does not include employees or equipment of a subcontractor, assignee, agent, or supplier of the Contractor. When determining whether the Contractor is in compliance with this requirement, the following shall apply:

(1) The cost of materials and manufactured products to be purchased or produced under the Contract shall be included in the amount upon which the percent requirement is computed.

(2) The percentage of subcontracted work shall be based on the Contract, rather than subcontract, unit prices. If only a part of a Contract item is to be sublet, its proportional value shall be determined on the same basis.

(3) When a firm sells materials to a Contractor and performs the work of incorporating the materials into the project, these actions must be considered in combination and as constituting a single subcontract.

**58.3 "SPECIALTY" ITEMS:** The cost of "Specialty Items" may be deducted from the total Contract price before computing the amount of work required to be performed by the Contractor's own organization. Specialty items will be designated, as such in Paragraph 17 and may be performed by subcontract.

**58.4 PERFORMANCE REQUIREMENTS:** The Contractor and its subcontractor(s) shall, in the staffing and administration of the Contract, comply with the following performance requirements:

(1) Commercially Useful Function. The Contractor and all subcontractor(s) must each perform a "commercially useful function". This means that the Contractor or Subcontractor is responsible for the execution of a distinct element of the work of a Contract and carries out its responsibilities by actually performing, managing, and

supervising the work involved. The Contractor or Subcontractor must have the latitude to independently:

a. Select contracts to be bid;

b. Determine prices to be quoted;

c. Select material suppliers;

d. Hire, fire, supervise, and pay employees; and

e. Direct or cause the direction of the management and policies of the firm.

The Contractor/subcontractor may not broker work for another firm or act as a bidding conduit.

(2) Contractor to Furnish Competent Representative; Safety Officer; Others. To ensure that any subcontracted work is performed in accordance with the Contract requirements, the Contractor shall be required to furnish:

a. A competent, reliable, English-speaking representative employed by the Contractor who has full authority to direct performance of the work in accordance with the Contract requirements and who is responsible for all construction operations on the project regardless of who performs the work.

b. A competent, reliable, English-speaking employee designated as the safety officer who is authorized to receive orders and to issue binding directions concerning safety to all persons except Sponsor representatives associated with the project, whether employed by the Contractor, subcontractors, or material suppliers.

c. Such other individual(s) from the Contractor's organization as the Sponsor's Construction Engineer determines are necessary to ensure the performance of the Contract, e.g., supervisory, managerial and engineering personnel.

(3) Employees on Payroll. The Contractor/subcontractor is not permitted to place on the payroll the employees of another firm for the purpose of avoiding Federal or State regulations or the provisions of the Contract.

**58.5 SUBLETTING WORK TO SUPPLIERS:** Suppliers that the Contractor or a lower tier Subcontractor or Supplier plans to sublet work to must be approved by the Sponsor. The Prime Contractor must submit a package of information to the Sponsor through the Resident Engineer at least 14 days prior to the date that the supplier will be supplying material to the project site.

The Supplier Sublet package shall include the following correctly filled out and executed forms:

i. Form MJ-211 – "Transmittal Request for Consent to Sublet";
ii. Form MJ-210 – "Contractor Acknowledgement Certification";
iii. Form MJ-217 – "EEO Officer Notification and Program Compliance Certification";
iv. EEO Appointment Letter;
v. EEO Policy Statement;

vi. Form MJ-203 – "Prohibition of Segregated Facilities"; and
vii. Form MJ-207 – "Subcontractor/Supplier – DBE/Small Business Reporting Information Form".

**58.6 SUBLETTING WORK TO SUBCONTRACTORS:** Subcontractors that the Contractor or a lower tier Subcontractor or Supplier plans to sublet work to must be approved by the State of Maine-Augusta State Airport. The Prime Contractor must submit a package of information to the State of Maine-Augusta State Airport through the Resident Engineer at least 14 days prior to the date that the supplier will be supplying material to the project site.

The Subcontractor Sublet package shall include the following correctly filled out and executed forms:

i. Form MJ-211 – "Transmittal Request for Consent to Sublet";
ii. Form MJ-210 – "Contractor Acknowledgement Certification;
iii. Form MJ-209 – "Annual Contractor Assurances – AIP Funded Contracts";
iv. Form MJ-217 – "EEO Officer Notification and Program Compliance Certification";
v. EEO Appointment Letter;
vi. EEO Policy Statement;
vii. Form MJ-203 – "Prohibition of Segregated Facilities";
viii. Form MJ-207 – "Subcontractor/Supplier – DBE/Small Business Reporting Information Form"; and
ix. Form MJ-204 – "Equal Employment Opportunity Report Statement as Required by 41 CFR 60-1.7(b)".

Form MJ-209 must be resubmitted by the Prime Contractor and each Subcontractor annually by January 15th.

## 59. PROOF OF PROMPT PAYMENT

Prompt payment of suppliers and subcontractors is required as outlined in Section 38.2 above.

With each Periodic Cost Estimate (PCE), the Prime Contractor shall provide proof of payment of all Subcontractors and Suppliers whose work was included in the previous PCE. Proof of payment shall consist of a copy of a cancelled check or a certificate of payment signed by the Subcontractor or Supplier. The Owner may provide the Contractor with one or more forms to be filled out and returned to the Owner to monitor and track payments.

To track work by Subcontractors and Suppliers, the Prime Contractor shall submit copies of Form MJ-216 "Subcontractor / Supplier Disadvantage Business Enterprise (DBE) and Small Business – Project Expenditure Report" for EVERY approved Subcontractor and Supplier with each PCE even if the Subcontractor or Supplier did not do any work on the project or supply any materials to the project during the period covered by the PCE.

If the Contractor is in violation of this prompt payment requirement, the Owner may withhold the amount due to the Subcontractor or Supplier from future payments due to the Contractor until satisfactory proof of payment is received. If the Contractor is in violation of this prompt payment requirement four (4) or more times, the Owner may terminate the Contract for cause and/or may require the Contractor to pay

some or all of their Subcontractors or Suppliers and provide proof of payment before the Subcontractor's or Supplier's work can be included on a PCE.

## 60. EQUAL EMPLOYMENT OPPORTUNITY (EEO) / AFFIRMATIVE ACTION (AF) / NON-DISCRIMINATION

The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth in Section 40, above. The Contractor and all Subcontractors and Suppliers shall comply with the EEO, AF, and Non-Discrimination requirements in the "Contact Provision Guidelines for Obligated Sponsors and Airport Improvement Program Projects" contained in Section SP-1, 41 CFR 60-4 (two sections are contained in Special Provisions Section SP-3), and federal Executive Order 11246. If the federal requirements and the state requirements conflict, the federal requirements shall govern. Requirements include, but are not limited to:

**60.1 SF-100:** The Contractor and all first tier Subcontractors must file SF-100 (EEO-1) by September 30th of each year but in no case later than the start of this project if they employ 50 or more employees at all locations and they have contracts of $50,000 or more. The Contractor shall confirm these requirements prior to the start of work.

**60.2 MINORITY AND FEMALE EMPLOYEE PARTICIPATION:** The Contractor and all Subcontractors must comply with 41 CFR Part 60-4 and federal Executive Order 11246 in regards to goals for minority and female employees in federally funded projects. Participating Contractors and Subcontractors must:

i. Take specific actions as outlined in 41 CFR Part 60-4 to ensure EEO;
ii. Have an EEO / AF Plan;
iii. Designate an EEO / AF Officer;
iv. Periodically notify and train supervisors and others on the Plan;
v. Recruit minorities and females;
vi. Maintain EEO / AF records;
vii. Develop or participate in on-the-job training programs;
viii. Disseminate their Plan;
ix. Post their Plan;
x. Annually evaluate all minorities for promotion; and
xi. Annually review supervisors' adherence to their Plan.

**60.3** The goals and timetables for minority and female participation, expressed in percentage terms for the contractor's aggregate workforce in each trade on all construction work in the covered area, are contained in the Invitation for Bids.

These goals are applicable to all of the contractor's construction work (whether or not it is Federal or federally-assisted) performed in the covered area. If the contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the contractor also is subject to the goals for both its Federally involved and non-federally involved construction.

The contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action

obligations required by the specifications set forth in 41 CFR 60-4.3(a), and its efforts to meet the goals. The hours of minority and female employment and training shall be substantially uniform throughout the length of the contract, and in each trade, and the contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from contractor to contractor or from project to project, for the sole purpose of meeting the contractor's goals, shall be a violation of the contract, the Executive Order, and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

**60.4** The contractor shall provide written notification to the US Department of Labor. Director, Office of Federal Contract Compliance Programs (OFCCP), within 10 working days of award of any construction subcontract in excess of $10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address, and telephone number of the subcontractor; employer identification number of the subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of subcontract; and the geographical area in which the subcontract is to be performed.

**60.5** As used in this notice and in the contract resulting from this solicitation, the "covered area" is State of Maine, Maine.

## 61. MATERIALS, SERVICES, AND FACILITIES

It is understood that, except as otherwise specifically stated in the Contract Documents, the Contractor shall provide at no cost to the Owner all materials, labor, tools, equipment, water, light, power, transportation, superintendence, temporary construction of any nature, and all other services and facilities of any nature whatsoever necessary to execute, complete, and deliver the work for the specified item.

Any work to be performed after regular hours, on Sundays or on Legal Holidays, shall be performed without additional expense to the Owner. This includes but is not limited to paying for additional Resident Engineering cost incurred by the Owner.

## 62. CONTRACTOR'S TITLE TO MATERIALS

No materials or supplies for the work shall be purchased by the Contractor or by any Subcontractor subject to any chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller. The Contractor warrants that he /she has good title to all materials and supplies used by him/her in the work free from all liens, claims or encumbrances.

## 63. LUMP SUM AND UNIT PRICES

Only those items for which unit prices are shown in the Bid Form will be considered for separate payment. Compensation for all other work shall be included in the appropriate Contract items.

Quantities listed in the Bid Form are estimated for Bidding purposes only and do not necessarily represent the exact amount of work to be done. Payment for unit price items will be based on the unit prices specified or Bid and the actual amount of work performed.

## 64. "OR EQUAL" CLAUSE

Whenever materials are identified on the Plans or in the Specifications by reference to manufacturer's or vendors' names, trade names, catalogue numbers, etc., it is intended merely to establish a standard; and any material of other manufacturers and vendors which will perform adequately the duties imposed by the general design will be considered equally acceptable provided the materials so proposed are, in the opinion of the Engineer, of equal substance and function. Such materials shall not be purchased or installed by the Contractor without the Engineer's written approvals through the Shop Drawing process.

## 65. REPRESENTATIONS OF THE CONTRACTOR

The Contractor represents and warrants:

a. that they are financially solvent and that they are experienced in and competent to perform the type of work or to furnish the plant, materials, supplies or equipment, to be so performed or furnished by him/her; and

b. that they are familiar with all Federal, State, municipal and Sponsor laws, ordinances and regulations, which may in any way affect the work or those employed therein, including but not limited to, rulings or actions specifically relating to the work or to the project of which it is a part; and

c. that such temporary and permanent work provided by the Contract Documents as is to be done by them can be satisfactorily constructed and used for the purpose for which it is intended, and that such construction will not injure any person or damage any property; and

d. that they have carefully examined the Plans, Specifications and site of the work, and that from their own investigations, they have satisfied themselves as to the nature and location of the work, the character, quality and quantity of equipment and other facilities needed for the performance of the work, the general and local conditions and all other materials which may in any way affect the work or its performance.

## 66. PROTECTION OF WORK AND PROPERTY AND EMERGENCIES

**66.1 PROTECTION OF WORK AND PROPERTY:** The Contractor shall at all times safely guard the Owner's property from injury or loss in connection with this Contract. The Contractor shall at all times safeguard and protect their own work and adjacent property from damage. The Contractor shall correct any such damage, loss or injury unless such is caused directly by errors contained in the Contract or caused by the Owner, or the Owner's duly authorized representative.

**66.2 EMERGENCIES:** In case of an emergency which threatens loss or injury of property, and/or safety of life, the Contractor will be allowed to act, without previous instructions from the Resident Engineer, in a diligent manner. The Contractor shall notify the Resident Engineer immediately thereafter. Any claim for compensation by the Contractor due to such extra work shall be promptly submitted to the Resident Engineer for approval.

The amount of reimbursement claimed by the Contractor on account of any emergency action shall be determined in the manner provided in Section 40 of the General Provisions.

Where the Contractor has not taken action but has notified the Engineer of any emergency threatening injury to persons or damage to the work or any adjoining property, the Contractor shall act as instructed or authorized by the Resident Engineer.

Any Contractor whose place of business is located outside of the boundary of the city or town where the airport is located and who does not maintain local headquarters 24 hours a day within that city or town must make satisfactory arrangements with the Engineer for taking care of emergencies or complaints which may occur at night, over the weekend, or when the job is shut down. If they do not, the Owner may make arrangements and the cost will be charged to the Contractor. Before the final estimate is certified for payment, the Contractor shall make similar arrange

**66.3 COVID-19:** The Contractor shall comply with all requirements of the State of Maine and the MaineDOT related to protection of workers and the public from COVID-19. This may include maintaining additional facilities, like hand-washing stations, at the work area and quarantining workers traveling into Maine. All costs for the Contractor's compliance with COVID-19 requirements shall be considered incidental to the project and shall be the full responsibility of the Contractor

## 67. PROTECTION AND RESTORATION OF PROPERTY

**67.1 GENERAL:** These requirements are in addition to those contained in Section 70 of the FAA General Provisions.

The Contractor shall:

(1) Not enter upon private property for any purpose without obtaining written permission;

(2) Use every precaution necessary to prevent damage or injury to public and private property;

(3) Protect all trees, shrubs, and other plants not marked by the Engineer for removal from damage by construction operations.

**67.2 PROTECTION OF EXISTING INFRASTRUCTURE:** The Contractor shall make sure that any portions of the existing airport, roadway and existing structures which are to be retained for public use or travel are left in as good condition as when the Contractor commenced work. The Contractor shall not move or use equipment on any pavement or structure in a manner that may or does cause damage

**67.3 CONTRACTOR'S RESPONSIBILITY:** The Contractor's responsibility shall not be released until the work has been completed and accepted and the applicable statute of limitations has expired.

**67.4 RESTORATION OF DAMAGED PROPERTY:** When 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 on the

part of the Contractor, such property shall be restored at the Contractor's expense to a condition similar or equal to that existing before such damage or injury was done or the Contractor shall make good such damage or injury in an acceptable manner.

**67.5 CLEANING TRAFFIC SIGNALS, STREET LIGHTING, AND AIRFIELD LIGHTING:** When the Contractor's operations compromise the functionality of existing traffic signals and/or street or airfield lighting equipment, the Engineer may require the Contractor to clean said equipment prior to project completion. Cleaning of traffic signals shall include all vehicle and pedestrian signal face lenses (inside and outside). Further, the inside of the controller cabinet shall be vacuumed and any vent filter shall be replaced; cleaning of streetlights shall include both the lens (inside and outside) and the reflector. The cleaning of electrical equipment shall be done by a traffic signal/electrical contractor. Any equipment that is damaged in the cleaning process shall be repaired or replaced at the Contractor's expense. The costs for cleaning will not be paid for directly, but will be considered incidental to other items in the Contract.

**67.6 GROUND VIBRATION LIMITS:** The maximum Peak Particle Velocity (PPV) of ground vibration in any of the three mutually perpendicular components of particle velocity for the following structure types shall be limited as follows:

PPV IN MM/S (IN/SEC)

| Type of Structure | Frequencies < 40 Hz | Frequencies > or = 40 Hz |
|---|---|---|
| Modern Homes (drywall interior) | 19 (0.75) | 50 (2.0) |
| Older Homes (plaster on wood or lath) | 13 (0.50) | 50 (2.0) |
| Non-Residential Structures<br>Underground Utilities | | |

The Sponsor reserves the right to lower the PPV limit in areas where there may be structures or elements with a higher sensitivity to ground vibration. Adherence to this specification does not waive the Contractor's responsibility for damage as specified in this Subsection and in Item 35 of this Section.

## 68. PUBLIC CONVENIENCE AND SAFETY

**68.1 GENERAL:** The Contractor shall conduct all work so as to ensure the least possible obstruction to traffic. The safety and convenience of the general public and the residents along the highway within the construction area and the protection of persons and property shall be provided for by the Contractor.

**68.2 DUST CONTROL:** The Contractor shall use all necessary dust control on haul road(s) and maintenance yard(s) in the same manner as required for materials sources and disposal areas. Dust control on haul road(s) and maintenance yard(s) shall be performed in accordance with Section GP, and will not be paid for directly, but will be considered incidental to all other Contract items. The Contractor shall perform all dust control directed by the Engineer on the haul road(s) and/or maintenance yard(s); unless otherwise provided, dust control will not be paid for directly, but will be considered incidental to all other Contract items.

The Engineer will direct the use of all necessary dust control within the limits of the construction performed under the Contract. Under those contracts which contain pay items for dust control, the dust control within the construction area shall be performed in accordance with the requirements of Section GP and will be paid for under the appropriate Contract item(s). Under those contracts which do not contain pay items for dust control, the necessary dust control shall be performed in accordance with the requirements of Section GP and the cost will not be paid for directly, but will be considered incidental to all other Contract items.

**68.3 STORED MATERIALS:** Materials stored within the construction area shall be placed so as to cause a minimum obstruction to the facility users, the traveling public and snow removal operations. Materials shall not be store in any areas regulated by MDEP or in buffers unless approved by the Resident Engineer.

**68.4 FIRE HYDRANTS:** Fire hydrants located within the construction area shall be kept accessible to fire apparatus at all times and no material or obstruction shall be placed within 15 feet of any such hydrants.

**68.5 ADJOINING WAYS:** Sidewalks, gutters, drainage inlets, and portions of highways adjoining the construction shall be obstructed only when necessary. If a sidewalk is obstructed, temporary pedestrian access meeting the requirements of ADA and the MUTCD shall be provided around the obstructed area.

**68.6 VEHICLE LANE RESTRICTIONS:** When the total useable width of a traveled way will be decreased to 14 feet or less for a period longer than one working day, the Contractor shall notify the Engineer of the date of the first day and the anticipated period of time such a lane restriction will be in effect. This notification shall be provided at least two weeks prior to the beginning of the lane restriction so that the Engineer may provide proper notification to the Oversized/Overweight Section of the Commercial Vehicle Enforcement Unit of the Department of Motor Vehicle and the Agency's Communications Section. When the date of the removal of the restriction becomes known, the Contractor shall notify the Engineer so that notification can be provided to these entities.

## 69. USE OF EXPLOSIVES

**69.1 GENERAL:** The Contractor shall use the utmost care to protect life and property and, whenever directed by the Engineer, shall reduce the number and size of explosive charges. Blasting mats shall be used when required by regulation or deemed necessary. The Contractor shall notify each person, company, corporation, or public utility that owns, leases, or occupies property or structures near the site of the work of plans to use explosives; notice shall be given sufficiently in advance to enable people to take such steps to protect their property or structure from injury as they may deem necessary. Provision of notice shall not relieve the Contractor of responsibility for any damage resulting from the Contractor's blasting operations. All persons within the danger zone of blasting operations shall be warned, a warning whistle shall be sounded, and the zone cleared just prior to blasting. A sufficient number of flaggers shall be stationed outside the danger zone to stop all approaching traffic during blasting operations. Explosives shall be used only during daylight hours and shall be handled only by competent, trained workers; particular care shall be taken to ensure that no unexploded charges remain in the work area unattended and when constructions operations cease for the day. All explosives shall be stored

securely, all storage locations shall be clearly marked "DANGEROUS-EXPLOSIVES," and all storage locations shall be supervised and controlled by a competent, trained person at all times. All explosives and highly flammable materials shall be stored and used in strict conformity with all Federal, State, and local laws, rules, and regulations. Attention is directed to VOSHA *Safety and Health Standards for* Construction, Subpart U, Blasting and the Use of Explosives.

**69.2 LIABILITY:** Each of the insurance policies required for a project shall include coverage for injury to persons and injury or destruction of any property arising out of the storage and use of explosives.

**69.3 INSURANCE:** The Contractor acknowledges full responsibility and assumes full liability for any and all damage or injury to persons or property caused either directly or indirectly by the Contractor's or a subcontractor's use of explosives. The liability of the Contractor shall apply equally to damages or injury to persons or property whether said injury or damage occurs within or outside of the right-of-way. The cost of all precautionary measures shall not be paid for directly, but all costs therefore shall be included in the bid prices for the pay items under the Contract.

**69.4 BLASTING CAP DANGER:** The Contractor and/or the Contractor's agents shall take all precautions necessary to prevent premature explosions of electric blasting caps individually or when they are connected into a circuit.

The Contractor and/or the Contractor's agents acknowledge and are hereby advised of the potential hazard of a premature explosion of electric blasting caps due to propagation of radio frequency energy by transmitters of radio and the related radio services such as television and radar. Mobile and fixed radio, cellular telephone, radar, television, and related transmitters are in general use in the project area, including police departments, fire departments, political subdivisions, utility companies, commercial carriers, private and public enterprises, and individuals.

**69.5 WARNING SIGNS; COSTS INCIDENTAL:** Prior to blasting operations the Contractor shall install warning signs in conformance with the MUTCD. Warning signs shall be located in prominent positions at least 1,200 feet from the point of blasting and visible to any person approaching the blasting point. Payment for furnishing, erecting and maintaining warning signs shall be considered incidental to other items in the Contract.

**69.6 DOCUMENTATION OF STRUCTURE CONDITION:** It shall be the responsibility of the Contractor to document the existing condition of all structures that have potential for damage. This documentation shall be in the form of a video or pictures, with sufficient description, and shall be supplied to the Engineer prior to any blasting on the project. The costs of preparing this documentation will not be paid for directly, but shall be considered incidental to all Contract items.

**69.7 BLAST SURVEYS:** The Contractor shall monitor all blasts and provide a report to the Engineer that shall indicate the Peak Particle Velocity (PPV) of the blast. The PPV sensitivity as reported shall range from less than 0.5 mm/s (0.02 in/s) to more than 125 mm/s (5.0 in/s). The Engineer reserves the right to request more than one instrument to monitor the blasting if there is a need for monitoring in more than one direction from the blasting area. The costs of the monitoring and preparing the reports will not be paid for directly, but shall be considered incidental to all Contract items.

## 70. PROTECTION AND RESTORATION OF UTILITIES AND SERVICES

**70.1 GENERAL.** The Contractor shall take proper precaution during construction to avoid damage to public and private services. These services include, but are not limited to gas, water, sewer and drainage pipes, springs, wells, septic tanks, cesspools, telephone, telegraph, television, and other communication and electrical services. Services may be located on or adjacent to the project, above, on, or under the ground, and may not be shown on the Plans.

**70.2 DIG-SAFE.** The Contractor shall comply with the requirements of Dig-Safe laws in the state in which the work will take place.

**70.3 NOTICE OF WORK.** At commencement or resumption of construction, the Contractor shall notify the owners, operators, occupants, or lessees of all the public or private services of any work to be done on, over, under, adjacent to, or in proximity to said utilities during the construction of the project. Further, the Contractor shall again notify the aforesaid parties seven (7) to fourteen (14) calendar days in advance of starting such work to enable them to take steps as they may deem necessary to protect their property or structures from damage. Provision of notice shall not relieve the Contractor of its responsibility for any damages resulting from the Contractor's work.

**70.4 OWNER ACCESS.** Owners, employees, or agents of public or private services located within the project limits shall be allowed free and full access with the tools, materials, and equipment necessary to install, operate, maintain, place, replace, relocate, and remove service facilities. No compensation will be paid to the Contractor for any inconvenience caused by working with these parties or around or with their services.

**70.5 SERVICE RELOCATION.** The exact location of any service facility relocated within the project limits shall be as directed by the Engineer.

**70.6 COOPERATION.** The Contractor shall cooperate with the owners of any of the aforementioned services in order that the service removal and/or relocation operation will progress in a reasonable manner, that duplication or temporary relocation work may be reduced to a minimum, and that services rendered by the concerned parties will not be unnecessarily interrupted.

**70.7 SERVICE INTERRUPTION.** If in connection with the work interruption in service occurs, the Contractor shall promptly notify the owner or the owner's authorized representative and cooperate with the owner to promptly restore service. In no case shall interruption to water or sewer service be allowed to exist outside of normal working hours without the substitution of acceptable alternate service.

**70.8 FIRE HYDRANTS.** No work shall be undertaken around fire hydrants until provisions for continued service have been approved by the local fire authority.

**70.9 RESPONSIBILITY FOR DAMAGE.** The Contractor shall be responsible for all damages done to services from the beginning of construction to the satisfactory completion of the project, including all damages to water supplies and sewage systems, including but not limited to damage to springs and wells, septic tanks, cesspools, and underground pipes, whether

located within or outside the project area or whether or not shown on the Plans, except as otherwise provided in the Contract.

**70.10 WATER; INVESTIGATION OF CLAIMS.** The Sponsor will receive and investigate all claims relating to damage to springs, wells, and water supply systems. The Contractor will be notified of the results of the investigation. If it is determined that the damage is the responsibility of the State, the Contractor will not be liable and will be reimbursed by the State for expenses incurred in providing temporary water service and repairing the damage.

**70.11 RESTORATION OF SERVICE BY AGENCY.** If the Contractor fails to restore a service or to make good on a damage or injury to service(s), the Engineer may proceed to repair, rebuild, or otherwise restore the service as deemed necessary and the cost thereof will be deducted from any monies due, or which may become due, the Contractor under the Contract.

## 71. RESPONSIBILITY FOR DAMAGE CLAIMS

These requirements are in addition to those contained in Section 70-11 of the FAA General Provisions.

**71.1 GENERAL.** The State shall notify the Contractor in the event of any claim or suit pursuant to the items listed in Section 50-16 of the FAA General Provisions, and the Contractor shall immediately retain counsel and otherwise provide a complete defense against the entire claim or suit.

After a final judgment or settlement the Contractor may request recoupment of specific defense costs and may file suit in the Court having jurisdiction, requesting recoupment. The Contractor shall be entitled to recoup costs only upon a showing that such costs were entirely unrelated to the defense of any claim arising from an act or omission of the Contractor.

The Contractor shall indemnify the State and its officers and employees in the event that the State, its officers or employees become legally obligated to pay any damages or losses arising from any act or omission of the Contractor.

**71.2 SUBMISSION OF DAMAGE CLAIMS.** With regard to each and every damage claim, the Contractor shall:

(1) Provide the claimant with a damage claim form for the submission of damage claims to the Contractor and Agency;

(2) Pay, settle, or otherwise resolve the claim;

(3) Submit the claim to the insurance carrier, with a copy to the Agency;

(4) Treat all claimants with respect.

## 72. SCHEDULES.

These requirements are in addition to those contained in Section 80 of the FAA General Provisions.

**PM PROGRESS SCHEDULE:** Within ten calendar days after the award of the Contract, the Contractor shall submit to the Engineer for approval a CPM progress schedule. The CPM progress schedule shall show the proposed sequence of work and when the Contractor proposes to complete the various items of work within the time(s) established in the Contract. During the progress of the work, the Contractor shall confer with the Engineer concerning performance of the work in accordance with the approved schedule. The approved schedule shall be used as a basis for establishing major construction operations and for checking the progress of the work.

## 73. CHARACTER OF WORKERS, METHODS, AND EQUIPMENT

ADD the following two (2) paragraphs to the end of Section 80-05 "CHARACTER OF WORKERS, METHODS, AND EQUIPMENT" of the FAA General Provisions:

"Electrical Work. All electrical work shall be performed by or under the supervision of a licensed electrician (master or journeyman). Electrical work shall be defined as any work which involves making connections to electrical components or splices in wiring that are, or will be, carrying 100 V or more. "Under the supervision of" means that the licensed electrician employed on the project shall be physically present on the project and must be actively supervising the work.

Removal of Machinery and Equipment. The Contractor shall not remove from the project any item of machinery or equipment after it has been placed on the project without the prior consent of the Engineer, which consent shall not be unreasonably withheld. Reasonableness shall be tested by the needs of the project and not by the needs of any other project in which the Contractor may be engaged."

## 74. LIQUIDATED DAMAGES

The amount to be assessed as Liquidated Damages in accordance with Section 80-08 of the FAA General Provisions shall be **One Thousand eight Hundred Dollars ($1,800.00)** per day.

Liability for Liquidated Damages. The Contractor covenants and agrees that should the amount of monies due or that may become due from the Contractor be more than the amount of ascertained liquidated damages, the Contractor and the Contractor's surety shall be liable to the Owner for the deficiency.

## 75. RETAINAGE

The Owner shall withhold ten percent (10%) retainage on the Contract in accordance with Section 90-06 "Partial Payments" of the FAA General Provisions.

## 76. DEFINITIONS.

The following definitions REPLACE the definitions of the same name in Section 10 in the FAA General Provisions:

**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 Contract includes those documents listed as Contract Documents in the Supplemental General Provisions, and any supplemental agreements that are required to complete the work in an acceptable manner.

**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. The term "Contractor" means the prime Contractor as differentiated from a subcontractor. All Contractors must be registered with the Secretary of State. The Contractor will act in an independent capacity and not as officers or employees of the Owner.

**10-60 SURETY.** The individual, partnership, firm, or corporation, or any acceptable combination thereof, other than the Contractor, executing the bond or bonds furnished by the Contractor. The Surety Company issuing the bond(s) shall be listed on the current United States Department of the Treasury "Department of the Treasury's listing of approved Sureties (Department Circular 570)" as authorized to do business in the State in which the project is located.

The following definitions shall be ADDED to the definitions in Section 10 in the FAA General Provisions:

**10-67 ACCEPTANCE.** All Contracts require proper acceptance of the described goods or services by the Owner. Proper acceptance shall be understood to include inspection of goods and certification of acceptable performance of services by Authorized Representative(s) of the Owner to insure that the goods or services are complete and are as specified in the Contract.

**10-68 AIRPORT OPERATOR.** The person or entity representing the Owner and having operational responsibility for the Airport.

**10-69 CONTRACT DOCUMENTS.** All the documents that comprise the awarded Contract as defined in Item 10-13 of this Section.

**10-70 GOODS.** Hard goods, supplies, or materials.

**10-71 HE, SHE, HE/SHE, HER, HERS, HIS/HER, HIM, AND HIS.** These terms shall be gender-neutral and shall be applied without regard to gender.

**10-72 SUBCONTRACTOR**. An individual or legal entity to whom or which the Contractor sublets part of the work. A Supplier can also be considered a Subcontractor

**10-73 SUPPLIER.** An individual or legal entity with which the Contractor enters an agreement to provide Goods for use in the Project.

**10-74 MaineDOT, THE AGENCY, OR MDOT.** These terms shall each mean the Maine Department of Transportation.

## 77. CLAIMS FOR ADJUSTMENT

**77.1 NOTICE REQUIREMENTS:** In order to bring a claim for additional compensation not clearly covered by the Contract for conditions substantially different than represented by the Contract and not ordered by the Engineer as Extra Work as defined herein, the Contractor must provide written notice ("the Notice of Intent to File a Claim" or the "Notice") to the Engineer before conducting any work or purchasing any materials subject to the claim (the "Claim"). The words "Notice of Intent to File a Claim" must appear in large print at the top of the document. The Notice must specify the basis for the Claim, including the nature of the Claim, the reason why the Contractor believes that the Owner is responsible for payment of the Claim, and a description of the additional compensation, including reference to each activity associated with the work and/or materials, including reference to any impacts to the Contractor's Progress Schedule (Critical Path). If the Contractor fails to provide the Notice as specified herein, the Contractor waives its right to bring the Claim under the Contract.

**77.2 NOTICE DOCUMENTATION REQUIREMENTS:** Upon providing the Notice of Intent to File a Claim, the Project Superintendent must commence daily records for all labor hours, equipment hours (idle and operating), and materials involved with the work or materials at issue in the Notice. The Contractor must submit such records to the Engineer on a daily basis. Such records must include a written analysis of how the work and/or materials at issue in the Notice impact/s the Critical Path. If the Contractor fails to provide such records to the Engineer as required herein, the Contractor waives its right to bring the Claim.

**77.3 CLAIMS PROCEDURE:** The Engineer's written acknowledgement of the Notice and receipt of the Contractor's daily reporting under this Subsection shall not be construed as an approval by the Owner of the merits of the Claim. Claims are evaluated by the Resident Engineer, the Owner, the FAA, and any other agency contributing funding to the project. If the Owner decides in favor of the Contractor, the Claim will be allowed, in whole or in part, and paid as provided in the Contract. If the Owner denies the Claim, in whole or in part, the Contractor may appeal to the Owner one time for review of the decision. Notwithstanding any other provision of law, case law, regulation, or the Contract, an appeal from the decision of the Engineer shall be made within 30 calendar days of denial, and not thereafter.

**77.4 CLAIMS DOCUMENTATION REQUIREMENTS:** The Contractor must provide the Engineer with the following documentation in support of the Claim:

(1) A detailed statement of the Claim, including all necessary dates, location, and work and material items at issue in the Claim;

(2) The date on which the Contractor first became aware of the actions or conditions giving rise to the Claim;

(3) A copy of the Notice of Intent to File a Claim;

(4) A list of the names of all Owner employees and agents, including consultants, the Contractor believes have knowledge or information concerning the facts giving rise to the Claim;

(5) A list of the names of all Contractor employees and agents, including subcontractors, whom the Contractor believes have knowledge or information concerning the facts giving rise to the Claim;

(6) A list of the specific provisions of the Contract that the Contractor believes support the Claim, and a description of why the Contractor believes those provisions support the Claim;

(7) A list of all documents and all oral statements that the Contractor believes support the Claim;

(8) A statement as to whether additional compensation and/or a time extension are being requested in the Claim;

(9) If a time extension is being requested in the Claim, a statement as to the specific number of days being requested, supported with reference to how the facts underlying the Claim affected the Contractor's performance schedule, including how such facts affected the Critical Path;

(10) A description of the amount of additional compensation being sought, itemized by category of work, including delays associated with performing the work, work items, materials costs, and any and all other costs at issue in the Claim. Such documentation includes, but is not limited to, invoices for rented equipment, a Blue Book analysis for owned equipment; and subcontractor agreements.

(11) If additional compensation for delays associated with performing the work is included in the Claim, the Contractor must provide a description of the operations that were delayed, the reasons for the delay, the impact of the delay on the operations, and how the delay impacted the Contractor's progress schedule, including the Critical Path. The Contractor must review the Contract for the project as claims for delays must be in accordance with the Contract terms.

(12) For every claim seeking additional compensation in excess of $50,000, the Contractor must provide a separate document certifying that the documentation provided in support of the Claim and that the amount of additional compensation sought in the Claim is accurate and that the Contractor has a good faith basis for believing that the Owner is responsible for payment of the Claim (the "Claims Certification"). The Claims Certification shall be notarized and executed by a senior officer of the Contractor with legal authority to bind the Contractor, or if the Contractor is a sole proprietor, by the proprietor. The Claims Certification may be used in any proceeding under the False Claims Act, 18 U.S.C. 1020, and/or 23 CFR 635.119.

**77.5 APPEAL TO THE OWNER:** Appeals will be judged by the OWNER in accordance with their policies. Should an appeal be judged in favor of the Contractor, it will be allowed and paid as provided for in the Contract. Should an appeal be denied by the Owner, the Contractor may not appeal this claim again.

**77.6 TIME FOR CLAIMS; APPEALS.** Notwithstanding any other provision of law, case law, regulation, or the Contract, all claims by the Contractor shall be submitted in writing within 30 calendar days after the Acceptance Date of the project or within 30 calendar days of the Notice

of Intent to File a Claim, whichever occurs first, and not thereafter (the "Claim Filing Period"). Such claims must meet the requirements set forth above, including but not limited to complete documentation supporting the Claim. If the Contractor fails to meet these requirements, the Owner may grant the Contractor additional time to meet the requirements. Any additional time granted for such purpose shall not be the subject of any demand for interest payments or for attorneys' fees and/or other costs. If the Contractor fails to file the Claim within the Claim Filing Period, the Contractor waives its right to bring the Claim. If the disputed work continues to be performed beyond the Claim Filing Period, the Contractor must submit a written request to extend the Claim Filing Period prior to the expiration of the Claim Filing Period. The Contractor shall submit such requests for extension of the Claims Filing Period every 30 calendar days until the disputed work is completed.

**78. INSPECTION BY OWNER AND PUBLIC AGENCIES**

The authorized representatives and agents of the Owner shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records. Representatives of the Owner shall have access to the work wherever it is in preparation or progress and the Contractor shall provide facilities for such access and inspection.

**79. REPORTS, RECORDS AND DATA**

The Contractor shall submit to the Owner such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data, as the Owner may request concerning work performed or to be performed under this Contract.

**80. GENERAL GUARANTEE**

Neither the final certificate of payment nor any provision in the Contract Documents nor partial or entire occupancy of the premises by the Owner shall constitute an acceptance of work not done in accordance with the Contract Documents or relieve the Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The Contractor shall remedy any defects in the work and pay for any damage to other work resulting there from, which shall appear within a period of one year of the date of final acceptance of the work unless a longer period is specified. The Owner will give notice of observed defects with reasonable promptness.

**81. NOTICE AND SERVICE THEREOF**

Any notice to any Contractor from the Owner relative to any part of this Contract shall be in writing and considered delivered and the service thereof completed when said notice is posted, by certified or registered mail, or by Fed-Ex or other express shipping to the said Contractor at their last given address, or delivered in person to said Contractor or their authorized representative.

## 82. PRE-CONSTRUCTION CONFERENCE

A Pre-construction Conference shall be held. The purpose of this conference is to go over the Contractor's proposed job organization, equipment and preliminary work schedule and to review Specification requirements. The order of construction shall be discussed with the Engineer and shall meet with their approval. The Contractor, prior to starting work, shall submit to the Engineer a written description of the methods they plan to use in doing the work.

A pre-construction conference for permitting may also be required by the Owner or the project permits. This may be concurrent with the regular pre-construction conference or separate at the discretion of the Owner.

## 83. REQUIRED PROVISIONS DEEMED INSERTED

Each and every provision of law and clause required by law to be inserted in this Contract shall be deemed to be inserted herein and the Contract shall be read and enforced as though it were included herein, and if through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the application of either party, the Contract shall forthwith be physically amended to make such insertion or correction.

## 84. RECORD "AS BUILT" PLANS

In addition to any other requirements in the Plans and Specifications pertaining to “As-Built” Plans and surveys:

1) The Contractor shall, during the progress of the work, keep a master set of prints on the job site, on which they shall keep a careful and neat record of all deviations from the Contract Plans prepared by the Engineer which are made during the course of the work.

2) Upon completion of the project, these "as built" prints shall be certified as to their correctness by the signature of the Contractor and turned over to the Engineer for use in the preparation of a permanent set of "As Built" Plans.

## 85. AIRPORT OPERATIONS AND SAFETY REQUIREMENTS DURING CONSTRUCTION

The Contractor's attention is directed to the FAA Advisory Circular (AC) 150/5370-2G, OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION, as amended or superseded.

The Contractor has been provided with a copy of the Construction Safety and Phasing Plan CSPP as part of the Plans. The Contractor must review the CSPP and file a Safety Plan Compliance Document Certification (Form MJ-208) indicating that they understand the plan and will comply with it throughout construction.

## 86. PERMITS AND APPROVALS

It is the Contractor's responsibility to secure, obtain and pay for any Permits, Licenses, Approvals and all other legal or administrative prerequisites to their performance of the Contract.

## 87. LIABILITY OF PUBLIC OFFICIALS

To the full extent permitted by law, no official, employee, agent or representative of the Owner shall be individually or personally liable on any obligation of the Owner under this Contract.

## 88. OSHA TRAINING

All employees to be employed at the job site shall have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration (OSHA) that is ten (10) hours in duration at the time the employee begins work.

The Contractor shall furnish documentation of successful completion of said course by either a copy of the OSHA card or a letter or certificate of completion from the person or company that administered the course. OSHA documentation shall be provided prior to any person beginning work on the site. It is recommended that Contractors and Subcontractors provide a copy of OSHA documentation for all employees prior to the start of work.

Periodic Cost Estimates will not be accepted for payment unless all OSHA documentation has been received. Final payment for the Project will not be made until all Project OSHA cards have been submitted to and approved by the Engineer.

**Part D – State / Agency / Airport Specific Clauses**

### 89. Responsibility for Damage to Work

Except as caused by uncontrollable events, the Contractor shall bear all risk of loss relating to the Work until Final Acceptance, regardless of cause, including completed Work, temporary Structures, and all other items or Materials not yet incorporated into the Work.

The Contractor shall, at its sole expense, rebuild, repair, restore, or replace such damaged Work or otherwise make good any losses that arise from such damage ("rebuilding, etc."). If the Contractor fails to promptly commence and continue such rebuilding, etc., the State of Maine or the State of Maine-Augusta State Airport may, upon 48 hours advance written notice, commence rebuilding, etc. of the damaged property without liability to the State of Maine or the State of Maine-Augusta State Airport with its own forces or with contracted forces and all costs will be deducted from amounts otherwise due the Contractor.

**END OF SUPPLEMENTAL GENERAL PROVISIONS**

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## FEDERAL AVIATION ADMINISTRATION

## PROPOSED DISADVANTAGED BUSINESS ENTERPRISE (DBE) AND SMALL BUSINESS UTILIZATION RACE-NEUTRAL PROJECTS

The undersigned Bidder/Offeror has made a good faith effort to make subcontracting and supplier opportunities available to all firms including, but not limited to, DBE's and small businesses as defined in 49 CFR 26. As a result of these efforts:

- The Bidder/Offeror is committed to a minimum of _____% **DBE** utilization on this Contract.
- The Bidder/Offeror is committed to a minimum of _____% **Small Business** utilization on this Contract (Include Small Businesses that are also DBE's in this percentage as well as Small Businesses that are not DBE's).

Name of Bidder/Offeror's firm:_____

AIP No.:_____

By:_____ _____
Signature Title

**DBE / Small Business Subcontractor / Supplier**

Name of Firm: _____

☐ DBE ☐ Small Business (Check One or Both)

Proposed Work: _____
(Be brief, i.e. electrical or excavation)

Dollar Amount of Work: _____

☐ Letter of Intent attached ☐ Firm is a Supplier.

**(Attach additional sheets as needed for additional firms)**

## FEDERAL AVIATION ADMINISTRATION

## PROPOSED DISADVANTAGED BUSINESS ENTERPRISE (DBE) AND SMALL BUSINESS UTILIZATION RACE-NEUTRAL PROJECTS

**DBE / Small Business Subcontractor / Supplier**

Name of Firm: _____

☐ DBE ☐ Small Business (Check One)

Proposed Work: _____
(Be brief, i.e. electrical or excavation)

Dollar Amount of Work: _____

☐ Letter of Intent attached ☐ Firm is a Supplier.

**DBE / Small Business Subcontractor / Supplier**

Name of Firm: _____

☐ DBE ☐ Small Business (Check One)

Proposed Work: _____
(Be brief, i.e. electrical or excavation)

Dollar Amount of Work: _____

☐ Letter of Intent attached ☐ Firm is a Supplier.

**DBE / Small Business Subcontractor / Supplier**

Name of Firm: _____

☐ DBE ☐ Small Business (Check One)

Proposed Work: _____
(Be brief, i.e. electrical or excavation)

Dollar Amount of Work: _____

☐ Letter of Intent attached ☐ Firm is a Supplier.

**(Attach additional sheets as needed for additional firms)**

**PRIME CONTRACTOR**
**DBE / SMALL BUSINESS REPORTING INFORMATION FORM**

**(To be filled out by the bidder and submitted with their bid package)**

Project Name: _____

Airport: _____

AIP Number: _____

**Prime Contractor Information**

Company Name: _____

Contact Person: _____

Address 1: _____

Address 2: _____

Address 3: _____

City / Town: _____

State: _____

Zip Code: _____

Phone: _____

Fax: _____

E-Mail: _____

NAICS Code: _____

| | |
|---|---|
| DBE Status: | ☐ Non-DBE ☐ Certified DBE (Check one) |
| Small Business Status: | ☐ Non-Small Business ☐ Small Business (Check one) |

**If Prime Contractor is a DBE or a Small Business, complete the following section:**

| | |
|---|---|
| States you are DBE Certified in: | (If not a DBE leave blank) |
| Age of Firm: | _____ Years |
| Annual Gross Receipts (Avg. over last 3 years per SBA regs.): | ☐ less than $500,000 (Check one)<br>☐ $500,000 to $999,999 ☐ $1,000,000 to $1,999,999<br>☐ $2,000,000 to $4,999,999 ☐ $5,000,000 to $9,999,999<br>☐ $10,000,000 to $14,999,999 ☐ $15,000,000 to $19,999,999<br>☐ $20,000,000 to $23,980,000 ☐ more than $23,980,000 |

**SUBCONTRACTOR / SUPPLIER**
**DBE / SMALL BUSINESS REPORTING INFORMATION FORM**

**(To be filled out by the Subcontractor / Supplier and submitted with the bid package and the Request for Consent to Sublet package)**

Project Name: _____

Airport: _____

AIP Number: _____

**Subcontractor / Supplier Information**

Company Name: _____

Contact Person: _____

Address 1: _____

Address 2: _____

Address 3: _____

City / Town: _____

State: _____

Zip Code: _____

Phone: _____

Fax: _____

E-Mail: _____

NAICS Code: _____

| | |
|---|---|
| DBE Status: | ☐ Non-DBE ☐ Certified DBE (Check one) |
| Small Business Status: | ☐ Non-Small Business ☐ Small Business (Check one) |
| Project Role: | ☐ Subcontractor ☐ Supplier ☐ Other _____(Check one) |

**If Subcontractor / Supplier is a DBE or a Small Business, complete the following section:**

| | |
|---|---|
| States you are DBE Certified in: | (If not a DBE leave blank) |
| Age of Firm: | _____ Years |
| Annual Gross Receipts (Avg. over last 3 years per SBA regs.): | ☐ less than $500,000 (Check one)<br>☐ $500,000 to $999,999 ☐ $1,000,000 to $1,999,999<br>☐ $2,000,000 to $4,999,999 ☐ $5,000,000 to $9,999,999<br>☐ $10,000,000 to $14,999,999 ☐ $15,000,000 to $19,999,999<br>☐ $20,000,000 to $23,980,000 ☐ more than $23,980,000 |

# SAFETY PLAN COMPLIANCE DOCUMENT (SPCD) CERTIFICATION

PROJECT:

LOCATION:

I. I hereby certify that I have reviewed the safety plans and fully understand the requirements set forth in the Construction Safety Phasing Plan (CSPP) as contained within the Contract Documents.

II. I agree that prior to the issuance of the Notice to Proceed (NTP), I will provide as part of the Safety Plan Compliance Document (SPCD), a detailed plan as to how the CSPP will be complied with. The detail plan will included but not be limited to: specific equipment that will be utilized on site; construction equipment heights; contractor's points of contacts; work area plan (including a work sequencing plan); verification of material stock pile areas and heights; understanding of haul route restrictions; safety procedures; and other information as needed.

III. I agree that I will follow the CSPP and approved SPCD and will not deviate from the plan without prior authorization from the Owner. I further acknowledge that requested revisions to the CSPP may require approval from the Federal Aviation Administration (FAA) and the review process requires at least 45 to 60 days. I further agree to reimburse the Owner for any and all costs resulting from a requested change or revision to the CSPP.

IV. ☐ Check box if SPCD document is attached.

Date: _____ _____
Signature of Authorized
Representative of Contractor

_____
Printed Name of Authorized Rep.

Corporate Seal _____
Signature of Witness

***(To be executed and submitted with the Contract.)***

**ANNUAL CONTRACTOR ASSURANCES**
**AIP FUNDED CONTRACTS**

(All participants of FAA Airport Improvement Program (AIP) funded contracts are required to submit this form annually)

_____(Contractor), hereinafter referred to as the "PARTICIPANT," Hereby agrees that as a condition of receiving payment in connection with work performed on any FAA Airport Improvement Program (AIP) assisted contract it will comply with the FAA Contract Provision Guidelines of Obligated Sponsors and Airport Improvement Projects and the provisions therein referenced, and all requirements imposed by the FAA, the State Department of Transportation, or the Owner pursuant to the implementing regulations, applicable U.S. Department laws, and other pertinent directives, to that end the PARTICIPANT HEREBY GIVES THE FOLLOWING SPECIFIC ASSURANCES with respect to its participation in the FAA Airport Improvement Program:

**Initial Next to Each**

1. _____ That the PARTICIPANT shall submit weekly certified payrolls, showing that each employee has been properly classified and paid for the time worked in each classification according to the minimum hourly wage(s) stipulated by the Wage Decision applicable to each of its contracts. The PARTICIPANT shall also be responsible for ensuring compliance of the same for any subcontractor or lower-tier subcontractor with which it holds an agreement under a Federal-aid contract.

2. _____ That the PARTICIPANT shall review the Wage Decision in each of its contracts and submit an Additional Work Classification Request for each classification that does not appear in the applicable Wage Decision; this shall be accomplished before the start of work for each project, regardless of any prior approval for another project in the same county.

3. _____ That the PARTICIPANT shall not sublet, assign or otherwise dispose of any portion of the contract without approval from the Owner and acknowledge that any work performed by an unapproved subcontractor or lower-tier subcontractor shall not be paid for by the Owner.

4. _____ That the PARTICIPANT is in full compliance with the Immigration Reform and Control Act of 1986 and has fulfilled all Form I-9 requirements by verifying identification and authorization to work for each employee reported on the payroll.

5. _____ That the PARTICIPANT acknowledges that any work performed or services provided under an FAA Airport Improvement Program contract shall be considered *satisfactorily completed* and payable only after the PARTICIPANT has fulfilled the contract requirements of the Owner and funding agencies, including the submission of all documentation required by the specifications and the subcontract. Satisfactory Completion is when the Engineer finds the work completed in accordance with the contract, plans and specifications. The determination of whether work meets the standards of satisfactory completion is the responsibility of the Engineer and not the prime contractor. The PARTICIPANT shall not disperse payment for an item of work under the contract without first obtaining certified payrolls from its subcontractors or lower-tier subcontractors, verifying the payment of wages according to paragraph "1." above.

6. _____The PARTICIPANT acknowledges that if found to be in violation of the FAA requirements it shall be required to take corrective action before participating in future projects funded by the FAA. Corrective action shall include, but is not limited to, the submission of certified payrolls or other records and reports necessary to verify compliance with the Provisions.

7. _____ Not used.

8. _____ That the PARTICIPANT, in order to participate in any public project, shall register its business name with the Maine Department of the Secretary of State, Bureau of Corporations, Elections, & Commissions and shall remain in *good standing* throughout the period of participation.

9. _____ That the PARTICIPANT shall maintain detailed pay records and other records documenting its compliance, and all efforts to comply, with the nondiscrimination and payroll requirements of the FAA requirements, and shall make these records available for inspection by authorized representatives of the Owner, the state, The U.S. Department of Labor, and the FAA at reasonable times and places for a period of 3 years following the completion of the contract work.

10. _____ That the PARTICIPANT is fully aware that it may seek compliance assistance and training for itself, its subcontractors, or lower-tier subcontractors by contacting the Owner.

11. _____ That the PARTICIPANT acknowledges that a breach of any of the stipulations contained in the FAA requirements shall be sufficient grounds for termination of its contract with the Owner. Where the violator is a subcontractor or lower-tier subcontractor, the prime contractor shall be required to terminate its contract and any related contract.

THESE ASSURANCES are given in consideration of and for the purpose of obtaining any and all contracts funded through the Owner under the FAA Airport Improvement Program. The person whose signature appears below is an executive officer or owner of

_____.
Name of Firm

_____ Date:_____
Printed Name & Title

_____
Signature

# CONTRACTOR ACKNOWLEDGEMENT CERTIFICATION
## (SUBCONTRACT and/or MATERIAL SUPPLIER)

**From:** _____ (Name of Firm) Date: _____
**To:** _____ (Name of Firm)
☐ Subcontractor ☐ Lower-tier Subcontractor ☐ Material Supplier
**Re:** _____ _____
Project Name, and Project Number County

**ITEMS 1 – 4 BELOW APPLY, UNLESS OTHERWISE INDICATED**
**PRIME CONTRACTOR CERTIFICATION**: I hereby certify the below documentation (as checked) was included in, and made part of, the subcontractor agreement entered into with the firm named above.

☐ 1. Contact Provision Guidelines for Obligated Sponsors and Airport Improvement Program Projects with Appendix Y – AIP Handbook (Special Provisions Section SP-1)
☐ 2. 41 CFR 60-4.2-3 (Solicitations and Equal Opportunity Clauses)* (Special Provisions Section SP-3)
☐ 3. Disadvantaged Business Enterprise (DBE) Policy and DBE Program Requirements
☐ 4. Davis-Bacon Wage Rates (Special Provisions Section SP-2)**

*Applicable only to contracts or subcontracts in excess of $10,000
**Does not apply to Material Suppliers, unless performing work on-site

Printed Name (Prime): _____ Signature: _____

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**SUBCONTRACTOR CERTIFICATION**: As an authorized official of this company, I certify that the documents selected above were made part of our agreement/contract and give assurance that this company will comply with the *Contact Provision Guidelines for Obligated Sponsors and Airport Improvement Program Projects*, and will properly obtain approval, before the start of work, for any portion of work sublet to a lower-tier Subcontractor or Material Supplier. I further certify that:

1. This company is in full compliance with applicable Federal and State Laws: (Not required of Suppliers)
   ☐ This company is properly registered and is in *good standing* with the Secretary of State's Office.
2. ☐ This company has attached a Form MJ-209, "Annual Contractor Assurances – AIP Funded Contracts," unless submitted in the past 12 months, in which case a copy of the previously submitted form is attached.
3. This company [check one] ☐ does, ☐ does not, anticipate performing work on this contract in the amount of $10,000 or more annually. **Companies that perform $10,000 or more of contract work must file a Form 2 annually.**
4. This company [check one] ☐ has, ☐ has no, outstanding compliance matters from a previous Federally Funded project contract.

Firm: _____ _____
Address: _____ Printed Name and Title
_____
_____
Telephone Number: _____ _____
Federal I.D. Number: _____ Signature
Estimated Start Date: _____
Estimated Completion Date: _____ _____
Estimated Dollar Amount: _____ Date

Form MJ-210 (ME) REV 3-2018

**TRANSMITTAL REQUEST FOR CONSENT TO SUBLET:**

☐ **SUBCONTRACTOR**

☐ **LOWER TIER SUBCONTRACTOR**

☐ **MATERIAL SUPPLIER (MS)**

** ☐ **THIS COMPANY IS A DISADVANTAGE BUSINESS ENTERPRISE (DBE)****

**Prime Contractor**:_____
(Name and Address)

**Subcontractor/MS**:_____
(Name and Address)

**Lower-tier Subcontractor/MS**:_____
(Name and Address)

**Project Name and AIP No**:_____

All contract items sublet are to be shown in the following tabulation. Estimated or agreed dollar amounts must be shown individually in the appropriate **PARTIAL** or **COMPLETE** column.

| ITEM NUMBER | DESCRIPTION OF ACTUAL WORK TO BE PERFORMED (Use a separate spreadsheet if needed and list total below) | PARTIAL WORK ON ITEM | COMPLETE ITEM |
|---|---|---|---|
| | | | |
| | | | |
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| | | | |
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| | | | |
| | | | |
| | | | |
| | | | |

**TOTAL SUBCONTRACT AMOUNT: $** _____

**By:** _____ _____
**Signature and Title of Prime Contractors Agent** **Date**

Signatory agrees and understands that subcontracts will contain, by inclusion or reference, all the pertinent provisions of the Prime Contract. It is further agreed and understood that consent to sublet shall not under any circumstance relieve the Prime Contractor or surety of any of their obligations under the Contract or bonds as specified in the Project Specifications.

**FOR ENGINEER / OWNER OFFICE USE ONLY**

| | |
|---|---|
| **Effective Date:** | **Recommended by Engineer:** |
| **Total Sublet to Date:** | |
| **Percent Sublet to Date:** | (Sign Here) |
| **DBE Commitment % to Date:** | **Approved by Owner:** |
| **Consent Number:** | |
| **Company Code:** | (Sign Here) |

**Copy to (check):** ☐ **RESIDENT ENGINEER** ☐ **HIGHER TIER SUB / MS** ☐ **OTHER:**_____

Form MJ-211 – Rev. 4-2013

**Submittal Number:** _____
**Revision Number:** _____

**CONTRACTOR / SUBCONTRACTOR / SUPPLIER**
**BUY AMERICAN CERTIFICATION**
**(Attach to all Shop Drawing Submittals)**

**Job Name:** _____

_____

_____

**AIP No.** _____ _____

**Contractor / Subcontractor / Supplier:** _____

**Address:** _____

**Contractor's Contact:** _____ **Phone Number:** _____

**Reviewed By:** _____ **Date Submitted:** _____

**Item No.:** _____

**Specification Section and Paragraph:** _____

**Description:** _____

The undersigned certifies that (check the item that applies):

☐ 1. The above referenced products or materials are wholly produced in the United States of America (US) of US produced materials.

☐ 2. A waiver for the use of non-US produced products or production outside of the US has been granted by the FAA for this product or material and a copy of the waiver is attached.

☐ 3. All the above referenced products or materials being used on the project are on the Nationwide Buy American conformance list located at (attach copy of list): http://www.faa.gov/airports/aip/buy_american/

☐ 4. A waiver for the use of non-US produced products or production outside of the US is being requested as part of this submission (see FAA AIP Handbook Appendix Y in the Federal Contract Provisions section of the Supplemental General Provisions for guidance on waiver types and requirements).

**CONTRACTOR / SUBCONTRACTOR / SUPPLIER**
**BUY AMERICAN CERTIFICATION**

Dated at _____ this _____ day of _____, _____.
(Location Signed) (Day) (Month) (Year)

Name of Bidder: _____(print name)

By: _____ (signature)

Title: _____(print title)

**Submittal Number: _____**
**Revision Number:_____**

# CONTRACTOR SUBMITTAL FORM
**(CONTRACTOR)**

**Job Name:** _____

_____

**AIP No.** _____

**Contractor:** _____

**Address:** _____

**Contractor's Contact:** _____ **Phone Number:** _____

**Reviewed By:** _____ **Date Submitted:** _____

☐ **Check here if submittal is from a Subcontractor**

**Item No.:** _____

**Specification Section and Paragraph:** _____

## CERTIFICATION

I HEREBY CERTIFY that the attached submittal has been reviewed under the terms of the Contract Documents and is in conformity with the requirements of the Plans and Specifications unless specifically noted otherwise. It is understood that the Contractor is responsible for dimensions and quantities to be confirmed and correlated at the site, for information that pertains solely to the fabrication process or to the means, methods, techniques, sequences and procedures of construction, and for coordination of the Work of all trades.

☐ 1- Submitted as specified

☐ 2 - Submitted "AS EQUAL" to the product specified

☐ 3 - Submitted "IN SUBSTITUTION" to the product specified

☐ 4 - Subcontractor submittal form included

☐ 5 - Other

Description of Submittal Components: _____

_____

_____

_____

**Submittal will not be approved without an acceptable Form MJ-212 "Contractor / Subcontractor / Supplier Buy American Certification."**

**(For additional comments attach and number additional pages)**

**Submittal Number: _____**
**Revision Number:_____**

# SUBCONTRACTOR SUBMITTAL FORM

**Job Name:** _____

_____

**AIP No.** _____

**Subcontractor:** _____

**Address:** _____

**Subcontractor's**

**Contact: Reviewed By:** _____ **Phone Number:**_____

_____ **Date Submitted:**_____

☐ **Check here if submittal is from a Subcontractor**

**Item No.:** _____

**Specification Section and Paragraph:**_____

## CERTIFICATION

I HEREBY CERTIFY that the attached submittal has been reviewed under the terms of the Contract Documents and is in conformity with the requirements of the Plans and Specifications unless specifically noted otherwise. It is understood that the Contractor is responsible for dimensions and quantities to be confirmed and correlated at the site, for information that pertains solely to the fabrication process or to the means, methods, techniques, sequences and procedures of construction, and for coordination of the Work of all trades.

☐ 1- Submitted as specified

☐ 2 - Submitted "AS EQUAL" to the product specified

☐ 3 - Submitted "IN SUBSTITUTION" to the product specified

☐ 4 - Subcontractor submittal form included

☐ 5 - Other

Description of Submittal Components:_____

_____

_____

_____

**Submittal will not be approved without an acceptable Form MJ-212 "Contractor / Subcontractor / Supplier Buy American Certification."**

**(For additional comments attach and number additional pages)**

SUBCONTRACTOR / SUPPLIER
DISADVANTAGED BUSINESS ENTERPRISE (DBE) AND
SMALL BUSINESS
LETTER OF INTENT

(To be filled out by the Contractor and the Subcontractor / Supplier and submitted within 36 hours of the bid opening by the two lowest bidders)

Project Name: _____

Airport: _____

AIP Number: _____

**Prime Contractor**

Company Name: _____

**Subcontractor / Supplier Contractor**

Company Name: _____

| | |
|---|---|
| DBE Status: | ☐ Non-DBE ☐ Certified DBE (Check one) |
| Small Business Status: | ☐ Non-Small Business ☐ Small Business (Check one) |

(Check Here) ☐ **Form MJ-206 or MJ-207 is attached (required)**

1. The undersigned DBE or Small Business firm intends to perform work in connection with the above referenced project as:

   (Check One)
   ☐ an individual ☐ a partnership ☐ a corporation

   ☐ a joint venture with _____

   ☐ other _____
   attach other sheets if necessary

2. If a DBE, the undersigned affirms that they are a duly authorized official representing the proposed Disadvantaged Business Enterprise and affirms that its certification has not expired nor been revoked (Attach a copy of certification letter)

3. If the bidder is awarded the Contract, the undersigned intend to enter into a Subcontract to perform the work described on the following sheet for the prices indicated.

**LETTER OF INTENT/SCHEDULE OF PARTICIPATION**

(Attach Additional Sheets if Needed)

| Contract Item No. | Description of Work To Be Performed by DBE / Small Business Contractor / Subcontractor / Supplier | Estimated Quantity | Unit Price | Item Subtotal |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| **Total Amount Credited to DBE / Small Business:** | | | | |
| **Total Project Bid Amount:** | | | | |
| **Percent of DBE / Small Business:** | | | | |

The undersigned certifies that they will enter into a formal agreement upon execution of the Contract for the above referenced project pursuant to all conditions noted in the attached Contract Documents, swearing and affirming under the pains and penalties of perjury, that the foregoing information and appropriate attachments are true to the best of their knowledge.

NAME OF SUBCONTRACTOR / SUPPLIER: _____

AUTHORIZED SIGNATURE: _____

PRINTED NAME AND TITLE: _____

DATE: _____

NAME OF PRIME CONTRACTOR: _____

AUTHORIZED SIGNATURE: _____

PRINTED NAME AND TITLE: _____

DATE: _____

Note: If the Prime Contractor is a DBE or Small Business, the Prime Contractor should fill out and submit a copy of this form listing themselves as the Prime Contractor and the Subcontractor / Supplier.

**Periodic Cost Estimate No.: _____**

SUBCONTRACTOR / SUPPLIER
DISADVANTAGED BUSINESS ENTERPRISE (DBE) AND
SMALL BUSINESS
PROJECT EXPENDITURE REPORT

(To be filled out by the Contractor and the Subcontractor / Supplier and submitted with each Periodic Cost Estimate)

Project Name: _____

Airport: _____

AIP Number: _____

**Prime Contractor**

Company Name: _____

**Subcontractor / Supplier Contractor**

Company Name: _____

| | |
|---|---|
| DBE Status: | □ Non-DBE □ Certified DBE (Check one) |
| Small Business Status: | □ Non-Small Business □ Small Business (Check one) |

| Contract Item No. | Description of Work Performed by Subcontractor / Supplier | Estimated Quantity | Unit Price | Item Amount |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| Total amount requested by Subcontractor / Supplier this Invoice: | | | | |
| Total amount previously requested by Subcontractor / Supplier: | | | | |
| Total amount requested by Subcontractor / Supplier to date: | | | | |

(Attach additional sheets if needed)

**Periodic Cost Estimate No.: _____**

# SUBCONTRACTOR / SUPPLIER
# DISADVANTAGED BUSINESS ENTERPRISE (DBE) AND
# SMALL BUSINESS
# PROJECT EXPENDITURE REPORT

The undersigned certifies that the Subcontractor / Supplier has successfully completed the above referenced work associated with this project and further assures that the Subcontractor / Supplier will be paid in full for the amount indicated above for said services in accordance with the Contract Documents.

NAME OF SUBCONTRACTOR / SUPPLIER: _____

AUTHORIZED SIGNATURE: _____

PRINTED NAME AND TITLE: _____

DATE: _____

NAME OF PRIME CONTRACTOR: _____

AUTHORIZED SIGNATURE: _____

PRINTED NAME AND TITLE: _____

DATE: _____

Note: If the Prime Contractor is a DBE or Small Business, the Prime Contractor should fill out and submit a copy of this form listing themselves as the Prime Contractor and the Subcontractor / Supplier.

# EEO OFFICER NOTIFICATION AND PROGRAM COMPLIANCE CERTIFICATION

(This form is required **annually** by companies that perform federally funded contract work in the amount of $10,000 or more annually)

FROM (Name of Company): _____ _____
Date

TO (Name of Airport Owner): _____

In accordance with the Required Federal Contract Provisions for AIP Obligated Projects contained in the Special Provisions of the Contract Documents, the following information is furnished:

***Initial Next to Each***

**THIS IS TO CERTIFY:**

_____This company has accepted the following statement as our operating policy: "It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, national origin, sexual orientation, gender identity, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on –the-job training."

_____Periodic meetings with supervisory and personnel office employees were conducted before the start of work and will be accomplished once every six (6) months.

_____All new supervisory or personnel office employees were given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within 30 days following their employment start date.

_____All personnel who are engaged in direct recruitment for the project were instructed by the EEO Officer in the contractor's procedures for locating and hiring minority group employees.

_____This company's EEO policy was reviewed and reaffirmed within the last 12 months and was brought to the attention of all our employees by the following means (check as applicable):

☐ Meetings/Briefings ☐ Employee Handbook ☐ Other: _____

_____A written record was made of the above meetings/briefings, person's attending, and the subject matter that was discussed. Signed acknowledgements of attendance at EEO meetings/training are on file.

_____I have **attached** a copy of this company's **EEO Appointment Letter** and **Policy Statement**.

***SIGNED CERTIFICATION AND NAME OF CORPORATE EEO OFFICER:**

_____ _____
Signed & Printed Name Title or Position in Firm

_____

_____ _____
Address (Include Zip Code) Telephone (Include Area Code)

Email Address: _____

* Named individual must be capable of effectively administering and promoting an active contractor program of EEO and who must be assigned adequate authority and responsibility to do so.

WAIVER AND RELEASE OF MECHANIC'S LIENS AND CLAIMS

Project Name:_____ Project No.:_____
Project Address:_____ Through period Ending:_____

Owner Representative:_____ Total Payments:_____
General Contractor:_____

WHEREAS, the UNDERSIGNED has provided labor and/or materials and/or rental and/or services on the Project; and WHEREAS the UNDERSIGNED acknowledges receipt from OWNER of the amount set forth above as payments received to date and hereby remises, releases and forever discharges and by these presents does for itself and its successors, remise, release and forever discharge the **Maine Department of Transportation** and **Augusta State Airport**, its successor, heirs, executors and administrators, of and from all, and all manner of action and actions, cause and causes of action, suits, debts, dues, sums of money accounts, reckoning, bonds, bills, specialties, covenants, contracts, controversies, agreements, promises, variances, trespasses, damages, judgements, extents, executions, claims and demands whatsoever, in law, in admiralty, or in equity which against the said **Maine Department of Transportation** and **Augusta State Airport**, UNDERSIGNED ever had now has or which it or its successors, hereafter can, shall or may have for, upon or by reason of any matter, cause thing whatsoever from the beginning of the world to the date above, and especially in connection with any and all claims of any nature whatsoever arising out of the Project.

The UNDERSIGNED warrants that the amount of the payments received for the period indicated above represents the total value earned by the UNDERSIGNED for materials, labor rentals, equipment and services supplied to the project for the period, warrants that it has not and will not assign any claims for payment or right to perfect a lien against such land and improvements and appurtenances and warrants that it has the right to execute this waive and release.

The UNDERSIGNED, does hereby warrant and certify that it has made full payment of any amounts due or claimed to be due through the period ending stated above to any person or entity who has supplied materials or labor or rentals or services to it, pursuant to contract or otherwise, for the purpose of construction, raising, removing, repairing or otherwise improving the Project described above.

The UNDERSIGNED. does hereby, through the above date, forever waive, relinquish and release any mechanic's, materialmen's or like liens, and all claims or liens it now has may have or may obtain in the future upon a piece of land all the buildings thereon standing known as **Augusta StateAirport** situated at **Airport Road, Augusta, Maine 04330**.

This release and waiver may not be changed orally.

The UNDERSIGNED, agrees that the owner of the Project, any lender, any title insurer, and any surety may rely upon this waiver and release. WITNESS the signature and seal of the undersigned as of this _____ day of _____, 20____

STATE OF **Maine**
COUNTY OF **Kennebec**

Company Name:_____
Authorized Agent:_____

Signature:_____
Title:

Sworn to before me this _____
day of _____, 20____

_____
Notary Public

## CHANGE OF SUBCONTRACTORS/SUPPLIERS

**SUBCONTRACTOR / SUPPLIER INFORMATION:**

Name of Prime Contractor: _____

The above-named firm requests approval of the following addition(s) and/or deletion(s) of the Subcontractor/Supplier firm(s) to the approved Disadvantaged Business Enterprise (DBE) Utilization (Form MJ-205) and Letter of Intent (Form MJ-215) as originally submitted as part of the above referenced contract. **No additional and/or substitute subcontractor/supplier shall begin work on the project until contractor receives written approval by the Airport.**

Please list the following information on Firm(s) that you wish to discontinue using:

| Name of Firm | Is Firm a Subcontractor, Supplier, or Joint-Venture Partner | Description of Work to be Performed by Firm | Is Firm DBE Certified in ME? (Yes or No) | Total Dollar Amount to be Performed by Firm |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

Reason(s) for removing each firm listed above: _____

_____

_____

_____

Please list the following information on Firm(s) that you wish to add or substitute:

| Name of Firm | Is Firm a Subcontractor, Supplier, or Joint-Venture Partner | Description of Work to be Performed by Firm | Is Firm DBE Certified in ME? (Yes or No) | Total Dollar Amount to be Performed by Firm |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

Please include a copy of Form MJ-207 for each firm added.

**No additional and/or substitute subcontractor/supplier shall begin work at the Airport until Contractor receives written approval by the Airport.**

1. If a DBE Subcontractor/Supplier/Partner was deleted/terminated/replaced, was it replaced with another DBE Firm? Yes ____ No _____ If not, why not:

_____

2. If another DBE Firm did not replace the DBE Firm, please submit for our review the good faith efforts used to find another DBE to perform at least the same amount of work under the contract as the DBE that was deleted/terminated/replaced.

3. If a Subcontractor/Supplier is added at any time during this project, Contractor shall submit for Owner review and approval the good faith efforts used to find a DBE to perform such work.

AFFIRMATION
*THE ABOVE INFORMATION IS TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF, I FURTHER UNDERSTAND AND AGREE THAT, THIS DOCUMENT SHALL BE ATTACHED THERETO AND BECOME A BINDING PART OF THE CONTRACT.*

Name & Title of Authorized Official:

Signature:

Approved: _____Denied _____

# DIVISION 1 - SPECIFICATIONS

## SPECIAL PROVISIONS

## SP-5 Construction Safety and Phasing Plan (CSPP)

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U.S. Department
of Transportation
**Federal Aviation**
**Administration**

# Advisory Circular

| **Subject:** Operational Safety on Airports During Construction | **Date:** 12/13/2017<br>**Initiated By:** AAS-100 | **AC No:** 150/5370-2G<br>**Change:** |
|---|---|---|

1 **Purpose.**

This AC sets forth guidelines for operational safety on airports during construction.

2 **Cancellation.**

This AC cancels AC 150/5370-2F, *Operational Safety on Airports during Construction,* dated September 29, 2011.

3 **Application.**

This AC assists airport operators in complying with Title 14 Code of Federal Regulations (CFR) Part 139, *Certification of Airports*. For those certificated airports, this AC provides one way, but not the only way, of meeting those requirements. The use of this AC is mandatory for those airport construction projects receiving funds under the Airport Improvement Program (AIP). See Grant Assurance No. 34, *Policies, Standards, and Specifications*. While we do not require non-certificated airports without grant agreements or airports using Passenger Facility Charge (PFC) Program funds for construction projects to adhere to these guidelines, we recommend that they do so to help these airports maintain operational safety during construction.

4 **Related Documents.**

ACs and Orders referenced in the text of this AC do not include a revision letter, as they refer to the latest version. Appendix A contains a list of reading material on airport construction, design, and potential safety hazards during construction, as well as instructions for obtaining these documents.

5 **Principal Changes.**

The AC incorporates the following principal changes:

1. Notification about impacts to both airport owned and FAA-owned NAVAIDs was added. See paragraph 2.13.5.3, NAVAIDs.

2. Guidance for the use of orange construction signs was added. See paragraph 2.18.4.2, Temporary Signs.
3. Open trenches or excavations may be permitted in the taxiway safety area while the taxiway is open to aircraft operations, subject to restrictions. See paragraph 2.22.3.4, Excavations.
4. Guidance for temporary shortened runways and displaced thresholds has been enhanced. See Figure 2-1 and Figure 2-2.
5. Figures have been improved and a new Appendix F on the placement of orange construction signs has been added.

Hyperlinks (allowing the reader to access documents located on the internet and to maneuver within this document) are provided throughout this document and are identified with underlined text. When navigating within this document, return to the previously viewed page by pressing the "ALT" and " ←" keys simultaneously.

Figures in this document are schematic representations and are not to scale.

6 **Use of Metrics.**

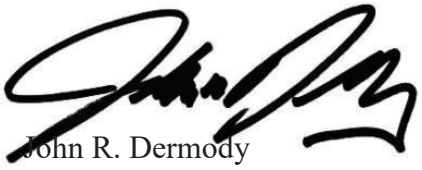
Throughout this AC, U.S. customary units are used followed with "soft" (rounded) conversion to metric units. The U.S. customary units govern.

7 **Where to Find this AC.**

You can view a list of all ACs at http://www.faa.gov/regulations_policies/advisory_circulars/. You can view the Federal Aviation Regulations at http://www.faa.gov/regulations_policies/faa_regulations/.

8 **Feedback on this AC.**

If you have suggestions for improving this AC, you may use the Advisory Circular Feedback form at the end of this AC.



John R. Dermody
Director of Airport Safety and Standards

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# CHAPTER 1. PLANNING AN AIRFIELD CONSTRUCTION PROJECT

## 1.1 Overview.

Airports are complex environments, and procedures and conditions associated with construction activities often affect aircraft operations and can jeopardize operational safety. Safety considerations are paramount and may make operational impacts unavoidable. However, careful planning, scheduling, and coordination of construction activities can minimize disruption of normal aircraft operations and avoid situations that compromise the airport's operational safety. The airport operator must understand how construction activities and aircraft operations affect one another to be able to develop an effective plan to complete the project. While the guidance in this AC is primarily used for construction operations, the concepts, methods and procedures described may also enhance the day-to-day airport maintenance operations, such as lighting maintenance and snow removal operations.

## 1.2 Plan for Safety.

Safety, maintaining aircraft operations, and construction costs are all interrelated. Since safety must not be compromised, the airport operator must strike a balance between maintaining aircraft operations and construction costs. This balance will vary widely depending on the operational needs and resources of the airport and will require early coordination with airport users and the FAA. As the project design progresses, the necessary construction locations, activities, and associated costs will be identified and their impact to airport operations must be assessed. Adjustments are made to the proposed construction activities, often by phasing the project, and/or to airport operations to maintain operational safety. This planning effort will ultimately result in a project Construction Safety and Phasing Plan (CSPP). The development of the CSPP takes place through the following five steps:

### 1.2.1 Identify Affected Areas.

The airport operator must determine the geographic areas on the airport affected by the construction project. Some, such as a runway extension, will be defined by the project. Others may be variable, such as the location of haul routes and material stockpiles.

### 1.2.2 Describe Current Operations.

Identify the normal airport operations in each affected area for each phase of the project. This becomes the baseline from which the impact on operations by construction activities can be measured. This should include a narrative of the typical users and aircraft operating within the affected areas. It should also include information related to airport operations: the Aircraft Approach Category (AAC) and Airplane Design Group (ADG) of the airplanes that operate on each runway; the ADG and Taxiway Design Group (TDG)[1] for each affected taxiway; designated approach visibility minimums;

[1] Find Taxiway Design Group information in AC 150/5300-13, *Airport Design.*

available approach and departure procedures; most demanding aircraft; declared distances; available air traffic control services; airport Surface Movement Guidance and Control System (SMGCS) plan; and others. The applicable seasons, days and times for certain operations should also be identified as applicable.

1.2.3 Allow for Temporary Changes to Operations.

To the extent practical, current airport operations should be maintained during the construction. In consultation with airport users, Aircraft Rescue and Fire Fighting (ARFF) personnel, and FAA Air Traffic Organization (ATO) personnel, the airport operator should identify and prioritize the airport's most important operations. The construction activities should be planned, through project phasing if necessary, to safely accommodate these operations. When the construction activities cannot be adjusted to safely maintain current operations, regardless of their importance, then the operations must be revised accordingly. Allowable changes include temporary revisions to approach procedures, restricting certain aircraft to specific runways and taxiways, suspension of certain operations, decreased weights for some aircraft due to shortened runways, and other changes. An example of a table showing temporary operations versus current operations is shown in Appendix E.

1.2.4 Take Required Measures to Revise Operations.

Once the level and type of aircraft operations to be maintained are identified, the airport operator must determine the measures required to safely conduct the planned operations during the construction. These measures will result in associated costs, which can be broadly interpreted to include not only direct construction costs, but also loss of revenue from impacted operations. Analysis of costs may indicate a need to reevaluate allowable changes to operations. As aircraft operations and allowable changes will vary widely among airports, this AC presents general guidance on those subjects.

1.2.5 Manage Safety Risk.

The FAA is committed to incorporating proactive safety risk management (SRM) tools into its decision-making processes. FAA Order 5200.11, *FAA Airports (ARP) Safety Management System (SMS)*, requires the FAA to conduct a Safety Assessment for certain triggering actions. Certain airport projects may require the airport operator to provide a Project Proposal Summary to help the FAA determine whether a Safety Assessment is required prior to FAA approval of the CSPP. The airport operator must coordinate with the appropriate FAA Airports Regional or District Office early in the development of the CSPP to determine the need for a Safety Risk Assessment. If the FAA requires an assessment, the airport operator must at a minimum:

1. Notify the appropriate FAA Airports Regional or District Office during the project "scope development" phase of any project requiring a CSPP.
2. Provide documents identified by the FAA as necessary to conduct SRM.
3. Participate in the SRM process for airport projects.
4. Provide a representative to participate on the SRM panel.

5. Ensure that all applicable SRM identified risks elements are recorded and mitigated within the CSPP.

## 1.3 Develop a Construction Safety and Phasing Plan (CSPP).

Development of an effective CSPP will require familiarity with many other documents referenced throughout this AC. See Appendix A for a list of related reading material.

### 1.3.1 List Requirements.

A CSPP must be developed for each on-airfield construction project funded by the Airport Improvement Program (AIP) or located on an airport certificated under Part 139. For on-airfield construction projects at Part 139 airports funded without AIP funds, the preparation of a CSPP represents an acceptable method the certificate holder may use to meet Part 139 requirements during airfield construction activity. As per FAA Order 5200.11, projects that require Safety Assessments do not include construction, rehabilitation, or change of any facility that is entirely outside the air operations area, does not involve any expansion of the facility envelope and does not involve construction equipment, haul routes or placement of material in locations that require access to the air operations area, increase the facility envelope, or impact line-of-sight. Such facilities may include passenger terminals and parking or other structures. However, extraordinary circumstances may trigger the need for a Safety Assessment and a CSPP. The CSPP is subject to subsequent review and approval under the FAA's Safety Risk Management procedures (see paragraph 1.2.5).

### 1.3.2 Prepare a Safety Plan Compliance Document (SPCD).

The Safety Plan Compliance Document (SPCD) details how the contractor will comply with the CSPP. Also, it will not be possible to determine all safety plan details (for example specific hazard equipment and lighting, contractor's points of contact, construction equipment heights) during the development of the CSPP. The successful contractor must define such details by preparing an SPCD that the airport operator reviews for approval prior to issuance of a notice-to-proceed. The SPCD is a subset of the CSPP, similar to how a shop drawing review is a subset to the technical specifications.

### 1.3.3 Assume Responsibility for the CSPP.

The airport operator is responsible for establishing and enforcing the CSPP. The airport operator may use the services of an engineering consultant to help develop the CSPP. However, writing the CSPP cannot be delegated to the construction contractor. Only those details the airport operator determines cannot be addressed before contract award are developed by the contractor and submitted for approval as the SPCD. The SPCD does not restate nor propose differences to provisions already addressed in the CSPP.

## 1.4 Who Is Responsible for Safety During Construction?

### 1.4.1 Establish a Safety Culture.

Everyone has a role in operational safety on airports during construction: the airport operator, the airport's consultants, the construction contractor and subcontractors, airport users, airport tenants, ARFF personnel, Air Traffic personnel, including Technical Operations personnel, FAA Airports Division personnel, and others, such as military personnel at any airport supporting military operations (e.g. national guard or a joint use facility). Close communication and coordination between all affected parties is the key to maintaining safe operations. Such communication and coordination should start at the project scoping meeting and continue through the completion of the project. The airport operator and contractor should conduct onsite safety inspections throughout the project and immediately remedy any deficiencies, whether caused by negligence, oversight, or project scope change.

### 1.4.2 Assess Airport Operator's Responsibilities.

An airport operator has overall responsibility for all activities on an airport, including construction. This includes the predesign, design, preconstruction, construction, and inspection phases. Additional information on the responsibilities listed below can be found throughout this AC. The airport operator must:

1.4.2.1 Develop a CSPP that complies with the safety guidelines of Chapter 2, Construction Safety and Phasing Plans, and Chapter 3, Guidelines for Writing a CSPP. The airport operator may develop the CSPP internally or have a consultant develop the CSPP for approval by the airport operator. For tenant sponsored projects, approve a CSPP developed by the tenant or its consultant.

1.4.2.2 Require, review and approve the SPCD by the contractor that indicates how it will comply with the CSPP and provides details that cannot be determined before contract award.

1.4.2.3 Convene a preconstruction meeting with the construction contractor, consultant, airport employees and, if appropriate, tenant sponsor and other tenants to review and discuss project safety before beginning construction activity. The appropriate FAA representatives should be invited to attend the meeting. See AC 150/5370-12*, Quality Management for Federally Funded Airport Construction Projects.* (Note "FAA" refers to the Airports Regional or District Office, the Air Traffic Organization, Flight Standards Service, and other offices that support airport operations, flight regulations, and construction/environmental policies.)

1.4.2.4 Ensure contact information is accurate for each representative/point of contact identified in the CSPP and SPCD.

1.4.2.5 Hold weekly or, if necessary, daily safety meetings with all affected parties to coordinate activities.

1.4.2.6 Notify users, ARFF personnel, and FAA ATO personnel of construction and conditions that may adversely affect the operational safety of the airport via Notices to Airmen (NOTAM) and other methods, as appropriate. Convene a meeting for review and discussion if necessary.

1.4.2.7 Ensure construction personnel know applicable airport procedures and changes to those procedures that may affect their work.

1.4.2.8 Ensure that all temporary construction signs are located per the scheduled list for each phase of the project.

1.4.2.9 Ensure construction contractors and subcontractors undergo training required by the CSPP and SPCD.

1.4.2.10 Ensure vehicle and pedestrian operations addressed in the CSPP and SPCD are coordinated with airport tenants, the airport traffic control tower (ATCT), and construction contractors.

1.4.2.11 At certificated airports, ensure each CSPP and SPCD is consistent with Part 139.

1.4.2.12 Conduct inspections sufficiently frequently to ensure construction contractors and tenants comply with the CSPP and SPCD and that there are no altered construction activities that could create potential safety hazards.

1.4.2.13 Take immediate action to resolve safety deficiencies.

1.4.2.14 At airports subject to 49 CFR Part 1542, *Airport Security*, ensure construction access complies with the security requirements of that regulation.

1.4.2.15 Notify appropriate parties when conditions exist that invoke provisions of the CSPP and SPCD (for example, implementation of low-visibility operations).

1.4.2.16 Ensure prompt submittal of a Notice of Proposed Construction or Alteration (Form 7460-1) for conducting an aeronautical study of potential obstructions such as tall equipment (cranes, concrete pumps, other), stock piles, and haul routes. A separate form may be filed for each potential obstruction, or one form may be filed describing the entire construction area and maximum equipment height. In the latter case, a separate form must be filed for any object beyond or higher than the originally evaluated area/height. The FAA encourages online submittal of forms for expediency at https://oeaaa.faa.gov/oeaaa/external/portal.jsp. The appropriate FAA Airports Regional or District Office can provide assistance in determining which objects require an aeronautical study.

1.4.2.17 Ensure prompt transmission of the Airport Sponsor Strategic Event Submission, FAA Form 6000-26, located at https://oeaaa.faa.gov/oeaaa/external/content/AIRPORT_SPONSOR_STRATEGIC_EVENT_SUBMISSION_FORM.pdf, to assure proper coordination for NAS Strategic Interruption per Service Level Agreement with ATO.

1.4.2.18 Promptly notify the FAA Airports Regional or District Office of any proposed changes to the CSPP prior to implementation of the change. Changes to the CSPP require review and approval by the airport operator and the FAA. The FAA Airports Regional or District office will determine if further coordination within the FAA is needed. Coordinate with appropriate local and other federal government agencies, such as Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA), Transportation Security Administration (TSA), and the state environmental agency.

1.4.3 Define Construction Contractor's Responsibilities.

The contractor is responsible for complying with the CSPP and SPCD. The contractor must:

1.4.3.1 Submit a Safety Plan Compliance Document (SPCD) to the airport operator describing how it will comply with the requirements of the CSPP and supply any details that could not be determined before contract award. The SPCD must include a certification statement by the contractor, indicating an understanding of the operational safety requirements of the CSPP and the assertion of compliance with the approved CSPP and SPCD unless written approval is granted by the airport operator. Any construction practice proposed by the contractor that does not conform to the CSPP and SPCD may impact the airport's operational safety and will require a revision to the CSPP and SPCD and re-coordination with the airport operator and the FAA in advance.

1.4.3.2 Have available at all times copies of the CSPP and SPCD for reference by the airport operator and its representatives, and by subcontractors and contractor employees.

1.4.3.3 Ensure that construction personnel are familiar with safety procedures and regulations on the airport. Provide a point of contact who will coordinate an immediate response to correct any construction-related activity that may adversely affect the operational safety of the airport. Many projects will require 24-hour coverage.

1.4.3.4 Identify in the SPCD the contractor's on-site employees responsible for monitoring compliance with the CSPP and SPCD during construction. At least one of these employees must be on-site when active construction is taking place.

1.4.3.5 Conduct sufficient inspections to ensure construction personnel comply with the CSPP and SPCD and that there are no altered construction activities that could create potential safety hazards.

1.4.3.6 Restrict movement of construction vehicles and personnel to permitted construction areas by flagging, barricading, erecting temporary fencing, or providing escorts, as appropriate, and as specified in the CSPP and SPCD.

1.4.3.7 Ensure that no contractor employees, employees of subcontractors or suppliers, or other persons enter any part of the air operations area (AOA) from the construction site unless authorized.

1.4.3.8 Ensure prompt submittal through the airport operator of Form 7460-1 for the purpose of conducting an aeronautical study of contractor equipment such as tall equipment (cranes, concrete pumps, and other equipment), stock piles, and haul routes when different from cases previously filed by the airport operator. The FAA encourages online submittal of forms for expediency at https://oeaaa.faa.gov/oeaaa/external/portal.jsp.

1.4.3.9 Ensure that all necessary safety mitigations are understood by all parties involved, and any special requirements of each construction phase will be fulfilled per the approved timeframe.

1.4.3.10 Participate in pre-construction meetings to review construction limits, safety mitigations, NOTAMs, and understand all special airport operational needs during each phase of the project.

1.4.4 Define Tenant's Responsibilities.

If planning construction activities on leased property, Airport tenants, such as airline operators, fixed base operators, and FAA ATO/Technical Operations sponsoring construction are strongly encouraged to:

1. Develop, or have a consultant develop, a project specific CSPP and submit it to the airport operator. The airport operator may forgo a complete CSPP submittal and instead incorporate appropriate operational safety principles and measures addressed in the advisory circular within their tenant lease agreements.
2. In coordination with its contractor, develop an SPCD and submit it to the airport operator for approval issued prior to issuance of a Notice to Proceed.
3. Ensure that construction personnel are familiar with safety procedures and regulations on the airport during all phases of the construction.
4. Provide a point of contact of who will coordinate an immediate response to correct any construction-related activity that may adversely affect the operational safety of the airport.
5. Identify in the SPCD the contractor's on-site employees responsible for monitoring compliance with the CSPP and SPCD during construction. At least one of these employees must be on-site when active construction is taking place.
6. Ensure that no tenant or contractor employees, employees of subcontractors or suppliers, or any other persons enter any part of the AOA from the construction site unless authorized.
7. Restrict movement of construction vehicles to construction areas by flagging and barricading, erecting temporary fencing, or providing escorts, as appropriate, as specified in the CSPP and SPCD.
8. Ensure prompt submittal through the airport operator of Form 7460-1 for conducting an aeronautical study of contractor equipment such as tall equipment (cranes, concrete pumps, other), stock piles, and haul routes. The FAA encourages online submittal of forms for expediency at https://oeaaa.faa.gov/oeaaa/external/portal.jsp.
9. Participate in pre-construction meetings to review construction limits, safety mitigations, NOTAMs, and understand all special airport operational needs during each phase of the project.

# CHAPTER 2. CONSTRUCTION SAFETY AND PHASING PLANS

## 2.1 Overview.

Aviation safety is the primary consideration at airports, especially during construction. The airport operator's CSPP and the contractor's Safety Plan Compliance Document (SPCD) are the primary tools to ensure safety compliance when coordinating construction activities with airport operations. These documents identify all aspects of the construction project that pose a potential safety hazard to airport operations and outline respective mitigation procedures for each hazard. They must provide information necessary for the Airport Operations department to conduct airfield inspections and expeditiously identify and correct unsafe conditions during construction. All aviation safety provisions included within the project drawings, contract specifications, and other related documents must also be reflected in the CSPP and SPCD.

## 2.2 Assume Responsibility.

Operational safety on the airport remains the airport operator's responsibility at all times. The airport operator must develop, certify, and submit for FAA approval each CSPP. It is the airport operator's responsibility to apply the requirements of the FAA approved CSPP. The airport operator must revise the CSPP when conditions warrant changes and must submit the revised CSPP to the FAA for approval. The airport operator must also require and approve a SPCD from the project contractor.

## 2.3 Submit the CSPP.

Construction Safety and Phasing Plans should be developed concurrently with the project design. Milestone versions of the CSPP should be submitted for review and approval as follows. While these milestones are not mandatory, early submission will help to avoid delays. Submittals are preferred in 8.5 × 11 inch or 11 × 17 inch format for compatibility with the FAA's Obstruction Evaluation / Airport Airspace Analysis (OE / AAA) process.

### 2.3.1 Submit an Outline/Draft.

By the time approximately 25% to 30% of the project design is completed, the principal elements of the CSPP should be established. Airport operators are encouraged to submit an outline or draft, detailing all CSPP provisions developed to date, to the FAA for review at this stage of the project design.

### 2.3.2 Submit a CSPP.

The CSPP should be formally submitted for FAA approval when the project design is 80 percent to 90 percent complete. Since provisions in the CSPP will influence contract costs, it is important to obtain FAA approval in time to include all such provisions in the procurement contract.

2.3.3 Submit an SPCD.

The contractor should submit the SPCD to the airport operator for approval to be issued prior to the Notice to Proceed.

2.3.4 Submit CSPP Revisions.

All revisions to a previously approved CSPP must be re-submitted to the FAA for review and approval/disapproval action.

## 2.4 Meet CSPP Requirements.

2.4.1 To the extent possible, the CSPP should address the following as outlined in Chapter 3, Guidelines for Writing a CSPP. Details that cannot be determined at this stage are to be included in the SPCD.

1. Coordination.
    a. Contractor progress meetings.
    b. Scope or schedule changes.
    c. FAA ATO coordination.
2. Phasing.
    a. Phase elements.
    b. Construction safety drawings.
3. Areas and operations affected by the construction activity.
    a. Identification of affected areas.
    b. Mitigation of effects.
4. Protection of navigation aids (NAVAIDs).
5. Contractor access.
    a. Location of stockpiled construction materials.
    b. Vehicle and pedestrian operations.
6. Wildlife management.
    a. Trash.
    b. Standing water.
    c. Tall grass and seeds.
    d. Poorly maintained fencing and gates.
    e. Disruption of existing wildlife habitat.
7. Foreign Object Debris (FOD) management.
8. Hazardous materials (HAZMAT) management.
9. Notification of construction activities.

a. Maintenance of a list of responsible representatives/ points of contact.
b. NOTAM.
c. Emergency notification procedures.
d. Coordination with ARFF Personnel.
e. Notification to the FAA.

10. Inspection requirements.
    a. Daily (or more frequent) inspections.
    b. Final inspections.
11. Underground utilities.
12. Penalties.
13. Special conditions.
14. Runway and taxiway visual aids. Marking, lighting, signs, and visual NAVAIDs.
    a. General.
    b. Markings.
    c. Lighting and visual NAVAIDs.
    d. Signs, temporary, including orange construction signs, and permanent signs.
15. Marking and signs for access routes.
16. Hazard marking and lighting.
    a. Purpose.
    b. Equipment.
17. Work zone lighting for nighttime construction (if applicable).
18. Protection of runway and taxiway safety areas, object free areas, obstacle free zones, and approach/departure surfaces.
    a. Runway Safety Area (RSA).
    b. Runway Object Free Area (ROFA).
    c. Taxiway Safety Area (TSA). Provide details for any adjustments to Taxiway Safety Area width to allow continued operation of smaller aircraft. See paragraph 2.22.3.
    d. Taxiway Object Free Area (TOFA). Provide details for any continued aircraft operations while construction occurs within the TOFA. See paragraph 2.22.4.
    e. Obstacle Free Zone (OFZ).
    f. Runway approach/departure surfaces.
19. Other limitations on construction.
    a. Prohibitions.

b. Restrictions.

2.4.2 The Safety Plan Compliance Document (SPCD) should include a general statement by the construction contractor that he/she has read and will abide by the CSPP. In addition, the SPCD must include all supplemental information that could not be included in the CSPP prior to the contract award. The contractor statement should include the name of the contractor, the title of the project CSPP, the approval date of the CSPP, and a reference to any supplemental information (that is, "I, (Name of Contractor), have read the (Title of Project) CSPP, approved on (Date), and will abide by it as written and with the following additions as noted:"). The supplemental information in the SPCD should be written to match the format of the CSPP indicating each subject by corresponding CSPP subject number and title. If no supplemental information is necessary for any specific subject, the statement, "No supplemental information," should be written after the corresponding subject title. The SPCD should not duplicate information in the CSPP:

1. Coordination. Discuss details of proposed safety meetings with the airport operator and with contractor employees and subcontractors.
2. Phasing. Discuss proposed construction schedule elements, including:
   a. Duration of each phase.
   b. Daily start and finish of construction, including "night only" construction.
   c. Duration of construction activities during:
      i. Normal runway operations.
      ii. Closed runway operations.
      iii. Modified runway "Aircraft Reference Code" usage.
3. Areas and operations affected by the construction activity. These areas and operations should be identified in the CSPP and should not require an entry in the SPCD.
4. Protection of NAVAIDs. Discuss specific methods proposed to protect operating NAVAIDs.
5. Contractor access. Provide the following:
   a. Details on how the contractor will maintain the integrity of the airport security fence (gate guards, daily log of construction personnel, and other).
   b. Listing of individuals requiring driver training (for certificated airports and as requested).
   c. Radio communications.
      i. Types of radios and backup capabilities.
      ii. Who will be monitoring radios.
      iii. Who to contact if the ATCT cannot reach the contractor's designated person by radio.

d. Details on how the contractor will escort material delivery vehicles.

6. Wildlife management. Discuss the following:
   a. Methods and procedures to prevent wildlife attraction.
   b. Wildlife reporting procedures.
7. Foreign Object Debris (FOD) management. Discuss equipment and methods for control of FOD, including construction debris and dust.
8. Hazardous Materials (HAZMAT) management. Discuss equipment and methods for responding to hazardous spills.
9. Notification of construction activities. Provide the following:
   a. Contractor points of contact.
   b. Contractor emergency contact.
   c. Listing of tall or other requested equipment proposed for use on the airport and the timeframe for submitting 7460-1 forms not previously submitted by the airport operator.
   d. Batch plant details, including 7460-1 submittal.
10. Inspection requirements. Discuss daily (or more frequent) inspections and special inspection procedures.
11. Underground utilities. Discuss proposed methods of identifying and protecting underground utilities.
12. Penalties. Penalties should be identified in the CSPP and should not require an entry in the SPCD.
13. Special conditions. Discuss proposed actions for each special condition identified in the CSPP.
14. Runway and taxiway visual aids. Including marking, lighting, signs, and visual NAVAIDs. Discuss proposed visual aids including the following:
   a. Equipment and methods for covering signage and airfield lights.
   b. Equipment and methods for temporary closure markings (paint, fabric, other).
   c. Temporary orange construction signs.
   d. Types of temporary Visual Guidance Slope Indicators (VGSI).
15. Marking and signs for access routes. Discuss proposed methods of demarcating access routes for vehicle drivers.
16. Hazard marking and lighting. Discuss proposed equipment and methods for identifying excavation areas.
17. Work zone lighting for nighttime construction (if applicable). Discuss proposed equipment, locations, aiming, and shielding to prevent interference with air traffic control and aircraft operations.

18. Protection of runway and taxiway safety areas, object free areas, obstacle free zones, and approach/departure surfaces. Discuss proposed methods of identifying, demarcating, and protecting airport surfaces including:
    a. Equipment and methods for maintaining Taxiway Safety Area standards.
    b. Equipment and methods to ensure the safe passage of aircraft where Taxiway Safety Area or Taxiway Object Free Area standards cannot be maintained.
    c. Equipment and methods for separation of construction operations from aircraft operations, including details of barricades.
19. Other limitations on construction should be identified in the CSPP and should not require an entry in the SPCD.

## 2.5 **Coordination.**

Airport operators, or tenants responsible for design, bidding and conducting construction on their leased properties, should ensure at all project developmental stages, such as predesign, prebid, and preconstruction conferences, they capture the subject of airport operational safety during construction (see AC 150/5370-12, *Quality Management for Federally Funded Airport Construction Projects*). In addition, the following should be coordinated as required:

### 2.5.1 Progress Meetings.

Operational safety should be a standing agenda item for discussion during progress meetings throughout the project developmental stages.

### 2.5.2 Scope or Schedule Changes.

Changes in the scope or duration at any of the project stages may require revisions to the CSPP and review and approval by the airport operator and the FAA (see paragraph 1.4.2.17).

### 2.5.3 FAA ATO Coordination.

Early coordination with FAA ATO is highly recommended during the design phase and is required for scheduling Technical Operations shutdowns prior to construction. Coordination is critical to restarts of NAVAID services and to the establishment of any special procedures for the movement of aircraft. Formal agreements between the airport operator and appropriate FAA offices are recommended. All relocation or adjustments to NAVAIDs, or changes to final grades in critical areas, should be coordinated with FAA ATO and may require an FAA flight inspection prior to restarting the facility. Flight inspections must be coordinated and scheduled well in advance of the intended facility restart. Flight inspections may require a reimbursable agreement between the airport operator and FAA ATO. Reimbursable agreements should be coordinated a minimum of 12 months prior to the start of construction. (See paragraph 2.13.5.3.2 for required FAA notification regarding FAA-owned NAVAIDs.)

## 2.6 Phasing.

Once it has been determined what types and levels of airport operations will be maintained, the most efficient sequence of construction may not be feasible. In this case, the sequence of construction may be phased to gain maximum efficiency while allowing for the required operations. The development of the resulting construction phases should be coordinated with local Air Traffic personnel and airport users. The sequenced construction phases established in the CSPP must be incorporated into the project design and must be reflected in the contract drawings and specifications.

### 2.6.1 Phase Elements.

For each phase the CSPP should detail:

- Areas closed to aircraft operations.
- Duration of closures.
- Taxi routes and/or areas of reduced TSA and TOFA to reflect reduced ADG use.
- ARFF access routes.
- Construction staging, disposal, and cleanout areas.
- Construction access and haul routes.
- Impacts to NAVAIDs.
- Lighting, marking, and signing changes.
- Available runway length and/or reduced RSA and ROFA to reflect reduced ADG use.
- Declared distances (if applicable).
- Required hazard marking, lighting, and signing.
- Work zone lighting for nighttime construction (if applicable).
- Lead times for required notifications.

### 2.6.2 Construction Safety Drawings.

Drawings specifically indicating operational safety procedures and methods in affected areas (i.e., construction safety drawings) should be developed for each construction phase. Such drawings should be included in the CSPP as referenced attachments and should also be included in the contract drawing package.

## 2.7 Areas and Operations Affected by Construction Activity.

Runways and taxiways should remain in use by aircraft to the maximum extent possible without compromising safety. Pre-meetings with the FAA ATO will support operational simulations. See Appendix E for an example of a table showing temporary operations versus current operations. The tables in Appendix E can be useful for coordination among all interested parties, including FAA Lines of Business.

2.7.1 Identification of Affected Areas.

Identifying areas and operations affected by the construction helps to determine possible safety problems. The affected areas should be identified in the construction safety drawings for each construction phase. (See paragraph 2.6.2.) Of particular concern are:

2.7.1.1 **Closing, or Partial Closing, of Runways, Taxiways and Aprons, and Displaced Thresholds.**

When a runway is partially closed, a portion of the pavement is unavailable for any aircraft operation, meaning taxiing, landing, or takeoff in either direction on that pavement is prohibited. A displaced threshold, by contrast, is established to ensure obstacle clearance and adequate safety area for landing aircraft. The pavement prior to the displaced threshold is normally available for take-off in the direction of the displacement and for landing and takeoff in the opposite direction. Misunderstanding this difference, may result in issuance of an inaccurate NOTAM, and can lead to a hazardous condition.

2.7.1.1.1 Partially Closed Runways.

The temporarily closed portion of a partially closed runway will generally extend from the threshold to a taxiway that may be used for entering and exiting the runway. If the closed portion extends to a point between taxiways, pilots will have to back-taxi on the runway, which is an undesirable operation. See Figure 2-1 for a desirable configuration.

2.7.1.1.2 Displaced Thresholds.

Since the portion of the runway pavement between the permanent threshold and a standard displaced threshold is available for takeoff and for landing in the opposite direction, the temporary displaced threshold need not be located at an entrance/exit taxiway. See Figure 2-2.

2.7.1.2 Closing of aircraft rescue and fire fighting access routes.

2.7.1.3 Closing of access routes used by airport and airline support vehicles.

2.7.1.4 Interruption of utilities, including water supplies for fire fighting.

2.7.1.5 Approach/departure surfaces affected by heights of objects.

2.7.1.6 Construction areas, storage areas, and access routes near runways, taxiways, aprons, or helipads.

## Figure 2-1. Temporary Partially Closed Runway

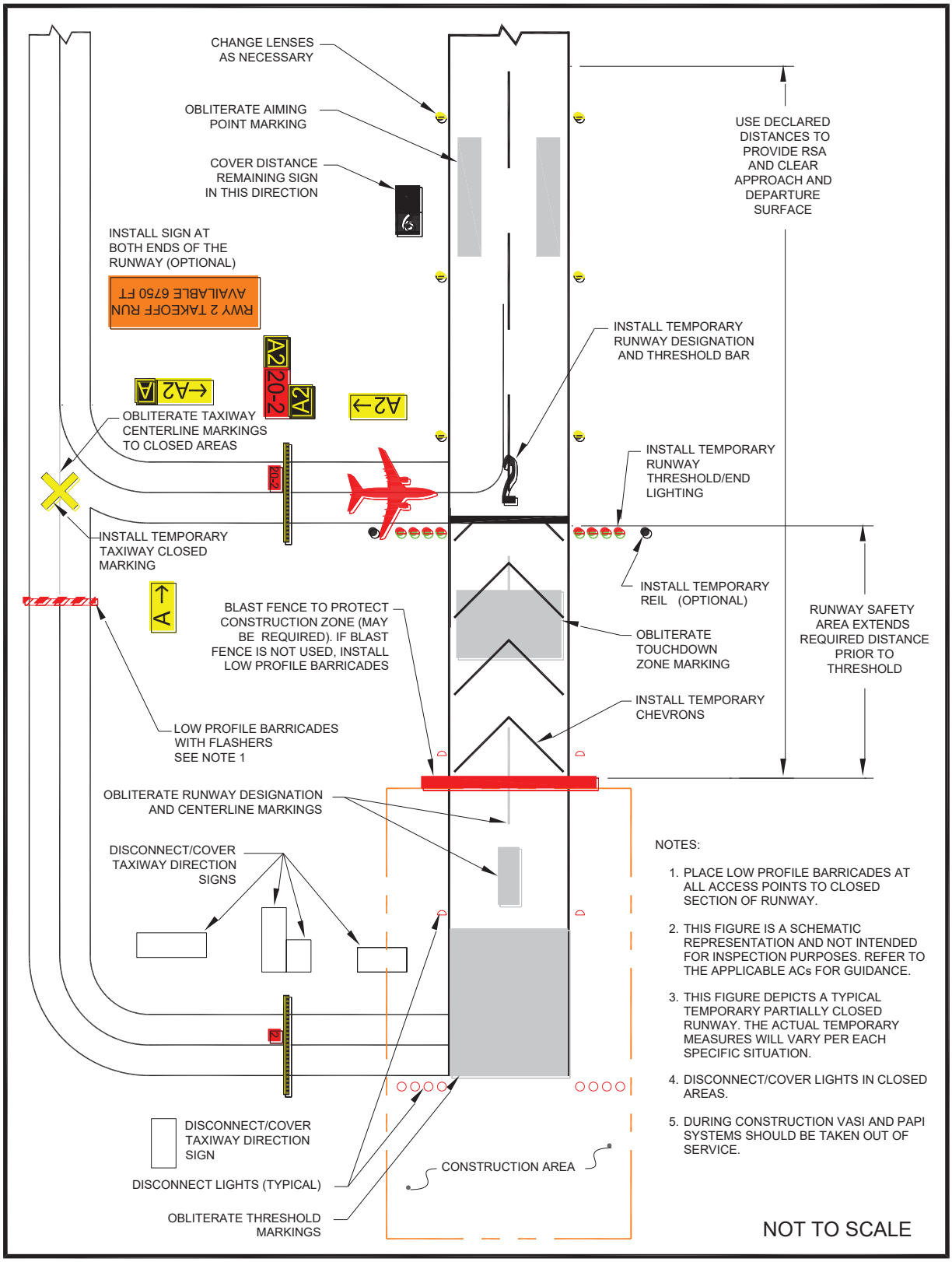
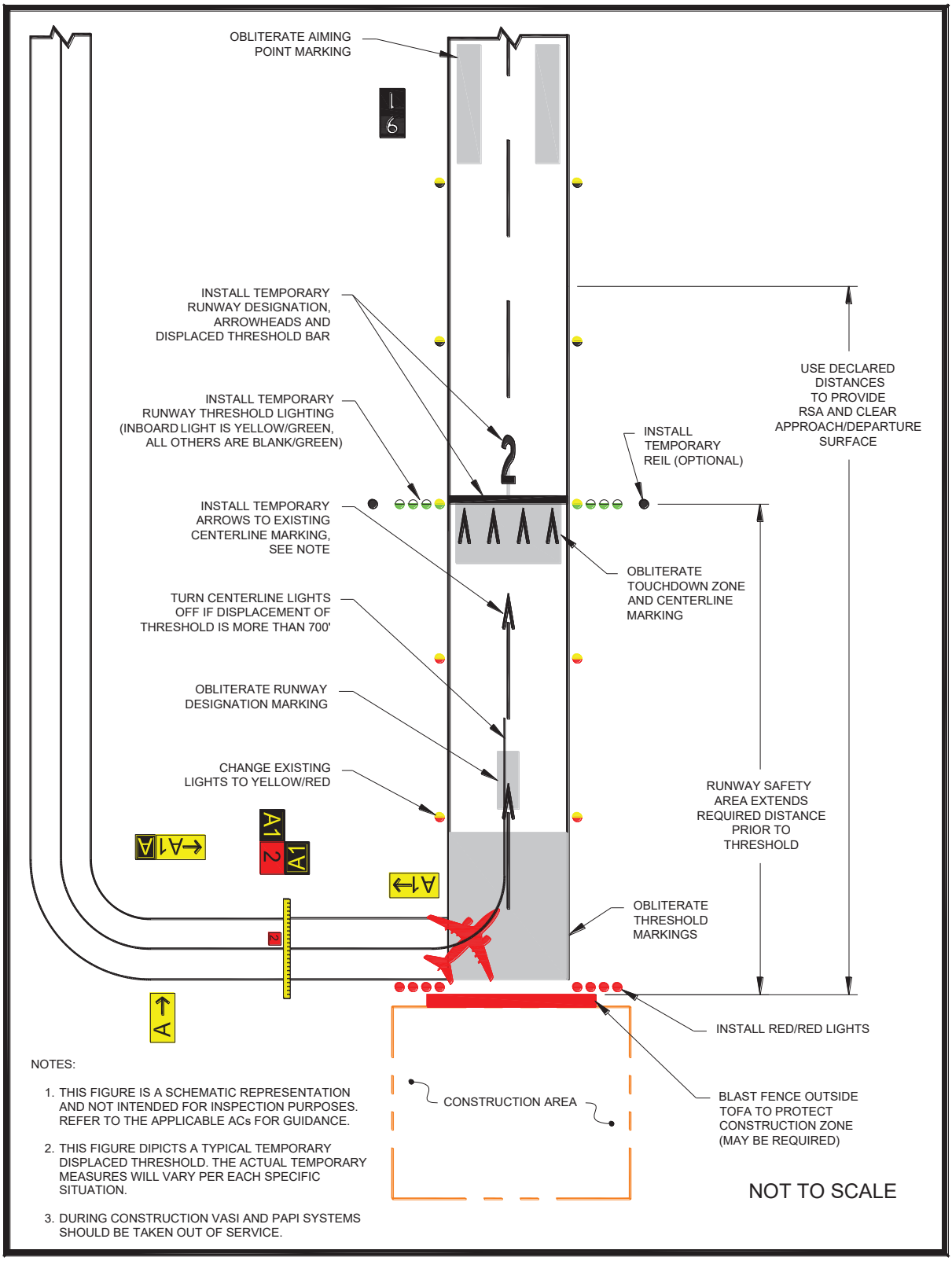


**Figure 2-2. Temporary Displaced Threshold**




**Note:** See paragraph 2.18.2.5.

2.7.2 Mitigation of Effects.

Establishment of specific procedures is necessary to maintain the safety and efficiency of airport operations. The CSPP must address:

2.7.2.1 Temporary changes to runway and/or taxi operations.

2.7.2.2 Detours for ARFF and other airport vehicles.

2.7.2.3 Maintenance of essential utilities.

2.7.2.4 Temporary changes to air traffic control procedures. Such changes must be coordinated with the ATO.

## 2.8 Navigation Aid (NAVAID) Protection.

Before commencing construction activity, parking vehicles, or storing construction equipment and materials near a NAVAID, coordinate with the appropriate FAA ATO/Technical Operations office to evaluate the effect of construction activity and the required distance and direction from the NAVAID. (See paragraph 2.13.5.3.) Construction activities, materials/equipment storage, and vehicle parking near electronic NAVAIDs require special consideration since they may interfere with signals essential to air navigation. If any NAVAID may be affected, the CSPP and SPCD must show an understanding of the "critical area" associated with each NAVAID and describe how it will be protected. Where applicable, the operational critical areas of NAVAIDs should be graphically delineated on the project drawings. Pay particular attention to stockpiling material, as well as to movement and parking of equipment that may interfere with line of sight from the ATCT or with electronic emissions. Interference from construction equipment and activities may require NAVAID shutdown or adjustment of instrument approach minimums for low visibility operations. This condition requires that a NOTAM be filed (see paragraph 2.13.2). Construction activities and materials/equipment storage near a NAVAID must not obstruct access to the equipment and instruments for maintenance. Submittal of a 7460-1 form is required for construction vehicles operating near FAA NAVAIDs. (See paragraph 2.13.5.3.)

## 2.9 Contractor Access.

The CSPP must detail the areas to which the contractor must have access, and explain how contractor personnel will access those areas. Specifically address:

2.9.1 Location of Stockpiled Construction Materials.

Stockpiled materials and equipment storage are not permitted within the RSA and OFZ, and if possible should not be permitted within the Object Free Area (OFA) of an operational runway. Stockpiling material in the OFA requires submittal of a 7460-1 form and justification provided to the appropriate FAA Airports Regional or District Office for approval. The airport operator must ensure that stockpiled materials and equipment adjacent to these areas are prominently marked and lighted during hours of restricted visibility or darkness. (See paragraph 2.18.2.) This includes determining and

verifying that materials are stabilized and stored at an approved location so as not to be a hazard to aircraft operations and to prevent attraction of wildlife and foreign object damage from blowing or tracked material. See paragraphs 2.10 and 2.11.

2.9.2 Vehicle and Pedestrian Operations.

The CSPP should include specific vehicle and pedestrian requirements. Vehicle and pedestrian access routes for airport construction projects must be controlled to prevent inadvertent or unauthorized entry of persons, vehicles, or animals onto the AOA. The airport operator should coordinate requirements for vehicle operations with airport tenants, contractors, and the FAA air traffic manager. In regard to vehicle and pedestrian operations, the CSPP should include the following, with associated training requirements:

2.9.2.1 **Construction Site Parking.**

Designate in advance vehicle parking areas for contractor employees to prevent any unauthorized entry of persons or vehicles onto the AOA. These areas should provide reasonable contractor employee access to the job site.

2.9.2.2 **Construction Equipment Parking.**

Contractor employees must park and service all construction vehicles in an area designated by the airport operator outside the OFZ and never in the safety area of an active runway or taxiway. Unless a complex setup procedure makes movement of specialized equipment infeasible, inactive equipment must not be parked on a closed taxiway or runway. If it is necessary to leave specialized equipment on a closed taxiway or runway at night, the equipment must be well lighted. Employees should also park construction vehicles outside the OFA when not in use by construction personnel (for example, overnight, on weekends, or during other periods when construction is not active). Parking areas must not obstruct the clear line of sight by the ATCT to any taxiways or runways under air traffic control nor obstruct any runway visual aids, signs, or navigation aids. The FAA must also study those areas to determine effects on airport design criteria, surfaces established by 14 CFR Part 77, Safe, Efficient Use, and Preservation of the Navigable Airspace (Part 77), and on NAVAIDs and Instrument Approach Procedures (IAP). See paragraph 2.13.1 for further information.

2.9.2.3 **Access and Haul Roads.**

Determine the construction contractor’s access to the construction sites and haul roads. Do not permit the construction contractor to use any access or haul roads other than those approved. Access routes used by contractor vehicles must be clearly marked to prevent inadvertent entry to areas open to airport operations. Pay special attention to ensure that if construction traffic is to share or cross any ARFF routes that ARFF right of way is not impeded at any time, and that construction traffic on haul

roads does not interfere with NAVAIDs or approach surfaces of operational runways. Address whether access gates will be blocked or inoperative or if a rally point will be blocked or inaccessible.

2.9.2.4 Marking and lighting of vehicles in accordance with AC 150/5210-5, *Painting, Marking, and Lighting of Vehicles Used on an Airport.*

2.9.2.5 Description of proper vehicle operations on various areas under normal, lost communications, and emergency conditions.

2.9.2.6 Required escorts.

2.9.2.7 **Training Requirements for Vehicle Drivers to Ensure Compliance with the Airport Operator's Vehicle Rules and Regulations.**

Specific training should be provided to vehicle operators, including those providing escorts. See AC 150/5210-20, *Ground Vehicle Operations on Airports*, for information on training and records maintenance requirements.

2.9.2.8 **Situational Awareness.**

Vehicle drivers must confirm by personal observation that no aircraft is approaching their position (either in the air or on the ground) when given clearance to cross a runway, taxiway, or any other area open to airport operations. In addition, it is the responsibility of the escort vehicle driver to verify the movement/position of all escorted vehicles at any given time. At non-towered airports, all aircraft movements and flight operations rely on aircraft operators to self-report their positions and intentions. However, there is no requirement for an aircraft to have radio communications. Because aircraft do not always broadcast their positions or intentions, visual checking, radio monitoring, and situational awareness of the surroundings is critical to safety.

2.9.2.9 **Two-Way Radio Communication Procedures.**

2.9.2.9.1 General.

The airport operator must ensure that tenant and construction contractor personnel engaged in activities involving unescorted operation on aircraft movement areas observe the proper procedures for communications, including using appropriate radio frequencies at airports with and without ATCT. When operating vehicles on or near open runways or taxiways, construction personnel must understand the critical importance of maintaining radio contact, as directed by the airport operator, with:

1. Airport operations
2. ATCT

3. Common Traffic Advisory Frequency (CTAF), which may include UNICOM, MULTICOM.
4. Automatic Terminal Information Service (ATIS). This frequency is useful for monitoring conditions on the airport. Local air traffic will broadcast information regarding construction related runway closures and "shortened" runways on the ATIS frequency.

2.9.2.9.2 Areas Requiring Two-Way Radio Communication with the ATCT.

Vehicular traffic crossing active movement areas must be controlled either by two-way radio with the ATCT, escort, flagman, signal light, or other means appropriate for the particular airport.

2.9.2.9.3 Frequencies to be Used.

The airport operator will specify the frequencies to be used by the contractor, which may include the CTAF for monitoring of aircraft operations. Frequencies may also be assigned by the airport operator for other communications, including any radio frequency in compliance with Federal Communications Commission requirements. At airports with an ATCT, the airport operator will specify the frequency assigned by the ATCT to be used between contractor vehicles and the ATCT.

2.9.2.9.4 Proper radio usage, including read back requirements.

2.9.2.9.5 Proper phraseology, including the International Phonetic Alphabet.

2.9.2.9.6 Light Gun Signals.

Even though radio communication is maintained, escort vehicle drivers must also familiarize themselves with ATCT light gun signals in the event of radio failure. See the FAA safety placard "Ground Vehicle Guide to Airport Signs and Markings." This safety placard may be downloaded through the Runway Safety Program Web site at http://www.faa.gov/airports/runway_safety/publications/ (see "Signs & Markings Vehicle Dashboard Sticker") or obtained from the FAA Airports Regional Office.

2.9.2.10 **Maintenance of the secured area of the airport, including:**

2.9.2.10.1 Fencing and Gates.

Airport operators and 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. Temporary gates should be equipped so they can be securely closed and locked to prevent access by animals and unauthorized people. Procedures should be in place to ensure that only authorized persons and vehicles have access to the AOA and to prohibit "piggybacking" behind another person or vehicle. The Department of Transportation (DOT) document DOT/FAA/AR-

00/52, *Recommended Security Guidelines for Airport Planning and Construction*, provides more specific information on fencing. A copy of this document can be obtained from the Airport Consultants Council, Airports Council International, or American Association of Airport Executives.

2.9.2.10.2 Badging Requirements.

Airports subject to 49 CFR Part 1542, *Airport Security*, must meet standards for access control, movement of ground vehicles, and identification of construction contractor and tenant personnel.

## 2.10 Wildlife Management.

The CSPP and SPCD must be in accordance with the airport operator's wildlife hazard management plan, if applicable. See AC 150/5200-33, *Hazardous Wildlife Attractants On or Near Airports,* and CertAlert 98-05, *Grasses Attractive to Hazardous Wildlife.* Construction contractors must carefully control and continuously remove waste or loose materials that might attract wildlife. Contractor personnel must be aware of and avoid construction activities that can create wildlife hazards on airports, such as:

2.10.1 Trash.

Food scraps must be collected from construction personnel activity.

2.10.2 Standing Water.

2.10.3 Tall Grass and Seeds.

Requirements for turf establishment can be at odds with requirements for wildlife control. Grass seed is attractive to birds. Lower quality seed mixtures can contain seeds of plants (such as clover) that attract larger wildlife. Seeding should comply with the guidance in AC 150/5370-10, *Standards for Specifying Construction of Airports,* Item T-901, Seeding. Contact the local office of the United Sates Department of Agriculture Soil Conservation Service or the State University Agricultural Extension Service (County Agent or equivalent) for assistance and recommendations. These agencies can also provide liming and fertilizer recommendations.

2.10.4 Poorly Maintained Fencing and Gates.

See paragraph 2.9.2.10.1.

2.10.5 Disruption of Existing Wildlife Habitat.

While this will frequently be unavoidable due to the nature of the project, the CSPP should specify under what circumstances (location, wildlife type) contractor personnel should immediately notify the airport operator of wildlife sightings.

2.11 **Foreign Object Debris (FOD) Management.**

Waste and loose materials, commonly referred to as FOD, are capable of causing damage to aircraft landing gears, propellers, and jet engines. Construction contractors must not leave or place FOD on or near active aircraft movement areas. Materials capable of creating FOD must be continuously removed during the construction project. Fencing (other than security fencing) or covers may be necessary to contain material that can be carried by wind into areas where aircraft operate. See AC 150/5210-24, *Foreign Object Debris (FOD) Management.*

2.12 **Hazardous Materials (HAZMAT) Management.**

Contractors operating construction vehicles and equipment on the airport must be prepared to expeditiously contain and clean-up spills resulting from fuel or hydraulic fluid leaks. Transport and handling of other hazardous materials on an airport also requires special procedures. See AC 150/5320-15, *Management of Airport Industrial Waste.*

2.13 **Notification of Construction Activities.**

The CSPP and SPCD must detail procedures for the immediate notification of airport users and the FAA of any conditions adversely affecting the operational safety of the airport. It must address the notification actions described below, as applicable.

2.13.1 List of Responsible Representatives/points of contact for all involved parties, and procedures for contacting each of them, including after hours.

2.13.2 NOTAMs.

Only the airport operator may initiate or cancel NOTAMs on airport conditions, and is the only entity that can close or open a runway. The airport operator must coordinate the issuance, maintenance, and cancellation of NOTAMs about airport conditions resulting from construction activities with tenants and the local air traffic facility (control tower, approach control, or air traffic control center), and must either enter the NOTAM into NOTAM Manager, or provide information on closed or hazardous conditions on airport movement areas to the FAA Flight Service Station (FSS) so it can issue a NOTAM. The airport operator must file and maintain a list of authorized representatives with the FSS. Refer to AC 150/5200-28, *Notices to Airmen (NOTAMs) for Airport Operators,* for a sample NOTAM form. Only the FAA may issue or cancel NOTAMs on shutdown or irregular operation of FAA owned facilities. Any person having reason to believe that a NOTAM is missing, incomplete, or inaccurate must notify the airport operator. See paragraph 2.7.1.1 about issuing NOTAMs for partially closed runways versus runways with displaced thresholds.

2.13.3 Emergency notification procedures for medical, fire fighting, and police response.

2.13.4 Coordination with ARFF.

The CSPP must detail procedures for coordinating through the airport sponsor with ARFF personnel, mutual aid providers, and other emergency services if construction requires:

1. The deactivation and subsequent reactivation of water lines or fire hydrants, or
2. The rerouting, blocking and restoration of emergency access routes, or
3. The use of hazardous materials on the airfield.

2.13.5 Notification to the FAA.

2.13.5.1 **Part 77.**

Any person proposing construction or alteration of objects that affect navigable airspace, as defined in Part 77, must notify the FAA. This includes construction equipment and proposed parking areas for this equipment (i.e., cranes, graders, other equipment) on airports. FAA Form 7460-1, *Notice of Proposed Construction or Alteration*, can be used for this purpose and submitted to the appropriate FAA Airports Regional or District Office. See Appendix A to download the form. Further guidance is available on the FAA web site at oeaaa.faa.gov.

2.13.5.2 **Part 157.**

With some exceptions, Title 14 CFR Part 157, *Notice of Construction, Alteration, Activation, and Deactivation of Airports*, requires that the airport operator notify the FAA in writing whenever a non-Federally funded project involves the construction of a new airport; the construction, realigning, altering, activating, or abandoning of a runway, landing strip, or associated taxiway; or the deactivation or abandoning of an entire airport. Notification involves submitting FAA Form 7480-1, *Notice of Landing Area Proposal*, to the nearest FAA Airports Regional or District Office. See Appendix A to download the form.

2.13.5.3 **NAVAIDs.**

For emergency (short-notice) notification about impacts to both airport owned and FAA owned NAVAIDs, contact: 866-432-2622.

2.13.5.3.1 Airport Owned/FAA Maintained.

If construction operations require a shutdown of 24 hours or greater in duration, or more than 4 hours daily on consecutive days, of a NAVAID owned by the airport but maintained by the FAA, provide a 45-day minimum notice to FAA ATO/Technical Operations prior to facility shutdown, using Strategic Event Coordination (SEC) Form 6000.26 contained within FAA Order 6000.15, *General Maintenance Handbook for National Airspace System (NAS) Facilities*.

2.13.5.3.2 FAA Owned.

1. The airport operator must notify the appropriate FAA ATO Service Area Planning and Requirements (P&R) Group a minimum of 45 days prior to implementing an event that causes impacts to NAVAIDs, using SEC Form 6000.26.
2. Coordinate work for an FAA owned NAVAID shutdown with the local FAA ATO/Technical Operations office, including any necessary reimbursable agreements and flight checks. Detail procedures that address unanticipated utility outages and cable cuts that could impact FAA NAVAIDs. Refer to active Service Level Agreement with ATO for specifics.

## 2.14 **Inspection Requirements.**

### 2.14.1 Daily Inspections.

Inspections should be conducted at least daily, but more frequently if necessary to ensure conformance with the CSPP. A sample checklist is provided in Appendix D, Construction Project Daily Safety Inspection Checklist. See also AC 150/5200-18, *Airport Safety Self-Inspection.* Airport operators holding a Part 139 certificate are required to conduct self-inspections during unusual conditions, such as construction activities, that may affect safe air carrier operations.

### 2.14.2 Interim Inspections.

Inspections should be conducted of all areas to be (re)opened to aircraft traffic to ensure the proper operation of lights and signs, for correct markings, and absence of FOD. The contractor should conduct an inspection of the work area with airport operations personnel. The contractor should ensure that all construction materials have been secured, all pavement surfaces have been swept clean, all transition ramps have been properly constructed, and that surfaces have been appropriately marked for aircraft to operate safely. Only if all items on the list meet with the airport operator's approval should the air traffic control tower be notified to open the area to aircraft operations. The contractor should be required to retain a suitable workforce and the necessary equipment at the work area for any last minute cleanup that may be requested by the airport operator prior to opening the area.

### 2.14.3 Final Inspections.

New runways and extended runway closures may require safety inspections at certificated airports prior to allowing air carrier service. Coordinate with the FAA Airport Certification Safety Inspector (ACSI) to determine if a final inspection will be necessary.

2.15 **Underground Utilities.**

The CSPP and/or SPCD must include procedures for locating and protecting existing underground utilities, cables, wires, pipelines, and other underground facilities in excavation areas. This may involve coordinating with public utilities and FAA ATO/Technical Operations. Note that "One Call" or "Miss Utility" services do not include FAA ATO/Technical Operations.

2.16 **Penalties.**

The CSPP should detail penalty provisions for noncompliance with airport rules and regulations and the safety plans (for example, if a vehicle is involved in a runway incursion). Such penalties typically include rescission of driving privileges or access to the AOA.

2.17 **Special Conditions.**

The CSPP must detail any special conditions that affect the operation of the airport and will require the activation of any special procedures (for example, low-visibility operations, snow removal, aircraft in distress, aircraft accident, security breach, Vehicle / Pedestrian Deviation (VPD) and other activities requiring construction suspension/resumption).

2.18 **Runway and Taxiway Visual Aids.**

This includes marking, lighting, signs, and visual NAVAIDs. The CSPP must ensure that areas where aircraft will be operating are clearly and visibly separated from construction areas, including closed runways. Throughout the duration of the construction project, verify that these areas remain clearly marked and visible at all times and that marking, lighting, signs, and visual NAVAIDs that are to continue to perform their functions during construction remain in place and operational. Visual NAVAIDs that are not serving their intended function during construction must be temporarily disabled, covered, or modified as necessary. The CSPP must address the following, as appropriate:

2.18.1 General.

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

2.18.2 Markings.

During the course of construction projects, temporary pavement markings are often required to allow for aircraft operations during or between work periods. During the design phase of the project, the designer should coordinate with the project manager,

airport operations, airport users, the FAA Airports project manager, and Airport Certification Safety Inspector for Part 139 airports to determine minimum temporary markings. The FAA Airports project manager will, wherever a runway is closed, coordinate with the appropriate FAA Flight Standards Office and disseminate findings to all parties. Where possible, the temporary markings on finish grade pavements should be placed to mirror the dimensions of the final markings. Markings must be in compliance with the standards of AC 150/5340-1, *Standards for Airport Markings,* except as noted herein. Runways and runway exit taxiways closed to aircraft operations are marked with a yellow X. The preferred visual aid to depict temporary runway closure is the lighted X signal placed on or near the runway designation numbers. (See paragraph 2.18.2.1.2.)

2.18.2.1 **Closed Runways and Taxiways.**

2.18.2.1.1 Permanently Closed Runways.

For runways, obliterate the threshold marking, runway designation marking, and touchdown zone markings, and place an X at each end and at 1,000-foot (300 m) intervals. For a multiple runway environment, if the lighted X on a designated number will be located in the RSA of an adjacent active runway, locate the lighted X farther down the closed runway to clear the RSA of the active runway. In addition, the closed runway numbers located in the RSA of an active runway must be marked with a flat yellow X.

2.18.2.1.2 Temporarily Closed Runways.

For runways that have been temporarily closed, place an X at each end of the runway directly on or as near as practicable to the runway designation numbers. For a multiple runway environment, if the lighted X on a designated number will be located in the RSA of an adjacent active runway, locate the lighted X farther down the closed runway to clear the RSA of the active runway. In addition, the closed runway numbers located in the RSA of an active runway must be marked with a flat yellow X. See Figure 2-3. See also paragraph 2.18.3.3.

2.18.2.1.3 Partially Closed Runways and Displaced Thresholds.

When threshold markings are needed to identify the temporary beginning of the runway that is available for landing, the markings must comply with AC 150/5340-1. An X is not used on a partially closed runway or a runway with a displaced threshold. See paragraph 2.7.1.1 for the difference between partially closed runways and runways with displaced thresholds. Because of the temporary nature of threshold displacement due to construction, it is not necessary to re-adjust the existing runway centerline markings to meet standard spacing for a runway with a visual approach. Some of the requirements below may be waived in the cases of low-activity airports and/or short duration changes that are measured in days rather than weeks. Consider whether the presence of an airport traffic

control tower allows for the development of special procedures. Contact the appropriate FAA Airports Regional or District Office for assistance.

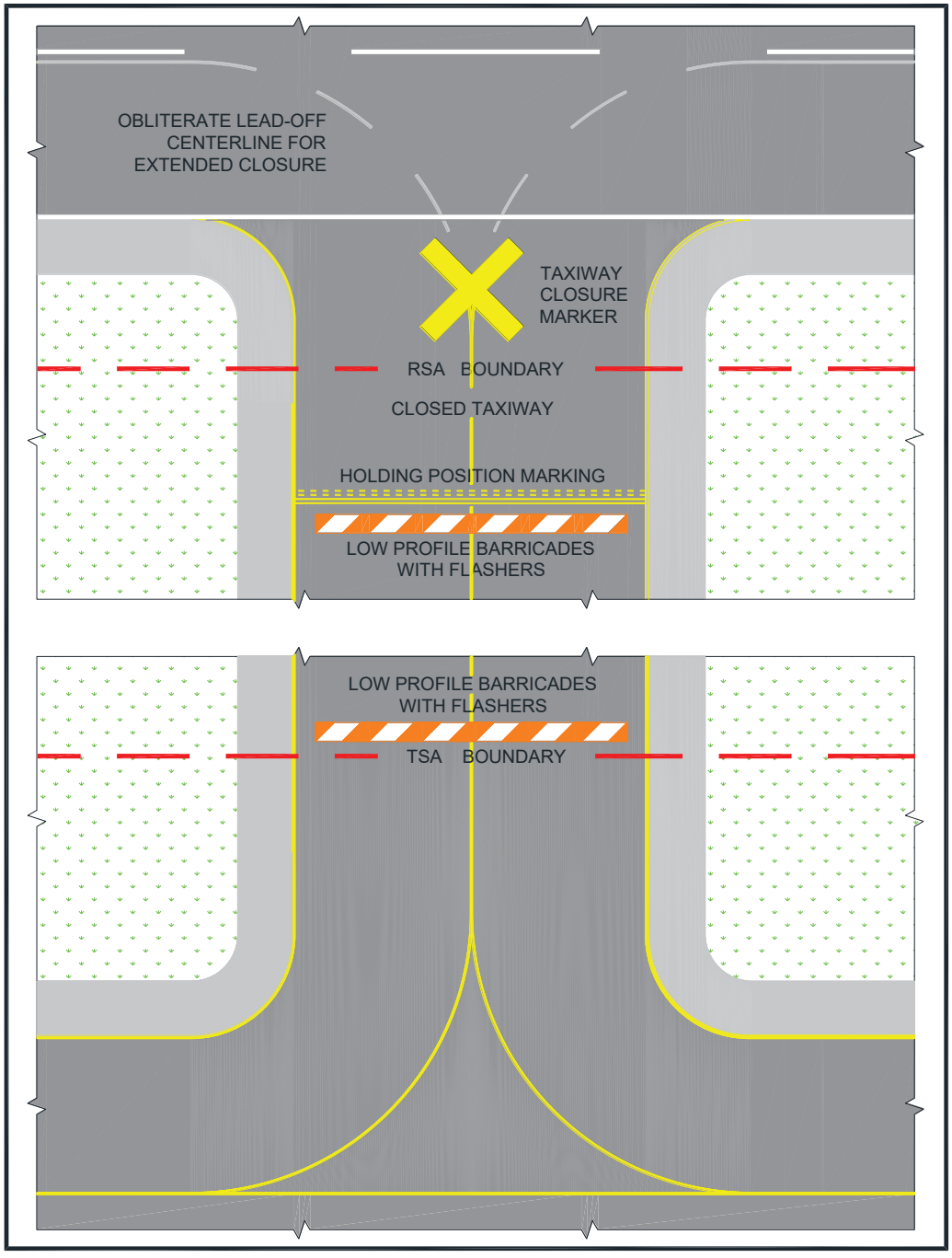
**Figure 2-3. Markings for a Temporarily Closed Runway**

1. **Partially Closed Runways.** Pavement markings for temporary closed portions of the runway consist of a runway threshold bar, runway designation, and yellow chevrons to identify pavement areas that are unsuitable for takeoff or landing (see AC 150/5340-1). Obliterate or cover markings prior to the moved threshold. Existing touchdown zone markings beyond the moved threshold may remain in place. Obliterate aiming point markings. Issue appropriate NOTAMs regarding any nonstandard markings. See Figure 2-4.
2. **Displaced Thresholds.** Pavement markings for a displaced threshold consist of a runway threshold bar, runway designation, and white arrowheads with and without arrow shafts. These markings are required to identify the portion of the runway before the displaced threshold to provide centerline guidance for pilots during approaches, takeoffs, and landing rollouts from the opposite direction. See AC 150/5340-1. Obliterate markings prior to the displaced threshold. Existing touchdown zone markings beyond the displaced threshold may remain in place. Obliterate aiming point markings. Issue appropriate NOTAMs regarding any nonstandard markings. See Figure 2-2.

2.18.2.1.4 Taxiways.

1. **Permanently Closed Taxiways.** AC 150/5300-13 *Airport Design,* notes that it is preferable to remove the pavement, but for pavement that is to remain, place an X at the entrance to both ends of the closed section. Obliterate taxiway centerline markings, including runway leadoff lines, leading to the closed taxiway. See Figure 2-4.

**Figure 2-4. Temporary Taxiway Closure**



2. **Temporarily Closed Taxiways.** Place barricades outside the safety area of intersecting taxiways. For runway/taxiway intersections, place an X at the entrance to the closed taxiway from the runway. If the taxiway will be closed for an extended period, obliterate taxiway centerline markings, including runway leadoff lines and taxiway to taxiway turns, leading to the closed section. Always obliterate runway lead-off lines for high speed exits, regardless of the duration of the closure. If the centerline markings will be reused upon reopening the taxiway, it is preferable to paint over the marking. This will result in less damage to the pavement when the upper layer of paint is ultimately removed. See Figure 2-4.

2.18.2.1.5 Temporarily Closed Airport.

When the airport is closed temporarily, mark all the runways as closed.

2.18.2.2 If unable to paint temporary markings on the pavement, construct them from any of the following materials: fabric, colored plastic, painted sheets of plywood, or similar materials. They must be properly configured and appropriately secured to prevent movement by prop wash, jet blast, or other wind currents. Items used to secure such markings must be of a color similar to the marking.

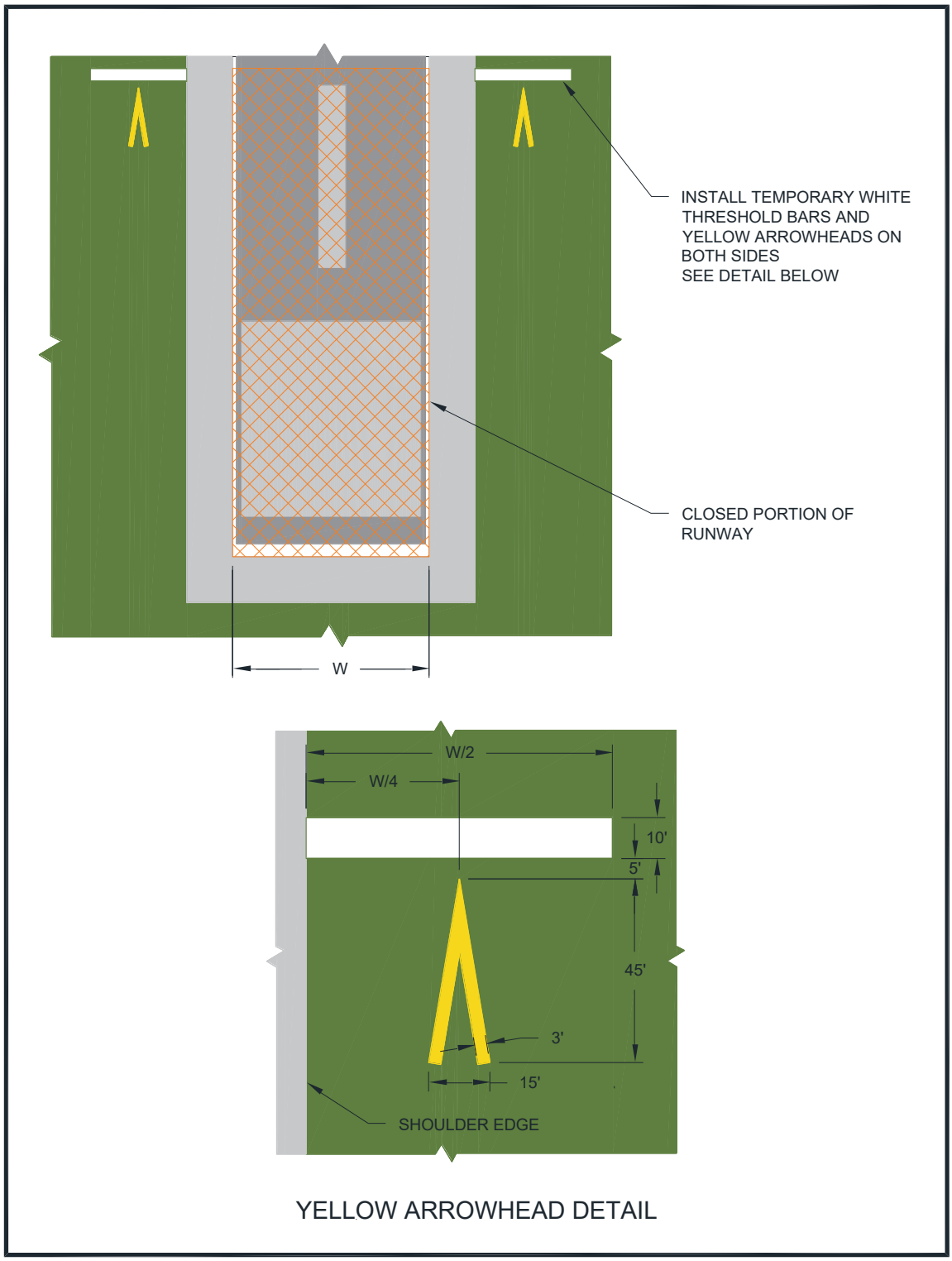
2.18.2.3 It may be necessary to remove or cover runway markings, including but not limited to, runway designation markings, threshold markings, centerline markings, edge stripes, touchdown zone markings and aiming point markings, depending on the length of construction and type of activity at the airport. When removing runway markings, apply the same treatment to areas between stripes or numbers, as the cleaned area will appear to pilots as a marking in the shape of the treated area.

2.18.2.4 If it is not possible to install threshold bars, chevrons, and arrows on the pavement, "temporary outboard white threshold bars and yellow arrowheads", see Figure 2-5, may be used. Locate them outside of the runway pavement surface on both sides of the runway. The dimensions must be as shown in Figure 2-5. If the markings are not discernible on grass or snow, apply a black background with appropriate material over the ground to ensure they are clearly visible.

2.18.2.5 The application rate of paint to mark a short-term temporary runway and taxiway markings may deviate from the standard (see Item P-620, "Runway and Taxiway Painting," in AC 150/5370-10), but the dimensions must meet the existing standards. When applying temporary markings at night, it is recommended that the fast curing, Type II paint be used to help offset the higher humidity and cooler temperatures often experienced at night. Diluting the paint will substantially increase cure time and is not recommended. Glass beads are not recommended for temporary markings. Striated markings may also be used for certain temporary markings. AC

150/5340-1, *Standards for Airport Markings,* has additional guidance on temporary markings.

**Figure 2-5. Temporary Outboard White Threshold Bars and Yellow Arrowheads**



2.18.3 Lighting and Visual NAVAIDs.

This paragraph refers to standard runway and taxiway lighting systems. See below for hazard lighting. Lighting installation must be in conformance with AC 150/5340-30, *Design and Installation Details for Airport Visual Aids,* and fixture design in conformance with AC 150/5345-50, *Specification for Portable Runway and Taxiway Lights.* When disconnecting runway and taxiway lighting fixtures, disconnect the associated isolation transformers. See AC 150/5340-26, *Maintenance of Airport Visual Aid Facilities*, for disconnect procedures and safety precautions. Alternately, cover the light fixture in such a way as to prevent light leakage. Avoid removing the lamp from energized fixtures because an excessive number of isolation transformers with open secondaries may damage the regulators and/or increase the current above its normal value. Secure, identify, and place any above ground temporary wiring in conduit to prevent electrocution and fire ignition sources. Maintain mandatory hold signs to operate normally in any situation where pilots or vehicle drivers could mistakenly be in that location. At towered airports certificated under Part 139, holding position signs are required to be illuminated on open taxiways crossing to closed or inactive runways. If the holding position sign is installed on the runway circuit for the closed runway, install a jumper to the taxiway circuit to provide power to the holding position sign for nighttime operations. Where it is not possible to maintain power to signs that would normally be operational, install barricades to exclude aircraft. Figure 2-1, Figure 2-2, Figure 2-3, and Figure 2-4 illustrate temporary changes to lighting and visual NAVAIDs.

2.18.3.1 **Permanently Closed Runways and Taxiways.**

For runways and taxiways that have been permanently closed, disconnect the lighting circuits.

2.18.3.2 **Temporarily Closed Runways and New Runways Not Yet Open to Air Traffic.**

If available, use a lighted X, both at night and during the day, placed at each end of the runway on or near the runway designation numbers facing the approach. (Note that the lighted X must be illuminated at all times that it is on a runway.) The use of a lighted X is required if night work requires runway lighting to be on. See AC 150/5345-55, *Specification for L-893, Lighted Visual Aid to Indicate Temporary Runway Closure.* For runways that have been temporarily closed, but for an extended period, and for those with pilot controlled lighting, disconnect the lighting circuits or secure switches to prevent inadvertent activation. For runways that will be opened periodically, coordinate procedures with the FAA air traffic manager or, at airports without an ATCT, the airport operator. Activate stop bars if available. Figure 2-6 shows a lighted X by day. Figure 2-7 shows a lighted X at night.

**Figure 2-6. Lighted X in Daytime**

**Figure 2-7. Lighted X at Night**

2.18.3.3 **Partially Closed Runways and Displaced Thresholds.**

When a runway is partially closed, a portion of the pavement is unavailable for any aircraft operation, meaning taxiing and landing or taking off in either direction. A displaced threshold, by contrast, is put in place to ensure obstacle clearance by landing aircraft. The pavement prior to the displaced threshold is available for takeoff in the direction of the displacement, and for landing and takeoff in the opposite direction. Misunderstanding this difference and issuance of a subsequently inaccurate NOTAM can result in a hazardous situation. For both partially

closed runways and displaced thresholds, approach lighting systems at the affected end must be placed out of service.

2.18.3.3.1 Partially Closed Runways.

Disconnect edge and threshold lights on that part of the runway at and behind the threshold (that is, the portion of the runway that is closed). Alternately, cover the light fixtures in such a way as to prevent light leakage. See Figure 2-1.

2.18.3.3.2 Temporary Displaced Thresholds.

Edge lighting in the area of the displacement emits red light in the direction of approach and yellow light (white for visual runways) in the opposite direction. If the displacement is 700 feet or less, blank out centerline lights in the direction of approach or place the centerline lights out of service. If the displacement is over 700 feet, place the centerline lights out of service. See AC 150/5340-30 for details on lighting displaced thresholds. See Figure 2-2.

2.18.3.3.3 Temporary runway thresholds and runway ends must be lighted if the runway is lighted and it is the intended threshold for night landings or instrument meteorological conditions.

2.18.3.3.4 A temporary threshold on an unlighted runway may be marked by retroreflective, elevated markers in addition to markings noted in paragraph 2.18.2.1.3. Markers seen by aircraft on approach are green. Markers at the rollout end of the runway are red. At certificated airports, temporary elevated threshold markers must be mounted with a frangible fitting (see 14 CFR Part 139.309). At non-certificated airports, the temporary elevated threshold markings may either be mounted with a frangible fitting or be flexible. See AC 150/5345-39, *Specification for L-853, Runway and Taxiway Retroreflective Markers.*

2.18.3.3.5 Temporary threshold lights and runway end lights and related visual NAVAIDs are installed outboard of the edges of the full-strength pavement only when they cannot be installed on the pavement. They are installed with bases at grade level or as low as possible, but not more than 3 inch (7.6 cm) above ground. (The standard above ground height for airport lighting fixtures is 14 inches (35 cm)). When any portion of a base is above grade, place properly compacted fill around the base to minimize the rate of gradient change so aircraft can, in an emergency, cross at normal landing or takeoff speeds without incurring significant damage. See AC 150/5370-10.

2.18.3.3.6 Maintain threshold and edge lighting color and spacing standards as described in AC 150/5340-30. Battery powered, solar, or portable lights that meet the criteria in AC 150/5345-50 may be used. These systems are intended primarily for visual flight rules (VFR) aircraft operations but may

be used for instrument flight rules (IFR) aircraft operations, upon individual approval from the Flight Standards Division of the applicable FAA Regional Office.

2.18.3.3.7 When runway thresholds are temporarily displaced, reconfigure yellow lenses (caution zone), as necessary, and place the centerline lights out of service.

2.18.3.3.8 Relocate the Visual Glide Slope Indicator (VGSI), such as Visual Approach Slope Indicator (VASI) and Precision Approach Path Indicator (PAPI); other airport lights, such as Runway End Identifier Lights (REIL); and approach lights to identify the temporary threshold. Another option is to disable the VGSI or any equipment that would give misleading indications to pilots as to the new threshold location. Installation of temporary visual aids may be necessary to provide adequate guidance to pilots on approach to the affected runway. If the FAA owns and operates the VGSI, coordinate its installation or disabling with the local ATO/Technical Operations Office. Relocation of such visual aids will depend on the duration of the project and the benefits gained from the relocation, as this can result in great expense. See FAA JO 6850.2, *Visual Guidance Lighting Systems*, for installation criteria for FAA owned and operated NAVAIDs.

2.18.3.3.9 Issue a NOTAM to inform pilots of temporary lighting conditions.

2.18.3.4 **Temporarily Closed Taxiways.**

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

2.18.4 Signs.

To the extent possible, signs must be in conformance with AC 150/5345-44, *Specification for Runway and Taxiway Signs,* and AC 150/5340-18, *Standard for Airport Sign Systems.*

2.18.4.1 **Existing Signs.**

Runway exit signs are to be covered for closed runway exits. Outbound destination signs are to be covered for closed runways. Any time a sign does not serve its normal function or would provide conflicting information, it must be covered or removed to prevent misdirecting pilots. Note that information signs identifying a crossing taxiway continue to perform their normal function even if the crossing taxiway is closed. For long term construction projects, consider relocating signs, especially runway distance remaining signs.

2.18.4.2 **Temporary Signs.**

Orange construction signs comprise a message in black on an orange background. Orange construction signs may help pilots be aware of changed conditions. The airport operator may choose to introduce these signs as part of a movement area construction project to increase situational awareness when needed. Locate signs outside the taxiway safety limits and ahead of construction areas so pilots can take timely action. Use temporary signs judiciously, striking a balance between the need for information and the increase in pilot workload. When there is a concern of pilot "information overload," the applicability of mandatory hold signs must take precedence over orange construction signs recommended during construction. Temporary signs must meet the standards for such signs in Engineering Brief 93, *Guidance for the Assembly and Installation of Temporary Orange Construction Signs.* Many criteria in AC 150/5345-44, *Specification for Runway and Taxiway Signs,* are referenced in the Engineering Brief. Permissible sign legends are:

1. CONSTRUCTION AHEAD,
2. CONSTRUCTION ON RAMP, and
3. RWY XX TAKEOFF RUN AVAILABLE XXX FT.

Phasing, supported by drawings and sign schedule, for the installation of orange construction signs must be included in the CSPP or SPCD.

2.18.4.2.1 Takeoff Run Available (TORA) signs.

**Recommended:** Where a runway has been shortened for takeoff, install orange TORA signs well before the hold lines, such as on a parallel taxiway prior to a turn to a runway hold position. See EB 93 for sign size and location.

2.18.4.2.2 Sign legends are shown in Figure F-1.

**Note:** See Figure E-1, Figure E-2, Figure E-3, Figure F-2, and Figure F-3 for examples of orange construction sign locations.

2.19 **Marking and Signs for Access Routes.**

The CSPP should indicate that pavement markings and signs for construction personnel will conform to AC 150/5340-18 and, to the extent practicable, with the Federal Highway Administration Manual on Uniform Traffic Control Devices (MUTCD) and/or State highway specifications. Signs adjacent to areas used by aircraft must comply with the frangibility requirements of AC 150/5220-23, *Frangible Connections,* which may require modification to size and height guidance in the MUTCD.

## 2.20 **Hazard Marking, Lighting and Signing.**

2.20.1 Hazard marking, lighting, and signing prevent pilots from entering areas closed to aircraft, and prevent construction personnel from entering areas open to aircraft. The CSPP must specify prominent, comprehensible warning indicators for any area affected by construction that is normally accessible to aircraft, personnel, or vehicles. Hazard marking and lighting must also be specified to identify open manholes, small areas under repair, stockpiled material, waste areas, and areas subject to jet blast. Also consider less obvious construction-related hazards and include markings to identify FAA, airport, and National Weather Service facilities cables and power lines; instrument landing system (ILS) critical areas; airport surfaces, such as RSA, OFA, and OFZ; and other sensitive areas to make it easier for contractor personnel to avoid these areas.

2.20.2 Equipment.

2.20.2.1 **Barricades.**

Low profile barricades, including traffic cones, (weighted or sturdily attached to the surface) are acceptable methods used to identify and define the limits of construction and hazardous areas on airports. Careful consideration must be given to selecting equipment that poses the least danger to aircraft but is sturdy enough to remain in place when subjected to typical winds, prop wash and jet blast. The spacing of barricades must be such that a breach is physically prevented barring a deliberate act. For example, if barricades are intended to exclude aircraft, gaps between barricades must be smaller than the wingspan of the smallest aircraft to be excluded; if barricades are intended to exclude vehicles, gaps between barricades must be smaller than the width of the excluded vehicles, generally 4 feet (1.2 meters). Provision must be made for ARFF access if necessary. If barricades are intended to exclude pedestrians, they must be continuously linked. Continuous linking may be accomplished through the use of ropes, securely attached to prevent FOD.

2.20.2.2 **Lights.**

Lights must be red, either steady burning or flashing, and must meet the luminance requirements of the State Highway Department. Batteries powering lights will last longer if lights flash. Lights must be mounted on barricades and spaced at no more than 10 feet (3 meters). Lights must be operated between sunset and sunrise and during periods of low visibility whenever the airport is open for operations. They may be operated by photocell, but this may require that the contractor turn them on manually during periods of low visibility during daytime hours.

2.20.2.3 **Supplement Barricades with Signs (for example) As Necessary.**

Examples are “No Entry” and “No Vehicles.” Be aware of the increased effects of wind and jet blast on barricades with attached signs.

2.20.2.4 **Air Operations Area – General.**

Barricades are not permitted in any active safety area or on the runway side of a runway hold line. Within a runway or taxiway object free area, and on aprons, use orange traffic cones, flashing or steady burning red lights as noted above, highly reflective collapsible barricades marked with diagonal, alternating orange and white stripes; and/or signs to separate all construction/maintenance areas from the movement area. Barricades may be supplemented with alternating orange and white flags at least 20 by 20 inch (50 by 50 cm) square and securely fastened to eliminate FOD. All barricades adjacent to any open runway or taxiway / taxilane safety area, or apron must be as low as possible to the ground, and no more than 18 inches high, exclusive of supplementary lights and flags. Barricades must be of low mass; easily collapsible upon contact with an aircraft or any of its components; and weighted or sturdily attached to the surface to prevent displacement from prop wash, jet blast, wing vortex, and other surface wind currents. If affixed to the surface, they must be frangible at grade level or as low as possible, but not to exceed 3 inch (7.6 cm) above the ground. Figure 2-8 and Figure 2-9 show sample barricades with proper coloring and flags.

**Figure 2-8. Interlocking Barricades**

**Figure 2-9. Low Profile Barricades**

2.20.2.5 **Air Operations Area – Runway/Taxiway Intersections.**

Use highly reflective barricades with lights to close taxiways leading to closed runways. Evaluate all operating factors when determining how to mark temporary closures that can last from 10 to 15 minutes to a much longer period of time. However, even for closures of relatively short duration, close all taxiway/runway intersections with barricades. The use of traffic cones is appropriate for short duration closures.

2.20.2.6 **Air Operations Area – Other.**

Beyond runway and taxiway object free areas and aprons, barricades intended for construction vehicles and personnel may be many different shapes and made from various materials, including railroad ties, sawhorses, jersey barriers, or barrels.

2.20.2.7 **Maintenance.**

The construction specifications must include a provision requiring the contractor to have a person on call 24 hours a day for emergency maintenance of airport hazard lighting and barricades. The contractor must file the contact person's information with the airport operator. Lighting should be checked for proper operation at least once per day, preferably at dusk.

## 2.21 Work Zone Lighting for Nighttime Construction.

Lighting equipment must adequately illuminate the work area if the construction is to be performed during nighttime hours. Refer to AC 150/5370-10 for minimum illumination levels for nighttime paving projects. Additionally, it is recommended that all support equipment, except haul trucks, be equipped with artificial illumination to safely

illuminate the area immediately surrounding their work areas. The lights should be positioned to provide the most natural color illumination and contrast with a minimum of shadows. The spacing must be determined by trial. Light towers should be positioned and adjusted to aim away from ATCT cabs and active runways to prevent blinding effects. Shielding may be necessary. Light towers should be removed from the construction site when the area is reopened to aircraft operations. Construction lighting units should be identified and generally located on the construction phasing plans in relationship to the ATCT and active runways and taxiways.

## 2.22 Protection of Runway and Taxiway Safety Areas.

Runway and taxiway safety areas, OFZs, OFAs, and approach surfaces are described in AC 150/5300-13. Protection of these areas includes limitations on the location and height of equipment and stockpiled material. An FAA airspace study may be required. Coordinate with the appropriate FAA Airports Regional or District Office if there is any doubt as to requirements or dimensions (see paragraph 2.13.5) as soon as the location and height of materials or equipment are known. The CSPP should include drawings showing all safety areas, object free areas, obstacle free zones and approach departure surfaces affected by construction.

### 2.22.1 Runway Safety Area (RSA).

A runway safety area is the defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway (see AC 150/5300-13). Construction activities within the existing RSA are subject to the following conditions:

2.22.1.1 No construction may occur within the existing RSA while the runway is open for aircraft operations. The RSA dimensions may be temporarily adjusted if the runway is restricted to aircraft operations requiring an RSA that is equal to the RSA width and length beyond the runway ends available during construction. (See AC 150/5300-13). The temporary use of declared distances and/or partial runway closures may provide the necessary RSA under certain circumstances. Coordinate with the appropriate FAA Airports Regional or District Office to have declared distances information published, and appropriate NOTAMs issued. See AC 150/5300-13 for guidance on the use of declared distances.

2.22.1.2 The airport operator must coordinate the adjustment of RSA dimensions as permitted above with the appropriate FAA Airports Regional or District Office and the local FAA air traffic manager and issue a NOTAM.

2.22.1.3 The CSPP and SPCD must provide procedures for ensuring adequate distance for protection from blasting operations, if required by operational considerations.

2.22.1.4 **Excavations.**

2.22.1.4.1 Open trenches or excavations are not permitted within the RSA while the runway is open. Backfill trenches before the runway is opened. If backfilling excavations before the runway must be opened is impracticable, cover the excavations appropriately. Covering for open trenches must be designed to allow the safe operation of the heaviest aircraft operating on the runway across the trench without damage to the aircraft.

2.22.1.4.2 Construction contractors must prominently mark open trenches and excavations at the construction site with red or orange flags, as approved by the airport operator, and light them with red lights during hours of restricted visibility or darkness.

2.22.1.5 **Erosion Control.**

Soil erosion must be controlled to maintain RSA standards, that is, the RSA must be cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations, and capable, under dry conditions, of supporting snow removal equipment, aircraft rescue and fire fighting equipment, and the occasional passage of aircraft without causing structural damage to the aircraft.

2.22.2 Runway Object Free Area (ROFA).

Construction, including excavations, may be permitted in the ROFA. However, equipment must be removed from the ROFA when not in use, and material should not be stockpiled in the ROFA if not necessary. Stockpiling material in the OFA requires submittal of a 7460-1 form and justification provided to the appropriate FAA Airports Regional or District Office for approval.

2.22.3 Taxiway Safety Area (TSA).

2.22.3.1 A taxiway safety area is a defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway. (See AC 150/5300-13.) Since the width of the TSA is equal to the wingspan of the design aircraft, no construction may occur within the TSA while the taxiway is open for aircraft operations. The TSA dimensions may be temporarily adjusted if the taxiway is restricted to aircraft operations requiring a TSA that is equal to the TSA width available during construction. Give special consideration to TSA dimensions at taxiway turns and intersections. (see AC 150/5300-13).

2.22.3.2 The airport operator must coordinate the adjustment of the TSA width as permitted above with the appropriate FAA Airports Regional or District Office and the FAA air traffic manager and issue a NOTAM.

2.22.3.3 The CSPP and SPCD must provide procedures for ensuring adequate distance for protection from blasting operations.

2.22.3.4 **Excavations.**

1. Curves. Open trenches or excavations are not permitted within the TSA while the taxiway is open. Trenches should be backfilled before the taxiway is opened. If backfilling excavations before the taxiway must be opened is impracticable, cover the excavations appropriately. Covering for open trenches must be designed to allow the safe operation of the heaviest aircraft operating on the taxiway across the trench without damage to the aircraft.
2. Straight Sections. Open trenches or excavations are not permitted within the TSA while the taxiway is open for unrestricted aircraft operations. Trenches should be backfilled before the taxiway is opened. If backfilling excavations before the taxiway must be opened is impracticable, cover the excavations to allow the safe passage of ARFF equipment and of the heaviest aircraft operating on the taxiway across the trench without causing damage to the equipment or aircraft. In rare circumstances where the section of taxiway is indispensable for aircraft movement, open trenches or excavations may be permitted in the TSA while the taxiway is open to aircraft operations, subject to the following restrictions:
   a. Taxiing speed is limited to 10 mph.
   b. Appropriate NOTAMs are issued.
   c. Marking and lighting meeting the provisions of paragraphs 2.18 and 2.20 are implemented.
   d. Low mass, low-profile lighted barricades are installed.
   e. Appropriate temporary orange construction signs are installed.
3. Construction contractors must prominently mark open trenches and excavations at the construction site with red or orange flags, as approved by the airport operator, and light them with red lights during hours of restricted visibility or darkness.

2.22.3.5 **Erosion control.**

Soil erosion must be controlled to maintain TSA standards, that is, the TSA must be cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations, and capable, under dry conditions, of supporting snow removal equipment, aircraft rescue and firefighting equipment, and the occasional passage of aircraft without causing structural damage to the aircraft.

2.22.4 Taxiway Object Free Area (TOFA).

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

2.22.4.1 The taxiway object free area dimensions may be temporarily adjusted if the taxiway is restricted to aircraft operations requiring a taxiway object free area that is equal to the taxiway object free area width available. Give special consideration to TOFA dimensions at taxiway turns and intersections.

2.22.4.2 Offset taxiway centerline and edge pavement markings (do not use glass beads) may be used as a temporary measure to provide the required taxiway object free area. Where offset taxiway pavement markings are provided, centerline lighting, centerline reflectors, or taxiway edge reflectors are required. Existing lighting that does not coincide with the temporary markings must be taken out of service.

2.22.4.3 Construction activity, including open excavations, may be accomplished without adjusting the width of the taxiway object free area, subject to the following restrictions:

2.22.4.3.1 Taxiing speed is limited to 10 mph.

2.22.4.3.2 NOTAMs issued advising taxiing pilots of hazard and recommending reduced taxiing speeds on the taxiway.

2.22.4.3.3 Marking and lighting meeting the provisions of paragraphs 2.18 and 2.20 are implemented.

2.22.4.3.4 If desired, appropriate orange construction signs are installed. See paragraph 2.18.4.2 and Appendix F.

2.22.4.3.5 Five-foot clearance is maintained between equipment and materials and any part of an aircraft (includes wingtip overhang). If such clearance can only be maintained if an aircraft does not have full use of the entire taxiway width (with its main landing gear at the edge of the usable pavement), then it will be necessary to move personnel and equipment for the passage of that aircraft.

2.22.4.3.6 Flaggers furnished by the contractor must be used to direct and control construction equipment and personnel to a pre-established setback distance for safe passage of aircraft, and airline and/or airport personnel. Flaggers must also be used to direct taxiing aircraft. Due to liability issues, the airport operator should require airlines to provide flaggers for directing taxiing aircraft.

2.22.5 Obstacle Free Zone (OFZ).

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

2.22.6 Runway Approach/Departure Areas and Clearways.

All personnel, materials, and/or equipment must remain clear of the applicable threshold siting surfaces, as defined in AC 150/5300-13. Objects that do not penetrate these surfaces may still be obstructions to air navigation and may affect standard instrument approach procedures. Coordinate with the FAA through the appropriate FAA Airports Regional or District Office.

2.22.6.1 Construction activity in a runway approach/departure area may result in the need to partially close a runway or displace the existing runway threshold. Partial runway closure, displacement of the runway threshold, as well as closure of the complete runway and other portions of the movement area also require coordination through the airport operator with the appropriate FAA air traffic manager (FSS if non-towered) and ATO/Technical Operations (for affected NAVAIDS) and airport users.

2.22.6.2 **Caution About Partial Runway Closures.**

When filing a NOTAM for a partial runway closure, clearly state that the portion of pavement located prior to the threshold is not available for landing and departing traffic. In this case, the threshold has been moved for both landing and takeoff purposes (this is different than a displaced threshold). There may be situations where the portion of closed runway is available for taxiing only. If so, the NOTAM must reflect this condition).

2.22.6.3 **Caution About Displaced Thresholds.**

Implementation of a displaced threshold affects runway length available for aircraft landing over the displacement. Depending on the reason for the displacement (to provide obstruction clearance or RSA), such a displacement may also require an adjustment in the landing distance available and accelerate-stop distance available in the opposite direction. If project scope includes personnel, equipment, excavation, or other work within the existing RSA of any usable runway end, do not implement a displaced threshold unless arrivals and departures toward the construction activity are prohibited. Instead, implement a partial closure.

2.23 **Other Limitations on Construction.**

The CSPP must specify any other limitations on construction, including but not limited to:

2.23.1 Prohibitions.

2.23.1.1 No use of tall equipment (cranes, concrete pumps, and so on) unless a 7460-1 determination letter is issued for such equipment.

2.23.1.2 No use of open flame welding or torches unless fire safety precautions are provided and the airport operator has approved their use.

2.23.1.3 No use of electrical blasting caps on or within 1,000 feet (300 meters) of the airport property. See AC 150/5370-10.

2.23.2 Restrictions.

2.23.2.1 Construction suspension required during specific airport operations.

2.23.2.2 Areas that cannot be worked on simultaneously.

2.23.2.3 Day or night construction restrictions.

2.23.2.4 Seasonal construction restrictions.

2.23.2.5 Temporary signs not approved by the airport operator.

2.23.2.6 Grades changes that could result in unplanned effects on NAVAIDs.

# CHAPTER 3. GUIDELINES FOR WRITING A CSPP

## 3.1 General Requirements.

The CSPP is a standalone document written to correspond with the subjects outlined in paragraph 2.4. The CSPP is organized by numbered sections corresponding to each subject listed in paragraph 2.4, and described in detail in paragraphs 2.5 - 2.23. Each section number and title in the CSPP matches the corresponding subject outlined in paragraph 2.4 (for example, 1. Coordination, 2. Phasing, 3. Areas and Operations Affected by the Construction Activity, and so on). With the exception of the project scope of work outlined in Section 2. Phasing, only subjects specific to operational safety during construction should be addressed.

## 3.2 Applicability of Subjects.

Each section should, to the extent practical, focus on the specific subject. Where an overlapping requirement spans several sections, the requirement should be explained in detail in the most applicable section. A reference to that section should be included in all other sections where the requirement may apply. For example, the requirement to protect existing underground FAA ILS cables during trenching operations could be considered FAA ATO coordination (Coordination, paragraph 2.5.3), an area and operation affected by the construction activity (Areas and Operations Affected by the Construction Activity, paragraph 2.7.1.4), a protection of a NAVAID (Protection of Navigational Aids (NAVAIDs), paragraph 2.8), or a notification to the FAA of construction activities (Notification of Construction Activities, paragraph 2.13.5.3.2). However, it is more specifically an underground utility requirement (Underground Utilities, paragraph 2.15). The procedure for protecting underground ILS cables during trenching operations should therefore be described in 2.4.2.11: “The contractor must coordinate with the local FAA System Support Center (SSC) to mark existing ILS cable routes along Runway 17-35. The ILS cables will be located by hand digging whenever the trenching operation moves within 10 feet of the cable markings.” All other applicable sections should include a reference to 2.4.2.11: “ILS cables shall be identified and protected as described in 2.4.2.11” or “See 2.4.2.11 for ILS cable identification and protection requirements.” Thus, the CSPP should be considered as a whole, with no need to duplicate responses to related issues.

## 3.3 Graphical Representations.

Construction safety drawings should be included in the CSPP as attachments. When other graphical representations will aid in supporting written statements, the drawings, diagrams, and/or photographs should also be attached to the CSPP. References should be made in the CSPP to each graphical attachment and may be made in multiple sections.

3.4 **Reference Documents.**

The CSPP must not incorporate a document by reference unless reproduction of the material in that document is prohibited. In that case, either copies of or a source for the referenced document must be provided to the contractor. Where this AC recommends references (e.g. as in paragraph 3.9) the intent is to include a reference to the corresponding section in the CSPP, not to this Advisory Circular.

3.5 **Restrictions.**

The CSPP should not be considered as a project design review document. The CSPP should also avoid mention of permanent ("as-built") features such as pavements, markings, signs, and lighting, except when such features are intended to aid in maintaining operational safety during the construction.

3.6 **Coordination.**

Include in this section a detailed description of conferences and meetings to be held both before and during the project. Include appropriate information from AC 150/5370-12. Discuss coordination procedures and schedules for each required FAA ATO Technical Operations shutdown and restart and all required flight inspections.

3.7 **Phasing.**

Include in this section a detailed scope of work description for the project as a whole and each phase of work covered by the CSPP. This includes all locations and durations of the work proposed. Attach drawings to graphically support the written scope of work. Detail in this section the sequenced phases of the proposed construction. Include a reference to paragraph 3.8, as appropriate.

3.8 **Areas and Operations Affected by Construction.**

Focus in this section on identifying the areas and operations affected by the construction. Describe corresponding mitigation that is not covered in detail elsewhere in the CSPP. Include references to paragraphs below as appropriate. Attach drawings as necessary to graphically describe affected areas and mechanisms proposed. See Appendix F for sample operational effects tables and figures.

3.9 **NAVAID Protection.**

List in this section all NAVAID facilities that will be affected by the construction. Identify NAVAID facilities that will be placed out of service at any time prior to or during construction activities. Identify individuals responsible for coordinating each shutdown and when each facility will be out of service. Include a reference to paragraph 3.6 for FAA ATO NAVAID shutdown, restart, and flight inspection coordination. Outline in detail procedures to protect each NAVAID facility remaining in service from interference by construction activities. Include a reference to paragraph 3.14 for the

issuance of NOTAMs as required. Include a reference to paragraph 3.16 for the protection of underground cables and piping serving NAVAIDs. If temporary visual aids are proposed to replace or supplement existing facilities, include a reference to paragraph 3.19. Attach drawings to graphically indicate the affected NAVAIDS and the corresponding critical areas.

3.10 **Contractor Access.**

This will necessarily be the most extensive section of the CSPP. Provide sufficient detail so that a contractor not experienced in working on airports will understand the unique restrictions such work will require. Due to this extent, it should be broken down into subsections as described below:

3.10.1 Location of Stockpiled Construction Materials.

Describe in this section specific locations for stockpiling material. Note any height restrictions on stockpiles. Include a reference to paragraph 3.21 for hazard marking and lighting devices used to identify stockpiles. Include a reference to paragraph 3.11 for provisions to prevent stockpile material from becoming wildlife attractants. Include a reference to paragraph 3.12 for provisions to prevent stockpile material from becoming FOD. Attach drawings to graphically indicate the stockpile locations.

3.10.2 Vehicle and Pedestrian Operations.

While there are many items to be addressed in this major subsection of the CSPP, all are concerned with one main issue: keeping people and vehicles from areas of the airport where they don't belong. This includes preventing unauthorized entry to the AOA and preventing the improper movement of pedestrians or vehicles on the airport. In this section, focus on mechanisms to prevent construction vehicles and workers traveling to and from the worksite from unauthorized entry into movement areas. Specify locations of parking for both employee vehicles and construction equipment, and routes for access and haul roads. In most cases, this will best be accomplished by attaching a drawing. Quote from AC 150/5210-5 specific requirements for contractor vehicles rather than referring to the AC as a whole, and include special requirements for identifying HAZMAT vehicles. Quote from, rather than incorporate by reference, AC 150/5210-20 as appropriate to address the airport's rules for ground vehicle operations, including its training program. Discuss the airport's recordkeeping system listing authorized vehicle operators.

3.10.3 Two-Way Radio Communications.

Include a special section to identify all individuals who are required to maintain communications with Air Traffic (AT) at airports with active towers, or monitor CTAF at airports without or with closed ATCT. Include training requirements for all individuals required to communicate with AT. Individuals required to monitor AT frequencies should also be identified. If construction employees are also required to communicate by radio with Airport Operations, this procedure should be described in detail. Usage of vehicle mounted radios and/or portable radios should be addressed. Communication procedures for the event of disabled radio communication (that is, light

signals, telephone numbers, others) must be included. All radio frequencies should by identified (Tower, Ground Control, CTAF, UNICOM, ATIS, and so on).

3.10.4 Airport Security.

Address security as it applies to vehicle and pedestrian operations. Discuss TSA requirements, security badging requirements, perimeter fence integrity, gate security, and other needs. Attach drawings to graphically indicate secured and/or Security Identification Display Areas (SIDA), perimeter fencing, and available access points.

3.11 **Wildlife Management.**

Discuss in this section wildlife management procedures. Describe the maintenance of existing wildlife mitigation devices, such as perimeter fences, and procedures to limit wildlife attractants. Include procedures to notify Airport Operations of wildlife encounters. Include a reference to paragraph 3.10 for security (wildlife) fence integrity maintenance as required.

3.12 **FOD Management.**

In this section, discuss methods to control and monitor FOD: worksite housekeeping, ground vehicle tire inspections, runway sweeps, and so on. Include a reference to paragraph 3.15 for inspection requirements as required.

3.13 **HAZMAT Management.**

Describe in this section HAZMAT management procedures: fuel deliveries, spill recovery procedures, Safety Data Sheet (SDS), Material Safety Data Sheet (MSDS) or Product Safety Data Sheet (PSDS) availability, and other considerations. Any specific airport HAZMAT restrictions should also be identified. Include a reference to paragraph 3.10 for HAZMAT vehicle identification requirements. Quote from, rather than incorporate by reference, AC 150/5320-15.

3.14 **Notification of Construction Activities.**

List in this section the names and telephone numbers of points of contact for all parties affected by the construction project. We recommend a single list that includes all telephone numbers required under this section. Include emergency notification procedures for all representatives of all parties potentially impacted by the construction. Identify individual representatives – and at least one alternate – for each party. List both on-duty and off-duty contact information for each individual, including individuals responsible for emergency maintenance of airport construction hazard lighting and barricades. Describe procedures to coordinate immediate response to events that might adversely affect the operational safety of the airport (such as interrupted NAVAID service). Explain requirements for and the procedures for the issuance of Notices to Airmen (NOTAMs), notification to FAA required by 14 CFR Part 77 and Part 157 and in the event of affected NAVAIDs. For NOTAMs, identify an individual, and at least one alternate, responsible for issuing and cancelling each specific type of Notice to

Airmen (NOTAM) required. Detail notification methods for police, fire fighting, and medical emergencies. This may include 911, but should also include direct phone numbers of local police departments and nearby hospitals. Identify the E911 address of the airport and the emergency access route via haul roads to the construction site. Require the contractor to have this information available to all workers. The local Poison Control number should be listed. Procedures regarding notification of Airport Operations and/or the ARFF Department of such emergencies should be identified, as applicable. If airport radio communications are identified as a means of emergency notification, include a reference to paragraph 3.10. Differentiate between emergency and nonemergency notification of ARFF personnel, the latter including activities that affect ARFF water supplies and access roads. Identify the primary ARFF contact person and at least one alternate. If notification is to be made through Airport Operations, then detail this procedure. Include a method of confirmation from the ARFF department.

3.15 **Inspection Requirements.**

Describe in this section inspection requirements to ensure airfield safety compliance. Include a requirement for routine inspections by the resident engineer (RE) or other airport operator's representative and the construction contractors. If the engineering consultants and/or contractors have a Safety Officer who will conduct such inspections, identify this individual. Describe procedures for special inspections, such as those required to reopen areas for aircraft operations. Part 139 requires daily airfield inspections at certificated airports, but these may need to be more frequent when construction is in progress. Discuss the role of such inspections on areas under construction. Include a requirement to immediately remedy any deficiencies, whether caused by negligence, oversight, or project scope change.

3.16 **Underground Utilities.**

Explain how existing underground utilities will be located and protected. Identify each utility owner and include contact information for each company/agency in the master list. Address emergency response procedures for damaged or disrupted utilities. Include a reference to paragraph 3.14 for notification of utility owners of accidental utility disruption as required.

3.17 **Penalties.**

Describe in this section specific penalties imposed for noncompliance with airport rules and regulations, including the CSPP: SIDA violations, VPD, and others.

3.18 **Special Conditions.**

Identify any special conditions that may trigger specific safety mitigation actions outlined in this CSPP: low visibility operations, snow removal, aircraft in distress, aircraft accident, security breach, VPD, and other activities requiring construction suspension/resumption. Include a reference to paragraph 3.10 for compliance with airport safety and security measures and for radio communications as required. Include

a reference to paragraph 3.14 for emergency notification of all involved parties, including police/security, ARFF, and medical services.

3.19 **Runway and Taxiway Visual Aids.**

Include marking, lighting, signs, and visual NAVAIDS. Detail temporary runway and taxiway marking, lighting, signs, and visual NAVAIDs required for the construction. Discuss existing marking, lighting, signs, and visual NAVAIDs that are temporarily, altered, obliterated, or shut down. Consider non-federal facilities and address requirements for reimbursable agreements necessary for alteration of FAA facilities and for necessary flight checks. Identify temporary TORA signs or runway distance remaining signs if appropriate. Identify required temporary visual NAVAIDs such as REIL or PAPI. Quote from, rather than incorporate by reference, AC 150/5340-1, *Standards for Airport Markings;* AC 150/5340-18, *Standards for Airport Sign Systems;* and AC 150/5340-30, as required. Attach drawings to graphically indicate proposed marking, lighting, signs, and visual NAVAIDs.

3.20 **Marking and Signs for Access Routes.**

Detail plans for marking and signs for vehicle access routes. To the extent possible, signs should be in conformance with the Federal Highway Administration MUTCD and/or State highway specifications, not hand lettered. Detail any modifications to the guidance in the MUTCD necessary to meet frangibility/height requirements.

3.21 **Hazard Marking and Lighting.**

Specify all marking and lighting equipment, including when and where each type of device is to be used. Specify maximum gaps between barricades and the maximum spacing of hazard lighting. Identify one individual and at least one alternate responsible for maintenance of hazard marking and lighting equipment in the master telephone list. Include a reference to paragraph 3.14. Attach drawings to graphically indicate the placement of hazard marking and lighting equipment.

3.22 **Work Zone Lighting for Nighttime Construction.**

If work is to be conducted at night, specify all lighting equipment, including when and where each type of device is to be used. Indicate the direction lights are to be aimed and any directions that aiming of lights is prohibited. Specify any shielding necessary in instances where aiming is not sufficient to prevent interference with air traffic control and aircraft operations. Attach drawings to graphically indicate the placement and aiming of lighting equipment. Where the plan only indicates directions that aiming of lights is prohibited, the placement and positioning of portable lights must be proposed by the Contractor and approved by the airport operator’s representative each time lights are relocated or repositioned.

3.23 **Protection of Runway and Taxiway Safety Areas.**

This section should focus exclusively on procedures for protecting all safety areas, including those altered by the construction: methods of demarcation, limit of access, movement within safety areas, stockpiling and trenching restrictions, and so on. Reference AC 150/5300-13, as required. Include a reference to paragraph 3.10 for procedures regarding vehicle and personnel movement within safety areas. Include a reference to paragraph 3.10 for material stockpile restrictions as required. Detail requirements for trenching, excavations, and backfill. Include a reference to paragraph 3.21 for hazard marking and lighting devices used to identify open excavations as required. If runway and taxiway closures are proposed to protect safety areas, or if temporary displaced thresholds and/or revised declared distances are used to provide the required Runway Safety Area, include a reference to paragraphs 3.14 and 3.19. Detail procedures for protecting the runway OFZ, runway OFA, taxiway OFA and runway approach surfaces including those altered by the construction: methods of demarcation, limit of cranes, storage of equipment, and so on. Quote from, rather than incorporate by reference, AC 150/5300-13, as required. Include a reference to paragraph 3.24 for height (i.e., crane) restrictions as required. One way to address the height of equipment that will move during the project is to establish a three-dimensional "box" within which equipment will be confined that can be studied as a single object. Attach drawings to graphically indicate the safety area, OFZ, and OFA boundaries.

3.24 **Other Limitations on Construction.**

This section should describe what limitations must be applied to each area of work and when each limitation will be applied: limitations due to airport operations, height (i.e., crane) restrictions, areas which cannot be worked at simultaneously, day/night work restrictions, winter construction, and other limitations. Include a reference to paragraph 3.7 for project phasing requirements based on construction limitations as required.

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# APPENDIX A. RELATED READING MATERIAL

Obtain the latest version of the following free publications from the FAA on its Web site at http://www.faa.gov/airports/.

**Table A-1. FAA Publications**

| Number | Title and Description |
|---|---|
| AC 150/5200-28 | *Notices to Airmen (NOTAMs) for Airport Operators*<br>Guidance for using the NOTAM System in airport reporting. |
| AC 150/5200-30 | *Airport Field Condition Assessments and Winter Operations Safety*<br>Guidance for airport owners/operators on the development of an acceptable airport snow and ice control program and on appropriate field condition reporting procedures. |
| AC 150/5200-33 | *Hazardous Wildlife Attractants On or Near Airports*<br>Guidance on locating certain land uses that might attract hazardous wildlife to public-use airports. |
| AC 150/5210-5 | *Painting, Marking, and Lighting of Vehicles Used on an Airport*<br>Guidance, specifications, and standards for painting, marking, and lighting vehicles operating in the airport air operations areas. |
| AC 150/5210-20 | *Ground Vehicle Operations to include Taxiing or Towing an Aircraft on Airports*<br>Guidance to airport operators on developing ground vehicle operation training programs. |
| AC 150/5300-13 | *Airport Design*<br>FAA standards and recommendations for airport design. Establishes approach visibility minimums as an airport design parameter, and contains the Object Free area and the obstacle free-zone criteria. |
| AC 150/5210-24 | *Airport Foreign Object Debris (FOD) Management*<br>Guidance for developing and managing an airport foreign object debris (FOD) program |

| Number | Title and Description |
|---|---|
| AC 150/5320-15 | *Management of Airport Industrial Waste*<br>Basic information on the characteristics, management, and regulations of industrial wastes generated at airports. Guidance for developing a Storm Water Pollution Prevention Plan (SWPPP) that applies best management practices to eliminate, prevent, or reduce pollutants in storm water runoff with particular airport industrial activities. |
| AC 150/5340-1 | *Standards for Airport Markings*<br>FAA standards for the siting and installation of signs on airport runways and taxiways. |
| AC 150/5340-18 | *Standards for Airport Sign Systems*<br>FAA standards for the siting and installation of signs on airport runways and taxiways. |
| AC 150/5345-28 | *Precision Approach Path Indicator (PAPI) Systems*<br>FAA standards for PAPI systems, which provide pilots with visual glide slope guidance during approach for landing. |
| AC 150/5340-30 | *Design and Installation Details for Airport Visual Aids*<br>Guidance and recommendations on the installation of airport visual aids. |
| AC 150/5345-39 | *Specification for L-853, Runway and Taxiway Retroreflective Markers* |
| AC 150/5345-44 | *Specification for Runway and Taxiway Signs*<br>FAA specifications for unlighted and lighted signs for taxiways and runways. |
| AC 150/5345-53 | *Airport Lighting Equipment Certification Program*<br>Details on the Airport Lighting Equipment Certification Program (ALECP). |
| AC 150/5345-50 | *Specification for Portable Runway and Taxiway Lights*<br>FAA standards for portable runway and taxiway lights and runway end identifier lights for temporary use to permit continued aircraft operations while all or part of a runway lighting system is inoperative. |
| AC 150/5345-55 | *Specification for L-893, Lighted Visual Aid to Indicate Temporary Runway Closure* |

| Number | Title and Description |
|---|---|
| AC 150/5370-10 | *Standards for Specifying Construction of Airports*<br>Standards for construction of airports, including earthwork, drainage, paving, turfing, lighting, and incidental construction. |
| AC 150/5370-12 | *Quality Management for Federally Funded Airport Construction Projects* |
| EB 93 | *Guidance for the Assembly and Installation of Temporary Orange Construction Signs* |
| FAA Order 5200.11 | FAA Airports (ARP) Safety Management System (SMS)<br>Basics for implementing SMS within ARP. Includes roles and responsibilities of ARP management and staff as well as other FAA lines of business that contribute to the ARP SMS. |
| FAA Certalert 98-05 | *Grasses Attractive to Hazardous Wildlife*<br>Guidance on grass management and seed selection. |
| FAA Form 7460-1 | Notice of Proposed Construction or Alteration |
| FAA Form 7480-1 | Notice of Landing Area Proposal |
| FAA Form 6000.26 | National NAS Strategic Interruption Service Level Agreement, Strategic Events Coordination, Airport Sponsor Form |

Obtain the latest version of the following free publications from the Electronic Code of Federal Regulations at http://www.ecfr.gov/.

**Table A-2. Code of Federal Regulation**

| Number | Title |
|---|---|
| Title 14 CFR Part 77 | Safe, Efficient Use and Preservation of the Navigable Airspace |
| Title 14 CFR Part 139 | Certification of Airports |
| Title 49 CFR Part 1542 | Airport Security |

Obtain the latest version of the Manual on Uniform Traffic Control Devices from the Federal Highway Administration at http://mutcd.fhwa.dot.gov/.

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# APPENDIX B. TERMS AND ACRONYMS

**Table B-1. Terms and Acronyms**

| Term | Definition |
|---|---|
| Form 7460-1 | Notice of Proposed Construction or Alteration. For on-airport projects, the form submitted to the FAA regional or airports division office as formal written notification of any kind of construction or alteration of objects that affect navigable airspace, as defined in 14 CFR Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspace*. (See guidance available on the FAA web site at https://oeaaa.faa.gov.) The form may be downloaded at http://www.faa.gov/airports/resources/forms/, or filed electronically at: https://oeaaa.faa.gov. |
| Form 7480-1 | Notice of Landing Area Proposal. Form submitted to the FAA Airports Regional Division Office or Airports District Office as formal written notification whenever a project without an airport layout plan on file with the FAA involves the construction of a new airport; the construction, realigning, altering, activating, or abandoning of a runway, landing strip, or associated taxiway; or the deactivation or abandoning of an entire airport The form may be downloaded at http://www.faa.gov/airports/resources/forms/. |
| Form 6000-26 | Airport Sponsor Strategic Event Submission Form |
| AC | Advisory Circular |
| ACSI | Airport Certification Safety Inspector |
| ADG | Airplane Design Group |
| AIP | Airport Improvement Program |
| ALECP | Airport Lighting Equipment Certification Program |
| ANG | Air National Guard |
| AOA | Air Operations Area, as defined in 14 CFR Part 107. Means a portion of an airport, specified in the airport security program, in which security measures are carried out. This area includes aircraft movement areas, aircraft parking areas, loading ramps, and safety areas, and any adjacent areas (such as general aviation areas) that are not separated by adequate security systems, measures, or procedures. This area does not include the secured area of the airport terminal building. |
| ARFF | Aircraft Rescue and Fire Fighting |
| ARP | FAA Office of Airports |
| ASDA | Accelerate-Stop Distance Available |
| AT | Air Traffic |
| ATCT | Airport Traffic Control Tower |
| ATIS | Automatic Terminal Information Service |
| ATO | Air Traffic Organization |
| Certificated Airport | An airport that has been issued an Airport Operating Certificate by the FAA under |

| Term | Definition |
|---|---|
| | the authority of 14 CFR Part 139, *Certification of Airports*. |
| CFR | Code of Federal Regulations |
| Construction | The presence of construction-related personnel, equipment, and materials in any location that could infringe upon the movement of aircraft. |
| CSPP | Construction Safety and Phasing Plan. 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. |
| CTAF | Common Traffic Advisory Frequency |
| Displaced Threshold | A threshold that is located at a point on the runway other than the designated beginning of the runway. The portion of pavement behind a displaced threshold is available for takeoffs in either direction or landing from the opposite direction. |
| DOT | Department of Transportation |
| EPA | Environmental Protection Agency |
| FAA | Federal Aviation Administration |
| FOD | Foreign Object Debris/Damage |
| FSS | Flight Service Station |
| GA | General Aviation |
| HAZMAT | Hazardous Materials |
| HMA | Hot Mix Asphalt |
| IAP | Instrument Approach Procedures |
| IFR | Instrument Flight Rules |
| ILS | Instrument Landing System |
| LDA | Landing Distance Available |
| LOC | Localizer antenna array |
| Movement Area | The runways, taxiways, and other areas of an airport that are used for taxiing or hover taxiing, air taxiing, takeoff, and landing of aircraft, exclusive of loading aprons and aircraft parking areas (reference 14 CFR Part 139). |
| MSDS | Material Safety Data Sheet |
| MUTCD | Manual on Uniform Traffic Control Devices |
| NAVAID | Navigation Aid |
| NAVAID Critical Area | An area of defined shape and size associated with a NAVAID that must remain clear and graded to avoid interference with the electronic signal. |
| Non-Movement Area | The area inside the airport security fence exclusive of the Movement Area. It is important to note that the non-movement area includes pavement traversed by aircraft. |

| Term | Definition |
|---|---|
| NOTAM | Notices to Airmen |
| Obstruction | Any object/obstacle exceeding the obstruction standards specified by 14 CFR Part 77, subpart C. |
| OCC | Operations Control Center |
| OE / AAA | Obstruction Evaluation / Airport Airspace Analysis |
| OFA | Object Free Area. An area on the ground centered on the runway, taxiway, or taxi lane centerline provided to enhance safety of aircraft operations by having the area free of objects except for those objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes. (See AC 150/5300-13 for additional guidance on OFA standards and wingtip clearance criteria.) |
| OFZ | Obstacle Free Zone. The airspace below 150 ft (45 m) above the established airport elevation and along the runway and extended runway centerline that is required to be clear of all objects, except for frangible visual NAVAIDs that need to be located in the OFZ because of their function, in order to provide clearance protection for aircraft landing or taking off from the runway and for missed approaches. The OFZ is subdivided as follows: Runway OFZ, Inner Approach OFZ, Inner Transitional OFZ, and Precision OFZ. Refer to AC 150/5300-13 for guidance on OFZ. |
| OSHA | Occupational Safety and Health Administration |
| OTS | Out of Service |
| P&R | Planning and Requirements Group |
| NPI | NAS Planning & Integration |
| PAPI | Precision Approach Path Indicator |
| PFC | Passenger Facility Charge |
| PLASI | Pulse Light Approach Slope Indicator |
| Project Proposal Summary | A clear and concise description of the proposed project or change that is the object of Safety Risk Management. |
| RA | Reimbursable Agreement |
| RE | Resident Engineer |
| REIL | Runway End Identifier Lights |
| RNAV | Area Navigation |
| ROFA | Runway Object Free Area |
| RSA | Runway Safety Area. A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway, in accordance with AC 150/5300-13. |
| SDS | Safety Data Sheet |
| SIDA | Security Identification Display Area |
| SMS | Safety Management System |

| Term | Definition |
|---|---|
| SPCD | Safety Plan Compliance Document. Details developed and submitted by a contractor to the airport operator for approval providing details on how the performance of a construction project will comply with the CSPP. |
| SRM | Safety Risk Management |
| SSC | System Support Center |
| Taxiway Safety Area | A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway, in accordance with AC 150/5300-13. |
| TDG | Taxiway Design Group |
| Temporary | Any condition that is not intended to be permanent. |
| Temporary Runway End | The beginning of that portion of the runway available for landing and taking off in one direction, and for landing in the other direction. Note the difference from a displaced threshold. |
| Threshold | The beginning of that portion of the runway available for landing. In some instances, the landing threshold may be displaced. |
| TODA | Takeoff Distance Available |
| TOFA | Taxiway Object Free Area |
| TORA | Takeoff Run Available. The length of the runway less any length of runway unavailable and/or unsuitable for takeoff run computations. See AC 150/5300-13 for guidance on declared distances. |
| TSA | Taxiway Safety Area, or<br>Transportation Security Administration |
| UNICOM | A radio communications system of a type used at small airports. |
| VASI | Visual Approach Slope Indicator |
| VGSI | Visual Glide Slope Indicator. A device that provides a visual glide slope indicator to landing pilots. These systems include precision approach path indicator (PAPI), visual approach slope indicator (VASI), and pulse light approach slope indicator (PLASI). |
| VFR | Visual Flight Rules |
| VOR | Very High Frequency Omnidirectional Radio Range |
| VPD | Vehicle / Pedestrian Deviation |

## APPENDIX C. SAFETY AND PHASING PLAN CHECKLIST

This appendix is keyed to Chapter 2. In the electronic version of this AC, clicking on the paragraph designation in the Reference column will access the applicable paragraph. There may be instances where the CSPP requires provisions that are not covered by the list in this appendix.

This checklist is intended as an aid, not a required submittal.

**Table C-1. CSPP Checklist**

| Coordination | Reference | Addressed? | | | Remarks |
|---|---|---|---|---|---|
| | | Yes | No | NA | |
| **General Considerations** | | | | | |
| Requirements for predesign, prebid, and preconstruction conferences to introduce the subject of airport operational safety during construction are specified. | 2.5 | | | | |
| Operational safety is a standing agenda item for construction progress meetings. | 2.5 | | | | |
| Scheduling of the construction phases is properly addressed. | 2.6 | | | | |
| Any formal agreements are established. | 2.5.3 | | | | |
| **Areas and Operations Affected by Construction Activity** | | | | | |
| Drawings showing affected areas are included. | 2.7.1 | | | | |
| Closed or partially closed runways, taxiways, and aprons are depicted on drawings. | 2.7.1.1 | | | | |
| Access routes used by ARFF vehicles affected by the project are addressed. | 2.7.1.2 | | | | |
| Access routes used by airport and airline support vehicles affected by the project are addressed. | 2.7.1.3 | | | | |
| Underground utilities, including water supplies for firefighting and drainage. | 2.7.1.4 | | | | |

| Coordination | Reference | Addressed? | | | Remarks |
|---|---|---|---|---|---|
| | | Yes | No | NA | |
| Approach/departure surfaces affected by heights of temporary objects are addressed. | 2.7.1.5 | | | | |
| Construction areas, storage areas, and access routes near runways, taxiways, aprons, or helipads are properly depicted on drawings. | 2.7.1 | | | | |
| Temporary changes to taxi operations are addressed. | 2.7.2.1 | | | | |
| Detours for ARFF and other airport vehicles are identified. | 2.7.2.2 | | | | |
| Maintenance of essential utilities and underground infrastructure is addressed. | 2.7.2.3 | | | | |
| Temporary changes to air traffic control procedures are addressed. | 2.7.2.4 | | | | |
| **NAVAIDs** | | | | | |
| Critical areas for NAVAIDs are depicted on drawings. | 2.8 | | | | |
| Effects of construction activity on the performance of NAVAIDS, including unanticipated power outages, are addressed. | 2.8 | | | | |
| Protection of NAVAID facilities is addressed. | 2.8 | | | | |
| The required distance and direction from each NAVAID to any construction activity is depicted on drawings. | 2.8 | | | | |
| Procedures for coordination with FAA ATO/Technical Operations, including identification of points of contact, are included. | 2.8, 2.13.1, 2.13.5.3.1, 2.18.1 | | | | |
| **Contractor Access** | | | | | |
| The CSPP addresses areas to which contractor will have access and how | 2.9 | | | | |

| Coordination | Reference | Addressed? | | | Remarks |
|---|---|---|---|---|---|
| | | Yes | No | NA | |
| the areas will be accessed. | | | | | |
| The application of 49 CFR Part 1542 Airport Security, where appropriate, is addressed. | 2.9 | | | | |
| The location of stockpiled construction materials is depicted on drawings. | 2.9.1 | | | | |
| The requirement for stockpiles in the ROFA to be approved by FAA is included. | 2.9.1 | | | | |
| Requirements for proper stockpiling of materials are included. | 2.9.1 | | | | |
| Construction site parking is addressed. | 2.9.2.1 | | | | |
| Construction equipment parking is addressed. | 2.9.2.2 | | | | |
| Access and haul roads are addressed. | 2.9.2.3 | | | | |
| A requirement for marking and lighting of vehicles to comply with AC 150/5210-5*, Painting, Marking and Lighting of Vehicles Used on an Airport,* is included. | 2.9.2.4 | | | | |
| Proper vehicle operations, including requirements for escorts, are described. | 2.9.2.5, 2.9.2.6 | | | | |
| Training requirements for vehicle drivers are addressed. | 2.9.2.7 | | | | |
| Two-way radio communications procedures are described. | 2.9.2.9 | | | | |
| Maintenance of the secured area of the airport is addressed. | 2.9.2.10 | | | | |
| **Wildlife Management** | | | | | |
| The airport operator's wildlife management procedures are addressed. | 2.10 | | | | |

| Coordination | Reference | Addressed? | | | Remarks |
|---|---|---|---|---|---|
| | | Yes | No | NA | |
| **Foreign Object Debris Management** | | | | | |
| The airport operator's FOD management procedures are addressed. | 2.11 | | | | |
| **Hazardous Materials Management** | | | | | |
| The airport operator's hazardous materials management procedures are addressed. | 2.12 | | | | |
| **Notification of Construction Activities** | | | | | |
| Procedures for the immediate notification of airport user and local FAA of any conditions adversely affecting the operational safety of the airport are detailed. | 2.13 | | | | |
| Maintenance of a list by the airport operator of the responsible representatives/points of contact for all involved parties and procedures for contacting them 24 hours a day, seven days a week is specified. | 2.13.1 | | | | |
| A list of local ATO/Technical Operations personnel is included. | 2.13.1 | | | | |
| A list of ATCT managers on duty is included. | 2.13.1 | | | | |
| A list of authorized representatives to the OCC is included. | 2.13.2 | | | | |
| Procedures for coordinating, issuing, maintaining and cancelling by the airport operator of NOTAMS about airport conditions resulting from construction are included. | 2.8, 2.13.2, 2.18.3.3.9 | | | | |
| Provision of information on closed or hazardous conditions on airport movement areas by the airport operator to the OCC is specified. | 2.13.2 | | | | |
| Emergency notification procedures for medical, fire fighting, and police | 2.13.3 | | | | |

| Coordination | Reference | Addressed? | | | Remarks |
|---|---|---|---|---|---|
| | | Yes | No | NA | |
| response are addressed. | | | | | |
| Coordination with ARFF personnel for non-emergency issues is addressed. | 2.13.4 | | | | |
| Notification to the FAA under 14 CFR parts 77 and 157 is addressed. | 2.13.5 | | | | |
| Reimbursable agreements for flight checks and/or design and construction for FAA owned NAVAIDs are addressed. | 2.13.5.3.2 | | | | |
| **Inspection Requirements** | | | | | |
| Daily and interim inspections by both the airport operator and contractor are specified. | 2.14.1, 2.14.2 | | | | |
| Final inspections at certificated airports are specified when required. | 2.14.3 | | | | |
| **Underground Utilities** | | | | | |
| Procedures for protecting existing underground facilities in excavation areas are described. | 2.15 | | | | |
| **Penalties** | | | | | |
| Penalty provisions for noncompliance with airport rules and regulations and the safety plans are detailed. | 2.16 | | | | |
| **Special Conditions** | | | | | |
| Any special conditions that affect the operation of the airport or require the activation of any special procedures are addressed. | 2.17 | | | | |
| **Runway and Taxiway Visual Aids - Marking, Lighting, Signs, and Visual NAVAIDs** | | | | | |
| The proper securing of temporary airport markings, lighting, signs, and visual NAVAIDs is addressed. | 2.18.1 | | | | |
| Frangibility of airport markings, lighting, signs, and visual NAVAIDs is specified. | 2.18.1, 2.18.3, 2.18.4.2, 2.20.2.4 | | | | |

| Coordination | Reference | Addressed? | | | Remarks |
|---|---|---|---|---|---|
| | | Yes | No | NA | |
| The requirement for markings to be in compliance with AC 150/5340-1, *Standards for Airport Markings,* is specified. | 2.18.2 | | | | |
| Detailed specifications for materials and methods for temporary markings are provided. | 2.18.2 | | | | |
| The requirement for lighting to conform to AC 150/5340-30, *Design and Installation Details for Airport Visual Aids;* AC 150/5345-50, *Specification for Portable Runway and Taxiway Lights;* and AC 150/5345-53, *Airport Lighting Certification Program,* is specified. | 2.18.3 | | | | |
| The use of a lighted X is specified where appropriate. | 2.18.2.1.2, 2.18.3.2 | | | | |
| The requirement for signs to conform to AC 150/5345-44*, Specification for Runway and Taxiway Signs;* AC 50/5340-18, *Standards for Airport Sign Systems;* and AC 150/5345-53, *Airport Lighting Certification Program,* is specified. | 2.18.4 | | | | |
| **Marking and Signs For Access Routes** | | | | | |
| The CSPP specifies that pavement markings and signs intended for construction personnel should conform to AC 150/5340-18 and, to the extent practicable, with the MUTCD and/or State highway specifications. | 2.18.4.2 | | | | |
| **Hazard Marking and Lighting** | | | | | |
| Prominent, comprehensible warning indicators for any area affected by construction that is normally accessible to aircraft, personnel, or vehicles are specified. | 2.20.1 | | | | |

| Coordination | Reference | Addressed? | | | Remarks |
|---|---|---|---|---|---|
| | | Yes | No | NA | |
| Hazard marking and lighting are specified to identify open manholes, small areas under repair, stockpiled material, and waste areas. | 2.20.1 | | | | |
| The CSPP considers less obvious construction-related hazards. | 2.20.1 | | | | |
| Equipment that poses the least danger to aircraft but is sturdy enough to remain in place when subjected to typical winds, prop wash and jet blast is specified. | 2.20.2.1 | | | | |
| The spacing of barricades is specified such that a breach is physically prevented barring a deliberate act. | 2.20.2.1 | | | | |
| Red lights meeting the luminance requirements of the State Highway Department are specified. | 2.20.2.2 | | | | |
| Barricades, temporary markers, and other objects placed and left in areas adjacent to any open runway, taxiway, taxi lane, or apron are specified to be as low as possible to the ground, and no more than 18 inch high. | 2.20.2.3 | | | | |
| Barricades are specified to indicate construction locations in which no part of an aircraft may enter. | 2.20.2.3 | | | | |
| Highly reflective barriers with lights are specified to barricade taxiways leading to closed runways. | 2.20.2.5 | | | | |
| Markings for temporary closures are specified. | 2.20.2.5 | | | | |
| The provision of a contractor's representative on call 24 hours a day for emergency maintenance of airport hazard lighting and barricades is specified. | 2.20.2.7 | | | | |

| Coordination | Reference | Addressed? | | | Remarks |
|---|---|---|---|---|---|
| | | Yes | No | NA | |
| **Work Zone Lighting for Nighttime Construction** | | | | | |
| If work is to be conducted at night, the CSPP identifies construction lighting units and their general locations and aiming in relationship to the ATCT and active runways and taxiways. | 2.21 | | | | |
| **Protection of Runway and Taxiway Safety Areas** | | | | | |
| The CSPP clearly states that no construction may occur within a safety area while the associated runway or taxiway is open for aircraft operations. | 2.22.1.1, 2.22.3.1 | | | | |
| The CSPP specifies that the airport operator coordinates the adjustment of RSA or TSA dimensions with the ATCT and the appropriate FAA Airports Regional or District Office and issues a local NOTAM. | 2.22.1.2, 2.22.3.2 | | | | |
| Procedures for ensuring adequate distance for protection from blasting operations, if required by operational considerations, are detailed. | 2.22.3.3 | | | | |
| The CSPP specifies that open trenches or excavations are not permitted within a safety area while the associated runway or taxiway is open, subject to approved exceptions. | 2.22.1.4 | | | | |
| Appropriate covering of excavations in the RSA or TSA that cannot be backfilled before the associated runway or taxiway is open is detailed. | 2.22.1.4 | | | | |
| The CSPP includes provisions for prominent marking of open trenches and excavations at the construction site. | 2.22.1.4 | | | | |
| Grading and soil erosion control to maintain RSA/TSA standards are | 2.22.3.5 | | | | |

| Coordination | Reference | Addressed? | | | Remarks |
|---|---|---|---|---|---|
| | | Yes | No | NA | |
| addressed. | | | | | |
| The CSPP specifies that equipment is to be removed from the ROFA when not in use. | 2.22.2 | | | | |
| The CSPP clearly states that no construction may occur within a taxiway safety area while the taxiway is open for aircraft operations. | 2.22.3 | | | | |
| Appropriate details are specified for any construction work to be accomplished in a taxiway object free area. | 2.22.4 | | | | |
| Measures to ensure that personnel, material, and/or equipment do not penetrate the OFZ or threshold siting surfaces while the runway is open for aircraft operations are included. | 2.22.4.3.6 | | | | |
| Provisions for protection of runway approach/departure areas and clearways are included. | 2.22.6 | | | | |
| **Other Limitations on Construction** | | | | | |
| The CSPP prohibits the use of open flame welding or torches unless adequate fire safety precautions are provided and the airport operator has approved their use. | 2.23.1.2 | | | | |
| The CSPP prohibits the use of electrical blasting caps on or within 1,000 ft (300 m) of the airport property. | 2.23.1.3 | | | | |

## APPENDIX D. CONSTRUCTION PROJECT DAILY SAFETY INSPECTION CHECKLIST

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

**Table D-1. Potentially Hazardous Conditions**

| Item | Action Required (Describe) | No Action Required (Check) |
|---|---|---|
| Excavation adjacent to runways, taxiways, and aprons improperly backfilled. | | |
| Mounds of earth, construction materials, temporary structures, and other obstacles near any open runway, taxiway, or taxi lane; in the related Object Free area and aircraft approach or departure areas/zones; or obstructing any sign or marking. | | |
| Runway resurfacing projects resulting in lips exceeding 3 inch (7.6 cm) from pavement edges and ends. | | |
| Heavy equipment (stationary or mobile) operating or idle near AOA, in runway approaches and departures areas, or in OFZ. | | |
| Equipment or material near NAVAIDs that may degrade or impair radiated signals and/or the monitoring of navigation and visual aids. Unauthorized or improper vehicle operations in localizer or glide slope critical areas, resulting in electronic interference and/or facility shutdown. | | |
| Tall and especially relatively low visibility units (that is, equipment with slim profiles) — cranes, drills, and similar objects — located in critical areas, such as OFZ and | | |

| Item | Action Required (Describe) | No Action Required (Check) |
|---|---|---|
| approach zones. | | |
| Improperly positioned or malfunctioning lights or unlighted airport hazards, such as holes or excavations, on any apron, open taxiway, or open taxi lane or in a related safety, approach, or departure area. | | |
| Obstacles, loose pavement, trash, and other debris on or near AOA. Construction debris (gravel, sand, mud, paving materials) on airport pavements may result in aircraft propeller, turbine engine, or tire damage. Also, loose materials may blow about, potentially causing personal injury or equipment damage. | | |
| Inappropriate or poorly maintained fencing during construction intended to deter human and animal intrusions into the AOA. Fencing and other markings that are inadequate to separate construction areas from open AOA create aviation hazards. | | |
| Improper or inadequate marking or lighting of runways (especially thresholds that have been displaced or runways that have been closed) and taxiways that could cause pilot confusion and provide a potential for a runway incursion. Inadequate or improper methods of marking, barricading, and lighting of temporarily closed portions of AOA create aviation hazards. | | |
| Wildlife attractants — such as trash (food scraps not collected from construction personnel activity), grass seeds, tall grass, or standing water — on or near airports. | | |
| Obliterated or faded temporary markings on active operational areas. | | |
| Misleading or malfunctioning obstruction lights. Unlighted or unmarked obstructions in the approach to any open runway pose aviation hazards. | | |

| Item | Action Required (Describe) | No Action Required (Check) |
|---|---|---|
| Failure to issue, update, or cancel NOTAMs about airport or runway closures or other construction related airport conditions. | | |
| Failure to mark and identify utilities or power cables. Damage to utilities and power cables during construction activity can result in the loss of runway / taxiway lighting; loss of navigation, visual, or approach aids; disruption of weather reporting services; and/or loss of communications. | | |
| Restrictions on ARFF access from fire stations to the runway / taxiway system or airport buildings. | | |
| Lack of radio communications with construction vehicles in airport movement areas. | | |
| Objects, regardless of whether they are marked or flagged, or activities anywhere on or near an airport that could be distracting, confusing, or alarming to pilots during aircraft operations. | | |
| Water, snow, dirt, debris, or other contaminants that temporarily obscure or derogate the visibility of runway/taxiway marking, lighting, and pavement edges. Any condition or factor that obscures or diminishes the visibility of areas under construction. | | |
| Spillage from vehicles (gasoline, diesel fuel, oil) on active pavement areas, such as runways, taxiways, aprons, and airport roadways. | | |
| Failure to maintain drainage system integrity during construction (for example, no temporary drainage provided when working on a drainage system). | | |

| Item | Action Required (Describe) | No Action Required (Check) |
|---|---|---|
| Failure to provide for proper electrical lockout and tagging procedures. At larger airports with multiple maintenance shifts/workers, construction contractors should make provisions for coordinating work on circuits. | | |
| Failure to control dust. Consider limiting the amount of area from which the contractor is allowed to strip turf. | | |
| Exposed wiring that creates an electrocution or fire ignition hazard. Identify and secure wiring, and place it in conduit or bury it. | | |
| Site burning, which can cause possible obscuration. | | |
| Construction work taking place outside of designated work areas and out of phase. | | |

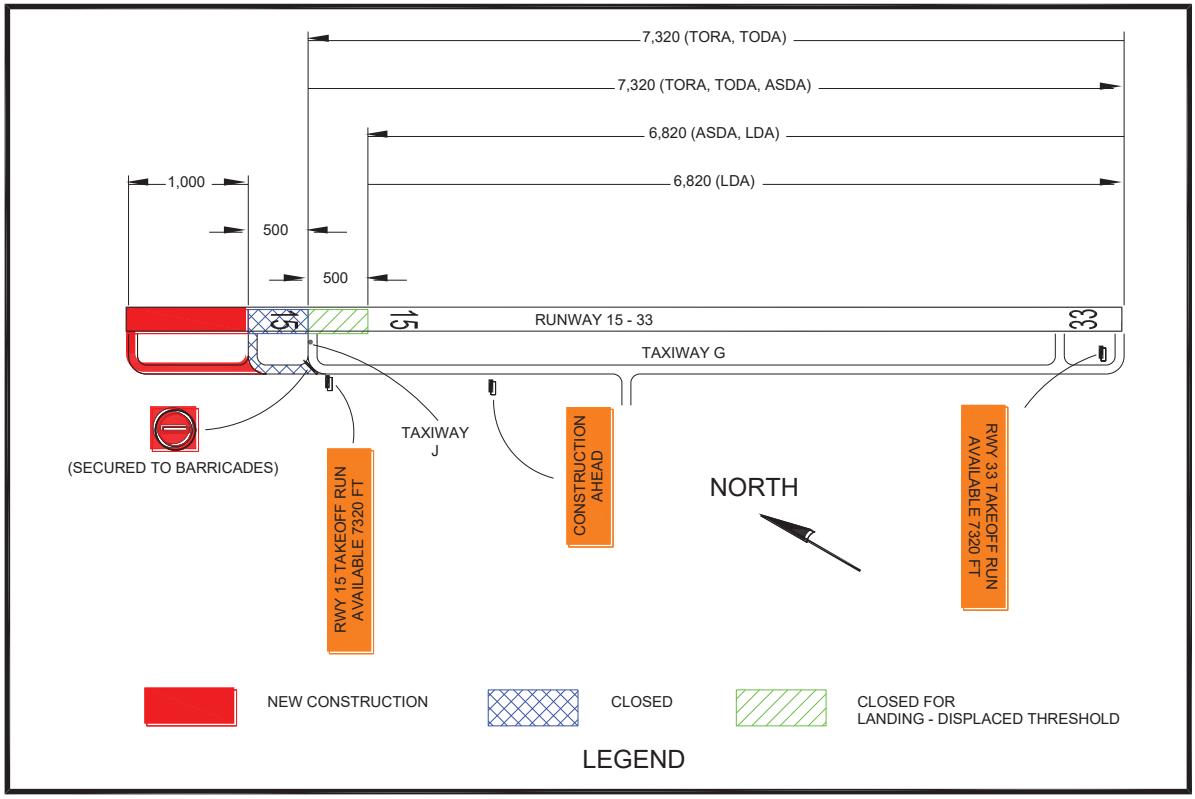
## APPENDIX E. SAMPLE OPERATIONAL EFFECTS TABLE

E.1 **Project Description.**

Runway 15-33 is currently 7820 feet long, with a 500 foot stopway on the north end. This project will remove the stopway and extend the runway 1000 feet to the north and 500 feet to the south. Finally, the existing portion of the runway will be repaved. The runway 33 glide slope will be relocated. The new runway 33 localizer has already been installed by FAA Technical Operations and only needs to be switched on. Runway 15 is currently served only by a localizer, which will remain in operation as it will be beyond the future RSA. Appropriate NOTAMS will be issued throughout the project.

E.1.1 During Phase I, the runway 15 threshold will be displaced 1000 feet to keep construction equipment below the approach surface. The start of runway 15 takeoff and the departure end of runway 33 will also be moved 500 feet to protect workers from jet blast. Declared distances for runway 33 will be adjusted to provide the required RSA and applicable departure surface. Excavation near Taxiway G will require its ADG to be reduced from IV to III. See Figure E-1.

**Figure E-1. Phase I Example**

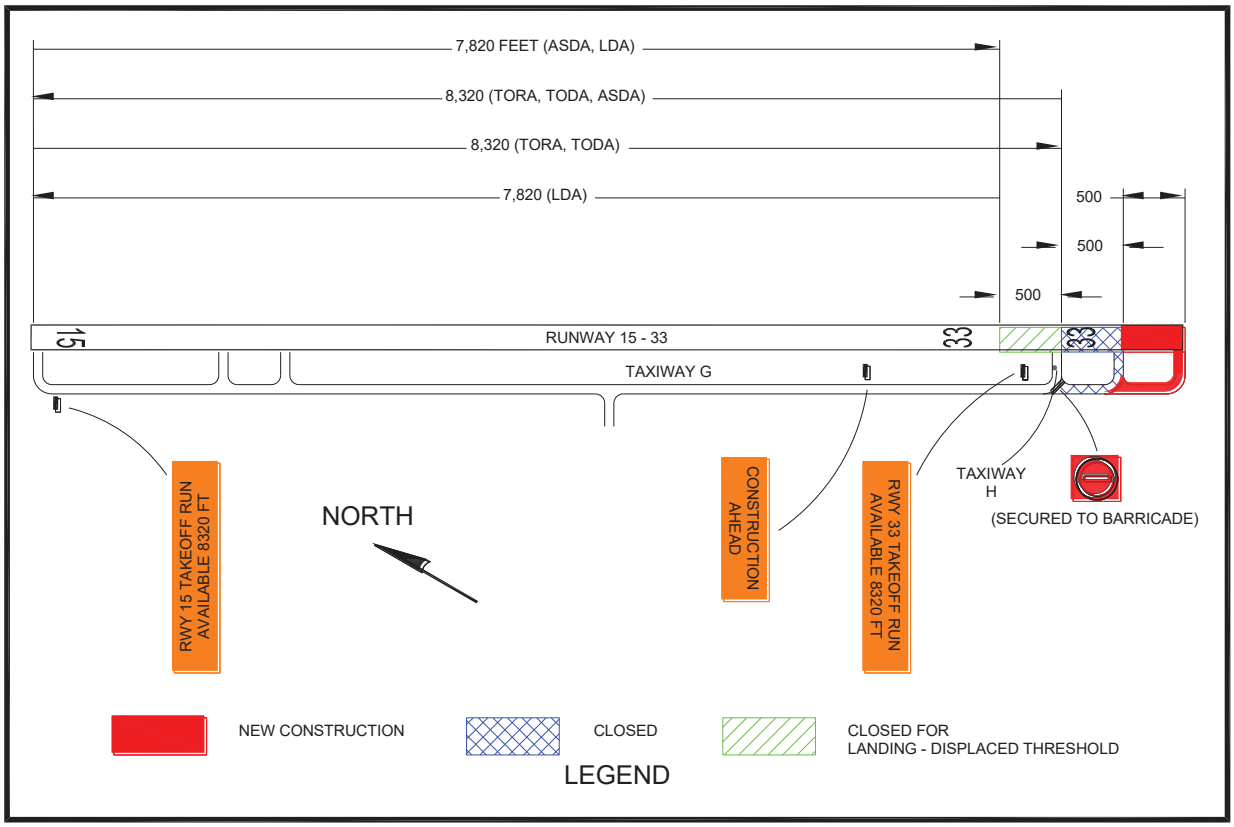



**Note 1:** Where hold signs are installed on both sides of a taxiway, install the TORA sign on the left side of the taxiway before the final turn to the runway intersection.

**Note 2:** Based on the declared distances for Runway 33 departures, the maximum equipment height in the construction area is 12.5 feet (500/40 = 12.5).

E.2 During Phase II, the runway 33 threshold will be displaced 1000 feet to keep construction equipment below the approach surface. The start of runway 33 takeoff and the departure end of runway 15 will also be moved 500 feet to protect workers from jet blast. Declared distances for runway 15 will be adjusted to provide the required RSA and applicable departure surface. See Figure E-2.

**Figure E-2. Phase II Example**




**Note 1:** Where hold signs are installed on both sides of a taxiway, install the TORA sign on the left side of the taxiway before the final turn to the runway intersection.

**Note 2:** Based on the declared distances for Runway 15 departures, the maximum equipment height in the construction area is 12.5 feet (500/40 = 12.5).

E.3 During Phase III, the existing portion of the runway will be repaved with Hot Mix Asphalt (HMA) and the runway 33 glide slope will be relocated. Construction will be accomplished between the hours of 8:00 pm and 5:00 am, during which the runway will be closed to operations.

**Figure E-3. Phase III Example**

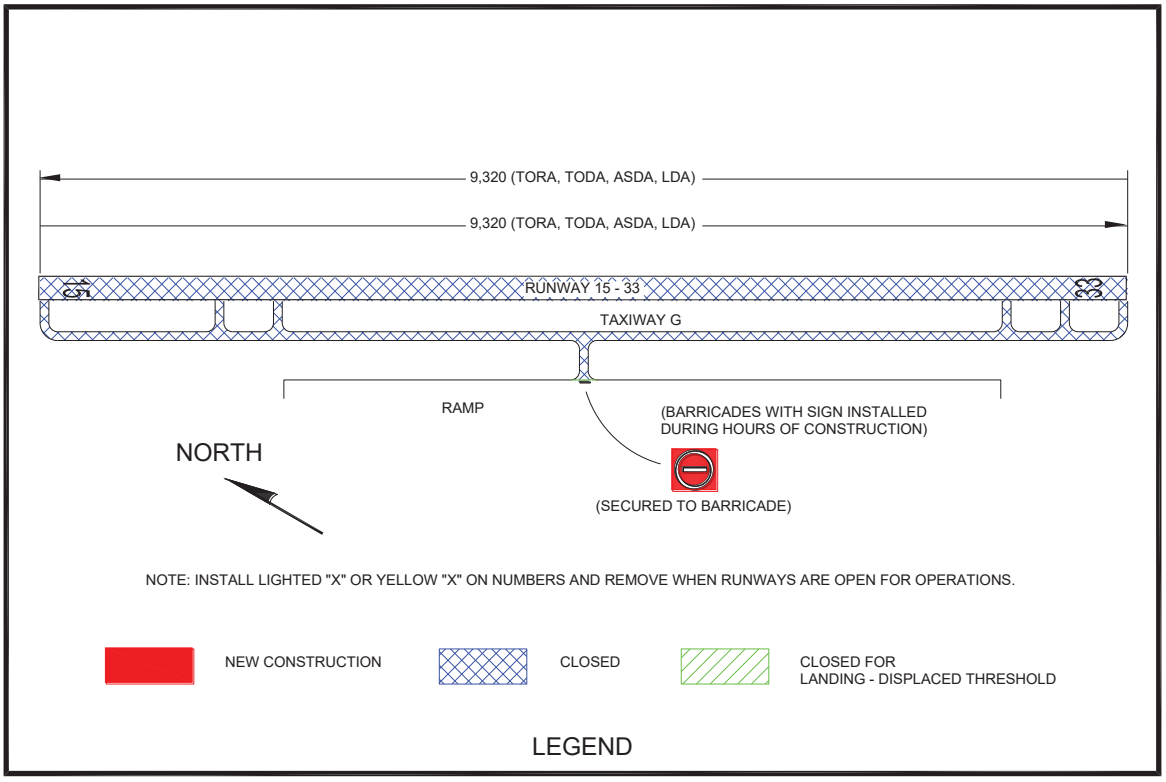


**Table E-1. Operational Effects Table**

| Project | Runway 15-33 Extension and Repaving | | | |
|---|---|---|---|---|
| **Phase** | **Normal (Existing)** | **Phase I: Extend Runway 15 End** | **Phase II: Extend Runway 33 End** | **Phase III: Repave Runway** |
| **Scope of Work** | N/A | Extend Runway 15-33 1,000 ft on north end with Hot Mix Asphaltic Concrete (HMA). | Extend Runway 15-33 500 ft on south end with Hot Mix Asphaltic Concrete (HMA). | Repave existing runway with HMA<br>Relocate Runway 33 Glide Slope |
| **Effects of Construction Operations** | N/A | Existing North 500 ft closed | Existing South 500 ft closed | Runway closed between 8:00 pm and 5:00 am<br>Edge lighting out of service |
| **Construction Phase** | N/A | Phase I (Anticipated) | Phase II (Anticipated) | Phase III (Anticipated) |
| **Runway 15 Average Aircraft Operations** | Carrier: 52 /day<br>GA: 26 /day<br>Military: 11 /day | Carrier: 40 /day<br>GA: 26 /day<br>Military: 0 /day | Carrier: 45 /day<br>GA: 26 /day<br>Military: 5 /day | Carrier: 45 / day<br>GA: 20 / day<br>Military: 0 /day |
| **Runway 33 Average Aircraft Operations** | Carrier: 40 /day<br>GA: 18 /day<br>Military: 10 /day | Carrier: 30 /day<br>GA: 18 /day<br>Military: 0 /day | Carrier: 25 /day<br>GA: 18 /day<br>Military: 5 /day | Carrier: 20 /day<br>GA: 5 /day<br>Military: 0 /day |
| **Runway 15-33 Aircraft Category** | C-IV | C-IV | C-IV | C-IV |
| **Runway 15 Approach Visibility Minimums** | 1 mile | 1 mile | 1 mile | 1 mile |
| **Runway 33 Approach Visibility Minimums** | ¾ mile | ¾ mile | ¾ mile | 1 mile |

**Note:** Proper coordination with Flight Procedures group is necessary to maintain instrument approach procedures during construction.

| Project | | Runway 15-33 Extension and Repaving | | | |
|---|---|---|---|---|---|
| Phase | | Normal (Existing) | Phase I: Extend Runway 15 End | Phase II: Extend Runway 33 End | Phase III: Repave Runway |
| Runway 15 Declared Distances | TORA | 7,820 | 7,320 | 8,320 | 9,320 |
| | TODA | 7,820 | 7,320 | 8,320 | 9,320 |
| | ASDA | 7,820 | 7,320 | 7,820 | 9,320 |
| | LDA | 7,820 | 6,820 | 7,820 | 9,320 |
| Runway 33 Declared Distances | TORA | 7,820 | 7,320 | 8,320 | 9,320 |
| | TODA | 7,820 | 7,320 | 8,320 | 9,320 |
| | ASDA | 8,320 | 6,820 | 8,320 | 9,320 |
| | LDA | 7,820 | 6,820 | 7,820 | 9,320 |
| Runway 15 Approach Procedures | | LOC only | LOC only | LOC only | LOC only |
| | | RNAV | RNAV | RNAV | RNAV |
| | | VOR | VOR | VOR | VOR |
| Runway 33 Approach Procedures | | ILS | ILS | ILS | LOC only |
| | | RNAV | RNAV | RNAV | RNAV |
| | | VOR | VOR | VOR | VOR |
| Runway 15 NAVAIDs | | LOC | LOC | LOC | LOC |
| Runway 33 NAVAIDs | | ILS, MALSR | ILS, MALSR | ILS, MALSR | LOC, MALSR |
| Taxiway G ADG | | IV | III | IV | IV |
| Taxiway G TDG | | 4 | 4 | 4 | 4 |
| ATCT (hours open) | | 24 hours | 24 hours | 24 hours | 0500 - 2000 |
| ARFF Index | | D | D | D | D |

| Project | Runway 15-33 Extension and Repaving | | | |
|---|---|---|---|---|
| **Phase** | **Normal (Existing)** | **Phase I: Extend Runway 15 End** | **Phase II: Extend Runway 33 End** | **Phase III: Repave Runway** |
| **Special Conditions** | Air National Guard (ANG) military operations | All military aircraft relocated to alternate ANG Base | Some large military aircraft relocated to alternate ANG Base | All military aircraft relocated to alternate ANG Base |
| **Information for NOTAMs** | | Refer above for applicable declared distances.<br>Taxiway G limited to 118 ft wingspan | Refer above for applicable declared distances. | Refer above for applicable declared distances.<br>Airport closed 2000 – 0500.<br>Runway 15 glide slope OTS. |

**Note:** This table is one example. It may be advantageous to develop a separate table for each project phase and/or to address the operational status of the associated NAVAIDs per construction phase.

Complete the following chart for each phase to determine the area that must be protected along the runway and taxiway edges:

**Table E-2. Runway and Taxiway Edge Protection**

| Runway/Taxiway | Aircraft Approach Category*<br>A, B, C, or D | Airplane Design Group*<br>I, II, III, or IV | Safety Area Width in Feet Divided by 2* |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

*See AC 150/5300-13 to complete the chart for a specific runway/taxiway.

Complete the following chart for each phase to determine the area that must be protected before the runway threshold:

**Table E-3. Protection Prior to Runway Threshold**

| Runway End Number | Airplane Design Group* I, II, III, or IV | Aircraft Approach Category* A, B, C, or D | Minimum Safety Area Prior to the Threshold* | Minimum Distance to Threshold Based on Required Approach Slope* | |
|---|---|---|---|---|---|
| | | | ft | ft | : 1 |
| | | | ft | ft | : 1 |
| | | | ft | ft | : 1 |
| | | | ft | ft | : 1 |

*See AC 150/5300-13 to complete the chart for a specific runway.

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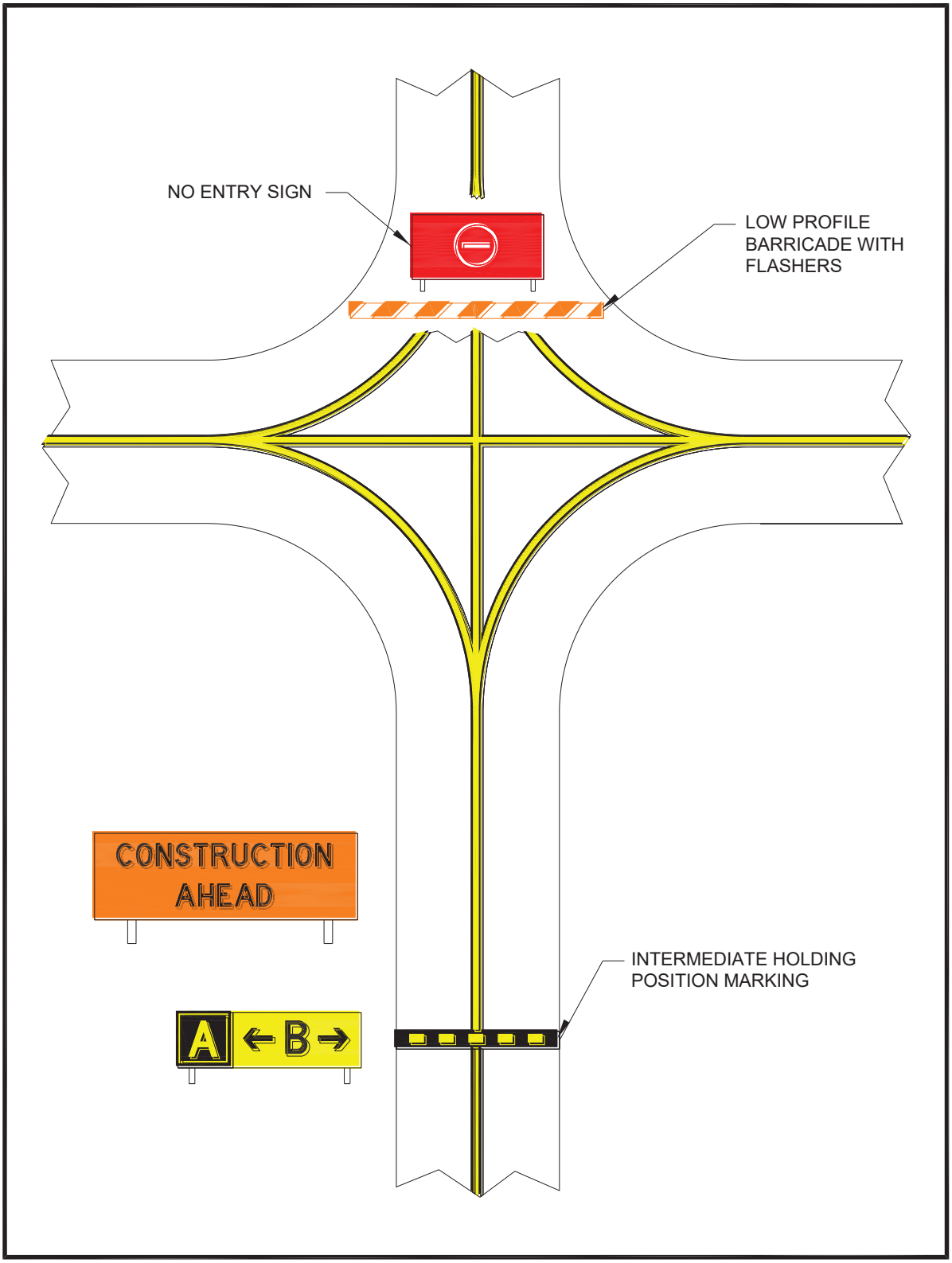
## APPENDIX F. ORANGE CONSTRUCTION SIGNS

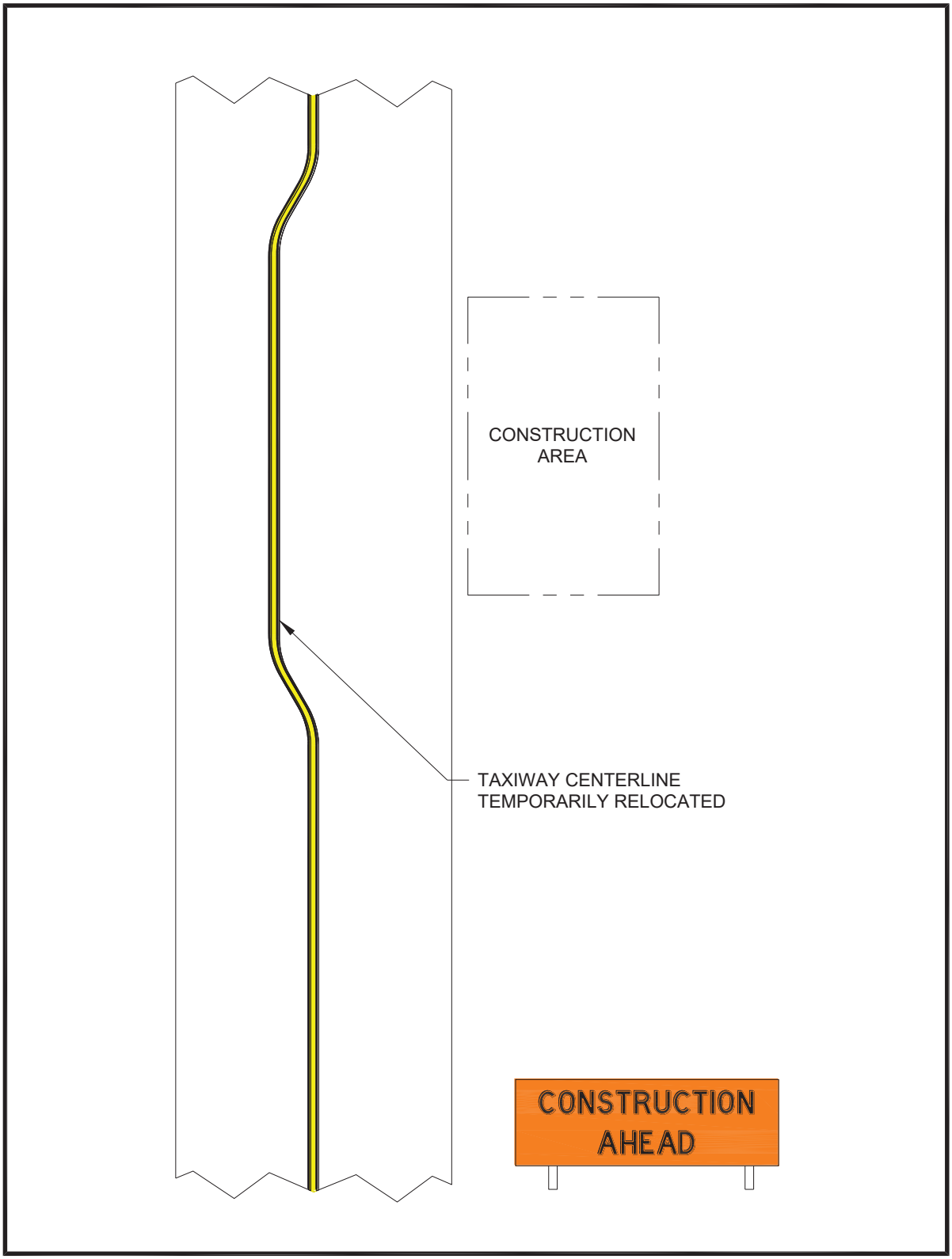
**Figure F-1. Approved Sign Legends**

**Figure F-2. Orange Construction Sign Example 1**




**Note:** For proper placement of signs, refer to EB 93.

**Figure F-3. Orange Construction Sign Example 2**




**Note:** For proper placement of signs, refer to EB 93.

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## Advisory Circular Feedback

If you find an error in this AC, have recommendations for improving it, or have suggestions for new items/subjects to be added, you may let us know by (1) mailing this form to Manager, Airport Engineering Division, Federal Aviation Administration ATTN: AAS-100, 800 Independence Avenue SW, Washington DC 20591 or (2) faxing it to the attention of the Office of Airport Safety and Standards at (202) 267-5383.

Subject: AC 150/5370-2G Date: _____

*Please check all appropriate line items:*

☐ An error (procedural or typographical) has been noted in paragraph _____ on page _____.

☐ Recommend paragraph _____ on page _____ be changed as follows:

_____
_____
_____

☐ In a future change to this AC, please cover the following subject:
*(Briefly describe what you want added.)*

_____
_____
_____

☐ Other comments:

_____
_____
_____

☐ I would like to discuss the above. Please contact me at (phone number, email address).

_____

Submitted by: _____ Date: _____

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27 January 2021

Robert Law
McFarland Johnson, Inc.
53 Regional Drive
Concord, NH 03301

Subject: Geotechnical Engineering Evaluation
Reconstruct Taxiway C
Augusta State Airport
Augusta, Maine
RWG&A Project No. 1569-011

Dear Mr. Law:

In accordance with McFarland Johnson, Inc.'s (MJ) request and authorization, R.W. Gillespie & Associates, Inc. (RWG&A) has completed a subsurface exploration and laboratory testing program for the subject project. The services were completed in general accordance with RWG&A Proposal No. P-10645GI dated 08 December 2020. The scope of services, as performed, included the following:

1. Drilled, logged, and sampled eight (8) test borings in pavement designated CB-1 through CB-8 and five (5) soil borings in turf areas designated B-1 through B-5. The exploration locations and designations were selected by MJ. Asphaltic pavement was cored at the explorations located in pavement.

2. Completed four (4) field California Bearing Ratio (CBR) tests in boreholes B-1 and B-3 through B-5 at a depth of about 36 inches below ground surface. Recovered composite bulk samples from each field CBR test location for use in laboratory moisture density relationship and CBR testing.

3. Completed sieve analyses of twenty-eight (28) soil samples and sieve analysis, moisture-density relationship tests, and laboratory CBR tests on four (4) composite bulk soil samples.

4. Prepared this summary of the services together with the final exploration logs.

The approximate project location is shown on Figure 1, *Locus Map*. The approximate exploration locations are shown on Figure 2, *Exploration Location Plan*. The exploration locations were selected and marked in the field by MJ prior to conducting the explorations.

The test borings were drilled on 19 December 2020 by Northern Test Boring, Inc. of Gorham, Maine using a track-mounted drill rig. Borings were conducted using a combination of solid-stem and hollow-stem augers with split-barrel samples generally taken at 2 to 5-foot intervals. Test boring activities were coordinated and monitored by RWG&A personnel who prepared the exploration logs.

The soils were described in the field in general accordance with *ASTM D2488, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)* and re-described based on the results of laboratory testing. Logs of the test borings prepared by RWG&A are provided in Appendix A.

Asphaltic pavement was cored with a 4-inch diameter core bit at borings located in paved areas. The cores were returned to RWG&A's laboratory and photographed; photographs are provided in Appendix B of this report. Topsoil thickness was measured at each boring in turf and is indicated on the exploration logs.

The field CBR tests were performed in accordance with *ASTM D 4429-09a Standard Test Method for CBR (California Bearing Ratio) of Soils in Place.* The field CBR tests were conducted at a depth of 36 inches below ground surface and were accomplished by sampling to the planned test depth with a 3-inch diameter split-spoon sampler, manually compacting materials at the test depth, and using the track-rig frame to mount the field CBR equipment and resist the test loads.

Laboratory testing was performed on soil samples recovered from the exploration program to assist in description of the soils and estimation of engineering properties. Tests were conducted at the RWG&A soil and materials testing laboratory in Biddeford, Maine, which is accredited by the American Association of State Highway and Transportation Officials (AASHTO) for the tests performed. All tests were performed in general accordance with the following methods and procedures:

- *ASTM D2216, Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.*
- *ASTM D6913/6913M – 17, Standard Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis*
- *ASTM D1140, Standard Test Method for Amount of Material in Soils Finer Than the No. 200 (75-µm) Sieve by Washing.*
- *ASTM D1557 – 12e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft$^3$ (2,700 kN-m/m$^3$))*
- *ASTM D1883, Standard Test Method for California Bearing Ratio (CBR) of Laboratory-Compacted Soils.*

Laboratory results have been summarized in tabular form. Exploration logs and individual laboratory results are also presented in the appendices. A summary of the data is as follows:

TABLE I. Summary of Sieve Analyses
TABLE II. Summary of Field CBR Values
TABLE III. Summary of Laboratory CBR Values
APPENDIX A. Exploration Logs
APPENDIX B. Asphaltic Pavement Core Photographs
APPENDIX C. Sieve Test Results
APPENDIX D. Field CBR Test Results
APPENDIX E. Laboratory CBR Test Results
APPENDIX F. Moisture-Density Relationship Test Results

## TAXIWAY A

The following summarizes subsurface conditions encountered. Please refer to the exploration logs in Appendix A for descriptions of subsurface conditions encountered at specific locations.

Asphalt: Asphalt was cored prior to drilling the test borings located in pavement. The measured asphalt pavement thickness ranged from about 3.25 to 4.75 inches.

Topsoil: Topsoil and organic material was observed in the test borings drilled in infield turf areas. The measured topsoil and organic material thickness ranged from about 4 to 12 inches.

Subsurface Soil Conditions: Beneath the asphaltic pavement and topsoil, soils generally consisted of fill over naturally deposited sand with varying amounts of silt and gravel extending to boring termination depth or to refusal surfaces. The fill soils generally consisted of sand with varying amounts of silt and gravel (USCS classifications: GW-GM, GM, SP-SM, SW-SM, and SM) and extended to naturally deposited soils at depths of about 1 to more than 9 feet below ground surface.

The naturally deposited soil generally consisted of medium dense to very dense sand with varying amounts of silt and gravel (USCS classifications: SP, SP-SM, and SM) which have medium to high frost susceptibility. Refusal surfaces were encountered at several explorations at depths ranging from about 2 feet to 7.5 feet below current ground surface. Refusal surfaces were interpreted to be on bedrock but might have been on boulders. Rock coring would be needed to verify the nature of the refusal surfaces.

Groundwater: Free water was not observed within the vertical reach of these explorations at the time of drilling. The absence of free water data on the exploration logs implies no groundwater data is available but does not necessarily mean that groundwater will not be encountered at these locations within the vertical reaches of the explorations in the future. Groundwater levels at the site will fluctuate due to season, temperature, rainfall and construction activity in the area; therefore, water levels during and following construction will vary from those observed in the explorations.

California Bearing Ratio: Laboratory CBR tests were conducted on composite bulk samples recovered from 3 to 5 feet below ground surface in the test borings. CBR values ranged from 8.5 to 81.1 for soils compacted between 97.5 percent and 100 percent of the maximum dry density, as determined by *ASTM D1557*. Field CBRs were conducted at a depth of about 36 inches below

ground surface. The field CBR test results ranged from 3.9 to 37.4. The variance in results for the field CBRs could be attributed to variation in soil type, relative density, and/or soil disturbance.

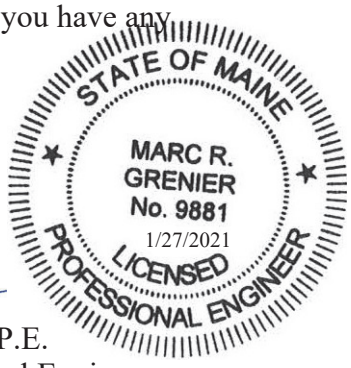
It is anticipated that the reconstruction of the taxiway would either be a full-depth reconstruction or a limited depth rehabilitation. RWG&A determined the recommended subgrade CBR value for pavement section design be in general accordance with FAA document *AC 15015320-6F, Airport Pavement Design and Evaluation*. RWG&A recommends a design CBR value of 3.5 should be used if pavement rehabilitation is the selected method of reconstruction based on the field CBR data. With full-depth reconstruction, the pavement section subgrade would be compacted and proof-rolled under the observation of a qualified inspector prior to pavement section construction and identified soft areas would be excavated and replaced. RWG&A recommends a design CBR value of 25 for full-depth reconstruction which is based on the subgrade being compacted to a minimum of 95% of the maximum dry density as determined by ASTM D-1557.

Reuse of On-site Soils: RWG&A evaluated the suitability of the existing pavement section base materials for reuse as Federal Airport Administration (FAA) Item P-154 Subbase Course and FAA Item P-209 Base Course. RWG&A's evaluations were based on the results of the laboratory tests performed on recovered base course materials and is considered suitable for planning purposes only. The results of the laboratory gradation testing indicate the in-place base course materials do not meet FAA Item P-154 or Item P-209 without modification. RWG&A evaluations indicate that a 1:1 mix of existing base to Maine Department of Transportation Item 703.31 might yield a blend that meets FAA Item P-154 but blends with Maine DOT Item 703.31 with in-place base would not meet FAA P-209. Reclaiming the existing asphalt pavement and the base material might yield a blend that meets FAA P-209. RWG&A can provide a proposal for pavement extraction gradation testing to determine if a blend is achievable, if requested. Test sections should be blended and tested during construction to verify the blends meets the intended gradation.

## CLOSURE

We trust the foregoing meets McFarland Johnson, Inc.'s present needs, and if you have any questions, please contact us.

Sincerely,
R. W. GILLESPIE & ASSOCIATES, INC.




Daniel E. Burgess
Geotechnical Engineer

Marc R. Grenier, P.E.
Senior Geotechnical Engineer

DEB/MRG:sf
In duplicate

Attachments:

Table I, Summary of Sieve Analyses
Table II, Summary of Field CBR Values
Table III, Summary of Laboratory CBR Values
Figure 1, Locus Map
Figure 2, Exploration Location Plan
APPENDIX A. Exploration Logs
APPENDIX B. Asphaltic Pavement Core Photographs
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APPENDIX D. Field CBR Test Results
APPENDIX E. Laboratory CBR Test Results
APPENDIX F. Moisture-Density Relationship Test Results

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# TABLE I

Summary of Sieve Analyses
Reconstruct Taxiway C, Augusta State Airport
Augusta, Maine

| Sieve Analysis | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Boring/ Sample Number | Depth of Sample, ft | Percent Passing Screen or Sieve Size | | | | | | | | | | | | % Finer than 0.02 mm | USCS |
| | | 2" | 1" | 3/4" | 1/2" | 3/8" | 4 | 10 | 20 | 40 | 80 | 140 | 200 | | |
| B-1/S-1 | 0-1.5 | 100 | 100 | 92.7 | 87.3 | 83.6 | 78.0 | 71.0 | 60.4 | 48.3 | 36.0 | 29.0 | 24.4 | -- | SM |
| B-1/S-3 | 5-7 | 100 | 83.6 | 83.6 | 83.6 | 80.3 | 74.3 | 67.6 | 59.3 | 53.0 | 44.1 | 36.9 | 32.7 | -- | SM |
| B-2/S-2 | 2-4 | 100 | 100 | 100 | 100 | 100 | 98.2 | 94.1 | 82.1 | 51.2 | 10.8 | 5.1 | 3.4 | -- | SP |
| B-2/S-4 | 7-9 | 100 | 100 | 100 | 97.6 | 97.1 | 91.3 | 84.0 | 72.5 | 43.3 | 8.5 | 6.4 | 6.2 | -- | SP-SM |
| B-3/S-1 | 0-1.5 | 100 | 100 | 75.3 | 71.9 | 67.4 | 56.6 | 48.0 | 40.8 | 33.1 | 24.3 | 20.4 | 17.8 | -- | GM |
| B-3/S-4 | 7-9 | 100 | 100 | 90.1 | 83.1 | 79.2 | 66.3 | 46.1 | 26.2 | 18.6 | 14.5 | 12.5 | 11.1 | -- | SP-SM |
| B-4/S-2 | 1.5-3.5 | 100 | 82.0 | 75.2 | 67.5 | 63.0 | 51.2 | 36.7 | 22.7 | 16.2 | 13.0 | 10.6 | 8.7 | -- | GW-GM |
| B-4/S-3 | 5-7 | 100 | 88.2 | 73.3 | 67.7 | 60.9 | 51.7 | 41.2 | 32.0 | 25.6 | 20.6 | 17.9 | 16.3 | -- | GM |
| B-5/S-1 | 0-1.5 | 100 | 81.9 | 81.9 | 79.7 | 75.8 | 60.0 | 46.5 | 34.5 | 27.5 | 21.7 | 18.3 | 16.0 | -- | SM |
| B-5/S-2 | 1.5-3 | 100 | 62.1 | 54.5 | 60.3 | 45.8 | 37.0 | 28.5 | 20.1 | 15.7 | 12.4 | 10.4 | 9.0 | -- | GW-GM |
| CB-1/S-1 | 0.4-1.0 | 100 | 100 | 100 | 87.4 | 75.2 | 62.2 | 56.4 | 42.3 | 28.1 | 14.3 | 8.6 | 6.5 | -- | SP-SM |
| CB-1/S-3 | 3-5 | 100 | 79.4 | 79.4 | 74.7 | 69.5 | 60.5 | 50.6 | 38.6 | 28.9 | 22.3 | 18.9 | 16.5 | -- | SM |
| CB-2/S-1 | 0.3-1 | 100 | 100 | 100 | 99.4 | 97.9 | 85.4 | 69.6 | 57.4 | 48.8 | 39.2 | 33.6 | 30.6 | -- | SM |
| CB-2/S-5 | 7-9 | 100 | 100 | 92.5 | 89.0 | 83.9 | 74.4 | 65.1 | 48.7 | 20.9 | 9.9 | 7.9 | 7.1 | -- | SW-SM |
| CB-3/S-1 | 0.3-1 | 100 | 100 | 94.3 | 83.0 | 75.8 | 61.5 | 46.0 | 35.0 | 27.3 | 19.3 | 15.1 | 13.0 | -- | SM |
| CB-3/S-2 | 1-3 | 100 | 84.7 | 78.5 | 73.1 | 67.2 | 58.3 | 47.1 | 35.4 | 26.4 | 19.2 | 16.1 | 14.2 | -- | SM |
| CB-4/S-1 | 0.3-1 | 100 | 100 | 100 | 95.7 | 89.5 | 72.3 | 57.5 | 46.5 | 38.3 | 29.6 | 25.2 | 22.8 | -- | SM |



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TABLE I (Continued)
Summary of Sieve Analyses
Reconstruct Taxiway C, Augusta State Airport
Augusta, Maine

| Sieve Analysis | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Boring Number | Depth of Sample, ft | Percent Passing Screen or Sieve Size | | | | | | | | | | | | % Finer than 0.02 mm | USCS |
| | | 2" | 1" | 3/4" | 1/2" | 3/8" | 4 | 10 | 20 | 40 | 80 | 140 | 200 | | |
| CB-4/S-4 | 5-7 | 100 | 93.9 | 85.2 | 67.1 | 62.7 | 52.1 | 40.7 | 26.3 | 19.1 | 15.2 | 12.9 | 11.8 | -- | GP-GM |
| CB-5/S-1 | 0.3-1 | 100 | 100 | 90.9 | 84.0 | 77.7 | 53.6 | 34.3 | 23.2 | 17.4 | 11.4 | 8.2 | 6.8 | -- | SW-SM |
| CB-5/S-4 | 5-7 | 100 | 86.1 | 71.7 | 63.6 | 59.3 | 48.4 | 37.3 | 29.0 | 23.9 | 19.8 | 17.6 | 16.0 | -- | GM |
| CB-6/S-1 | 0.3-1 | 100 | 100 | 100 | 98.9 | 96.3 | 81.9 | 65.8 | 53.3 | 44.4 | 35.0 | 30.0 | 27.3 | -- | SM |
| CB-6/S-3 | 3-5 | 100 | 100 | 100 | 100 | 100 | 98.1 | 91.4 | 70.9 | 45.0 | 25.6 | 20.9 | 20.0 | -- | SM |
| CB-7/S-1 | 0.3-1 | 100 | 100 | 100 | 96.9 | 92.8 | 76.8 | 62.2 | 50.1 | 40.9 | 31.8 | 27.2 | 24.8 | -- | SM |
| CB-7/S-2 | 1-3 | 100 | 100 | 100 | 100 | 99.5 | 96.9 | 89.4 | 68.2 | 44.4 | 26.9 | 22.7 | 21.7 | -- | SM |
| CB-8/S-1 | 0.3-1 | 100 | 100 | 100 | 98.0 | 94.5 | 80.4 | 63.3 | 51.0 | 42.7 | 33.3 | 28.0 | 25.1 | -- | SM |
| CB-8/S-5 | 7-9 | 100 | 95.0 | 87.9 | 78.3 | 74.2 | 64.5 | 55.3 | 42.6 | 26.1 | 16.7 | 13.8 | 13.2 | -- | SM |
| B-1/Bulk | 3-5 | 100 | 92.0 | 86.7 | 79.5 | 74.6 | 65.5 | 57.1 | 46.7 | 37.5 | 29.5 | 25.8 | 23.7 | -- | SM |
| B-3/Bulk | 3-5 | 100 | 89.4 | 82.6 | 73.8 | 68.2 | 57.8 | 49.5 | 40.6 | 33.0 | 25.6 | 22.0 | 19.9 | -- | SM |
| B-4/Bulk | 3-5 | 96.7 | 89.1 | 79.9 | 69.0 | 62.5 | 51.0 | 40.9 | 30.7 | 24.3 | 19.6 | 16.6 | 14.5 | -- | SM |
| B-5/Bulk | 3-5 | 91.6 | 76.3 | 69.9 | 61.0 | 55.3 | 42.7 | 32.8 | 24.4 | 19.5 | 15.5 | 13.0 | 11.1 | -- | GP-GM |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |



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TABLE II

**Summary of Field CBR Values**

Project: Reconstruct Taxiway C, Augusta State Airport

RWG&A Project No: 1569-011 Client: McFarland Johnson, Inc.

Location: Augusta, Maine Date: December 2020

| Boring Location | Depth (in) | CBR Value at 0.1 Inches of Penetration |
|---|---|---|
| B-1 | 36 | 4.8 |
| B-2 | 36 | 3.0 |
| B-3 | 36 | 37.4 |
| B-4 | 36 | 8.9 |

TABLE III

**Summary of Laboratory CBR Values**

Project: Reconstruct Taxiway C, Augusta State Airport

RWG&A Project No: 1569-011 Client: McFarland Johnson, Inc.

Location: Augusta, Maine Date: December 2020

| Boring Location | Sample Depth (feet) | Percent Max. Dry Density/ CBR Value |
|---|---|---|
| B-1 | 3-5 | 97.5%/ 8.5 |
| B-3 | 3-5 | 97.8%/ 28.0 |
| B-4 | 3-5 | 100%/ 81.1 |
| B-5 | 3-5 | 98.7%/ 70.4 |

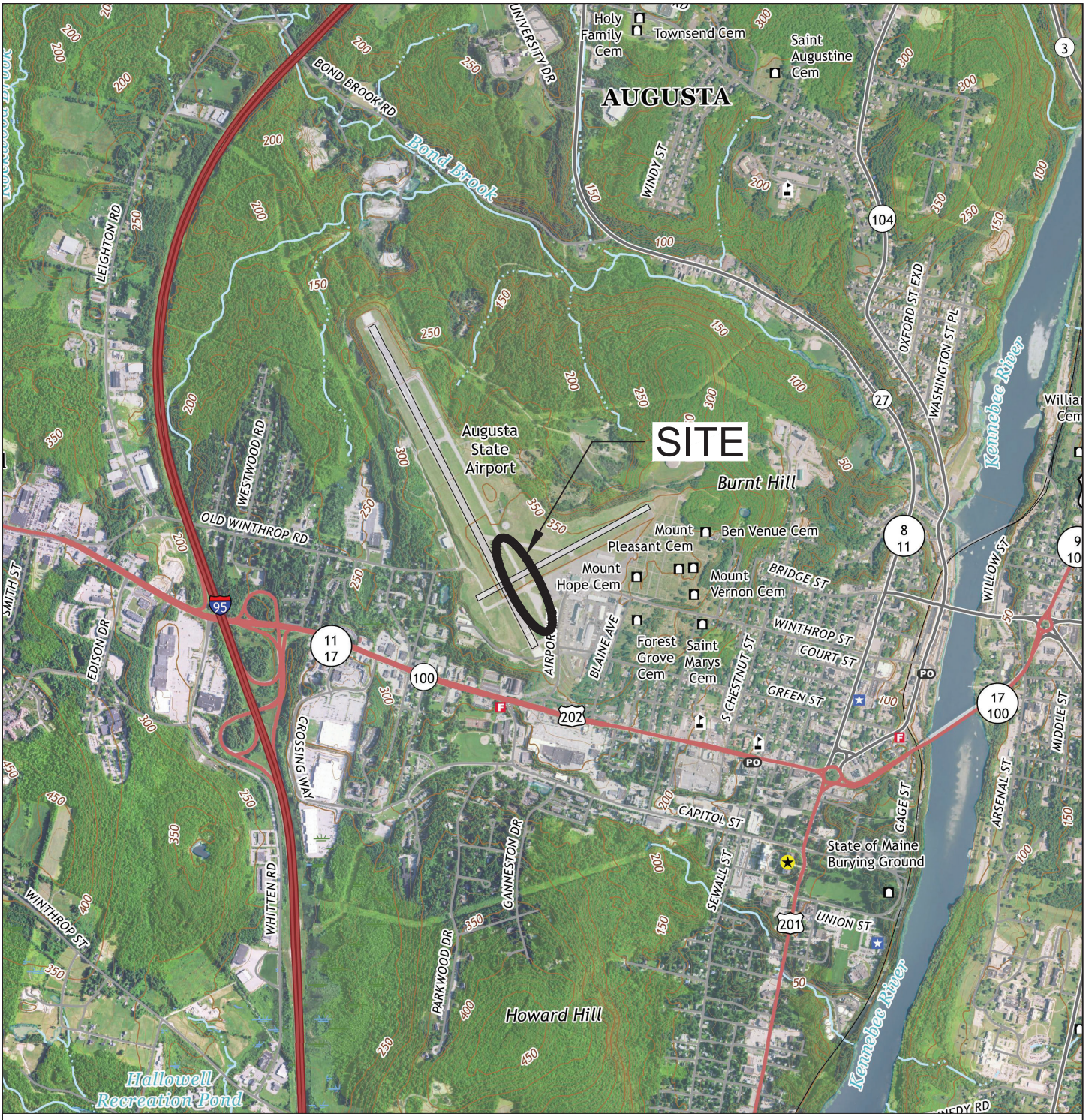


FIGURE 1
LOCUS MAP
GEOTECHNICAL EVALUATION
RECONSTRUCT TAXIWAY C
AUGUSTA STATE AIRPORT
AUGUSTA, MAINE

N

0 2000 3000 4000

SCALE, FEET

SOURCE:
USGS 7.5-MINUTE TOPOGRAPHIC QUADRANGLE OF AUGUSTA, ME, DATED 2018.

DECEMBER 2020 PROJECT NO. 1569-011

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G:\PROJECTS\1500\1569\1569-011\AutoCAD\FIG 1, LOCUS MAP 1569-011.dwg, 12/23/2020 2:56:26 PM

LEGEND:

B-1 APPROXIMATE LOCATION OF SOIL BORING DRILLED 19 DECEMBER 2020.

SOURCE:
© GOOGLE EARTH 2018 IMAGE.

N

0 150 225 300
SCALE, FEET

FIGURE 2
EXPLORATION LOCATION PLAN
GEOTECHNICAL EVALUATION
RECONSTRUCT TAXIWAY C
AUGUSTA STATE AIRPORT
AUGUSTA, MAINE

DECEMBER 2020 PROJECT NO. 1803-001

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G:\PROJECTS\1500\1569\1569-011\AutoCAD\FIG 2_ELP 1569-011.dwg, 12/23/2020 4:18:52 PM

# APPENDIX A

# EXPLORATION LOGS

Geotechnical Engineering Evaluation
Reconstruct Taxiway C
Augusta State Airport
Augusta, Maine

R.W. Gillespie & Associates
- Geotechnical Engineering
- Environmental Consulting
- Materials Testing Services

Boring Log: B-1
Total Depth (ft): 9
Sheet 1 of 1

Project Name: Reconstruct Taxiway C
RWG&A Project No. 1569-011
Location: Augusta, Maine
Client: McFarland Johnson, Inc.
RWG&A Representative: Dan Burgess
Boring Location: See Exploration Location Plan
Boring Abandonment Method: Backfill with cuttings
Observed Water Depth: Not Obs.

Drilling Co.: Northern Test Boring
Drill Rig: Diedrich D50
Driller Rep.: Mike Nadeau
Date Started: 12/19/2020
Date Completed: 12/19/2020
Surface Elevation:
Drilling Method: 2 1/4" HSA
Casing Type: N/A

| DEPTH, FT. | SYMBOL | SAMPLES | SAMPLE NUMBER | DESCRIPTION OF MATERIAL | SAMPLE RECOVERY, IN. | BLOWS PER 6" | SPT-N BLOWS PER FT. | MOISTURE CONTENT % | LAB TESTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | S-1 | FILL; TOPSOIL AND ORGANIC MATERIAL (12 inches). | 13 | 7<br>9 | 18 | 18.5 | GS<br>NM |
| | | | S-2 | FILL; Silty sand with gravel, moist, coarse to fine subangular gravel, medium to fine sand, little silt, few asphalt fragments, brown. | 20 | 9<br>9 | 19 | | |
| | | | | ASPHALTIC PAVEMENT (2 inches). | | 11 | | | |
| 5 | | | S-3 | FILL; Silty sand with gravel, moist, coarse to fine subangular gravel, medium to fine sand, little silt, few asphalt fragments, brown. | 24 | 8<br>8<br>12<br>22 | 41 | 9.3 | GS<br>NM |
| | | | S-4 | | 15 | 19<br>12<br>12 | 16 | | |
| 10 | | | | Bottom of Exploration at 9'; Not refusal. | | 8<br>8<br>10 | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |

Notes:

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Boring Log: B-2
Total Depth (ft): 9
Sheet 1 of 1

Project Name: Reconstruct Taxiway C
RWG&A Project No. 1569-011
Location: Augusta, Maine
Client: McFarland Johnson, Inc.
RWG&A Representative: Dan Burgess
Boring Location: See Exploration Location Plan
Boring Abandonment Method: Backfill with cuttings
Observed Water Depth: Not Obs.

Drilling Co.: Northern Test Boring
Drill Rig: Diedrich D50
Driller Rep.: Mike Nadeau
Date Started: 12/19/2020
Date Completed: 12/19/2020
Surface Elevation:
Drilling Method: 2 1/4" HSA
Casing Type: N/A

| DEPTH, FT. | SYMBOL | SAMPLES | SAMPLE NUMBER | DESCRIPTION OF MATERIAL | SAMPLE RECOVERY, IN. | BLOWS PER 6" | SPT-N BLOWS PER FT. | MOISTURE CONTENT % | LAB TESTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | S-1 | FILL; TOPSOIL AND ORGANIC MATERIAL (4 inches). | 10 | 13<br>14<br>14 | 28 | | |
| | | | S-2 | FILL; Sand with silt, moist, medium to fine sand, few coarse to fine gravel, little silt, brown. | 10 | 13<br>6 | 16 | 4.5 | GS<br>NM |
| 5 | | | S-3 | SAND (SP); Medium dense to loose, moist, coarse to fine sand, trace silt, brown. | 0 | 11<br>5<br>4<br>6 | 9 | | |
| | | | S-4 | SAND WITH SILT (SP-SM); Loose, medium to fine sand, few silt, brown. | 20 | 5<br>5<br>3<br>3<br>4 | 6 | 5.3 | GS<br>NM |
| 10 | | | | Bottom of Exploration at 9'; Not refusal. | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |

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**Boring Log: B-3**
**Total Depth (ft): 9**
**Sheet 1 of 1**

Project Name: Reconstruct Taxiway C
RWG&A Project No. 1569-011
Location: Augusta, Maine
Client: McFarland Johnson, Inc.
RWG&A Representative: Dan Burgess
Boring Location: See Exploration Location Plan
Boring Abandonment Method: Backfill with cuttings
Observed Water Depth: Not Obs.

Drilling Co.: Northern Test Boring
Drill Rig: Diedrich D50
Driller Rep.: Mike Nadeau
Date Started: 12/19/2020
Date Completed: 12/19/2020
Surface Elevation:
Drilling Method: 2 1/4" HSA
Casing Type: N/A

| DEPTH, FT. | SYMBOL | SAMPLES | SAMPLE NUMBER | DESCRIPTION OF MATERIAL | SAMPLE RECOVERY, IN. | BLOWS PER 6" | SPT-N BLOWS PER FT. | MOISTURE CONTENT % | LAB TESTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | S-1 | FILL; TOPSOIL AND ORGANIC MATERIAL (3 inches). | 12 | 5<br>6<br>10 | 16 | 9.0 | GS<br>NM |
| | | | S-2 | FILL; Sand with silt and gravel, moist, coarse to fine subangular to angular gravel, medium to fine sand, little silt, brown. | 18 | 7<br>12<br>12 | 24 | | |
| 5 | | | S-3 | | 18 | 20<br>10<br>12 | 26 | | |
| | | | S-4 | SAND WITH SILT AND GRAVEL (SP-SM); Medium dense, moist, coarse to fine sand, coarse to fine gravel, trace silt, brown. | 12 | 14<br>8<br>8 | 15 | 6.9 | GS<br>NM |
| 10 | | | | Bottom of Exploration at 9'; Not refusal. | | 7<br>8<br>5 | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |

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**Boring Log: B-4**
**Total Depth (ft): 6.5**
Sheet 1 of 1

Project Name: Reconstruct Taxiway C
RWG&A Project No. 1569-011
Location: Augusta, Maine
Client: McFarland Johnson, Inc.
RWG&A Representative: Dan Burgess
Boring Location: See Exploration Location Plan
Boring Abandonment Method: Backfill with cuttings
Observed Water Depth: Not Obs.

Drilling Co.: Northern Test Boring
Drill Rig: Diedrich D50
Driller Rep.: Mike Nadeau
Date Started: 12/19/2020
Date Completed: 12/19/2020
Surface Elevation:
Drilling Method: 2 1/4" HSA
Casing Type: N/A

| DEPTH, FT. | SYMBOL | SAMPLES | SAMPLE NUMBER | DESCRIPTION OF MATERIAL | SAMPLE RECOVERY, IN. | BLOWS PER 6" | SPT-N BLOWS PER FT. | MOISTURE CONTENT % | LAB TESTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | S-1 | FILL; TOPSOIL AND ORGANIC MATERIAL (5 inches). | 10 | 5<br>15 | 23 | | |
| | | | S-2 | FILL; Sand with silt and gravel, moist, coarse to fine sand, coarse to fine gravel, few silt, few asphalt fragments, brown. | 12 | 8<br>6<br>6 | 20 | 5.8 | GS<br>NM |
| 5 | | | S-3 | | 10 | 14<br>5<br>21<br>36<br>48<br>50/1" | 78 | 4.8 | GS<br>NM |
| | | | | Bottom of Exploration at 6.5'; Auger refusal, possible bedrock or boulder. | | | | | |
| 10 | | | | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |

Notes:

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Boring Log: B-5
Total Depth (ft): 4.3
Sheet 1 of 1

Project Name: Reconstruct Taxiway C
RWG&A Project No. 1569-011
Location: Augusta, Maine
Client: McFarland Johnson, Inc.
RWG&A Representative: Dan Burgess
Boring Location: See Exploration Location Plan
Boring Abandonment Method: Backfill with cuttings
Observed Water Depth: Not Obs.

Drilling Co.: Northern Test Boring
Drill Rig: Diedrich D50
Driller Rep.: Mike Nadeau
Date Started: 12/19/2020
Date Completed: 12/19/2020
Surface Elevation:
Drilling Method: 2 1/4" HSA
Casing Type: N/A

| DEPTH, FT. | SYMBOL | SAMPLES | SAMPLE NUMBER | DESCRIPTION OF MATERIAL | SAMPLE RECOVERY, IN. | BLOWS PER 6" | SPT-N BLOWS PER FT. | MOISTURE CONTENT % | LAB TESTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | S-1 | FILL; TOPSOIL AND ORGANIC MATERIAL (4 inches). | 15 | 7<br>17 | 28 | 5.7 | GS<br>NM |
| | | | S-2 | FILL; Sand with silt and gravel, moist, coarse to fine sand, little coarse to fine gravel, few silt, brown. | 20 | 11<br>28<br>42<br>32 | 74 | 3.2 | GS<br>NM |
| 5 | | | | Bottom of Exploration at 4.3'; Auger refusal, possible bedrock or boulder. | | | | | |
| 10 | | | | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |

Notes:

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Boring Log: CB-1
Total Depth (ft): 9
Sheet 1 of 1

Project Name: Reconstruct Taxiway C
RWG&A Project No. 1569-011
Location: Augusta, Maine
Client: McFarland Johnson, Inc.
RWG&A Representative: Dan Burgess
Boring Location: See Exploration Location Plan
Boring Abandonment Method: Backfill with cuttings
Observed Water Depth: Not Obs.

Drilling Co.: Northern Test Boring
Drill Rig: Diedrich D50
Driller Rep.: Mike Nadeau
Date Started: 12/19/2020
Date Completed: 12/19/2020
Surface Elevation:
Drilling Method: 2 1/4" HSA
Casing Type: N/A

| DEPTH, FT. | SYMBOL | SAMPLES | SAMPLE NUMBER | DESCRIPTION OF MATERIAL | SAMPLE RECOVERY, IN. | BLOWS PER 6" | SPT-N BLOWS PER FT. | MOISTURE CONTENT % | LAB TESTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | S-1 | ASPHALTIC PAVEMENT (4.75 inches). | GRAB | | | 15.6 | GS |
| | | | S-2 | FILL; Gravelly sand with silt, moist, coarse to fine subangular to angular gravel, coarse to fine sand, trace silt, brown. | 24 | 15<br>20 | 37 | | NM |
| | | | S-3 | | 16 | 15<br>22<br>18 | 31 | 6.7 | GS<br>NM |
| 5 | | | S-4 | | 10 | 16<br>15<br>12 | 17 | | |
| | | | S-5 | SAND WITH SILT (SP-SM); Medium dense, moist, coarse to fine sand, trace to few fine gravel, few silt, brown. | 8 | 11<br>11<br>6 | 22 | | |
| | | | | Bottom of Exploration at 9'; Not refusal. | | 10<br>10<br>10<br>12<br>8 | | | |
| 10 | | | | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |

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**Boring Log: CB-2**
**Total Depth (ft): 9**
**Sheet 1 of 1**

Project Name: Reconstruct Taxiway C
RWG&A Project No. 1569-011
Location: Augusta, Maine
Client: McFarland Johnson, Inc.
RWG&A Representative: Dan Burgess
Boring Location: See Exploration Location Plan
Boring Abandonment Method: Backfill with cuttings
Observed Water Depth: Not Obs.

Drilling Co.: Northern Test Boring
Drill Rig: Diedrich D50
Driller Rep.: Mike Nadeau
Date Started: 12/19/2020
Date Completed: 12/19/2020
Surface Elevation:
Drilling Method: 2 1/4" HSA
Casing Type: N/A

| DEPTH, FT. | SYMBOL | SAMPLES | SAMPLE NUMBER | DESCRIPTION OF MATERIAL | SAMPLE RECOVERY, IN. | BLOWS PER 6" | SPT-N BLOWS PER FT. | MOISTURE CONTENT % | LAB TESTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | S-1 | ASPHALTIC PAVEMENT (4.25 inches). | GRAB | | | 13.2 | GS |
| | | | S-2 | FILL; Sand with silt and gravel, moist, coarse to fine sand, little coarse to fine subangular to subround gravel, few silt, trace asphalt, brown. | 24 | 21<br>21<br>22 | 43 | | NM |
| | | | S-3 | | 23 | 21<br>19 | 41 | | |
| 5 | | | S-4 | SAND WITH SILT (SP-SM); Dense, moist, coarse to fine sand, trace fine gravel, few silt, light brown. | 24 | 20<br>21<br>21 | 20 | | |
| | | | | SAND (SP); Medium dense, moist, coarse to fine sand, trace silt, red/brown. | | 16<br>11<br>9 | | | |
| | | | S-5 | | | 11<br>10 | 18 | 3.7 | GS<br>NM |
| 10 | | | | Bottom of Exploration at 9'; Not refusal. | | 10<br>8<br>7 | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |

Notes:

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**Boring Log: CB-3**
**Total Depth (ft): 7.5**
**Sheet 1 of 1**

Project Name: Reconstruct Taxiway C
RWG&A Project No. 1569-011
Location: Augusta, Maine
Client: McFarland Johnson, Inc.
RWG&A Representative: Dan Burgess
Boring Location: See Exploration Location Plan
Boring Abandonment Method: Backfill with cuttings
Observed Water Depth: Not Obs.

Drilling Co.: Northern Test Boring
Drill Rig: Diedrich D50
Driller Rep.: Mike Nadeau
Date Started: 12/19/2020
Date Completed: 12/19/2020
Surface Elevation:
Drilling Method: 2 1/4" HSA
Casing Type: N/A

| DEPTH, FT. | SYMBOL | SAMPLES | SAMPLE NUMBER | DESCRIPTION OF MATERIAL | SAMPLE RECOVERY, IN. | BLOWS PER 6" | SPT-N BLOWS PER FT. | MOISTURE CONTENT % | LAB TESTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | S-1 | ASPHALTIC PAVEMENT (4 inches). | GRAB | | | 11.0 | GS |
| | | | S-2 | FILL; Sand with silt and gravel, moist, coarse to fine subangular subround gravel, coarse to fine sand, few silt, brown. | 24 | 23<br>26<br>33 | 59 | 4.3 | NM<br>GS<br>NM |
| | | | S-3 | | 22 | 33<br>44 | 52 | | |
| 5 | | | S-4 | | 15 | 26<br>26<br>31 | 44 | | |
| | | | S-5 | | 3 | 16<br>19<br>25<br>20<br>50/4" | 100+ | | |
| | | | | Bottom of Exploration at 7.5'; Auger refusal, possible bedrock or boulder. | | | | | |
| 10 | | | | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |

Notes:

R.W. Gillespie & Associates
- Geotechnical Engineering
- Environmental Consulting
- Materials Testing Services

**Boring Log: CB-4**
**Total Depth (ft): 7.5**
**Sheet 1 of 1**

Project Name: Reconstruct Taxiway C
RWG&A Project No. 1569-011
Location: Augusta, Maine
Client: McFarland Johnson, Inc.
RWG&A Representative: Dan Burgess
Boring Location: See Exploration Location Plan
Boring Abandonment Method: Backfill with cuttings
Observed Water Depth: Not Obs.

Drilling Co.: Northern Test Boring
Drill Rig: Diedrich D50
Driller Rep.: Mike Nadeau
Date Started: 12/19/2020
Date Completed: 12/19/2020
Surface Elevation:
Drilling Method: 2 1/4" HSA
Casing Type: N/A

| DEPTH, FT. | SYMBOL | SAMPLES | SAMPLE NUMBER | DESCRIPTION OF MATERIAL | SAMPLE RECOVERY, IN. | BLOWS PER 6" | SPT-N BLOWS PER FT. | MOISTURE CONTENT % | LAB TESTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | S-1 | ASPHALTIC PAVEMENT (4 inches). | GRAB | | | 10.9 | GS |
| | | | S-2 | FILL; Sand with silt and gravel, moist, coarse to fine sand, little coarse to fine subangular to subround gravel, few silt, brown. | 24 | 19<br>28<br>24 | 52 | | NM |
| | | | S-3 | | 24 | 26<br>30<br>31 | 70 | | |
| 5 | | | S-4 | | 15 | 39<br>28<br>21 | 38 | 4.5 | GS<br>NM |
| | | | S-5 | SAND WITH SILT AND GRAVEL (SP-SM); Very dense to dense, coarse to fine sand, little coarse to fine subround to round gravel, few silt, brown. | 4 | 21<br>17<br>10<br>20<br>50/1" | 100+ | | |
| | | | | Bottom of Exploration at 7.5'; Auger refusal, possible bedrock or boulder. | | | | | |
| 10 | | | | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |

Notes:

R.W. Gillespie & Associates
- Geotechnical Engineering
- Environmental Consulting
- Materials Testing Services

Boring Log: CB-5
Total Depth (ft): 2
Sheet 1 of 1

Project Name: Reconstruct Taxiway C
RWG&A Project No. 1569-011
Location: Augusta, Maine
Client: McFarland Johnson, Inc.
RWG&A Representative: Dan Burgess
Boring Location: See Exploration Location Plan
Boring Abandonment Method: Backfill with cuttings
Observed Water Depth: Not Obs.

Drilling Co.: Northern Test Boring
Drill Rig: Diedrich D50
Driller Rep.: Mike Nadeau
Date Started: 12/19/2020
Date Completed: 12/19/2020
Surface Elevation:
Drilling Method: 2 1/4" HSA
Casing Type: N/A

| DEPTH, FT. | SYMBOL | SAMPLES | SAMPLE NUMBER | DESCRIPTION OF MATERIAL | SAMPLE RECOVERY, IN. | BLOWS PER 6" | SPT-N BLOWS PER FT. | MOISTURE CONTENT % | LAB TESTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | S-1 | ASPHALTIC PAVEMENT (3.25 inches). | GRAB | | | 10.2 | GS |
| | | | S-2 | FILL; Sand with silt and gravel, moist, coarse to fine sand, coarse to fine gravel, little silt, brown. | 8 | 31<br>50/4" | 100+ | 3.6 | NM<br>GS<br>NM |
| | | | | Bottom of Exploration at 2'; Auger refusal, possible bedrock or boulder. | | | | | |
| 5 | | | | | | | | | |
| 10 | | | | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |

Notes:

R.W. Gillespie & Associates
- Geotechnical Engineering
- Environmental Consulting
- Materials Testing Services

**Boring Log: CB-6**

Total Depth (ft): 4.7

Sheet 1 of 1

Project Name: Reconstruct Taxiway C
RWG&A Project No. 1569-011
Location: Augusta, Maine
Client: McFarland Johnson, Inc.
RWG&A Representative: Dan Burgess
Boring Location: See Exploration Location Plan
Boring Abandonment Method: Backfill with cuttings
Observed Water Depth: Not Obs.

Drilling Co.: Northern Test Boring
Drill Rig: Diedrich D50
Driller Rep.: Mike Nadeau
Date Started: 12/19/2020
Date Completed: 12/19/2020
Surface Elevation:
Drilling Method: 2 1/4" HSA
Casing Type: N/A

| DEPTH, FT. | SYMBOL | SAMPLES | SAMPLE NUMBER | DESCRIPTION OF MATERIAL | SAMPLE RECOVERY, IN. | BLOWS PER 6" | SPT-N BLOWS PER FT. | MOISTURE CONTENT % | LAB TESTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | S-1 | ASPHALTIC PAVEMENT (4.5 inches). | GRAB | | | 17.1 | GS |
| | | | S-2 | FILL; Sand with silt and gravel, moist, coarse to fine sand, little coarse to fine gravel, few silt, brown. | 22 | 16<br>23<br>21 | 44 | | NM |
| | | | S-3 | SILTY SAND (SM); Very dense, moist, coarse to fine sand, trace fine gravel, little silt, brown. | 10 | 22<br>28<br>50/5" | 100+ | 7.2 | GS<br>NM |
| 5 | | | | Bottom of Exploration at 4.7'; Auger refusal, possible bedrock or boulder. | | | | | |
| 10 | | | | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |

Notes:

R.W. Gillespie & Associates
- Geotechnical Engineering
- Environmental Consulting
- Materials Testing Services

**Boring Log: CB-7**
**Total Depth (ft): 4.1**
**Sheet 1 of 1**

Project Name: Reconstruct Taxiway C
RWG&A Project No. 1569-011
Location: Augusta, Maine
Client: McFarland Johnson, Inc.
RWG&A Representative: Dan Burgess
Boring Location: See Exploration Location Plan
Boring Abandonment Method: Backfill with cuttings
Observed Water Depth: Not Obs.

Drilling Co.: Northern Test Boring
Drill Rig: Diedrich D50
Driller Rep.: Mike Nadeau
Date Started: 12/19/2020
Date Completed: 12/19/2020
Surface Elevation:
Drilling Method: 2 1/4" HSA
Casing Type: N/A

| DEPTH, FT. | SYMBOL | SAMPLES | SAMPLE NUMBER | DESCRIPTION OF MATERIAL | SAMPLE RECOVERY, IN. | BLOWS PER 6" | SPT-N BLOWS PER FT. | MOISTURE CONTENT % | LAB TESTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | S-1 | ASPHALTIC PAVEMENT (4.25 inches). | GRAB | | | 15.5 | GS |
| | | | S-2 | FILL; Silty sand with gravel, moist, coarse to fine sand, coarse to fine gravel, little silt, brown. | 22 | 20<br>21<br>24 | 45 | 6.4 | NM<br>GS |
| | | | S-3 | SAND WITH SILT (SP-SM); Very dense, moist, coarse to fine sand, little silt, brown. | 10 | 24<br>29<br>50/4" | 100+ | | NM |
| 5 | | | | Bottom of Exploration at 4.1'; Auger refusal, possible bedrock or boulder. | | | | | |
| 10 | | | | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |

Notes:

R.W. Gillespie & Associates
- Geotechnical Engineering
- Environmental Consulting
- Materials Testing Services

**Boring Log: CB-8**
**Total Depth (ft): 9**
**Sheet 1 of 1**

Project Name: Reconstruct Taxiway C
RWG&A Project No. 1569-011
Location: Augusta, Maine
Client: McFarland Johnson, Inc.
RWG&A Representative: Dan Burgess
Boring Location: See Exploration Location Plan
Boring Abandonment Method: Backfill with cuttings
Observed Water Depth: Not Obs.

Drilling Co.: Northern Test Boring
Drill Rig: Diedrich D50
Driller Rep.: Mike Nadeau
Date Started: 12/19/2020
Date Completed: 12/19/2020
Surface Elevation:
Drilling Method: 2 1/4" HSA
Casing Type: N/A

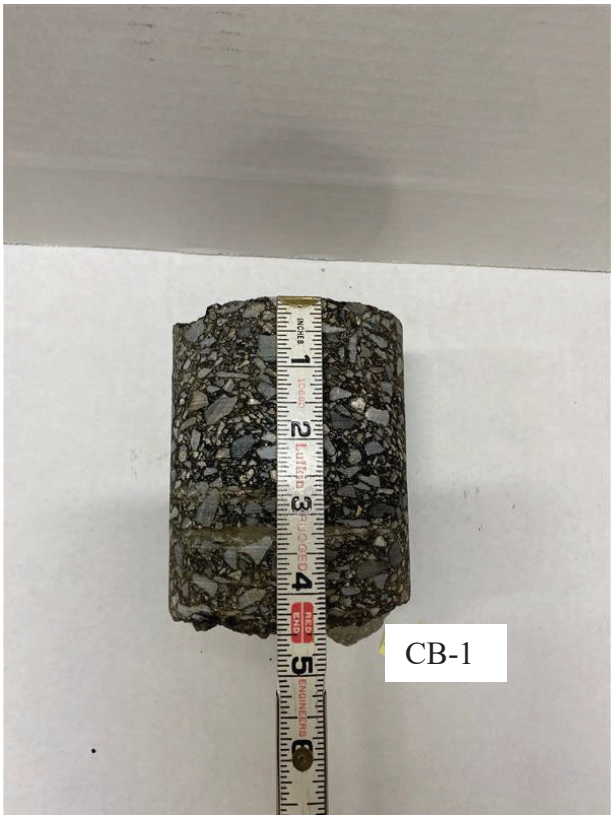
| DEPTH, FT. | SYMBOL | SAMPLES | SAMPLE NUMBER | DESCRIPTION OF MATERIAL | SAMPLE RECOVERY, IN. | BLOWS PER 6" | SPT-N BLOWS PER FT. | MOISTURE CONTENT % | LAB TESTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | S-1 | ASPHALTIC PAVEMENT (4 inches). | GRAB | | | 13.9 | GS |
| | | | S-2 | FILL; Sand with silt and gravel, moist, coarse to fine sand, few to little coarse to fine gravel, few silt, brown. | 24 | 17<br>19<br>22 | 41 | | NM |
| | | | S-3 | SAND WITH SILT (SP-SM); Dense, moist, coarse to fine sand, little silt, brown. | 24 | 16<br>20<br>21 | 73 | | |
| 5 | | | S-4 | Coarse to fine gravel. | 20 | 52<br>39<br>25 | 58 | | |
| | | | S-5 | | 15 | 27<br>31<br>23<br>23 | 34 | 3.8 | GS<br>NM |
| | | | | Bottom of Exploration at 9'; Not refusal. | | 18<br>16<br>13 | | | |
| 10 | | | | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |

Notes:

# APPENDIX B

## ASPHALTIC PAVEMENT CORE PHOTOGRPAHS

Geotechnical Engineering Evaluation
Reconstruct Taxiway C
Augusta State Airport
Augusta, Maine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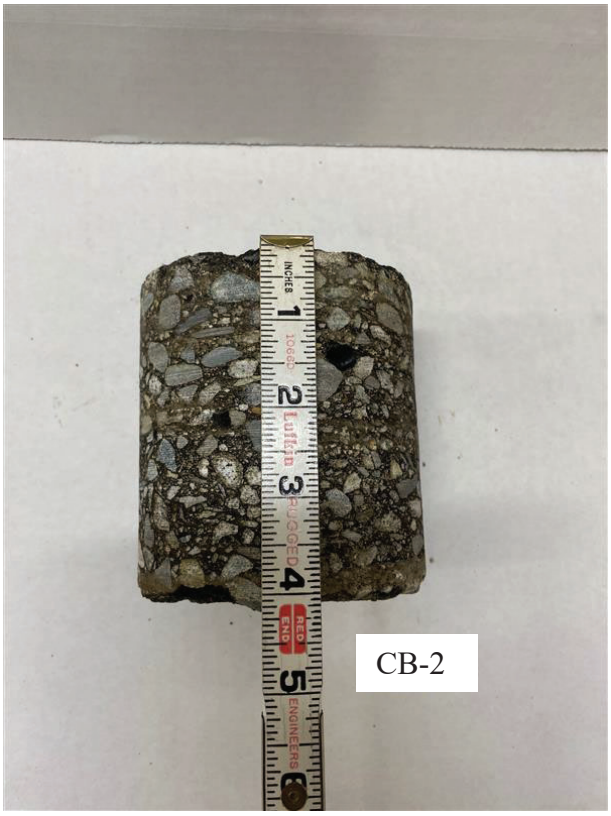
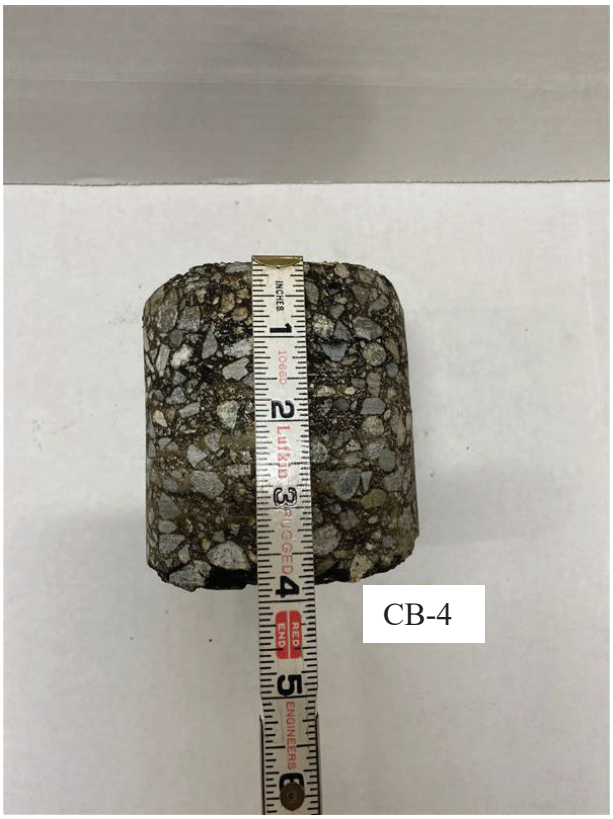

CB-2

CB-3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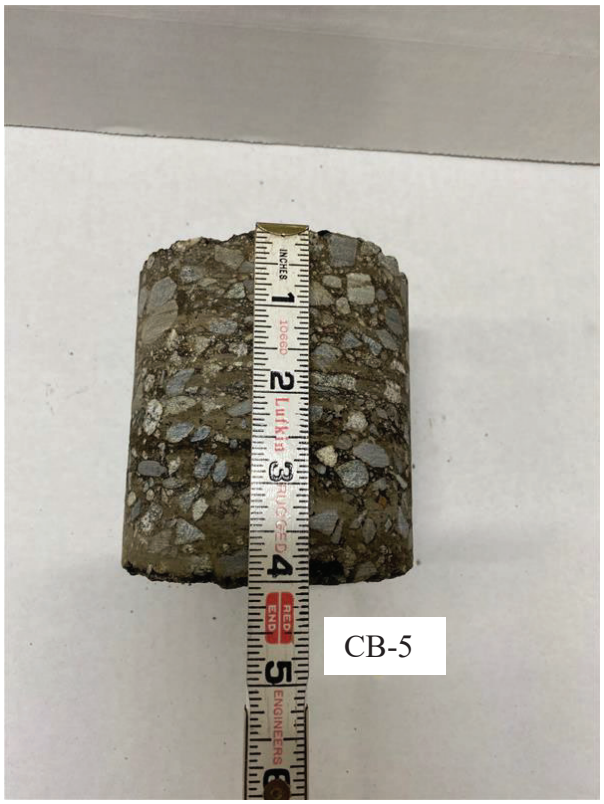
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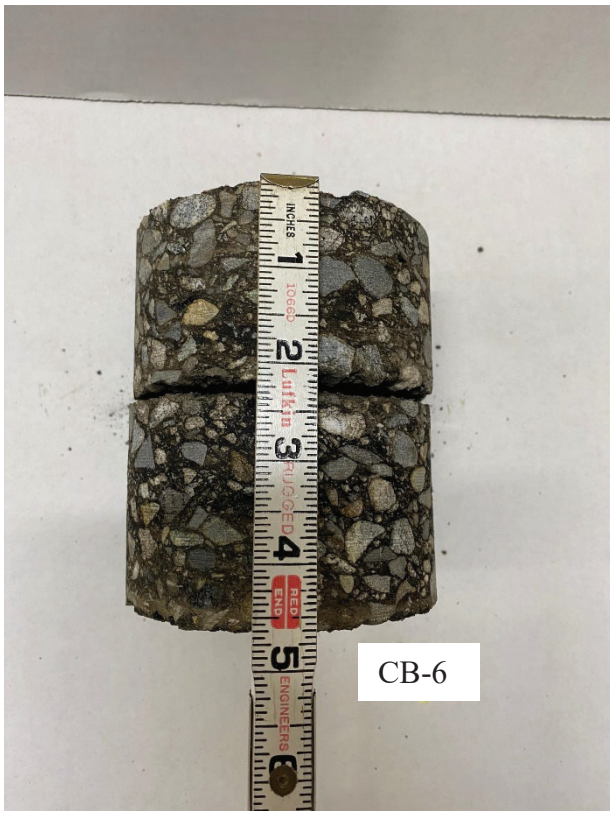
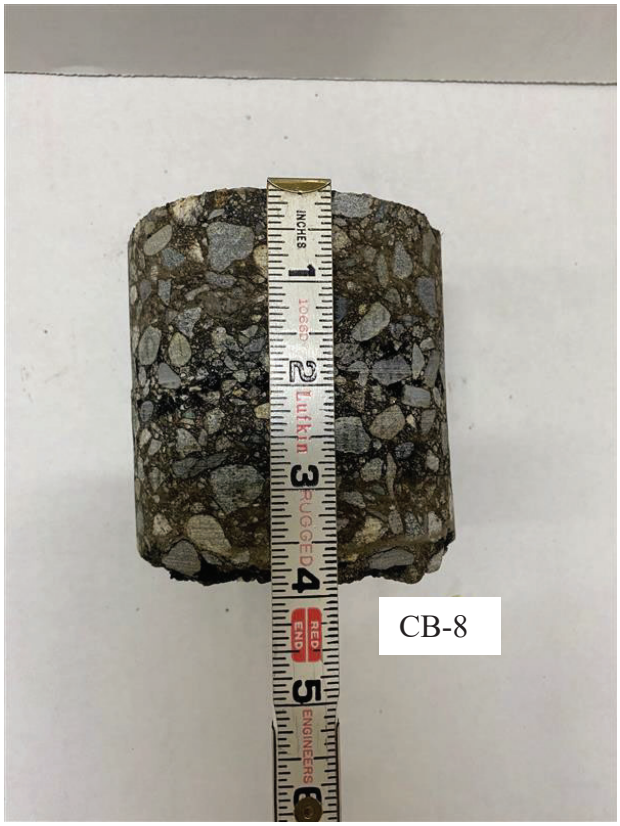

CB-6

CB-7


CB-8

**APPENDIX C**

**SIEVE TEST RESULTS**

Geotechnical Engineering Evaluation
Reconstruct Taxiway C
Augusta State Airport
Augusta, Maine

RWG&A, Inc. soil descriptions are based on the following criteria. Descriptive terminology is used to denote the grain size and percentage of each component. The soil descriptions are based on visual-manual classification procedures, Standard Penetration Test results, and the results of laboratory testing on selected soil samples, where available. The Unified Soil Classification Group Symbol will be indicated in capital letters.

COMPONENT DEFINITIONS BY GRADATION SIEVE LIMITS

| Materials | Definitions | Fractions | Upper | Lower |
|---|---|---|---|---|
| Boulders | Material too large to pass through an opening 12 in. square. | | | |
| Cobbles | Material passing through a 12 in. opening and retained on the 3 in. sieve. | | | |
| Gravel | Material passing the 3 in. sieve and retained on 1/4" (No. 4 sieve). | Coarse<br>Fine | 3 in.<br>3/4 in. | 3/4 in.<br>1/4 in. |
| Sand | Material passing the No. 4 sieve and retained on the No. 200 sieve. | Coarse<br>Medium<br>Fine | No. 4 (1/4")<br>No. 10 (1/8")<br>No. 40 (1/32") | No. 10 (1/8")<br>No. 40 (1/32")<br>No. 200 |
| Silt | Material passing the No. 200 sieve which is usually non-plastic in character and exhibits little or no strength when air dried. | | No. 200 | |
| Clay | Material passing the No. 200 sieve which can also be made to exhibit plasticity within a certain range of moisture contents and which exhibits considerable strength when air dried. | | No. 200 | |

SOIL DESCRIPTION

General

Soils are described as to the Unified Soil Classification Systems Group Symbol, density or consistency, color, grain size distribution and other pertinent properties such as plasticity and dry strength. The RWG&A order of descriptors is as follows:

1. USCS Group Name and Symbol, or Fill
2. Density or Consistency
3. Moisture
4. Grain Size & Constituent percentages
5. Other pertinent descriptors
6. Color

DESCRIPTIVE TERMINOLOGY DENOTING COMPONENT PROPORTIONS

| Descriptive Terms | Range of Proportions |
|---|---|
| Noun (major component) | ∃50% |
| Adjective (secondary component) | 20 - 50% |
| Some (third component) | 25 - 45% |
| Little (second or third component) | 15 - 25% |
| Few (second or third component) | 5 - 15% |
| Trace | 0 - 5% |
| With | Amount of component not determined. Used as a conjunction only. Does not indicate component percentile |

OTHER DESCRIPTIVE TERMS

Where appropriate, geological classifications are also used (Glacial Till, etc.)

TYPICAL DESCRIPTIONS

SAND WITH SILT (SP-SM): Medium dense, moist, coarse to medium sand, few silt, brown.
FILL; Loose, dry, fine sand, some gravel and silt, with brick and concrete fragments, dark brown.
SILTY CLAY (CL); Very stiff, moist, silty clay, olive-brown.

DENSITY OR CONSISTENCY OF SOILS

COHESIVE SOILS

| Consistency of Cohesive Soils | Standard Penetration Test (Blows Per Foot) (N) | Undrained Shear Strength (TSF) |
|---|---|---|
| Very Soft | 0 - 2 | Below 0.13 (250 psf) |
| Soft | 2 - 4 | 0.13 to 0.25 (to 500 psf) |
| Medium | 4 - 8 | 0.25 to 0.5 (to 1,000 psf) |
| Stiff | 8 - 15 | 0.5 to 1.0 (to 2,000 psf) |
| Very Stiff | 15 - 30 | 1.0 to 2.0 (to 4,000 psf) |
| Hard | Over 30 | over 2.0 (over 4,000 psf) |

Consistency of cohesive soils is based upon field vane shear, torvane, or pocket penetrometer, or laboratory vane shear or Unconsolidated-Undrained Triaxial Compression tests. Consistency of cohesive soils is based upon the Standard Penetration test when no other data is available.

COHESIONLESS SOILS

| Density of Cohesionless Soils | Standard Penetration Test (Blows per Foot) (in) |
|---|---|
| Very Loose | 0 - 4 |
| Loose | 4 - 10 |
| Medium Dense | 10 - 30 |
| Dense | 30 - 50 |
| Very Dense | over 50 |

PENETRATION RESISTANCE

STANDARD PENETRATION TEST (ASTM D1586) - a 2.0-inch diameter, 1-3/8 inch inside diameter split barrel sample is driven into soil by means of a 140-pound weight falling freely through a vertical distance of 30 inches. The total number of blows required for penetration from 6 to 18 inches is the Standard Penetration Resistance (N).

COBBLES AND BOULDERS

The percentage of cobbles and boulders is estimated visually where possible.

| Descriptive Term | Estimated Percentage |
|---|---|
| Very Few | 0 - 10% |
| Few | 10 - 25% |
| Common | 25 - 40% |
| Numerous | 40 - 50% |

If the percentage cannot be determined, as in a typical test boring, then use “with” to indicate the presence of cobbles and/or boulders. (i.e., gravelly sand with cobbles and boulders).

FILLS

The following terminology is used to denote size range of man-made materials within fill deposits:

| Size Range | Comparative Soil Terms |
|---|---|
| <No. 200 Sieve | Silt - size |
| No. 200 to 1/4 in. | Sand - size |
| 1/4 in. to 3 in. | Gravel - size |
| 3 in. to 12 in. | Cobble - size |
| >12 in. | Boulder - size |

SUPPLEMENTAL SOIL DESCRIPTION TERMINOLOGY

| Term | Example | |
|---|---|---|
| Seam | Typically 1/16 to 1/2 inch thick | 1/4 inch sand seams |
| Layer | Greater than 1/2 inch thick | 2-inch sand layers |
| Occasional | One or less per foot of thickness | |
| Frequent | More than one per foot of thickness | |
| Interbedded | Alternating soil layers of different composition | |
| Varved | Alternating thin seams of silt and clay | |
| Mottled | Variations in color | |

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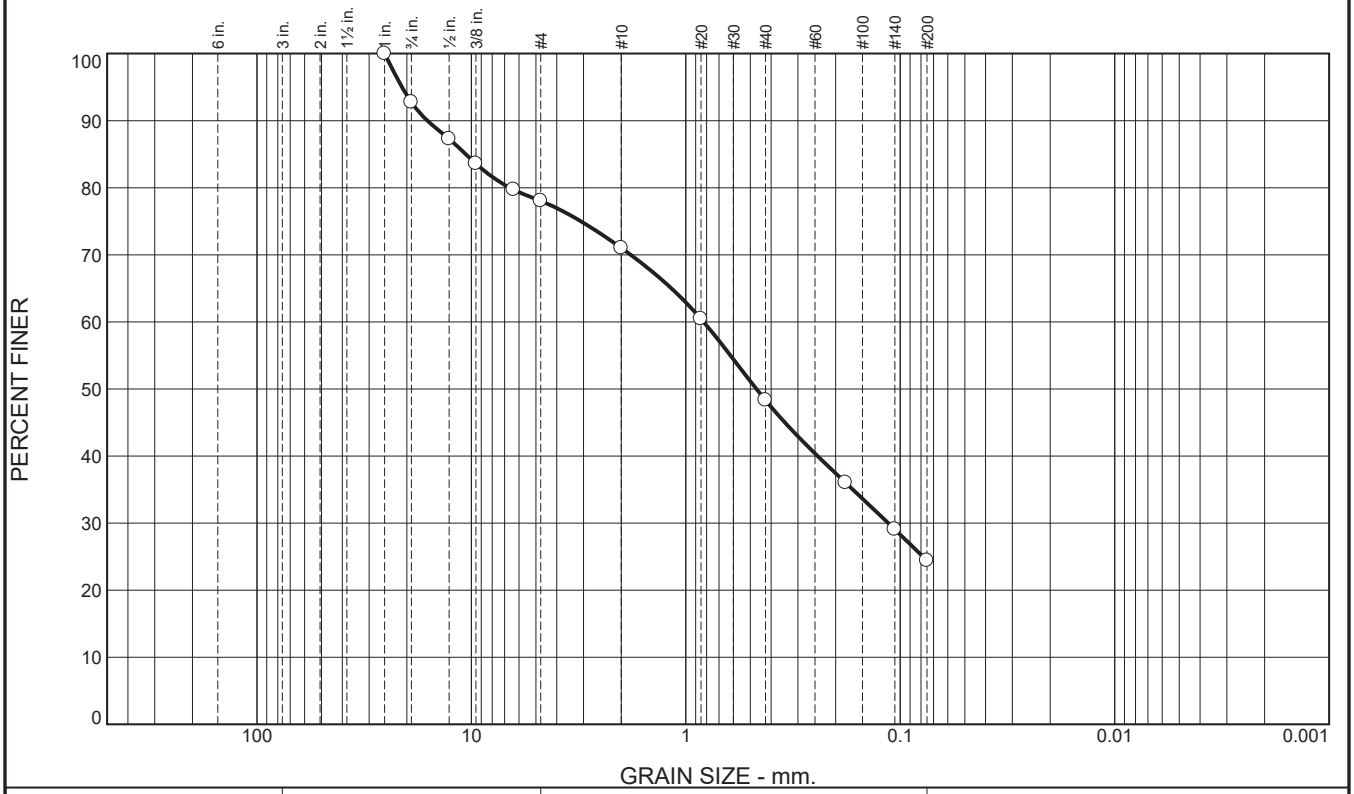
# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 7.3 | 14.7 | 7.0 | 22.7 | 23.9 | 24.4 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1" | 100.0 | | |
| 3/4" | 92.7 | | |
| 1/2" | 87.3 | | |
| 3/8" | 83.6 | | |
| 1/4" | 79.7 | | |
| #4 | 78.0 | | |
| #10 | 71.0 | | |
| #20 | 60.4 | | |
| #40 | 48.3 | | |
| #80 | 36.0 | | |
| #140 | 29.0 | | |
| #200 | 24.4 | | |

* (no specification provided)

**Soil Description**

silty sand with gravel

**Atterberg Limits**

PL= LL= PI=

**Coefficients**

$D_{90}$= 16.0475 $D_{85}$= 10.6271 $D_{60}$= 0.8266
$D_{50}$= 0.4687 $D_{30}$= 0.1138 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-1-b

**Remarks**

Moisture Content: 18.5%
Roots and organics present in sample.

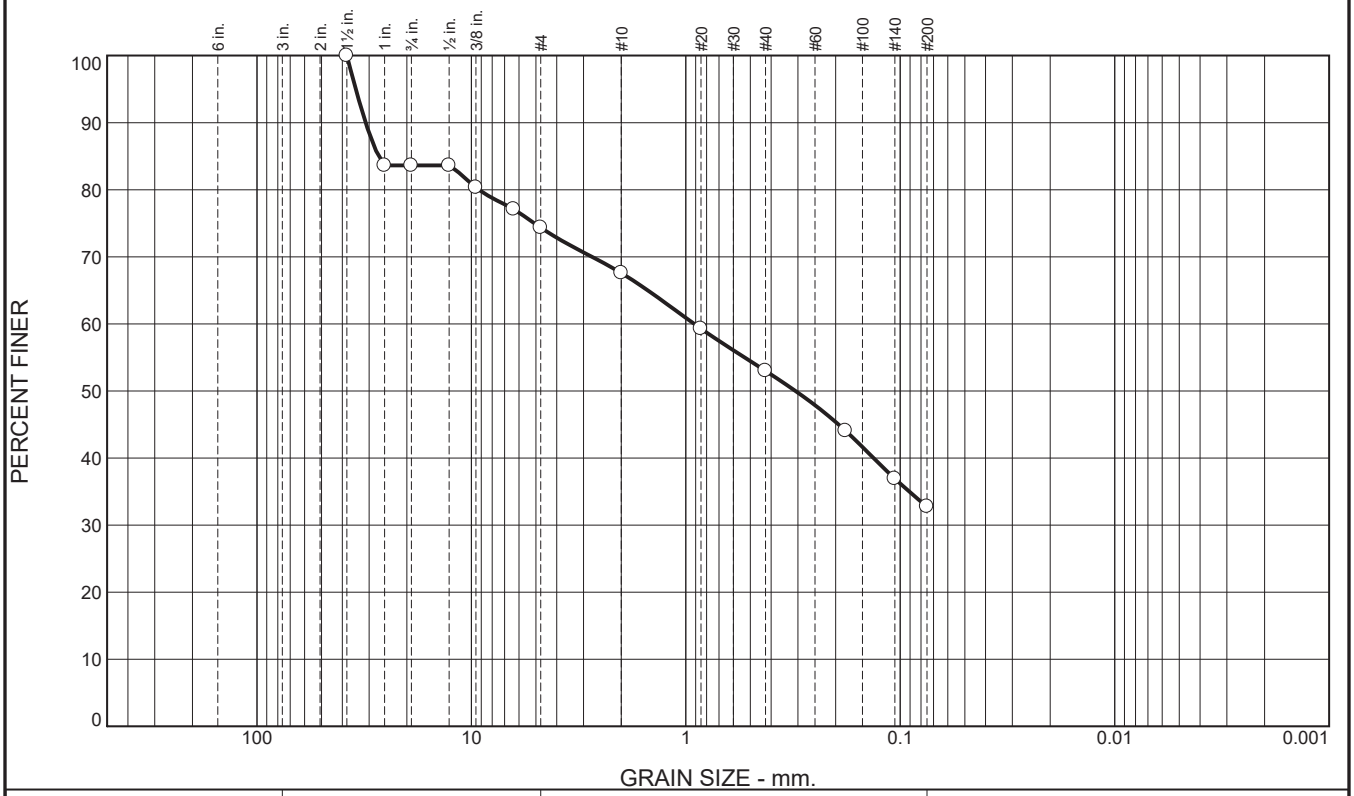
**Location:** B-1
**Sample Number:** S-1 **Depth:** 0-1.5' **Date:** 12-31-2020

**R.W. Gillespie & Associates, Inc.**
**Biddeford, Maine**

**Client:** McFarland Johnson, Inc.
**Project:** Reconstruct Taxiway C
Augusta, ME
**Project No:** 1569-011 **Lab No.** 16369-01

**Tested By:** CAG/AGS **Checked By:** MTG

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 16.4 | 9.3 | 6.7 | 14.6 | 20.3 | 32.7 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1 1/2" | 100.0 | | |
| 1" | 83.6 | | |
| 3/4" | 83.6 | | |
| 1/2" | 83.6 | | |
| 3/8" | 80.3 | | |
| 1/4" | 77.1 | | |
| #4 | 74.3 | | |
| #10 | 67.6 | | |
| #20 | 59.3 | | |
| #40 | 53.0 | | |
| #80 | 44.1 | | |
| #140 | 36.9 | | |
| #200 | 32.7 | | |

* (no specification provided)

**Soil Description**

silty sand with gravel

**Atterberg Limits**

PL= LL= PI=

**Coefficients**

$D_{90}$= 31.1308 $D_{85}$= 27.0718 $D_{60}$= 0.9137
$D_{50}$= 0.3080 $D_{30}$= $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Moisture Content: 9.3%

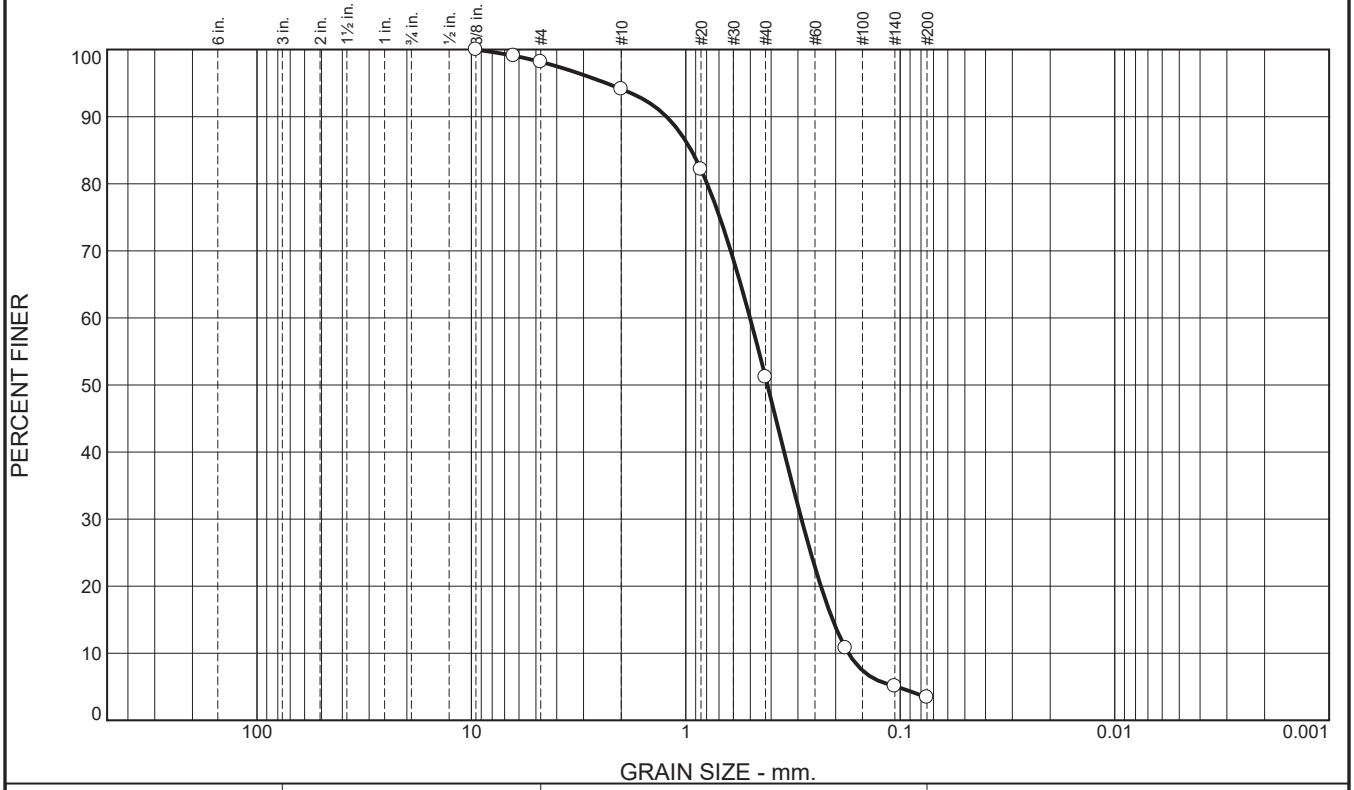
**Location:** B-1
**Sample Number:** S-3 **Depth:** 5-7' **Date:** 12-31-2020

**R.W. Gillespie & Associates, Inc.**
**Biddeford, Maine**

**Client:** McFarland Johnson, Inc.
**Project:** Reconstruct Taxiway C
Augusta, ME
**Project No:** 1569-011 **Lab No.** 16369-02

**Tested By:** AGS/CAG **Checked By:** MTG

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 0.0 | 1.8 | 4.1 | 42.9 | 47.8 | 3.4 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/8" | 100.0 | | |
| 1/4" | 99.1 | | |
| #4 | 98.2 | | |
| #10 | 94.1 | | |
| #20 | 82.1 | | |
| #40 | 51.2 | | |
| #80 | 10.8 | | |
| #140 | 5.1 | | |
| #200 | 3.4 | | |

* (no specification provided)

**Soil Description**

poorly graded sand

**Atterberg Limits**

PL= LL= PI=

**Coefficients**

$D_{90}$= 1.2302 $D_{85}$= 0.9437 $D_{60}$= 0.5020
$D_{50}$= 0.4162 $D_{30}$= 0.2888 $D_{15}$= 0.2068
$D_{10}$= 0.1743 $C_u$= 2.88 $C_c$= 0.95

**Classification**

USCS= SP AASHTO= A-3

**Remarks**

Moisture Content: 4.5%

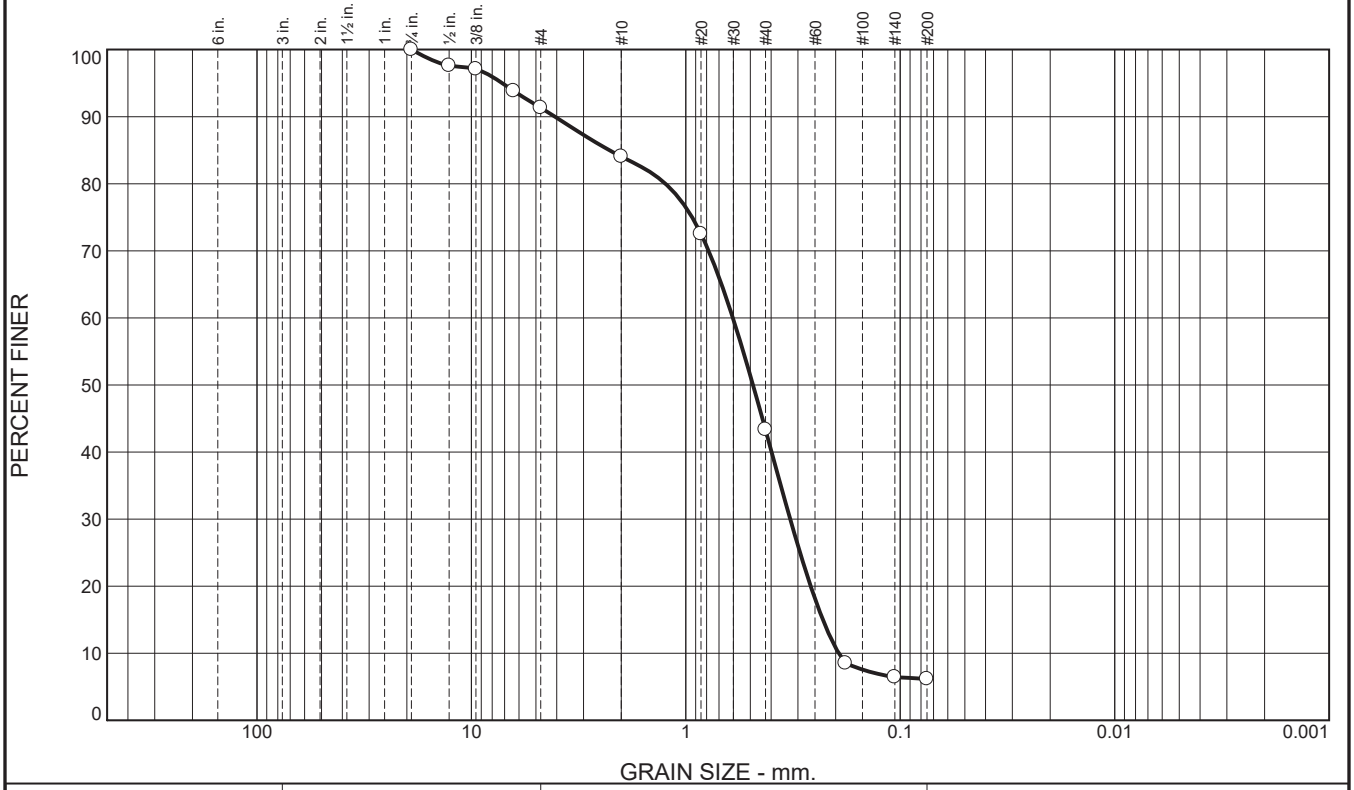
**Location:** B-2
**Sample Number:** S-2 **Depth:** 2-4' **Date:** 12-31-2020

**R.W. Gillespie & Associates, Inc.**
**Biddeford, Maine**

**Client:** McFarland Johnson, Inc.
**Project:** Reconstruct Taxiway C
Augusta, ME
**Project No:** 1569-011 **Lab No.** 16369-03

**Tested By:** CAG/AGS **Checked By:** MTG

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 0.0 | 8.7 | 7.3 | 40.7 | 37.1 | 6.2 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 97.6 | | |
| 3/8" | 97.1 | | |
| 1/4" | 93.8 | | |
| #4 | 91.3 | | |
| #10 | 84.0 | | |
| #20 | 72.5 | | |
| #40 | 43.3 | | |
| #80 | 8.5 | | |
| #140 | 6.4 | | |
| #200 | 6.2 | | |

* (no specification provided)

**Soil Description**

poorly graded sand with silt

**Atterberg Limits**

PL= LL= PI=

**Coefficients**

$D_{90}$= 4.0849 $D_{85}$= 2.2739 $D_{60}$= 0.6034
$D_{50}$= 0.4862 $D_{30}$= 0.3258 $D_{15}$= 0.2296
$D_{10}$= 0.1937 $C_u$= 3.12 $C_c$= 0.91

**Classification**

USCS= SP-SM AASHTO= A-1-b

**Remarks**

Moisture Content: 5.3%

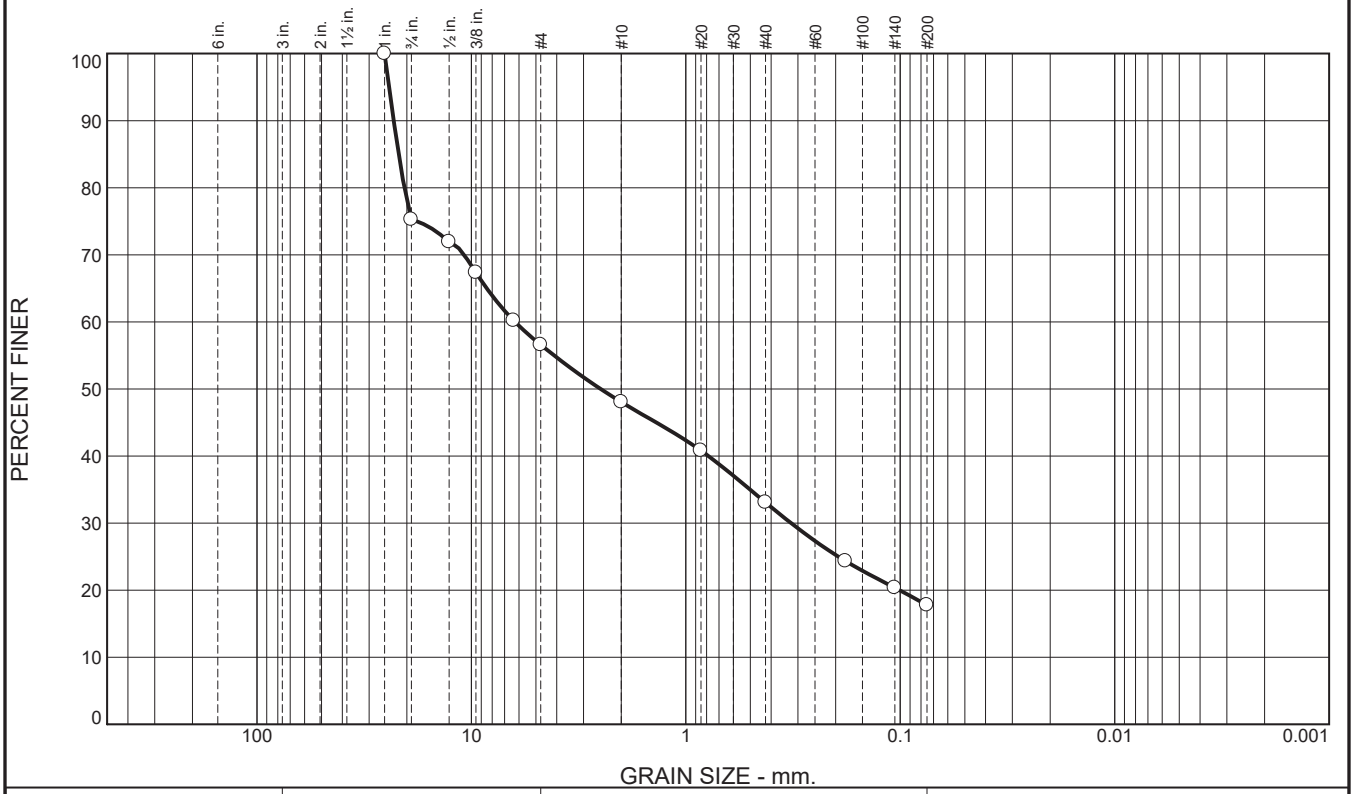
**Location:** B-2
**Sample Number:** S-4 **Depth:** 7-9' **Date:** 12-31-2020

**R.W. Gillespie & Associates, Inc.**
**Biddeford, Maine**

**Client:** McFarland Johnson, Inc.
**Project:** Reconstruct Taxiway C
Augusta, ME
**Project No:** 1569-011 **Lab No.** 16369-04

**Tested By:** CAG/AGS **Checked By:** MTG

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 24.7 | 18.7 | 8.6 | 14.9 | 15.3 | 17.8 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1" | 100.0 | | |
| 3/4" | 75.3 | | |
| 1/2" | 71.9 | | |
| 3/8" | 67.4 | | |
| 1/4" | 60.2 | | |
| #4 | 56.6 | | |
| #10 | 48.0 | | |
| #20 | 40.8 | | |
| #40 | 33.1 | | |
| #80 | 24.3 | | |
| #140 | 20.4 | | |
| #200 | 17.8 | | |

* (no specification provided)

**Soil Description**

silty gravel with sand

**Atterberg Limits**

PL= LL= PI=

**Coefficients**

$D_{90}$= 23.0299 $D_{85}$= 21.8343 $D_{60}$= 6.2664
$D_{50}$= 2.4968 $D_{30}$= 0.3227 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= GM AASHTO= A-1-b

**Remarks**

Moisture Content: 9.0%

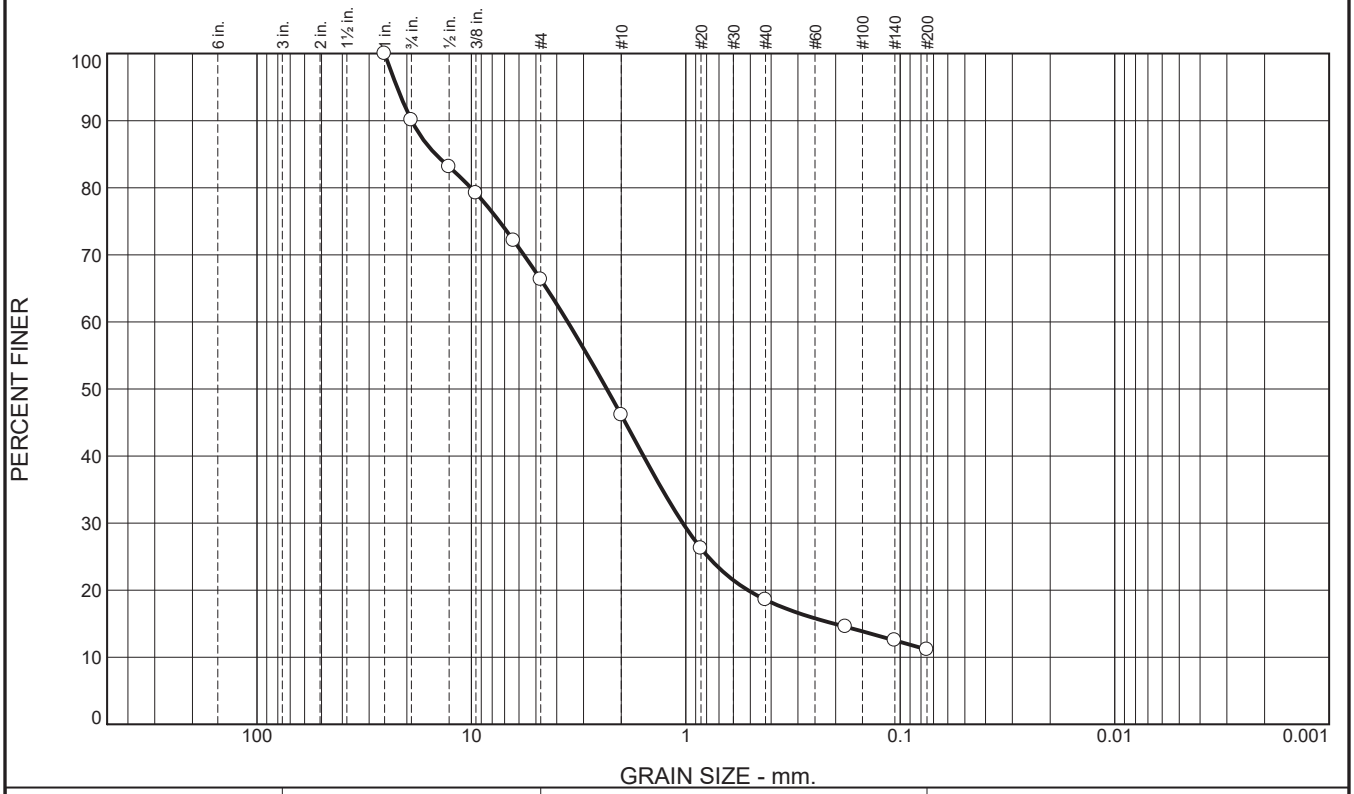
**Location:** B-3
**Sample Number:** S-1 **Depth:** 0-1.5' **Date:** 12-31-2020

**R.W. Gillespie & Associates, Inc.**
**Biddeford, Maine**

**Client:** McFarland Johnson, Inc.
**Project:** Reconstruct Taxiway C
Augusta, ME
**Project No:** 1569-011 **Lab No.** 16369-05

**Tested By:** CAG/AGS **Checked By:** MTG

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 9.9 | 23.8 | 20.2 | 27.5 | 7.5 | 11.1 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1" | 100.0 | | |
| 3/4" | 90.1 | | |
| 1/2" | 83.1 | | |
| 3/8" | 79.2 | | |
| 1/4" | 72.1 | | |
| #4 | 66.3 | | |
| #10 | 46.1 | | |
| #20 | 26.2 | | |
| #40 | 18.6 | | |
| #80 | 14.5 | | |
| #140 | 12.5 | | |
| #200 | 11.1 | | |

* (no specification provided)

**Soil Description**

poorly graded sand with silt and gravel

**Atterberg Limits**

PL= LL= PI=

**Coefficients**

$D_{90}$= 18.9937 $D_{85}$= 14.6890 $D_{60}$= 3.5567
$D_{50}$= 2.3353 $D_{30}$= 1.0333 $D_{15}$= 0.2033
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SP-SM AASHTO= A-1-a

**Remarks**

Moisture Content: 6.9%

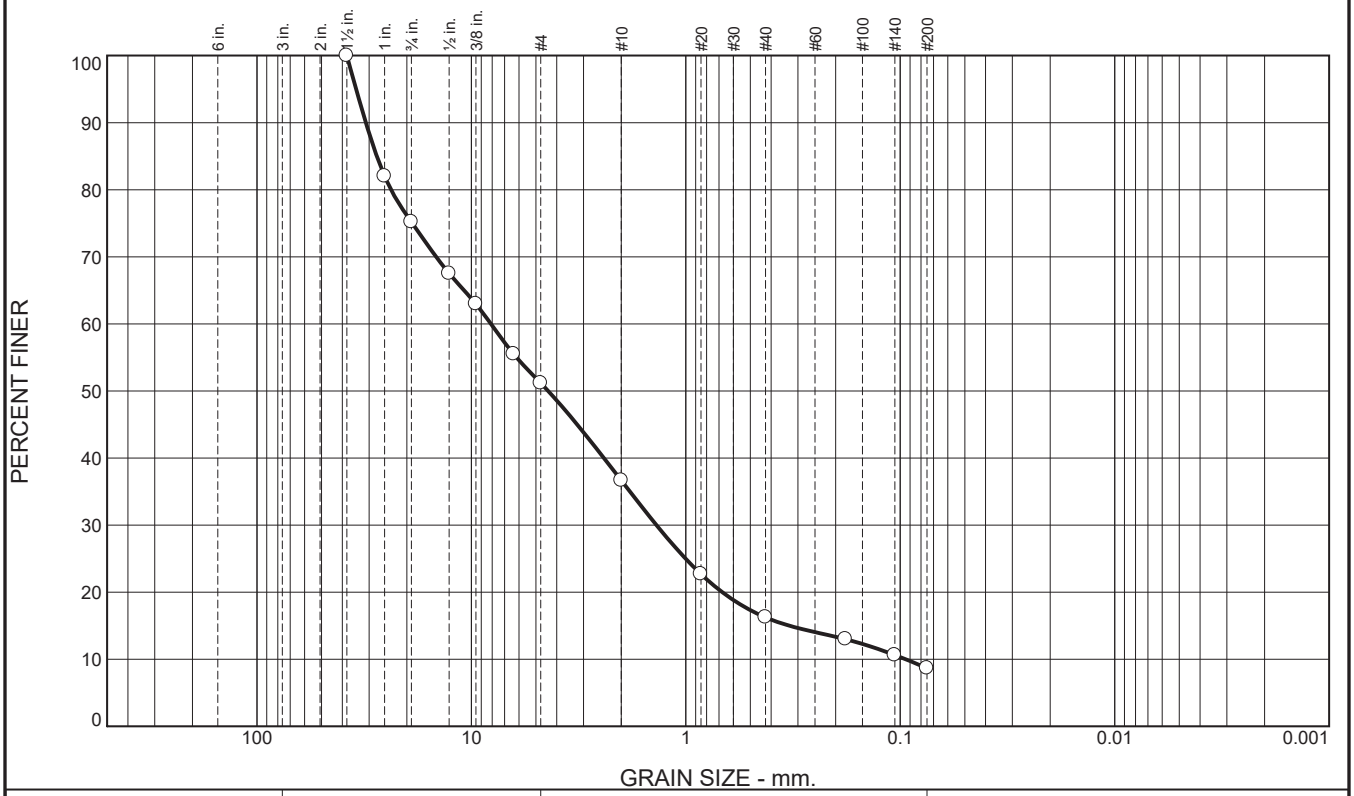
**Location:** B-3
**Sample Number:** S-4 **Depth:** 7-9' **Date:** 12-31-2020

**R.W. Gillespie & Associates, Inc.**
**Biddeford, Maine**

**Client:** McFarland Johnson, Inc.
**Project:** Reconstruct Taxiway C
Augusta, ME
**Project No:** 1569-011 **Lab No.** 16369-06

**Tested By:** CAG/AGS **Checked By:** MTG

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 24.8 | 24.0 | 14.5 | 20.5 | 7.5 | 8.7 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1 1/2" | 100.0 | | |
| 1" | 82.0 | | |
| 3/4" | 75.2 | | |
| 1/2" | 67.5 | | |
| 3/8" | 63.0 | | |
| 1/4" | 55.5 | | |
| #4 | 51.2 | | |
| #10 | 36.7 | | |
| #20 | 22.7 | | |
| #40 | 16.2 | | |
| #80 | 13.0 | | |
| #140 | 10.6 | | |
| #200 | 8.7 | | |

* (no specification provided)

**Soil Description**

well-graded gravel with silt and sand

**Atterberg Limits**

PL= LL= PI=

**Coefficients**

$D_{90}$= 31.0572 $D_{85}$= 27.6209 $D_{60}$= 8.1026
$D_{50}$= 4.3894 $D_{30}$= 1.3705 $D_{15}$= 0.3287
$D_{10}$= 0.0945 $C_u$= 85.73 $C_c$= 2.45

**Classification**

USCS= GW-GM AASHTO= A-1-a

**Remarks**

Moisture Content: 5.8%

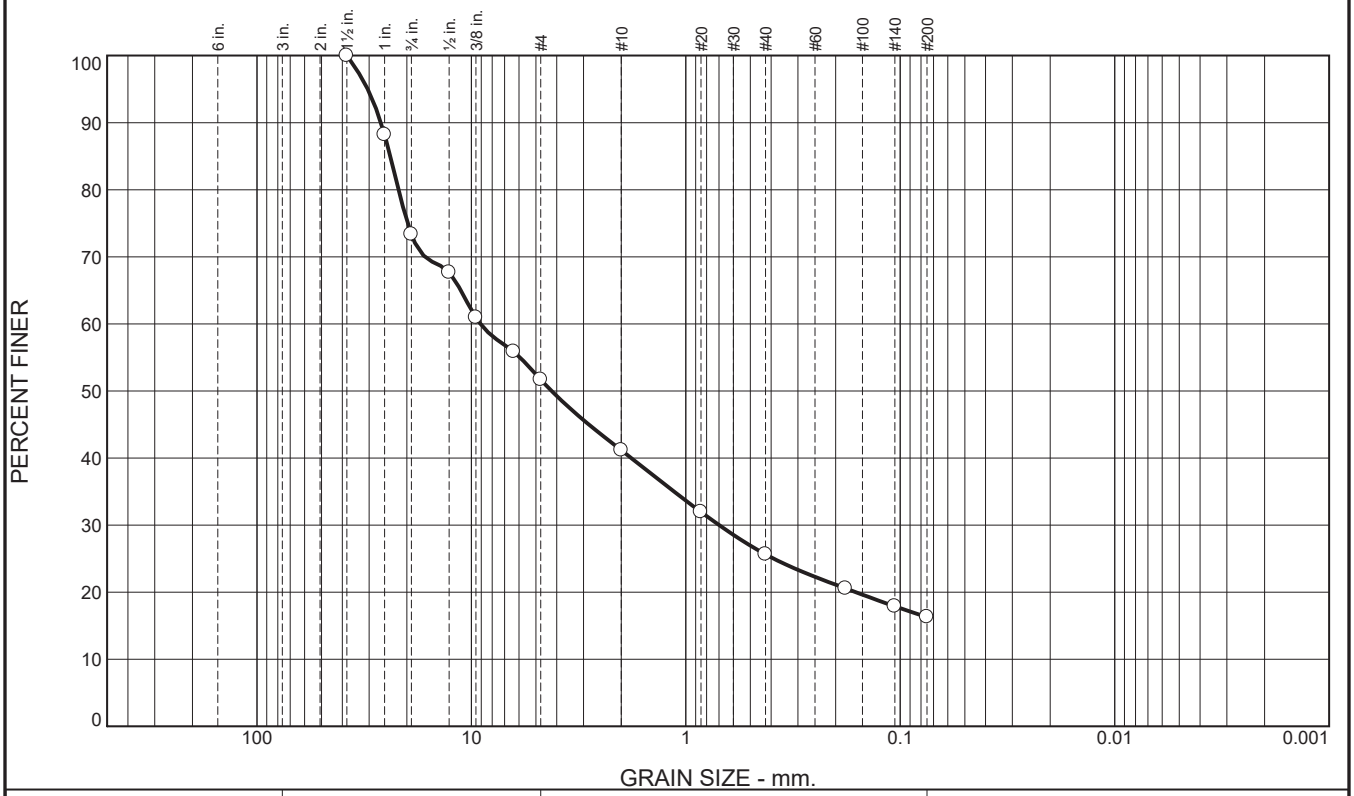
**Location:** B-4
**Sample Number:** S-2 **Depth:** 1.5-3.5' **Date:** 12-31-2020

**R.W. Gillespie & Associates, Inc.**
**Biddeford, Maine**

**Client:** McFarland Johnson, Inc.
**Project:** Reconstruct Taxiway C
Augusta, ME
**Project No:** 1569-011 **Lab No.** 16369-07

**Tested By:** CAG/AGS **Checked By:** MTG

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 26.7 | 21.6 | 10.5 | 15.6 | 9.3 | 16.3 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1 1/2" | 100.0 | | |
| 1" | 88.2 | | |
| 3/4" | 73.3 | | |
| 1/2" | 67.7 | | |
| 3/8" | 60.9 | | |
| 1/4" | 55.8 | | |
| #4 | 51.7 | | |
| #10 | 41.2 | | |
| #20 | 32.0 | | |
| #40 | 25.6 | | |
| #80 | 20.6 | | |
| #140 | 17.9 | | |
| #200 | 16.3 | | |

* (no specification provided)

**Soil Description**

silty gravel with sand

**Atterberg Limits**

PL= LL= PI=

**Coefficients**

$D_{90}$= 26.4121 $D_{85}$= 23.8933 $D_{60}$= 9.0759
$D_{50}$= 4.2289 $D_{30}$= 0.6992 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= GM AASHTO= A-1-b

**Remarks**

Moisture Content: 4.8%

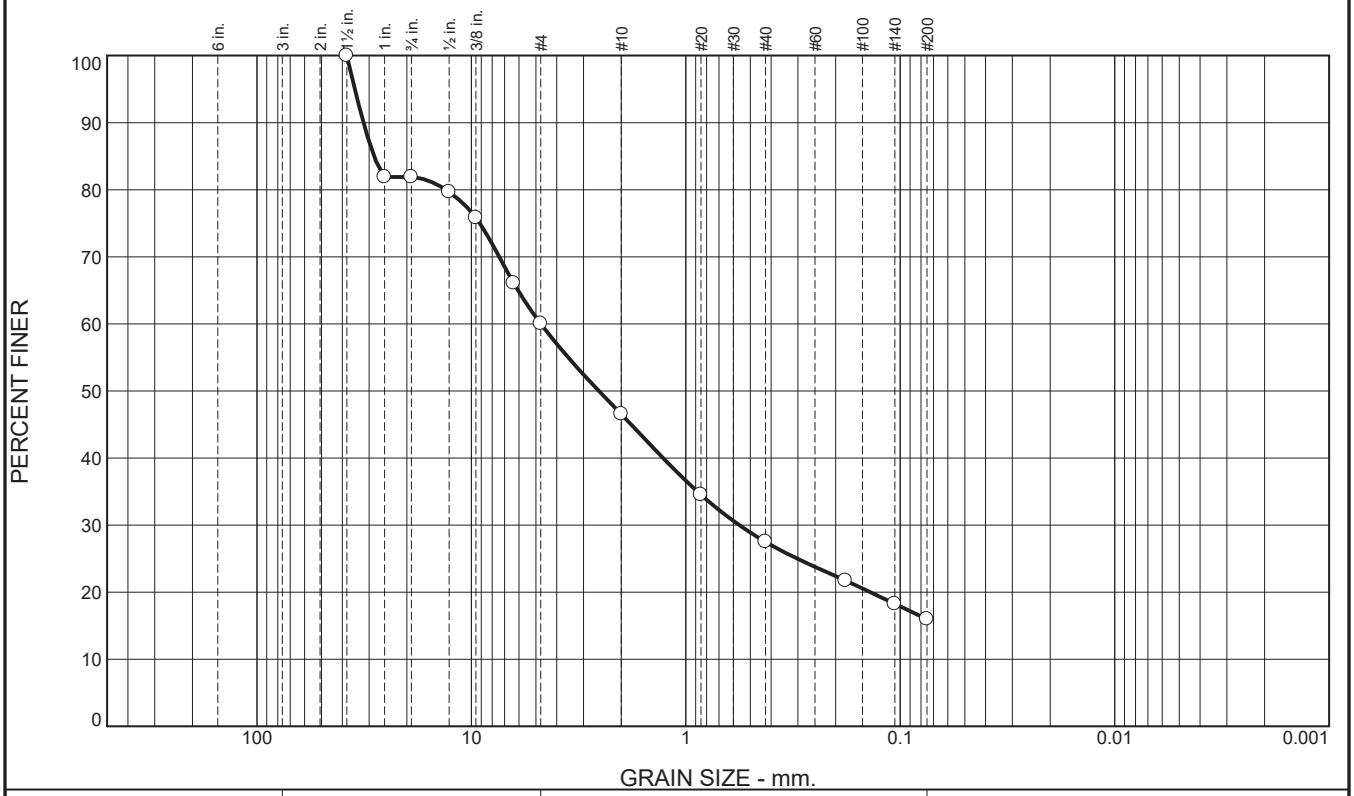
**Location:** B-5
**Sample Number:** S-3 **Depth:** 5-7' **Date:** 12-31-2020

**R.W. Gillespie & Associates, Inc.**
**Biddeford, Maine**

**Client:** McFarland Johnson, Inc.
**Project:** Reconstruct Taxiway C
Augusta, ME
**Project No:** 1569-011 **Lab No.** 16369-08

**Tested By:** CAG/AGS **Checked By:** MTG

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 18.1 | 21.9 | 13.5 | 19.0 | 11.5 | 16.0 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1 1/2" | 100.0 | | |
| 1" | 81.9 | | |
| 3/4" | 81.9 | | |
| 1/2" | 79.7 | | |
| 3/8" | 75.8 | | |
| 1/4" | 66.1 | | |
| #4 | 60.0 | | |
| #10 | 46.5 | | |
| #20 | 34.5 | | |
| #40 | 27.5 | | |
| #80 | 21.7 | | |
| #140 | 18.3 | | |
| #200 | 16.0 | | |

* (no specification provided)

**Soil Description**

silty sand with gravel

**Atterberg Limits**

PL= LL= PI=

**Coefficients**

$D_{90}$= 31.8576 $D_{85}$= 28.4494 $D_{60}$= 4.7437
$D_{50}$= 2.5404 $D_{30}$= 0.5632 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-1-b

**Remarks**

Moisture Content: 5.7%

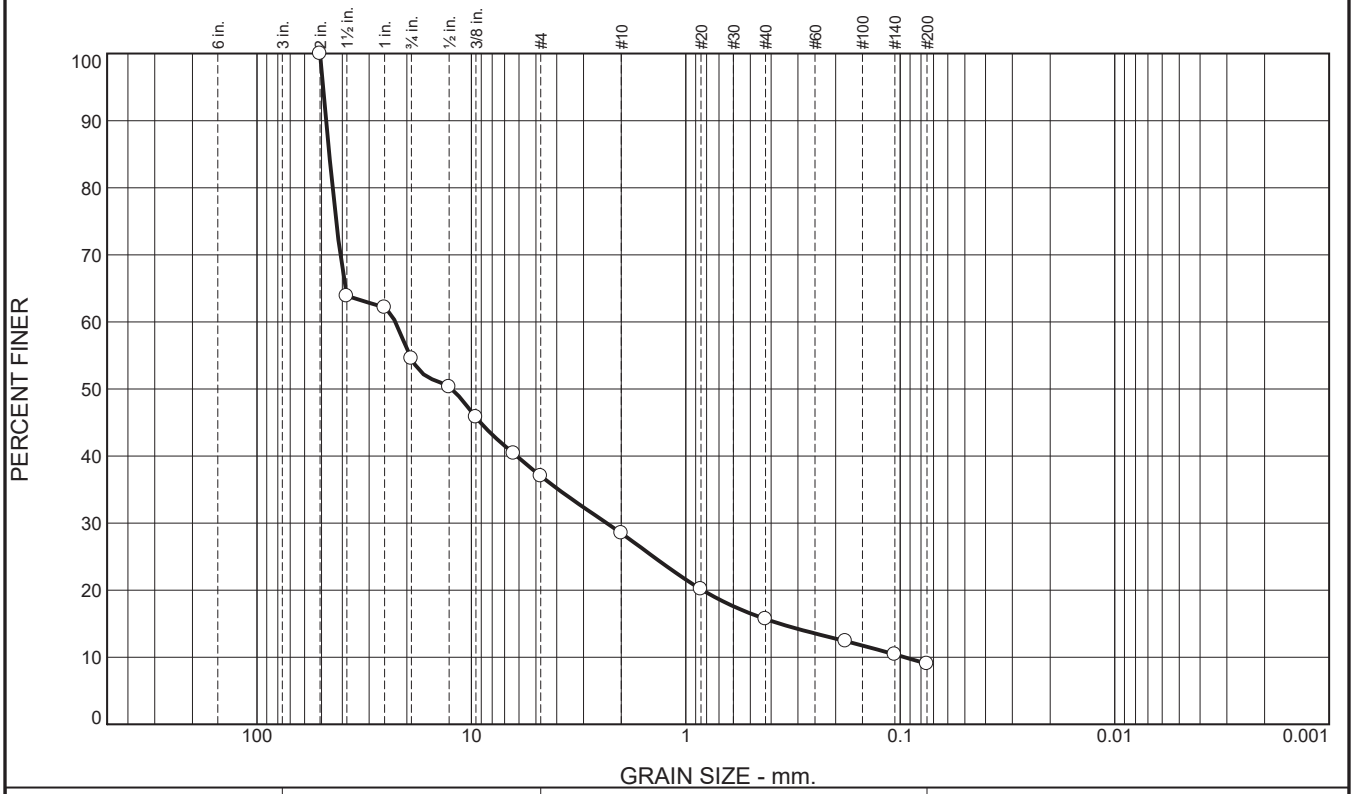
**Location:** B-5
**Sample Number:** S-1 **Depth:** 0-1.5' **Date:** 12-31-2020

**R.W. Gillespie & Associates, Inc.**
**Biddeford, Maine**

**Client:** McFarland Johnson, Inc.
**Project:** Reconstruct Taxiway C
Augusta, ME
**Project No:** 1569-011 **Lab No.** 16369-09

**Tested By:** CAG/AGS **Checked By:** MTG

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 45.5 | 17.5 | 8.5 | 12.8 | 6.7 | 9.0 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 2" | 100.0 | | |
| 1 1/2" | 63.9 | | |
| 1" | 62.1 | | |
| 3/4" | 54.5 | | |
| 1/2" | 50.3 | | |
| 3/8" | 45.8 | | |
| 1/4" | 40.4 | | |
| #4 | 37.0 | | |
| #10 | 28.5 | | |
| #20 | 20.1 | | |
| #40 | 15.7 | | |
| #80 | 12.4 | | |
| #140 | 10.4 | | |
| #200 | 9.0 | | |

* (no specification provided)

**Soil Description**

well-graded gravel with silt and sand

**Atterberg Limits**

PL= LL= PI=

**Coefficients**

$D_{90}$= 47.5980 $D_{85}$= 46.0148 $D_{60}$= 22.6232
$D_{50}$= 12.3721 $D_{30}$= 2.3368 $D_{15}$= 0.3644
$D_{10}$= 0.0954 $C_u$= 237.03 $C_c$= 2.53

**Classification**

USCS= GW-GM AASHTO= A-1-a

**Remarks**

Moisture Content: 3.2%

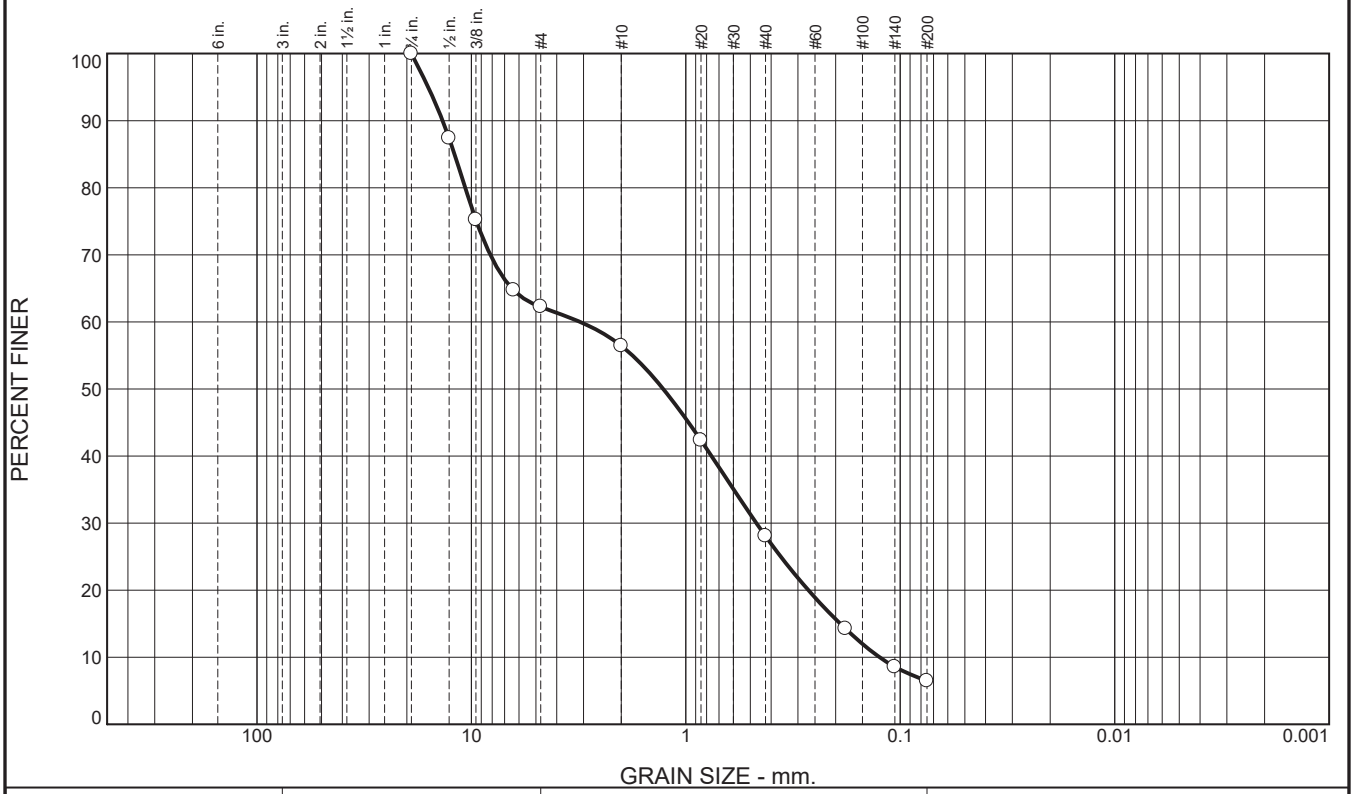
**Location:** B-5
**Sample Number:** S-2 **Depth:** 1.5-3' **Date:** 12-31-2020

**R.W. Gillespie & Associates, Inc.**
**Biddeford, Maine**

**Client:** McFarland Johnson, Inc.
**Project:** Reconstruct Taxiway C
Augusta, ME
**Project No:** 1569-011 **Lab No.** 16369-10

**Tested By:** CAG/AGS **Checked By:** MTG

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 0.0 | 37.8 | 5.8 | 28.3 | 21.6 | 6.5 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 87.4 | | |
| 3/8" | 75.2 | | |
| 1/4" | 64.7 | | |
| #4 | 62.2 | | |
| #10 | 56.4 | | |
| #20 | 42.3 | | |
| #40 | 28.1 | | |
| #80 | 14.3 | | |
| #140 | 8.6 | | |
| #200 | 6.5 | | |

* (no specification provided)

**Soil Description**

poorly graded sand with silt and gravel

**Atterberg Limits**

PL= LL= NV PI=

**Coefficients**

$D_{90}$= 13.6158 $D_{85}$= 11.9842 $D_{60}$= 3.1161
$D_{50}$= 1.2747 $D_{30}$= 0.4689 $D_{15}$= 0.1904
$D_{10}$= 0.1248 $C_u$= 24.96 $C_c$= 0.57

**Classification**

USCS= SP-SM AASHTO= A-1-b

**Remarks**

Moisture Content: 15.6%

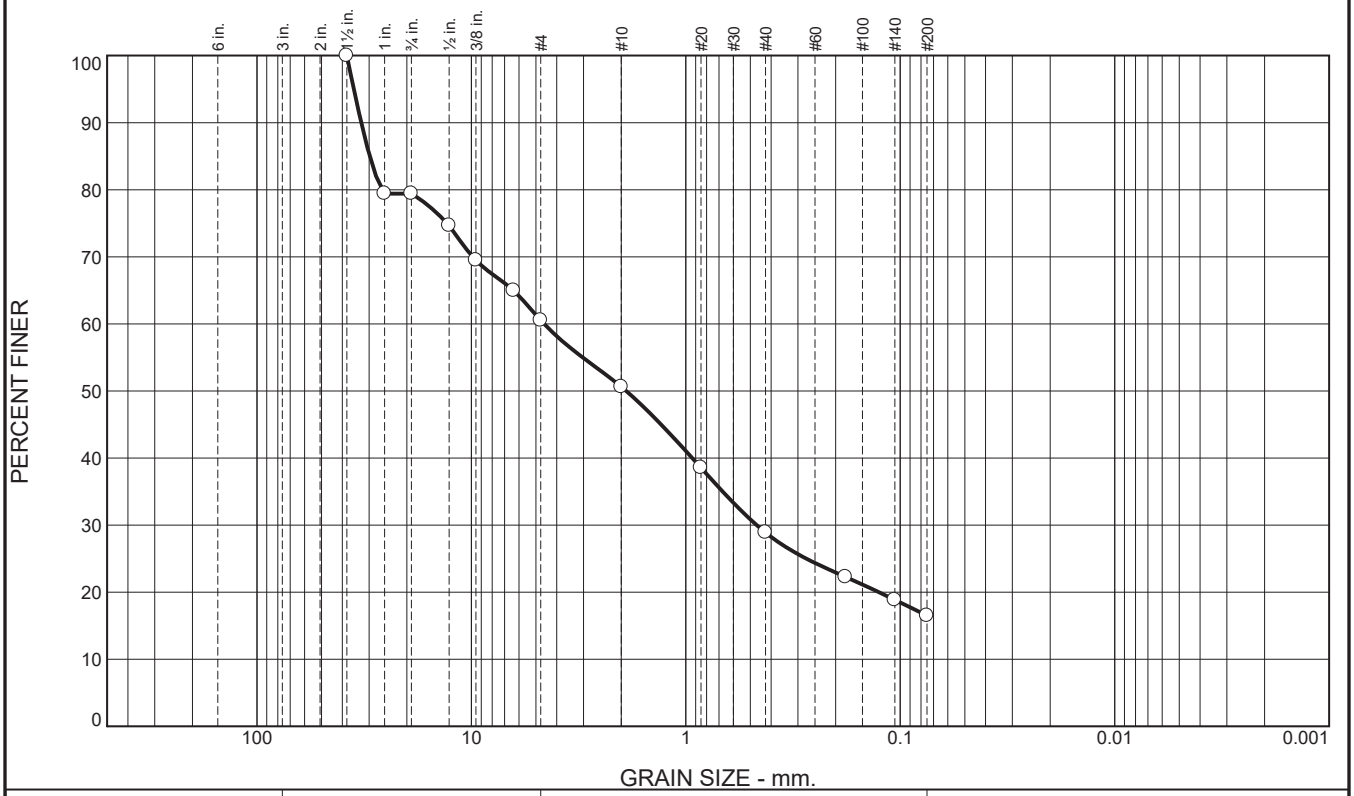
**Location:** CB-1
**Sample Number:** S-1 **Depth:** 0.4-1' **Date:** 12-31-2020

**R.W. Gillespie & Associates, Inc.**
**Biddeford, Maine**

**Client:** McFarland Johnson, Inc.
**Project:** Reconstruct Taxiway C
Augusta, ME
**Project No:** 1569-011 **Lab No.** 16369-11

**Tested By:** CAG/AGS **Checked By:** MTG

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 20.6 | 18.9 | 9.9 | 21.7 | 12.4 | 16.5 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1 1/2" | 100.0 | | |
| 1" | 79.4 | | |
| 3/4" | 79.4 | | |
| 1/2" | 74.7 | | |
| 3/8" | 69.5 | | |
| 1/4" | 65.0 | | |
| #4 | 60.5 | | |
| #10 | 50.6 | | |
| #20 | 38.6 | | |
| #40 | 28.9 | | |
| #80 | 22.3 | | |
| #140 | 18.9 | | |
| #200 | 16.5 | | |

* (no specification provided)

**Soil Description**

silty sand with gravel

**Atterberg Limits**

PL= LL= PI=

**Coefficients**

$D_{90}$= 32.6383 $D_{85}$= 29.7976 $D_{60}$= 4.5828
$D_{50}$= 1.8977 $D_{30}$= 0.4675 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-1-b

**Remarks**

Moisture Content: 6.7%

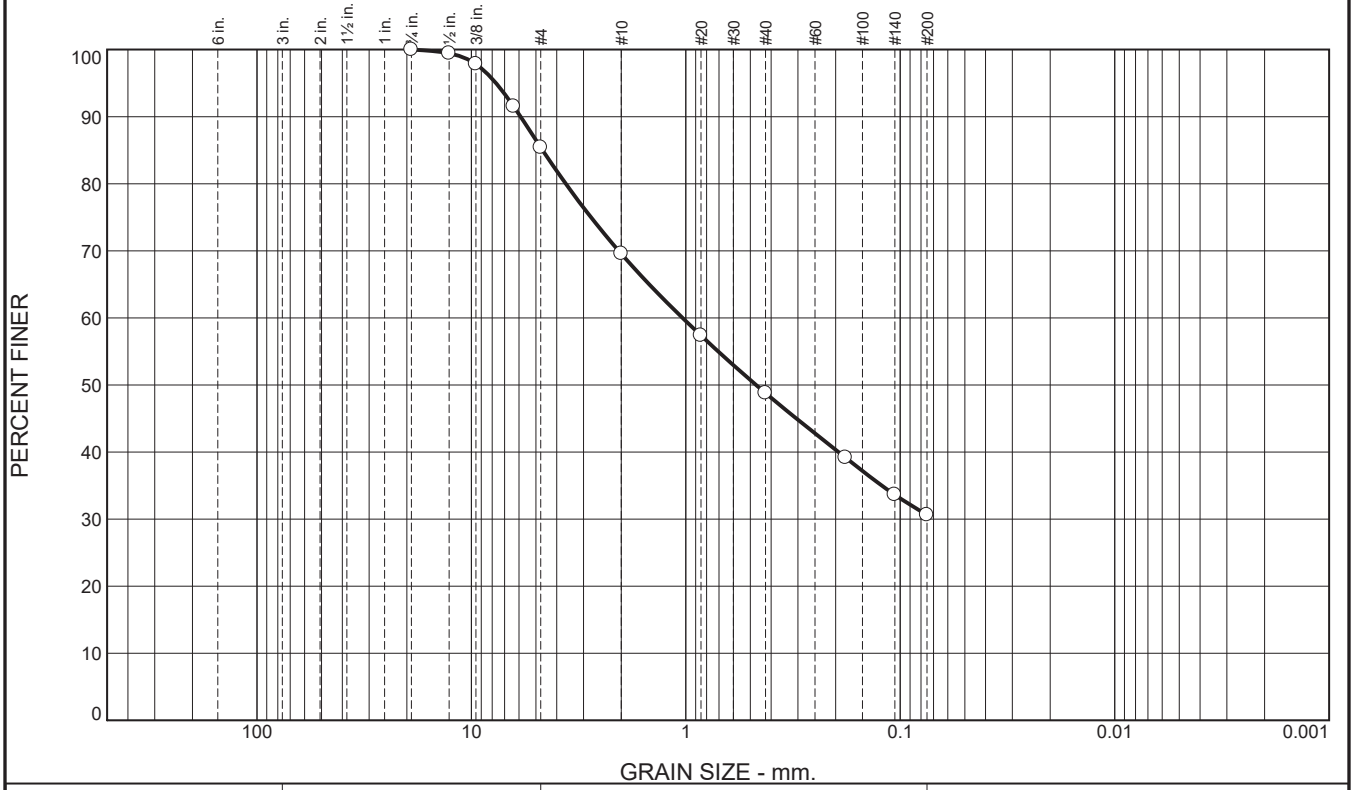
**Location:** CB-1
**Sample Number:** S-3 **Depth:** 3-5' **Date:** 12-31-2020

**R.W. Gillespie & Associates, Inc.**
**Biddeford, Maine**

**Client:** McFarland Johnson, Inc.
**Project:** Reconstruct Taxiway C
Augusta, ME
**Project No:** 1569-011 **Lab No.** 16369-12

**Tested By:** CAG/AGS **Checked By:** MTG

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 0.0 | 14.6 | 15.8 | 20.8 | 18.2 | 30.6 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 99.4 | | |
| 3/8" | 97.9 | | |
| 1/4" | 91.5 | | |
| #4 | 85.4 | | |
| #10 | 69.6 | | |
| #20 | 57.4 | | |
| #40 | 48.8 | | |
| #80 | 39.2 | | |
| #140 | 33.6 | | |
| #200 | 30.6 | | |

* (no specification provided)

**Soil Description**

silty sand

**Atterberg Limits**

PL= LL= PI=

**Coefficients**

$D_{90}$= 5.8956 $D_{85}$= 4.6580 $D_{60}$= 1.0360
$D_{50}$= 0.4704 $D_{30}$= $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Moisture Content: 13.2%

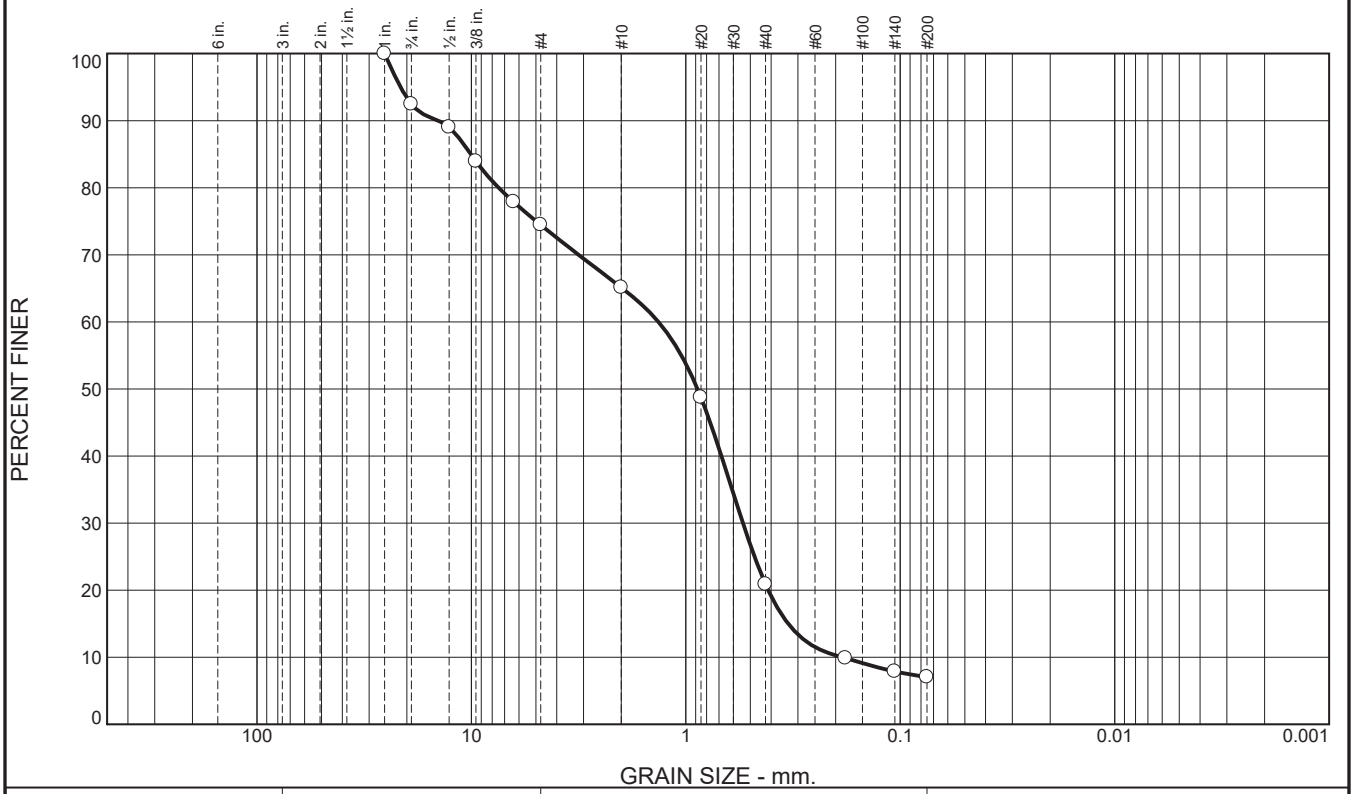
**Location:** CB-2
**Sample Number:** S-1 **Depth:** 0.3-1' **Date:** 12-31-2020

**R.W. Gillespie & Associates, Inc.**
**Biddeford, Maine**

**Client:** McFarland Johnson, Inc.
**Project:** Reconstruct Taxiway C
Augusta, ME
**Project No:** 1569-011 **Lab No.** 16369-13

**Tested By:** CAG/AGS **Checked By:** MTG

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 7.5 | 18.1 | 9.3 | 44.2 | 13.8 | 7.1 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1" | 100.0 | | |
| 3/4" | 92.5 | | |
| 1/2" | 89.0 | | |
| 3/8" | 83.9 | | |
| 1/4" | 77.9 | | |
| #4 | 74.4 | | |
| #10 | 65.1 | | |
| #20 | 48.7 | | |
| #40 | 20.9 | | |
| #80 | 9.9 | | |
| #140 | 7.9 | | |
| #200 | 7.1 | | |

* (no specification provided)

**Soil Description**

well-graded sand with silt and gravel

**Atterberg Limits**

PL= LL= PI=

**Coefficients**

$D_{90}$= 14.2735 $D_{85}$= 10.0646 $D_{60}$= 1.3418
$D_{50}$= 0.8821 $D_{30}$= 0.5415 $D_{15}$= 0.3331
$D_{10}$= 0.1865 $C_u$= 7.19 $C_c$= 1.17

**Classification**

USCS= SW-SM AASHTO= A-1-b

**Remarks**

Moisture Content: 3.7%

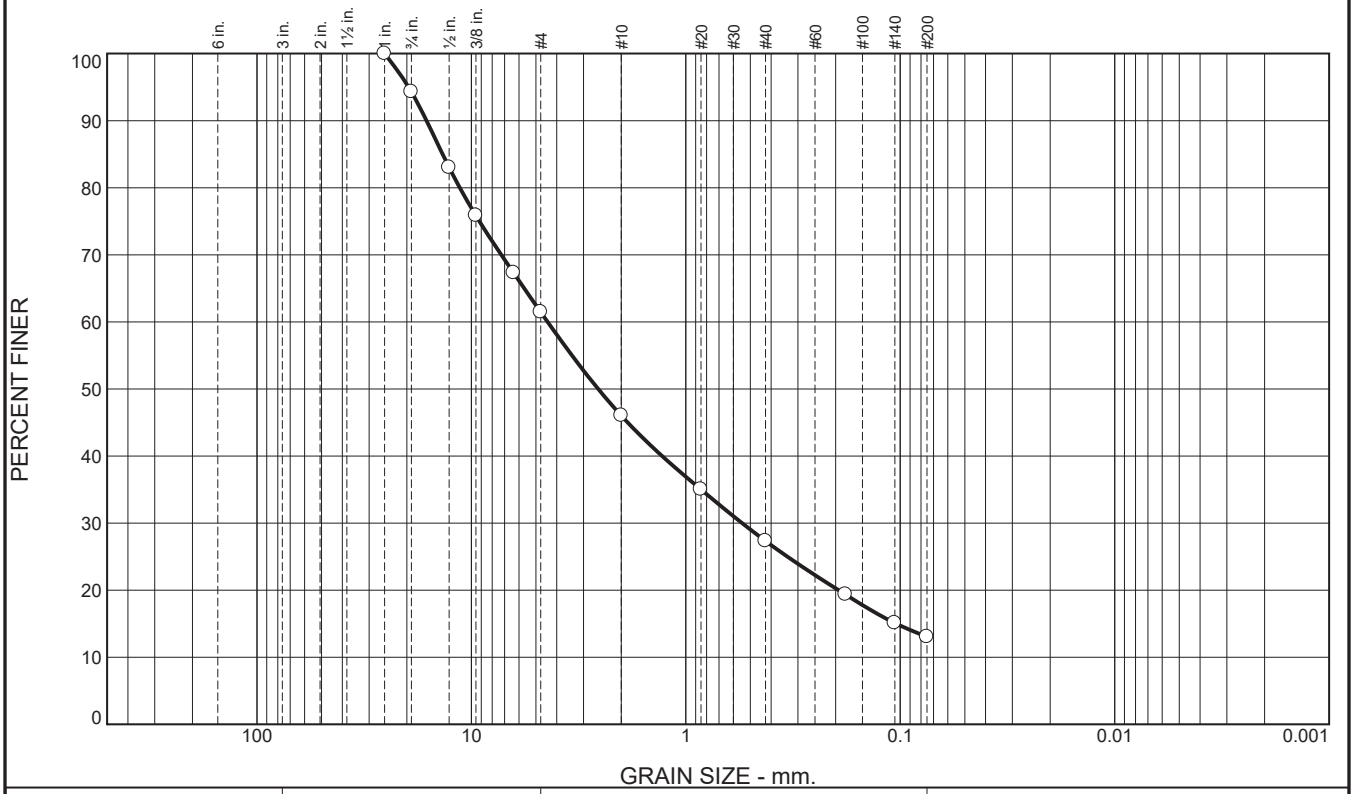
**Location:** CB-2
**Sample Number:** S-5 **Depth:** 7-9' **Date:** 12-31-2020

**R.W. Gillespie & Associates, Inc.**
**Biddeford, Maine**

**Client:** McFarland Johnson, Inc.
**Project:** Reconstruct Taxiway C
Augusta, ME
**Project No:** 1569-011 **Lab No.** 16369-14

**Tested By:** CAG/AGS **Checked By:** MTG

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 5.7 | 32.8 | 15.5 | 18.7 | 14.3 | 13.0 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1" | 100.0 | | |
| 3/4" | 94.3 | | |
| 1/2" | 83.0 | | |
| 3/8" | 75.8 | | |
| 1/4" | 67.3 | | |
| #4 | 61.5 | | |
| #10 | 46.0 | | |
| #20 | 35.0 | | |
| #40 | 27.3 | | |
| #80 | 19.3 | | |
| #140 | 15.1 | | |
| #200 | 13.0 | | |

* (no specification provided)

**Soil Description**

silty sand with gravel

**Atterberg Limits**

PL= LL= PI=

**Coefficients**

$D_{90}$= 16.1841 $D_{85}$= 13.6193 $D_{60}$= 4.4131
$D_{50}$= 2.5615 $D_{30}$= 0.5463 $D_{15}$= 0.1045
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-1-a

**Remarks**

Moisture Content: 11.0%

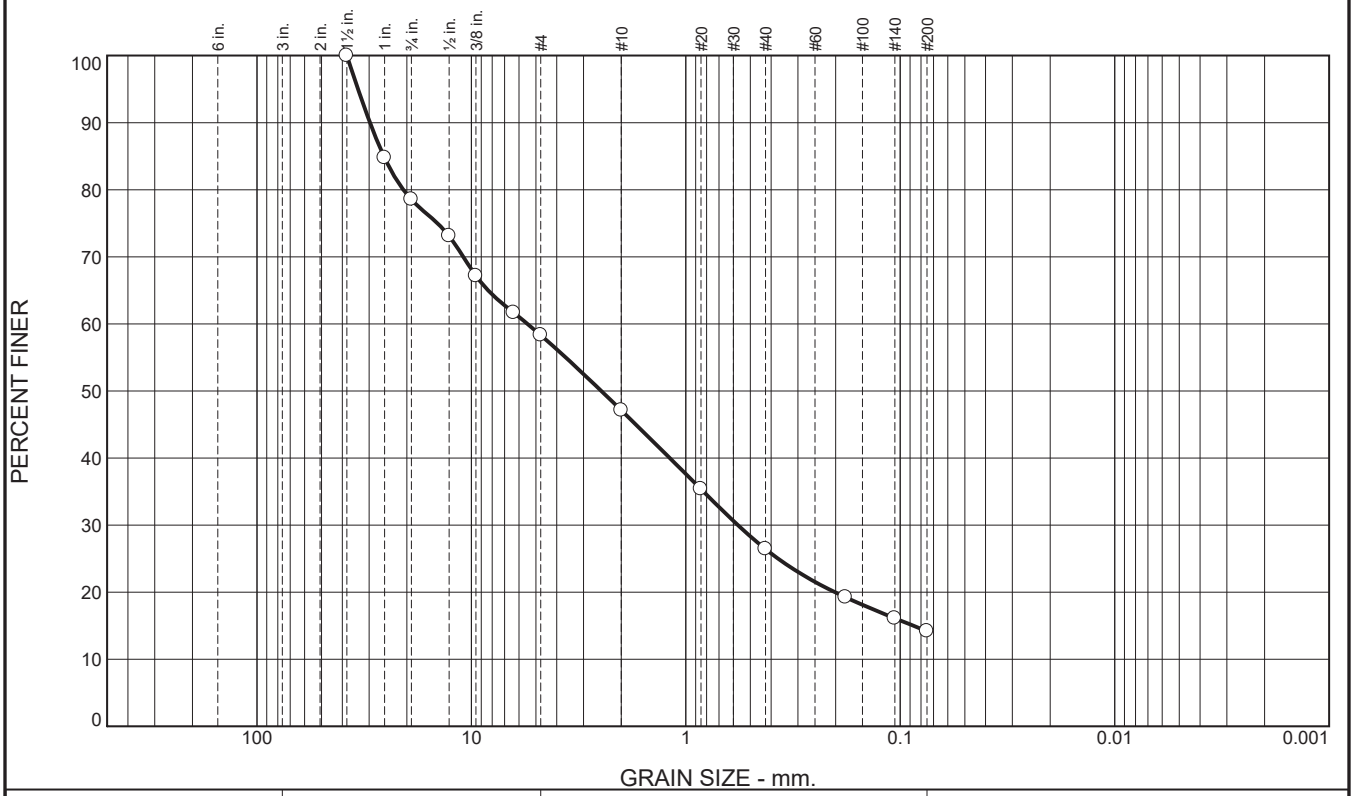
**Location:** CB-3
**Sample Number:** S-1 **Depth:** 0.3-1' **Date:** 12-31-2020

**R.W. Gillespie & Associates, Inc.**
**Biddeford, Maine**

**Client:** McFarland Johnson, Inc.
**Project:** Reconstruct Taxiway C
Augusta, ME
**Project No:** 1569-011 **Lab No.** 16369-15

**Tested By:** CAG/AGS **Checked By:** MTG

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 21.5 | 20.2 | 11.2 | 20.7 | 12.2 | 14.2 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1 1/2" | 100.0 | | |
| 1" | 84.7 | | |
| 3/4" | 78.5 | | |
| 1/2" | 73.1 | | |
| 3/8" | 67.2 | | |
| 1/4" | 61.7 | | |
| #4 | 58.3 | | |
| #10 | 47.1 | | |
| #20 | 35.4 | | |
| #40 | 26.4 | | |
| #80 | 19.2 | | |
| #140 | 16.1 | | |
| #200 | 14.2 | | |

* (no specification provided)

**Soil Description**

silty sand with gravel

**Atterberg Limits**

PL= LL= PI=

**Coefficients**

$D_{90}$= 29.7129 $D_{85}$= 25.6176 $D_{60}$= 5.4810
$D_{50}$= 2.4779 $D_{30}$= 0.5716 $D_{15}$= 0.0869
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-1-a

**Remarks**

Moisture Content: 4.3%

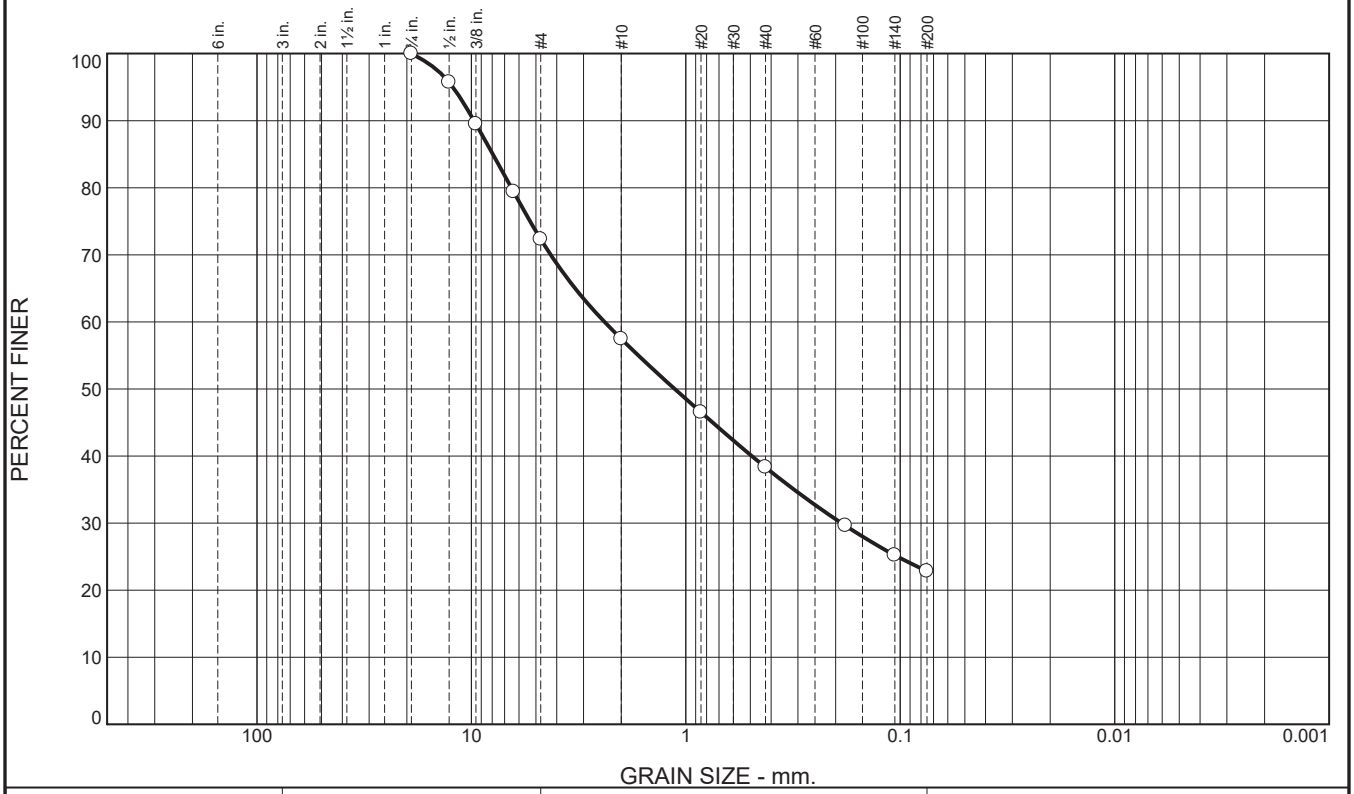
**Location:** CB-3
**Sample Number:** S-2 **Depth:** 1-3' **Date:** 12-31-2020

**R.W. Gillespie & Associates, Inc.**
**Biddeford, Maine**

**Client:** McFarland Johnson, Inc.
**Project:** Reconstruct Taxiway C
Augusta, ME
**Project No:** 1569-011 **Lab No.** 16369-16

**Tested By:** CAG/AGS **Checked By:** MTG

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 0.0 | 27.7 | 14.8 | 19.2 | 15.5 | 22.8 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 95.7 | | |
| 3/8" | 89.5 | | |
| 1/4" | 79.4 | | |
| #4 | 72.3 | | |
| #10 | 57.5 | | |
| #20 | 46.5 | | |
| #40 | 38.3 | | |
| #80 | 29.6 | | |
| #140 | 25.2 | | |
| #200 | 22.8 | | |

* (no specification provided)

**Soil Description**

silty sand with gravel

**Atterberg Limits**

PL= LL= PI=

**Coefficients**

$D_{90}$= 9.7259 $D_{85}$= 7.9402 $D_{60}$= 2.3940
$D_{50}$= 1.1267 $D_{30}$= 0.1878 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-1-b

**Remarks**

Moisture Content: 10.9%

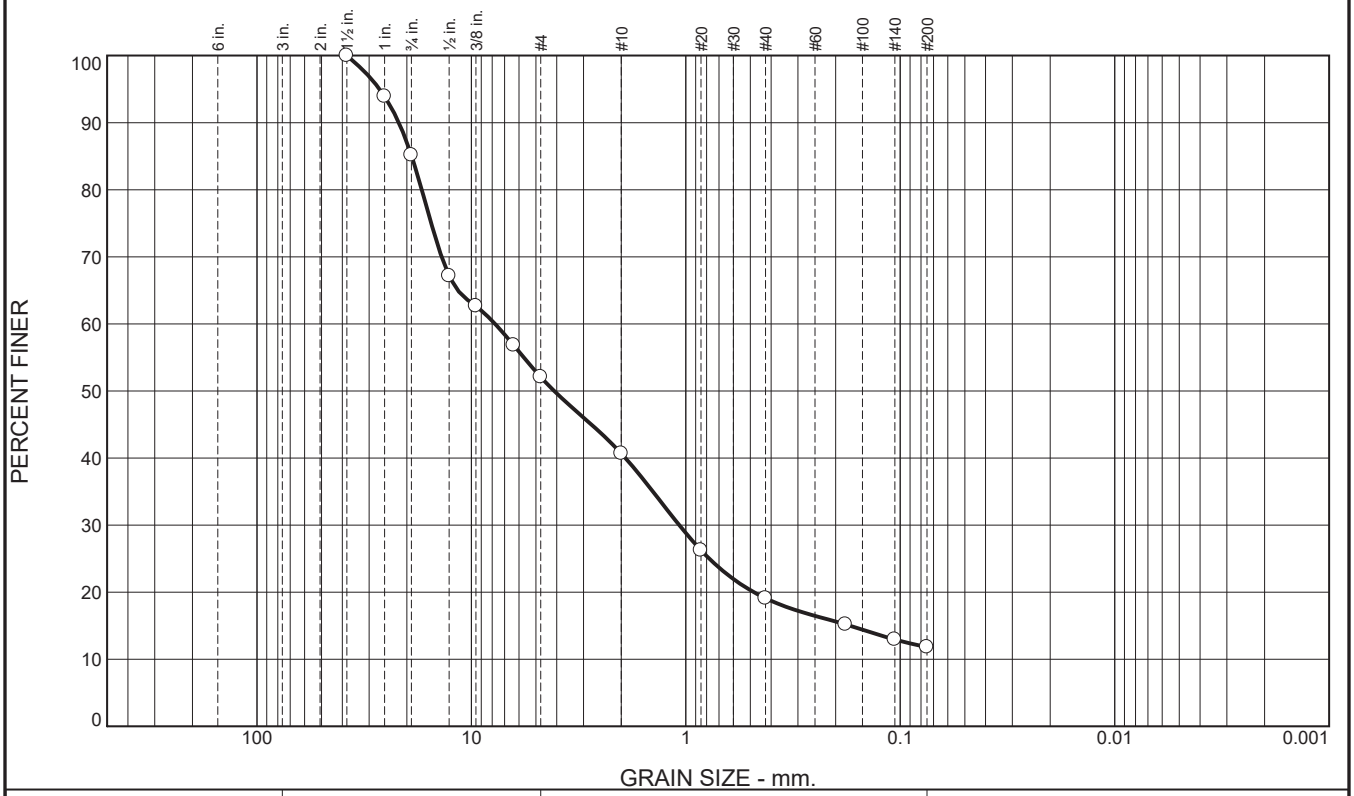
**Location:** CB-4
**Sample Number:** S-1 **Depth:** 0.3-1' **Date:** 12-31-2020

**R.W. Gillespie & Associates, Inc.**
**Biddeford, Maine**

**Client:** McFarland Johnson, Inc.
**Project:** Reconstruct Taxiway C
Augusta, ME
**Project No:** 1569-011 **Lab No.** 16369-17

**Tested By:** CAG/AGS **Checked By:** MTG

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 14.8 | 33.1 | 11.4 | 21.6 | 7.3 | 11.8 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1 1/2" | 100.0 | | |
| 1" | 93.9 | | |
| 3/4" | 85.2 | | |
| 1/2" | 67.1 | | |
| 3/8" | 62.7 | | |
| 1/4" | 56.8 | | |
| #4 | 52.1 | | |
| #10 | 40.7 | | |
| #20 | 26.3 | | |
| #40 | 19.1 | | |
| #80 | 15.2 | | |
| #140 | 12.9 | | |
| #200 | 11.8 | | |

* (no specification provided)

**Soil Description**

poorly graded gravel with silt and sand

**Atterberg Limits**

PL= LL= PI=

**Coefficients**

$D_{90}$= 21.7967 $D_{85}$= 18.9792 $D_{60}$= 7.7533
$D_{50}$= 4.1120 $D_{30}$= 1.0731 $D_{15}$= 0.1718
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= GP-GM AASHTO= A-1-a

**Remarks**

Moisture Content: 4.5%

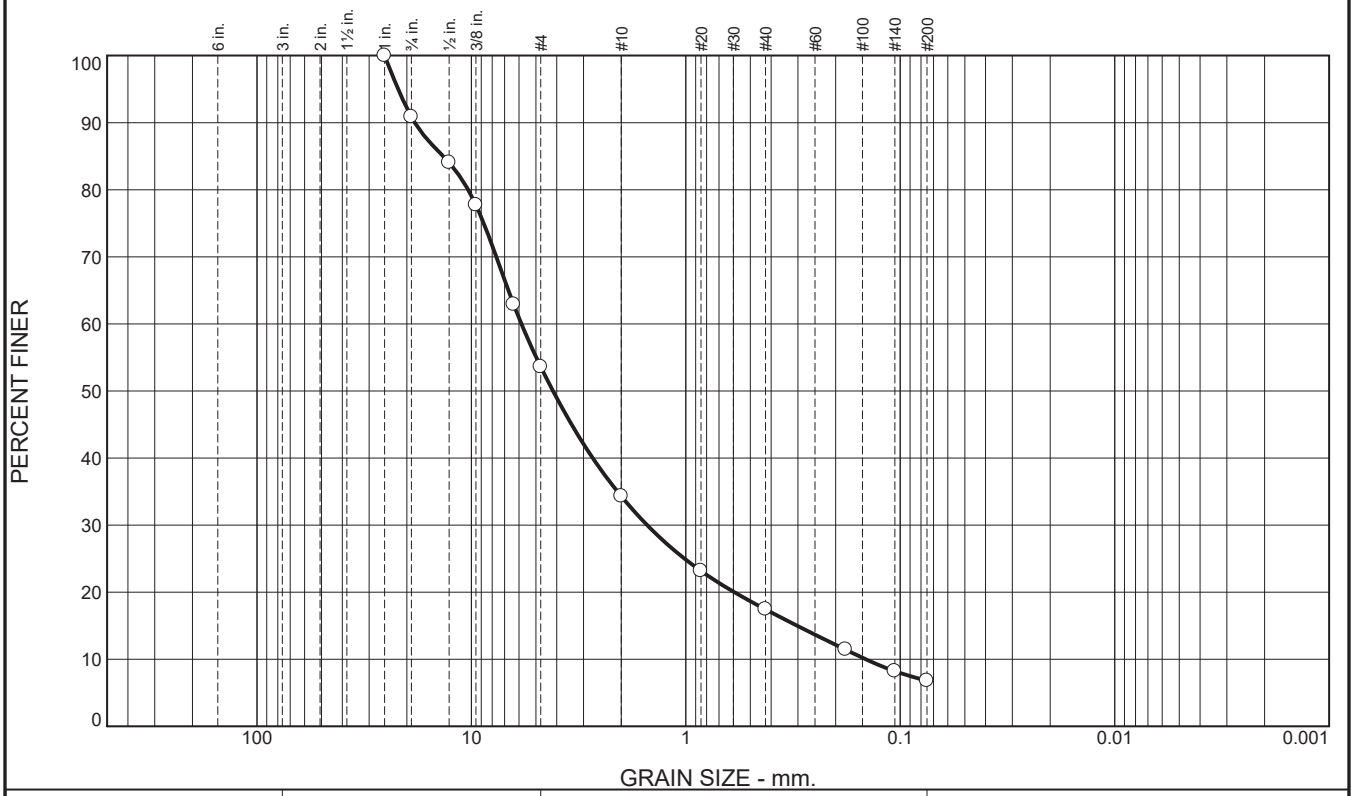
**Location:** CB-4
**Sample Number:** S-4 **Depth:** 5-7' **Date:** 12-31-2020

**R.W. Gillespie & Associates, Inc.**
**Biddeford, Maine**

**Client:** McFarland Johnson, Inc.
**Project:** Reconstruct Taxiway C
Augusta, ME
**Project No:** 1569-011 **Lab No.** 16369-18

**Tested By:** CAG/AGS **Checked By:** MTG

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 9.1 | 37.3 | 19.3 | 16.9 | 10.6 | 6.8 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1" | 100.0 | | |
| 3/4" | 90.9 | | |
| 1/2" | 84.0 | | |
| 3/8" | 77.7 | | |
| 1/4" | 62.9 | | |
| #4 | 53.6 | | |
| #10 | 34.3 | | |
| #20 | 23.2 | | |
| #40 | 17.4 | | |
| #80 | 11.4 | | |
| #140 | 8.2 | | |
| #200 | 6.8 | | |

* (no specification provided)

**Soil Description**

well-graded sand with silt and gravel

**Atterberg Limits**

PL= LL= PI=

**Coefficients**

$D_{90}$= 18.3602 $D_{85}$= 13.5387 $D_{60}$= 5.8459
$D_{50}$= 4.1667 $D_{30}$= 1.5151 $D_{15}$= 0.3027
$D_{10}$= 0.1447 $C_u$= 40.39 $C_c$= 2.71

**Classification**

USCS= SW-SM AASHTO= A-1-a

**Remarks**

Moisture Content: 10.2

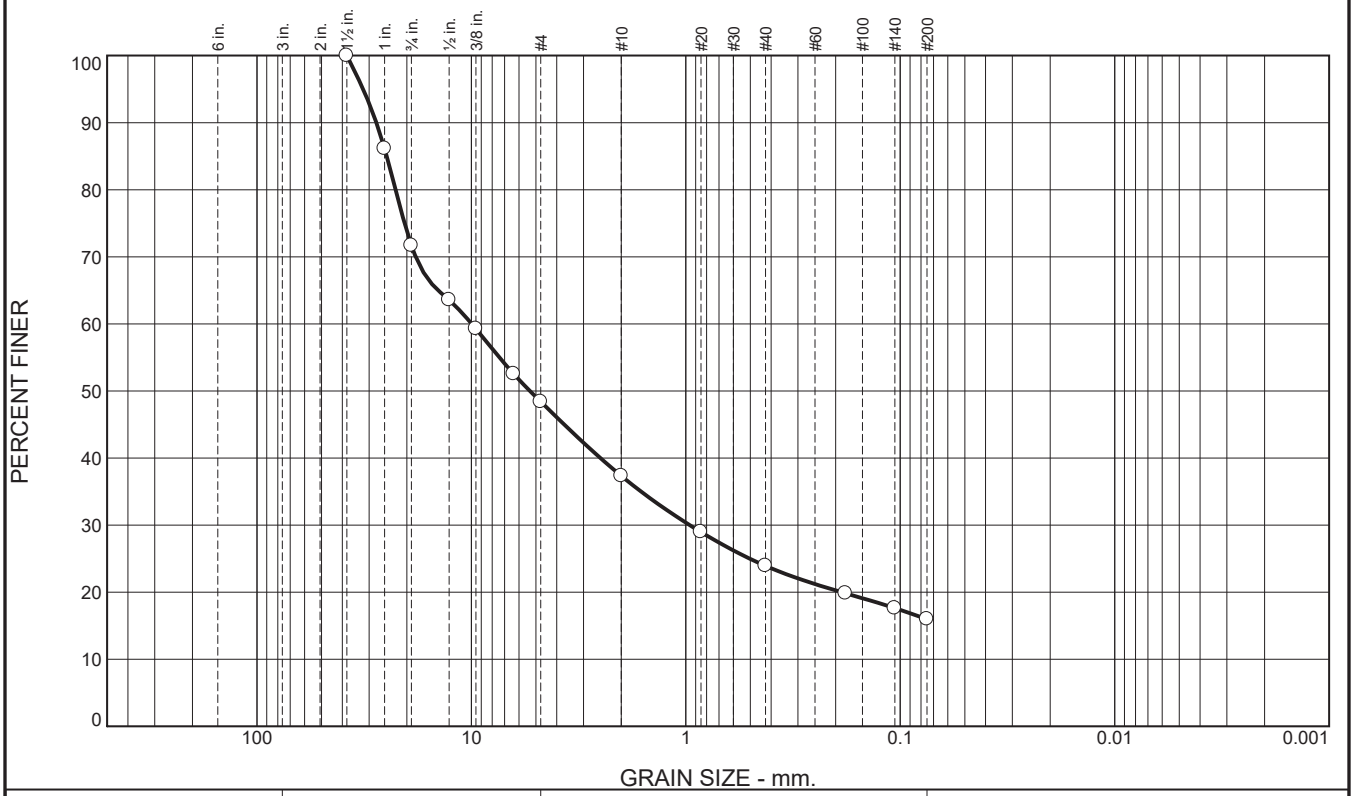
**Location:** CB-5
**Sample Number:** S-1 **Depth:** 0.3-1' **Date:** 12-31-2020

**R.W. Gillespie & Associates, Inc.**
**Biddeford, Maine**

**Client:** McFarland Johnson, Inc.
**Project:** Reconstruct Taxiway C
Augusta, ME
**Project No:** 1569-011 **Lab No.** 16369-19

**Tested By:** CAG/AGS **Checked By:** MTG

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 28.3 | 23.3 | 11.1 | 13.4 | 7.9 | 16.0 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1 1/2" | 100.0 | | |
| 1" | 86.1 | | |
| 3/4" | 71.7 | | |
| 1/2" | 63.6 | | |
| 3/8" | 59.3 | | |
| 1/4" | 52.5 | | |
| #4 | 48.4 | | |
| #10 | 37.3 | | |
| #20 | 29.0 | | |
| #40 | 23.9 | | |
| #80 | 19.8 | | |
| #140 | 17.6 | | |
| #200 | 16.0 | | |

* (no specification provided)

**Soil Description**

silty gravel with sand

**Atterberg Limits**

PL= LL= PI=

**Coefficients**

$D_{90}$= 27.7434 $D_{85}$= 24.8199 $D_{60}$= 9.9606
$D_{50}$= 5.3360 $D_{30}$= 0.9591 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= GM AASHTO= A-1-b

**Remarks**

Moisture Content: 3.6

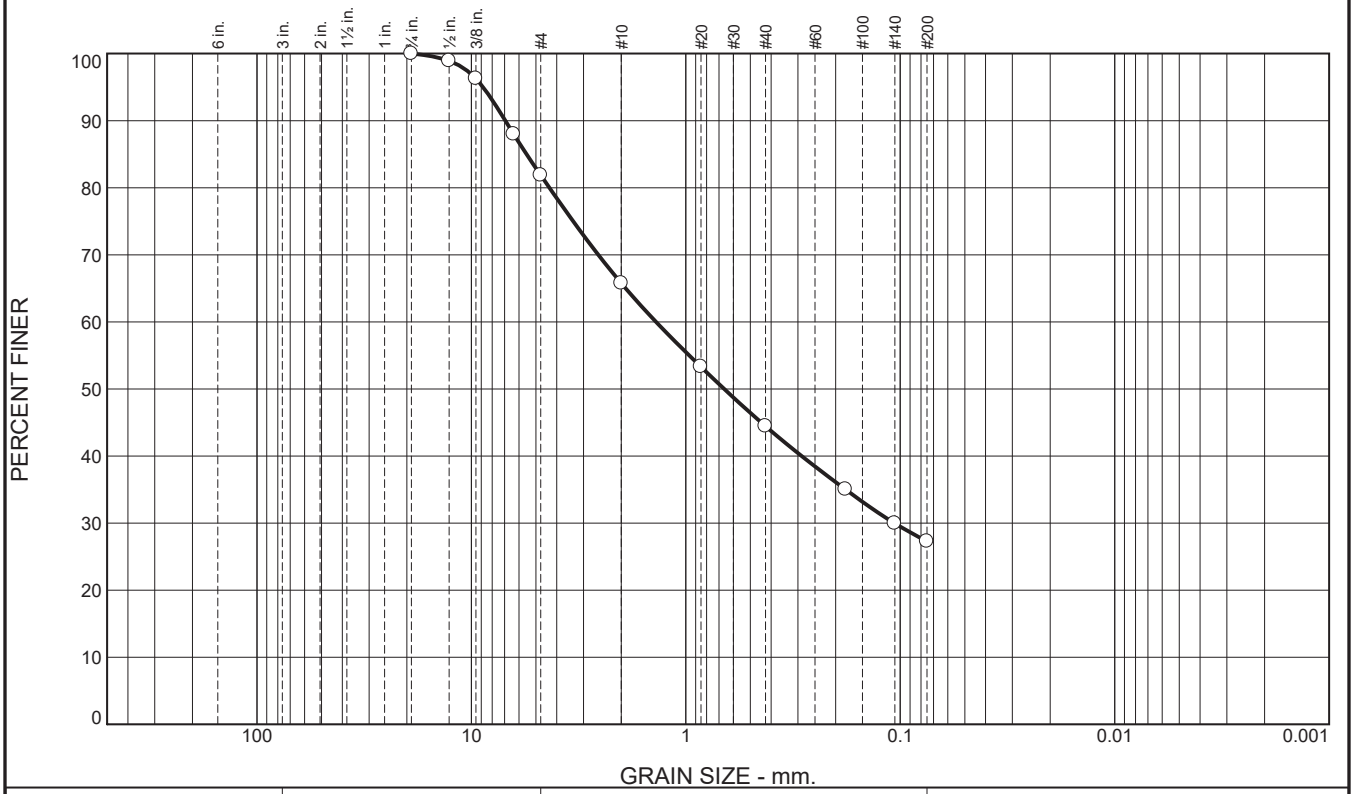
**Location:** CB-5
**Sample Number:** S-4 **Depth:** 5-7' **Date:** 12-31-2020

**R.W. Gillespie & Associates, Inc.**
**Biddeford, Maine**

**Client:** McFarland Johnson, Inc.
**Project:** Reconstruct Taxiway C
Augusta, ME
**Project No:** 1569-011 **Lab No.** 16369-20

**Tested By:** CAG/AGS **Checked By:** MTG

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 0.0 | 18.1 | 16.1 | 21.4 | 17.1 | 27.3 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 98.9 | | |
| 3/8" | 96.3 | | |
| 1/4" | 88.0 | | |
| #4 | 81.9 | | |
| #10 | 65.8 | | |
| #20 | 53.3 | | |
| #40 | 44.4 | | |
| #80 | 35.0 | | |
| #140 | 30.0 | | |
| #200 | 27.3 | | |

* (no specification provided)

**Soil Description**

Silty sand with gravel

**Atterberg Limits**

PL= LL= PI=

**Coefficients**

$D_{90}$= 6.9455 $D_{85}$= 5.5312 $D_{60}$= 1.3773
$D_{50}$= 0.6619 $D_{30}$= 0.1066 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-2-4(0)

**Remarks**

Moisture Content: 17.1%

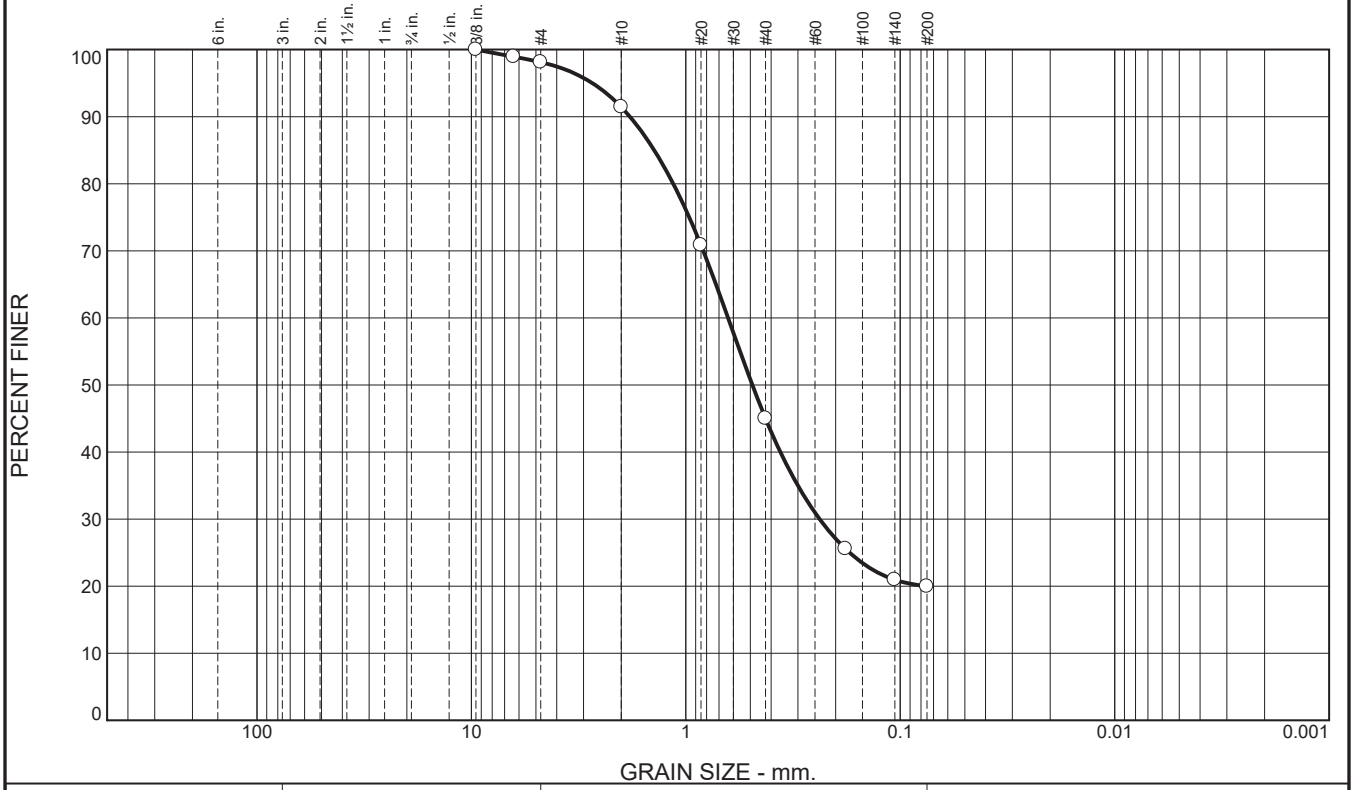
**Location:** CB-6
**Sample Number:** S-1 **Depth:** 0.3'-1' **Date:** 1/5/2021

**R.W. Gillespie & Associates, Inc.**
**Biddeford, Maine**

**Client:** McFarland Johnson, Inc.
**Project:** Reconstruct Taxiway C
Augusta, ME
**Project No:** 1569-011 **Lab No.** 16369-21

**Tested By:** CAG **Checked By:** MTG

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 0.0 | 1.9 | 6.7 | 46.4 | 25.0 | 20.0 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/8" | 100.0 | | |
| 1/4" | 98.9 | | |
| #4 | 98.1 | | |
| #10 | 91.4 | | |
| #20 | 70.9 | | |
| #40 | 45.0 | | |
| #80 | 25.6 | | |
| #140 | 20.9 | | |
| #200 | 20.0 | | |

* (no specification provided)

**Soil Description**

Silty sand

**Atterberg Limits**

PL= LL= PI=

**Coefficients**

$D_{90}$= 1.8218 $D_{85}$= 1.4039 $D_{60}$= 0.6352
$D_{50}$= 0.4895 $D_{30}$= 0.2378 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-1-b

**Remarks**

Moisture Content: 7.2%

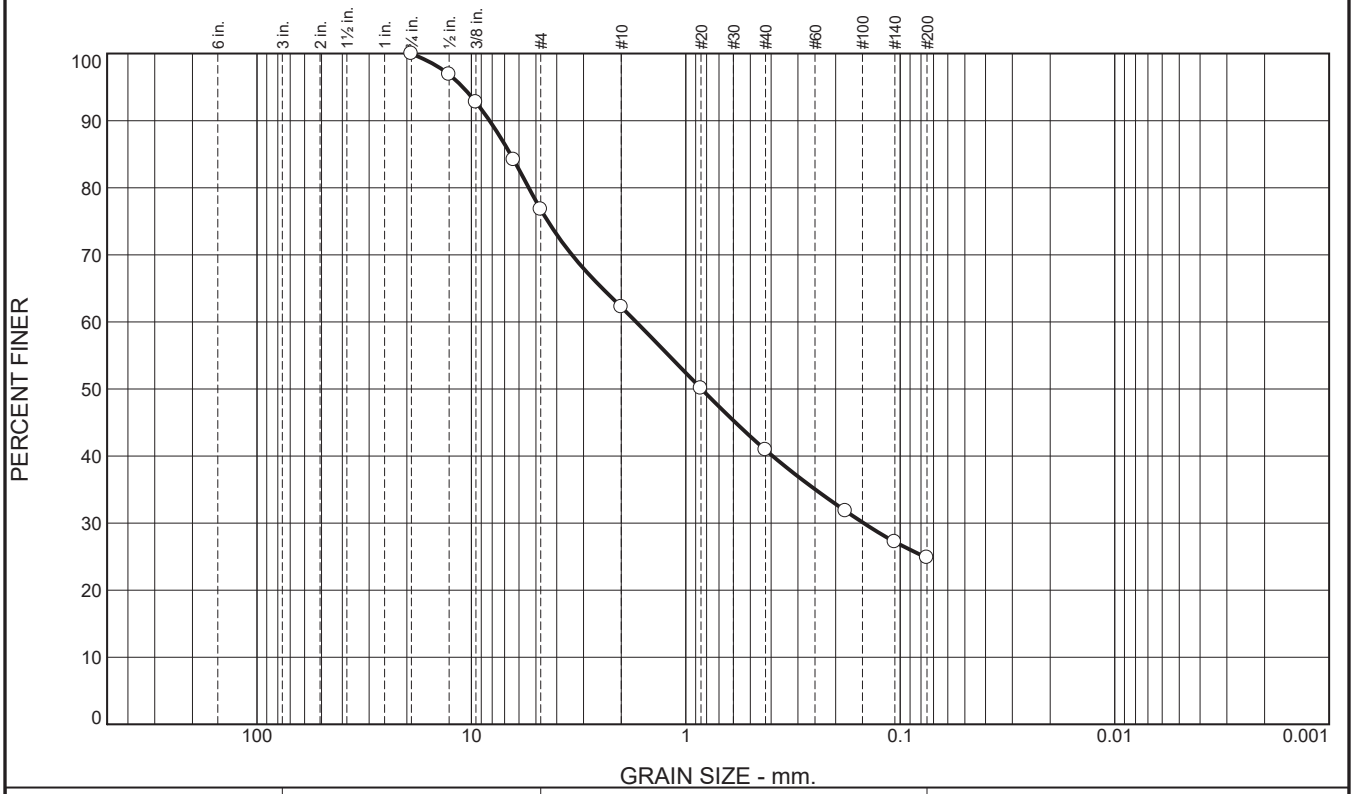
**Location:** CB-6
**Sample Number:** S-3 **Depth:** 3'-5' **Date:** 1/5/2021

**R.W. Gillespie & Associates, Inc.**
**Biddeford, Maine**

**Client:** McFarland Johnson, Inc.
**Project:** Reconstruct Taxiway C
Augusta, ME
**Project No:** 1569-011 **Lab No.** 16369-22

**Tested By:** CAG **Checked By:** MTG

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 0.0 | 23.2 | 14.6 | 21.3 | 16.1 | 24.8 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 96.9 | | |
| 3/8" | 92.8 | | |
| 1/4" | 84.2 | | |
| #4 | 76.8 | | |
| #10 | 62.2 | | |
| #20 | 50.1 | | |
| #40 | 40.9 | | |
| #80 | 31.8 | | |
| #140 | 27.2 | | |
| #200 | 24.8 | | |

* (no specification provided)

**Soil Description**

Silty sand with gravel

**Atterberg Limits**

PL= LL= PI=

**Coefficients**

$D_{90}$= 8.2228 $D_{85}$= 6.5686 $D_{60}$= 1.7056
$D_{50}$= 0.8450 $D_{30}$= 0.1482 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-1-b

**Remarks**

Moisture Content: 15.5%

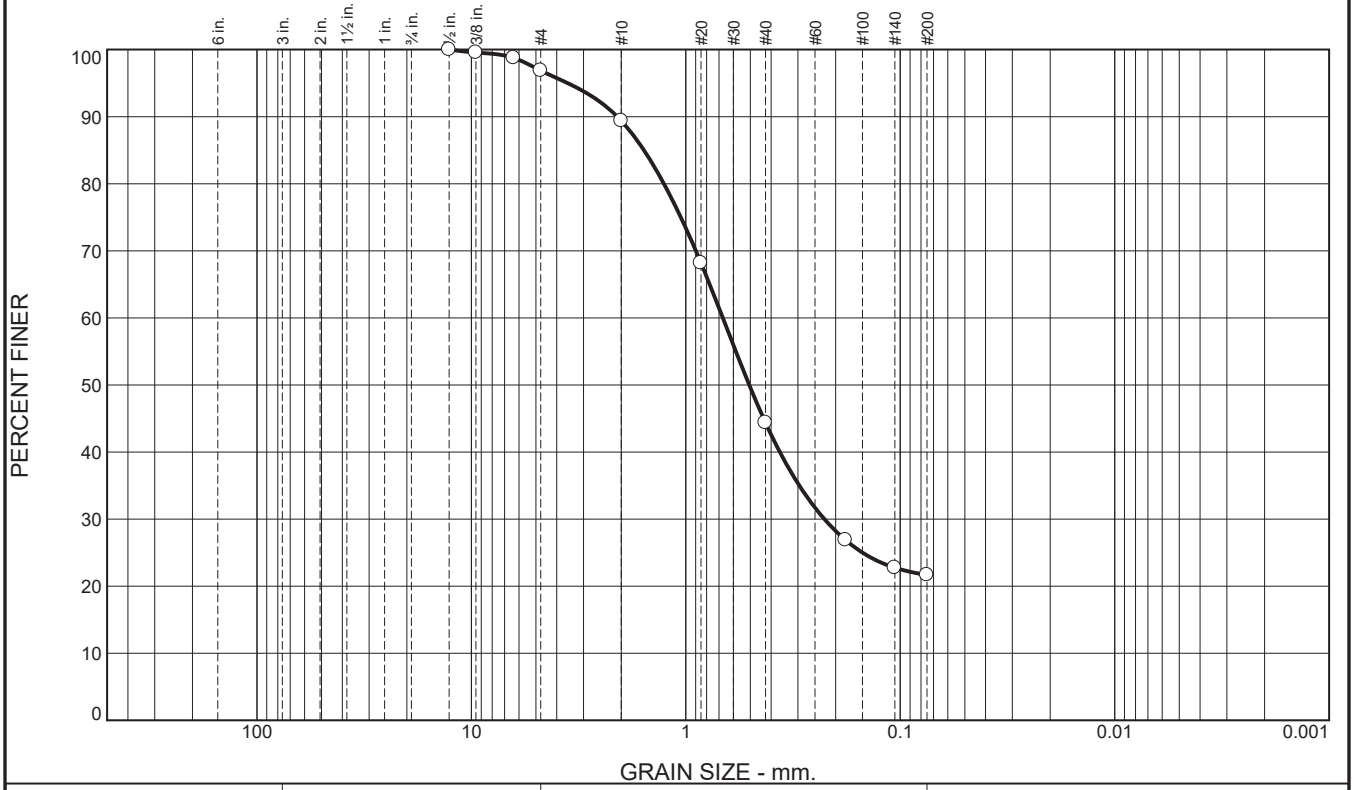
**Location:** CB-7
**Sample Number:** S-1 **Depth:** 0.3'-1' **Date:** 1/5/2021

**R.W. Gillespie & Associates, Inc.**
**Biddeford, Maine**

**Client:** McFarland Johnson, Inc.
**Project:** Reconstruct Taxiway C
Augusta, ME
**Project No:** 1569-011 **Lab No.** 16369-23

**Tested By:** CAG **Checked By:** MTG

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 0.0 | 3.1 | 7.5 | 45.0 | 22.7 | 21.7 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1/2" | 100.0 | | |
| 3/8" | 99.5 | | |
| 1/4" | 98.8 | | |
| #4 | 96.9 | | |
| #10 | 89.4 | | |
| #20 | 68.2 | | |
| #40 | 44.4 | | |
| #80 | 26.9 | | |
| #140 | 22.7 | | |
| #200 | 21.7 | | |

* (no specification provided)

**Soil Description**

Silty sand

**Atterberg Limits**

PL= LL= PI=

**Coefficients**

$D_{90}$= 2.0866 $D_{85}$= 1.5677 $D_{60}$= 0.6719
$D_{50}$= 0.5061 $D_{30}$= 0.2259 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-1-b

**Remarks**

Moisture Content: 6.4%

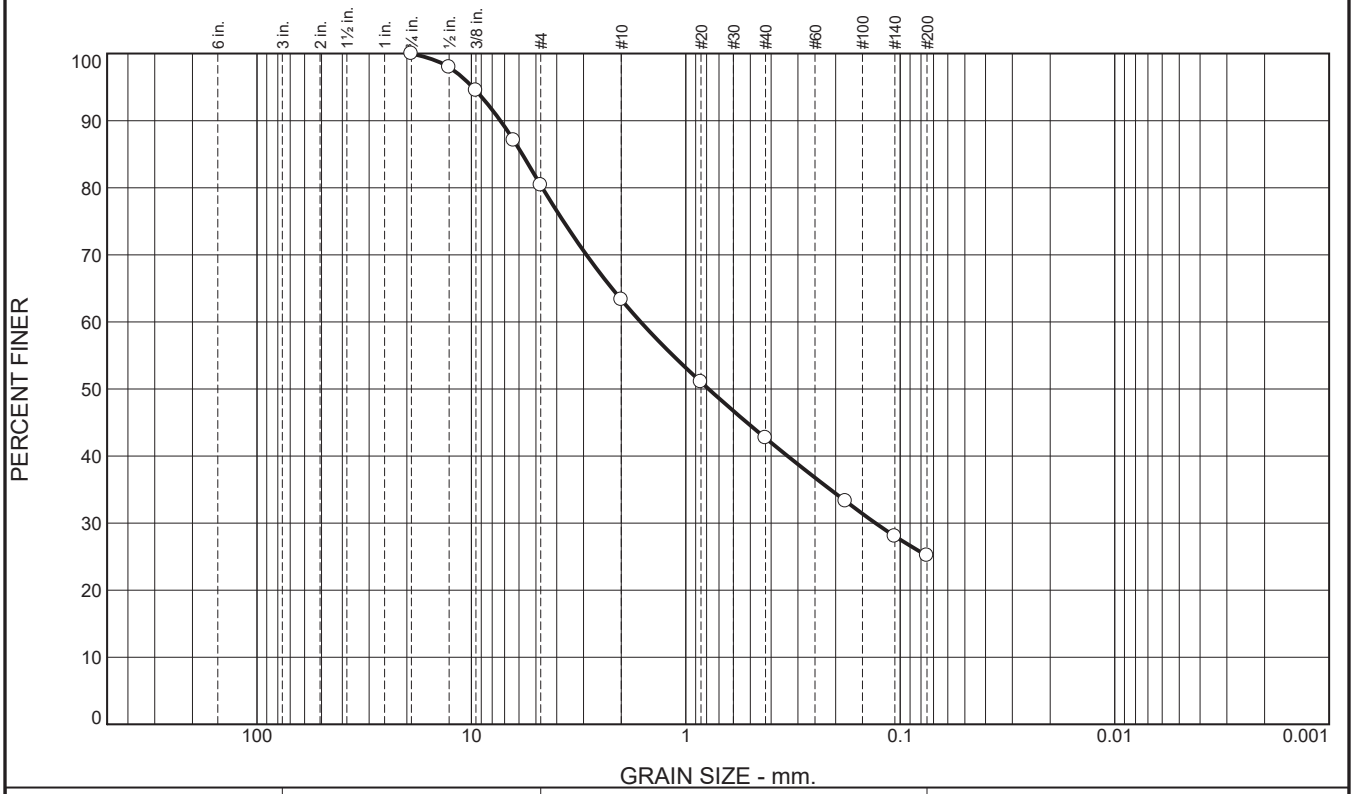
**Location:** CB-7
**Sample Number:** S-2 **Depth:** 1'-3' **Date:** 1/5/2021

**R.W. Gillespie & Associates, Inc.**
**Biddeford, Maine**

**Client:** McFarland Johnson, Inc.
**Project:** Reconstruct Taxiway C
Augusta, ME
**Project No:** 1569-011 **Lab No.** 16369-24

**Tested By:** CAG **Checked By:** MTG

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 0.0 | 19.6 | 17.1 | 20.6 | 17.6 | 25.1 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4" | 100.0 | | |
| 1/2" | 98.0 | | |
| 3/8" | 94.5 | | |
| 1/4" | 87.1 | | |
| #4 | 80.4 | | |
| #10 | 63.3 | | |
| #20 | 51.0 | | |
| #40 | 42.7 | | |
| #80 | 33.3 | | |
| #140 | 28.0 | | |
| #200 | 25.1 | | |

* (no specification provided)

**Soil Description**

Silty sand with gravel

**Atterberg Limits**

PL= LL= PI=

**Coefficients**

$D_{90}$= 7.3205 $D_{85}$= 5.7879 $D_{60}$= 1.6241
$D_{50}$= 0.7832 $D_{30}$= 0.1306 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-1-b

**Remarks**

Moisture Content: 13.9%

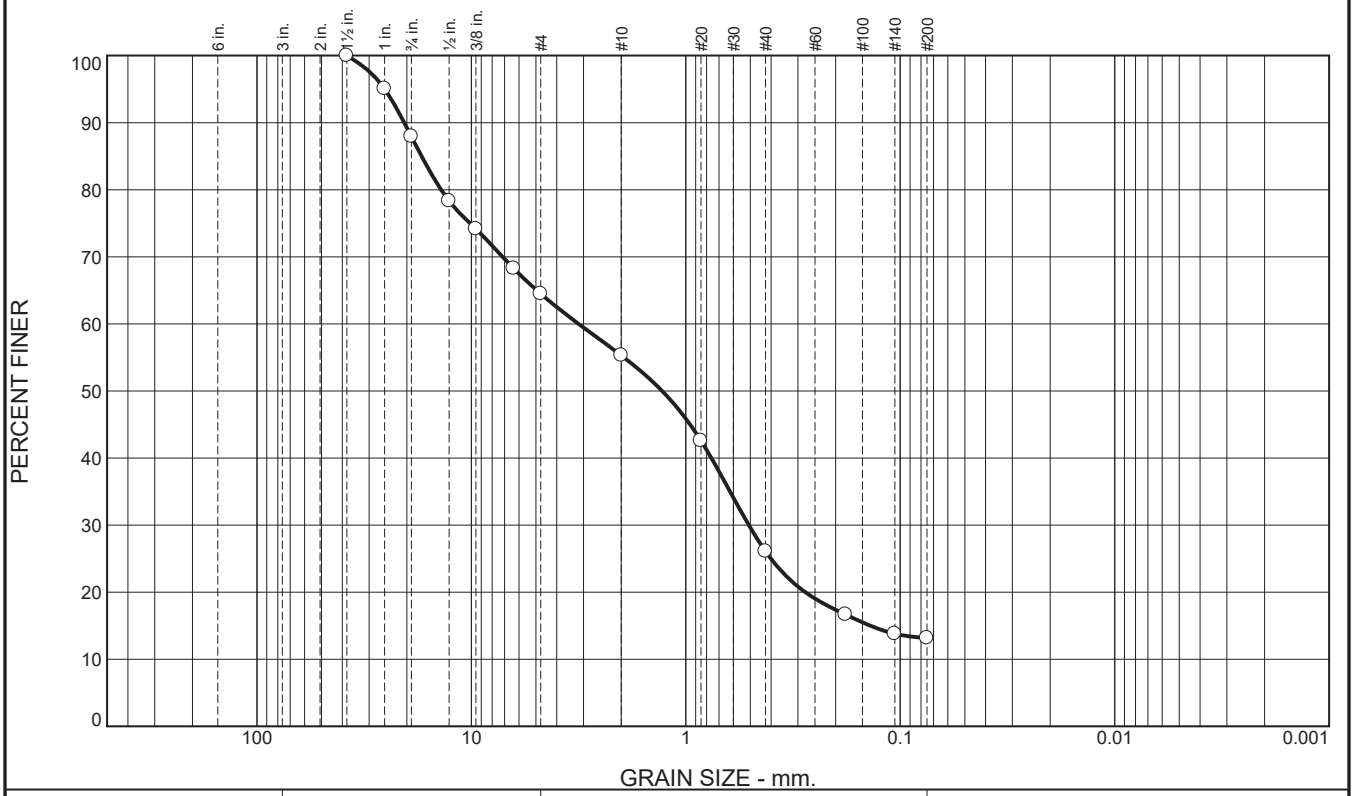
**Location:** CB-8
**Sample Number:** S-1 **Depth:** 0.3'-1' **Date:** 1/5/2021

**R.W. Gillespie & Associates, Inc.**
**Biddeford, Maine**

**Client:** McFarland Johnson, Inc.
**Project:** Reconstruct Taxiway C
Augusta, ME
**Project No:** 1569-011 **Lab No.** 16369-25

**Tested By:** CAG **Checked By:** MTG

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 12.1 | 23.4 | 9.2 | 29.2 | 12.9 | 13.2 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1 1/2" | 100.0 | | |
| 1" | 95.0 | | |
| 3/4" | 87.9 | | |
| 1/2" | 78.3 | | |
| 3/8" | 74.2 | | |
| 1/4" | 68.3 | | |
| #4 | 64.5 | | |
| #10 | 55.3 | | |
| #20 | 42.6 | | |
| #40 | 26.1 | | |
| #80 | 16.7 | | |
| #140 | 13.8 | | |
| #200 | 13.2 | | |

* (no specification provided)

**Soil Description**

Silty sand with gravel

**Atterberg Limits**

PL= LL= PI=

**Coefficients**

$D_{90}$= 20.5672 $D_{85}$= 17.0621 $D_{60}$= 3.1603
$D_{50}$= 1.2898 $D_{30}$= 0.5086 $D_{15}$= 0.1379
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-1-b

**Remarks**

Moisture Content: 3.8%

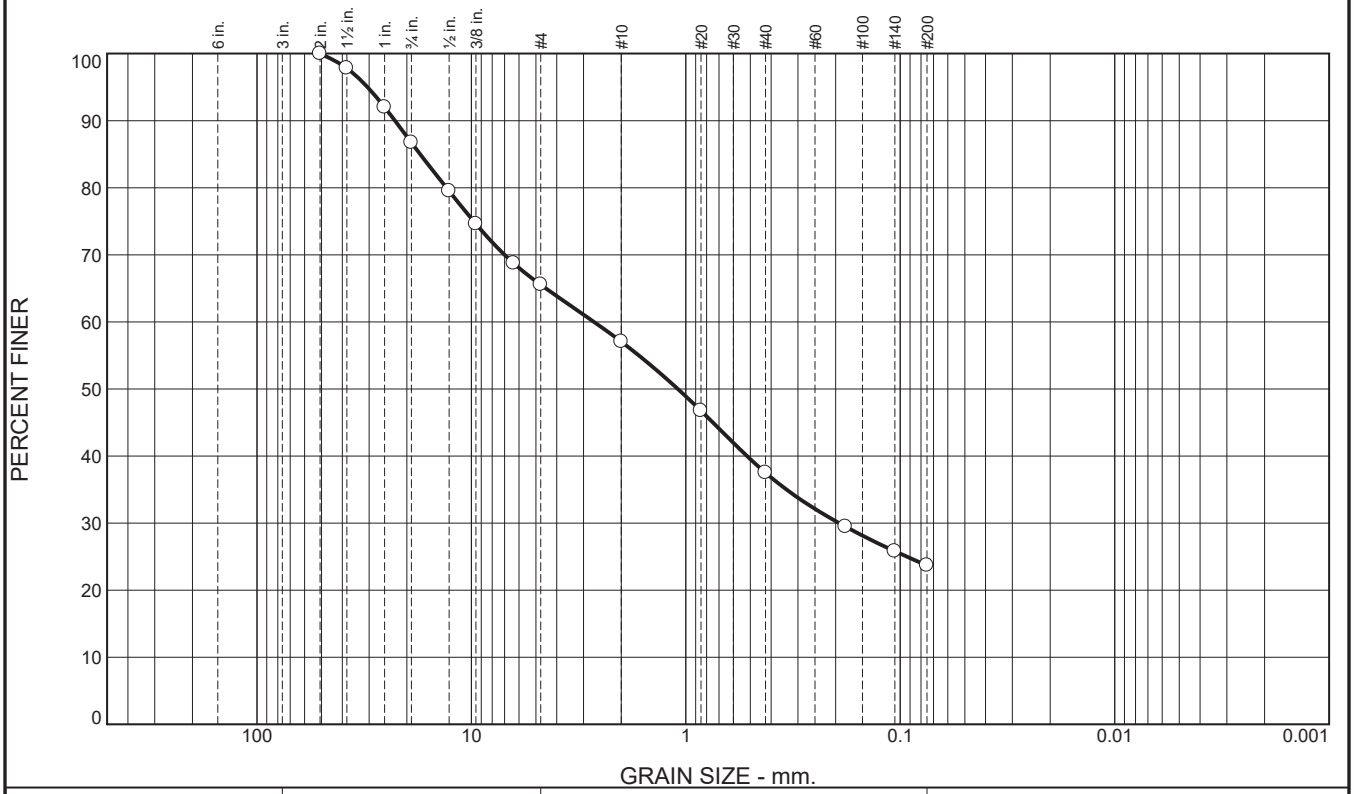
**Location:** CB-8
**Sample Number:** S-5 **Depth:** 7'-9' **Date:** 1/5/2021

**R.W. Gillespie & Associates, Inc.**
**Biddeford, Maine**

**Client:** McFarland Johnson, Inc.
**Project:** Reconstruct Taxiway C
Augusta, ME
**Project No:** 1569-011 **Lab No.** 16369-26

**Tested By:** CAG **Checked By:** MTG

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 13.3 | 21.2 | 8.4 | 19.6 | 13.8 | 23.7 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 2" | 100.0 | | |
| 1 1/2" | 97.8 | | |
| 1" | 92.0 | | |
| 3/4" | 86.7 | | |
| 1/2" | 79.5 | | |
| 3/8" | 74.6 | | |
| 1/4" | 68.7 | | |
| #4 | 65.5 | | |
| #10 | 57.1 | | |
| #20 | 46.7 | | |
| #40 | 37.5 | | |
| #80 | 29.5 | | |
| #140 | 25.8 | | |
| #200 | 23.7 | | |

* (no specification provided)

**Soil Description**

silty sand with gravel

**Atterberg Limits**

PL= LL= PI=

**Coefficients**

$D_{90}$= 22.7259 $D_{85}$= 17.3264 $D_{60}$= 2.6821
$D_{50}$= 1.0900 $D_{30}$= 0.1928 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-1-b

**Remarks**

As Tested Moisture Content: 5.4%

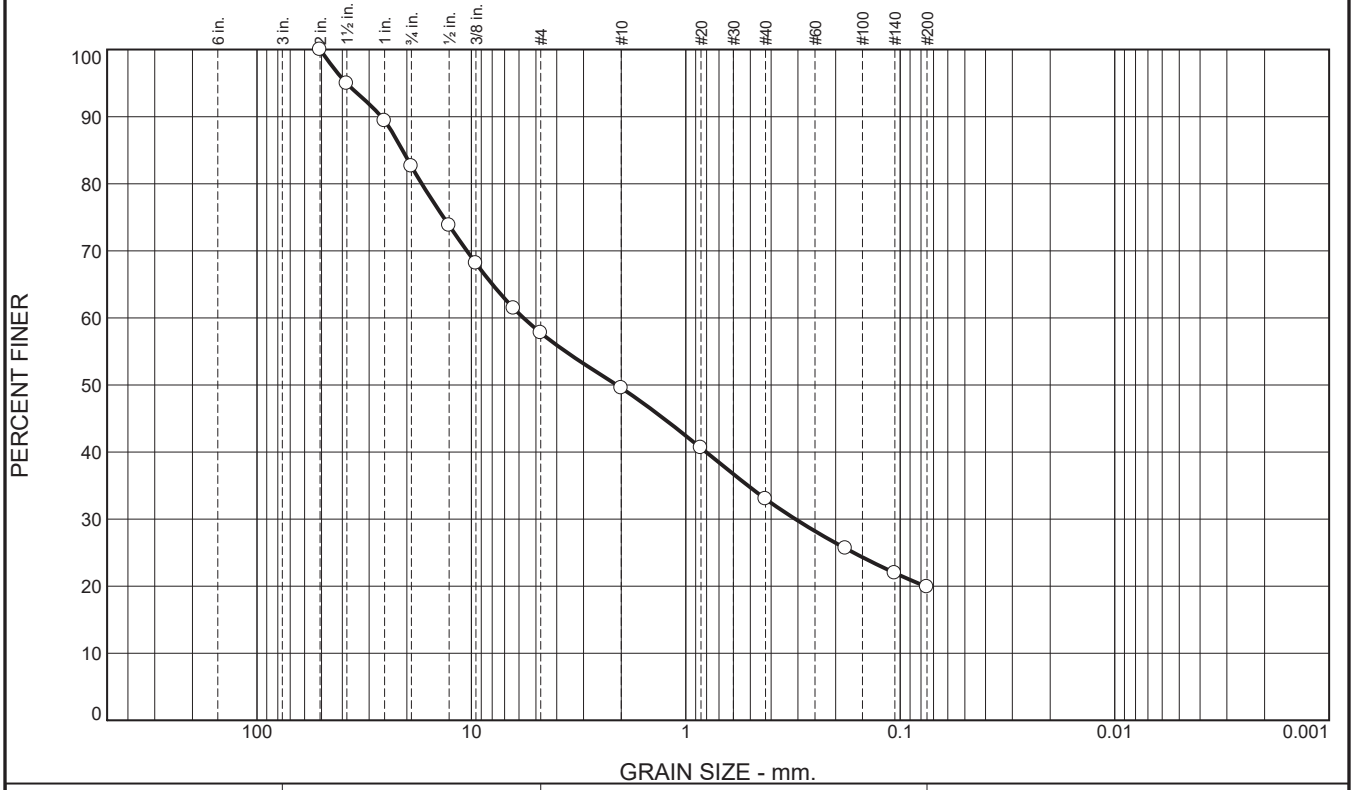
**Location:** B-1
**Sample Number:** Bulk **Depth:** 3-5' **Date:** 12-31-2020

**R.W. Gillespie & Associates, Inc.**
**Biddeford, Maine**

**Client:** McFarland Johnson, Inc.
**Project:** Reconstruct Taxiway C
Augusta, ME
**Project No:** 1569-011 **Lab No.** 16370-01

**Tested By:** JMT **Checked By:** MTG

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 17.4 | 24.8 | 8.3 | 16.5 | 13.1 | 19.9 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 2" | 100.0 | | |
| 1 1/2" | 94.9 | | |
| 1" | 89.4 | | |
| 3/4" | 82.6 | | |
| 1/2" | 73.8 | | |
| 3/8" | 68.2 | | |
| 1/4" | 61.4 | | |
| #4 | 57.8 | | |
| #10 | 49.5 | | |
| #20 | 40.6 | | |
| #40 | 33.0 | | |
| #80 | 25.6 | | |
| #140 | 22.0 | | |
| #200 | 19.9 | | |

* (no specification provided)

**Soil Description**

silty gravel with sand

**Atterberg Limits**

PL= LL= PI=

**Coefficients**

$D_{90}$= 26.3170 $D_{85}$= 20.9641 $D_{60}$= 5.7147
$D_{50}$= 2.1003 $D_{30}$= 0.3087 $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= GM AASHTO= A-1-b

**Remarks**

As Tested Moisture Content: 4.2%

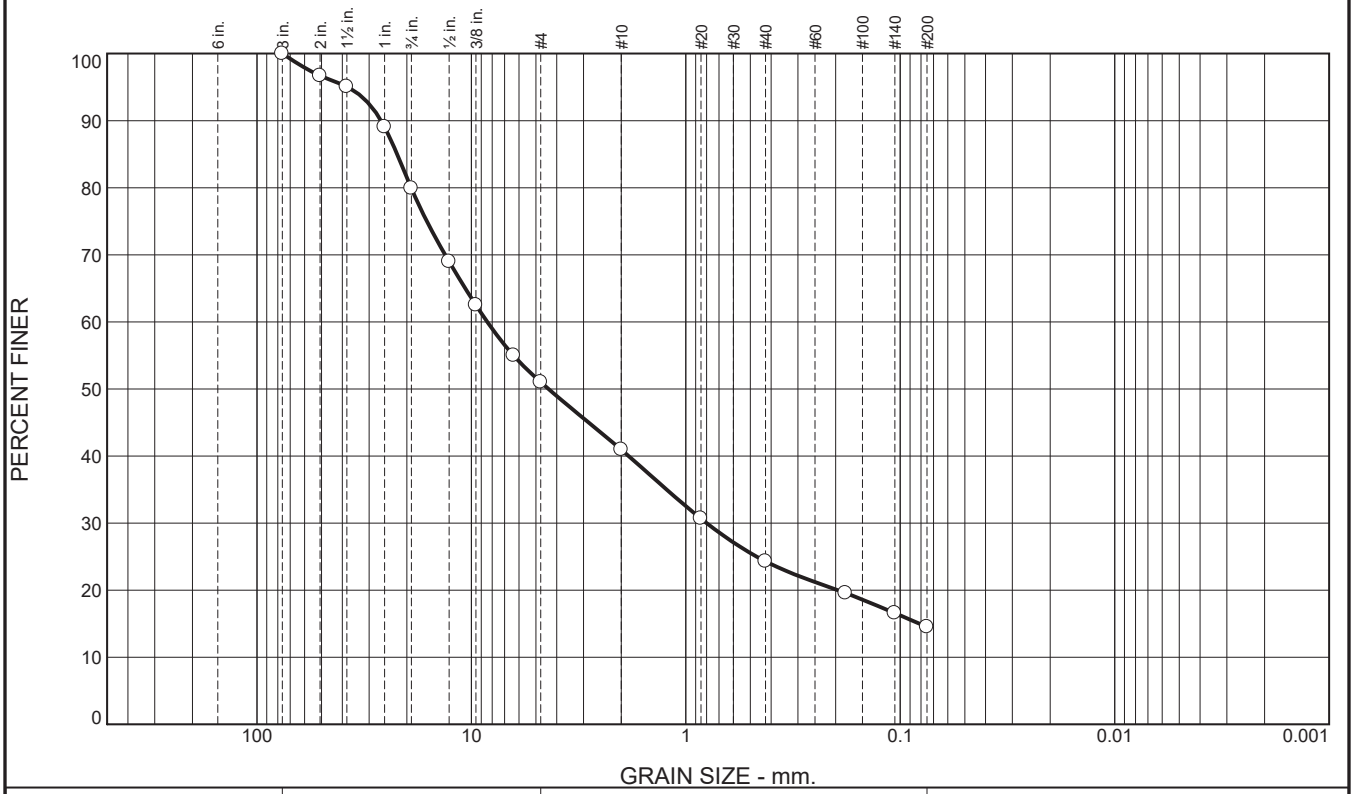
**Location:** B-3
**Sample Number:** Bulk **Depth:** 3-5' **Date:** 12-31-2020

**R.W. Gillespie & Associates, Inc.**
**Biddeford, Maine**

**Client:** McFarland Johnson, Inc.
**Project:** Reconstruct Taxiway C
Augusta, ME
**Project No:** 1569-011 **Lab No.** 16370-02

**Tested By:** AGS/JMT **Checked By:** MTG

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 20.1 | 28.9 | 10.1 | 16.6 | 9.8 | 14.5 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3" | 100.0 | | |
| 2" | 96.7 | | |
| 1 1/2" | 95.0 | | |
| 1" | 89.1 | | |
| 3/4" | 79.9 | | |
| 1/2" | 69.0 | | |
| 3/8" | 62.5 | | |
| 1/4" | 55.0 | | |
| #4 | 51.0 | | |
| #10 | 40.9 | | |
| #20 | 30.7 | | |
| #40 | 24.3 | | |
| #80 | 19.6 | | |
| #140 | 16.6 | | |
| #200 | 14.5 | | |

* (no specification provided)

**Soil Description**

silty gravel with sand

**Atterberg Limits**

PL= LL= PI=

**Coefficients**

$D_{90}$= 26.3658 $D_{85}$= 22.1963 $D_{60}$= 8.4278
$D_{50}$= 4.3711 $D_{30}$= 0.7992 $D_{15}$= 0.0813
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= GM AASHTO= A-1-a

**Remarks**

As Tested Moisture Content: 4.8%

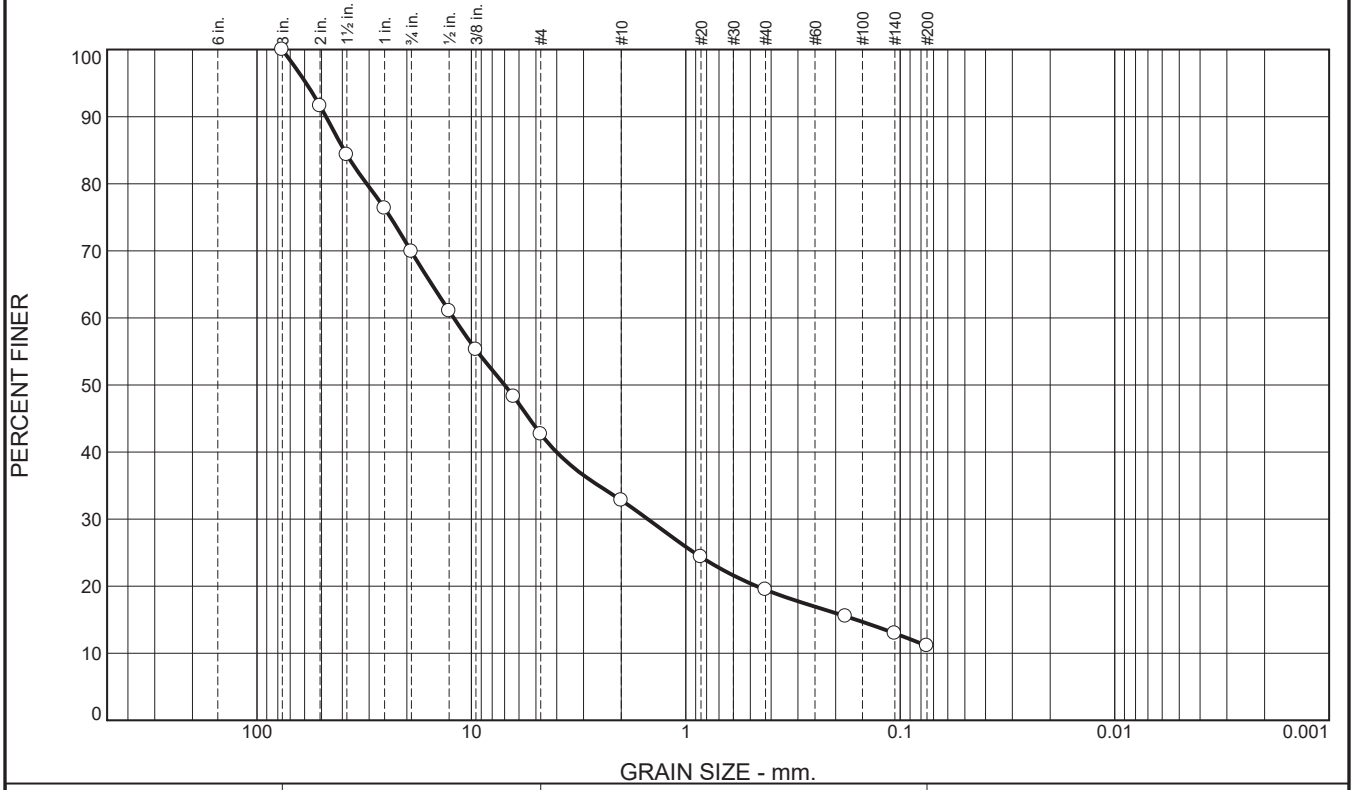
**Location:** B-4
**Sample Number:** Bulk **Depth:** 3-5 **Date:** 12/31/2020

**R.W. Gillespie & Associates, Inc.**
**Biddeford, Maine**

**Client:** McFarland Johnson, Inc.
**Project:** Reconstruct Taxiway C
Augusta, ME
**Project No:** 1569-011 **Lab No.** 16370-03

**Tested By:** JMT **Checked By:** MTG

# Particle Size Distribution Report




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 30.1 | 27.2 | 9.9 | 13.3 | 8.4 | 11.1 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3" | 100.0 | | |
| 2" | 91.6 | | |
| 1 1/2" | 84.3 | | |
| 1" | 76.3 | | |
| 3/4" | 69.9 | | |
| 1/2" | 61.0 | | |
| 3/8" | 55.3 | | |
| 1/4" | 48.3 | | |
| #4 | 42.7 | | |
| #10 | 32.8 | | |
| #20 | 24.4 | | |
| #40 | 19.5 | | |
| #80 | 15.5 | | |
| #140 | 13.0 | | |
| #200 | 11.1 | | |

* (no specification provided)

**Soil Description**

Poorly graded gravel with silt and sand

**Atterberg Limits**

PL= LL= PI=

**Coefficients**

$D_{90}$= 47.6464 $D_{85}$= 39.2038 $D_{60}$= 12.0865
$D_{50}$= 6.9981 $D_{30}$= 1.5035 $D_{15}$= 0.1606
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= GP-GM AASHTO= A-1-a

**Remarks**

Moisture Content: 3.8%

**Location:** B-5
**Sample Number:** Bulk **Depth:** 3'-5' **Date:** 1/7/2021

**R.W. Gillespie & Associates, Inc.**
**Biddeford, Maine**

**Client:** McFarland Johnson, Inc.
**Project:** Reconstruct Taxiway C
Augusta, ME
**Project No:** 1569-011 **Lab No.** 16370-04

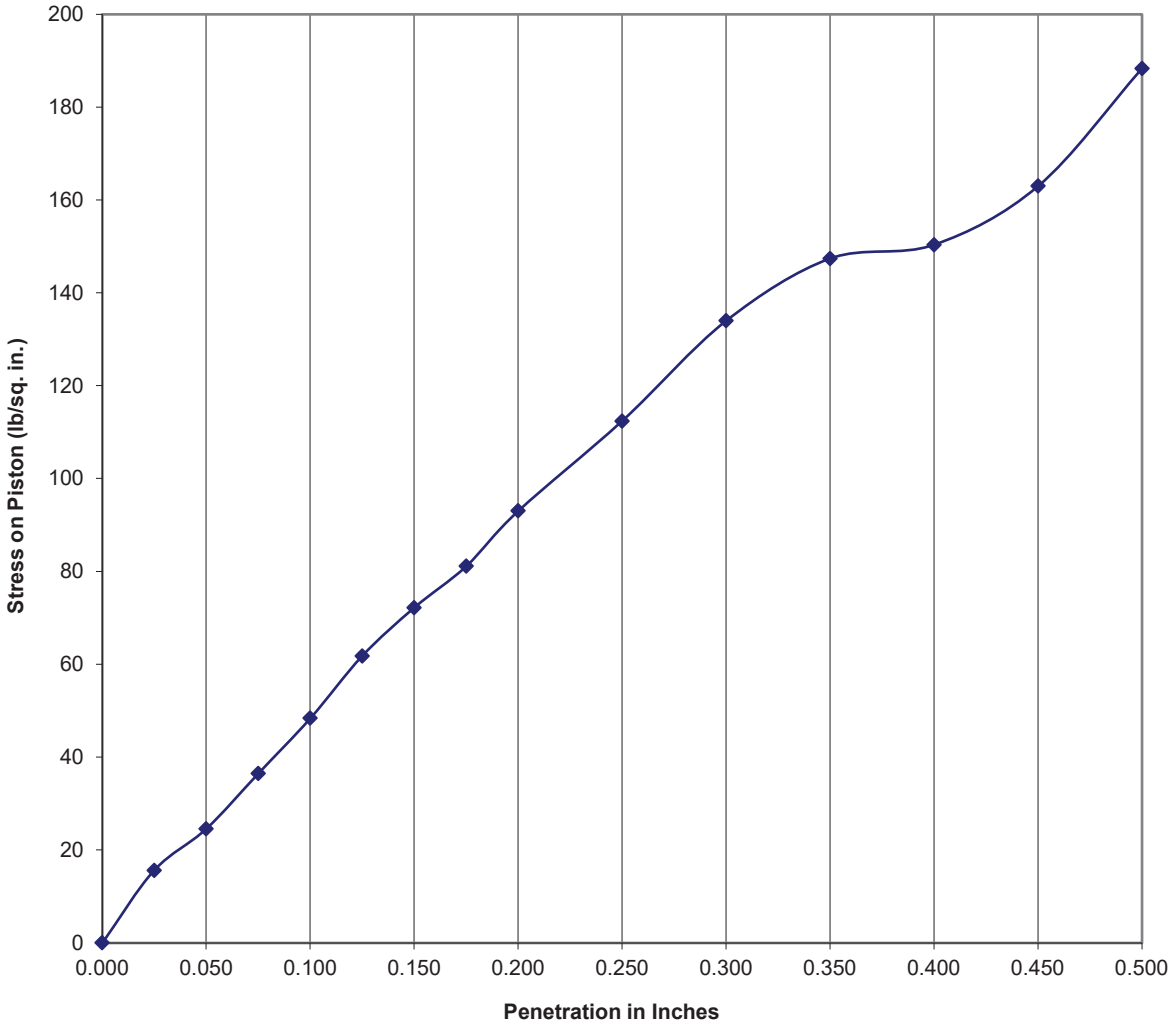
**Tested By:** AGS **Checked By:** MTG

# APPENDIX D

## FIELD CALIFORNIA BEARING RATIO TEST RESULTS

Geotechnical Engineering Evaluation
Reconstruct Taxiway C
Augusta State Airport
Augusta, Maine

## Field California Bearing Ratio
***ASTM D4429***



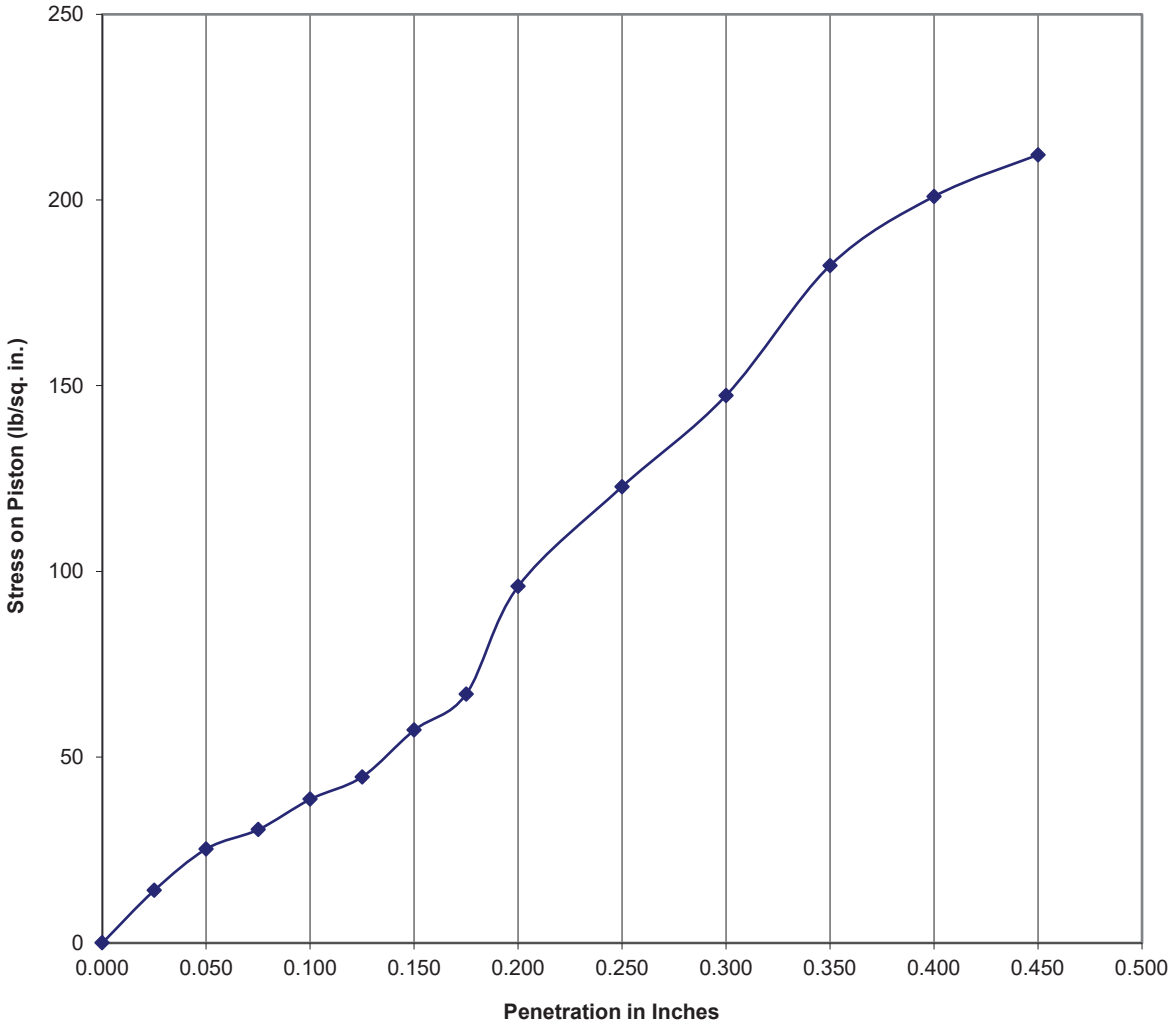

**Bearing Ratio at 0.1 inch penetration = 4.8**

| | | | |
|---|---|---|---|
| Test Location: | B-1 | Test Depth: | 36 inches |
| Project: | Reconstruct Taxiway C | | |
| RWG&A Project No: | 1569-011 | Client: | McFarland Johnson Inc. |
| Location: | Augusta, ME | Date: | 18-Dec-2020 |


**R. W. Gillespie & Associates**

20 Pomerleau Street, Suite 100, Biddeford, ME 04005
44 Wood Avenue, Suite 1, Mansfield, MA 02048
177 Shattuck Way, Suite 1 West, Newington, NH 03801

## Field California Bearing Ratio
***ASTM D4429***



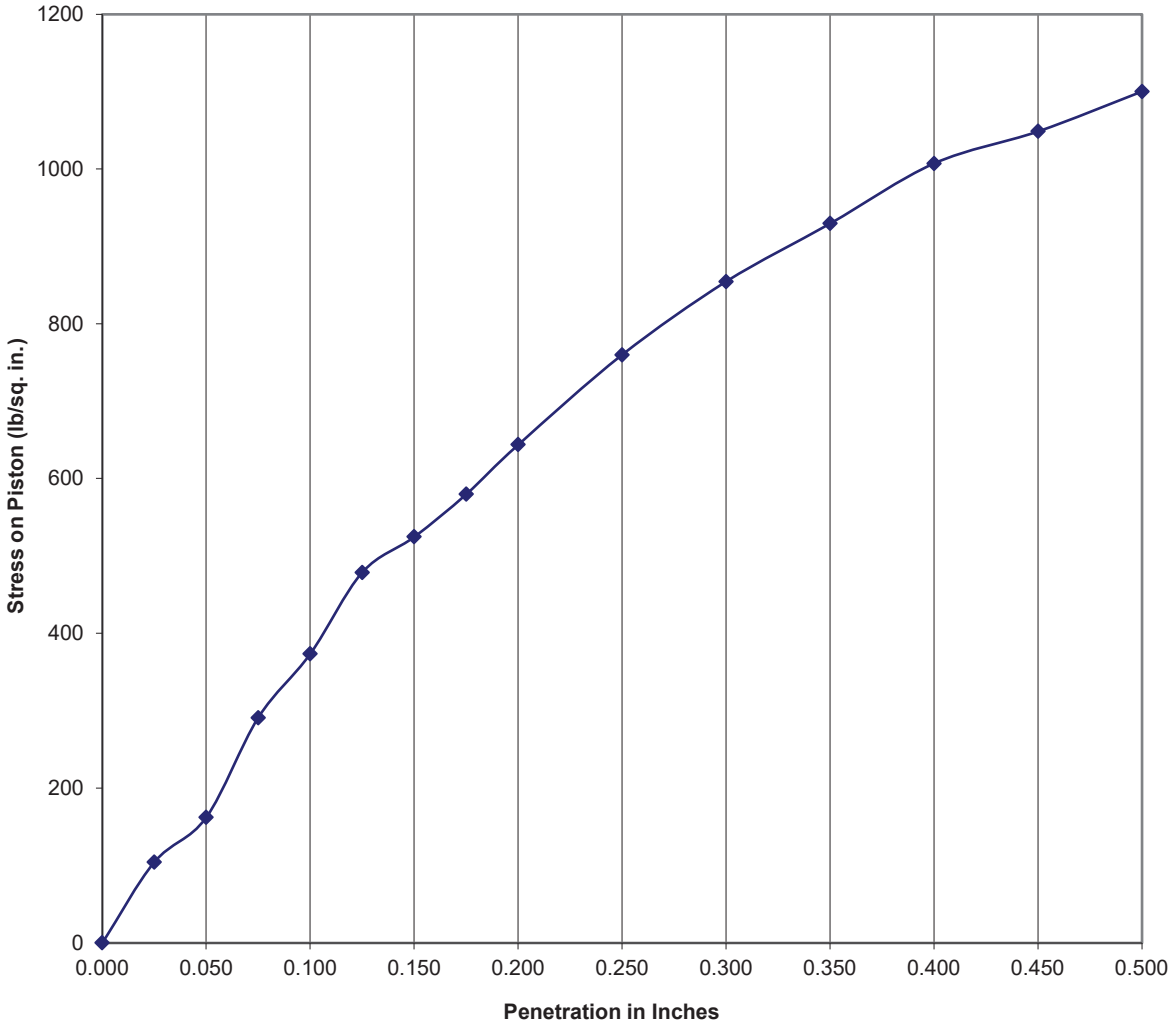

**Bearing Ratio at 0.1 inch penetration = 3.9**

| | | | |
|---|---|---|---|
| Test Location: | B-3 | Test Depth: | 36 inches |
| Project: | Reconstruct Taxiway C | | |
| RWG&A Project No: | 1569-011 | Client: | McFarland Johnson Inc. |
| Location: | Augusta, ME | Date: | 18-Dec-2020 |


**R. W. Gillespie & Associates**

20 Pomerleau Street, Suite 100, Biddeford, ME 04005
44 Wood Avenue, Suite 1, Mansfield, MA 02048
177 Shattuck Way, Suite 1 West, Newington, NH 03801

## Field California Bearing Ratio
***ASTM D4429***



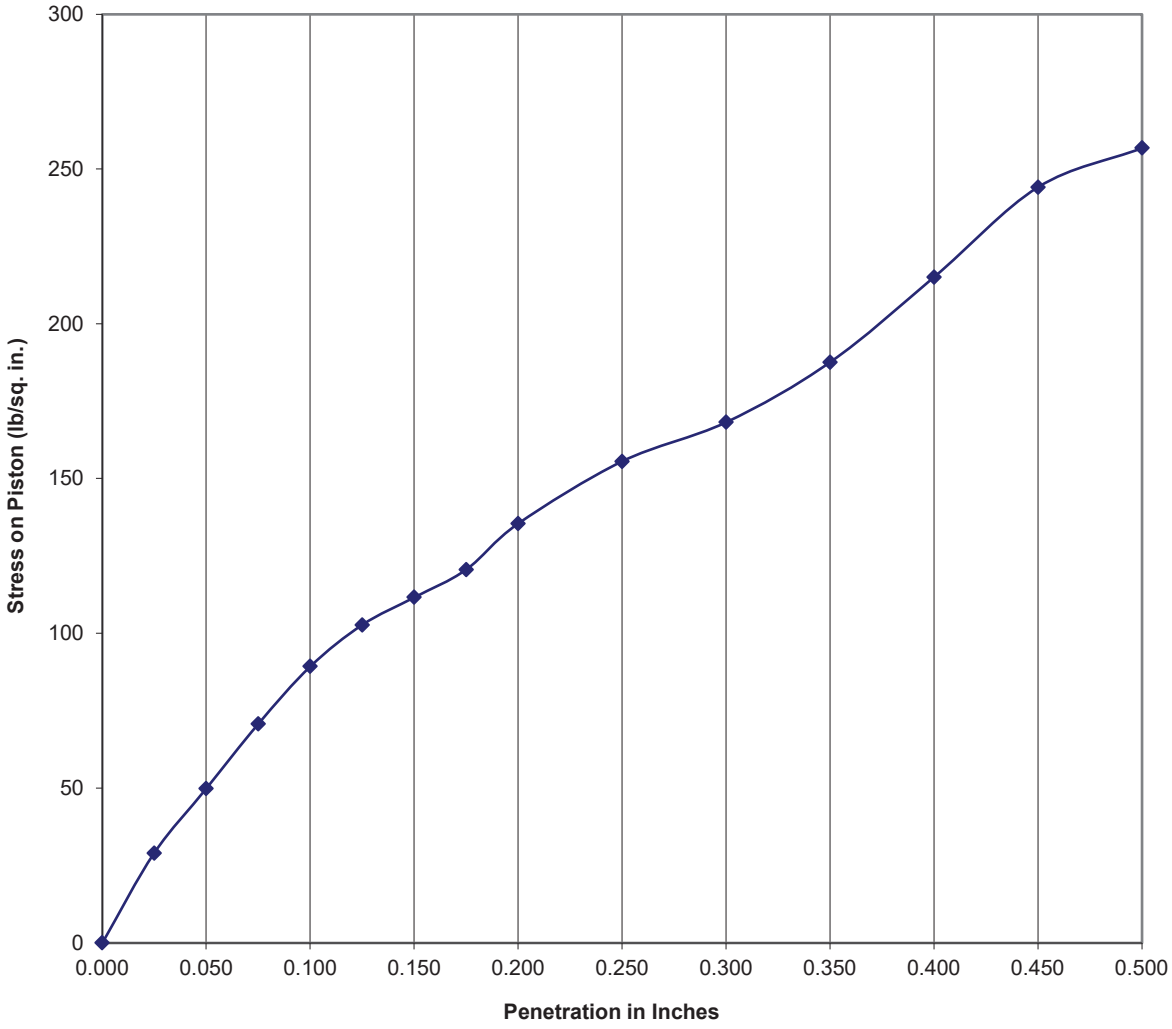

**Bearing Ratio at 0.1 inch penetration = 37.4**

| | | | |
|---|---|---|---|
| Test Location: | B-4 | Test Depth: | 36 inches |
| Project: | Reconstruct Taxiway C | | |
| RWG&A Project No: | 1569-011 | Client: | McFarland Johnson Inc. |
| Location: | Augusta, ME | Date: | 18-Dec-2020 |


**R. W. Gillespie & Associates**

20 Pomerleau Street, Suite 100, Biddeford, ME 04005
44 Wood Avenue, Suite 1, Mansfield, MA 02048
177 Shattuck Way, Suite 1 West, Newington, NH 03801

## Field California Bearing Ratio
***ASTM D4429***




**Bearing Ratio at 0.1 inch penetration = 8.9**

| | | | |
|---|---|---|---|
| Test Location: | B-5 | Test Depth: | 36 inches |
| Project: | Reconstruct Taxiway C | | |
| RWG&A Project No: | 1569-011 | Client: | McFarland Johnson Inc. |
| Location: | Augusta, ME | Date: | 18-Dec-2020 |


**R. W. Gillespie & Associates**

20 Pomerleau Street, Suite 100, Biddeford, ME 04005
44 Wood Avenue, Suite 1, Mansfield, MA 02048
177 Shattuck Way, Suite 1 West, Newington, NH 03801

# APPENDIX E

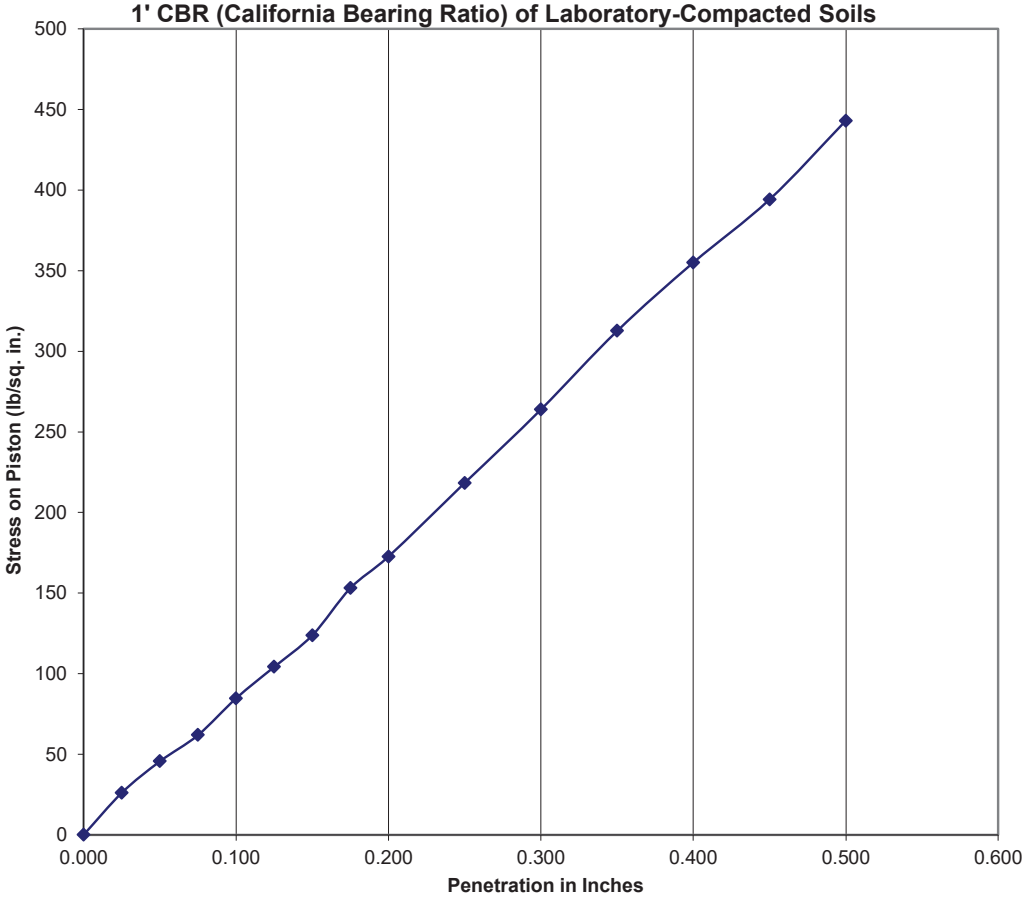
## LABORATORY CALIFORNIA BEARING RATIO TEST RESULTS

Geotechnical Engineering Evaluation
Reconstruct Taxiway C
Augusta State Airport
Augusta, Maine

## Lab California Bearing Ratio

**ASTM D 1883**

**1' CBR (California Bearing Ratio) of Laboratory-Compacted Soils**




Bearing Ratio = 8.5 at 96.0% Compaction

| **Test Location:** | **B-1** | **Sample #/Test Depth:** | **Bulk/3'-5'** |
|---|---|---|---|
| Prep Method: | D1557 | As Compacted Moisture Content: | 9.9% |
| Curing Conditions: | Soaked | Top 1" of Test Sample Moisture Content: | 11.2% |
| Tested Dry Density: | 128.9 | Sample Swell: | 0% |
| Surcharge Weight: | 10 lbs | % Retained on 19mm Sieve: | 13.3% |

Special Sample Testing Procedures or Comments from Above

None

Project: Reconstruct Taxiway C
Project #: 1569-011
Location: Augusta, ME

Client: McFarland Johnson
Date: 1/11/2021
Sample #: 16370-01

**R. W. Gillespie & Associates**

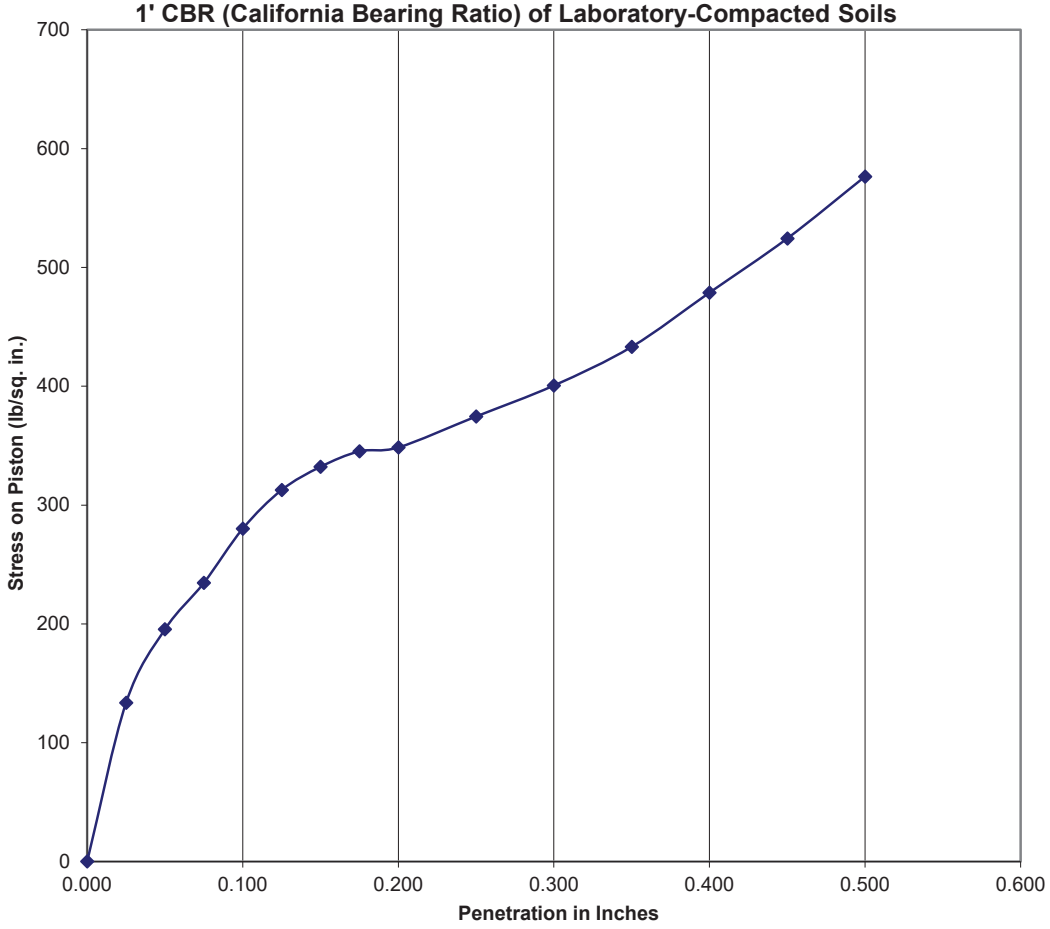
20 Pomerleau St. Suite 100
Biddeford, ME 04005

177 Shattuck Way, Suite 1 West
Newington, NH 03801

# Lab California Bearing Ratio

**ASTM D 1883**

**1' CBR (California Bearing Ratio) of Laboratory-Compacted Soils**




Bearing Ratio = 28.0 at 96.0% Compaction

| **Test Location:** | **B-3** | **Sample #/Test Depth:** | **Bulk/3'-5'** |
|---|---|---|---|
| Prep Method: | D1557 | As Compacted Moisture Content: | 5.0% |
| Curing Conditions: | Soaked | Top 1" of Test Sample Moisture Content: | 11.3% |
| Tested Dry Density: | 131.1 | Sample Swell: | 0% |
| Surcharge Weight: | 10 lbs | % Retained on 19mm Sieve: | 20.1% |

Special Sample Testing Procedures or Comments from Above

None

| | | | |
|---|---|---|---|
| Project: | Reconstruct Taxiway C | Client: | McFarland Johnson |
| Project #: | 1569-011 | Date: | 1/11/2021 |
| Location: | Augusta, ME | Sample #: | 16370-02 |

**R. W. Gillespie & Associates**

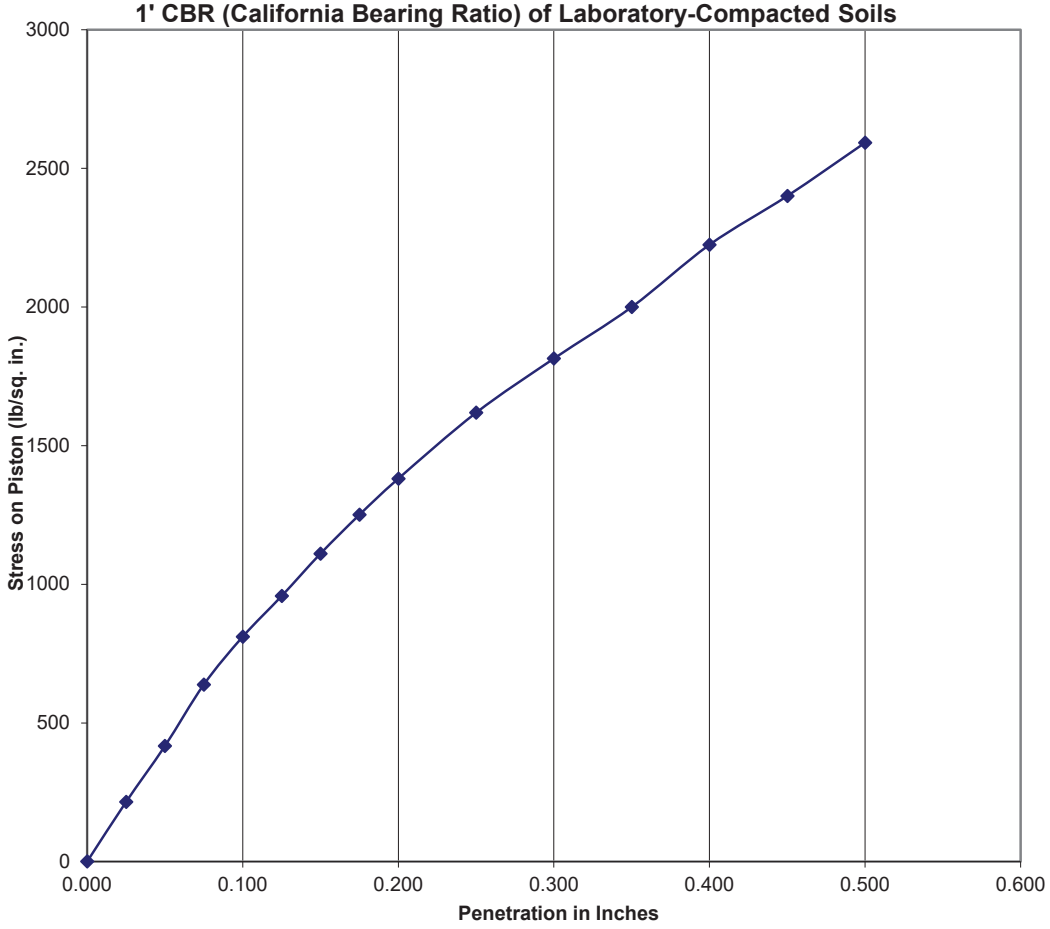
20 Pomerleau St. Suite 100
Biddeford, ME 04005

177 Shattuck Way, Suite 1 West
Newington, NH 03801

# Lab California Bearing Ratio

**ASTM D 1883**

**1' CBR (California Bearing Ratio) of Laboratory-Compacted Soils**




Bearing Ratio = 81.1 at 100.0% Compaction

| **Test Location:** | **B-4** | **Sample #/Test Depth:** | **Bulk/3'-5'** |
|---|---|---|---|
| Prep Method: | D1557 | As Compacted Moisture Content: | 7.0% |
| Curing Conditions: | Soaked | Top 1" of Test Sample Moisture Content: | 9.5% |
| Tested Dry Density: | 136.0 | Sample Swell: | 0% |
| Surcharge Weight: | 10 lbs | % Retained on 19mm Sieve: | 20.1% |

Special Sample Testing Procedures or Comments from Above

None

| | | | |
|---|---|---|---|
| Project: | Reconstruct Taxiway C | Client: | McFarland Johnson |
| Project #: | 1569-011 | Date: | 1/11/2021 |
| Location: | Augusta, ME | Sample #: | 16370-03 |


**R. W. Gillespie & Associates**

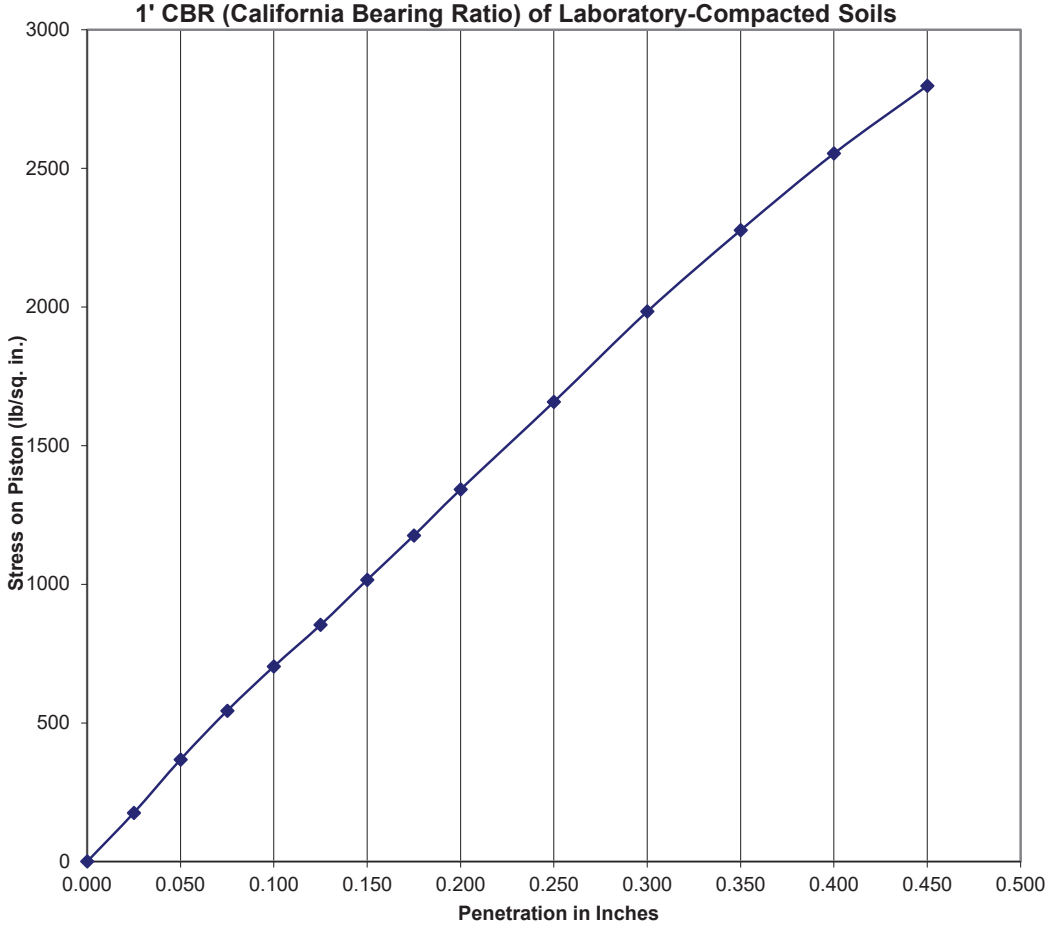
20 Pomerleau St. Suite 100
Biddeford, ME 04005

177 Shattuck Way, Suite 1 West
Newington, NH 03801

# Lab California Bearing Ratio

**ASTM D 1883**

**1' CBR (California Bearing Ratio) of Laboratory-Compacted Soils**




Bearing Ratio = 70.4 at 96.6% Compaction

| **Test Location:** | **B-5** | **Sample #/Test Depth:** | **Bulk/3'-5'** |
|---|---|---|---|
| Prep Method: | D1557 | As Compacted Moisture Content: | 6.8% |
| Curing Conditions: | Soaked | Top 1" of Test Sample Moisture Content: | 9.2% |
| Tested Dry Density: | 137.5 | Sample Swell: | 0% |
| Surcharge Weight: | 10 lbs | % Retained on 19mm Sieve: | 13.3% |

Special Sample Testing Procedures or Comments from Above

No reading for 0.500 inches of penetration. 10000 lb Proving Ring was approaching its maximum load before damage. Loading was terminated at 0.450 inches.

| | | | |
|---|---|---|---|
| Project: | Reconstruct Taxiway C | Client: | McFarland Johnson |
| Project #: | 1569-011 | Date: | 1/11/2021 |
| Location: | Augusta, ME | Sample #: | 16370-04 |

**R. W. Gillespie & Associates**

20 Pomerleau St. Suite 100
Biddeford, ME 04005

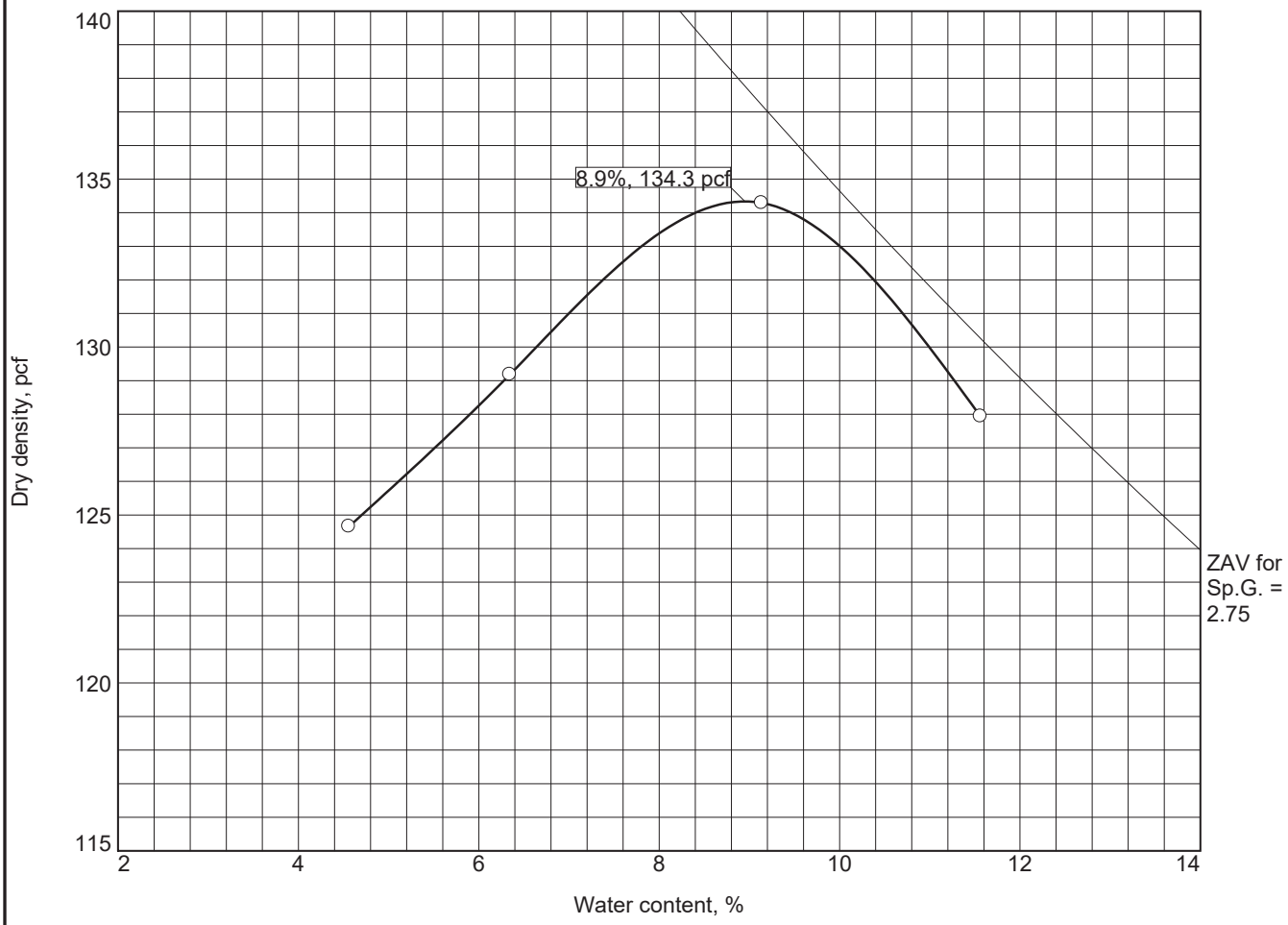
177 Shattuck Way, Suite 1 West
Newington, NH 03801

# APPENDIX F

## MOISTURE-DENSITY RELATIONSHIP TEST RESULTS

Geotechnical Engineering Evaluation
Reconstruct Taxiway C
Augusta State Airport
Augusta, Maine

# MOISTURE-DENSITY TEST REPORT




Test specification: ASTM D 1557-12 Method C Modified - Mechanical
ASTM D4718-15 Oversize Corr. Applied to Each Test Point

| Elev/ Depth | Classification | | Nat. Moist. | Sp.G. | LL | PI | % > 3/4 in. | % < No.200 |
|---|---|---|---|---|---|---|---|---|
| | USCS | AASHTO | | | | | | |
| 3-5' | SM | A-1-b | | | | | 13.3 | 23.7 |

| ROCK CORRECTED TEST RESULTS | MATERIAL DESCRIPTION |
|---|---|
| Maximum dry density = 134.3 pcf<br>Optimum moisture = 8.9 % | silty sand with gravel |

**Project No.** 1569-011 **Client:** McFarland Johnson, Inc.
**Project:** Reconstruct Taxiway C
Augusta, ME
○**Location:** B-1 **Sample Number:** Bulk

**R.W. Gillespie & Associates, Inc.**

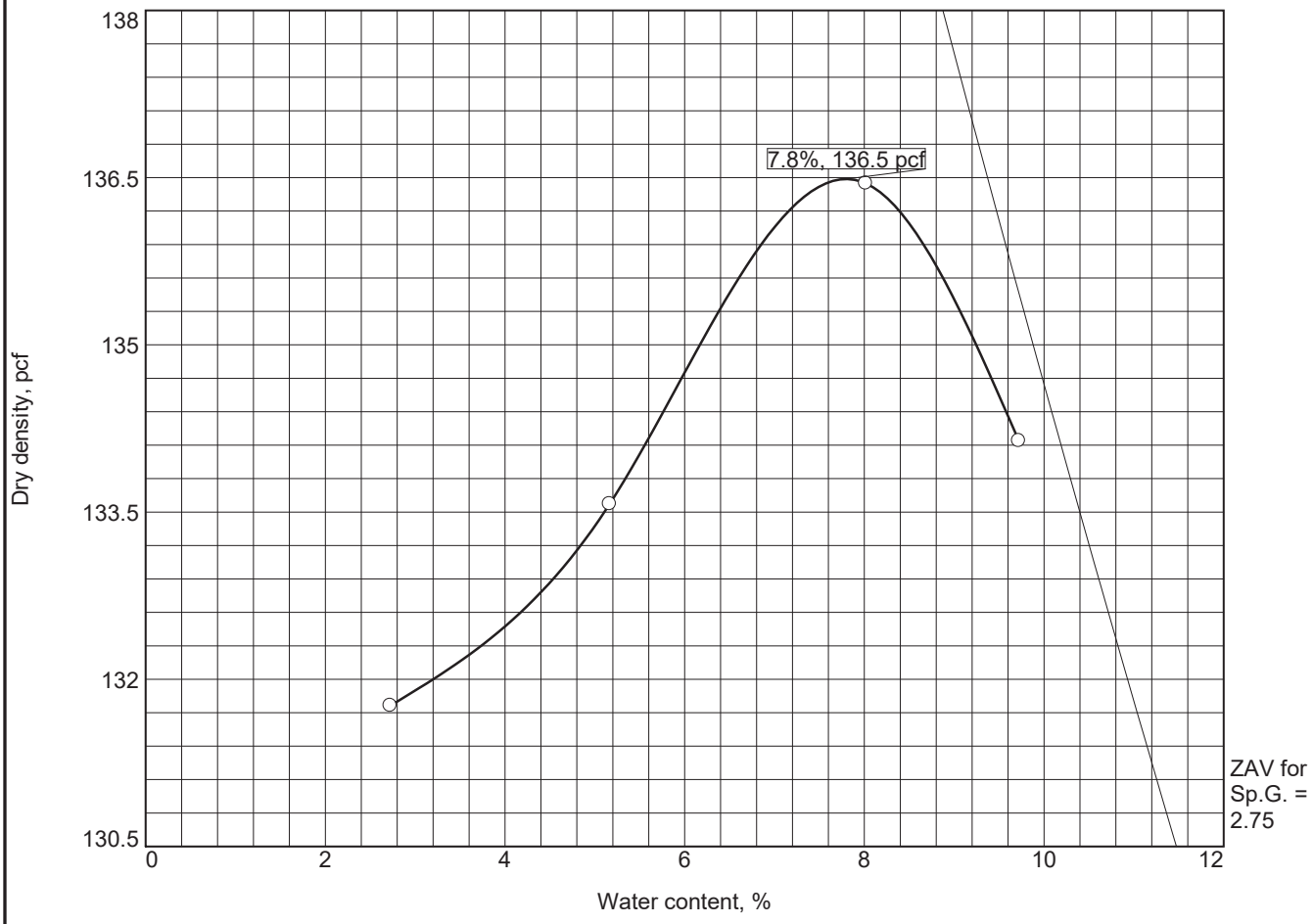
**Biddeford, Maine**

**Remarks:**

**Lab No.** 16370-01

**Tested By:** _____ **Checked By:** _____

# MOISTURE-DENSITY TEST REPORT




Test specification: ASTM D 1557-12 Method C Modified - Mechanical
ASTM D4718-15 Oversize Corr. Applied to Each Test Point

| Elev/ Depth | Classification | | Nat. Moist. | Sp.G. | LL | PI | % > 3/4 in. | % < No.200 |
|---|---|---|---|---|---|---|---|---|
| | USCS | AASHTO | | | | | | |
| 3-5' | GM | A-1-b | | | | | 17.4 | 19.9 |

| ROCK CORRECTED TEST RESULTS | MATERIAL DESCRIPTION |
|---|---|
| Maximum dry density = 136.5 pcf<br>Optimum moisture = 7.8 % | silty gravel with sand |

**Project No.** 1569-011 **Client:** McFarland Johnson, Inc.
**Project:** Reconstruct Taxiway C
Augusta, ME
○**Location:** B-3 **Sample Number:** Bulk]

**R.W. Gillespie & Associates, Inc.**

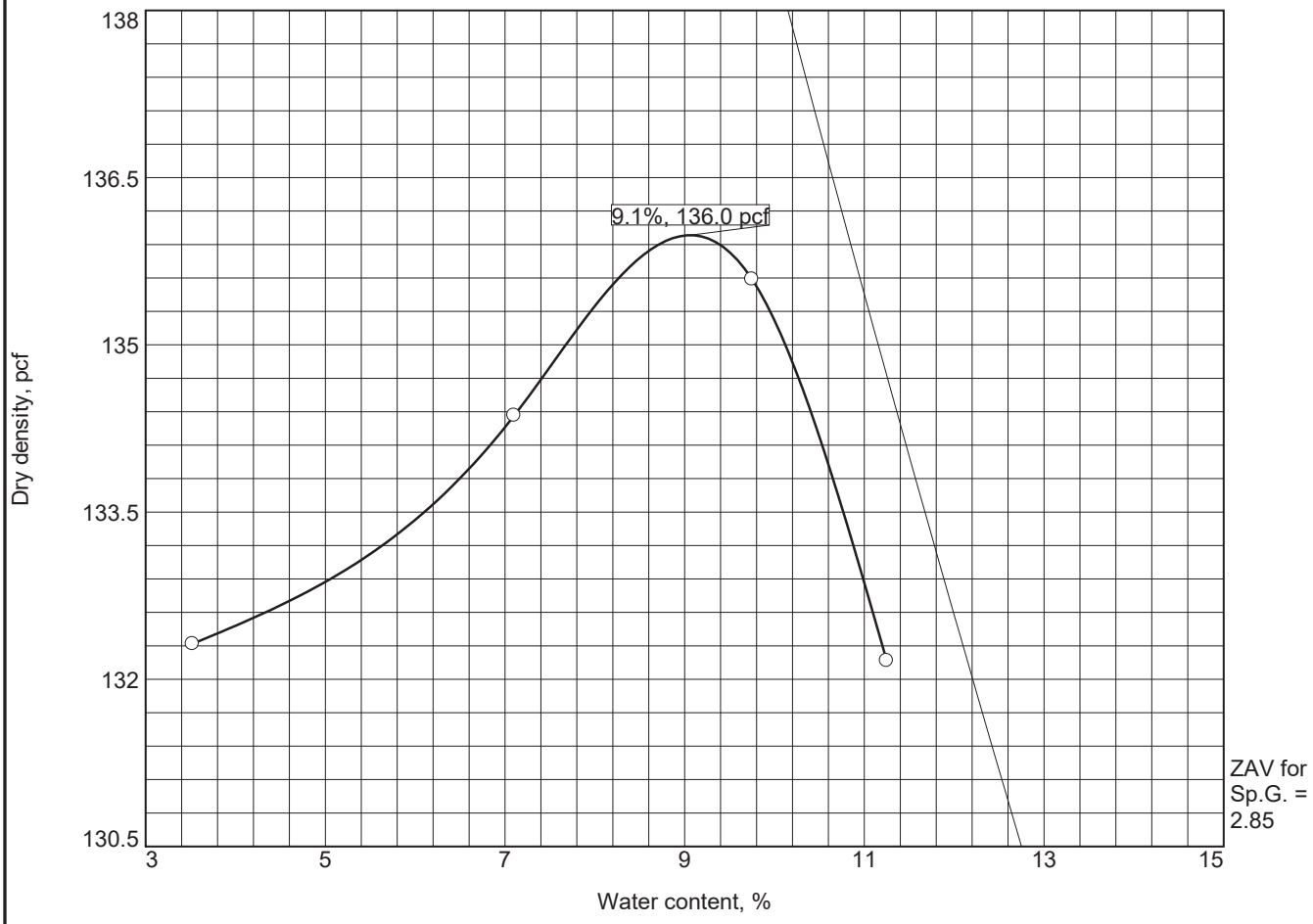
**Biddeford, Maine**

**Remarks:**

**Lab No.** 16370-02

**Tested By:** _____ **Checked By:** _____

# MOISTURE-DENSITY TEST REPORT




Test specification: ASTM D 1557-12 Method C Modified - Mechanical
ASTM D4718-15 Oversize Corr. Applied to Each Test Point

| Elev/ Depth | Classification | | Nat. Moist. | Sp.G. | LL | PI | % > 3/4 in. | % < No.200 |
|---|---|---|---|---|---|---|---|---|
| | USCS | AASHTO | | | | | | |
| 3-5 | GM | A-1-a | | | | | 20.1 | 14.5 |

| ROCK CORRECTED TEST RESULTS | MATERIAL DESCRIPTION |
|---|---|
| Maximum dry density = 136.0 pcf<br>Optimum moisture = 9.1 % | silty gravel with sand |

**Project No.** 1569-011 **Client:** McFarland Johnson, Inc.
**Project:** Reconstruct Taxiway C
Augusta, ME
○**Location:** B-4 **Sample Number:** Bulk

**R.W. Gillespie & Associates, Inc.**

**Biddeford, Maine**

**Remarks:**

**Lab No.** 16370-03

**Tested By:** JMT **Checked By:** MTG

# MOISTURE-DENSITY TEST REPORT

Test specification: ASTM D 1557-12 Method C Modified - Mechanical
ASTM D4718-15 Oversize Corr. Applied to Each Test Point

| Elev/ Depth | Classification | | Nat. Moist. | Sp.G. | LL | PI | % > 3/4 in. | % < No.200 |
|---|---|---|---|---|---|---|---|---|
| | USCS | AASHTO | | | | | | |
| 3'-5' | GP-GM | A-1-a | | | | | 30.1 | 11.1 |

| ROCK CORRECTED TEST RESULTS | MATERIAL DESCRIPTION |
|---|---|
| Maximum dry density = 142.3 pcf<br>Optimum moisture = 6.3 % | Poorly graded gravel with silt and sand |

**Project No.** 1569-011 **Client:** McFarland Johnson, Inc.
**Project:** Reconstruct Taxiway C
Augusta, ME
○**Location:** B-5 **Sample Number:** Bulk

**R.W. Gillespie & Associates, Inc.**

**Biddeford, Maine**

**Remarks:**

**Lab No.** 16370-04

**Tested By:** AGS **Checked By:** MTG

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Matt O'Brien
McFarland Johnson, Inc.
49 Court Street
Binghamton, NY 13902
February 17, 2021

**Subject: Augusta, ME Airport Rehabilitation Recommendation**

Greetings Matt:

Thank you for allowing us to provide you with the following recommendations for trenchless rehabilitation services following the primary and secondary stormwater pipe inspections from project 20T0976, completed in February 2021.

See below Table 1 "Augusta, ME Airport Defect Grade Report" with NASSCO PACP gradings for the pipes with the most defects. PACP (Pipeline Assessment Certification Program) is the North American Standard for pipeline defect identification and assessment, providing standardization and consistency to the methods in which pipeline conditions are identified, evaluated and managed. Pipelines are graded on a 1 to 5 scale:

5 – Most significant defect grade
4 – Significant defect grade
3 – Moderate defect grade
2 – Minor to moderate defect grade
1 – Minor defect grade

Table 1 "Augusta, ME Airport Defect Grade Report"

| Pipe Segment Reference | Street | Description | Grade | Upstream MH | Downstream MH | Direction | Distance | Clock 1 | Clock 2 | Width | Material | Date |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CB13 - CB14 | TW-C | Fracture Multiple | 4 | CB13 | CB14 | Downstream | 3 | 2 | 5 | 12 | Reinforced Concrete Pipe | 2/4/2021 |
| CB18 - CB20 | TW-C | Hole Soil Visible | 5 | CB18 | CB20 | Downstream | 15 | 11 | 1 | 12 | Reinforced Concrete Pipe | 2/5/2021 |
| CB5 - CO2 | TW-C | Joint Angular Large | 4 | CB5 | CO2 | Downstream | 77.9 | | | 12 | Reinforced Concrete Pipe | 2/4/2021 |

After reviewing the CCTV footage and the grade report shown in Table 1, Vortex Services recommends installing CIPP Sectional Repairs in select areas as described in Table 2. Only secondary pipes were found to have significant defects. See attached CIPP Sectional Repair specifications. Sectional fiberglass repairs have a 50 year design life. Vortex Services offers a (1) year warrantee.

Billable Units

| ITEM | DESCRIPTION | UNIT PRICE | UNIT | QUANTITY | TOTAL PRICE |
|---|---|---|---|---|---|
| 1 | 12" CIPP Point Repairs | $2,750.00 | EA | 3 | $8,250.00 |

**Terms and Conditions**
All quotes are good for 30 days from date of inquiry.
Payment is due Net 30 from the date the project is completed.

**All Conditions**
The parties acknowledge that the nature of the Work to be performed hereunder at the Property is such that the line and other characteristics and conditions of the site and Property cannot be fully assessed by Contractor until the Services identified in Schedule A have commenced. As such, the parties acknowledge that the condition of the Property including the sewer line may necessitate modifying Schedule A and executing applicable Purchase Orders. Neither party, at this

time, can satisfy itself as to coordination of such schedules and as to the existing condition of all parts of the Property and its location, including, without limitation, access to the Site, availability, location, and condition of the sewer line, all necessary utilities, climatic conditions, surface and subsurface conditions, potential exposure to hazardous or toxic wastes and substances, gases and other hazardous conditions and the condition of all improvements in or on the Property. Once the actual condition of the Property or of any of the other items described above is determined and necessary modifications to Schedule A and/or Purchase Orders are mutually agreed upon, the Contractor shall be solely responsible for completing the Work

We appreciate the opportunity to provide you with this proposal and we look forward to the chance to work with you. Please sign and return signed copy upon acceptance of this proposal.

Sincerely,

Isaiah Bean
Project Manager

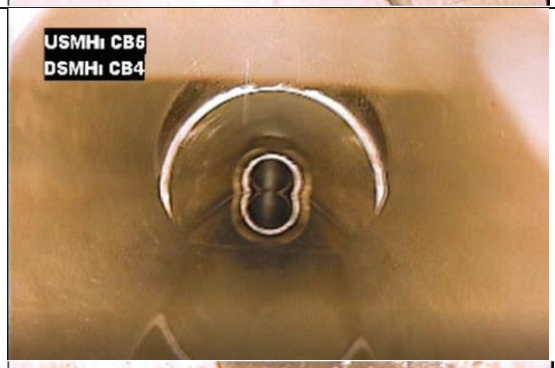
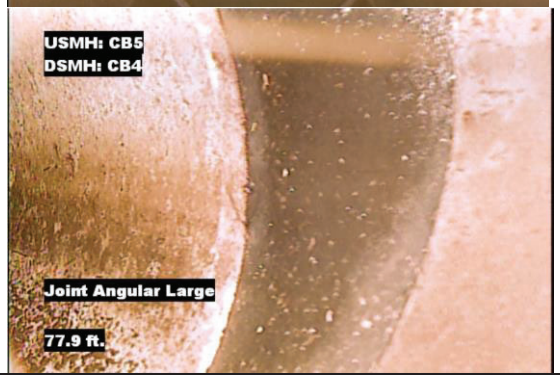
Accepted by:

_____ Title: _____
Print name:

_____ Date:_____

Table 2: Secondary Pipe Rehabilitation

| Location | Pipe Size | Description | Photo | Recommendation |
|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| CB13 to CB14 | 12” | Multiple Fractures located at 3’ | | | CIPP Point Repair at location |
| CB18 to CB20 | 12” | Hole in pipe located at 15’ | | | CIPP Point Repair at location |
| CB05 to C02 | 12” | Joint Offset |  <br>  | | CIPP Point Repair at location |

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# DIVISION 1 - SPECIFICATIONS

## GP - FAA – GENERAL PROVISIONS

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# 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). |
| **10-09** | **Award** | The Owner's notice to the successful bidder of the acceptance of the submitted bid. |

| Paragraph Number | Term | Definition |
|---|---|---|
| **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.<br>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 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 |

| Paragraph Number | Term | Definition |
|---|---|---|
| | | 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 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 |

| Paragraph Number | Term | Definition |
|---|---|---|
| | | 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.<br><br>**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.<br><br>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 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. |

| Paragraph Number | Term | Definition |
|---|---|---|
| **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 **City of Waterville, Maine, Waterville-Robert LaFleur Airport**. |
| 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.' |
| **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. |

| Paragraph Number | Term | Definition |
|---|---|---|
| **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. |
| **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. |

| Paragraph Number | Term | Definition |
|---|---|---|
| **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. |
| **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. |

| Paragraph Number | Term | Definition |
|---|---|---|
| **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** | **MaineDOT** | **Maine Department of Transportation** |

**END OF SECTION 10**

## Section 20 Proposal Requirements and Conditions

**20-01 Advertisement (Notice to Bidders). Please refer to the Invitation for Bid as contained with the Contract Documents**

**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*.

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. Refer to the Invitation to Did for the time and place of the pre-bid meeting

**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.

Prices should generally be written in whole dollars and cents. The extended total amount of each item should not be rounded.

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 project number, location of airport, and name and business address of the bidder on the outside. 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 in writing, by fax **or 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 5 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**

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## 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 the bid validation period as indicated in the bid documents, unless otherwise specified herein.

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

For AIP contracts, unless otherwise specified in this subsection, no award shall be made until the FAA has reviewed the Owner's recommendation to make such award in accordance with 2 CFR 200.324.

**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. Unless otherwise specified in this subsection, the surety bond or bonds 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 the

number of calendar days as specified in the Contract Documents 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**

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## 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.

**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**

## 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.** Refer to the Supplemental General provisions.

**50-05 Cooperation of Contractor**. The Contractor shall be supplied with four (4) 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): Hard copies, PDF or other agreeable electronic format.

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.

**50-17 Value Engineering Cost Proposal.**

The provisions of this paragraph will apply only to contracts awarded to the lowest bidder pursuant to competitive bidding.

On projects with original contract amounts in excess of $100,000, the Contractor may submit to the RPR, in writing, proposals for modifying the plans, specifications or other requirements of the contract for the sole purpose of reducing the cost of construction. The value engineering cost proposal shall not impair, in any manner, the essential functions or characteristics of the project, including but not limited to service life, economy of operation, ease of maintenance, desired appearance, design and safety standards. This provision shall not apply unless the proposal submitted is specifically identified by the Contractor as being presented for consideration as a value engineering proposal.

Not eligible for value engineering cost proposals are changes in the basic design of a pavement type, runway and taxiway lighting, visual aids, hydraulic capacity of drainage facilities, or changes in grade or alignment that reduce the geometric standards of the project.

As a minimum, the following information shall be submitted by the Contractor with each proposal:

a. A description of both existing contract requirements for performing the work and the proposed changes, with a discussion of the comparative advantages and disadvantages of each.

b. An itemization of the contract requirements that must be changed if the proposal is adopted.

c. A detailed estimate of the cost of performing the work under the existing contract and under the proposed changes.

d. A statement of the time by which a change order adopting the proposal must be issued.

e. A statement of the effect adoption of the proposal will have on the time for completion of the contract.

f. The contract items of work affected by the proposed changes, including any quantity variation attributable to them.

The Contractor may withdraw, in whole or in part, any value engineering cost proposal not accepted by the RPR, within the period specified in the proposal. The provisions of this subsection shall not be construed to require the RPR to consider any value engineering cost proposal that may be submitted.

The Contractor shall continue to perform the work in accordance with the requirements of the contract until a change order incorporating the value engineering cost proposal has been issued. If a change order has not been issued by the date upon which the Contractor's value engineering cost proposal specifies that a decision should be made, or such other date as the Contractor may subsequently have requested in writing, such value engineering cost proposal shall be deemed rejected.

The RPR shall be the sole judge of the acceptability of a value engineering cost proposal and of the estimated net savings from the adoption of all or any part of such proposal. In determining the estimated net savings, the RPR may disregard the contract bid prices if, in the RPR's judgment such prices do not represent a fair measure of the value of the work to be performed or deleted.

The Owner may require the Contractor to share in the Owner's costs of investigating a value engineering cost proposal submitted by the Contractor as a condition of considering such proposal. Where such a condition is imposed, the Contractor shall acknowledge acceptance of it in writing. Such acceptance shall constitute full authority for the Owner to deduct the cost of investigating a value engineering cost proposal from amounts payable to the Contractor under the contract.

If the Contractor's value engineering cost proposal is accepted in whole or in part, such acceptance will be by a contract change order that shall specifically state that it is executed pursuant to this paragraph. Such change order shall incorporate the changes in the plans and specifications which are necessary to permit the value engineering cost proposal or such part of it as has been accepted and shall include any conditions upon which the RPR's approval is based. The change order shall also set forth the estimated net savings attributable to the value engineering cost proposal. The net savings shall be determined as the difference in costs between the original contract costs for the involved work items and the costs occurring as a result of the proposed change. The change order shall also establish the net savings agreed upon and shall provide for adjustment in the contract price that will divide the net savings equally between the Contractor and the Owner.

The Contractor's 50% share of the net savings shall constitute full compensation to the Contractor for the value engineering cost proposal and the performance of the work.

Acceptance of the value engineering cost proposal and performance of the work shall not extend the time of completion of the contract unless specifically provided for in the contract change order.

**END OF SECTION 50**

## 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.

**END OF SECTION 60**

## 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: Location of public or private utility service, FAA or National Oceanic and Atmospheric Administration (NOAA) facility, or a utility service of another government agency are shown on the plans.

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) designated as "S-_" of the project plans.

**70-09 Use of explosives**. When the use of explosives is necessary for the execution of the work, the Contractor shall exercise the utmost care not to endanger life or property, including new work. The Contractor shall be responsible for all damage resulting from the use of explosives.

All explosives shall be stored in a secure manner in compliance with all laws and ordinances, and all such storage places shall be clearly marked. Where no local laws or ordinances apply, storage shall be provided satisfactory to the RPR and, in general, not closer than 1,000 feet (300 m) from the work or from any building, road, or other place of human occupancy.

The Contractor shall notify each property Owner and public utility company having structures or facilities in proximity to the site of the work of their intention to use explosives. Such notice shall be given sufficiently in advance to enable them to take such steps as they may deem necessary to protect their property from injury.

The use of electrical blasting caps shall not be permitted on or within 1,000 feet (300 m) of the airport property.

**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 and 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.

**Refer to CSPP and Specification Section M-001**.

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 manager 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.

The splicing of cables may not be an acceptable form of repair for certain projects. If any FAA cables are damaged, the Owner shall replace the cables in their entirety.

**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.

The contractor shall comply with all permit conditions on permits received by the owner for this project in addition to all general permits as they apply to this project. No additional compensation will be paid to the Contractor for permit compliance.

**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.** Refer to the Insurance requirement in the CONTRACT section of the Contract Documents.

**END OF SECTION 70**

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## 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 25 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 72 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 14 calendar 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 48 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) and 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:

Refer to the CSPP and Specification Section M-001.

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 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.

Refer to Supplemental General Provisions for liquidated damages and contract time..

**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.

**END OF SECTION 80**

## 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 km) 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 |

| Term | Description |
|---|---|
| | 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 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.<br><br>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. |

| Term | Description |
|---|---|
| | In the event inspection reveals the scales have been "overweighing" (indicating more than correct weight) they will be immediately adjusted. All materials received subsequent to the last previous correct weighting-accuracy test will be reduced by the percentage of error in excess of 0.5%.<br><br>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.<br><br>Beams, dials, platforms, and other scale equipment shall be so arranged that the operator and the RPR can safely and conveniently view them.<br><br>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.<br><br>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.

a. 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 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.

b. 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.

c. 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 fourteen (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 manufacturers 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.

**m.** Other items as requested by the Engineer.

**END OF SECTION 90**

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## 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 fourteen (14) 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 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 | Contractor Quality Control Program (CQCP) | Lump Sum (LS) |

## 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.** Installation and removal of inlet protection will be measured per each.

**c.** Installation and removal of the stabilized Construction Entrance will be measured by each.

**d.** Installation and removal of check dams will be measured by each.

**e.** Installation and removal of silt fence 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-102-5.1a | Temporary seeding and mulching - per square yard (square meter) |
| Item C-102-5.1b | Installation and Removal of Inlet Protection - per each |
| Item C-102-5.1c | Stabilized Construction Entrance – per each |
| Item C-102-5.1d | Check Dam – per each |
| Item C-102-5.1e | Installation and removal of silt fence - per linear feet (meter) |

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**

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## 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 five (5) percent of the total project cost.

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

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

### METHOD OF MEASUREMENT

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

**a.** With first pay request, 25%.

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

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

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

### BASIS OF PAYMENT

**105-6 Payment will be made under:**

Item C-105 Mobilization **-** Lump Sum (LS)

### 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 |

| 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 |
| 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 |

| 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 |
| 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 |

| 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 |
| 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 M-001 SPECIAL WORK REQUIREMENTS

## DESCRIPTION

**001-1.1 GENERAL.** The special requirements set forth in this section of these Specifications shall govern any aspect of the Contract work where such requirements are deemed applicable by the Owner or the Engineer. The purpose of these requirements is to help ensure that the Contract work complies with Airport Operation requirements, does not create any hazard to aircraft operations and point out special coordination or schedule conditions of which the Contractor should be aware. It shall be the Contractor's responsibility to conduct all work in strict accordance with the special requirements set forth herein, the Construction Safety and Phasing Plan (CSPP), the Contractor's Safety Plan Compliance Document (SPCD) and to fully cooperate with the Owner and the Engineer in every way necessary to fulfill the purposes of these requirements as set forth above.

Under this item, the Contractor shall set up his/her necessary general plant, including shops, storage areas, office, and such sanitary and other facilities as are required by local or state law or regulation. No sperate measurement for payment will be made for work required by this item but rather the work shall be considered incidental to the overall project, unless covered by elsewhere.

Required materials that are not to be a part of the completed contract shall be, as determined by the Contractor, except that they shall conform to any pertinent local or state law, regulation, or code.

Work in providing the facilities and services under this item shall be done in a safe and workmanlike manner and shall conform to any pertinent local or state law, regulation, or code. Good housekeeping consistent with safety shall be maintained.

**001-1.2 PROJECT DESCRIPTION.**

This project is to Reconstruct, Mark, Light and Sign a Portion of Taxiway 'C' (Approx. 1,200 LF x 35 FT); Reconstruct, Mark, Light and Sign a Portion of Taxiway 'E' (Approx. 545 LF x 35 FT); Reconstruct, the Non-Movement Area of the Terminal Apron (Approx. 1,595 SY) – BASE BID. Reconstruct, Mark, Light and Sign Taxiway 'C' Bypass Taxiway (Approx. 1,800 SY) – ALTERNATE NO. 1 at the Augusta State Airport , Augusta Maine.

This construction will include but is not limited to: installation of temporary and permanent erosion control measures, excavation, removal of existing bituminous pavement, preparation of a reclaimed (recycled) Asphalt Aggregate Base Course, placement of new base course material, placement of Airport Asphalt Mix Pavement, Underground Electrical Duct Installation, Installation of Underground electrical Cable(s), installation of electrical Handholes, Installation of Airport Taxiway Edge Lighting, Installation of Airport Signage, Drainage Installation, Electrical Vault Equipment Installation, Topsoiling, Seeding, Mulching, Airfield Pavement Markings and other work as shown on the plans, as specified here in and as directed by the Engineer.

The Project is contingent upon the receipt of funding assistance from the Federal Aviation Administration (FAA) under the Airport Improvement Program (AIP) and Maine Department of Transportation.

**01-1.3 PROJECT TIMETABLE.**

Anticipated Project Timetable is as follows:

- It is anticipated that the start of the project the Spring of 2022.
- Notice of award will be made in the Fall of 2021.
- The FAA does not allow unit price escalation clauses for work under this contract.
- The contract construction time is **60 calendar days** for the award of the base bid or base bid plus Alternate No. 1.

The project has been divided up into separate work areas for safety and to minimize disturbance to Airport operations by construction activities. Within the **60 calendar days** of total contract time, the contractor shall complete work within the specified work areas within the following specified time:

- Work Area 1A – Within ten (10) non-consecutive calendar days, as long as Taxiway 'B' can be opened for aircraft use.
- Work Area 1B - Within the sixty (60) consecutive calendar days project schedule**.**
- Work Area 2 **-** Within the sixty (60) consecutive calendar days project schedule, except when Runway 8-26 is open for departures and landings, at which time the RSA and ROFA must meet FAA safety standards.
- Work Area 3 - Within the sixty (60) consecutive calendar days project schedule**.** Vehicle traffic including but not limited to; Emergency Vehicles, Pick-ups and 18 passenger van shall access to the Terminal apron at all times.
- Work Area 4 – **Required, Nighttime Work Only.** Limited to ten (10) calendar days. Runway 17-35 is to be closed. Runway 8-26 to be opened. Can not occur simultaneous with work in Work Area 2.

For additional work area information and restrictions refer to the Construction Safety and Phasing Plans (CSPP) contained with the Contract Plans and Documents.

**001-1.4 BID ALTERNATIVES.** The project will consist of a Base Bid and one (1) alternate as follows:

Base Bid.

Reconstruct, Mark, Light and Sign a Portion of Taxiway 'C' (Approx. 1,200 LF x 35 FT);

Reconstruct, Mark, Light and Sign a Portion of Taxiway 'E' (Approx. 545 LF x 35 FT); Reconstruct, the Non-Movement Area of the Terminal Apron (Approx. 1,595 SY) – BASE BID.

Alternate No. 1.

Reconstruct, Mark, Light and Sign Taxiway 'C' Bypass Taxiway (Approx. 1,800 SY) – ALTERNATE NO. 1 – Alternate No. 1.

There shall be no contract construction time adjustment beyond that provided for the base bid for the award of Alternate No. 1 work.

**001-1.5 EXISTING CONDITIONS AND PROJECT REQUIREMENTS.** With the submission of a bid, it shall be understood that the Contractor has fully examined the Plans, Specifications and existing field conditions and understands fully all project requirements and obligations. Any claims for additional compensation for failure to completely understand the project requirements and obligations will be rejected by the Owner.

The Owner will be holding a pre-bid conference at which time prospective bidders will have access to investigate the work site. Additional access to the Airfield may be obtained with the permission of the Owner. All requests for additional access shall be made by contacting the Engineer.

Data on pavement core thickness, soil borings and the geotechnical report are being provided for your use and reference (refer to the Special Provisions of the project specifications). It is the sole responsibility of the Contractor regarding interpretations, assumptions or conclusions drawn from these reference items and test results in the preparation of their bid proposal.

**001-1.6 WETLANDS.** Wetlands are shown on the plans shall be delineated at the start of the project by the Contractor. The wetland disturbance shown on the plans has been permitted for, and any additional wetland disturbance caused by contractor shall be paid for by the contractor at no additional cost to the owner.

**001-1.7 PERMIT AND REGULATION COMPLIANCE.** The Contractor shall comply with all project permits, general permits, state laws, and local regulations. Any fines assessed against the Airport and related expenses due to non-compliance with the permits, laws, rules, and regulations cited in the Contract Documents and caused by the Contractor and their personnel, Subcontractors and Vendors shall be paid for by the Contractor.

For permit requirements refer to the Special Provisions of the project specifications.

**001-1.8 PRE-CONSTRUCTION VIDEO SURVEY.** The Contractor shall perform a video survey prior to the start of construction. The intent of the survey will be to document existing conditions

prior to construction. The video survey shall include but not be limited to:

- Apron
- Existing Taxiways
- Runway 17-35
- Runway 8-26
- Existing NAVAIDS
- Existing Threshold Lights
- Existing Runway Lights in work area
- Existing Wetlands
- Haul Routes
- Staging Area
- And other areas subject to Contractor Activities

Audio notes shall accompany the video to identify the existing condition of the items being surveyed. A copy of the video shall be provided to the Engineer in DVD format prior to the start of construction.

**001-1.9 COORDINATION WITH THE AIRPORT AND OTHER CONTRACTORS.** The Owner reserves the right to contract for and perform other work on the airfield within and outside the work areas of this contract.

When separate Contractors are let within the limits of any one project, each Contractor shall conduct their work so as not to interfere with or hinder the progress of completion of the work being performed by other Contractors. Contractors working within the same project area shall cooperate with each other as directed. Where necessary, each Contractor shall make reasonable adjustments in their schedules to allow for the proper sequencing of work by others.

The Contractor shall arrange their work and shall place and dispose of the materials being used or stored for later use so as not to interfere with the operations of the other Contractors. Contractors utilizing haul routes shall share in the responsibility of maintenance, dust control, and restoration of the haul routes. The responsibilities shall be pro-rated to each Contractor based on use. In areas of dispute between Contractors on the responsibilities for maintenance, dust control, and restoration of the haul routes or other items, the Engineer shall have the sole judgment as to the assessment of responsibilities to each respective Contractor.

Coordination between Contractors shall be at no additional cost to the Owner.

No additional compensation will be considered eligible due to contractor claims of delay, hindrance, or interference from other contractors.

**001-1.10 CONSTRUCTION SAFETY AND PHASING PLAN (CSPP).** To enhance safety and to minimize disturbance to daily airport operations the project has been divided in separate phases or

work areas as shown on the Safety and Phasing Drawings. The safety and phasing drawings are part of the Construction Safety and Phasing Plan (CSPP). The Contractor shall follow the CSPP explicitly. Deviations from the CSPP will require a revision to the CSPP subject to the Owner and FAA approval. Refer to Specification M-120 for additional information on the Maintenance and Protection of Traffic.

**001-1.11 SAFETY PLAN COMPLIANCE DOCUMENT (SPCD).** The Contractor will be required to provide a Safety Plan Compliance Document (SPCD). The SPCD will detail how the CSPP will be compiled to. Within the SPCD the Contractor shall provide details including but not limited to contact names and numbers, barricades proposed, runway closed markers proposed, haul routes to work areas, communication plan, fueling of equipment, Foreign Object Debris (FOD) and dust control, verification of height restriction on stockpiles and equipment, and other safety procedures. The Contractor shall also include a SPCD certification that they have read, understand the requirements of, and will follow the CSPP. Approval of the SPCD by the Owner will be required prior to the issuance of the Notice to Proceed (NTP).

**001-1.12 UNDERGROUND UTILITIES AND CABLES.** The approximate locations of known utilities and underground cables are shown on the Plans. There may exist active or inactive underground cables and utilities within the project areas that are not shown on the Plans. Prior to commencement of any excavation the Contractor shall locate and verify the locations and depths of all underground utilities and cables.

The Contractor shall coordinate all work with the following agencies as appropriate.

1. The Federal Aviation Administration – Airways Facilities Branch
2. The National Oceanic and Atmospheric Administration – National Weather Bureau
3. Central Maine Power Company
4. Augusta State Airport

The Contractor shall furnish and install all materials necessary to protect existing underground utilities and cables that are to remain. The Contractor shall comply with the current version of the Dig Safe Law, effective Dec 17, 1998 or as revised. The Contractor is required to pre-mark the construction-site and give notice of planned digging near utility, cable, and fuel lines.

The Contractor shall locate and verify all underground utilities and cables at no additional cost to the Owner.

The Contractor shall repair, at their own expense, utilities damaged by their operations, including any damage done by driving their equipment over existing underground cables. The repair of utilities shall be inspected and approved by the appropriate utility and witnessed by the Engineer.

**001-1.13 SUBMITTALS.** Upon receipt of the "NOTICE OF AWARD" of the Contract, the Contractor shall submit all appropriate Shop Drawings, material certifications, Buy American Certifications, federal compliance documents, and equipment data sheets in accordance with relevant sections of these Specifications. Once approvals have been obtained, the Contractor shall order all necessary equipment and materials and shall notify the Engineer of their receipt. Please note that Contract Time will not start until the date specified in the "NOTICE TO PROCEED".

The Contractor shall identify all long lead-time material items and incorporate them into the construction schedule. The Contractor is reminded to include sufficient time for material Shop Drawing review in this schedule. In general, submittals requiring in-office review only will be processed within ten (10) business days. Submittals requiring outside review can take up to twenty (20) business days. It shall be the Contractor's responsibility to identify long lead-time material items and incorporate their delivery into the overall work schedule.

No additional Contract time will be provided for failure to identify long lead-time materials.

**001-1.14 WORK HOURS.** Work hours available to the Contractor are Monday through Friday **6:30 a.m. to 6:00 p.m. and Saturday 8:00 a.m. to 4:30 p.m. Nighttime work will be between the hours of 7:00 p.m. to 6:30 a.m.** If applicable, local work hour ordinances shall also apply. Additional hours may be allowed with the approval of the Owner. In case of conflict in the Work Hours noted, the more stringent shall govern. Additional hours may be allowed with prior approval of the Owner.

**001-1.15 OVERALL WORK SCHEDULE.** The Contractor shall be required to submit a proposed schedule of how the work will be accomplished over the Contract period. The schedule shall be prepared using Microsoft Project or similar computer software. The schedule shall indicate detailed tasks with early and late start dates and critical path activities. This overall schedule shall be submitted to the Engineer prior to the Pre-Construction Conference. The Contractor shall be prepared to review the schedule at the Pre-Construction Conference with all parties. If so requested, the Contractor shall make modifications to the schedule to minimize disruption to Airport operations. The overall construction schedule is subject to the approval of the Airport and the Engineer.

It shall be understood that the "NOTICE TO PROCEED" will not be provided until the overall work schedule is submitted and determined to be acceptable by the Engineer and Owner.

During construction, the overall project schedule shall be updated biweekly with copies provided to the Engineer.

In accordance with the FAA General Provisions paragraph 80-02 of section 80, the Contractor shall notify the Engineer at least seventy-two (72) hours in advance of the time they intend to start work. It should be noted by the Contractor that seventy-two (72) hours is the time required by the Owner

to issue a proper NOTAM of the pending construction activities.

The FAA requires 30 days advance notice for the nighttime shut down of Runway 17-35.

**001-1.16 MONTHLY, WEEKLY, AND DAILY SCHEDULES REQUIRED.** To facilitate the specific requirements and intent of this section, the Contractor shall weekly prepare and submit a schedule of operations for the following workweek. The schedule shall be given to the Engineer by the end of the work week, proceeding the week covered by the schedule. The weekly schedule shall be subject to the approval of the Engineer, and shall include as a minimum, the following:

1. Major work items to be accomplished.
2. Subcontractors to be on-site.
3. Names of each Contractor's and Subcontractor's personnel to be on-site.
4. Type and quantity of equipment to be on-site.
5. Areas of the site where construction is scheduled.
6. Any anticipated closing of facilities that will be required.
7. Other information requested by the Owner or Engineer.

A daily schedule shall be provided to the Engineer each morning of activities that will be accomplished that day. The daily schedule may be verbal. The Engineer may disallow work that is not included in the current weekly work schedule.

**001-1.17 ON-SITE SUPERVISION.** The Contractor shall have a competent superintendent on the work site **at all times** that workers of the Contractor and/or Subcontractors are on-site.

Any time that work is proceeding without the Contractor's superintendent on-site by the Prime Contractor, Subcontractors and Vendors will result in an immediate suspension of work by the Owner. If a suspension of work order is issued, the Contractor shall secure and maintain the site during the period of the suspension of work. No additional compensation will be considered for work performed in preparation of the suspension of work or maintenance of the site during the suspension. No additional Contract time or compensation will be considered for delays or work required by the Contractor for failure to have a competent superintendent on-site at all times.

The superintendent(s) shall be fully authorized to act as the Contractor's agent on the project. The superintendent shall be capable of reading and thoroughly understanding the Plans and Specifications and shall receive and fulfill instructions from the Engineer or the Owner. The superintendent(s) shall be experienced in the type and nature of the work to be completed.

**001-1.18 CONTRACTOR "ON-CALL NAMES AND PHONE NUMBERS".** The Contractor shall

provide the Engineer and the Airport Manager with the name(s) and telephone number(s) of persons (two (2) minimum) that can be contacted before or after work hours for emergency situations affecting the construction. The Contractor shall be "on call" at all times during the length of the construction period until the end of the Warranty Period as described in the Supplemental General Provisions. The Contractor contact information shall be provided to the Engineer one (1) week prior to the Pre-Construction Conference.

**001-1.19 ADDITIONAL RESIDENT ENGINEER SERVICES.** The Owner has established a Resident Engineering budget based on the work hours made available to the Contractor. If the Contractor's work schedule exceeds the weekly Resident Engineering hours budgeted for the project, the Contractor agrees to pay the Owner the additional cost for the Resident Engineer in excess of the budgeted hours. The weekly Resident Engineering budget is sixty (60) hours per week. The cost to the Contractor shall be based on the Resident Engineer's actual billing rate plus expenses and fifteen percent (15%) profit in effect at the time the services were provided. For budgeting purposes, an hourly rate of $140.00/hour is recommended. It shall be understood that these charges are in addition to any other damage claims available to the Owner (Liquidated Damages, Breach of Contract, etc.), as described within the Contract Documents.

**001-1.20 CONTRACTOR'S AUTHORIZED AREA.** The Contractor shall not have access to the whole Airport. The Contractor shall be restricted to the designated work areas, haul route(s), staging area(s) and employee parking area shown on the plans.

The Contractor shall keep personnel and equipment clear of all other Airport critical areas and active Aircraft Operations Areas (AOA) at all times during construction.

No stationary equipment or stockpiles of materials will be allowed to penetrate the Runway 15-33 FAR Part 77 Approach Surfaces, or the runway transitional surfaces, and the runway or taxiway object free areas unless the area is closed to aircraft operations. At no time shall any construction equipment or stockpiles of materials penetrate the threshold approach surface.

For additional information refer to the Safety Plans.

**001-1.21 CONTRACTOR STAGING AREA AND EQUIPMENT YARD.** The area(s) for the location of the Contractor's field office and for storing materials and servicing, repairing, and parking construction equipment (Contractor's staging areas and auto parking areas) are located as shown on the Plans.

The Contractor will only be permitted to store equipment and materials in the Contractor's staging area. All equipment booms shall be lowered at the close of each day's work or when stored.

The Contractor (and their Subcontractors) shall provide all necessary temporary fencing and gates to protect materials and equipment from pilferage. The Owner will not be responsible for any

vandalized equipment or material stored on the Airport property.

All areas occupied by the Contractor shall be maintained in a clean and orderly condition satisfactory to the Engineer. Attention shall be given to the elimination of combustible rubbish or debris in the areas and none shall be left exposed overnight or at other periods of time the work is shut down.

At the completion of the Contract, all Contractor's and Subcontractor's facilities shall be removed promptly in a workmanlike manner and the area restored to original or better condition and left clean and free of all debris or surplus material.

**001-1.22 HAUL ROUTES.** The Contractor shall not be granted access to the entire airfield and shall restrict their activities to the designated haul routes (roads) and service roads, staging areas and work areas as shown on the Plans.

Haul routes on the Airport shall be shown on the Plans. The Contractor shall stake, delineate with construction fence the haul routes to be used by Contractor vehicles. The maximum speed limit on all haul routes is **15 mph**.

The Contractor shall construct haul routes shown in non-paved or turf areas. The haul routes shall be constructed to support the equipment and vehicles that will be using them. The haul routes shall be constructed with a smooth and constant grade that will allow positive drainage off of the pavement to the existing drainage swale or drainage devices. Portions of the haul routes within the taxiway safety area and taxiway object free area shall be maintained at all times to allow for the safe use of the taxiway pavement by aircraft. Any ruts or holes greater than three inches (3") in depth shall be filled or graded smooth. Any stones, foreign objects and debris over three inches (3") in any diameter shall be removed. No windrows will be allowed within the taxiway safety area and no windrows that exceed three inches (3") in height above the taxiway centerline elevation will be allowed within the taxiway object free area.

In areas that haul routes cross underground cable(s) or utilities, the crossing shall be protected by placing steel plates over the cable(s) or utility. Any damage to the underground cable(s) or utilities shall be repaired or replaced at the Owners discretion at no additional cost to the Owner.

When active airfield pavements (runways, taxiways, and aprons) are used for haul routes they shall be kept clean of all stones, dirt, debris and foreign matter at all times.

The Contractor shall be responsible for all improvements necessary to construct the haul routes. These improvements shall include but not be limited to stripping and stockpiling of topsoil, excavation, placement of base material (gravel, recycled asphalt pavement, or other suitable material), grading and compaction of the base material. The thickness of the haul route base material shall be sufficient to allow passage of heaviest vehicle anticipated to utilize the haul route without considerable rutting.

The Contractor shall maintain all haul routes (roads) during the course of construction. At the completion of the work, all haul routes constructed by the Contractor shall be removed and the area restored to its original or better condition.

All paved haul routes shall be kept clean at all times to prevent the accumulation of dirt and mud and other debris. Haul routes shall be cleaned at regular intervals not to exceed two (2) hours and prior to opening areas for use by aircraft. If, in the opinion of the Engineer, sweeping of the pavement surface will generate too much dust, then a vacuum type of street cleaner or other approved pavement cleaning equipment shall be used.

The Contractor shall always provide dust control on the haul routes during the duration of this project. The Contractor shall have on-site at all times a functional water truck and operator who shall monitor construction activities for dust and take corrective action as required.

The Contractor shall construct stabilized construction entrance in accordance with Best Management Practices (BMP) before entering a paved surface or a non-paved surface.

All haul routes constructed or disturbed shall be restored to their original condition or better before the Contract will be considered complete. This includes any damage to paved surfaces caused by the Contractor's activities. Unless otherwise shown on the Plans, the construction, or improvements to haul routes, all restoration of haul routes (including pavement repair) and dust control shall not be measured separately for payment but rather shall be considered incidental to the project.

All non-paved turf areas disturbed by the Contractor's operations shall be scarified or otherwise loosened to a depth not less than five inches (5"). Clods shall be broken and the top three inches (3") of soil shall be worked into a satisfactory seedbed by discing, or by use of cultipackers, rollers, drags, harrows, or other appropriate means. This area shall then be seeded, fertilized and mulched.

Haul routes constructed with gravel shall be restored by removing a sufficient amount of gravel to allow for four inches (4") of topsoil to be placed, graded, seeded and mulched. Grades and grading required for the restoration of constructed gravel haul routes shall be as directed by the Engineer.

All pavements damaged by the Contractor's activities shall be repaired to equal or better than prior conditions and to the satisfaction of the Engineer. The work may include, but not be limited to; saw cutting and removing damaged pavement, repair or replacement of base materials, tack coating of existing pavement edges, placement of hot bituminous concrete pavement meeting P-401 Specifications, placed in two (2) lifts or more matching the thickness of the existing pavement, and re-marking of the pavements.

When public roads and highways are used as haul routes, it will become the Contractor's

responsibility to obtain the proper permits needed for this function and to obey all rules and regulations pertinent to the public road and highway.

**001-1.23 REQUIRED COMPLIANCE OF CONTRACTOR PERSONNEL WITH AIRPORT SAFETY AND SECURITY MEASURES.** The Contractor shall take all precautions necessary to ensure the safety of operating aircraft; airport security is maintained, as well as the safety of their own equipment and personnel.

The Contractor shall be responsible for meeting all applicable FAA, and Airport regulations concerning safety and security.

The Contractor is responsible for any temporary fencing, gates or security arrangements needed to meet these requirements. See Plans for additional information on operations and safety during construction.

**001-1.24 TRENCHES AND EXCAVATIONS AND COVER REQUIREMENTS.** The Contractor will not be permitted to leave any trenches or excavations exceeding three (3) inches in depth open within active Safety Areas (RSA/TSA), Object Free Areas (ROFA/TOFA) and other active Aircraft Operation Areas (AOA) at night, on weekends, or at other times when work is not actually taking place on the excavation. All excavations shall be backfilled, compacted, and the pavement repaired and properly cured prior to the area being reopened to traffic.

Prior to the close of work each day, the Contractor shall ensure that the work area within active Safety Areas, Object Free Areas, and other active Aircraft Operation Areas (AOAs) are graded away from the pavements at a maximum slope of five percent (5%) and shall be left in such a condition that it will drain readily and effectively and will not pose a hazard to vehicles or aircraft. No piles of soil shall be left un-spread, no sharp changes in grade will be permitted, and the surface shall be thoroughly compacted.

**001-1.25 AIRFIELD BADGES.** There is no badging procedure at Augusta State Airport. The site superintendent is responsible for being educated on airport security, and safe airport operating procedures either from the Airport Manager, the Engineer or both, and relaying their message to other employees, and subcontractors. Security and safe airport operating procedures will also be discussed at the start of everyday during the daily Tailgate sections held by the engineer.

The Owner and Engineer reserves the right to deny airfield access to any personnel, whom in the opinion of the Airport present a safety or security risk.

**001-1.26 AIRFIELD DRIVING.** All Contractor and Subcontractor shall follow haul routes as shown on the safety and phasing plans, the prime contractor is responsible for making all subs aware of these haul routes. No active taxiways or runways shall be crossed without the ability to monitor the airport **UNICOM** active frequency.

The Owner and Engineer reserves the right to deny airfield access to any personnel, whom in the opinion of the Airport present a safety or security risk.

**001-1.27 VEHICLE IDENTIFICATION.** All Contractor vehicles shall have the company identification plainly visible on both sides of the vehicle in order to identify the vehicle and a unique and visible identification number or letter.

In addition, each Contractor's vehicle operating on the Airport or public roads shall be equipped with an amber flashing light. Each Contractor's motorized vehicle operating within the Airport or in the vicinity of an active runway approach shall be equipped with an amber flashing light and/or a three foot (3′) square flag consisting of international orange and white squares not less than one foot (1′) displayed in full view above the vehicle. Work during poor visibility conditions and at night will require ambler flashing light.

**001-1.28 ESCORT VEHICLES.** The Contractor shall provide an airfield escort for all vehicles requiring access to the work area locations which are not radio equipped and are crossing active Taxiways or Runways.

**0001-1.29 ESCORTS.** No Escorts will be needed on this project. The superintendent will inform all employees and subcontractors of safe airport operating procedures.

**01-1.30 WILDLIFE MANAGEMENT.** The Contractor shall be responsible to assist the Airport in the management of wildlife in the designated work areas to the satisfaction of the Engineer.

No wildlife attractants such as food scraps, grass seeds or ponded water shall remain on or near the Airport property. The Contractor shall be responsible for maintaining the construction site in the designated work areas to the satisfaction of the Engineer. Spotted wildlife shall be reported to Airport Operations.

**001-1.31 FOREIGN OBJECT DEBRIS (FOD) CONTROL PROVISIONS.** Waste and loose materials, commonly referred to as Foreign Object Debris (FOD) are capable of damaging aircraft and are a life safety concern. Contractors and their employees shall not leave or place FOD on or near active aircraft movement areas. Materials tracked onto these areas shall be continuously removed during the construction project.

The Contractor shall continuously monitor the active aircraft pavements for FOD and immediately, notify the Engineer and Airport operations if FOD is observed. With authorization, the Contractor will be responsible to remove or mitigate the FOD concern.

The Contractor shall have on-site at all times a sweeper which is capable of removing, to the satisfaction of the Engineer, any dirt or FOD tracked onto active pavements.

Prior to leaving the work site each night, the Contractor shall coordinate a FOD inspection with Airport Operations of all active pavement surfaces impacted by the construction activities that day and coordinate with Airport Operations the removal of any and all FOD encountered.

The Contractor shall take all necessary precautions to prevent FOD, including but not limited to covering dumpsters, securing store materials, cleaning tires prior to traveling on pavements, and other measures as directed by the Engineer.

**001-1.32 HAZARDOUS MATERIAL (HAZMAT) MANAGEMENT.** All hazardous and unsuitable materials, as identified on the Plans and Specifications or as removed by the Contractor, shall be legally disposed of by the Contractor off Airport property.

**001-1.33 INSPECTION REQUIREMENTS.** At the end of each workday, the Contractor shall coordinate with the engineer for an inspection of all active aircraft areas; construction work areas, temporary runway/taxiway markings, temporary visual aids, lighted barricades, runway lights (if required), runway/taxiway safety areas, runway/taxiway surfaces and other items to ensure that conditions allow for safe Airport operations to the satisfaction of the Airport prior to leaving the site for the day.

Any deficiencies encountered in the engineer inspection shall be remedied prior to the Contractor leaving the site for the day. The Contractor shall provide written daily reports of the inspection, noting deficiencies found and corrective action taken to remedy the deficiency.

**001-1.34 RADIO CONTROL.** The Contractor shall have reliable two-way communication between all work crews, the Resident Engineer and Airport Operations at all times. No FAA or other Airport radio frequency will be used for this purpose. Contractor provided radios or cellular phones will be considered acceptable.

The Contractor shall have on-site at all times radio equipped vehicles, at least one (1) per working crew, which shall be monitored by a competent individual at all times during working hours. The radio shall have a two-way radio capable of communicating over the UNICOM/CTAF active frequency. The radio shall be capable of reliable two-way communication from any location on the Airport.

The Contractor shall supplement the radio equipped vehicles, with handheld radios for when the radio equipped vehicles are not occupied. Before the start of daily activities, the Contractor shall perform a radio check to ensure radios are in proper working order.

**001-1.35 RESIDENT ENGINEER COMMUNICATION.** The Contractor shall supply the Engineer with one (1) two-way radio and mobile phone, set at the Contractor's frequency as specified above. At the end of the project, the radio or cell phone will revert back to the Contractor. At the option of the Contractor, a cell phone may be provided in place of a radio.

**001-1.36 ENGINEER'S AIRFIELD RADIOS.** The Contractor shall supply the Engineer for their use, one (1) Airport hand-held radios for two-way communications with the Airports frequencies as specified above. The radios shall be handheld units, supplied new, with spare batteries, exterior antennas (magnetic mount), ear plug, remote mike, belt carrying case and battery chargers. At the end of the project the radios will revert back to the Contractor.

**001-1.37 ENGINEER'S FIELD OFFICE AND EQUIPMENT.** Refer to Specification Section M-110.

**001-1.38 CONSTRUCTION LAYOUT.** The Engineer will provide layout information that includes horizontal and vertical control points. Prior to layout, the Contractor shall inverse between these points and satisfy to them self as to the accuracy of the control points provided. The layout for construction shall be the responsibility of the Contractor.

The Contractor shall furnish assistance to the Engineer as requested to check the layout or otherwise control the work. Such assistance shall be understood to include the provision of suitable manpower to assist the Engineer in taping measurements, holding a survey rod for checking grades and the like. The Contractor's obligations for layout and furnishing assistance to the Engineer shall be deemed incidental to the completion of the various work items and no separate payment will be made for such layout, final survey, and assistance.

Refer to Specification Section M-150 for additional requirements.

**001-1.39 MAINTENANCE OF THE CONSTRUCTION-SITE.** The Contractor shall keep the construction-site free of paper, boxes, and other debris, which could be blown onto the runways and taxiways. The Contractor's main staging area shall be supplied with a dumpster with cover. All Airport pavements shall be kept clear and clean at all times. All rocks, mud, and other debris carried onto the Airport pavement by the Contractor's equipment must be reported to the Engineer or the Owner. The Owner will then close the affected area to traffic and the Contractor will immediately sweep, wash, and/or vacuum the area to the satisfaction of the Owner.

The Contractor shall also be responsible for supplying any other equipment as may be necessary to clean all areas that are contaminated as a result of their operations to the complete satisfaction of the Engineer and the Owner.

Trucks loaded in the construction area shall have loads trimmed as necessary to assure that no particles, stones, or debris will fall off and that no legal load limits are exceeded.

The Contractor shall be particularly careful not to track foreign material onto pavements outside of and within the Airport. The Contractor shall be responsible for removing foreign materials from vehicle tires prior to the vehicle leaving its work area.

**001-1.40 WASTE REDUCTION AND RECYCLE PLAN.** The Contractor shall prepare a waste reduction and recycle plan which will specify how the Contractor intends to minimize and reduce waste and recycle waste materials for review by the Engineer.

**001-1.41 TEMPORARY WORK STOPPAGES.** Temporary work stoppages are subject to the approval of the Owner. If the Contractor desires to request a temporary work stoppage, it shall be made in writing to the owner. The request shall state the reason for temporary work stoppage request. It shall be understood that it is the Owner sole decision whether a temporary work stoppage request will be granted or denied.

The Owner reserve the right to order a temporary work stoppage for any reason deem by the Owner to be in the airports best interest. If the Owner does implement a temporary work stoppage, it shall be in writing to the contractor. No contract time will be incurred by the contractor for Temporary work stoppage ordered by the Owner. No additional compensation will be allowed for a temporary work stoppage ordered by the Owner.

The Contractor shall be responsible to secure and stabilize all areas disturbed by Contractor operations for the period of the shut down and maintain the site to the satisfaction of the Engineer. All erosion and sedimentation control measures shall be put in place and maintained and checked regularly through the course of the temporary work stoppage. The Contractor agrees to compensate the Owner for additional all additional soft costs No additional compensation will be allowed for temporary work stoppages.

**001-1.42 "AS-BUILT DRAWINGS" (RECORD DRAWINGS) AND FINAL SURVEY.**

A. The Contractor shall maintain at the site, a set of drawings on which shall be recorded accurately as the work progresses, the actual "As-Built" dimensions, areas, clearing methods and grades of all their work, indicating thereon all variations from the Plans. This record of "As-Built" conditions shall include the work of all Subcontractors. Notations on mechanical and electrical drawings shall include nameplate data for all installed equipment. These drawings shall be kept current and available for review by the Engineer at all times.

The Contractor shall record on the final "As-Built" drawings any unknown active or abandoned underground cables discovered during construction. If a cable is damaged during construction, the permanent repair must be clearly marked in full description on the "As-Built" drawings.

B. Prior to final acceptance of the work, the Contractor shall have a final survey made by a land surveyor licensed in the State the project is located. The final survey shall consist of

taking cross sections at the same stations as the design cross sections with elevations recorded at every location where a proposed grade was shown on the design cross section, at all changes in grade, at the top and toes of slopes, and at the limits of work. The survey shall include the distance from the construction baseline or centerline of each elevation, measured horizontally to the nearest 0.1 foot. The "As-Built" locations (station and offset from the construction baseline or centerline) and "As-Built" rim and invert elevations of all drainage structures and pipes and electrical structures will be included in the survey. The elevation of all pavements and structures and pipes shall be measured to the nearest 0.01 foot and elevation in turf area shall be measured to the nearest 0.1 foot and shall be based on NGVD MSL from the project benchmarks.

All "As-Built" information from the final survey shall be shown on the "As-Built" drawings. In addition, a copy of the electronic survey information prepared in a standard surveyor's format that can be easily followed and checked shall be provided.

The Contractor shall record on the final "As-Built" drawings any unknown active or abandoned underground cables discovered during construction. If a cable is damaged during construction, the permanent repair must be clearly marked in full description on the "As-Built" drawings.

C. The final "As-Built" drawings (Record Drawings) shall be submitted to the Engineer for review and shall be corrected by the Contractor as required. The "As-Built" drawings shall be completed and accepted by the Engineer before the time when the final payment shall be due and payable. The preparation of the "As-Built" drawings shall be deemed incidental to the completion of the various work items and no separate payment will be made for such.

**001-1.43 LIGHTED RUNWAY CLOSURE MARKERS AND BARRICADES.** Airfield Lighted Runway Closure Markers if required will be provided by the Contractor. The contractor will be required to assist the Airport in setting up and removal of the Runway Closed Markers as requested by the airport. The Lighted Runway Closure Maker shall be used anytime that the runway needs to be closed for work by the contractor that is within the Runway safety area and that work can't be performed within the Airports Prior Permission Required PPR rules.

Low profile Lighted barricades shall be provided by the Contractor. The Contractor shall assist the Airport of the set-up, adjustment, relocation and final removal of the low-profile barricades when requested by the Airport.

**001-1.44 MAINTENANCE OF THE EXISTING AIRFIELD LIGHTING.** The existing airfield lighting systems shall be maintained throughout construction (except for periods when the runway is closed). At the end of each day's construction activities, the Contractor shall assist the Engineer in a lighting check to verify that construction activities have not affected the operation of the airfield lights. All lights and signs on closed taxiway shall be covered during the duration of the phase.

**001-1.45 ACCEPTANCE TESTING.** All acceptance testing of materials required by various sections of the Specifications will be at no cost to the Contractor unless otherwise specified herein.

However, the Contractor will pay for the cost of any retesting required because the materials did not pass the acceptance tests.

**001-1.46 PROJECT PHOTOGRAPHS.** The Contractor shall furnish photographs of the project; the views shall be as directed or approved by the Engineer. The photographs shall show the project site prior to construction, the work in progress and the project site at the completion of work.

A minimum of forty-eight (48) digital, color photographs will be taken during each thirty (30) day period of the Contract.

At the completion of each thirty (30) day period of the project, the Contractor shall deliver to the Engineer two (2) color prints of each view. Each view shall be clearly labeled with the date, project, and identification of the view. The photos shall be placed in a black bound album, in chronological order, such that the descriptions can be read without removing the photos. In addition, electronic copies of the photos are to be provided.

At the completion of the Project, the Contractor shall have a color aerial photograph taken of the Airport. This photograph shall be taken with a mapping quality (cartographic) camera. The Contractor shall submit certification that the camera has been calibrated within the last three (3) years in accordance with USGS mapping standards. Photos shall not be obscured by cloud cover. Photos are to be clear, in focus, with high resolution and sharpness. Color shall be correct; overly green or washed-out photos will not be accepted. Snow cover will not be permitted. The view shall be vertical and shall include the entire Airport property. The contractor shall provide a contact print for approval of the Engineer and Owner prior to making the enlargements. The Contractor shall provide four (4) sets of enlargements at a minimum 40" x 40" at scale of 1" = 400'. Each enlargement is to be mounted on acid free gator board. **The Contractor shall submit to the Engineer prints of the photograph for approval prior to making the enlargements.**

In addition, oblique aerial color photographs taken from an altitude to completely cover just the site of the work, with sufficient detail to show the work from the four (4) different quadrants. If required, numerous photos may be taken to represent each view. The oblige photos may be taken from a high-resolution digital camera from a drone or plane. These photographs shall be taken after the completion of the work.

The Contractor shall provide a letter from the photographer transferring all rights to the photo to the Augusta State Airport. Electronic copies of the photographs shall be provided on CD, complete with labels, indicating the Airport, Project, AIP number, date of the photograph and what the photographs are. Photos shall be supplied in both high-resolution and in low-resolution.

**001-1.47 DAVIS-BACON AND WAGE COMPLIANCE.** This Project is subject to the requirements of the Davis-Bacon Act, The Contract Work Hours and Safety Act, The Copeland Act, and Fair Labor Standards Act.

The Contractor (also referred to as the Principal Contractor, Prime Contractor or General Contractor) is responsible for full compliance of all employers (the Contractor, Subcontractor, any/all lower-tier Subcontractors) with the labor standards and provisions applicable to this Project.

All certified payrolls shall be channeled through the Contractor. It shall be the Contractor's responsibility to review all Subcontractor, and any/all lower-tier Subcontractor's certified payrolls for compliance with the labor standards provisions applicable to this Project. Each Subcontractor and any/all lower-tier Subcontractors payroll submission shall be reviewed and stamped by the Contractor as "reviewed and found to be incompliance" prior to submission to the Engineer.

Certified payrolls shall be submitted in a format as prescribe by the law.

If the Project requires a work classification and rate that is not contained within the decisions or classifications contained within the Specifications, it shall be the Contractor's responsibility to request an additional classification(s) from the Department of the Labor. Failure of the decision to include a classification or wage determination does not relieve the Contractor from the obligation to meet applicable classification and wage rates. If additional wage rate requests are requested by the Contractor, the Contractor shall provide a copy of all correspondence and wage requests to the Engineer and the Airport Operator.

The Contractor shall post the Project's wage rate classifications at the work site, in a location approved by the Engineer prior to starting work.

The Owner is required to conduct employee interviews for compliance with the Davis-Bacon Wage requirements. The Contractor shall make employees available for interviews.

If it is necessary to make payment restitution to employee(s) the restitution shall be made independently of standard payroll. Documentation shall be provided which details the restitution action.

Certified payrolls shall be submitted and accepted prior to the acceptance of any Periodic Cost Estimates (PCEs) for the work period covered in the PCEs. Retainage for the project will not be released until all project certified payrolls have been submitted to and accepted by the Engineer.

**001-1.48 WORK FORCE UTILIZATION REPORTING.** The Contractor shall submit monthly work force utilization reports. The reports shall include the work force of the Contractor, Subcontractors, and lower tiered Subcontractors. The reports shall include the following:

- A list of all workers (including classification) that worked on the Project for the reporting period. This shall include all workers in addition to those employed on the

job site including, Principals, Project Managers, and other office staff.
- Number of hours worked on the project by each person listed for the reporting period.
- Totals shall be provided separately for the Contractor, Subcontractor and lower tiered Subcontractors.
- Total number of hours, including, the Contractor, Subcontractor, and lower-tiered Subcontractors.

Monthly utilization reports will be required prior to the acceptance of any Periodic Cost Estimate (PCE). Retainage for the project will not be released until all project work force utilization reporting has been submitted to and approved by the Engineer.

**001-1.49 MONTHLY DBE REPORTING.** The Contractor shall submit monthly Disadvantaged Business Enterprise (DBE) reports. The Contractor shall use the report form as included within this Specification. The report shall be submitted regardless of if any DBE participation took place during the period indicated.

The Contractor shall continually monitor their DBE participation on the Project. If it appears that the actual DBE participation will be lower than indicated in the Contractor's DBE Letter of Intent, the Contractor shall provide written notification, and indicate just reason for the change. The Contractor shall further provide additional Good Faith Effort documentation that effort was made to replace this DBE participation as outlined in the Supplemental General Provisions.

Monthly DBE reports will be required prior to the acceptance of any Periodic Cost Estimate (PCE). Retainage for the Project will not be released until all Project monthly DBE reporting documentation has been submitted to and approved by the Engineer.

**001-1.50 OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) DOCUMENTATION.** All employees to be employed at the job site shall have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration (OSHA) that is ten (10) hours in duration at the time the employee begins work.

The Contractor shall furnish documentation of successful completion of said course by either a copy of the OSHA card or a letter or certificate of completion from the person or company that administered the course. OSHA documentation shall be provided prior to any person beginning work on the site. It is recommended that Contractors and Subcontractors provide a copy of OSHA documentation for all employees prior to the start of work.

Periodic Cost Estimates will not be accepted for payment unless all OSHA documentation has been received. Retainage for the Project will not be released until all Project OSHA cards have been submitted to and approved by the Engineer.

**001-1.51 CONTRACT CHANGE ORDERS.** Any work to be included in this Project by Change Order must be approved by the State of Maine, FAA, and the Engineer. Any additional cost for change order work shall be at a fair and reasonable cost to the Owner. The Contractor shall provide a detailed breakdown of costs on all Change Order work. The break down shall use Contract unit prices, if available. If Contract unit prices are not available the Contractor shall provide a detailed breakdown of costs, indicating labor, equipment, and materials as separate line items and then sum together for a subtotal. Material costs shall include copies of supplier's quotes. Administrative costs, including but not limited to, office time and cost to increase the bonds or insurance will not be eligible for consideration in the change order. Labor costs for pricing Change Orders shall be actual rates including fringes without mark-up. Equipment costs shall be at standard industry rates, not to exceed rates as published by RS Means or other approved industry rate guideline.

Mark-up for overhead and profit shall be limited to ten (10) percent for the Contractor or Subcontractor performing the Change Order work. When a Subcontractor or lower-tiered Subcontractor is performing the Change Order work, each Subcontractor or Contractor above the firm performing the Change Order work shall be limited to a five (5) percent mark-up for overhead and profit. The total mark-up for any Change Order shall not exceed twenty (20) percent of the change order prior to the application of profit.

**001-1.52 SUBSTANTIAL COMPLETION.** Substantial Completion shall be achieved when work is complete, and the work areas can be occupied or utilized for their intended purpose by the Owner without interference or restrictions.

It shall be the Contractor's responsibility to inform the Engineer, in writing, when the Contractor believes the project is substantially completed. The Engineer and Owner maintain the sole right to accept the requested substantial completion date or reject it. If the date of substantial completion is accepted, the Owner will temporarily suspend Contract time effective at the end of the day on the date of substantial completion. On or after the date of substantial completion, the Engineer will submit to the Contractor, in writing, a punch list of deficiencies.

The Contractor shall complete all punch list work (both field work and administrative work) within thirty (30) calendar days of the receipt of the punch list from the Engineer. Within the thirty (30) calendar days, the Contractor can work on the site up to five (5) days. Should the field portions of the punch list work remain incomplete after five (5) days of work on the site, the Owner may restart the assessment of Contract time. If any of the punch list work, including administrative work, remains incomplete after thirty (30) calendar days, the Owner may restart the assessment of Contract time.

The resumption of contract time may result in the assessment of liquidated damages in accordance with Supplemental General Provisions.

If the Contractor feels that additional time is required for field work, administrative work, or both, they may submit a request for additional time in writing to the Engineer before the start of work on the punch list. The request must include supporting justification and a schedule to complete the

work. The Engineer and Owner maintain the sole right to accept the request for additional time or reject it. If no request for additional time is received by the engineer prior to the start of punch list work, it will be understood that the Contractor accepts the time frame outlined above.

The Owner reserves the right to add additional items to the punch list at any time. If the Contractor feels that additional time is required for the additional punch list item or items, they may submit a request for additional time in writing to the Engineer before the start of work on the additional punch list item or items. The request must include supporting justification and a schedule to complete the work. The Engineer and Owner maintain the sole right to accept the request for additional time or reject it. If no request for additional time is received by the engineer prior to the start of punch list work, it will be understood that the Contractor accepts the time frame outlined above.

**001-1.53 REQUIRED SUBMITTALS.** The following items must be submitted to the Engineer as part of this Specification section (along with all other submittals specifically referenced in the Plans and Specifications):

- Pre-Construction Video DVD
- Project Schedules
- Safety Plan Compliance Document (SPCD)
- Waste Reduction and Recycling Plan
- Construction Plan (detailing means and methods)
- Insurance Certificates
- Material Shop Drawings
- Project Photographs
- Aerial Photographs
- As-Built Plans
- Payroll Certifications
- Work Force Utilization Documentation
- Disadvantaged Business Enterprise Documentation
- OSHA Compliance Documentation
- Signed Contractor's Guarantee (after substantial completion)
- Lien Waiver

## METHOD OF MEASUREMENT

**001-2.1** No separate measurement for payment will be made for work under this item unless carried in other item specification. This work shall be considered incidental to the overall project.

## END OF SECTION M-001

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# ITEM M-120 MAINTENANCE AND PROTECTION OF TRAFFIC

## DESCRIPTION

**120-1.1 GENERAL.** This work shall consist of maintaining aircraft and vehicular traffic and protecting the public from damage to person and property within the limits of and for the duration of the Contract.

The Contractor shall comply with all guidelines regarding construction safety set forth in FAA Advisory Circular 150/5370-2G, *Operational Safety on Airports during Construction,* and Special Provisions.

The following items are specifically included without limiting the generality implied by these Specifications and the Contract Drawings.

- Preparation of the Safety Plan Compliance Document (SPCD) with submission to the Engineer and Airport for review and implementation.
- Installation, maintenance and removal of temporary work zone delineation markers, including the furnishing of stakes and cones.
- Installation, maintenance, and removal/restoration of any temporary haul routes/roads and staging areas.
- Installation, maintenance and removal of temporary or permanent barricades, warning signs, hazard markings and runway closure markings. The Contractor shall provide the barricades and safety devices and shall remain the Contractor's property as the completion of the project. The owner has two (2) daytime "X" that can be used on one (1) runway.
- Placement, operation and maintenance of four (4) lighted runway closure markers, two (2) of the light runway closed markers "X" will be provided by the Airport for use on one (1) runway, the other two (2) lighted runway closed markers are to be rented/purchased by the contractor. All operation and maintenance costs (i.e., bulbs, fuel, etc.) shall be provided by the Contractor.
- Placement of low-profile lighted barricades to be rented/purchased by the Contractor.
- Placement, maintenance and removal of temporary signage and pavement markings.
- Staged or phased construction.
- Off-peak construction periods.
- Temporary alteration or decommissioning of any existing Runway or Taxiway lighting, signage, or NAVAID.
- Locating and marking of existing underground lighting or other airfield circuits within the project work areas.
- Installation, maintenance, and removal of temporary lights and lighting circuits including lighted runway closure markings and "jumpers" for any circuit, as required.
- Installation, maintenance, and removal of temporary guidance sign coverings.
- Installation, maintenance, and removal of temporary lights and lighting.
- Testing and maintenance of existing, temporary, and new lighting circuitry Installation,

maintenance, and removal/restoration of any temporary haul routes and staging areas.

- Installation, maintenance, and removal of any temporary pavement tapers, transitions or temporary accesses to any airport facilities.
- Installation, maintenance, and removal of any temporary drainage, including, ditches, swales, piping and de-watering of work areas.
- Alteration, adjustment, maintenance of any drainage inlets, structures or systems necessary to maintain runway drainage during construction.
- Cleaning and maintenance of all areas within construction limits and haul routes or areas disturbed by the Contractor's operation via vacuum sweeper trucks.
- Restoration of all surfaces disturbed because of the Contractor's Operations, which are not otherwise paid for under a specific item, including but not limited to: haul roads, haul routes, staging areas, stockpile locations, and other areas outside of payment limits.

## METHOD OF MEASUREMENT

**120-2.1 MAINTENANCE AND PROTECTION OF TRAFFIC.** Payment for maintenance and protection of traffic will be made on a lump sum basis. The lump sum shall include all items required to satisfy this Specification. The Contractor will be required to submit a Schedule of Values for the Maintenance and Protection of Traffic items and provide a copy of this Schedule as part of the bid package.

## BASIS OF PAYMENT

**120-3.1 MAINTENANCE AND PROTECTION OF TRAFFIC.** The lump sum price bid for maintenance and protection of traffic shall include all equipment, materials, and labor necessary to adequately and safely maintain and protect traffic. Progress payments will be made for this item in proportion to the total amount of contract work completed, less any deductions for unsatisfactory maintenance and protection of traffic.

In the event the contract completion date is extended, no additional payment will be made for maintenance and protection of traffic.

No payment will be made under maintenance and protection of traffic for each calendar day during which there are substantial deficiencies in compliance with the Specification requirements of any subsection of this Section as determined by the Engineer. The amount of such calendar day non-payment will be determined by dividing the lump sum amount bid for maintenance and protection of traffic by the number of calendar days between the date the Contractor commences work and the date of completion as designated in this proposal, without regard to any extension of time.

If the Contractor fails to maintain and protect traffic adequately and safely for a period of four (4) hours, the Owner shall correct the adverse conditions by any means it deems appropriate and shall deduct the cost of the corrective work from any monies due the Contractor. The cost of this work shall be in addition to the liquidated damages and non-payment for maintenance and protection of traffic listed above.

However, where major non-conformance with the requirement of this Specification is noted by the Engineer and prompt Contractor compliance is deemed not to be obtainable, all contract work may be stopped by direct order of the Engineer regardless of whether corrections are made by the Owner as stated in the paragraph above.

Partial payments will be allowed as follows:

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

Payment will be made under:

Item M-120-1 Maintenance and Protection of Traffic – Lump Sum

**END OF SECTION M-200**

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# ITEM M-150 FIELD SURVEY AND STAKEOUT

## CONTRACT DOCUMENTS

**150-0.1** This section of these Specifications is a part of the Contract Documents as defined in the General Provisions. All applicable parts of the balance of the Contract Documents are equally as binding for this section as for all other sections.

Attention shall be directed to Paragraphs 1.38 Construction Layout and 1.42 "As-Built Drawings" (Record Drawings) and Final Survey of these Specifications entitled, Section M-001 "Special Work Requirements" for additional information.

## DESCRIPTION

**150-1.1** Under this item, the Contractor shall do all necessary surveying required to construct all elements of the Project as shown on the Contract Drawings and specified in the Proposal and Specifications. This shall include but not be limited to computations, checking existing baseline traverse, control points, stakeout, layout and elevations for pavements, structures, forms, pile layouts and appurtenances as shown and required, consistent with current practices and shall be performed by qualified personnel acceptable to the Engineer.

The stakeout survey shall proceed immediately following the award of the Contract and shall be expeditiously progressed to completion in a manner and at a rate satisfactory to the Engineer. The Contractor shall keep the Engineer fully informed as to the progress of the stakeout survey. **All survey fieldwork and computations shall be performed under the direction of a Licensed Land Surveyor, licensed in the State in which the project is located.**

In addition, the surveyor shall be experienced in:

1. Survey projects utilizing Global Positioning System (GPS) collection methods.
2. National Geodetic Survey (NGS) specifications, standards, and software.
3. Knowledge of the National Spatial Reference System (NSRS), NGS Continuously Operating Reference Stations (CORS), horizontal and vertical controls, and the High Accuracy Reference Network (HARN).
4. Using CORS data to establish geodetic ties to NSRS.
5. Establishing aerial photography, photo control points, reading and annotating information on aerial photography.
6. Recovering marks, setting marks, and writing station descriptions of survey marks to NGS standards.

**150-1.1** As part of the Final Survey and "As-Built" (Record) Drawings work, the surveyor shall include the requirements for providing aeronautical data collection and conversion associated with work Tasks herein. This includes but is not limited to collection of airfield features within the project limits for GIS conversion in accordance with FAA criteria.

## CONSTRUCTION METHODS AND MATERIALS

**150-2.1 PROTECTION OF EXISTING SURVEY CONTROL POINTS.** The Contractor shall protect all existing survey control points disturbance during construction. Any survey control point disturb

by the Contractor, shall be replace with a control point of equal accuracy and value at no additional cost to the Owner.

**150-2.2 SURVEY METHODS.** Conventional TPS survey methods are required for vertical stakeout, quality assurance checks during construction and basis for acceptance of construction. GPS survey methods will be allowed for rough grading during construction and horizontal stakeout only.

**150-2.3 SURVEY MATERIALS.** All survey equipment shall be properly calibrated according to the manufacturer's guidelines. All GPS survey equipment shall be certified as achieving the minimum standards by comparison to conventional survey methods.

All instruments, equipment, stakes, and any other material necessary to perform the work satisfactorily shall be provided by the Contractor. All stakes used shall be of a type approved by the Engineer. It shall be the Contractor's responsibility to maintain these stakes in their proper position and location at all times.

**150-2.5 SUBMITTALS.**

**Preconstruction:** The Contractor shall provide to the Engineer a submittal containing the overseeing surveyor's license and experience information demonstrating qualifications for construction stakeout personnel. In addition, the submittal shall include a complete list of the survey equipment (mfg. make and model) proposed for use during the project, including the equipment calibration certification. Construction: Contractor shall provide survey computations in the form of surface elevations at the grid locations to the Engineer for approval before beginning the next construction operation. Construction of the next phase shall not commence until the submittal is approved by the Engineer. All construction submittals of grade information by the Contractor shall be signed and sealed by a licensed land surveyor.

**Postconstruction:** The Contractor submit all collected data (in AutoCAD format), and associated required deliverables specified in FAA AC 150/5300-18B. This includes, but is not limited to:

1. Survey Quality Control Plan (completed prior to the start of Final Survey work)
2. Final Project Report
3. Documentation required for each feature as defined by Chapter 5 of FAA AC 150/5300-18B
4. All final processing, adjustment, or reduction files used to produce the final data. This includes the results of independent software files produced during the reduction of the final data, and any other product necessary to recreate the data.

## CONSTRUCTION DETAILS

**150-3.1 GENERAL.** The position of all work shall be established from control points, baseline traverse points or other points of similar nature which are shown on the Contract Drawings and/or modified by the Contractor. Prior to layout, the Contractor shall inverse between these points and satisfy to them self as to the accuracy of the control points provided. Any error, apparent discrepancy or absence in or of data shown or required for accurately accomplishing the stakeout survey shall be referred to the Engineer for interpretation or furnishing when such is observed or required. The Engineer shall be made aware of any discrepancies between the topographical information shown on the contract drawings and the Contractor survey before construction commences.

The Contractor shall place references marks at each baseline station and quarter stations and at such intermediate locations as the Engineer may direct. Offset marks shall be installed at a maximum of 50-foot intervals, unless otherwise noted, with 25-foot maximum intervals required for pavement areas. From computations and measurements made by the Contractor, these marks shall be clearly and legibly marked with the correct centerline station number, offset and cut or fill so as to permit the establishment of the exact baseline location and elevation during construction. If markings become faded or blurred for any reason, the markings shall be restored by the Contractor. Contractor shall locate and place all cut, fill, slope, fine grade, structures or other stakes and points, as the Engineer may direct, for the proper progress of the work. All control points shall be properly guarded and flagged for easy identification.

During the progress of the construction work, the Contractor will be required to furnish all of the surveying and stakeout incidental to establish the proper location by line and grade for each phase of the work. For paving and any other operation requiring extreme accuracy, the Contractor will re-stake with pins or other acceptable hubs located directly adjacent to the work at a spacing directed by the Engineer.

The Contractor shall be responsible for the accuracy of his work and shall maintain all reference points, stakes, etc., throughout the life of the Contract. Damaged or destroyed points, benchmarks, or stakes, or any reference points made inaccessible by the progress of the construction, shall be replaced or transferred by the Contractor. All control points shall be referenced by ties to acceptable objects and recorded. Any alterations or revisions in the ties shall be so noted and the information furnished to the Engineer immediately. All stakeout survey work shall be referenced to the baseline shown on the Contract Drawings. All computations necessary to establish the exact position of the work from control points shall be made and preserved by the Contractor. All computations, survey notes and other records necessary to accomplish the work, shall be neatly made. Such computations, survey notes and other records shall be made available to the Engineer and shall become the property of the Owner.

The Contractor shall perform complete construction survey, stakeout and cross sections of the proposed work area, prior to any excavation, after excavation or embankment placement, subbase placement, cold milling, and successive asphalt courses are completed. Construction survey shall be based upon a maximum 25–foot grid, unless otherwise noted, based upon the horizontal and vertical control lines provided on the plans.

The Engineer may check all, or any portion of the stakeout survey work or notes made by the Contractor. Any necessary correction to the work shall be made immediately by the Contractor. Such checking by the Engineer shall not relieve the Contractor of any responsibilities for the accuracy or completeness of his work. The Contractor shall furnish assistance to the Engineer as requested to check the layout or otherwise control the work. Such assistance shall be understood to include the provision of suitable manpower to assist the Engineer in taping measurements, holding a survey rod for checking grades and the like. The Contractor's obligations for layout, final survey and furnishing assistance to the Engineer shall be deemed incidental to the completion of the various work items and no separate payment will be made for such layout, final survey and assistance.

**150-3.2 DATA COLLECTION.** The Contractor shall ensure that all relevant layers/features are collected and/or converted in accordance with FAA AC 150/5300-18B.

**150-3.3 TOLERANCES.** All surveys shall meet the following tolerances. Contractor shall provide verification that acceptable tolerances are obtained.

Pavement: All stakes, points or locations shall be set within 0.08 foot horizontally and 0.02 foot vertically of calculated position.

Drainage Structures: All stakes, points or locations shall be set within 0.08 foot horizontally and 0.05 foot vertically of calculated position.

Earthwork: All stakes, points or locations shall be set within 0.1 foot horizontally and 0.1 foot vertically of calculated position

Permanent Runway End Survey Points shall be set within 0.05 foot horizontal and 0.01 foot vertical.

**150-3.4 PERMANENT RUNWAY END BRASS CONTROL DISK.** Not Used.

**150-3.5 ACCEPTANCE.** The Engineer reserves the right to perform an independent survey for basis of acceptance and payment purposes.

## METHOD OF MEASUREMENT

**150-4.1 Project Survey and stakeout**: Measurement will be made based on the percent progression of the work on a basis of project completion, at the discretion of the RPR, at the lump sum price amount for this item.

Also, the final ten percent (10%) of the lump sum payment will not be released for final measurement until the Record Drawings have been submitted and accepted by the Engineer and the RPR.

**In addition, the Field Survey and Record Drawings shall be limited to a maximum of one-half percent (0.5%) of the total project bid cost.**

## BASIS OF PAYMENT

**150-5.1 Project Survey and stakeout.** Payment for the lump sum price amount shall include the cost of furnishing all labor, equipment, instruments, and all other material necessary to satisfactorily complete the project surveying and stakeout, as well as the final submission of Record Drawings.

As noted above under Method of Measurement, partial payments for the percent progression shall be made at the discretion of the RPR as the work progresses.

**Payment will be made under:**

| | | |
|---|---|---|
| Item M-150-5.1 | Project Survey and Stakeout | Per Lump Sum |

## REFERENCE DOCUMENTS

Federal Aviation Administration (FAA) Advisory Circulars (AC):

| | |
|---|---|
| 150/5300-16A | General Guidance and Specifications for Aeronautical Surveys: Establishment of Geodetic Control and Submissions to the National Geodetic Survey |
| 150/5300-17C | Standards for Using Remote Sensing Technologies in Airport Surveys |
| 150/5300-18B | General Guidance and Specifications for Aeronautical Surveys to NGS: Field Data Collection and Geographic Information System (GIS) Standards |

**END OF SECTION M-150**

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# 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 four inches (4"). 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 which is not part of ITEM P-207 IN-PLACE FULL DEPTH RECYCLED (FDR) APHALT AGGREGATE BASE 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 stockpiled (wasted) on the airport, it shall be meet the following gradation:

Gradation for Pavement Removal

| Sieve Size | Percent Passing By Weight |
|---|---|
| 3 in (75 mm) | 100 |
| 1-1/2 in (37.5 mm) | 80 – 100 |
| 3/4 in (19.0 mm) | 55 - 90 |
| No. 4 (4.75 mm) | 40 - 70 |

**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 (25 mm). 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 (6 mm) 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 (3 mm), not to exceed ¼ inch (6 mm). Any excess joint or crack sealer shall be removed from the pavement surface.

Wider cracks (over 1-1/2 inch wide (38 mm)), 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 void less mass. The joint or crack shall be filled to within +0 to -1/8 inches (+0 to -3 mm) 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, sealcoat 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 and 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 wastes 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.**

**a. Repair of concrete spalls in areas to be overlaid with asphalt.** The Contractor shall repair all spalled concrete as shown on the plans or as directed by the RPR. The perimeter of the repair shall be saw cut a minimum of 2 inches (50 mm) outside the affected area and 2 inches (50 mm) deep. The deteriorated material shall be removed to a depth where the existing material is firm or cannot be easily removed with a geologist pick. The removed area shall be filled with asphalt mixture with aggregate sized appropriately for the depth of the patch. The material shall be compacted with equipment approved by the RPR until the material is dense and no movement or marks are visible. The material shall not be placed in lifts over 4 inches (100 mm) in depth. This method of repair applies only to pavement to be overlaid.

**b. Asphalt pavement repair.** The Contractor shall repair all spalled concrete as shown on the plans or as directed by the RPR. The failed areas shall be removed as specified in paragraph 101-3.1b. All failed material including surface, base course, subbase course, and subgrade shall be removed. Materials and methods of construction shall comply with the applicable sections of these specifications.

**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 in areas designated on the plans. 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 (30 cm) 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 (2m), 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 (+0 mm and -6mm) 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 of off Airport property.

**101-3.6. Preparation of asphalt pavement surfaces prior to surface treatment.** Existing asphalt pavements to be treated with a surface treatment shall be prepared as follows:

**a.** Patch asphalt pavement surfaces that have been softened by petroleum derivatives or have failed due to any other cause. Remove damaged pavement to the full depth of the damage and replace with new asphalt pavement similar to that of the existing pavement in accordance with paragraph 101-3.4b.

**b.** Repair joints and cracks in accordance with paragraph 101-3.2.

**c.** Remove oil or grease that has not penetrated the asphalt pavement by scrubbing with a detergent and washing thoroughly with clean water. After cleaning, treat these areas with an oil spot primer.

**d.** Clean pavement surface immediately prior to placing the surface treatment so that it is free of dust, dirt, grease, vegetation, oil or any type of objectionable surface film.

**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.** 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 joint and does not damage the joint.

**101-3.8.1 Removal of Existing Joint Sealant**. All existing joint sealants will be removed by plowing or use of hand tools. Any remaining sealant and or debris will be removed by use of wire brushes or other tools as necessary. Resaw joints removing no more than 1/16 inch (2 mm) from each joint face. Immediately after sawing, flush out joint with water and other tools as necessary to completely remove the slurry.

**101-3.8.2 Cleaning prior to sealing**. Immediately before sealing, joints shall be cleaned by removing any remaining laitance and other foreign material. Allow sufficient time to dry out joints prior to sealing. Joint surfaces will be surface-dry prior to installation of sealant.

**101-3.8.3 Joint sealant.** Joint material and installation will be in accordance with Item P-605.

**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 router by removing a minimum of 1/16 inch (2 mm) 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 routing. Following routing 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.** Where indicated on the plans or as directed by the RPR, inlets and/or 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 , 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 (square meters) 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. Saw cutting shall be incidental to pavement removal. Dowel bar installation shall be incidental to pavement removal.

**101-4.6 Cold milling.** The unit of measure for cold milling shall be up to four (4)inches of milling per square yard (square meter). 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.**]**

**101-4.7 Removal of Pipe and other Buried Structures.** The unit of measurement for removal of pipe and other buried structures will be lump sum. No separate measurement for payment will be made. The work covered by this section shall be considered as a subsidiary obligation of the Contractor and covered under the other contract items.

## 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 (square meter) |
| Item P-101-5.6 | Cold Milling **–** per square yard (square meter) |
| Item P 101-5.7 | Removal of Pipes and Other Buried Structures - per LS |

## 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**

# Item P-151 Clearing and Grubbing

## DESCRIPTION

**151-1.1** This item shall consist of clearing or clearing and grubbing, including the disposal of materials, for all areas within the limits designated on the plans or as required by the Resident Project Representative (RPR).

**a. Clearing** shall consist of the cutting and removal of all trees, stumps, brush, logs, hedges, the removal of fences and other loose or projecting material from the designated areas. The grubbing of stumps and roots will not be required.

**b. Clearing and grubbing** shall consist of clearing the surface of the ground of the designated areas of all trees, stumps, down timber, logs, snags, brush, undergrowth, hedges, heavy growth of grass or weeds, fences, structures, debris, and rubbish of any nature, natural obstructions or such material which in the opinion of the RPR is unsuitable for the foundation of strips, pavements, or other required structures, including the grubbing of stumps, roots, matted roots, foundations, and the disposal from the project of all spoil materials resulting from clearing and grubbing.

**c. Tree Removal.** Tree Removal shall consist of the cutting and removal of isolated single trees or isolated groups of trees, and the grubbing of stumps and roots. The removal of all the trees of this classification shall be in accordance with the requirements for the particular area being cleared.

## CONSTRUCTION METHODS

**151-2.1 General.** The areas denoted on the plans to be cleared and grubbed shall be staked on the ground by the Contractor as indicated on the plans.

The removal of existing structures and utilities required to permit orderly progress of work shall be accomplished by local agencies, unless otherwise shown on the plans. Whenever a telephone pole, pipeline, conduit, sewer, roadway, or other utility is encountered and must be removed or relocated, the Contractor shall advise the RPR who will notify the proper local authority or owner to secure prompt action.

**151-2.1.1 Disposal.** All materials removed by clearing or by clearing and grubbing shall be disposed of outside the Airport's limits at the Contractor's responsibility, except when otherwise directed by the RPR. As far as practicable, waste concrete and masonry shall be placed on slopes of embankments or channels. When embankments are constructed of such material, this material shall be placed in accordance with requirements for formation of embankments. Any broken concrete or masonry that cannot be used in construction and all other materials not considered suitable for use elsewhere, shall be disposed of by the Contractor. In no case, shall any discarded materials be left in windrows or piles adjacent to or within the airport limits. The manner and location of disposal of materials shall be subject to the approval of the RPR and shall not create an unsightly or objectionable view. When the Contractor is required to locate a disposal area outside the airport property limits, the Contractor shall obtain and file with the RPR permission in writing from the property owner for the use of private property for this purpose.

**151-2.1.2 Blasting.** Blasting and explosive storage shall be in accordance with Section 70, paragraph 70-09 and all federal, state, and local safety regulations. Submit notice 15 days prior

to starting work. Submit a Blasting Plan, prepared and sealed by a registered professional Engineer, that includes calculations for overpressure and debris hazard. Obtain written approval prior to performing any blasting and notify the RPR 24 hours prior to blasting. Include provisions for storing, handling and transporting explosives as well as for the blasting operations in the plan. The Contractor is responsible for damage caused by blasting operations.

**151-2.2 Clearing.** The Contractor shall clear the staked or indicated area of all materials as indicated on the plans. Trees unavoidably falling outside the specified clearing limits must be cut up, removed, and disposed of in a satisfactory manner. To minimize damage to trees that are to be left standing, trees shall be felled toward the center of the area being cleared. The Contractor shall preserve and protect from injury all trees not to be removed. The trees, stumps, and brush shall be cut flush with the original ground surface. The grubbing of stumps and roots will not be required.

Fences shall be removed and disposed of as directed by the RPR. Fence wire shall be neatly rolled and the wire and posts stored on the airport if they are to be used again, or stored at a location designated by the RPR if the fence is to remain the property of a local owner or authority.

**151-2.3 Clearing and grubbing.** In areas designated to be cleared and grubbed, all stumps, roots, buried logs, brush, grass, and other unsatisfactory materials as indicated on the plans, shall be removed, except where embankments exceeding 3-1/2 feet (105 cm) in depth will be constructed outside of paved areas. For embankments constructed outside of paved areas, all unsatisfactory materials shall be removed, but sound trees, stumps, and brush can be cut off flush with the original ground and allowed to remain. Tap roots and other projections over 1-1/2 inches (38 mm) in diameter shall be grubbed out to a depth of at least 18 inches (0.5 m) below the finished subgrade or slope elevation.

Any buildings and miscellaneous structures that are shown on the plans to be removed shall be demolished or removed, and all materials shall be disposed of by removal from the site. The cost of removal is incidental to this item. The remaining or existing foundations, wells, cesspools, and like structures shall be destroyed by breaking down the materials of which the foundations, wells, cesspools, etc., are built to a depth at least 2 feet (60 cm) below the existing surrounding ground. Any broken concrete, blocks, or other objectionable material that cannot be used in backfill shall be removed and disposed of at the Contractor's expense. The holes or openings shall be backfilled with acceptable material and properly compacted.

All holes in embankment areas remaining after the grubbing operation shall have the sides of the holes flattened to facilitate filling with acceptable material and compacting as required in Item P-152. The same procedure shall be applied to all holes remaining after grubbing in areas where the depth of holes exceeds the depth of the proposed excavation.

## METHOD OF MEASUREMENT

**151-3.1** No separate measurement for payment shall be made for clearing or clearing and grubbing on this project but rather it shall be considered incidental to the Item P-152-4.1a Unclassified excavation.

## END OF ITEM P-151

# 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 disposal of all material, regardless of its nature which is not otherwise classified and paid for under one of the following items.

**b. Rock excavation**. Rock excavation shall include all solid rock in ledges, in bedded deposits, in unstratified masses, and conglomerate deposits which are so firmly cemented they cannot be removed without blasting or using rippers. All boulders containing a volume of more than 1/2 cubic yard (0.4 $m^3$) will be classified as "rock excavation."

**c. Muck excavation**. Muck excavation shall consist of the removal and disposal of deposits or mixtures of soils and organic matter not suitable for foundation material. Muck shall include materials that will decay or produce subsidence in the embankment. It may consist of decaying stumps, roots, logs, humus, or other material not satisfactory for incorporation in the embankment.

**152-1.3 Unsuitable excavation.** Unsuitable material shall be disposed in designated waste areas as shown on the plans. Materials containing vegetable or organic matter, such as muck, peat, organic silt, or sod shall be considered unsuitable for use in embankment construction. Material suitable for topsoil may be used on the embankment slope when approved by the RPR.

## 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 will be permitted as directed by the RPR and in accordance with the following:

Blasting will be permitted only when proper precautions are taken for the safety of all persons, work, and property. All damage done to the work or property shall be repaired by the Contractor. The cost of repair is incidental to this item. All operations of the Contractor in connection with the transportation, storage, and use of explosives shall conform to all federal, state and local regulations and explosive manufacturers' instructions, with applicable approved permits reviewed by the RPR. Any approval will not relieve the Contractor of their responsibility in blasting operations.

Where blasting is approved, the Contractor shall employ a vibration consultant, approved by the RPR, to advise on explosive charge weights per delay and to analyze records from seismograph recordings. The seismograph shall be capable of producing a permanent record of the three components of the motion in terms of particle velocity, and in addition shall be capable of internal dynamic calibration.

In each distinct blasting area, where pertinent factors affecting blast vibrations and their effects in the area remain the same, the Contractor shall submit a blasting plan of the initial blasts to the RPR for approval. This plan must consist of hole size, depth, spacing, burden, type of explosives, type of delay sequence, maximum amount of explosive on any one delay period, depth of rock, and depth of overburden if any. The maximum explosive charge weights per delay included in the plan shall not be increased without the approval of the RPR.

The Contractor shall keep a record of each blast: its date, time and location; the amount of explosives used, maximum explosive charge weight per delay period, and, where necessary, seismograph records identified by instrument number and location.

Blasting and explosive storage shall be in accordance with Section 70, paragraph 70-09 and all federal, state, and local safety regulations.

These records shall be made available to the RPR on a monthly basis or in tabulated form at other times as required.

**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 off the airport. 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 Muck 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 rock 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.** Borrow areas are not required.

**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 (150 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.

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 contractor 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 ASTM D 1557. A new Proctor shall be developed for each soil type based on visual classification.

Density tests will be taken by the RPR for every 3,000 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 100% of maximum density for non-cohesive soils, and 95% 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% 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 tests. 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.** Not Used.

**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 **p**ercent 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 (300 mm) and to a density of not less than 95 percent 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 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 1,000 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 be 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 cross-sections and the final theoretical pay line established by cross-sections shown on the plans, subject to verification by the RPR.

**152-3.1** The quantity of unclassified, rock**,** and muck excavation to be paid for shall be the number of cubic yards (cubic meters) 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.

## BASIS OF PAYMENT

**152-4.1** Unclassified excavation, Rock Excavation**, and** Muck Excavation payment shall be made at the contract unit price per cubic yard (cubic meter). This price shall be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item.

**Payment will be made under:**

| | |
|---|---|
| Item P-152-4.1a | Unclassified Excavation - per cubic yard |
| Item P-152-4.1b | Rock Excavation - per cubic yard |
| Item P-152-4.1c | Muck Excavation - 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

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**

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# Item P-207 In-place Full Depth Reclamation (FDR)
# Recycled Asphalt Aggregate Base Course

## DESCRIPTION

**207-1.1** This item consists of a recycled asphalt aggregate base course resulting from the in-place full depth reclamation (FDR) of the existing pavement section (asphalt wearing surface and aggregate base), plus mechanical stabilization with additional aggregate or chemical stabilization with cement, asphalt emulsion or fly ash when required.

## MATERIALS

**207-2.1 Aggregate.** The FDR shall consist of materials produced by recycling (pulverizing and mixing) the existing asphalt pavement, aggregate base, subgrade, and any additional aggregate as necessary. Material larger than 2 inches in any dimension shall not be permitted in the recycle asphalt aggregate base course.

The FDR shall meet the gradation in the table below.

**FDR Gradation**

| Sieve | Minimum Percentage by weight passing sieves |
|---|---|
| 2 inch (51 mm) | 100 |
| No. 4 (4.75 mm) | 55 |
| No. 200 (75 µm) | 0-10 |

**a. Deleterious substances.** Materials for aggregate base shall be kept free from weeds, sticks, grass, roots and other foreign matter.

**b. Uniformity**. The materials shall be thoroughly recycled (pulverized and mixed) to ensure a uniform gradation.

**207-2.2 Stabilization.**

**a. Mechanical stabilization.** Addition of corrective aggregate material to adjust gradation shall be equivalent to P-208 Coarse Aggregate or better.

**207-2.3 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.

**207-2.4 Quality Control (QC) Sampling and testing.** The Contractor shall take at least two FDR samples per day of production in the presence of the Resident Project Representative (RPR) to check the gradation. Sampling shall be per ASTM D75. Material shall meet the requirements in paragraph 207-2.1. Samples shall be taken from the in-place, un-compacted material at random sampling locations per ASTM D3665.

## CONSTRUCTION METHODS

**207-3.1 Milling**. Milling is not required.

**207-3.2 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. 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. Upon acceptance of the control strip 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.

**207-3.3 Recycling (Pulverization and mixing)**. The asphalt pavement, aggregate base and subgrade shall be recycled (pulverized and mixed) into a uniformly blended mixture with three (3) inches (75 mm) of P-208 Coarse Aggregate Base by dry unit weight and water to the depth indicated on the plans. All material over approximately 2 inches (50 mm) shall be removed by the Contractor. The mixture shall be brought to the desired moisture content.

The maximum lift thickness of the recycled aggregate base course material to be compacted shall be 12 inches (300 mm).

**207-3.4 Grading and compaction**. Immediately upon completion of recycling (pulverization and mixing), the material shall be shaped and graded in accordance with the project plans. The recycled asphalt aggregate base course shall be compacted within the same day to an in-place density of 100% as determined by ASTM D1557. The moisture content of the material during compaction shall be within ±2% of the optimum moisture content as determined by ASTM D2216. The number, type and weight of rollers shall be sufficient to compact the material to the required density. Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.

**207-3.5 Finishing**. The surface of the aggregate base course shall be finished by blading or with automated equipment designed for this purpose. If the top layer is 1/2 inch (12 mm) or more below grade, the top layer shall be scarified to a depth of at least 3 inches (75mm), new material added, and the layer blended and re-compacted to bring it to grade. The addition of layers less than 3 inches (75mm) shall not be allowed.

**207-3.6 Proof rolling.** Compacted asphalt aggregate base course shall be proof rolled with a tandem axle dual wheel dump truck loaded to the legal limit with tires inflated to 80 psi (550 kPa) in the presence of the RPR. Soft areas that deflect greater than 0.5 inch (12 mm) or show permanent deformation greater than 0.5 inch (12 mm) shall be removed and reworked at the Contractor's expense.

**207-3.7 Weather limitations.** When weather conditions detrimentally affect the construction process and/or quality of the materials, the Contractor shall stop construction. Cement or fly ash shall not be applied when wind conditions affect the distribution of the materials. When the aggregates contain frozen materials or when the underlying course is frozen or wet, the construction shall be stopped. Construction shall not be performed unless the atmospheric temperature is above 35°F (2°C) and rising or approved by the RPR. When the temperature falls below 35°F (2°C), protect all completed areas against detrimental effects of freezing by approved methods. Correct completed areas damaged by freezing, rainfall, or other weather conditions to meet specified requirements.

**207-3.8 Maintenance.** The asphalt aggregate base course shall be maintained in a satisfactory condition until the work is accepted by the RPR. Equipment used in the construction of an adjoining section may be routed over completed sections of asphalt aggregate base course, provided that no damage results and equipment is routed over the full width of the completed asphalt aggregate base course. Any damage to the recycled asphalt aggregate base course shall be repaired by the Contractor at the Contractor's expense.

**207-3.9 Surface tolerances.** The finished surface shall be tested for smoothness and accuracy of grade. Any area failing smoothness or grade shall be scarified to a depth of at least 3 inches (75 mm), reshaped and re-compacted by the Contractor at the Contractor's expense.

**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 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.

**207-3.10 Acceptance sampling and testing for density.** FDR base course shall be accepted for density and thickness on an area basis. One (1) test for density and thickness will be made for each 1200 square yds (1000 square meters). Sampling locations will be determined on a random basis in accordance with ASTM D3665.

**a. Density**. The RPR shall perform all density.

Each area will be accepted for density when the field density is at least 100% of the maximum density of the FDR base course in accordance with ASTM D1557. 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. 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.** The thickness of the base course shall be within +0 and -1/2 inch (12 mm) of the specified thickness as determined by depth tests taken by the Contractor 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, and recompacted to grade. The Contractor shall replace, at his expense, base material where depth tests have been taken.

## METHOD OF MEASUREMENT

**207-4.1** The quantity of FDR asphalt aggregate base course shall be measured by the number of square yards ($m^2$) of material in compliance with the plans and specifications.

**207-4.2** The quantity of corrective aggregate material shall be measured by the ton.

## BASIS OF PAYMENT

**207-5.1** Payment shall be made at the contract unit price per square yard ($m^2$) for recycling the existing asphalt pavement, aggregate base course, subgrade and mixing with stabilizing agent, if required, spreading, compacting, and maintaining the recycled material to the compacted thickness as indicated on the drawings. This price shall be full compensation for furnishing all materials, for preparing and placing these materials, and for all labor, equipment tools and incidentals to complete the item.

Payment will be made under:

| | |
|---|---|
| Item P-207-5.1 | In-place Full Depth Recycled (FDR) asphalt aggregate base course – per square yard ($m^2$) |

**207-5.2** Payment shall be made at the contract unit price per ton (kg) for the stabilizing agent.

| | |
|---|---|
| Item P-207-5.2 | Corrective Aggregate Material - 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 | Unit Weight of Aggregate |
| ASTM C88 | Soundness of Aggregates by Use of Sodium or Magnesium Sulfate |
| ASTM C117 | Materials Finer than 75-µm (No. 200) Sieve in Mineral Aggregate by Washing |
| ASTM C131 | Resistance to abrasion of Small Size Coarse Aggregate by Use of Los Angeles Machine |
| ASTM C136 | Sieve or Screen Analysis of Fine and Coarse Aggregate |
| ASTM C150 | Standard Specification for Portland Cement |
| ASTM C595 | Standard Specification for Blended Hydraulic Cements |
| ASTM C1602 | Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete |
| ASTM D75 | Sampling Aggregate |
| ASTM D558 | ASTM D558 Standard Test Methods for Moisture-Density (Unit Weight) Relations of Soil-Cement Mixtures |
| ASTM D698 | Moisture Density Relations of Soils and Aggregate using 5.5 lb Rammer and 12 in drop. |
| ASTM D977 | Standard Specification for Emulsified Asphalt |

| | |
|---|---|
| ASTM D1556 | Test Method for Density and Unit Weight of Soil in Place by the Sand Cone Method |
| ASTM D1557 | Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort |
| ASTM D2216 | Test Methods for Laboratory Determination of Water (Moisture) Soil and Rock by Mass |
| ASTM D2419 | Test Method for Sand Equivalent Value of Soils and Fine Aggregate |
| ASTM D2487 | Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System) |
| 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 D4751 | Standard Test Methods for Determining Apparent Opening Size of a Geotextile |
| 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) |
| American Association of State Highway and Transportation Officials (AASHTO) | |
| M288 | Standard Specification for Geosynthetic Specification for Highway Applications |

**END OF ITEM P-207**

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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:<br>12% maximum using Sodium sulfate - or -<br>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:<br>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):<br>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. |

**b.** [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.

**c.** [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).

**d.** [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:<br>10% maximum using Sodium sulfate - or -<br>15% maximum using magnesium sulfate | ASTM C88 |
| Clay lumps and friable particles | 1.0% maximum | ASTM C142 |
| Sand equivalent | 45 minimum | ASTM D2419 |
| | | |

**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) 70-28.

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 a Marshall compactor in accordance with ASTM D6926.

Should a change in sources of materials be made, a new JMF must be submitted to the 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 45 days prior to the start of paving operations. The JMF shall be developed within the same construction season using aggregates proposed for project use.

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

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

- Number of blows or 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 blows or 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)[2,3] | Less than 10 mm @ 4000 passes | AASHTO T340 at 250 psi hose pressure at 64°C test temperature |

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

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

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

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

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

**Table 2. Aggregate - Asphalt Pavements**

| Sieve Size | Percentage by Weight Passing Sieve |
|---|---|
| 1 inch (25.0 mm) | -- |
| 3/4 inch (19.0 mm) | 100 |
| 1/2 inch (12.5 mm) | 90-100 |
| 3/8 inch (9.5 mm) | 72-88 |
| No. 4 (4.75 mm) | 53-73 |
| No. 8 (2.36 mm) | 38-60 |
| No. 16 (1.18 mm) | 26-48 |
| No. 30 (600 µm) | 18-38 |
| No. 50 (300 µm) | 11-27 |
| No. 100 (150 µm) | 6-18 |
| No. 200 (75 µm) | 3-6 |
| **Minimum Voids in Mineral Aggregate (VMA)[1]** | 15.0 |
| **Asphalt Percent:** | |
| Stone or gravel | 5.0-7.5 |
| Slag | 6.5-9.5 |
| **Recommended Minimum Construction Lift Thickness** | 2 inch |

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

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

**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 17.5 feet (m) 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).On areas where irregularities or unavoidable obstacles make

the use of mechanical spreading and finishing equipment impractical, the asphalt may be spread and luted by hand tools.

The 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. 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 (3.7 m) "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 either 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 by the end of the following working day.

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 D6926.

**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 operation 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**.**

**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.

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.

## 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 (kg) 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-401-8.1 Asphalt Surface 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 D6927 | Standard Test Method for Marshall Stability and Flow of Bituminous Mixtures |
| ASTM D6995 | Standard Test Method for Determining Field VMA based on the Maximum Specific Gravity of the Mix (Gmm) |
| ASTM E11 | Standard Specification for Woven Wire Test Sieve Cloth and Test Sieves |
| ASTM E178 | Standard Practice for Dealing with Outlying Observations |
| ASTM E1274 | Standard Test Method for Measuring Pavement Roughness Using a Profilograph |
| ASTM E950 | Standard Test Method for Measuring the Longitudinal Profile of Traveled Surfaces with an Accelerometer Established Inertial Profiling Reference |
| ASTM E2133 | Standard Test Method for Using a Rolling Inclinometer to Measure Longitudinal and Transverse Profiles of a Traveled Surface |

American Association of State Highway and Transportation Officials (AASHTO)

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

Asphalt Institute (AI)

Asphalt Institute Handbook MS-26, Asphalt Binder

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

AI State Binder Specification Database

Federal Highway Administration (FHWA)

Long Term Pavement Performance Binder Program

Advisory Circulars (AC)

| | |
|---|---|
| AC 150/5320-6 | Airport Pavement Design and Evaluation |

FAA Orders

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

Software

FAARFIELD

**END OF ITEM P-401**

# 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 (liter). 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 (liter) 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-603-5.1 | Emulsified Asphalt Tack Coat - per gallon (liter) |

## 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 D6690 Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.

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, 30 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.** Sandblasting is not allowed.

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

**g. 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 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 be measured by the **linear** foot (meter) of sealant in place, completed, and accepted.

## BASIS OF PAYMENT

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

Payment will be made under:

Item P-605-5.1 Joint Sealing Filler **-** per linear foot (meter)

## REFERENCES

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

ASTM International (ASTM)

| | |
|---|---|
| ASTM D789 | Standard Test Method for Determination of Relative Viscosity of Polyamide (PA) |
| ASTM D5249 | Standard Specification for Backer Material for Use with Cold- and Hot-Applied Joint Sealants in Portland-Cement Concrete and Asphalt Joints |
| ASTM D5893 | Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements |
| ASTM D6690 | Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt |
| ASTM D7116 | Standard Specification for Joint Sealants, Hot Applied, Jet Fuel Resistant Types for Portland Cement Concrete Pavements] |

Advisory Circulars (AC)

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

**END ITEM P-605**

# Item P-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<br>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.** Not used.

**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, IA, II, IIA, III, III; V.

**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 1751**.**

**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 shall consist of Reinforcing conforming to the requirements of ASTM A165, ASTM A706, ASTM A775, ASTM A934**.**

**610-2.11 Materials for curing concrete.** Curing materials shall conform to:

**Materials for Curing**

| | |
|---|---|
| **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 28 MPa 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.

## BASIS OF PAYMENT

**610-6.1** Concrete shall be considered incidental, 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 II | White[3] | 37925 | 115 ft$^2$/gal | Type I, Gradation A | 7 lb/gal |
| Waterborne Type II | White[4] | 37925 | 115 ft$^2$/gal | Type III | 10 lb/gal |
| Waterborne Type II | Yellow | 33538 or 33655 | 115 ft$^2$/gal | Type I, Gradation A | 7 lb/gal |
| Waterborne Type II | Red | 31136 | 115 ft$^2$/gal | Type I, Gradation A | 5 lb/gal |
| Waterborne Type II | Black | 37038 | 115 ft$^2$/gal | No Beads | No Beads |

| | | | | | |
|---|---|---|---|---|---|
| Waterborne Type II | Green | 34108 | 115 $ft^2$/gal | No Beads | No Beads |
| Temporary Marking Waterborne Type II | ALL | See Above | 230 $ft^2$/gal | No beads | No beads |

[1] See paragraph 620-2.2a

[2] See paragraph 620-2.2b

[3] General application of White Paint

[4] Application of White Paint in Designators for Surface Painted Hold Markings

**a. Paint**. Paint shall be waterborne in accordance with the requirements of this paragraph. Paint colors shall comply with Federal Standard No. 595. See Table 1 above.

**Waterborne**. Paint shall meet the requirements of Federal Specification TT-P-1952F, Type II. The non-volatile portion of the vehicle for all paint types shall be composed of a 100% acrylic polymer as determined by infrared spectral analysis.

**b. Reflective media.** Glass beads for white and yellow paint shall meet the requirements for Federal Specification TT-B-1325D Type I, Gradation A .

Glass beads for red 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 30 days shall elapse between placement of surface course or seal coat and application of the permanent paint markings. Paint shall be applied at the locations and to the dimensions and spacing shown on the plans. Paint shall not be applied until the layout and condition of the surface has been approved by the 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**. Not used.

**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

**620-4.1a** The quantity of surface preparation shall be measured by the number of square feet (square meters) for each type of surface preparation specified in paragraph 620-3.3.

**620-4.1b** The quantity of markings shall be paid for shall be measured by the number of square feet (square meters) of painting**.**

**620-4.1c** The quantity of reflective media shall be paid for by the number of pounds (km) of reflective media.

**620-4.1d** The quantity of temporary markings to be paid for shall be the number of square feet (square meters) of painting performed in accordance with the specifications and accepted by the RPR. Temporary marking includes surface preparation, application, and complete removal of the temporary marking.

## BASIS OF PAYMENT

**620-5.1** This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item complete in place and accepted by the RPR in accordance with these specifications.

**620-5.1a** Payment for surface preparation shall be made at the contract price for the number of square feet (square meters) for each type of surface preparation specified in paragraph 620-3.3.

**620-5.2b** Payment for markings shall be made at the contract price for the number of square feet (square meters) of painting.

**620-5.3c** Payment for reflective media shall be made at the contract unit price for the number of pounds (km) of reflective media.

**620-5.4d** Payment for temporary markings shall be made at the contract price for the number of square feet (square meters) 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-620-5.1a | Surface Preparation - per square foot (square meter). |
| Item P-620-5.2b | Surface Pavement Marking - per square foot (square meter). |
| Item P-620-5.3c | Reflective Media **-** per pound (km). |

## REFERENCES

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

ASTM International (ASTM)

| | |
|---|---|
| ASTM D476 | Standard Classification for Dry Pigmentary Titanium Dioxide Products |
| ASTM D968 | Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive |
| ASTM D1652 | Standard Test Method for Epoxy Content of Epoxy Resins |
| ASTM D2074 | Standard Test Method for Total, Primary, Secondary, and Tertiary Amine Values of Fatty Amines by Alternative Indicator Method |
| ASTM D2240 | Standard Test Method for Rubber Property - Durometer Hardness |
| ASTM D7585 | Standard Practice for Evaluating Retroreflective Pavement Markings Using Portable Hand-Operated Instruments |
| ASTM E303 | Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester |
| ASTM E1710 | Standard Test Method for Measurement of Retroreflective Pavement Marking Materials with CEN-Prescribed Geometry Using a Portable Retroreflectometer |

| | |
|---|---|
| ASTM E2302 | Standard Test Method for Measurement of the Luminance Coefficient Under Diffuse Illumination of Pavement Marking Materials Using a Portable Reflectometer |
| ASTM G154 | Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials |

Code of Federal Regulations (CFR)

40 CFR Part 60, Appendix A-7, Method 24
Determination of volatile matter content, water content, density, volume solids, and weight solids of surface coatings

| | |
|---|---|
| 29 CFR Part 1910.1200 | Hazard Communication |

Federal Specifications (FED SPEC)

| | |
|---|---|
| FED SPEC TT-B-1325D | Beads (Glass Spheres) Retro-Reflective |
| FED SPEC TT-P-1952F | Paint, Traffic and Airfield Marking, Waterborne |
| FED STD 595 | Colors used in Government Procurement |

Commercial Item Description

| | |
|---|---|
| A-A-2886B | Paint, Traffic, Solvent Based |

Advisory Circulars (AC)

| | |
|---|---|
| AC 150/5340-1 | Standards for Airport Markings |
| AC 150/5320-12 | Measurement, Construction, and Maintenance of Skid Resistant Airport Pavement Surfaces |

**END OF ITEM P-620**

# Item D-701 Pipe for Storm Drains and Culverts

## DESCRIPTION

**701-1.1** This item shall consist of the construction of pipe culverts and storm drains in accordance with these specifications and in reasonably close conformity with the lines and grades shown on the plans.

## MATERIALS

**701-2.1** Materials shall meet the requirements shown on the plans and specified below. Underground piping and components used in drainage systems for terminal and aircraft fueling ramp drainage shall be noncombustible and inert to fuel in accordance with National Fire Protection Association (NFPA) 415.

**701-2.2 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:

| | |
|---|---|
| American Association of State Highway and Transportation Officials (AASHTO) M167 | Standard Specification for Corrugated Steel Structural Plate, Zinc-Coated, for Field-Bolted Pipe, Pipe-Arches, and Arches |
| 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 M219 | Standard Specification for Corrugated Aluminum Alloy Structural Plate for Field-Bolted Pipe, Pipe-Arches, and Arches |
| AASHTO M243 | Standard Specification for Field-Applied Coating of Corrugated Metal Structural Plate for Pipe, Pipe-Arches, and Arches |
| AASHTO M252 | Standard Specification for Corrugated Polyethylene Drainage Pipe |
| 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 Drainpipe 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 R73 | Standard Practice for Evaluation of Precast Concrete Drainage Productions |
| ASTM A760 | Standard Specification for Corrugated Steel Pipe, Metallic Coated for Sewers and Drains |
| ASTM A761 | Standard Specification for Corrugated Structural Steel Plate, Zinc-Coated, for Field-Bolted Pipe, Pipe-Arches, and Arches |

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| ASTM A762 | Standard Specification for Corrugated Steel Pipe, Polymer Precoated for Sewers and Drains |
| ASTM A849 | Standard Specification for Post Applied Coatings, Paving's, and Linings for Corrugated Steel Sewer and Drainage Pipe |
| ASTM B745 | Standard Specification for Corrugated Aluminum Pipe for Sewers and Drains |
| ASTM C14 | Standard Specification for Nonreinforced Concrete Sewer, Storm Drain, and Culvert Pipe |
| ASTM C76 | Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe |
| ASTM C506 | Standard Specification for Reinforced Concrete Arch Culvert, Storm Drain, and Sewer Pipe |
| ASTM C507 | Standard Specification for Reinforced Concrete Elliptical Culvert, Storm Drain, and Sewer Pipe |
| ASTM C655 | Standard Specification for Reinforced Concrete D-Load Culvert, Storm Drain, and Sewer Pipe |
| ASTM C1433 | Standard Specification for Precast Reinforced Concrete Monolithic Box Sections for Culverts, Storm Drains, and Sewers |
| ASTM C1479 | Standard Practice for Installation of Precast Concrete Sewer, Storm Drain, and Culvert Pipe Using Standard Installations |
| ASTM C1577 | Standard Specification for Precast Reinforced Concrete Monolithic Box Sections for Culverts, Storm Drains, and Sewers Designed According to AASHTO LRFD |
| ASTM C1786 | Standard Specification for Segmental Precast Reinforced Concrete Box Sections for Culverts, Storm Drains, and Sewers Designed According to AASHTO LRFD |
| ASTM C1840 | Standard Practice for Inspection and Acceptance of Installed Reinforced Concrete Culvert, Storm Drain, and Storm Sewer Pipe |
| 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 F667 | Standard Specification for 3 through 24 in Corrugated Polyethylene Pipe and Fittings |
| ASTM F714 | Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Outside Diameter |
| ASTM F794 | Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter |
| ASTM F894 | Standard Specification for Polyethylene (PE) Large Diameter Profile Wall Sewer and Drainpipe |

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|---|---|
| ASTM F949 | Standard Specification for Poly (Vinyl Chloride) (PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings |
| ASTM F2435 | Standard Specification for Steel Reinforced Polyethylene (PE) Corrugated Pipe |
| ASTM F2562 | Specification for Steel Reinforced Thermoplastic Ribbed Pipe and Fittings for Non-Pressure Drainage and Sewerage |
| ASTM F2736 | Standard Specification for 6 to 30 in. (152 to 762 mm) Polypropylene (PP) Corrugated Single Wall Pipe and Double Wall Pipe |
| ASTM F2764 | Standard Specification for 30 to 60 in. (750 to 1500 mm) Polypropylene (PP) Triple Wall Pipe and Fittings for Non-Pressure Sanitary Sewer Applications |
| ASTM F2881 | Standard Specification for 12 to 60 in. (300 to 1500 mm) Polypropylene (PP) Dual Wall Pipe and Fittings for Non-Pressure Storm Sewer Applications |
| ASTM D3034 | Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings |

**701-2.3 Concrete.** Concrete for pipe cradles shall have a minimum compressive strength of 2000 psi (13.8 MPa) at 28 days and conform to the requirements of ASTM C94.

**701-2.4 Rubber gaskets.** Rubber gaskets for rigid pipe shall conform to the requirements of ASTM C443. Rubber gaskets for PVC pipe, polyethylene, and polypropylene pipe shall conform to the requirements of ASTM F477. Rubber gaskets for zinc-coated steel pipe and precoated galvanized pipe shall conform to the requirements of ASTM D1056, for the "RE" closed cell grades. Rubber gaskets for steel reinforced thermoplastic ribbed pipe shall conform to the requirements of ASTM F477.

**701-2.5 Joint mortar.** Pipe joint mortar shall consist of one part 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.

**701-2.6 Joint fillers.** Poured filler for joints shall conform to the requirements of ASTM D6690.

**701-2.7 Plastic gaskets.** Plastic gaskets shall conform to the requirements of ASTM C990.

**701-2.8. Controlled low-strength material (CLSM).** Controlled low-strength material shall conform to the requirements of Item P-153. When CLSM is used, all joints shall have gaskets.

**701-2.9 Precast box culverts.** Manufactured in accordance with and conforming to ASTM C1433.

**701-2.10 Precast concrete pipe.** Precast concrete structures shall be furnished by a plant meeting National Precast Concrete Association Plant Certification Program or American Concrete Pipe Association QCast Plant Certification program.

## CONSTRUCTION METHODS

**701-3.1 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 it shall

not be less than the external diameter of the pipe plus 12 inches (300 mm) on each side. The trench walls shall be approximately vertical.

The Contractor shall comply with all current federal, state and local rules and regulations governing the safety of men and materials during the excavation, installation and backfilling operations. Specifically, the Contractor shall observe that all requirements of the Occupational Safety and Health Administration (OSHA) relating to excavations, trenching and shoring are strictly adhered to. The width of the trench shall be sufficient to permit satisfactorily jointing of the pipe and thorough compaction of the bedding material under the pipe and backfill material around the pipe, but it shall not be greater than the widths shown on the plans trench detail.

Where rock, hardpan, or other unyielding material is encountered, the Contractor shall remove it from below the foundation grade for a depth of at least 8 inch (200 mm) or 1/2 inch (12 mm) for each foot of fill over the top of the pipe (whichever is greater) but for no more than three-quarters of the nominal diameter of the pipe. The excavation below grade should be filled with granular material to form a uniform 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.

The excavation for pipes placed in embankment fill shall not be made until the embankment has been completed to a height above the top of the pipe as shown on the plans.

**701-3.2 Bedding.** The bedding surface for the pipe shall provide a foundation of uniform density to support the pipe throughout its entire length.

**a. Rigid pipe.** The pipe bedding shall be constructed uniformly for the full length of the pipe barrel, as required on the plans. The maximum aggregate size shall be 1 in when the bedding thickness is less than 6 inches, and 1-1/2 in 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.

**b. Flexible pipe.** For flexible pipe, the bed shall be roughly shaped to fit the pipe, and a bedding blanket of sand or fine granular material shall be provided as follows:

**Flexible Pipe Bedding**

| **Pipe Corrugation Depth** | | **Minimum Bedding Depth** | |
|---|---|---|---|
| **inch** | **mm** | **inch** | **mm** |
| 1/2 | 12 | 1 | 25 |
| 1 | 25 | 2 | 50 |
| 2 | 50 | 3 | 75 |
| 2-1/2 | 60 | 3-1/2 | 90 |

**c. Other pipe materials.** For PVC, polyethylene, polypropylene, or fiberglass pipe, the bedding material shall consist of coarse sands and gravels with a maximum particle size of 3/4 inches (19 mm). For pipes installed under paved areas, no more than 12% of the material shall

pass the No. 200 (0.075 mm) sieve. For all other areas, no more than 50% of the material shall pass the No. 200 (0.075 mm) sieve. The bedding shall have a thickness of at least 6 inches (150 mm) below the bottom of the pipe and extend up around the pipe for a depth of not less than 50% of the pipe's vertical outside diameter.

**701-3.3 Laying pipe.** The pipe laying shall begin at the lowest point of the trench and proceed upgrade. The lower segment of the pipe shall be in contact with the bedding throughout its full length. Bell or groove ends of rigid pipes and outside circumferential laps of flexible pipes shall be placed facing upgrade.

Paved or partially lined pipe shall be placed so that the longitudinal center line of the paved segment coincides with the flow line.

Elliptical and elliptically reinforced concrete pipes shall be placed with the manufacturer's reference lines designating the top of the pipe within five degrees of a vertical plane through the longitudinal axis of the pipe.

**701-3.4 Joining pipe.** Joints shall be made with (1) cement mortar, (2) cement grout, (3) rubber gaskets, (4) plastic gaskets, (5) coupling bands.

Mortar joints shall be made with an excess of mortar to form a continuous bead around the outside of the pipe and shall be finished smooth on the inside. Molds or runners shall be used for grouted joints to retain the poured grout. Rubber ring gaskets shall be installed to form a flexible watertight seal.

**a. Concrete pipe.** Concrete pipe may be either bell and spigot or tongue and groove. Pipe sections at joints shall be fully seated and the inner surfaces flush and even. Concrete pipe joints shall be sealed with rubber gaskets meeting ASTM C443 when leak resistant joints are required.

**b. Metal pipe.** Metal pipe shall be firmly joined by form-fitting bands conforming to the requirements of ASTM A760 for steel pipe and AASHTO M196 for aluminum pipe.

**c. PVC, Polyethylene, or Polypropylene pipe.** Joints for PVC, Polyethylene, or Polypropylene pipe shall conform to the requirements of ASTM D3212 when leak resistant joints are required. Joints for PVC and Polyethylene pipe shall conform to the requirements of AASHTO M304 when soil tight joints are required. Fittings for polyethylene pipe shall conform to the requirements of AASHTO M252 or ASTM M294. Fittings for polypropylene pipe shall conform to ASTM F2881, ASTM F2736, or ASTM F2764.

**d. Fiberglass pipe.** Joints and fittings shall be as detailed on the plans and in accordance with the manufacturer's recommendations. Joints shall meet the requirements of ASTM D4161 for flexible elastomeric seals.

**701-3.5 Embedment and Overfill.** Pipes shall be inspected before any fill material is placed; any pipes found to be out of alignment, unduly settled, or damaged shall be removed and re-laid or replaced at the Contractor's expense.

**701-3.5-1 Embedment Material Requirements**

**a. Concrete Pipe.** Embedment material and compaction requirements shall be in accordance with the applicable Type of Standard Installation (Types 1, 2, 3, or 4) per ASTM C1479. If a concrete cradle or CLSM embedment material is used, it shall conform to the plan details.

**b. Plastic and fiberglass Pipe.** Embedment material shall meet the requirements of ASTM D3282, A-1, A-2-4, A-2-5, or A-3. Embedment material shall be free of organic material, stones

larger than 1.5 inches in the greatest dimension, or frozen lumps. Embedment material shall extend to 12 inches above the top of the pipe.

**c. Metal Pipe.** Embedment material shall be granular as specified in the contract document and specifications, and shall be free of organic material, rock fragments larger than 1.5 inches in the greatest dimension and frozen lumps. As a minimum, backfill materials shall meet the requirements of ASTM D3282, A-1, A-2, or A-3. Embedment material shall extend to 12 inches above the top of the pipe.

**701-3.5-2 Placement of Embedment Material**

The embedment material shall be compacted in layers not exceeding 6 inches (150 mm) on each side of the pipe and shall be brought up one foot (30 cm) above the top of the pipe or to natural ground level, whichever is greater. Thoroughly compact the embedment material under the haunches of the pipe without displacing the pipe. Material shall be brought up evenly on each side of the pipe for the full length of the pipe.

When the top of the pipe is above the top of the trench, the embedment material shall be compacted in layers not exceeding 6 inches (150 mm) and shall be brought up evenly on each side of the pipe to one foot (30 cm) above the top of the pipe. All embedment material shall be compacted to a density required under Item P-152.

Concrete cradles and flowable fills, such as controlled low strength material (CLSM) or controlled density fill (CDF), may be used for embedment provided adequate flotation resistance can be achieved by restraints, weighing, or placement technique.

It shall be the Contractor's responsibility to protect installed pipes and culverts from damage due to construction equipment operations. The Contractor shall be responsible for installation of any extra strutting or backfill required to protect pipes from the construction equipment.

**701-3.6 Overfill**

Pipes shall be inspected before any overfill is in place. Any pipes found to be out of alignment, unduly settled, or damaged shall be removed and re-laid or replaced at the Contractor's expense. Evaluation of any damage to RCP shall be evaluated based on AASHTO R73.

Overfill material shall be place and compacted in layers as required to achieve compaction to at least 95 percent standard proctor per ASTM D1557. The soil shall contain no debris, organic matter, frozen material, or stones with a diameter greater than one half the thickness of the compacted layers being placed.

**701-3.7 Inspection Requirements**

An initial post installation inspection shall be performed by the RPR no sooner than 30 days after completion of installation and final backfill. Clean or flush all lines prior to inspection.

For pipe sizes larger than 48 inches, a walk-through visual inspection shall be performed.

Reinforced concrete pipe shall be inspected, evaluated, and reported on in accordance with ASTM C1840, "Standard Practice for Inspection and Acceptance of Installed Reinforced Concrete Culvert, Storm Drain, and Storm Sewer Pipe." Any issues reported shall include still photo and video documentation. The zoom ratio shall be provided for all still or video images that document any issues of concern by the inspection firm.

Flexible pipes shall be inspected for rips, tears, joint separations, soil migration, cracks, localized buckling, settlement, alignment, and deflection. Determine whether the allowable deflection has been exceeded by use of a laser profiler for internal pipe diameters of 48 inches or less, or direct

measurement for internal pipe diameters greater than 48 inches. Laser profile equipment shall utilize low barrel distortion video equipment. Deflection of installed pipe shall not exceed the limits provided in the table below, as a percentage of the average inside diameter of the pipe.

Maximum Allowable Pipe Deflection

| **Type of Pipe** | **Maximum Allowable Deflection (%)** |
|---|---|
| Corrugated Metal Pipe | 5 |
| Concrete Lined CMP | 3 |
| Thermoplastic Pipe | 5 |
| Fiberglass | 5 |

If deflection readings in excess of the allowable deflection are obtained, remove the pipe with excessive deflection and replace with new pipe. Isolated areas may exceed allowable by 2.5% with concurrence of RPR. Repair or replace any pipe with cracks exhibiting displacement across the crack, bulges, creases, tears, spalls, or delamination. The report for flexible pipe shall include as a minimum, the deflection results and final post installation inspection report. The inspection report shall include: a copy of all video taken, pipe location identification, equipment used for inspection, inspector name, deviation from design line and grade, and inspector's notes.

## METHOD OF MEASUREMENT

**701-4.1** The length of pipe shall be measured in linear feet (m) of pipe in place, completed, and accepted. It shall be 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 identify each class, types and size of pipe shall be measured separately. All fittings shall be included in the footage as typical pipe sections in the pipe being measured.

**701-4.2.** Not used.

**701-4.3** Not used.

**701-4.4** Not used.

## BASIS OF PAYMENT

**701-5.0** These prices shall fully compensate the Contractor 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.

**701-5.1** Payment will be made at the contract unit price per linear foot (meter) for identify each class and size of pipe.

**701-5.2** Not used.

**701-5.3** Not used.

**701-5.4** Not used.

**Payment will be made under:**

Item D-701-1a 12" Class V Reinforced Concrete Pipe - 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.

American Association of State Highway and Transportation Officials (AASHTO)

| | |
|---|---|
| AASHTO M167 | Standard Specification for Corrugated Steel Structural Plate, Zinc-Coated, for Field-Bolted Pipe, Pipe-Arches, and Arches |
| 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 M219 | Standard Specification for Corrugated Aluminum Alloy Structural Plate for Field-Bolted Pipe, Pipe-Arches, and Arches |
| AASHTO M243 | Standard Specification for Field Applied Coating of Corrugated Metal Structural Plate for Pipe, Pipe-Arches, and Arches |
| AASHTO M252 | Standard Specification for Corrugated Polyethylene Drainage Pipe |
| 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 Drainpipe 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 |

ASTM International (ASTM)

| | |
|---|---|
| ASTM A760 | Standard Specification for Corrugated Steel Pipe, Metallic Coated for Sewers and Drains |
| ASTM A761 | Standard Specification for Corrugated Steel Structural Plate, Zinc Coated, for Field-Bolted Pipe, Pipe-Arches, and Arches |
| ASTM A762 | Standard Specification for Corrugated Steel Pipe, Polymer Precoated for Sewers and Drains |
| ASTM A849 | Standard Specification for Post-Applied Coatings, Paving's, and Linings for Corrugated Steel Sewer and Drainage Pipe |
| ASTM B745 | Standard Specification for Corrugated Aluminum Pipe for Sewers and Drains |
| ASTM C14 | Standard Specification for Nonreinforced Concrete Sewer, Storm Drain, and Culvert Pipe |

| | |
|---|---|
| ASTM C76 | Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe |
| ASTM C94 | Standard Specification for Ready Mixed Concrete |
| 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 C506 | Standard Specification for Reinforced Concrete Arch Culvert, Storm Drain, and Sewer Pipe |
| ASTM C507 | Standard Specification for Reinforced Concrete Elliptical Culvert, Storm Drain and Sewer Pipe |
| ASTM C655 | Standard Specification for Reinforced Concrete D-Load Culvert, Storm Drain and Sewer Pipe |
| ASTM C990 | Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants |
| ASTM C1433 | Standard Specification for Precast Reinforced Concrete Monolithic Box Sections for Culverts, Storm Drains, and Sewers |
| ASTM D1056 | Standard Specification for Flexible Cellular Materials Sponge or Expanded Rubber |
| ASTM D3034 | Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings |
| ASTM D3212 | Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals |
| ASTM D3262 | Standard Specification for "Fiberglass" (Glass-Fiber Reinforced Thermosetting Resin) Sewer Pipe |
| ASTM D3282 | Standard Practice for Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes |
| ASTM D4161 | Standard Specification for "Fiberglass" (Glass-Fiber Reinforced Thermosetting Resin) Pipe Joints Using Flexible Elastomeric Seals |
| ASTM D6690 | Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements |
| ASTM F477 | Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe |
| ASTM F667 | Standard Specification for 3 through 24 in. Corrugated Polyethylene Pipe and Fittings |
| ASTM F714 | Standard Specification for Polyethylene (PE) Plastic Pipe (DR PR) Based on Outside Diameter |
| ASTM F794 | Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe & Fittings Based on Controlled Inside Diameter |

| | |
|---|---|
| ASTM F894 | Standard Specification for Polyethylene (PE) Large Diameter Profile Wall Sewer and Drainpipe |
| ASTM F949 | Standard Specification for Poly (Vinyl Chloride) (PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings |
| ASTM F2435 | Standard Specification for Steel Reinforced Polyethylene (PE) Corrugated Pipe |
| ASTM F2562 | Specification for Steel Reinforced Thermoplastic Ribbed Pipe and Fittings for Non-Pressure Drainage and Sewerage |
| ASTM F2736 | Standard Specification for 6 to 30 in. (152 to 762 mm) Polypropylene (PP) Corrugated Single Wall Pipe and Double Wall Pipe |
| ASTM F2764 | Standard Specification for 30 to 60 in. (750 to 1500 mm) Polypropylene (PP) Triple Wall Pipe and Fittings for Non-Pressure Sanitary Sewer Applications |
| ASTM F2881 | Standard Specification for 12 to 60 in. (300 to 1500 mm) Polypropylene (PP) Dual Wall Pipe and Fittings for Non-Pressure Storm Sewer Applications |

National Fire Protection Association (NFPA)

| | |
|---|---|
| NFPA 415 | Standard on Airport Terminal Buildings, Fueling Ramp Drainage, and Loading Walkways |

**END ITEM D-701**

# 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 |
| 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 Drainpipe and Fittings Based on Controlled Inside Diameter |
| 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 |

**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. 2 |
| 1-1/2 inch (37.5 mm) | 100 |
| 1 inch (25.0 mm) | 90-100 |
| 3/8 inch (9.5 mm) | 25-65 |
| No. 4 (4.75 mm) | 5-40 |
| No. 8 (2.36 mm) | 1-20 |
| 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.** Not used.

**705-3.8 Connections.** 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** Not used.

**705-4.3** Not used.

**705-4.4**. The quantity of pipe underdrains shall be made at the contract unit price per linear foot (meter) complete, including porous backfill and filter fabric.

**705-5.4 Pipe underdrains, Complete**. 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.

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:**

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|---|---|
| Item D-705-5.1 | 6-inch underdrain pipe complete, including porous backfill and filter fabric - **.** per linear foot (meter) |

**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)

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| 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)

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|---|---|
| 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 |

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| 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 Drainpipe 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**

# ITEM D-700 STORMWATER SYSTEM TRENCHLESS REPAIRS

## DESCRIPTION

**700-1.1 GENERAL.** This Specification is intended to provide the performance characteristics, and other minimum requirements for trenchless repairs to the existing enclosed drainage system at the Waterville-Robert Lafleur Airport.

The Owner, under a sperate contract, had a video pipe inspection performed on the existing enclosed drainage system. The purpose of the video pipe inspection was to determine the condition of the existing drainage pipe and determine whether the existing drainage pipes required replacement or if repairs were necessary, would a trenchless method of repair be applicable to extend the existing drainage system(s) service life.

The investigation was conducted by the Ted Berry Company, LLC. The results of the existing drainage investigation can be found in Special Provision (SP) section eight (8) and is entitled *DRAINAGE SYSTEM INVESTIGATION REPORT.* Video tape of the pipe inspection is available upon request.

The *DRAINAGE SYSTEM INVESTIGATION REPORT* concluded that none of the existing drainage pipe required replacement and that and that repairs could be made with a cured in place short liner.

**700-1.2 CONTRACTOR PREQUALIFICATIONS:** The contractor to perform the trenchless drainage system repair shall have a minimum of five (5) years' experience in similar type of repair. The trenchless drainage repair contractor shall provide at least five (5) references that can vouch for the contractor experience, quality and performance of work.

The Owner reserves the right to reject the contractor if in their sole opinion the contractor lacks the qualifications, skill and experience to successful complete the work under this specification.

**700-1.3 PREBID INSPECTION:** Bidder shall examine video tapes of lines prior to the pre-bid meeting. Bidder shall use tape to identify obstacles, and residual load carrying capacity of the host pipe or any items of concern. At the pre-bid meeting the contractor shall voice any concerns in repairs to the pipe as specified. Engineer will review differing opinions regarding host pipe capacity or other items of concern at the Prebid meeting and make a determination of the required design assumptions by addendum.

**700-1.3 LINING DESIGN:** All cured-in-place Pipe Point Repair (CIPP-PR) sectional liners shall be compatible with the host pipe material of the existing drainage system, provide a watertight seal, and retore the integrity of the drainage pipe. Minimum liner thickness for each liner depth/diameter combination shall be determined by the Contractor to provide a **50-year design** life. Contractor proposed design must be supported by detailed calculations satisfactory to Engineer.

**700-1.4 POST INSTALLATION VIDEO:** Contractor shall provide one (1) copy of a videotape showing pipe after lining. Video shall be annotated.

**700-1.5 SUBMITTALS: The** Contractor's submittal shall include but not be limited to the following:

- Cured-in-place Pipe Point Repair (CIPP-PR) sectional liners design including, resin, sealant, and fittings, adapters, and specials.
- Certificates and Affidavits (furnish prior to shipment or installation as applicable):
- Affidavit of compliance with applicable standards for resins and tube materials.
- Certification that Contractor is a licensed installer of any patented process.
- Post installation video.
- Frames and Grates
- Brick

## MATERIALS

**700-2.1 CURED-IN-PLACE LINING PRODUCTS:** Products shall conform to ASTM D5813, "Cured- In-Place Thermosetting Resin Sewer Pipe".

**700-2.2 LINER TUBE:** The tube shall consist of one or more layers of flexible nonwoven or woven material capable of carrying resin and withstanding installation pressures and curing temperatures. The liner tube shall be manufactured of a resin-impregnated flexible tube cured in place using circulating hot water or equivalent. The tube shall be compatible with the resin system used. The tube shall be capable of conforming to offset joints, bells, and disfigured pipe sections. The tube shall be custom fabricated to a size that, when installed, will tightly fit the internal circumference of the original conduit and is compatible with the existing conduit material. Allowance shall be made for circumferential stretching during installation. Contractor shall determine the tube lengths for individual installation runs in accordance with manufacturer's recommendations.

The cured liner tube shall conform to the following minimum structural standards:

- Tensile strength- 3,000 psi.
- Flexural stress- 4,500 psi.
- Flexural modulus of elasticity- 250,000 psi.

**700-2.3 RESIN:** The resin used shall have the following characteristics:

A. The resin used shall be high-grade corrosion resistant isophthalic polyester, vinyl ester, or epoxy that is compatible with the liner tube and installation process to be used.
B. The resin must be able to cure in the presence of water, and the initiation temperature for cure shall be less than 180° F.

**700-2.4 SEALANT:** A sealant composed of a resin mixture compatible with the liner tube and as recommended by the liner tube manufacturer shall be used at pipe terminations and at points where the cured lining tube fails to make a tight seal.

**700-2.5 INTALLATION EQUIPMENT:** Provide equipment for the installation and curing of the liner tube as recommended by the manufacturer.

**700-2.6 FRAMES AND GRATES.** 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 and covers 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 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.

**700-2.7 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.

**700-2.8 CONCRETE.** Concrete shall be proportioned, placed, and cured per Item P-610, Concrete for Miscellaneous Structures.

**700-2.9 BRICK.** Brick used for adjusting frames and grates to grade shall be clay.

## EXECUTION

**700-3.1 GENERAL**: Installation shall be performed in strict compliance with the manufacturer's recommendations and requirements. All safety precautions (confine space entry and other) as required by federal, state and local laws, ordinances and requirement shall be followed. All federal, state and local environmental laws, regulations and ordinances shall apply and be followed.

**700-3.2 DELIVERY AND STORAGE:** Delivery and storage of lining and other materials shall conform to requirements of the manufacturer. Furnish required storage facilities. Handle lining materials in compliance with manufacturer's recommendations. Damaged material will be unacceptable for installation.

**700-3.3 PRECLEANING:** Contractor shall remove all internal sediments, debris, solids, and other foreign substances from the drain line that will interfere with the installation or adhesion of the lining. Some sections of the pipe shall require deep cleaning. Contractor shall make a post cleaning/pre-installation video to verify line is clean and obstructions are clear, and the pipe is ready for the lining.

**700-3.4 CURED-IN-PLACE PIPE POINT REPAIR (CIPP-PR):** The cured-in-place Pipe Point Repair (CIPP-PR) shall be performed in strict conformance to the manufacture's recommendations and requirements. The installation may only be performed by a licensed install if required or recommended by the manufacture. At the discretion of the owner, a representative of the manufacturer shall be on site to inspect the installation.

**700-3.5 STRENGTH TESTS:** Short-term flexural properties and tensile properties tests specified in ASTM F1216 shall be performed and the results submitted to Engineer.

**700-3.6 TIGHTNESS TESTS:** Tightness tests can be conducted by any means allowed for drainage pipes as recommended by the manufacture. Results shall be submitted to Engineer.

**700-3.7 FINAL VIDEO**: At the completion the Contractor shall provide a video of all repairs to verify the extent of the repair performed and to include with the project AS BUILTS.

**700-3.8 NEW FRAME AND GRATE.** New frame and grate shall be installed per detailed on the plans.

**700-3.9 ADJUST EXISTING FRAME AND GRATE.** Adjust existing frame and grate shall be installed per detailed on the plans.

## METHOD OF MEASUREMENT

**700-4.1** The work to for the drainage system repair shall be measured for payment as a single unit, including but not limited to, design for the pipe lining, submittals, cleaning the pipe, pre-installation pipe video, install the pipe lining repair section, testing, post video inspection and AS BUILT video.

## BASIS OF PAYMENT

**700-5.1** Payment shall be made at the contract lump sum price for the work measured as specified above which price and the payment thereof shall constitute full compensation for all labor, materials, equipment, and incidentals and expenses necessary to satisfactorily drainage system repair to the satisfaction of the Engineer.

**Payment will be made under:**

D-700-5.1 Drainage System Repair – Lump Sum

D-700-5.2 New Frame and Grate on Exting Structure – Each

D-700-5.3 Adjust Existing Frame and Grate - Each

## REFERENCES

ASTM F1216 – Standard practice for rehabilitation of existing pipelines and conduits by the inversion and curing of a resin-impregnated tube.

ASTM D543 – Practices for evaluating the resistance of plastics to chemical reagents.

ASTM D790 – Test methods for flexural properties of unreinforced and reinforced plastics and electrical insulating materials.

ASTM D2990 – Standard Test Methods for Tensile, Compressive, and Flexural Creep and Creep-Rupture of Plastics

ASTM D5813 – Specification for cured in place thermosetting resin sewer piping systems.

ASTM D6289 – Standard Test Method for Measuring Shrinkage from Mold Dimensions of Molded Thermosetting Plastics

European Standard DIN EN 295, Part 3 – Darmstadt Tipping Apparatus (abrasion resistance test for sewers) 9.) European Standard DIN EN 19523 – High-pressure jetting and flushing resistance test

ISO 2577 – Plastics – Thermosetting moulding materials – Determination of shrinkage

**END OF SECTION D-700**

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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-751-5.2 | Catch Basins - per each |
| Item D-751-5.3 | Inlets - per each |
| Item D-751-5.4 | Inspection Holes - 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 ethylene propylene insulation, cross-linked polyethylene insulation. Conductors for use on 20 ampere primary airfield lighting series circuits shall be single conductor, seven strand, #6 AWG, L-824 Type B, Type C, 5,000 volts, non-shielded, with ethylene propylene insulation, 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. For voltage powered circuits, the equipment grounding conductor shall comply with NEC Article 250.

Ground rods shall be copper or 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 (2.54 m) long and 3/4 inch (19 mm) 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.** A cast splice, employing a plastic mold and using epoxy resin equivalent to that manufactured by 3M™ Company, "Scotchcast" Kit No. 82-B, or an approved equivalent, used for potting the splice is acceptable.

**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.** Taped splices employing field-applied rubber, or synthetic rubber tape covered with plastic tape is acceptable. The rubber tape should meet the requirements of ASTM D4388 and the plastic tape should comply with Military Specification MIL-I-24391 or Commercial Item Description A-A-55809. Heat shrinkable tubing shall be heavy-wall, self-sealing tubing rated for the voltage of the wire being spliced and suitable for direct-buried installations. The tubing shall be factory coated with a thermoplastic adhesive-sealant that will adhere to the insulation of the wire being spliced forming a moisture- and dirt-proof seal. Additionally, heat shrinkable tubing for multi-conductor cables, shielded cables, and armored cables shall be factory kits that are designed for the application. Heat shrinkable tubing and tubing kits shall be manufactured by Tyco Electronics/ Raychem Corporation, Energy Division, or approved equivalent.

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.** Flowable material used to backfill trenches for power cable trenches shall conform to the requirements of Item P-153, Controlled Low Strength Material.

**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.

**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.** Unless otherwise specified, the Contractor shall not use a cable plow for installing the cable. Cable shall be unreeled uniformly in place alongside or in the trench and shall be carefully placed along the bottom of the trench. The cable shall not be unreeled and pulled into the trench from one end. Slack cable sufficient to provide strain relief shall be placed in the trench in a series of S curves. Sharp bends or kinks in the cable shall not be permitted.

Where cables must cross over each other, a minimum of 3 inches (75 mm) vertical displacement shall be provided with the topmost cable depth at or below the minimum required depth below finished grade.

**a. Trenching.** Where turf is well established and the sod can be removed, it shall be carefully stripped and properly stored. Trenches for cables may be excavated manually or with mechanical trenching equipment. Walls of trenches shall be essentially vertical so that a minimum of surface is disturbed. Graders shall not be used to excavate the trench with their blades. The bottom surface of trenches shall be essentially smooth and free from coarse aggregate. Unless otherwise specified, cable trenches shall be excavated to a minimum depth of 18 inches (0.5 m) below finished grade per NEC Table 300.5, except as follows:

- When off the airport or crossing under a roadway or driveway, the minimum depth shall be 36 inches (91 cm) unless otherwise specified.
- Minimum cable depth when crossing under a railroad track, shall be 42 inches (1 m) unless otherwise specified.

The Contractor shall excavate all cable trenches to a width not less than 6 inches (150 mm). Unless otherwise specified on the plans, all cables in the same location and running in the same general direction shall be installed in the same trench.

When rock is encountered, the rock shall be removed to a depth of at least 3 inches (75 mm) below the required cable 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 material may alternatively be used.

Duct bank or conduit markers temporarily removed for trench excavations shall be replaced as required.

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:

**(1)** Existing cables shall be located manually. Unearthed cables shall be inspected to assure absolutely no damage has occurred.

**(2)** 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 or replacement.

**b. Backfilling.** After the cable has been installed, the trench shall be backfilled. The first layer of backfill in the trench shall encompass all cables ; be 3 inches (75 mm) deep, loose measurement; and shall be either earth or sand containing no mineral aggregate particles that would be retained on a 1/4-inch (6.3 mm) sieve. This layer shall not be compacted. The second layer shall be 5 inches (125 mm) deep, loose measurement, and shall contain no particles that would be retained on a one inch (25.0 mm) sieve. The remaining third and subsequent layers of backfill shall not exceed 8 inches (20 cm) of loose measurement and be excavated or imported material and shall not contain stone or aggregate larger than 4 inches (100 mm) maximum diameter.

The second and subsequent layers shall be thoroughly tamped and compacted to at least the density of the adjacent material. If the cable is to be installed in locations or areas where other compaction requirements are specified (under pavements, embankments, etc.) the backfill compaction shall be to a minimum of 100 percent of ASTM D1557.

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 when turf is to be established over the trench, the backfilling shall be stopped at an appropriate depth consistent with the type of turfing operation to be accommodated. A proper allowance for settlement shall also be provided. Any excess excavated material shall be removed and disposed of per the plans and specifications.

Underground electrical warning (caution) tape shall be installed in the trench above all direct-buried cable. Contractor shall submit a sample of the proposed warning tape for acceptance by the RPR. If not shown on the plans, the warning tape shall be located 6 inches (150 mm) above the direct-buried cable or the counterpoise wire if present. A 3-6 inch (75 - 150 mm) wide polyethylene film detectable tape, with a metalized foil core, shall be installed above all direct buried cable or counterpoise. The tape shall be of the color and have a continuous legend as indicated on the plans. The tape shall be installed 8 inches (200 mm) minimum below finished grade.

**c. Restoration.** Following restoration of all trenching near airport movement surfaces, the Contractor shall visually inspect the area for foreign object debris (FOD) and remove any that is found. Where soil and sod has been removed, it shall be replaced as soon as possible after the backfilling is completed. All areas disturbed by work shall be restored to its original condition. The restoration shall include the topsoiling, fertilizing**,** liming, seeding and mulching as shown on the plans. The Contractor shall be held responsible for maintaining all disturbed surfaces and replacements until final acceptance. When trenching is through paved areas, restoration shall be equal to existing conditions. If the cable is to be installed in locations or areas where other compaction requirements are specified (under pavements, embankments, etc.) the backfill compaction shall be to a minimum of 100 percent of ASTM D1557. Restoration shall be considered incidental to the pay item of which it is a component part.

**108-3.4 Cable markers for direct-buried cable.** The location of direct buried circuits shall be marked by a concrete slab marker, 2 feet (60 cm) square and 4-6 inch (10 - 15 cm) thick, extending approximately one inch (25 mm) above the surface. Each cable run from a line of lights and signs

to the equipment vault shall be marked at approximately every 200 feet (61 m) along the cable run, with an additional marker at each change of direction of cable run. All other direct-buried cable shall be marked in the same manner. Cable markers shall be installed directly above the cable. The Contractor shall impress the word "CABLE" and directional arrows on each cable marking slab. The letters shall be approximately 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. Stencils shall be used for cable marker lettering; no hand lettering shall be permitted.

At the location of each underground cable connection/splice, except at lighting units, or isolation transformers, a concrete marker slab shall be installed to mark the location of the connection/splice. The Contractor shall impress the word "SPLICE" on each slab. The Contractor also shall impress additional circuit identification symbols on each slab as directed by the RPR. All cable markers and splice markers shall be painted international orange. Paint shall be specifically manufactured for uncured exterior concrete. After placement, all cable or splice markers shall be given one coat of high-visibility aviation orange paint as approved by the RPR. Furnishing and installation of cable markers is incidental to the respective cable pay item.

**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.** These shall be made by using crimp connectors for jointing conductors. Molds shall be assembled, and the compound shall be mixed and poured per the manufacturer's instructions and to the satisfaction of the RPR.

**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.** A taped splice shall be made in the following manner:

Bring the cables to their final position and cut so that the conductors will butt. Remove insulation and jacket allowing for bare conductor of proper length to fit compression sleeve connector with 1/4 inch (6 mm) of bare conductor on each side of the connector. Prior to splicing, the two ends of the cable insulation shall be penciled using a tool designed specifically for this purpose and for cable size and type. Do not use emery paper on splicing operation since it contains metallic particles. The copper conductors shall be thoroughly cleaned. Join the conductors by inserting them equidistant into the compression connection sleeve. Crimp conductors firmly in place with crimping tool that requires a complete crimp before tool can be removed. Test the crimped connection by pulling on the cable. Scrape the insulation to assure that the entire surface over

which the tape will be applied (plus 3 inches (75 mm) on each end) is clean. After scraping, wipe the entire area with a clean lint-free cloth. Do not use solvents.

Apply high-voltage rubber tape one-half lapped over bare conductor. This tape should be tensioned as recommended by the manufacturer. Voids in the connector area may be eliminated by highly elongating the tape, stretching it just short of its breaking point. The manufacturer's recommendation for stretching tape during splicing shall be followed. Always attempt to exactly half-lap to produce a uniform buildup. Continue buildup to 1-1/2 times cable diameter over the body of the splice with ends tapered a distance of approximately one inch (25 mm) over the original jacket. Cover rubber tape with two layers of vinyl pressure-sensitive tape one-half lapped. Do not use glyptol or lacquer over vinyl tape as they react as solvents to the tape. No further cable covering or splice boxes are required.

Heat shrinkable tubing shall be installed following manufacturer's instructions. Direct flame heating shall not be permitted unless recommended by the manufacturer. Cable surfaces within the limits of the heat-shrink application shall be clean and free of contaminates prior to application.

**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** Trenching shall be measured by the linear feet (meters) of trench, including the excavation, backfill, and restoration, completed, measured as excavated, and accepted as satisfactory. When specified, separate measurement shall be made for trenches of various specified widths.

**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 not include additional quantities required for slack.

Cable and counterpoise slack is considered incidental to this item and is included in the Contractor's unit price. No separate measurement or payment will be made for cable or counterpoise slack.

**108-4.3** No separate payment will be made for ground rods

## BASIS OF PAYMENT

**108-5.1** Payment will be made at the contract unit price for trenching, cable and bare counterpoise wire installed in trench (direct-buried), or cable and equipment ground 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, and incidentals, including ground rods and ground connectors and trench marking tape, necessary to complete this item.

**Payment will be made under:**

| | |
|---|---|
| Item L-108-5.1 | Trenching for direct-buried cable, 18-inch minimum depth - per linear foot (meter) |
| Item L-108-5.2 | No. 8 AWG Type C Cable, Installed in Trench, Duct Bank or Conduit - per liner foot (meter) |
| Item L-108-5.3 | No. 6 AWG, Solid, Bare Copper Counterpoise Wire, Installed in Trench, Above the Duct Bank or Conduit, Including Connections/Terminations - per linear foot (meter) |

## 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-109 Airport Transformer Vault and Vault Equipment

### DESCRIPTION

**109-1.1** This item shall consist of constructing an airport transformer vault or a prefabricated metal housing per these specifications and per the design and dimensions shown in the plans. This work shall also include the installation of conduits in the floor and foundation, painting and lighting of the vault or metal housing, and the furnishing of all incidentals that are necessary to produce a completed unit. Included as a separate part under this item or as a separate item where an existing vault is to be used shall be the furnishing of all vault equipment, wiring, electrical buses, cable, conduit, potheads, and grounding systems. This work shall also include the painting of equipment and conduit; the marking and labeling of equipment and the labeling or tagging of wires; the testing of the installation; and the furnishing of all incidentals necessary to place it in operating condition as a completed unit to the satisfaction of the RPR.

### EQUIPMENT AND MATERIALS

**109-2.1 General.**

**a.** Airport lighting equipment and materials covered by advisory circulars (AC) shall be certified in AC 150/5345-53, Airport Lighting Equipment Certification Program (ALECP) and listed in the ALECP Addendum.

**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 provided in electronic 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.

**f.** 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.

## CONSTRUCTION OF VAULT AND PREFABRICATED METAL HOUSING

**109-3.1 Electrical vault building.** The electrical vault building must comply with NEC Article 110.31, Enclosure for Electrical Installations, Item (A) Electrical Vaults. Construct the building of materials having adequate structural strength for the conditions and installed location, has a minimum fire rating of two or three hours as determined by the authority having jurisdiction (AHJ), and is bullet resistant to minimum UL 752 Level 4.

**109-3.2 Concrete.** Concrete shall be proportioned, placed, and cured per Item P-610, Concrete for Miscellaneous Structures.

**109-3.3 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.

**109-3.4 Reinforcing steel.** Reinforcing steel bars shall be intermediate or structural grade deformed-type bars and shall be per ASTM A615.

**109-3.5 Brick.** Brick shall be per ASTM C62, Grade SW.

**109-3.6 Rigid steel conduit.** Rigid steel conduit and fittings shall be per Underwriters Laboratories Standards 6 and 514B.

**109-3.7** Plastic Conduit and fittings. Plastic Conduit and fittings shall conform to the requirements of UL-651 and UL-654 schedule 40 polyvinyl chloride (PVC) suitable for use above or below ground.

**109-3.8 Lighting.** Vault or metal-housing light fixtures shall be of a vapor-proof type.

**109-3.9 Outlets.** Convenience outlets shall be heavy-duty duplex units designed for industrial service.

**109-3.10 Switches.** Vault or metal-housing light switches shall be single-pole switches.

**109-3.11 Paint.**

**a.** Priming paint for non-galvanized metal surfaces shall be a high solids alkyd primer compatible with the manufacturer's recommendations for the intermediate or topcoat.

**b.** White paint for body and finish coats on metal and wood surfaces shall be ready-mixed paint conforming to the Master Painter's Institute (MPI), Reference #9, Exterior Alkyd, Gloss.

**c.** Priming paint for wood surfaces shall be mixed on the job by thinning the specified white paint by adding 1/2 pint (0.24 liter) of raw linseed oil to each gallon (liter).

**d.** Paint for the floor, ceiling, and inside walls shall be per Porter Paint Company 69, 71, and 79 or equivalent. Walls and ceiling shall be light gray and the floor shall be medium gray.

**e.** The roof coating shall be hot asphalt material per ASTM D2823. Asbestos-free roof coating per ASTM D4479 may be substituted if required by local codes.

**109-3.12 Ground bus.** Ground bus shall be 1/8 × 3/4 inch (3 × 19 mm) minimum copper bus bar.

**109-3.13 Square duct.** Duct shall be square similar to that manufactured by the Square D Company (or equivalent), or the Trumbull Electric Manufacturing Company (or equivalent). The entire front of the duct on each section shall consist of hinged or removable cover for ready access to the interior. The cross-section of the duct shall be not less than 4 × 4 inch (100 × 100 mm) except where otherwise shown in the plans.

**109-3.14 Ground rods.** Ground rods shall be in accordance with Item L-108.

**109-3.15 Vault prefabricated metal housing.** The prefabricated metal housing shall be a commercially available unit.

**109-3.16 FAA-approved equipment.** Certain items of airport lighting equipment installed in vaults are covered by individual ACs listed below:

| | |
|---|---|
| AC 150/5345-3 | Specification for L-821, Panels for Remote Control of Airport Lighting |
| AC 150/5345-5 | Circuit Selector Switch |
| AC 150/5345-7 | Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits |
| AC 150/5345-10 | Specification for Constant Current Regulators and Regulator Monitors |
| AC 150/5345-13 | Specification for L-841 Auxiliary Relay Cabinet Assembly for Pilot Control of Airport Lighting Circuits. |
| AC 150/5345-49 | Specification for L-854, Radio Control Equipment |
| AC 150/5345-56 | Specification for L-890 Airport Lighting Control and Monitoring System (ALCMS) |

**109-3.17 Other electrical equipment.** Distribution transformers, oil switches, cutouts, relays, terminal blocks, transfer relays, circuit breakers, and all other regularly used commercial items of electrical equipment not covered by FAA equipment specifications and ACs shall conform to the applicable rulings and standards of the Institute of Electrical and Electronic Engineers (IEEE) or the National Electrical Manufacturers Association (NEMA). When specified, test reports from a testing laboratory indicating that the equipment meets the specifications shall be supplied. In all cases, equipment shall be new and a first-grade product. This equipment shall be supplied in the quantities required for the specific project and shall incorporate the electrical and mechanical characteristics specified in the proposal and plans. Equipment selected and installed by the Contractor shall maintain the interrupting current rating of the existing systems or specified rating whichever is greater.

**109-3.18 Wire.** Wire (in conduit) rated up to 5,000 volts shall be per AC 150/5345-7, Specification for L-824 Underground Electrical Cables for Airport Lighting Circuits. For ratings up to 600 volts, moisture and heat resistant thermoplastic wire conforming to Commercial Item Description A-A-59544A Type THWN-2 shall be used. The wires shall be of the type, size, number of conductors, and voltage shown in the plans or in the proposal.

**a. Control circuits.** Unless otherwise indicated on the plans, wire shall be not less than No. 12 American wire gauge (AWG) and shall be insulated for 600 volts. If telephone control cable is specified, No. 19 AWG telephone cable per ANSI/Insulated Cable Engineers Association (ICEA) S-85-625 specifications shall be used.

**b. Power circuits.**

**(1)** 600 volts maximum – Wire shall be No. 6 AWG or larger and insulated for at least 600 volts.

**(2)** 3,000 volts maximum – Wire shall be No. 6 AWG or larger and insulated for at least 3,000 volts.

**(3)** Over 3,000 volts-Wire shall be No. 6 AWG or larger and insulated for at least the circuit voltage.

**109-3.19 Short circuit / coordination / device evaluation / arc flash analysis.** The Contractor shall, based upon the equipment provided, include as a part of the submittal process the electrical system "Short Circuit / Coordination / Device evaluation / Arc Flash Analysis". The analysis shall be performed by the equipment manufacturer and submitted in a written report. The analysis shall be signed and sealed by a registered professional Engineer from the state in which the project is located. The analysis shall comply with NFPA-70E and IEEE 1584.

The analysis will include: one line diagrams, short circuit analysis, coordination analysis, equipment evaluation, arc flash analysis and arc flash labels containing at a minimum, equipment name, voltage/current rating, available incident energy and flash protection boundary.

The selected firms field service Engineer shall perform data gathering for analysis completion and device settings, perform device setting as recommended by the analysis and will furnish and install the arc flash labels. The components worst case incident energy will be considered the available arc flash energy at that specific point in the system. Submit three written copies and one electronic copy of the report.

## CONSTRUCTION METHODS

## CONSTRUCTION OF VAULT AND PREFABRICATED METAL HOUSING

**109-4.1 General.** The Contractor shall construct the transformer vault or prefabricated metal housing at the location indicated in the plans. Vault construction shall be reinforced concrete, concrete masonry, or brick wall as specified. The metal housing shall be prefabricated equipment enclosure to be supplied in the size specified. The mounting pad or floor details, installation methods, and equipment placement are shown in the plans. 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.

The Contractor shall clear, grade, and seed the area around the vault or metal housing for a minimum distance of 10 feet (3 m) on all sides. The slope shall be not less than 1/2 inch per foot (12 mm per 0.3 m) away from the vault or metal housing in all directions.

The vault shall provide adequate protection against weather elements, including rain, wind-driven dust, snow, ice and excessive heat. The vault shall have sufficient filtered ventilation, to assure that the interior room temperatures and conditions do not exceed the recommended limits of the electrical equipment to be installed in the vault. The Contractor is responsible for contacting the manufacturer of the equipment to be installed to obtain environmental limitations of the equipment to be installed

**109-4.2 Foundation and walls.**

**a. Reinforced concrete construction.** The Contractor shall construct the foundation and walls per the details shown in the plans. Unless otherwise specified, internal ties shall be of the mechanical type so that when the forms are removed the ends of the ties shall be at least one

inch (25 mm) beneath the concrete surface; the holes shall be plugged and finished to prevent discoloration. Reinforcing steel shall be placed, as shown in the drawings, and secured in position to prevent displacement during the concrete placement.

The external surfaces of the concrete shall be thoroughly worked during the placing operation to force all coarse aggregate from the surface. Thoroughly work the mortar against the forms to produce a smooth finish free from air pockets and honeycomb.

The surface film of all pointed surfaces shall be removed before setting occurs. As soon as the pointing has set sufficiently, the entire surface inside and outside of the vault shall be thoroughly wet with water and rubbed with a No. 16 carborundum stone, or equivalent quality abrasive, bringing the surface to a paste. All form marks and projections shall be removed. The surface produced shall be smooth and dense without pits or irregularities. The materials which have been ground into a paste during the rubbing process shall be spread or brushed uniformly over the entire surface (except the interior surfaces that are to be painted shall have all paste removed by washing before painting) and permitted to reset. Final exterior finish shall be obtained by rubbing with No. 30 carborundum stone, or an equivalent quality abrasive. The surface shall be rubbed until the entire surface is smooth and uniform in color.

**b. Brick and concrete construction.** When this type of construction is specified, the foundation shall be concrete conforming to the details shown in the plans. The outer edge of the foundation at the floor level shall be beveled 1-1/2 inches (38 mm) at 45 degrees. Brick walls shall be 8 inches (200 mm) thick, laid in running bond with every sixth course a header course. Brick shall be laid in cement mortar (one part masonry cement and 3 parts sand) with full mortar bed and shoved joints. All joints shall be completely filled with mortar, and facing brick shall be back-parged with mortar as work progresses. All joints shall be 3/8 inch (9 mm) thick, exterior joints tooled concave, and interior joints struck flush. Both interior and exterior brick surfaces shall be cleaned and nail holes, cracks and other defects filled with mortar. When specified, a nonfading mineral pigment mortar coloring shall be added to the mortar. Steel reinforcing bars, 3/8 inch (9 mm) in diameter and 12 inches (300 mm) long, shall be set vertically in the center of the brick wall on not more than 2 feet (60 cm) centers to project 2-1/2 inches (60 mm) into the concrete roof slab. Lintels for supporting the brickwork over doors, windows, and louvers shall consist of two 4 $\times$ 3 $\times$ 3/8 inch (100 $\times$ 75 $\times$ 9 mm) steel angles. Lintels shall be painted with one coat of corrosion-inhibiting primer before installation, and all exposed parts shall be painted similar to doors and window sash after installation.

Window sills may be concrete poured in place or precast concrete as indicated in the plans. All exposed surfaces shall have a rubbed finish as specified under reinforced concrete construction. After completion, all interior and exterior faces of walls shall be scrubbed with a solution of muriatic acid and water in the proportions of not less than one part acid to 10 parts of water. All traces of efflorescence, loose mortar, and mortar stain shall be removed, and the walls washed down with clear water.

**c. Concrete masonry construction.** When this type of construction is specified, the foundation shall be concrete conforming to the details shown in the plans. The concrete masonry units shall be standard sizes and shapes and shall conform to ASTM C90 and shall include the closures, jambs, and other shapes required by the construction as shown in the plans. Standard construction practice shall be followed for this type of work including mortar, joints, reinforcing steel for extensions into roof slab, etc. Plaster for interior walls, if specified, shall be Portland cement plaster.

**109-4.3 Roof.** The roof shall be reinforced concrete as shown in the plans. Reinforcing steel shall be placed as shown in the drawing and secured in position to prevent displacement during the pouring of the concrete. The concrete shall be poured monolithically and shall be free of honeycombs and voids. The surface shall have a steel-troweled finish and shall be sloped as shown in the drawing. The underside of the roof slab shall be finished in the same manner as specified for walls.

One brush or mop coat of hot asphalt roof coating shall be applied to the top surface of the roof slab. The asphalt material shall be heated to within the range specified by the manufacturer and immediately applied to the roof. The finished coat shall be continuous over the roof surface and free from holidays and blisters. Smears and dribbles of asphalt on the roof edges and building walls shall be removed.

**109-4.4 Floor.** Construct building foundation in accordance with the details shown in the plans. The floor shall be reinforced concrete as shown in the drawings. When present, all sod, roots, refuse, and other perishable material shall be removed from the area under the floor to a depth of 8 inches (200 mm), unless a greater depth is specified in the invitation for bids. This area shall be backfilled with materials consisting of sand, cinders, gravel, or stone. Fill shall be placed in layers not to exceed 4 inches (100 mm) and shall be thoroughly compacted by tamping or rolling. A layer of building paper shall be placed over the fill prior to placing concrete. The floor surfaces shall have a steel-troweled finish. The floor shall be level unless a drain is specified, in which case the floor shall be pitched 1/4 inch (6 mm) per foot downward toward the drain. A 1/4-inch (6-mm) asphalt felt expansion joint shall be placed between floor and foundation walls. The floor shall be poured monolithically and shall be free of honeycombs and voids.

**109-4.5 Floor drain.** If shown in the plans, a floor drain and dry well shall be installed in the center of the floor of the equipment room. The dry well shall be excavated 4 × 4 feet (1.2 × 1.2 m) square and to a depth of 4 feet (1.2 m) below the finished floor elevation and shall be backfilled to the elevation of the underside of the floor with gravel - which shall all pass a 2-inch (50 mm) mesh sieve and shall all be retained on a 1/4-inch (6.3 mm) mesh sieve. The gravel backfill shall be placed in 6 inch (150 mm) maximum layers, and the entire surface of each layer shall be tamped either with a mechanical tamper or with a hand tamper weighing not less than 25 pounds (11 kg) and having a face area of not more than 36 square inches (232 square cm) nor less than 16 square inches (103 square cm). The drain inlet shall be set flush in the concrete floor. The drain shall have a clear opening of not less than 8 inches (200 mm) in diameter.

**109-4.6 Conduits in floor and foundation.** Conduits shall be installed in the floor and through the foundation walls per the details shown in the plans. All underground conduit shall be painted with an asphalt compound. Conduit shall be installed with a coupling or metal conduit adapter flush with the top of the floor. All incoming conduit shall be closed with a pipe plug to prevent the entrance of foreign material during construction. Space conduit entrances shall be left closed.

**109-4.7 Doors.** Doors shall be metal-clad fireproof Class A (three (3) hour rated) doors conforming to requirements of the National Electrical Code (NEC) and local electrical codes. Panic bar exit hardware shall be installed per NEC requirements. Refer to the new electrical vault detail plan sheets for construction requirements.

**109-4.8 Painting.** The floor, ceiling, and inside walls of concrete construction shall first be given a hardening treatment, after which the Contractor shall apply two coats of paint as specified below, except that interior face brick walls need not be painted. The hardening treatment shall consist of applying two coats of either a commercial floor hardener or a solution made by dissolving 2 pounds (0.9 kg) of magnesium fluorosilicate or zinc sulfate crystals in one gallon (liter) of water.

Each coat shall be allowed to dry at least 48 hours before the next application. After the second treating coat has dried, the surfaces shall be brushed clean of all crystals and thoroughly washed with clear water. Paint for walls and ceiling shall be a light gray color approved by the RPR. The floor paint shall be a medium gray color approved by the RPR. Before painting, the surfaces shall be dry and clean. The first coat shall be thinned by adding 2/3-quart (0.63 liters) of spar varnish and 1/3-quart (0.31 liters) of turpentine to each gallon (liter) of paint. The second coat shall be applied without thinning. All doors, lintels, and windows shall be cleaned to remove any rust or foreign material and shall be given one body and one finish coat of white paint. Bare metal surfaces shall be given a prime coat of corrosion-inhibiting primer prior to the body and finish coats.

**109-4.9 Lights and switches.** The Contractor shall furnish and install a minimum of two duplex convenience outlets in the vault room. Where a control room is specified, at least two duplex outlets shall be installed.

## INSTALLATION OF EQUIPMENT IN VAULT OR PREFABRICATED METAL HOUSING

**109-5.1 General.** The Contractor shall furnish, install, and connect all equipment, equipment accessories, conduit, cables, wires, buses, grounds, and support necessary to ensure a complete and operable electrical distribution center for the airport lighting system as specified herein and shown in the plans. When specified, an emergency power supply and transfer switch shall be provided and installed.

The equipment installation and mounting shall comply with the requirements of the National Electrical Code and local code agency having jurisdiction. All electrical work shall comply with the NEC and local code agency having jurisdiction including the separation of under 600V work from 5,000V work."

**109-5.2 Power supply equipment.** Transformers, regulators, booster transformers, and other power supply equipment items shall be furnished and installed at the location shown in the plans or as directed by the RPR. The power supply equipment shall be set on steel "H" sections, "I" beams, channels, or concrete blocks to provide a minimum space of 1-1/2 inch (38 mm) between the equipment and the floor. The equipment shall be placed so as not to obstruct the oil-sampling plugs of the oil-filled units; and name-plates shall, so far as possible, not be obscured.

If specified in the plans and specifications, equipment for an alternate power source or an emergency power generator shall be furnished and installed. The alternate power supply installation shall include all equipment, accessories, an automatic changeover switch, and all necessary wiring and connections. The emergency power generator set shall be the size and type specified.

**109-5.3 Switchgear and panels.** Oil switches, fused cutouts, relays, transfer switches, panels, panel boards, and other similar items shall be furnished and installed at the location shown in the plans or as directed by the RPR. Wall or ceiling mounted items shall be attached to the wall or ceiling with galvanized bolts of not less than 3/8-inch (9 mm) diameter engaging metal expansion shields or anchors in masonry or concrete vaults.

**109-5.4 Duct and conduit.** The Contractor shall furnish and install square-type exposed metallic ducts with hinged covers for the control circuits in the vault. These shall be mounted along the walls behind all floor-mounted equipment and immediately below all wall-mounted equipment. The hinged covers shall be placed to open from the front side with the hinges at the front bottom.

Wall brackets for square ducts shall be installed at all joints 2 feet (60 cm) or more apart with intermediate brackets as specified. Conduit shall be used between square ducts and equipment or between different items of equipment when the equipment is designed for conduit connection. When the equipment is not designed for conduit connection, conductors shall enter the square-type control duct through insulating bushings in the duct or on the conduit risers.

**109-5.5 Wiring and connections.** The Contractor shall make all necessary electrical connections in the vault per the wiring diagrams furnished and as directed by the RPR. In wiring to the terminal blocks, the Contractor shall leave sufficient extra length on each control lead to make future changes in connections at the terminal block. This shall be accomplished by running each control lead the longest way around the box to the proper terminal. Leads shall be neatly laced in place.

**109-5.6 Marking and labeling.** All equipment, control wires, terminal blocks, etc., shall be tagged, marked, or labeled as specified below:

**a. Wire identification.** The Contractor shall furnish and install self-sticking wire labels or identifying tags on all control wires at the point where they connect to the control equipment or to the terminal blocks. Wire labels, if used, shall be of the self-sticking preprinted type and of the manufacturer's recommended size for the wire involved. Identification -markings designated in the plans shall be followed. Tags, if used, shall be of fiber not less than 3/4 inch (19 mm) in diameter and not less than 1/32 inch (1 mm) thick. Identification markings designated in the plans shall be stamped on tags by means of small tool dies. Each tag shall be securely tied to the proper wire by a nonmetallic cord.

**b. Labels.** The Contractor shall stencil identifying labels on the cases of regulators, breakers, and distribution and control relay cases with white oil paint as designated by the RPR. The letters and numerals shall be not less than one inch (25 mm) in height and shall be of proportionate width. The Contractor shall also mark the correct circuit designations per the wiring diagram on the terminal marking strips, which are a part of each terminal block.

## METHOD OF MEASUREMENT

**109-6.3** The quantity of equipment to be paid for under this item shall consist of all equipment installed, connected and accepted as a complete unit ready for operation within an existing vault or prefabricated metal housing.

## BASIS OF PAYMENT

**109-7.1** Payment will be made at the contract unit price for each completed and accepted vault or prefabricated metal housing equipment installation. 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 the item.

**Payment will be made under:**

Item L-109-7.2 Installation of Airport Transformer Vault Equipment in Place - per unit

## 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 150/5340-30 | Design and Installation Details for Airport Visual Aids |
| AC 150/5345-3 | Specification for L-821, Panels for Remote Control of Airport Lighting |
| AC 150/5345-5 | Circuit Selector Switch |
| AC 150/5345-7 | Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits |
| AC 150/5345-10 | Specification for Constant Current Regulators and Regulator Monitors |
| AC 150/5345-13 | Specification for L-841 Auxiliary Relay Cabinet Assembly for Pilot Control of Airport Lighting Circuits |
| AC 150/5345-49 | Specification L-854, Radio Control Equipment; |
| AC 150/5345-53 | Airport Lighting Equipment Certification Program |

American National Standards Institute / Insulated Cable Engineers Association (ANSI/ICEA)

| | |
|---|---|
| ANSI/ICEA S-85-625 | Standard for Telecommunications Cable Aircore, Polyolefin Insulated, Copper Conductor Technical Requirements |

ASTM International (ASTM)

| | |
|---|---|
| ASTM A615 | Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement |
| ASTM C62 | Standard Specification for Building Brick (Solid Masonry Units Made from Clay or Shale) |
| ASTM C90 | Standard Specification for Loadbearing Concrete Masonry Units |
| ASTM D2823 | Standard Specification for Asphalt Roof Coatings, Asbestos Containing |
| ASTM D4479 | Standard Specification for Asphalt Roof Coatings – Asbestos-Free |

Commercial Item Description (CID)

| | |
|---|---|
| A-A 59544 | Cable and Wire, Electrical (Power, Fixed Installation) |

Institute of Electrical and Electronic Engineers (IEEE)

| | |
|---|---|
| IEEE 1584 | Guide for Performing Arc-Flash Hazard Calculations |

Master Painter's Institute (MPI)

| | |
|---|---|
| MPI Reference #9 | Alkyd, Exterior, Gloss (MPI Gloss Level 6) |

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 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 |
| National Fire Protection Association (NFPA) | |
| NFPA-70 | National Electrical Code (NEC) |
| NFPA-70E | Standard for Electrical Safety in the Workplace |
| NFPA-780 | Standard for the Installation of Lightning Protection Systems |

**END OF ITEM L-109**

# 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 neatly bound in a properly sized 3-ring binder, tabbed by specification section or 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**. Trenches for single-conduit lines shall be not less than 6 inches (150 mm) nor more than 12 inches (300 mm) wide. The trench for 2 or more conduits installed at the same level shall be proportionately wider. Trench bottoms for conduits without concrete encasement shall be made to conform accurately to grade so as to provide uniform support for the conduit along its entire length.

Unless otherwise shown on the plans, a layer of fine earth material, at least 4 inches (100 mm) thick (loose measurement) shall be placed in the bottom of the trench as bedding for the conduit. The bedding material shall consist of soft dirt, sand or other fine fill, and it shall contain no particles that would be retained on a 1/4-inch (6.3 mm) sieve. The bedding material shall be tamped until firm. Flowable backfill may alternatively be used.

Unless otherwise shown on plans, conduits shall be installed so that the tops of all conduits within the Airport's secured area where trespassing is prohibited are at least 18 inches (0.5 m) below the finished grade. Conduits outside the Airport's secured area shall be installed so that the tops of the conduits are at least 24 inches (60 cm) below the finished grade per National Electric Code (NEC), Table 300.5.

When two or more individual conduits intended to carry conductors of equivalent voltage insulation rating are installed in the same trench without concrete encasement, they shall be spaced not less than 3 inches (75 mm) apart (measured from outside wall to outside wall) in a horizontal direction and not less than 6 inches (150 mm) apart in a vertical direction. Where two or more individual conduits intended to carry conductors of differing voltage insulation rating are installed in the same trench without concrete encasement, they shall be placed not less than 3 inches (75 mm) apart (measured from outside wall to outside wall) in a horizontal direction and lot less than 6 inches (150 mm) apart in a vertical direction.

Trenches shall be opened the complete length between normal termination points before conduit is installed so that if any unforeseen obstructions are encountered, proper provisions can be made to avoid them.

Conduits 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 while backfilling. 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.

**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; sodding, topsoiling,
fertilizing, liming, seeding and mulching as 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 Contractor shall dispose of any cables removed off of Airport Property.

## METHOD OF MEASUREMENT

**110-4.1** Underground conduits and duct banks shall be measured by the linear feet (meter) of conduits and duct banks installed, including encasement, locator tape, trenching and backfill with designated material, and restoration, and for drain lines, the termination at the drainage structure, all measured in place, completed, and accepted. Separate measurement shall be made for the various types and sizes.

## BASIS OF PAYMENT

**110-5.1** Payment will be made at the contract unit price per linear foot for each type and size of conduit and duct bank completed and accepted, including trench and backfill with the designated material, and, for drain lines, the termination at the drainage structure. This price shall be full compensation for removal and disposal of existing duct banks and conduits as shown on the plans, 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 | Non-Encased Electrical Duct Bank, 1-Way 2-inch - per linear foot (meter) |
| Item L-110-5.2 | Concrete Encased Electrical Duct Bank, 4-Way 4-Inch, 24" Minimum Coverage - per linear foot (meter) |

## 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**

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# 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 including removal of existing manholes and junction structures as shown on the plans.

## 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 neatly bound in a properly sized 3-ring binder, tabbed by specification section or 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 were 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 100,000 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.** Junction boxes shall be L-867 Class 1 (non-load bearing) or L-868 Class 1 (load bearing) airport light bases that are encased in concrete. The light bases shall have a L-894 blank cover, gasket, and stainless-steel hardware. All bolts, studs, nuts, lock washers, and other similar fasteners used for the light fixture assemblies must be fabricated from 316L (equivalent to EN 1.4404), 18-8, 410, or 416 stainless steel. If 18-8, 410, or 416 stainless steel is utilized it shall be passivated and be free from any discoloration. Covers shall be 3/8-inch (9-mm) thickness for L-867 and 3/4-inch (19-mm) thickness for L-868. All junction boxes shall be provided with both internal and external ground lugs.

**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.** Ladders, if specified, shall be galvanized steel or as shown on the plans.

**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 non-metallic material. 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.** Pulling-in irons shall be manufactured with 7/8-inch (22 mm) diameter hot-dipped galvanized steel or stress-relieved carbon steel roping designed for concrete applications (7 strand, 1/2-inch (12 mm) diameter with an ultimate strength of 270,000 psi (1862 MPa)). Where stress-relieved carbon steel roping is used, a rustproof sleeve shall be installed at the hooking point and all exposed surfaces shall be encapsulated with a polyester coating to prevent corrosion.

**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 10 feet (2.4 m) long nor less than ¾ 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 affected 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.** Ladders shall be installed such that they may be removed if necessary. Mounting brackets shall be supplied top and bottom and shall be cast in place during fabrication of the structure or drilled and grouted in place after erection of the structure.

**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 backfilled 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** Electrical manholes and junction structures shall be measured by each unit completed in place and accepted. The following items shall be included in the price of each unit: All required excavation and dewatering: sheeting and bracing; all required backfilling with on-site materials; restoration of all surfaces and finished grading and turfing; all required connections; temporary cables and connections; and ground rod testing.

**115-4.2 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** The accepted quantity of electrical manholes and junction structures will be paid for at the Contract unit price per each, complete and in place. 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 appurtenances and connections to duct banks 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.

**115-5.2** 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-115-5.2 Electrical Junction Structure 3' x3' - 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 a neatly bound, properly sized 3-ring binder, tabbed by specification section or 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.

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 manufacture.

## 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.** Retroreflective markers shall be type L-853 and shall conform to the requirements of AC 150/5345-39.

**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.

the light concerned or to the standard referenced.

**Lights**

| Type | Class | Mode | Style | Option | Base | Filter | Transformer | Notes |
|---|---|---|---|---|---|---|---|---|
| **L-861T(L)** | 2 | 1 | N/A | | L-867 | Blue | L-830 | See note 1,2 below – 24" Ht. |
| **L-861T(L)** | 2 | 1 | N/A | | Stake | Blue | L-830 | See note 1,2 below – 24" Ht. |

**(L) = LED Fixture**

**Note 1: Provide fixture without arctic kit (heaters)**

**Note 2: Provide with snow marker (Whip)**

**125-2.8 Runway and Taxiway Signs.** Runway and Taxiway Guidance Signs should conform to the requirements of AC 150/5345-44.

**Signs**

| Type | Size | Style | Class | Mode | Notes |
|---|---|---|---|---|---|
| **L-858L(L)** | 2 | 2 | 2 | 2 | Location - Refer to Sign Schedule for Modules & Layout |
| **L-858Y(L)** | 2 | 2 | 2 | 2 | Directional - Refer to Sign Schedule for Modules & Layout |
| **L-858R (L)** | 2 | 3 | 2 | 2 | Mandatory - Refer to Sign Schedule for Modules & Layout |
| **L-858R (L)** | 2 | 2 | 2 | 2 | Mandatory - Refer to Sign Schedule for Modules & Layout |

**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 Required

**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 as completed units in place, ready for operation, and accepted by the RPR. Guidance sign installed will be measured by the number of each installed as completed units, in place, ready for operation, and accepted by the RPR. Separate measurement for payment will be made for signs of differing number of modules as indicated on the plans.

## BASIS OF PAYMENT

**125-5.1** Payment will be made at the Contract unit price for each complete runway or taxiway light, or guidance sign panel relocation installed 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, and for all labor, equipment, tools and incidentals necessary to complete this item.

**Payment will be made under:**

| | |
|---|---|
| Item L-125-5.1 | L-861T Base Mounted LED Elevated Taxiway Edge Light – per each |
| Item L-125-5.2 | L-861T Stake Mounted LED Elevated Taxiway Edge Light – per each |
| Item L-125-5.3 | L- 858 Airfield Guidance Sign on Foundation – 1 Module - per each |
| Item L-125-5.4 | L- 858 Airfield Guidance Sign on Foundation – 2 Module - per each |
| Item L-125-5.5 | L- 858 Airfield Guidance Sign on Foundation – 3 Module - 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**

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# ITEM T-901 SEEDING

## DESCRIPTION

**901-1.1** This item shall consist of soil preparation, seeding, fertilizing and liming 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 the MaineDOT 717.03 Method #1 – Park Mixture and applied as follows:

| Property | Specification |
|---|---|
| Germination | >80% |
| Pure Live Seed | >85% |
| Purity | >85% |
| Weed Seed | <1.0% |
| Application Rate | 4lbs/1000sf |

| Seed | Mixture |
|---|---|
| Creeping Red Fescue | 45% +/- 4% |
| Kentucky Bluegrass | 25 +/- 4% |
| Chewings Fescue | 15 +/- 4% |
| Perennial Ryegrass | 10 +/- 2% |
| Annual Ryegrass | 5 +/- 2% |

The Contractor shall not seed during January, February, or March, or when the ground is frozen or snow covered, or at other times as the that the Engineer may direct. Seeding shall be performed during the period between April 1 and June 1 and August 15 and October 14 inclusive, unless otherwise approved by the Engineer.

Seeding shall be performed as recommended by the seed provider, unless otherwise approved by the Engineer.

**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 mesh sieve and 50% will pass through a No. 100 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 120 lbs/1000 sf. All liming materials shall conform to the requirements of ASTM C602.

**Table 1 – Supplemental Lime**

| Existing Soil pH | Limestone to be Added | |
|---|---|---|
| | lbs / Acre | Pounds / Cubic Yard |
| 4.0 – 4.4 | 6,000 | 12 |
| 4.5 – 4.9 | 4,000 | 8 |
| 5.0 – 5.4 | 2,000 | 4 |

**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 10-10-10 commercial fertilizer and shall be spread at the rate of 20 lbs/1000 sf.

**Table 2 – Fertilizer Application Information**

| Percent of Nutrients | | Minimum Application Rate (Lbs per 1000 Sq. Ft.) | Measurement Factor |
|---|---|---|---|
| Initial | Re-fertilization | | |
| 10-10-10 | | 20.0 | 1.0 |
| 15-15-15 | | 13.4 | 1.5 |
| 19-19-19 | | 10.5 | 1.9 |
| | 10-3-6 | 20.0 | 1.0 |
| | 12-2-8 | 16.7 | 1.2 |
| | 12-4-8 | 16.7 | 1.2 |

**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. 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.

b. 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 pipe lines 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 when bare spots are one square foot (0.01 sq m) or less, randomly dispersed, and do not exceed 3% of the area seeded.

## METHOD OF MEASUREMENT

**901-4.1** The quantity of seeding to be paid for shall be the number of units 1,000 square feet measured on the ground surface, completed and accepted.

## BASIS OF PAYMENT

**901-5.1** Payment shall be made at the contract unit price per 1,000 square feet, 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 1,000 square feet |

## MATERIAL REQUIREMENTS

| | |
|---|---|
| ASTM C602 | Standard Specification for Agricultural Liming Materials |
| FED SPEC | JJJ-S-181, Federal Specification, Seeds, Agricultural |
| MaineDOT | MaineDOT Section 717 |

## END OF ITEM T-901

# ITEM E-200 SPARE PARTS

## CONTRACT DOCUMENTS

**200-0.1** This section of these Specifications is part of the Contract Documents as defined in the General Provisions. All applicable parts of the balance of the Contract Documents are equally as binding for this section as for all other sections.

## DESCRIPTION

**200-1.1** This work shall consist of providing spare parts for the airport lighting systems. The FAA considers up to 10% of the cost of the airport lighting system or a maximum of $10,000 eligible for funding participation. Under this item, the contractor shall provide to the Owner a part list and price sheets for the airfield lighting system installed under this project. The Owner will use the parts and price list to choose the spare parts desired. The parts selected by the Owner will be paid for using the allowance provided in the bid proposal form.

## MATERIALS

**200-2.1 GENERAL.** The contractor shall provide manufactures parts and price lists to the Owner for the electrical components used for the airfield lighting system work included in this project including but not limit to; elevated taxiway edge lights, airfield guidance signs, constant current regulators, splice kits, L-824 cable and other electrical spare parts that may be recommended by the manufacturer. The Owner shall use the parts and price lists to select the spare parts desired. The contractor shall use the parts list and price to provide a formal quote to the Owner for the parts selected. Parts shall meet the buy American provisions of this project.

The spare parts and price list shall be provided during the submittal process for the airfield lighting work items.

## CONSTRUCTION DETAILS

**200-3.1 Not Used.**

## METHOD OF MEASUREMENT

**200-4.1** The spare parts to be provided by the Contractor shall be paid for at the actual cost of the parts being charged to the Contractor. Freight and shipping will be eligible for payment as a direct expense to the Contractor and shall be clearly indicated. Measurement for payment will be made using actual manufacturers billing(s)/invoice(s) for the spare parts plus shipping being provided. No mark up by the Contractor will be allowed for spare parts to be provided.

## BASIS OF PAYMENT

**200-5.1** This work shall include payment based on the actual cost invoiced to the Contractor from manufacturers plus shipping shall be attached to payment request. The Contractor will not be allowed to include a mark-up on spare parts provided.

**Payment will be made under:**

| | |
|---|---|
| E-200-1 | Spare Parts - Allowance |

**END OF ITEM E-200**

# ITEM T-905 TOPSOILING

## DESCRIPTION

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

## MATERIALS

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

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

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

## CONSTRUCTION METHODS

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

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

**905-3.2 PREPARING THE GROUND SURFACE.** Immediately prior to dumping and spreading the topsoil on any area, the surface shall be loosened by discs or spike-tooth harrows, or by other means approved by the RPR, to a minimum depth of 2 inches (50 mm) to facilitate bonding of the topsoil to the covered subgrade soil. The surface of the area to be topsoiled shall be cleared of all stones larger than **2 inches (50 mm) in any diameter** and all litter or other material which may be detrimental to proper bonding, the rise of capillary moisture, or the proper growth of the desired planting. Limited areas, as shown on the plans, which are too compact to respond to these operations shall receive special scarification.

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

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

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

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

**905-3.4 PLACING TOPSOIL.** The topsoil shall be evenly spread on the prepared areas to a

minimum uniform depth of **4 inches (100 mm) after compaction**, unless otherwise shown on the plans or stated in the special provisions. Spreading shall not be done when the ground or topsoil is frozen, excessively wet, or otherwise in a condition detrimental to the work. Spreading shall be carried on so that turfing operations can proceed with a minimum of soil preparation or tilling.

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

## METHOD OF MEASUREMENT

**905-4.1** Topsoil 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 | Topsoil (Obtained on Site or Removed from Stockpile - per cubic yard (cubic meter) |
| Item T-905-5.2 | Topsoil (Furnished from Off the Site) - per cubic yard (cubic meter) |

## REFERENCES

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

ASTM International (ASTM)

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

Advisory Circulars (AC)

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

FAA/United States Department of Agriculture

Wildlife Hazard Management at Airports, A Manual for Airport Personnel

**END OF ITEM T-905**

# 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 farm land, 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.** Not Used

**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 thirty (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.

## 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 (square meter)

## 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**

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