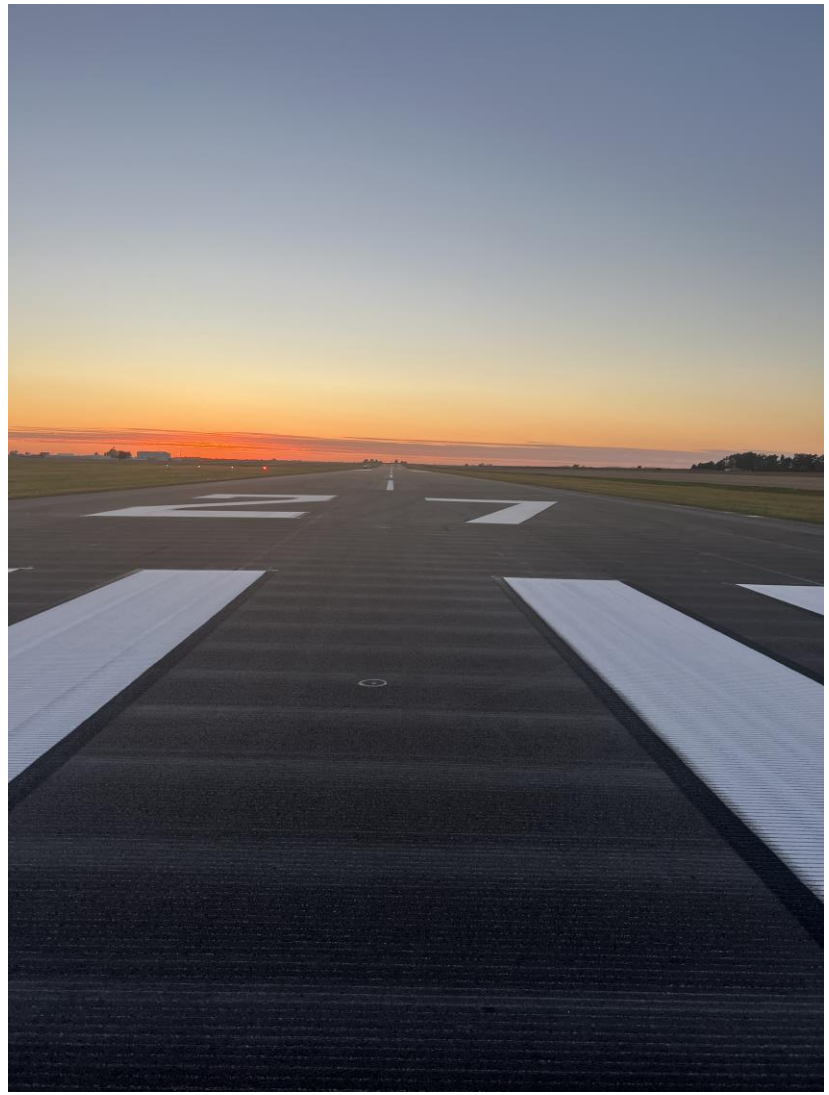
Illinois Airport HMA:
IDOT Specifications, Mix Design, Construction, Testing & Payment

William Eves, P.E.
Bureau Chief of Airport Engineering
Division of Aeronautics
Illinois Department of Transportation

December 5, 2023

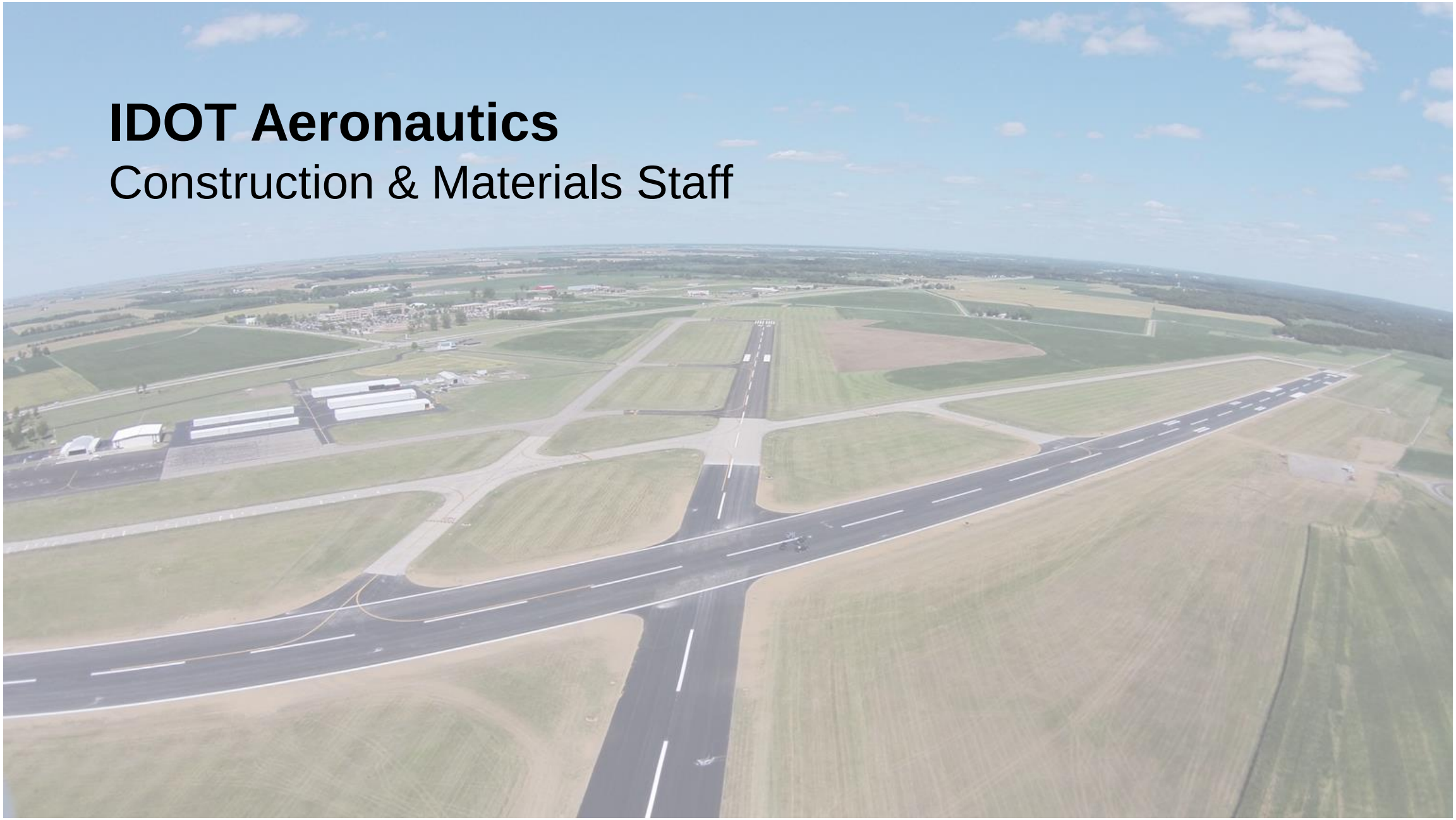
Overview

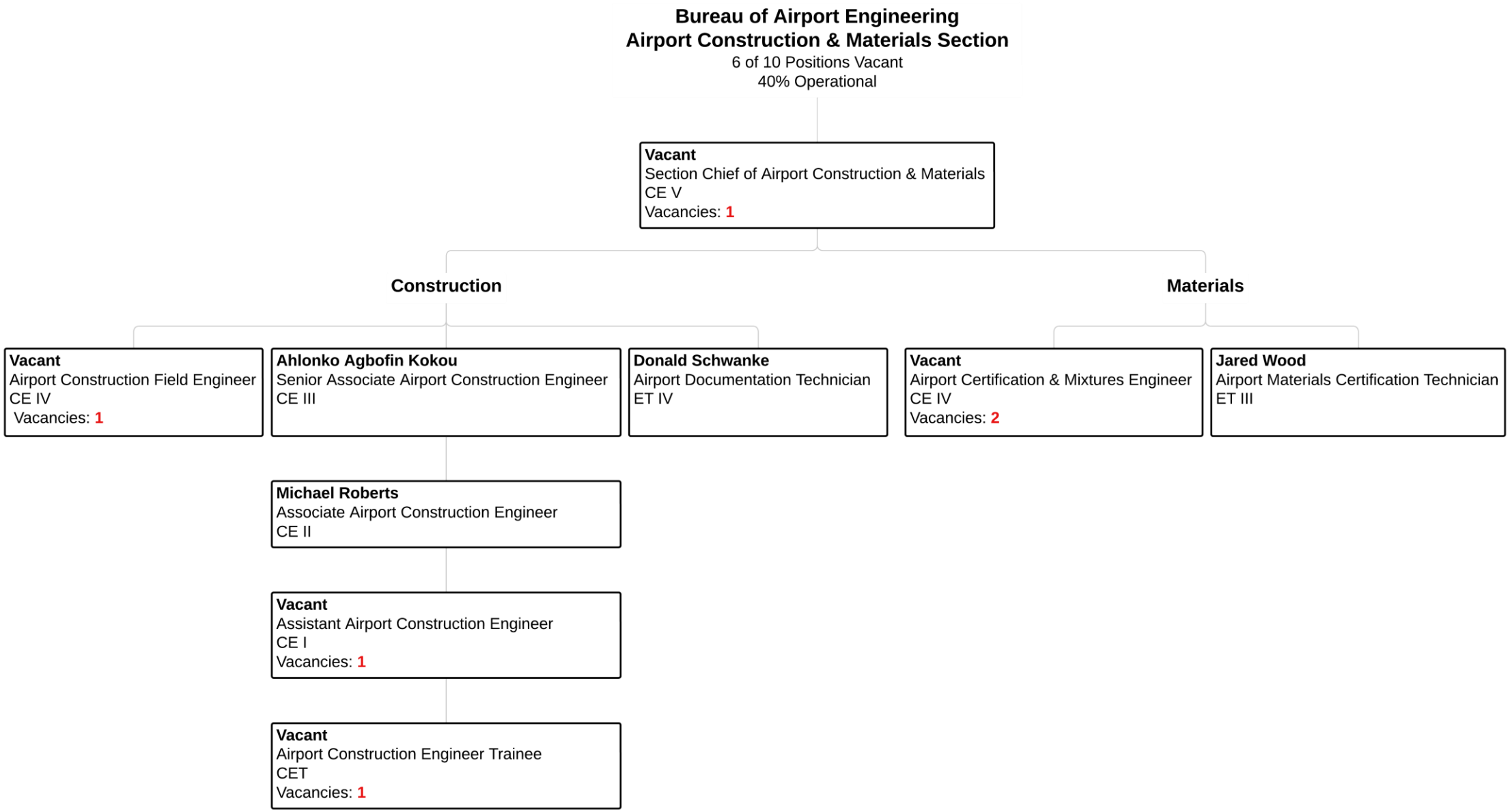
- Aeronautics Construction & Materials Staff
- Specifications For Airport Construction In Illinois
- IDOT Aeronautics HMA Mix Design
- Construction & Testing
- Acceptance & Payment

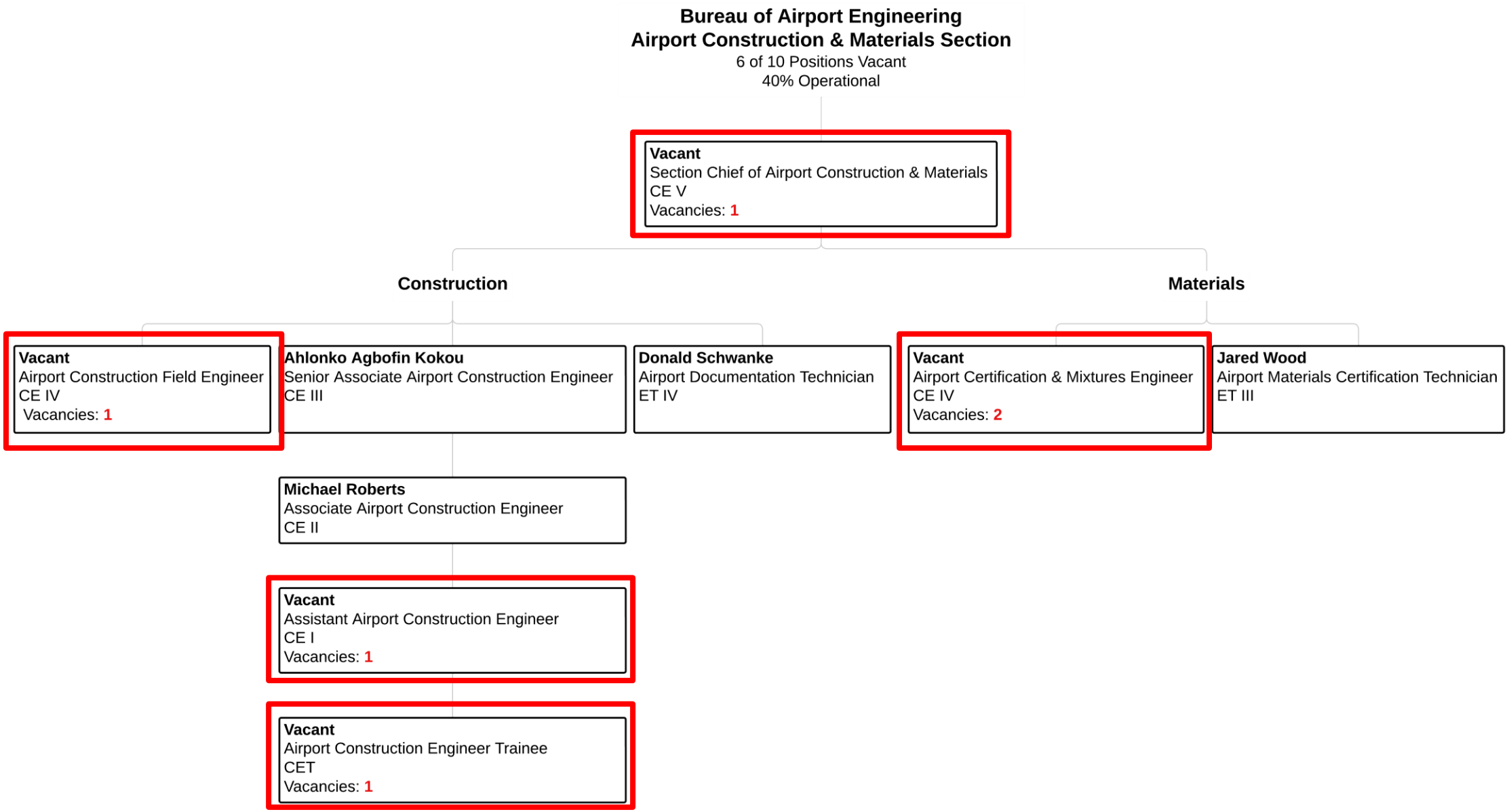


IDOT Aeronautics

Construction & Materials Staff




Bureau of Airport Engineering
Airport Construction & Materials Section
6 of 10 Positions Vacant
40% Operational
Vacant
Section Chief of Airport Construction & Materials
CE V
Vacancies: 1
Construction
Materials
Vacant
Airport Construction Field Engineer
CE IV
Vacancies: 1
Ahlonko Agbofin Kokou
Senior Associate Airport Construction Engineer
CE III
Donald Schwanke
Airport Documentation Technician
ET IV
Vacant
Airport Certification & Mixtures Engineer
CE IV
Vacancies: 2
Jared Wood
Airport Materials Certification Technician
ET III
Michael Roberts
Associate Airport Construction Engineer
CE II
Vacant
Assistant Airport Construction Engineer
CE I
Vacancies: 1
Vacant
Airport Construction Engineer Trainee
CET
Vacancies: 1


Bureau of Airport Engineering
Airport Construction & Materials Section
6 of 10 Positions Vacant
40% Operational
Vacant
Section Chief of Airport Construction & Materials
CE V
Vacancies: 1
Construction
Materials
Vacant
Airport Construction Field Engineer
CE IV
Vacancies: 1
Ahlonko Agbofin Kokou
Senior Associate Airport Construction Engineer
CE III
Donald Schwanke
Airport Documentation Technician
ET IV
Vacant
Airport Certification & Mixtures Engineer
CE IV
Vacancies: 2
Jared Wood
Airport Materials Certification Technician
ET III
Michael Roberts
Associate Airport Construction Engineer
CE II
Vacant
Assistant Airport Construction Engineer
CE I
Vacancies: 1
Vacant
Airport Construction Engineer Trainee
CET
Vacancies: 1

Specifications

Airport Construction in Illinois

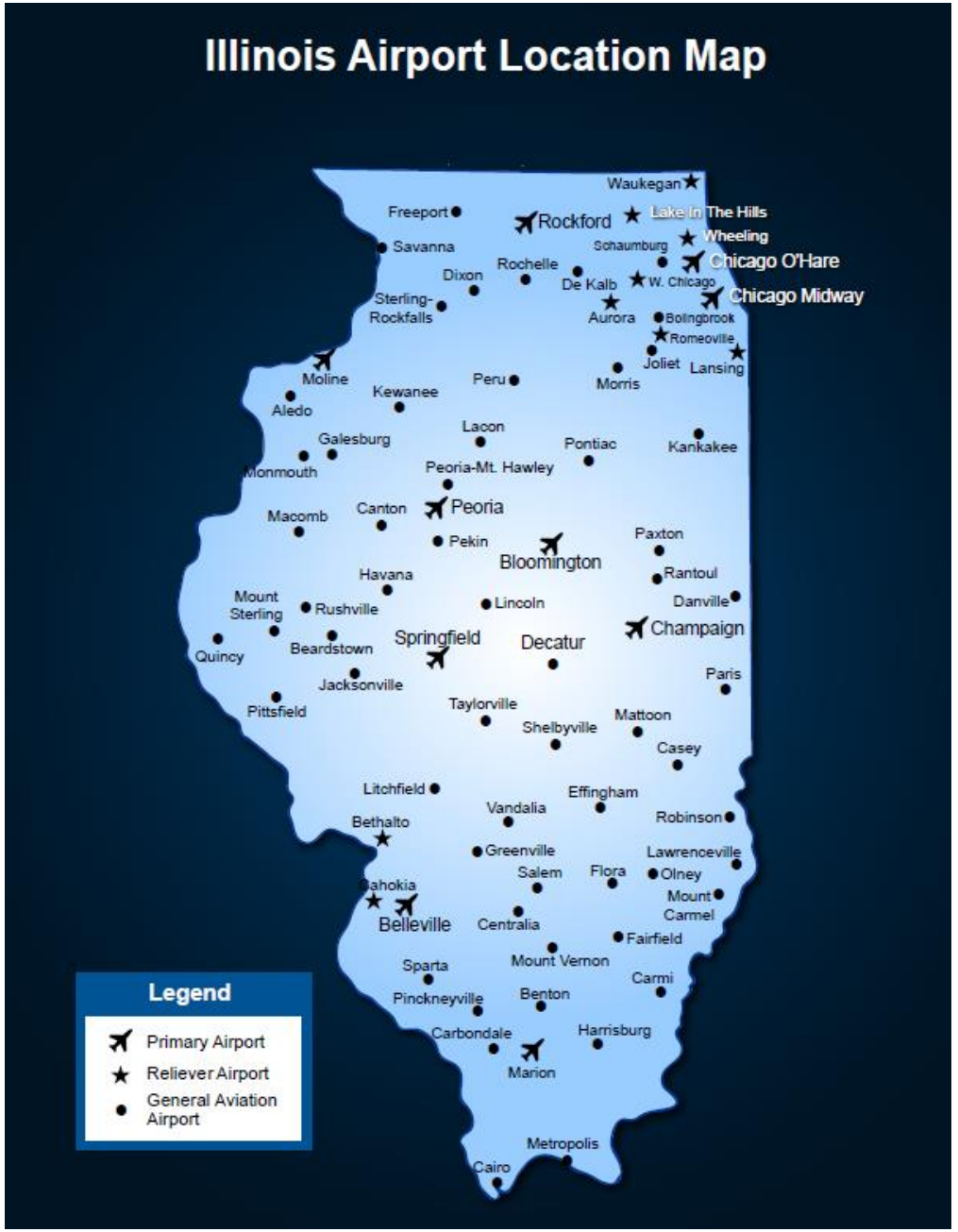
Three Spec Books

Which one are we using for this project?

(BACKGROUND INFORMATION)

75 Public Airports in Illinois

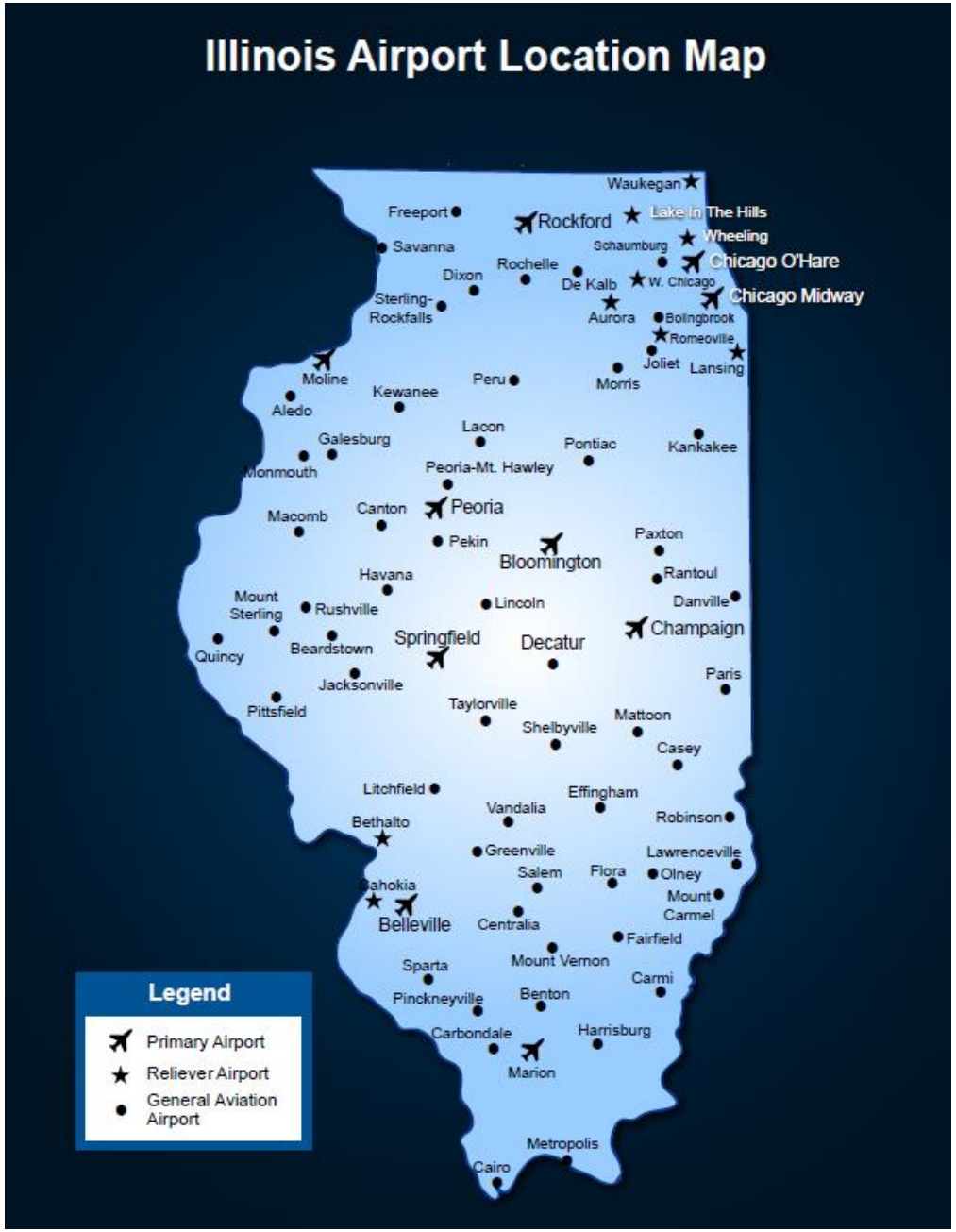
- 10 Primary Airports
  Moline (MLI)
  Rockford (RFD)
  Peoria (PIA)
  Bloomington (BMI)
  Champaign (CMI)
  Quincy (UIN)
  Springfield (SPI)
  Decatur (DEC)
  Belleville (BLV)
  Marion (MWA)



(BACKGROUND INFORMATION)

75 Public Airports in Illinois

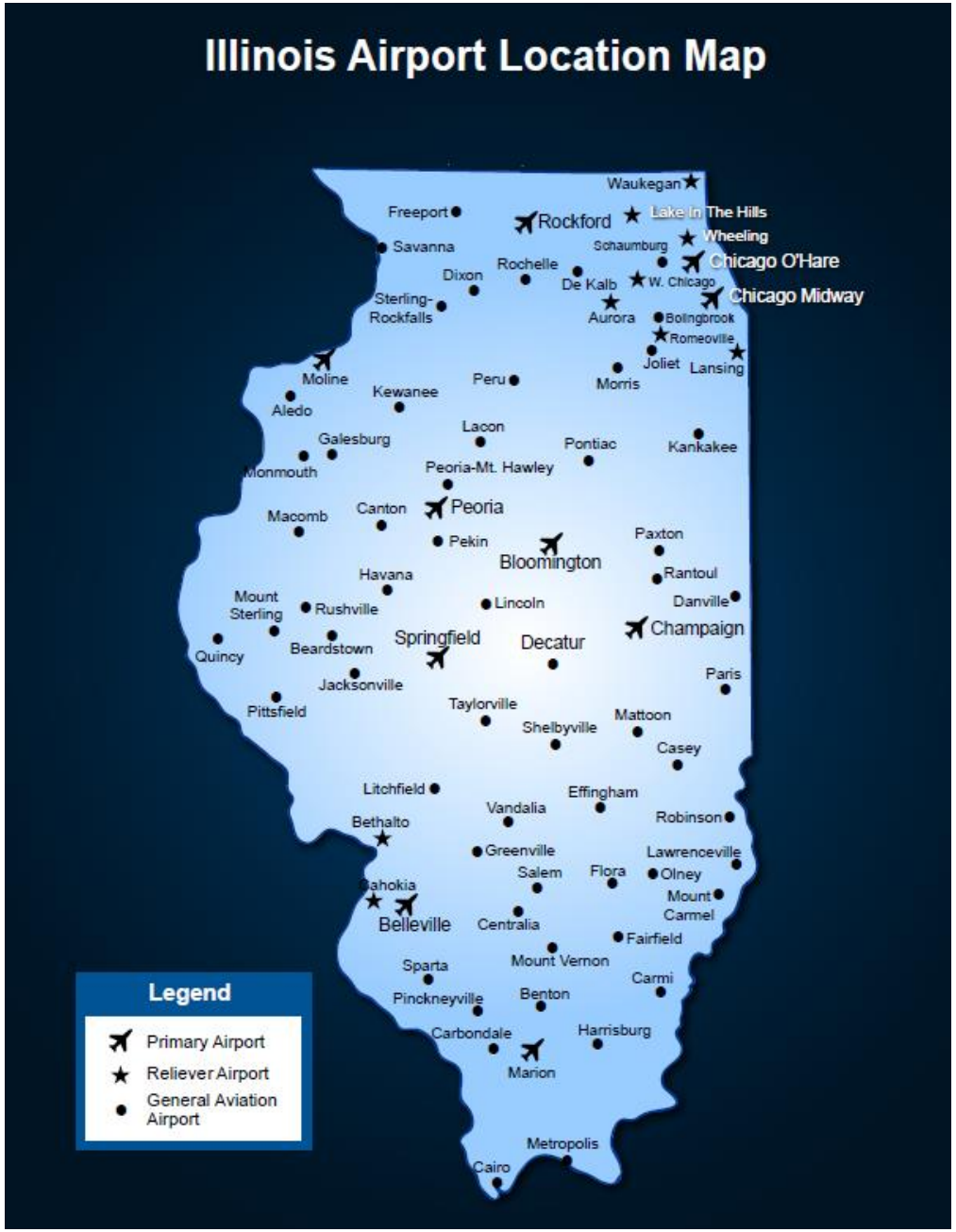
- 9 Reliever Airports
  Waukegan (UGN)
  Lake In The Hills (3CK)
  Wheeling (PWK)
  West Chicago (DPA)
  Aurora (ARR)
  Romeoville (LOT)
  Lansing (IGQ)
  Bethalto (ALN)
  Cahokia (CPS)



(BACKGROUND INFORMATION)

75 Public Airports in Illinois

- 56 General Aviation Airports
- Examples:
  Schaumburg (06C)
  Dixon (C73)
  Danville (DNV)
  Mount Vernon (MVN)
  Cairo (CIR)



About IDOT Doing Business Travel Information Transportation System

idot.illinois.gov

Illinois Department of Transportation

Be prepared for traveling in winter weather.

READ IDOT'S WINTER DRIVING TIPS >

Learn how to do business with State of Illinois Agencies and Universities

CLICK HERE FOR MORE INFORMATION >

About IDOT | Doing Business | Travel Information | Transportation System

- Construction Contractor Quick Links
- Procurements
- Innovative Project Delivery
- Material Approvals
- Certifications
- Registration
- Permits
- Sales
- Special Sign Programs
- Exclusive Agreements
- IDOTCADD Support and Information
- Report Fraud

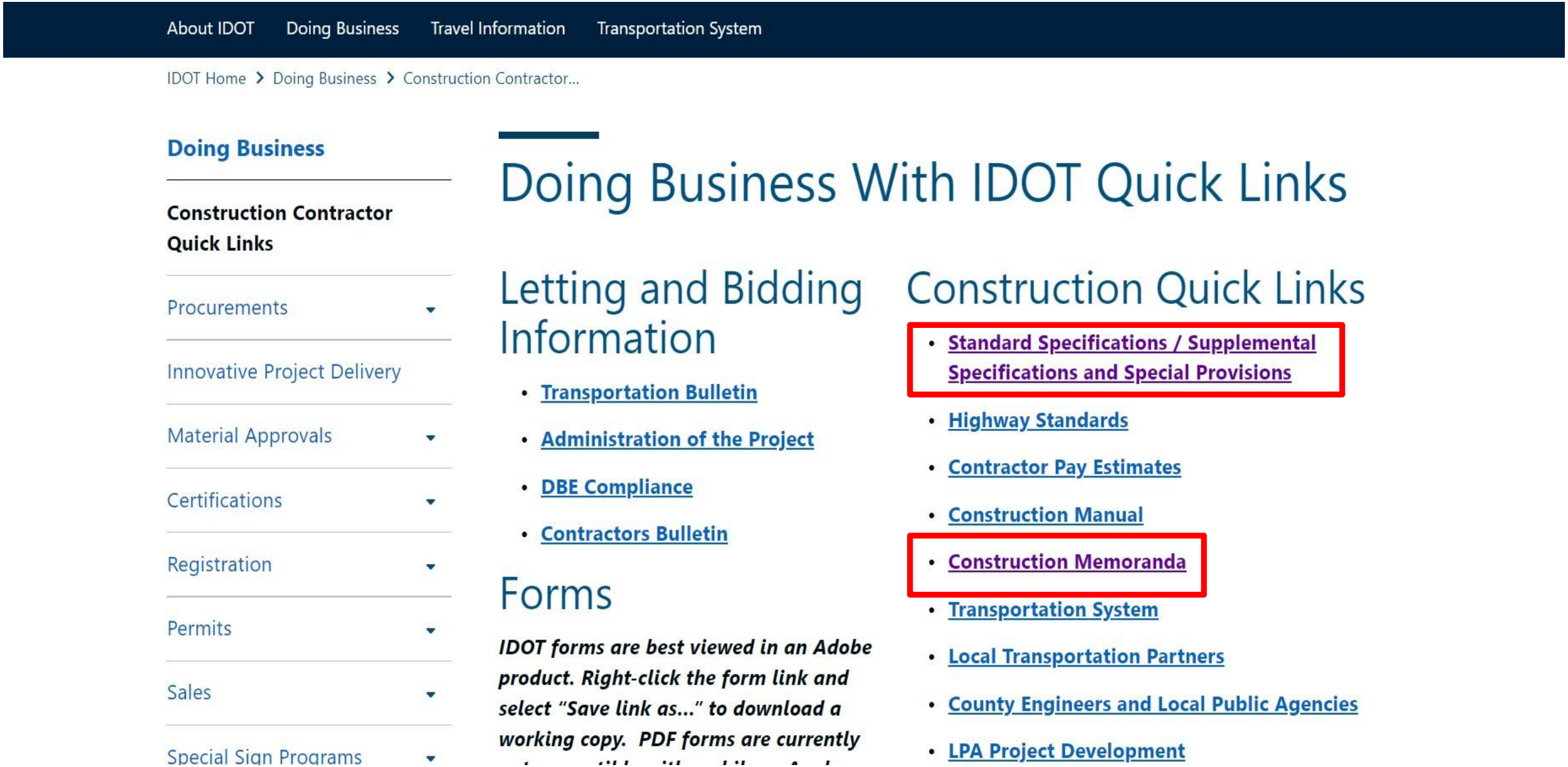
partment of Transportation

ng in winter

ER DRIVING

Learn how to do business with State of Illinois Agencies and Universities

CLICK HERE FOR MORE INFORMATION >


About IDOT
Doing Business
Travel Information
Transportation System
IDOT Home › Doing Business › Construction Contractor...
Doing Business
Construction Contractor Quick Links
Procurements
Innovative Project Delivery
Material Approvals
Certifications
Registration
Permits
Sales
Special Sign Programs
Doing Business With IDOT Quick Links
Letting and Bidding Information
Transportation Bulletin
Administration of the Project
DBE Compliance
Contractors Bulletin
Forms
IDOT forms are best viewed in an Adobe product. Right-click the form link and select "Save link as..." to download a working copy. PDF forms are currently
Construction Quick Links
Standard Specifications / Supplemental Specifications and Special Provisions
Highway Standards
Contractor Pay Estimates
Construction Manual
Construction Memoranda
Transportation System
Local Transportation Partners
County Engineers and Local Public Agencies
LPA Project Development

- Aeronautics
  - Construction and Materials
  - Contracts
  - Design
  - Land
  - Planning and Programming
  - Safety
  - **Construction Memorandums**
  - Contractor's Bulletin
  - Transportation Bulletin

33	Operational Review of Contract Quantities	04/30/2012
39	Transportation or Operation of Heavy Equipment on Pavement or Bridges Within the Contract Limits - Article 107.16	03/31/2006
4	Authorization of Contract Changes	09/09/2020
40	Rubblizing PCC Pavement and Placing a Bituminous Concrete Overlay	05/31/2001
46	Field Control of Railroad and Utility Adjustments	06/03/2002

Showing 1 to 10 of 28 entries

Previous 1 2 3 Next

Navigate back to Contractor Resources

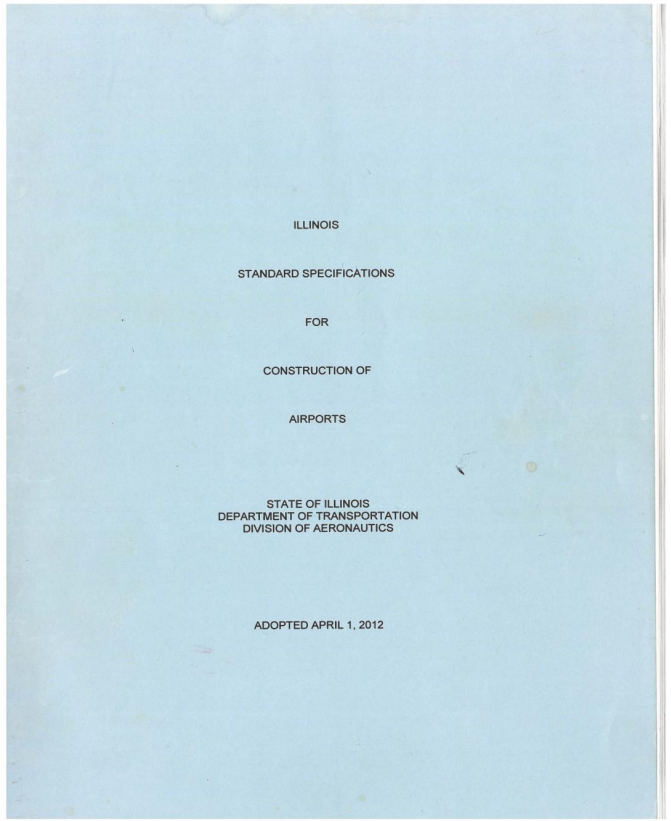
- Special Sign Programs
- Exclusive Agreements
- CADD
- Report Fraud

with Bituminous Concrete Paving (2020)

- Policy Memorandum (Aeronautics) 97-2 Pavement Marking Acceptance (2020)
- Policy Memorandum (Aeronautics) 2001-1 Requirements for Cold Weather Concreting (2020)
- Policy Memorandum (Aeronautics) 2003-1 Requirements for Laboratory, Testing, Quality Control and Paving of Superpave HMA Concrete Mixtures for Airports (2020)
- Policy Memorandum (Aeronautics) 2011-1 Requirements for Laboratory, Testing, Quality Control, and Paving of Porous Friction Course (2020)
- Policy Memorandum (Aeronautics) HMA Comparison Samples (2020)
- Policy Memorandum (Aeronautics) 07-21 Acceptance Procedure for Finely Divided Minerals used in Portland Cement Concrete and Other Applications
- Policy Memorandum (Aeronautics) 2001-1 Requirements for Cold Weather Concreting
- Policy Memorandum (Aeronautics) 2003-1 Requirements for Laboratory, Testing, Quality Control, and Paving of Superpave HMA Concrete Mixtures for Airports
- Policy Memorandum (Aeronautics) 2011-1 Requirements for Laboratory, Testing, Quality Control, and Paving of Porous Friction Course
- Policy Memorandum (Aeronautics) 87-2 Density Acceptance of Bituminous Pavements
- Policy Memorandum (Aeronautics) 87-3 Mix Design, Test Batch, Quality Control, and Acceptance Testing of PCC Pavement Mixture

Three Spec Books

Which one are we using for this project?


ILLINOIS

STANDARD SPECIFICATIONS

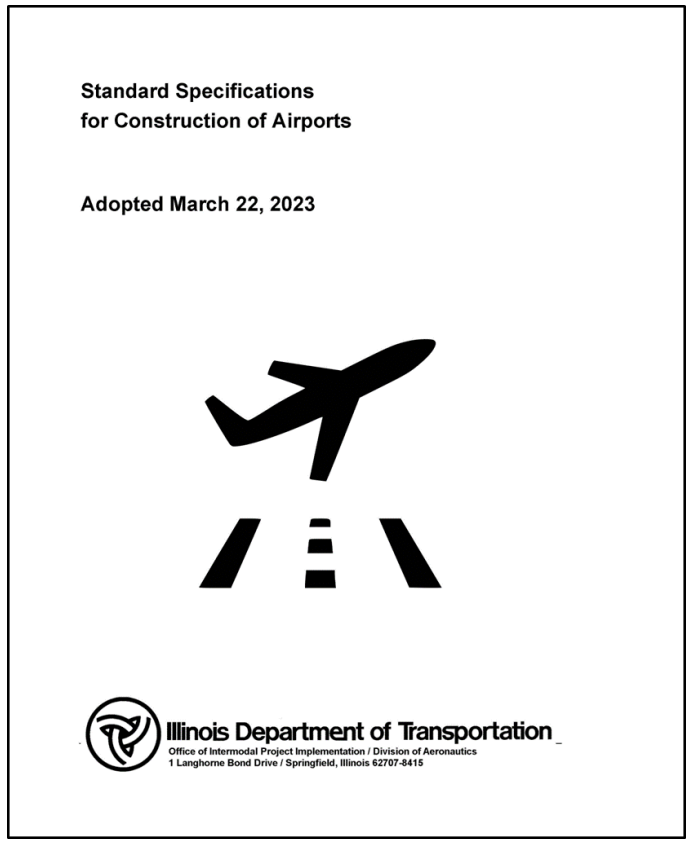
FOR

CONSTRUCTION OF

AIRPORTS

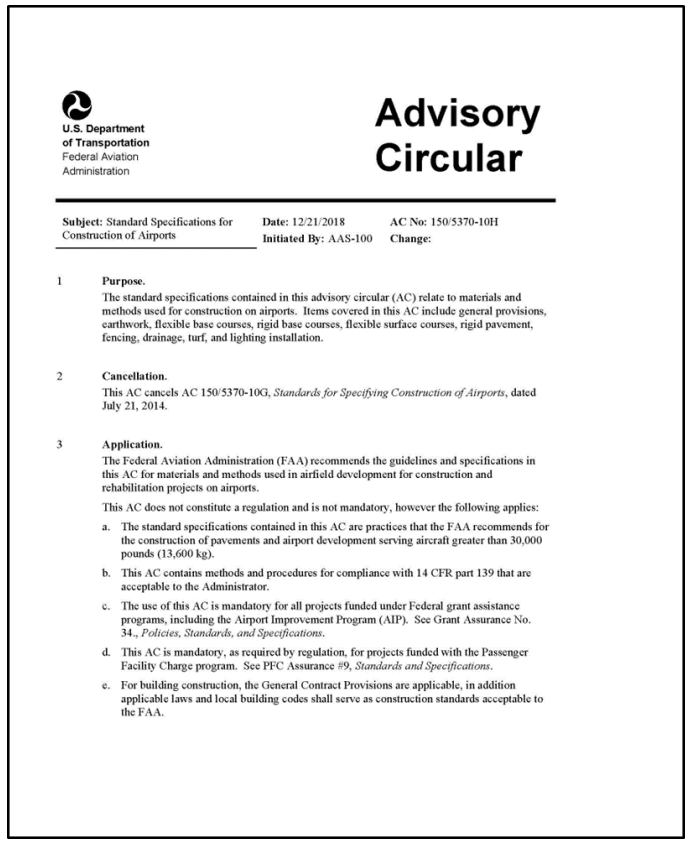
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF AERONAUTICS

ADOPTED APRIL 1, 2012


Standard Specifications for Construction of Airports

Adopted March 22, 2023

Illinois Department of Transportation
Office of Intermodal Project Implementation / Division of Aeronautics
1 Langhorne Bond Drive / Springfield, Illinois 62707-8415


U.S. Department of Transportation
Federal Aviation Administration

Advisory Circular

Subject: Standard Specifications for Construction of Airports | **Date:** 12/21/2018 | **Initiated By:** AAS-100 | **AC No:** 150/5370-10H | **Change:**

1 **Purpose.**
The standard specifications contained in this advisory circular (AC) relate to materials and methods used for construction on airports. Items covered in this AC include general provisions, earthwork, flexible base courses, rigid base courses, flexible surface courses, rigid pavement, fencing, drainage, turf, and lighting installation.

2 **Cancellation.**
This AC cancels AC 150/5370-10G, *Standards for Specifying Construction of Airports*, dated July 21, 2014.

3 **Application.**
The Federal Aviation Administration (FAA) recommends the guidelines and specifications in this AC for materials and methods used in airfield development for construction and rehabilitation projects on airports.

This AC does not constitute a regulation and is not mandatory, however the following applies:

a. The standard specifications contained in this AC are practices that the FAA recommends for the construction of pavements and airport development serving aircraft greater than 30,000 pounds (13,600 kg).

b. This AC contains methods and procedures for compliance with 14 CFR part 139 that are acceptable to the Administrator.

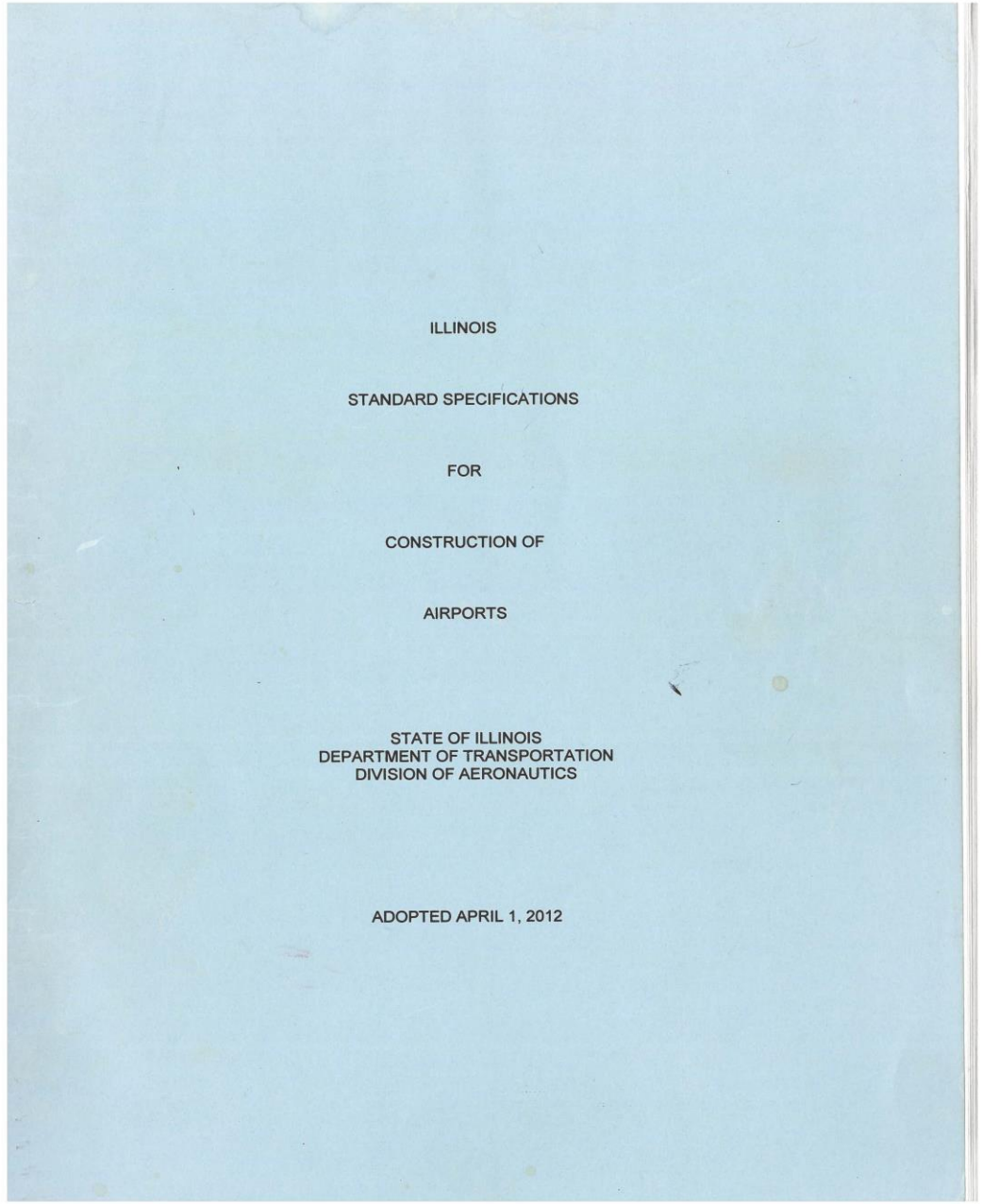
c. The use of this AC is mandatory for all projects funded under Federal grant assistance programs, including the Airport Improvement Program (AIP). See Grant Assurance No. 34., *Policies, Standards, and Specifications*.

d. This AC is mandatory, as required by regulation, for projects funded with the Passenger Facility Charge program. See PFC Assurance #9, *Standards and Specifications*.

e. For building construction, the General Contract Provisions are applicable, in addition applicable laws and local building codes shall serve as construction standards acceptable to the FAA.

2012 Illinois Standard Specifications for Construction of Airports

- Still in use when there is NO Federal money at a Non-Primary airport project
- Rebuild Illinois
- Many upcoming projects (Nov. ‘23 and Jan. ‘24 IDOT Lettings)


ILLINOIS

STANDARD SPECIFICATIONS

FOR

CONSTRUCTION OF

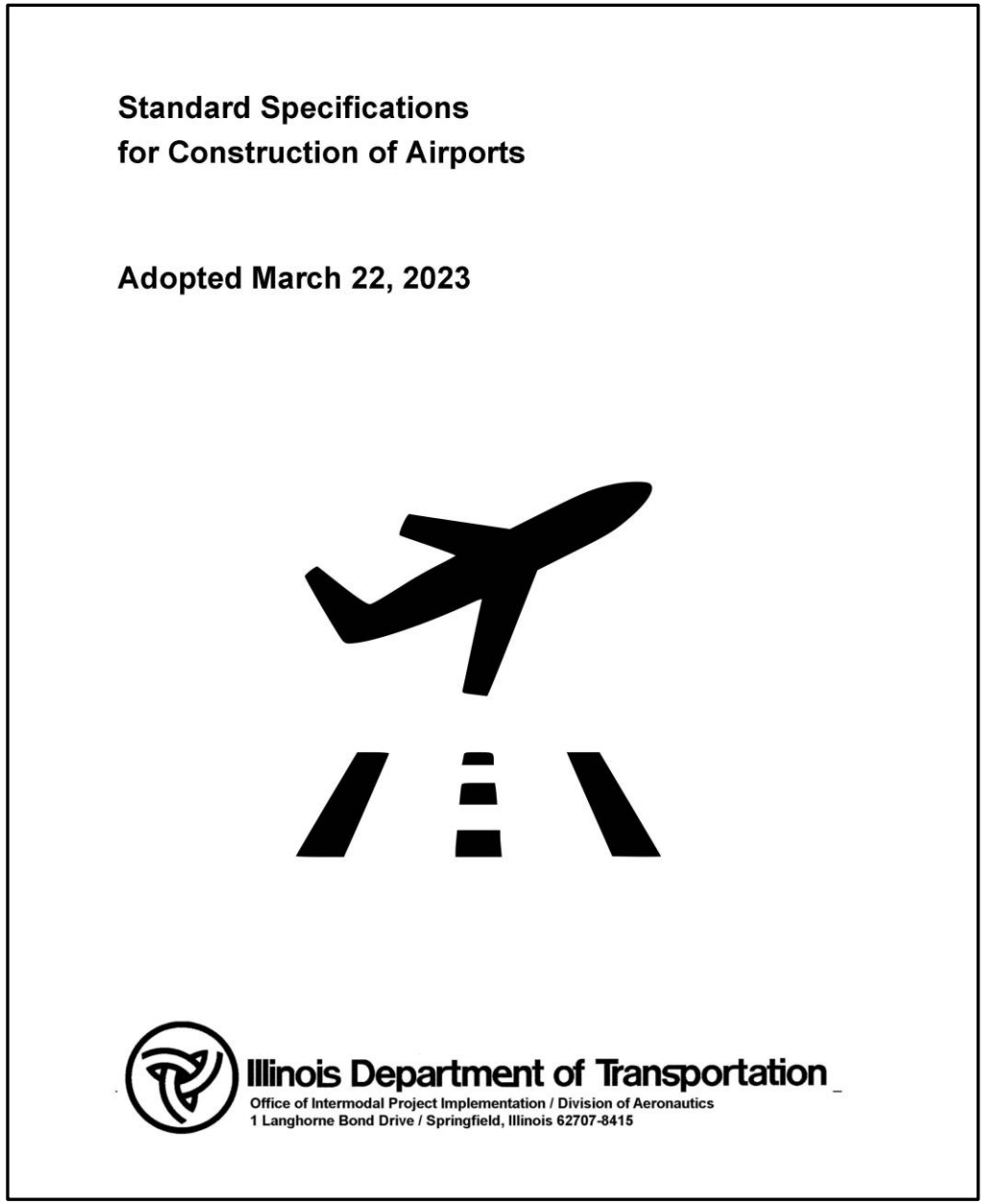
AIRPORTS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF AERONAUTICS

ADOPTED APRIL 1, 2012

2023 Illinois Standard Specifications for Construction of Airports

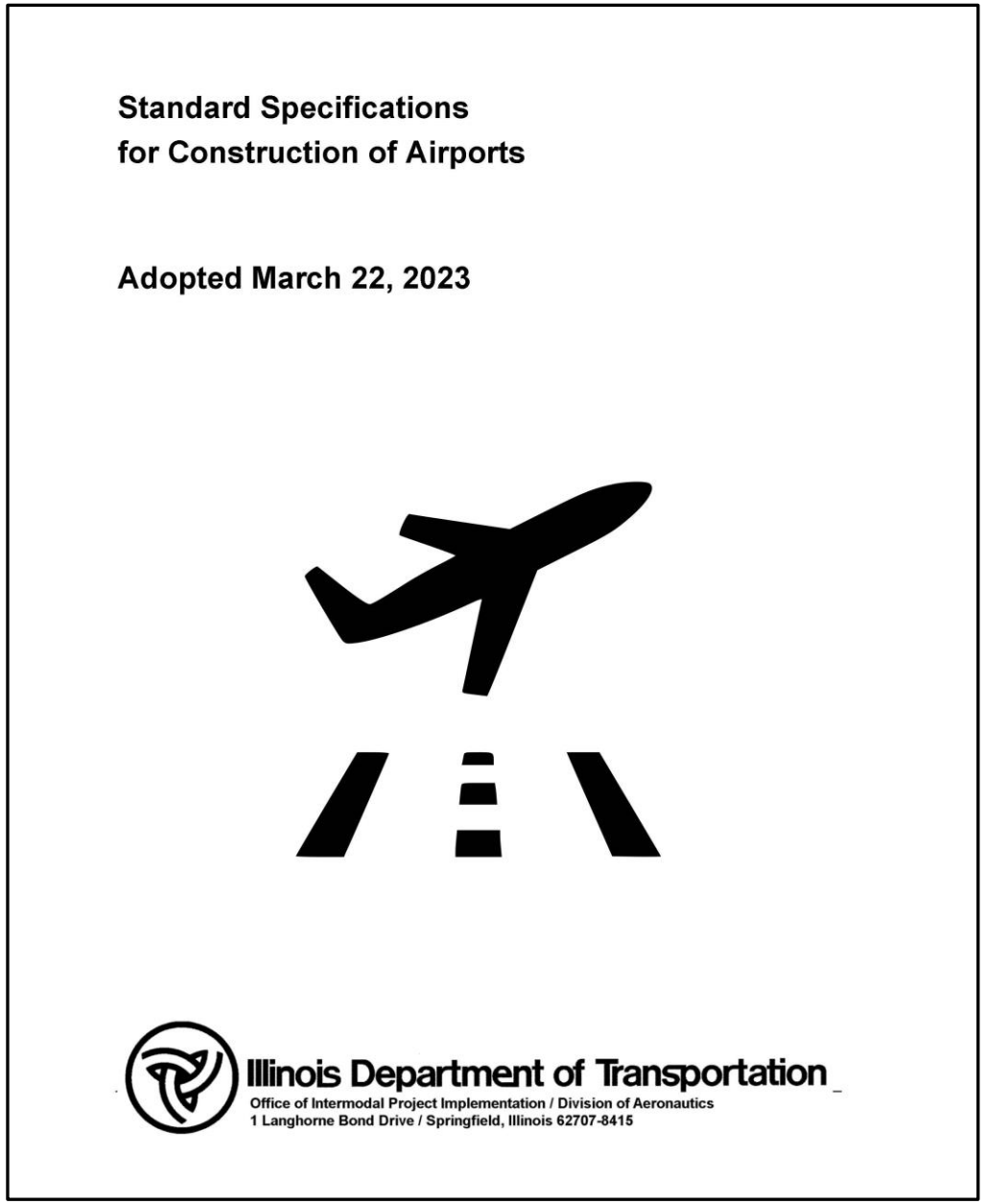
- Required for Non-Primary airport projects with Federal funding
- Approved by FAA in September 2020, First published edition 12/15/2020, Known as “2020 Spec”.
- Two Revisions: 3/12/21 and 11/12/21



2023 Illinois Standard Specifications for Construction of Airports

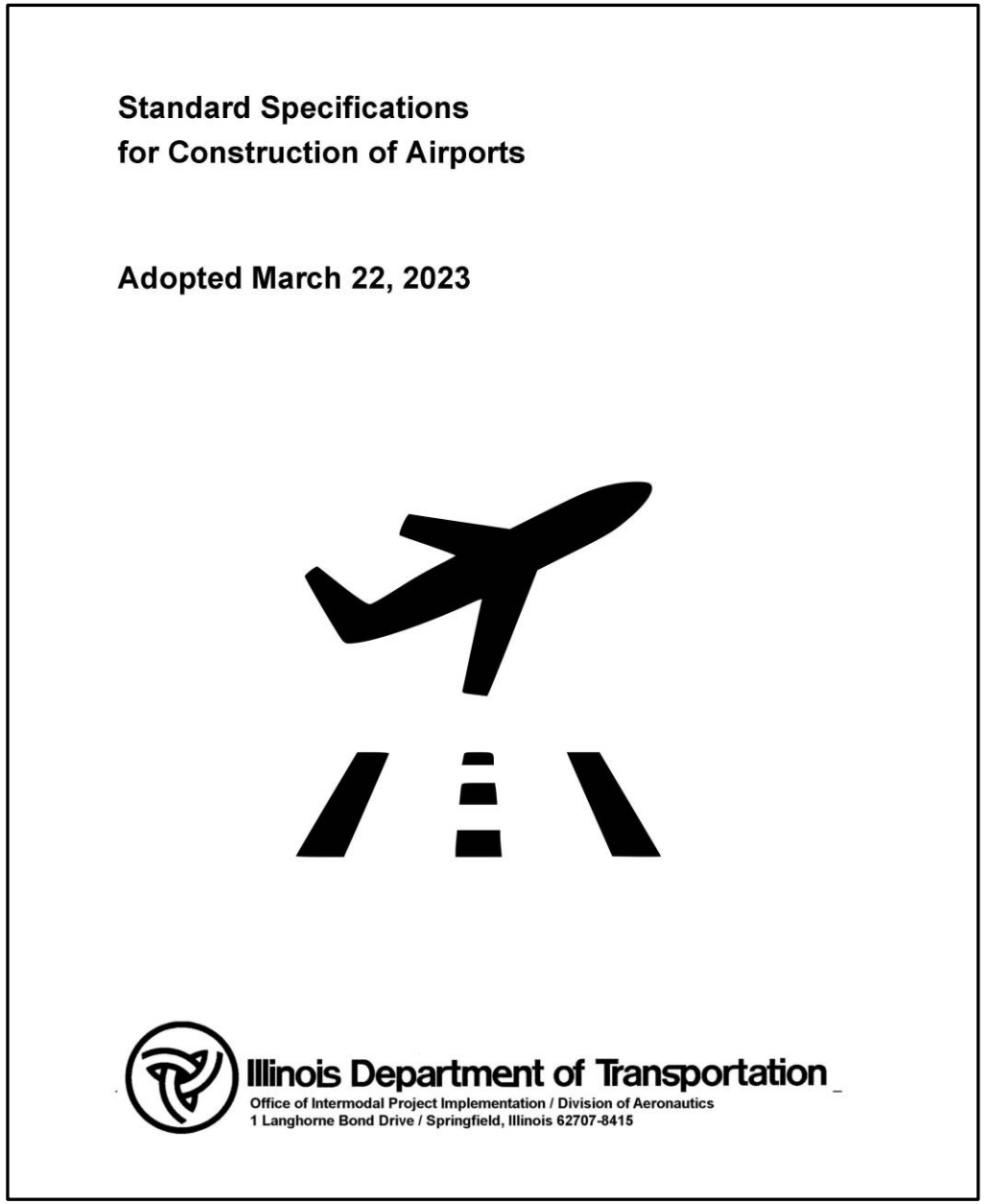
- **3/12/21 Revision:** 8 Projects between April ‘21 and July ‘21 IDOT Lettings. Only 4 with HMA paving. All HMA projects substantially complete.

- **11/12/21 Revision:** 47 Projects between Jan. ‘22 and June ‘23 IDOT Lettings. 24 with HMA paving. 12 substantially complete, 8 not yet started, 4 in progress.



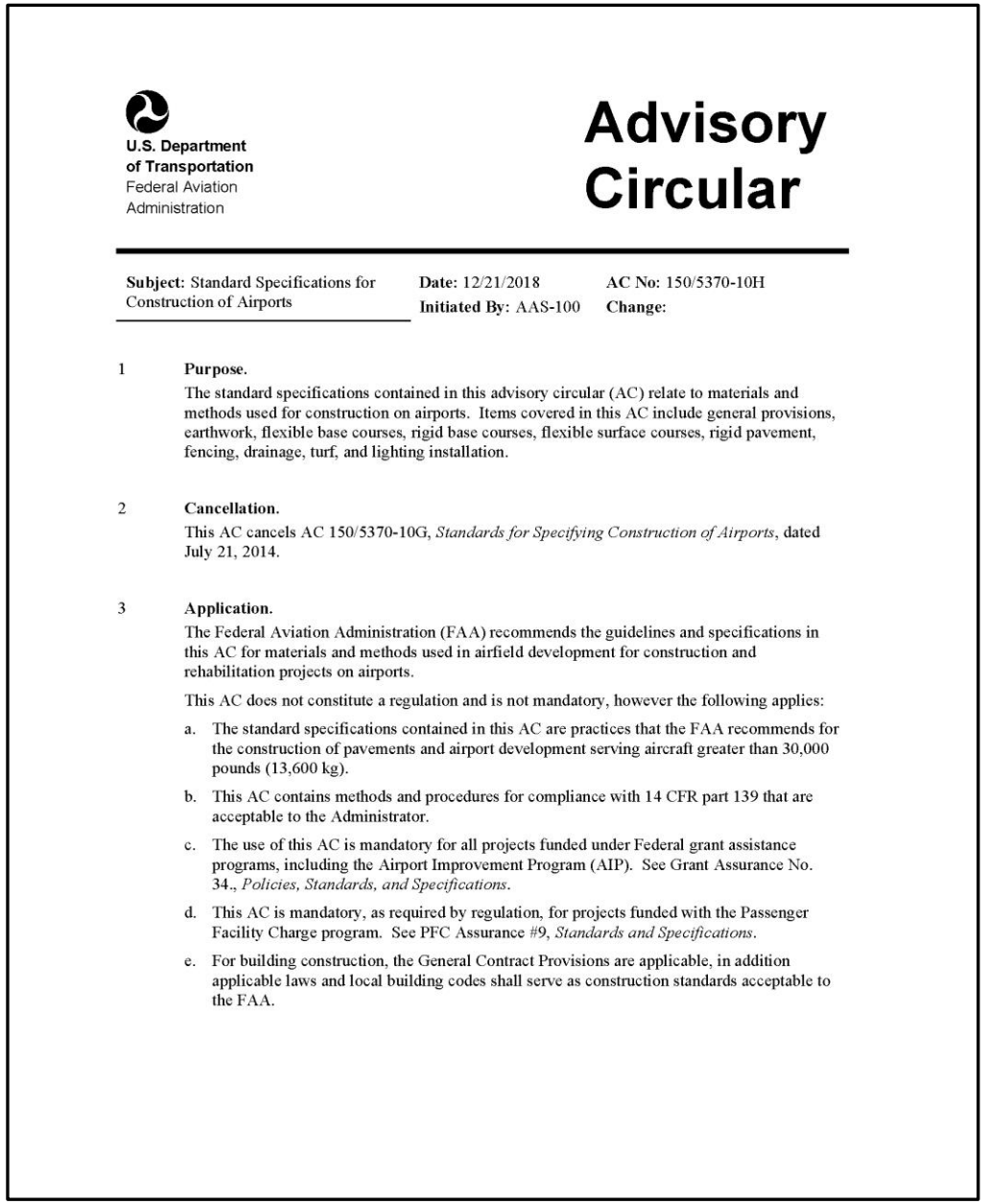
2023 Illinois Standard Specifications for Construction of Airports

- **3/22/23 Revision:** Current Version. First used on August ‘23 IDOT Letting. Known as “2023 Spec”.
- No HMA projects started yet using this spec.
- No further updates to Spec anticipated until FAA updates Federal Specifications.



FAA Standard Specifications for Construction of Airports

- Advisory Circular 150/5370-10H
- Must be used at Primary airports when project has Federal funding.
- Many projects at Primary airports are Local Let. Recent IDOT Let projects include CMI, SPI, MWA, UIN, DEC.



U.S. Department of Transportation
Federal Aviation Administration

Advisory Circular

Subject: Standard Specifications for Construction of Airports | **Date:** 12/21/2018 | **AC No:** 150/5370-10H
Initiated By: AAS-100 | **Change:**

1 **Purpose.**
The standard specifications contained in this advisory circular (AC) relate to materials and methods used for construction on airports. Items covered in this AC include general provisions, earthwork, flexible base courses, rigid base courses, flexible surface courses, rigid pavement, fencing, drainage, turf, and lighting installation.

2 **Cancellation.**
This AC cancels AC 150/5370-10G, *Standards for Specifying Construction of Airports*, dated July 21, 2014.

3 **Application.**
The Federal Aviation Administration (FAA) recommends the guidelines and specifications in this AC for materials and methods used in airfield development for construction and rehabilitation projects on airports.

This AC does not constitute a regulation and is not mandatory, however the following applies:

a. The standard specifications contained in this AC are practices that the FAA recommends for the construction of pavements and airport development serving aircraft greater than 30,000 pounds (13,600 kg).

b. This AC contains methods and procedures for compliance with 14 CFR part 139 that are acceptable to the Administrator.

c. The use of this AC is mandatory for all projects funded under Federal grant assistance programs, including the Airport Improvement Program (AIP). See Grant Assurance No. 34., *Policies, Standards, and Specifications*.

d. This AC is mandatory, as required by regulation, for projects funded with the Passenger Facility Charge program. See PFC Assurance #9, *Standards and Specifications*.

e. For building construction, the General Contract Provisions are applicable, in addition applicable laws and local building codes shall serve as construction standards acceptable to the FAA.

Aggregates

CA QUALITY FROM HIGHWAY SPEC

COARSE AGGREGATE QUALITY				
QUALITY TEST	CLASS			
	A	B	C	D
Na_2SO_4 Soundness 5 Cycle, Illinois Modified AASHTO T 104 [1/], % Loss max.	15	15	20	25 [2/]
Los Angeles Abrasion, Illinois Modified AASHTO T 96 [11/], % Loss max.	40 [3/]	40 [4/]	40 [5/]	45
Minus No. 200 (75 µm) Sieve Material, Illinois Modified AASHTO T 11	1.0 [6/]	---	2.5 [7/]	---
Deleterious Materials [10/]				
Shale, % max.	1.0	2.0	4.0 [8/]	---
Clay Lumps, % max.	0.25	0.5	0.5 [8/]	---
Coal & Lignite, % max.	0.25	---	---	---
Soft & Unsound Fragments, % max.	4.0	6.0	8.0 [8/]	---
Other Deleterious, % max.	4.0 [9/]	2.0	2.0 [8/]	---
Total Deleterious, % max.	5.0	6.0	10.0 [8/]	---
Oil-Stained Aggregate [10/], % max.	5.0	---	---	

Art. 1004.01

FA QUALITY FROM HIGHWAY SPEC

FINE AGGREGATE QUALITY			
QUALITY TEST	CLASS		
	A	B	C
Na_2SO_4 Soundness 5 Cycle, Illinois Modified AASHTO T 104, % Loss max.	10	15	20
Minus No. 200 (75 µm) Sieve Material, Illinois Modified AASHTO T 11, % max. [4/]	3	6 [1/]	10 [1/]
Organic Impurities Check, Illinois Modified AASHTO T 21	Yes [2/]	---	---
Deleterious Materials: [3/ 5/]			
Shale, % max.	3.0	3.0	---
Clay Lumps, % max.	1.0	3.0	---
Coal, Lignite, & Shells, % max.	1.0	3.0	---
Conglomerate, % max.	3.0	3.0	---
Other Deleterious, % max.	3.0	3.0	---
Total Deleterious, % max.	3.0	5.0	---

Art. 1003.01

Illinois Specifications for Airports
Aggregates

2012 SPEC BOOK (401-2.1)

- BITUMINOUS SURFACE COURSE
- B Quality CA & FA
- Total Deleterious Materials:
  Maximum for CA is 6.0%
  Maximum for FA is 5.0%

2020/2023 SPEC BOOK (401-2.1)

- BITUMINOUS SURFACE COURSE
- A Quality CA & FA
- Total Deleterious Materials:
  Maximum for CA is 5.0%
  Maximum for FA is 3.0%
- See Aero PM 22-2

Illinois Specifications for Airports
Aggregates

POLICY MEMORANDUM 22-2

State of Illinois Department of Transportation
Office of Intermodal Project Implementation
Aeronautics

POLICY MEMORANDUM

February 10, 2022	Springfield, Illinois	Number: 22-2

TO: CONSULTING ENGINEERS / CONTRACTORS

SUBJECT: OBTAINING APPROVED AGGREGATES COMPLYING WITH 2020 STANDARD SPECIFICATIONS FOR CONSTRUCTION OF AIRPORTS

I. SCOPE

This Policy Memorandum addresses the additional aggregate quality requirements of the 2020 Illinois Standard Specifications for Construction of Airports, Special Provisions, and policies of IDOT Aeronautics. The airport quality requirements exceed those normally expected for similar IDOT highways pay items.

II. REQUIREMENTS

The contractor shall use these procedures to demonstrate aggregate compliance with the contract requirements.

A. Contractor Responsibility

1.) For Item 208 Aggregate Base and Item 209 Crushed Aggregate Base, the Contractor shall use aggregates with test requirements conforming to 2020 Standard Specifications for Construction of Airports, Coarse Aggregate Quality table, Section 208-2.2 and Section 209-2.2. Note: Item 208 and 209 Airport aggregates require B Quality coarse aggregates instead of the IDOT Highways allowed D Quality.

a) Na2SO4 Soundness 5 Cycle, Illinois Modified AASHTO T 104, maximum percent loss = 15%.

b) Los Angeles Abrasion, Illinois Modified AASHTO 96, maximum percent loss = 40%.

c) Deleterious Materials, Illinois Testing Procedure 203, Deleterious Particles in Coarse Aggregate.
   i. Shale, 2.0% maximum.
   ii. Clay Lumps, 0.5% maximum.
   iii. Soft & Unsound Fragments, 6.0 % maximum.
   iv. Other Deleterious, 2.0% maximum.
   v. Total Deleterious, 6.0% maximum.

2.) For Item 401 HMA Mixtures, the Contractor shall use aggregates with quality testing requirements conforming to 2020 Standard Specifications for Construction of Airports, Coarse Aggregate Quality table, Section 401-2.1a(2) and Fine Aggregate Quality table, Section 401-2.1b(2). Note: Airport HMA mixtures require A Quality coarse and fine aggregates instead of the IDOT Highways allowed B Quality.

a) Deleterious Materials, Illinois Testing Procedure 203, Deleterious Particles in Coarse Aggregate.
   i. Shale, 1% max.
   ii. Clay Lumps, 0.25% max
   iii. Coal & Lignite, 0.25% max
   iv. Soft & Unsound Fragments, 4.0 % max
   v. Other Deleterious, 4.0% max
   vi. Total Deleterious, 5.0% max

3.) For Item 501 PCC Mixtures, the Contractor shall use aggregates with quality testing requirements conforming to 2020 Standard Specifications for Construction of Airports, Coarse Aggregate Quality table, Section 501-2.3(b). It is noted that this A Quality table has been modified from the current IDOT Highways A Quality requirements. Aggregate testing procedures and acceptance are as follows.

a) Total Deleterious Maximum % = 2.6% conforming to Illinois Testing Procedure 203 Deleterious Particles in Coarse Aggregate (ITP 203).

b) Maximum Deleterious Chert % = 0.1% conforming to Illinois Modified AASHTO T 113, Standard Method of Test for Lightweight Pieces in Aggregate.

4.) Obtaining aggregates conforming to the requirements of the 2020 Standard Specifications for Construction of Airports.

a) First, check with your aggregate source(s) to see if their product recently passed Aeronautics requirements. It is possible the aggregate source in questions has met the Aeronautics requirements, but the IDOT Bureau of Materials does not have the Aeronautics-approved product listed. For example: the B Quality aggregate 031CM16 at a particular source has been confirmed to also meet Aeronautics A Quality. Check with your aggregate source to confirm aggregate quality to be used in the above pay items. Check with IDOT Aeronautics for previously approved sources.

b) If the aggregate source does not have recent tests to show it meets Aeronautics requirements, the Contractor shall ask the aggregate source to request the IDOT District Materials Engineer to test the aggregate for the required parameters.

c) If the IDOT District is unable to perform the requested test(s) or the IDOT District schedule is not compatible with the Contractor's timetable, the Contractor shall have the aggregate tested by a third-party testing laboratory. The third-party laboratory shall be IDOT-approved or AASHTO-approved. AASHTO approval consists of accreditation in accordance with AASHTO Materials Reference Laboratory (AMRL).

d) Additional expense incurred by the Contractor for third-party testing may be approved for payment by a Change Authorization in the amount of the actual testing cost. Confirm with the Aeronautics Materials & Certifications Engineer to get prior approval for testing expenses.

e) Aeronautics will maintain a database of approved sources and third-party tested aggregates that conform to the requirements of the 2020 Specifications.

5) Frequency of Testing. Test results for aggregate products from the same ledge, processed using the same method and equipment, shall be considered to meet the Aeronautics requirements for 1 year from the testing date. IDOT Aeronautics reserves the right to re-test aggregates to confirm compliance.

Illinois Specifications for Airports
Aggregates

2012 SPEC BOOK (403-2.1)

- 403-BITUMINOUS BASE COURSE

  CA C Quality

  FA B Quality

2020/2023 SPEC BOOK (403-2.1)

- 403-BITUMINOUS BASE COURSE

  CA & FA B Quality

Illinois Specifications for Airports
Asphalt Binder

2012 SPEC BOOK (401-2.3)

BITUMINOUS MATERIAL

- Performance Graded PG 64-22

2020/2023 SPEC BOOK (401-2.3)

ASPHALT BINDER

Asphalt Binder Selection

Airport Location	Layer	PG Binder Grade	
		Runway & Taxiway	Apron
IDOT Districts 1-6	Surface and Top Binder	SBS PG 70-28	SBS PG 76-28
	Lower Binder	PG 64-22	PG 64-22
IDOT Districts 7-9	Surface and Top Binder	SBS PG 70-22	SBS PG 76-22
	Lower Binder	PG 64-22	PG 64-22

Illinois Specifications for Airports
Asphalt Binder

2012 SPEC BOOK (403-2.3)

BITUMINOUS MATERIAL

- Performance Graded PG 64-22

2020/2023 SPEC BOOK (403-2.3)

ASPHALT BINDER

Asphalt Binder Selection

Airport Location	Design Aircraft	PG Binder Grade	
		Runway & Taxiway	Apron
IDOT Districts 1-6	60,000 lb or More	SBS PG 70-28	SBS PG 76-28
	Under 60,000 lb	PG 64-22	PG 64-22
IDOT Districts 7-9	60,000 lb or More	SBS PG 70-22	SBS PG 76-22
	Under 60,000 lb	PG 64-22	PG 64-22

Illinois Specifications for Airports
2012 Design Criteria

401-3.2 and 403-3.2

TABLE 1 SUPERPAVE DESIGN CRITERIA

TRAFFIC MIX					
Design Parameter	Aircraft over 60,000 lbs. [1/]		Aircraft under 60,000 lbs.		Automobile
	Runway or Taxiway	Parking Apron	Runway or Taxiway	Parking Apron	Entrance roads and Parking Lots
N_{ini} [2/]	5	7	5	5	5
N_{des} [3/]	40	50	30	30	30
N_{max}	58	74	42	42	42
% Air Voids V_a [4/]	2-4	2-4	2-4	2-4	2-4
VFA (min %)	75-90	75-90	75-90	75-90	75-90

1/ Stone sand (IDOT Gradation FA20 or FA21) shall be required as part of the fine aggregate portion of the JMF. The exact amount of stone sand will be determined by the Contractor based on preparation of the Mix Design. The percentage of stone sand will be verified as acceptable by the Division of Aeronautics based upon the Contractor's final proposed JMF. The Division reserves the right to request a change in the amount of stone sand at any point in the mix design process, as well as during production, based upon performance of the mix during placement.

2/ Where N= number of gyrations on an IDOT approved Superpave gyratory compactor.

3/ The N_{des} value may be changed in order to obtain an acceptable mix design when approved by the Engineer.

4/ Contact the Division for optimum target voids required.

Illinois Specifications for Airports
2020/2023 Design Criteria

401-3.3 and 403-3.3

Asphalt Design Criteria

Traffic Mix					
Design Parameter	Aircraft 60,000 Pounds Or More[1]		Aircraft Under 60,000 Pounds		Automobile[5]
	Runway/ Taxiway	Apron	Runway/ Taxiway	Apron	Roadways/ Parking Lots
N_{ini}[2]	7	7	5	5	5
N_{des}[3]	50	50	30	30	30
N_{max}	74	74	42	42	42
Air Voids (AV)[4]	2-4	2-4	2-4	2-4	2-4
VFA (min %)	75-90	75-90	75-90	75-90	75-90

1. Stone sand, gradation FA 20 or FA 21, shall be required as part of the fine aggregate portion of the JMF. The exact amount of stone sand will be determined by the Contractor. The percentage of stone sand will be verified as acceptable by the Department based upon the Contractor's final proposed JMF. The Department reserves the right to request a change in the amount of stone sand at any point in the mix design process, as well as during production, based upon performance of the mix during placement.
2. Number of gyrations on a Department approved Superpave gyratory compactor.
3. Value may be changed in order to obtain an acceptable mix design when approved by the Engineer
4. To be specified in plan documents. In general, target air voids are 2%-3% for lower traffic airports, and 3%-4% for higher traffic airports.
5. To be specified in plan documents. Highways N_{50} mix may be substituted for above roadways/parking lot criteria.

Illinois Specifications for Airports
Gradation – Surface Course

2012 Spec. 401-3.2

TABLE 2. AGGREGATE HMA SURFACE COURSE
Percentage by Weight Passing Sieves
Job Mix Formula (JMF)

Sieve Size	Gradation B Range 1/2" Maximum	Ideal Target
1 in.	100	100
3/4 in.	100	100
1/2 in.	99 – 100	100
3/8 in.	91 – 97	94
No. 4	56 – 62	59
No. 8	36 – 42	39
No. 16	27 – 32	30
No. 30	19 – 25	22
No. 100	7 – 9	8
No. 200	5 – 7	6
Bitumen %:	5.0 – 7.0	6.0

2020/2023 Spec. 401-3.3

Aggregate - Asphalt Pavements

Sieve Size	Percent by Weight Passing Sieve	
	1/2" Maximum	Ideal Target
1 inch	--	100
3/4 inch	--	100
1/2 inch	99-100	100
3/8 inch	91-97	94
No. 4	56-62	59
No. 8	36-42	39
No. 16	27-32	30
No. 30	19-25	22
No. 100	7-9	8
No. 200	5-7	6
Asphalt Content	5.0-7.0	6.0
Recommended Minimum Construction Lift Thickness	2 inch	2 inch

Illinois Specifications for Airports
Gradation – Surface Course

2012 Spec. 401-3.2

TABLE 2. AGGREGATE HMA SURFACE COURSE
Percentage by Weight Passing Sieves
Job Mix Formula (JMF)

Sieve Size	Gradation B Range 1/2" Maximum	Ideal Target
1 in.	100	100
3/4 in.	100	100
1/2 in.	99 – 100	100
3/8 in.	91 – 97	94
No. 4	56 – 62	59
No. 8	36 – 42	39
No. 16	27 – 32	30
No. 30	19 – 25	22
No. 100	7 – 9	8
No. 200	5 – 7	6
Bitumen %:	5.0 – 7.0	6.0

2020/2023 Spec. 401-3.3

Aggregate - Asphalt Pavements

Sieve Size	Percent by Weight Passing Sieve	
	1/2" Maximum	Ideal Target
1 inch	--	100
3/4 inch	--	100
1/2 inch	99-100	100
3/8 inch	91-97	94
No. 4	56-62	59
No. 8	36-42	39
No. 16	27-32	30
No. 30	19-25	22
No. 100	7-9	8
No. 200	5-7	6
Asphalt Content	5.0-7.0	6.0
Recommended Minimum Construction Lift Thickness	2 inch	2 inch

Illinois Specifications for Airports
Gradation – Surface Course

FAA Spec. 401-3.3

Table 2. Aggregate - Asphalt Pavements

Sieve Size	Percentage by Weight Passing Sieves		
	Gradation 1	Gradation 2	Gradation 3[1]
1 inch (25.0 mm)	100	--	--
3/4 inch (19.0 mm)	90-100	100	--
1/2 inch (12.5 mm)	68-88	90-100	100
3/8 inch (9.5 mm)	60-82	72-88	90-100
No. 4 (4.75 mm)	45-67	53-73	58-78
No. 8 (2.36 mm)	32-54	38-60	40-60
No. 16 (1.18 mm)	22-44	26-48	28-48
No. 30 (600 µm)	15-35	18-38	18-38
No. 50 (300 µm)	9-25	11-27	11-27
No. 100 (150 µm)	6-18	6-18	6-18
No. 200 (75 µm)	3-6	3-6	3-6
Minimum Voids in Mineral Aggregate (VMA)	14.0	15.0	16.0
Asphalt percent by total weight of mixture:			
Stone or gravel	4.5-7.0	5.0-7.5	5.5-8.0
Slag	5.0-7.5	6.5-9.5	7.0-10.5
Recommended Minimum Construction Lift Thickness	3 inch	2 inch	1 1/2 inch

[1] Gradation 3 is intended for leveling courses. FAA approval is required for use in other locations.

2012/2020/2023 State Specs

Aggregate - Asphalt Pavements

Sieve Size	Percent by Weight Passing Sieve	
	1/2" Maximum	Ideal Target
1 inch	--	100
3/4 inch	--	100
1/2 inch	99-100	100
3/8 inch	91-97	94
No. 4	56-62	59
No. 8	36-42	39
No. 16	27-32	30
No. 30	19-25	22
No. 100	7-9	8
No. 200	5-7	6
Asphalt Content	5.0-7.0	6.0
Recommended Minimum Construction Lift Thickness	2 inch	2 inch

Illinois Specifications for Airports
Gradation – Base Course

2012 Spec. 403-3.2

TABLE 2. AGGREGATE HMA BASE COURSE
Percentage by Weight Passing Sieves
Job Mix Formula (JMF)

Sieve Size	Gradation B Range1" Maximum	Ideal Target
1-1/4 in.		
1 in.	100	100
3/4 in.	93 – 97	95
1/2 in.	75 – 79	77
3/8 in.	64 – 68	66
No. 4	45 – 51	48
No. 8	34 – 40	37
No. 16	27 – 33	30
No. 30	19 – 23	21
No. 100	6 – 10	8
No. 200	4 – 6	5
Bitumen %:	4.5 – 7.0	5.5

2020/2023 Spec. 403-3.3

Aggregate - Asphalt Pavements

Sieve Size	Percentage by Weight Passing Sieve	
	1" Maximum	Ideal Target
1 inch	100	100
3/4 inch	93-97	95
1/2 inch	75-79	77
3/8 inch	64-68	66
No. 4	45-51	48
No. 8	34-40	37
No. 16	27-33	30
No. 30	19-23	21
No. 100	6-10	8
No. 200	4-6	5
Asphalt Content	4.5-7.0	5.5
Recommended Minimum Construction Lift Thickness	3 inch	3 inch

Illinois Specifications for Airports
Gradation – Base Course

2012 Spec. 403-3.2

TABLE 2. AGGREGATE HMA BASE COURSE
Percentage by Weight Passing Sieves
Job Mix Formula (JMF)

Sieve Size	Gradation B Range1" Maximum	Ideal Target
1-1/4 in.		
1 in.	100	100
3/4 in.	93 – 97	95
1/2 in.	75 – 79	77
3/8 in.	64 – 68	66
No. 4	45 – 51	48
No. 8	34 – 40	37
No. 16	27 – 33	30
No. 30	19 – 23	21
No. 100	6 – 10	8
No. 200	4 – 6	5
Bitumen %:	4.5 – 7.0	5.5

2020/2023 Spec. 403-3.3

Aggregate - Asphalt Pavements

Sieve Size	Percentage by Weight Passing Sieve	
	1" Maximum	Ideal Target
1 inch	100	100
3/4 inch	93-97	95
1/2 inch	75-79	77
3/8 inch	64-68	66
No. 4	45-51	48
No. 8	34-40	37
No. 16	27-33	30
No. 30	19-23	21
No. 100	6-10	8
No. 200	4-6	5
Asphalt Content	4.5-7.0	5.5
Recommended Minimum Construction Lift Thickness	3 inch	3 inch

Illinois Specifications for Airports
Gradation – Base Course

FAA Spec. 403-3.3

Table 2. Aggregate - Asphalt Pavements

Sieve Size	Percentage by Weight Passing Sieves		
	Gradation 1	Gradation 2	Gradation 3[1]
1 inch (25.0 mm)	100	--	--
3/4 inch (19.0 mm)	90-100	100	--
1/2 inch (12.5 mm)	68-88	90-100	100
3/8 inch (9.5 mm)	60-82	72-88	90-100
No. 4 (4.75 mm)	45-67	53-73	58-78
No. 8 (2.36 mm)	32-54	38-60	40-60
No. 16 (1.18 mm)	22-44	26-48	28-48
No. 30 (600 µm)	15-35	18-38	18-38
No. 50 (300 µm)	9-25	11-27	11-27
No. 100 (150 µm)	6-18	6-18	6-18
No. 200 (75 µm)	3-6	3-6	3-6
Voids in Mineral Aggregate (VMA)	14	15	16
Asphalt percent by total weight of mixture:			
Stone or gravel	4.5-7.0	5.0-7.5	5.5-8.0
Slag	5.0-7.5	6.5-9.5	7.0-10.5
Recommended Minimum Construction Lift Thickness	3 inch	2 inch	1 1/2 inch

[1]Gradation 3 is intended for leveling courses. FAA approval is required for use in other locations.

2012/2020/2023 State Specs

Aggregate - Asphalt Pavements

Sieve Size	Percentage by Weight Passing Sieve	
	1" Maximum	Ideal Target
1 inch	100	100
3/4 inch	93-97	95
1/2 inch	75-79	77
3/8 inch	64-68	66
No. 4	45-51	48
No. 8	34-40	37
No. 16	27-33	30
No. 30	19-23	21
No. 100	6-10	8
No. 200	4-6	5
Asphalt Content	4.5-7.0	5.5
Recommended Minimum Construction Lift Thickness	3 inch	3 inch

IDOT Aeronautics

HMA Mix Design

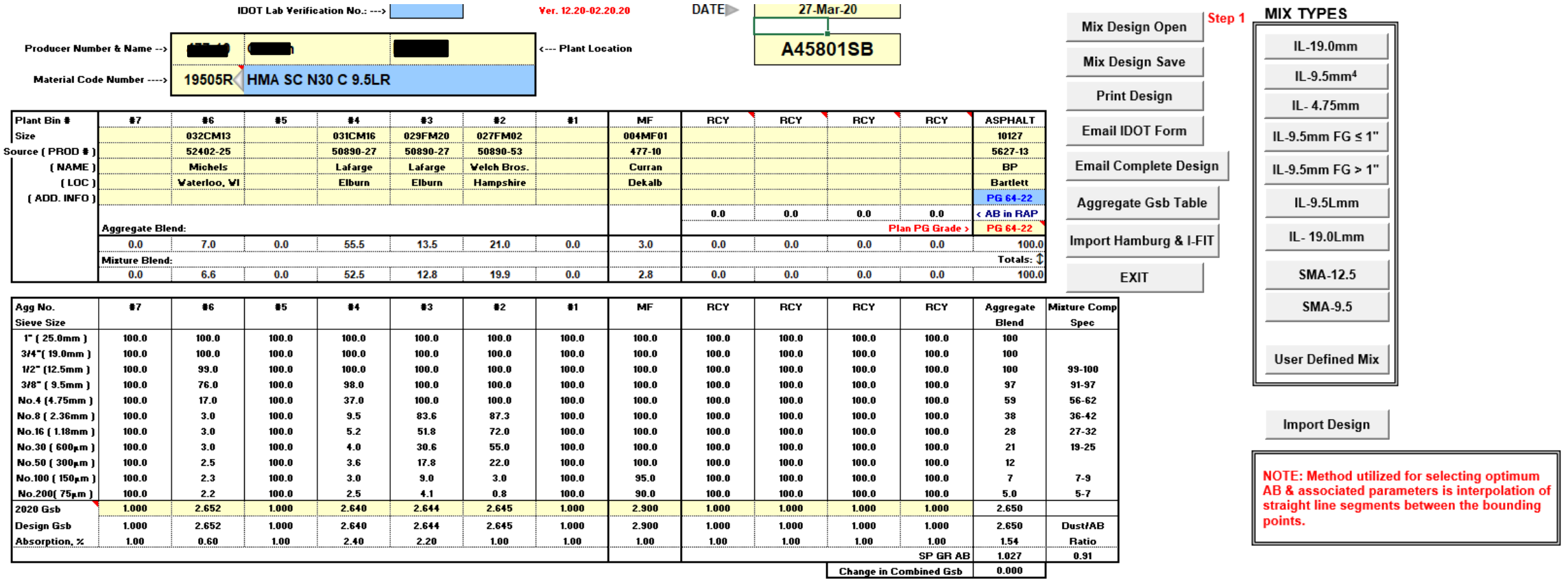
Mix Design Approval Process
All Specs

Procedure is the SAME for all IDOT Let Projects

- Submit proposed sources and gradation to Aero Mixture Engineer (or Aero Construction Engineer) for review
- When Draft Approval given, perform gyratory tests
- Submit Mix Design with lab data showing optimum AB content for target air void.

Mix Design
IDOT QC/QA Reporting Module

ALL IDOT-LET PROJECTS

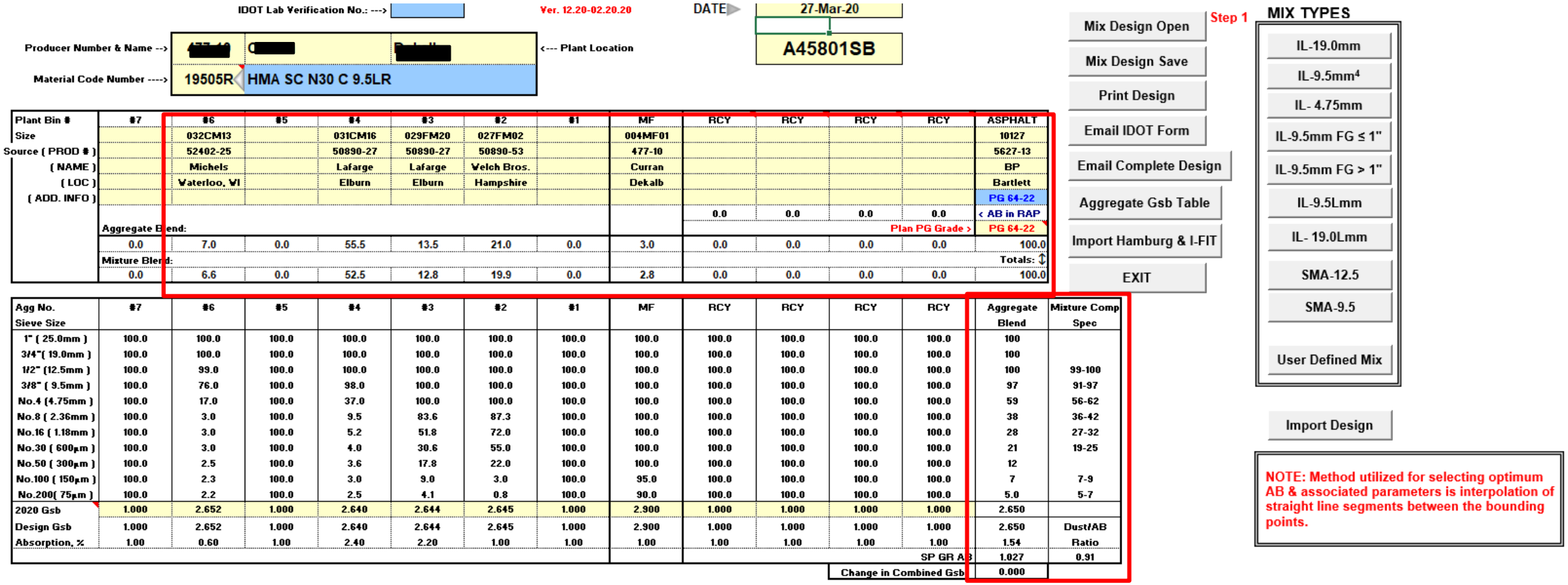


Plant Bin #	#7	#6	#5	#4	#3	#2	#1	MF	RCY	RCY	RCY	RCY	ASPHALT
Size		032CM13		031CM16	029FM20	027FM02		004MF01					10127
Source (PROD #)		52402-25		50890-27	50890-27	50890-53		477-10					5627-13
(NAME)		Michels		Lafarge	Lafarge	Welch Bros.		Curran					BP
(LOC)		Waterloo, WI		Elburn	Elburn	Hampshire		Dekalb					Bartlett
(ADD. INFO)													PG 64-22
									0.0	0.0	0.0	0.0	< AB in RAP
	Aggregate Blend:											Plan PG Grade >	PG 64-22
	0.0	7.0	0.0	55.5	13.5	21.0	0.0	3.0	0.0	0.0	0.0	0.0	100.0
	Mixture Blend:												Totals:
	0.0	6.6	0.0	52.5	12.8	19.9	0.0	2.8	0.0	0.0	0.0	0.0	100.0

Agg No. / Sieve Size	#7	#6	#5	#4	#3	#2	#1	MF	RCY	RCY	RCY	RCY	Aggregate Blend	Mixture Comp Spec
1" (25.0mm)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100	
3/4"(19.0mm)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100	
1/2" (12.5mm)	100.0	99.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100	99-100
3/8" (9.5mm)	100.0	76.0	100.0	98.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	97	91-97
No.4 (4.75mm)	100.0	17.0	100.0	37.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	59	56-62
No.8 (2.36mm)	100.0	3.0	100.0	9.5	83.6	87.3	100.0	100.0	100.0	100.0	100.0	100.0	38	36-42
No.16 (1.18mm)	100.0	3.0	100.0	5.2	51.8	72.0	100.0	100.0	100.0	100.0	100.0	100.0	28	27-32
No.30 (600µm)	100.0	3.0	100.0	4.0	30.6	55.0	100.0	100.0	100.0	100.0	100.0	100.0	21	19-25
No.50 (300µm)	100.0	2.5	100.0	3.6	17.8	22.0	100.0	100.0	100.0	100.0	100.0	100.0	12	
No.100 (150µm)	100.0	2.3	100.0	3.0	9.0	3.0	100.0	95.0	100.0	100.0	100.0	100.0	7	7-9
No.200(75µm)	100.0	2.2	100.0	2.5	4.1	0.8	100.0	90.0	100.0	100.0	100.0	100.0	5.0	5-7
2020 Gsb	1.000	2.652	1.000	2.640	2.644	2.645	1.000	2.900	1.000	1.000	1.000	1.000	2.650	
Design Gsb	1.000	2.652	1.000	2.640	2.644	2.645	1.000	2.900	1.000	1.000	1.000	1.000	2.650	Dust/AB
Absorption, %	1.00	0.60	1.00	2.40	2.20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.54	Ratio
												SP GR AB	1.027	0.91
											Change in Combined Gsb		0.000	

Mix Design
IDOT QC/QA Reporting Module

ALL IDOT-LET PROJECTS



Plant Bin #	#7	#6	#5	#4	#3	#2	#1	MF	RCY	RCY	RCY	RCY	ASPHALT
Size		032CM13		031CM16	029FM20	027FM02		004MF01					10127
Source (PROD #)		52402-25		50890-27	50890-27	50890-53		477-10					5627-13
(NAME)		Michels		Lafarge	Lafarge	Welch Bros.		Curran					BP
(LOC)		Waterloo, WI		Elburn	Elburn	Hampshire		Dekalb					Bartlett
(ADD. INFO)													PG 64-22
									0.0	0.0	0.0	0.0	< AB in RAP
	Aggregate Blend:											Plan PG Grade >	PG 64-22
	0.0	7.0	0.0	55.5	13.5	21.0	0.0	3.0	0.0	0.0	0.0	0.0	100.0
	Mixture Blend:												Totals:
	0.0	6.6	0.0	52.5	12.8	19.9	0.0	2.8	0.0	0.0	0.0	0.0	100.0

Agg No. / Sieve Size	#7	#6	#5	#4	#3	#2	#1	MF	RCY	RCY	RCY	RCY	Aggregate Blend	Mixture Comp Spec
1" (25.0mm)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100	
3/4"(19.0mm)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100	
1/2" (12.5mm)	100.0	99.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100	99-100
3/8" (9.5mm)	100.0	76.0	100.0	98.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	97	91-97
No.4 (4.75mm)	100.0	17.0	100.0	37.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	59	56-62
No.8 (2.36mm)	100.0	3.0	100.0	9.5	83.6	87.3	100.0	100.0	100.0	100.0	100.0	100.0	38	36-42
No.16 (1.18mm)	100.0	3.0	100.0	5.2	51.8	72.0	100.0	100.0	100.0	100.0	100.0	100.0	28	27-32
No.30 (600µm)	100.0	3.0	100.0	4.0	30.6	55.0	100.0	100.0	100.0	100.0	100.0	100.0	21	19-25
No.50 (300µm)	100.0	2.5	100.0	3.6	17.8	22.0	100.0	100.0	100.0	100.0	100.0	100.0	12	
No.100 (150µm)	100.0	2.3	100.0	3.0	9.0	3.0	100.0	95.0	100.0	100.0	100.0	100.0	7	7-9
No.200(75µm)	100.0	2.2	100.0	2.5	4.1	0.8	100.0	90.0	100.0	100.0	100.0	100.0	5.0	5-7
2020 Gsb	1.000	2.652	1.000	2.640	2.644	2.645	1.000	2.900	1.000	1.000	1.000	1.000	2.650	
Design Gsb	1.000	2.652	1.000	2.640	2.644	2.645	1.000	2.900	1.000	1.000	1.000	1.000	2.650	Dust/AB
Absorption, %	1.00	0.60	1.00	2.40	2.20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.54	Ratio
												SP GR A	1.027	0.91
											Change in Combined Gsb		0.000	

Mix Design
IDOT QC/QA Reporting Module

ALL IDOT-LET PROJECTS

After Draft Approval of sources and gradation, perform lab testing:

SUMMARY OF SUPERPAVE GYRATORY DESIGN DATA

DATA for N-int.	5								
	AB, %MIX	Gmb	Gmm	Voids (Pa)	VMA	VFA	Vbe	Pbe	Pba
MIX 1	4.5	2.191	2.520	13.1	21.0	37.9	8.00	3.75	0.79
MIX 2	5.0	2.236	2.502	10.6	19.8	46.4	9.19	4.22	0.82
MIX 3	5.5	2.249	2.484	9.5	19.8	52.2	10.34	4.72	0.83
MIX 4	6.0	2.237	2.465	9.3	20.7	55.2	11.39	5.23	0.82

DATA for N-des.	30								
		Gmb	Gmm	Voids (Pa)	VMA	VFA	Vbe	Pbe	Gse	Pba
MIX 1	4.5	2.394	2.520	5.0	13.7	63.6	8.74	3.75	2.705	0.79
MIX 2	5.0	2.415	2.502	3.5	13.4	74.1	9.92	4.22	2.707	0.82
MIX 3	5.5	2.426	2.484	2.3	13.5	82.7	11.15	4.72	2.708	0.83
MIX 4	6.0	2.434	2.465	1.3	13.7	90.8	12.40	5.23	2.707	0.82

Performance Test Data	
Hamburg No. Passes	
Hamburg Wheel Depth	
Unaged Flexibility Index (FI)	
LTA FI (SURFACE ONLY)	
TSR Information	
Conditioned	
Unconditioned	
TSR	
CA Strip Rating	
FA Strip Rating	
Additive Prod #	
Additive Product Name	
Additive %	

OPTIMUM DESIGN DATA @ Ndes												
GYRATIONS	AB	Gmb	Gmm	%VOIDS (Pa)	VMA	VFA	Gse	Gsb	TSR	RCY AB	Virgin AB	ABR
	5.43			Target								
30	5.4	2.425	2.487	2.5	13.5	81.4	2.708	2.650	0.00	0.00	5.43	0.0

REMARKS LINE 1
REMARKS LINE 2

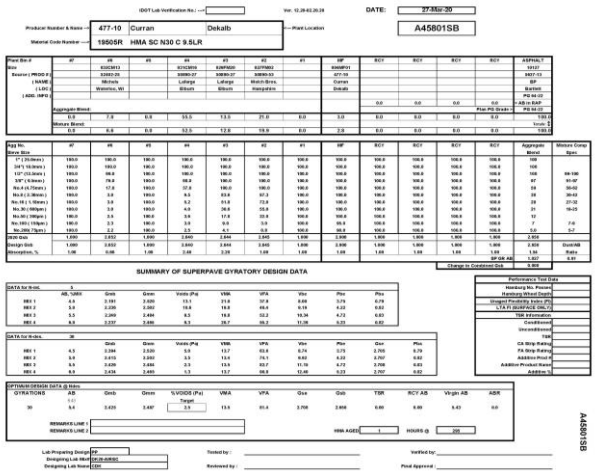
HMA AGED 1 HOURS @ 295

A45801SB

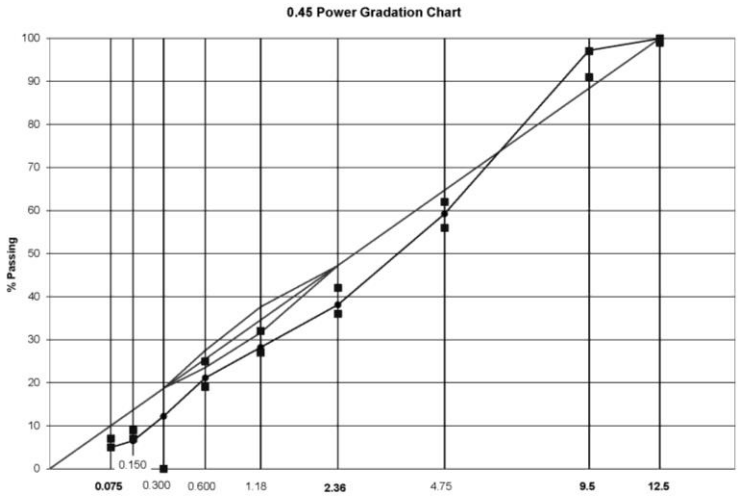
Mix Design
IDOT QC/QA Reporting Module

ALL IDOT-LET PROJECTS

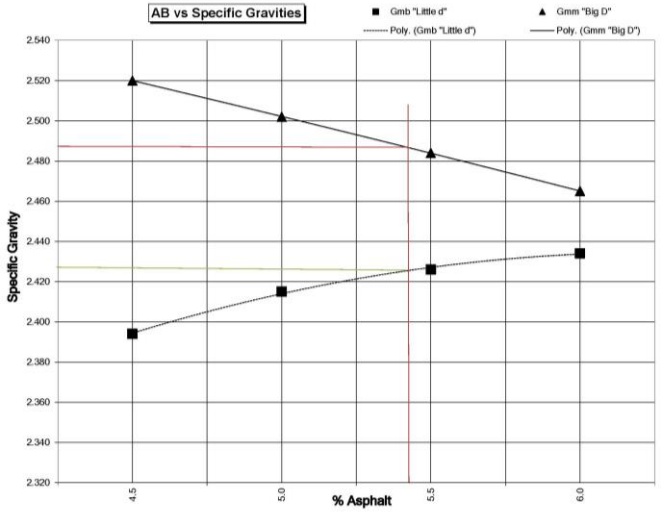
Submit IDOT Form and graphs:



IDOT Form



0.45 Power Gradation

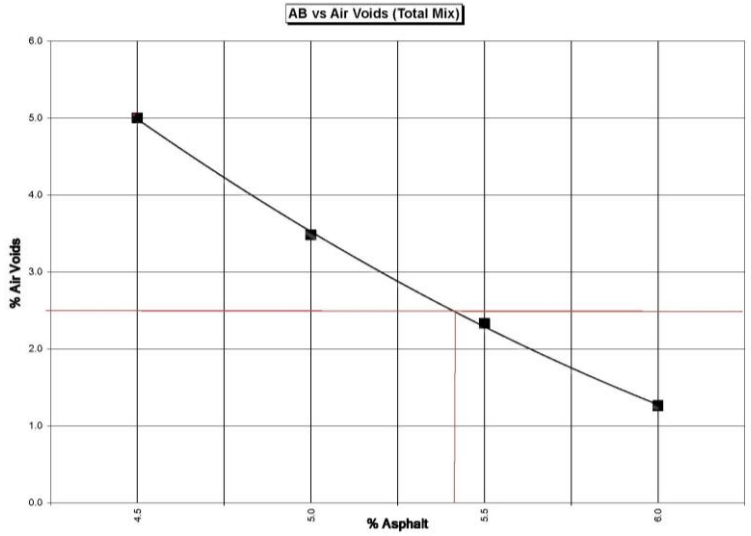


AB vs. Specific Gravities

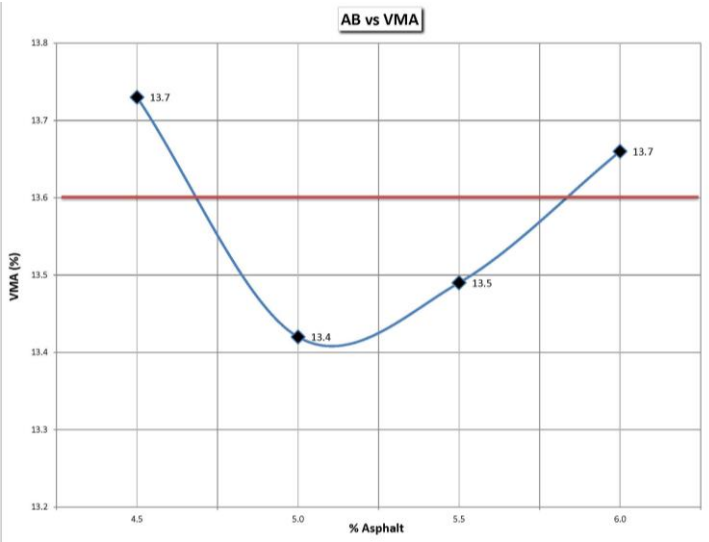
Mix Design
IDOT QC/QA Reporting Module

ALL IDOT-LET PROJECTS

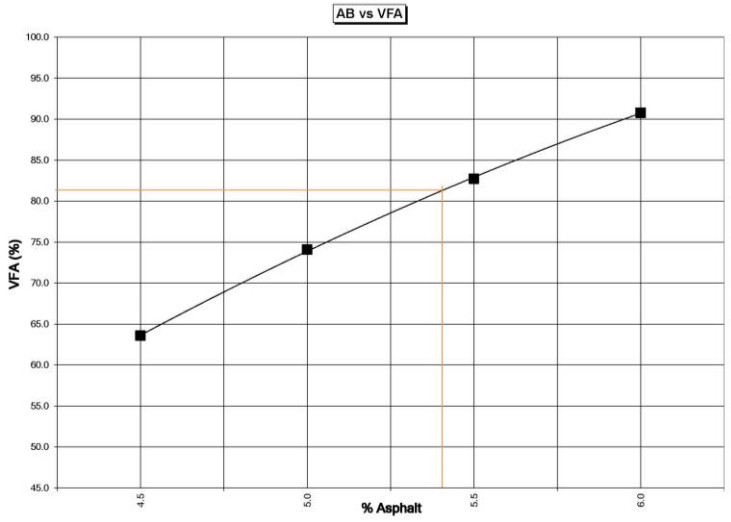
Submit IDOT Form and graphs (continued):



AB vs. Air Voids



AB vs. VMA



AB vs. VFA

IDOT Aeronautics

Construction & Testing

Construction & Testing

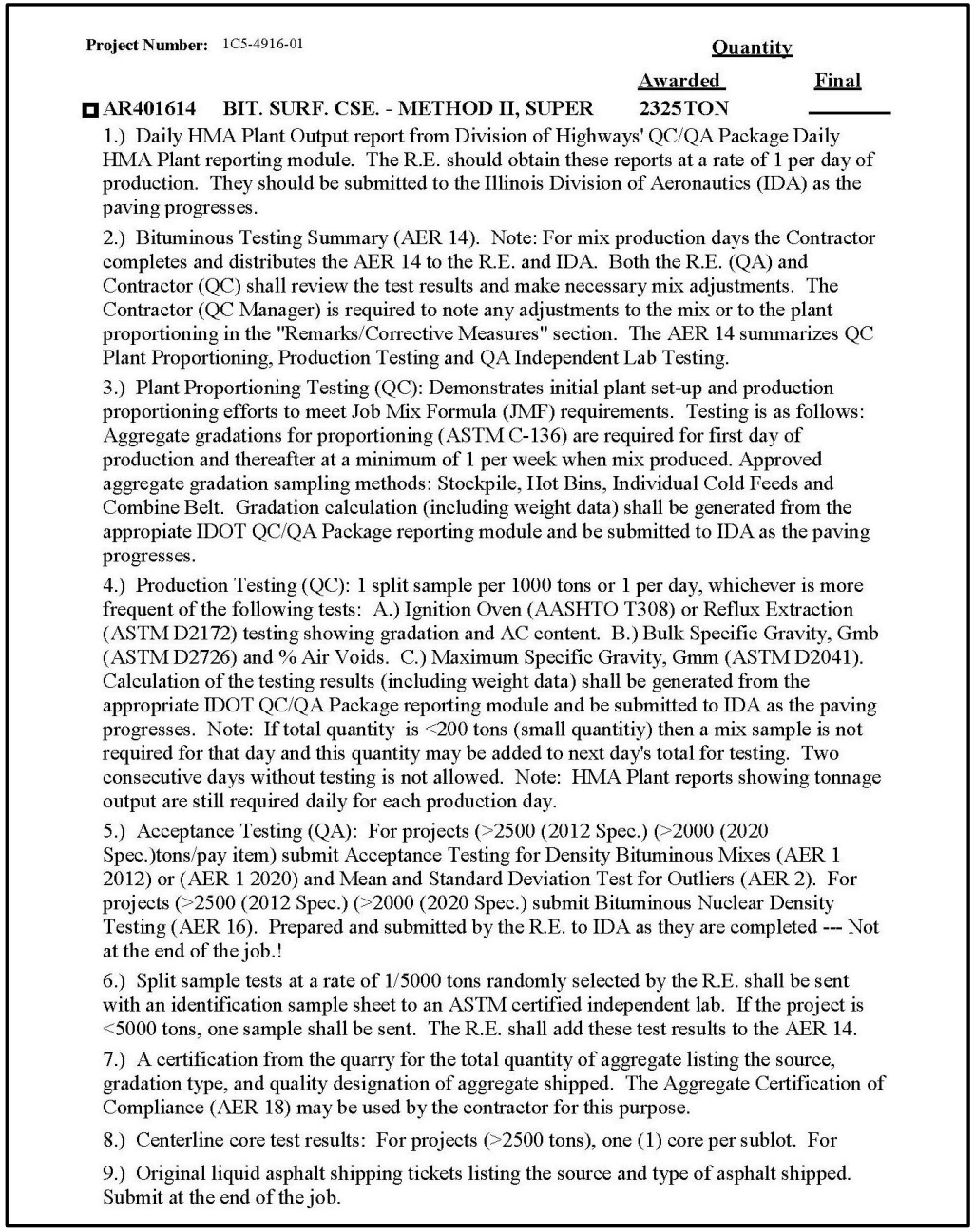
ALL IDOT-LET PROJECTS

- Pre-Construction Meeting → Get PDTR
- Notice to Proceed
- Pre-Pave Meeting & QC Plan Approval
- Control Strip (Method II) → Varies by Spec
- Production
- Testing

} → Follow PM 2003-1
Submit AER 14

Project Documentation & Testing Requirements (PDTR)

- Prepared by IDOT Aeronautics and provided at or before Pre-Construction meeting.
- Lists all Contract Pay Items and necessary documentation, certification, and/or testing required to get paid.
- 2012 and 2020/2023 Specs use same PDTR. FAA Spec has separate PDTR.



Project Number: 1C5-4916-01

		Quantity Awarded	Final
☐ AR401614	BIT. SURF. CSE. - METHOD II, SUPER	2325 TON	

1.) Daily HMA Plant Output report from Division of Highways' QC/QA Package Daily HMA Plant reporting module. The R.E. should obtain these reports at a rate of 1 per day of production. They should be submitted to the Illinois Division of Aeronautics (IDA) as the paving progresses.

2.) Bituminous Testing Summary (AER 14). Note: For mix production days the Contractor completes and distributes the AER 14 to the R.E. and IDA. Both the R.E. (QA) and Contractor (QC) shall review the test results and make necessary mix adjustments. The Contractor (QC Manager) is required to note any adjustments to the mix or to the plant proportioning in the "Remarks/Corrective Measures" section. The AER 14 summarizes QC Plant Proportioning, Production Testing and QA Independent Lab Testing.

3.) Plant Proportioning Testing (QC): Demonstrates initial plant set-up and production proportioning efforts to meet Job Mix Formula (JMF) requirements. Testing is as follows: Aggregate gradations for proportioning (ASTM C-136) are required for first day of production and thereafter at a minimum of 1 per week when mix produced. Approved aggregate gradation sampling methods: Stockpile, Hot Bins, Individual Cold Feeds and Combine Belt. Gradation calculation (including weight data) shall be generated from the appropiate IDOT QC/QA Package reporting module and be submitted to IDA as the paving progresses.

4.) Production Testing (QC): 1 split sample per 1000 tons or 1 per day, whichever is more frequent of the following tests: A.) Ignition Oven (AASHTO T308) or Reflux Extraction (ASTM D2172) testing showing gradation and AC content. B.) Bulk Specific Gravity, Gmb (ASTM D2726) and % Air Voids. C.) Maximum Specific Gravity, Gmm (ASTM D2041). Calculation of the testing results (including weight data) shall be generated from the appropriate IDOT QC/QA Package reporting module and be submitted to IDA as the paving progresses. Note: If total quantity is <200 tons (small quantitiy) then a mix sample is not required for that day and this quantity may be added to next day's total for testing. Two consecutive days without testing is not allowed. Note: HMA Plant reports showing tonnage output are still required daily for each production day.

5.) Acceptance Testing (QA): For projects (>2500 (2012 Spec.) (>2000 (2020 Spec.)tons/pay item) submit Acceptance Testing for Density Bituminous Mixes (AER 1 2012) or (AER 1 2020) and Mean and Standard Deviation Test for Outliers (AER 2). For projects (>2500 (2012 Spec.) (>2000 (2020 Spec.) submit Bituminous Nuclear Density Testing (AER 16). Prepared and submitted by the R.E. to IDA as they are completed --- Not at the end of the job.!

6.) Split sample tests at a rate of 1/5000 tons randomly selected by the R.E. shall be sent with an identification sample sheet to an ASTM certified independent lab. If the project is <5000 tons, one sample shall be sent. The R.E. shall add these test results to the AER 14.

7.) A certification from the quarry for the total quantity of aggregate listing the source, gradation type, and quality designation of aggregate shipped. The Aggregate Certification of Compliance (AER 18) may be used by the contractor for this purpose.

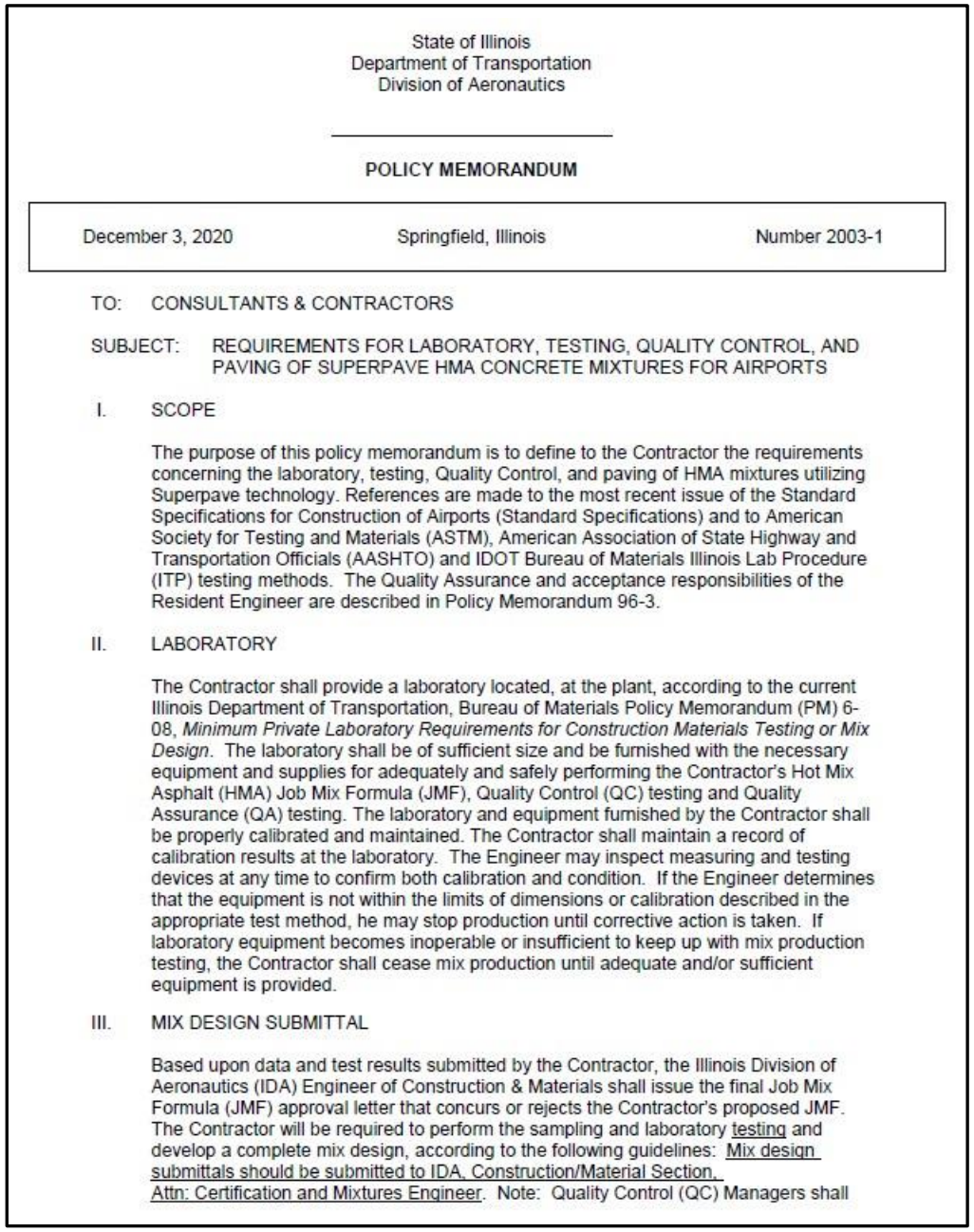
8.) Centerline core test results: For projects (>2500 tons), one (1) core per sublot. For

9.) Original liquid asphalt shipping tickets listing the source and type of asphalt shipped. Submit at the end of the job.

Policy Memorandum 2003-1

Requirements for Laboratory, Testing, Quality Control, and Paving of Superpave HMA Concrete Mixtures for Airports

- 2014 and 2020 versions on website
- Addresses:
  - Laboratory
  - Mix Design Submittal
  - Mix Production Testing
  - Control Strip
  - Material Acceptance



State of Illinois
Department of Transportation
Division of Aeronautics

POLICY MEMORANDUM

December 3, 2020	Springfield, Illinois	Number 2003-1

TO: CONSULTANTS & CONTRACTORS

SUBJECT: REQUIREMENTS FOR LABORATORY, TESTING, QUALITY CONTROL, AND PAVING OF SUPERPAVE HMA CONCRETE MIXTURES FOR AIRPORTS

I. SCOPE

The purpose of this policy memorandum is to define to the Contractor the requirements concerning the laboratory, testing, Quality Control, and paving of HMA mixtures utilizing Superpave technology. References are made to the most recent issue of the Standard Specifications for Construction of Airports (Standard Specifications) and to American Society for Testing and Materials (ASTM), American Association of State Highway and Transportation Officials (AASHTO) and IDOT Bureau of Materials Illinois Lab Procedure (ITP) testing methods. The Quality Assurance and acceptance responsibilities of the Resident Engineer are described in Policy Memorandum 96-3.

II. LABORATORY

The Contractor shall provide a laboratory located, at the plant, according to the current Illinois Department of Transportation, Bureau of Materials Policy Memorandum (PM) 6-08, *Minimum Private Laboratory Requirements for Construction Materials Testing or Mix Design*. The laboratory shall be of sufficient size and be furnished with the necessary equipment and supplies for adequately and safely performing the Contractor's Hot Mix Asphalt (HMA) Job Mix Formula (JMF), Quality Control (QC) testing and Quality Assurance (QA) testing. The laboratory and equipment furnished by the Contractor shall be properly calibrated and maintained. The Contractor shall maintain a record of calibration results at the laboratory. The Engineer may inspect measuring and testing devices at any time to confirm both calibration and condition. If the Engineer determines that the equipment is not within the limits of dimensions or calibration described in the appropriate test method, he may stop production until corrective action is taken. If laboratory equipment becomes inoperable or insufficient to keep up with mix production testing, the Contractor shall cease mix production until adequate and/or sufficient equipment is provided.

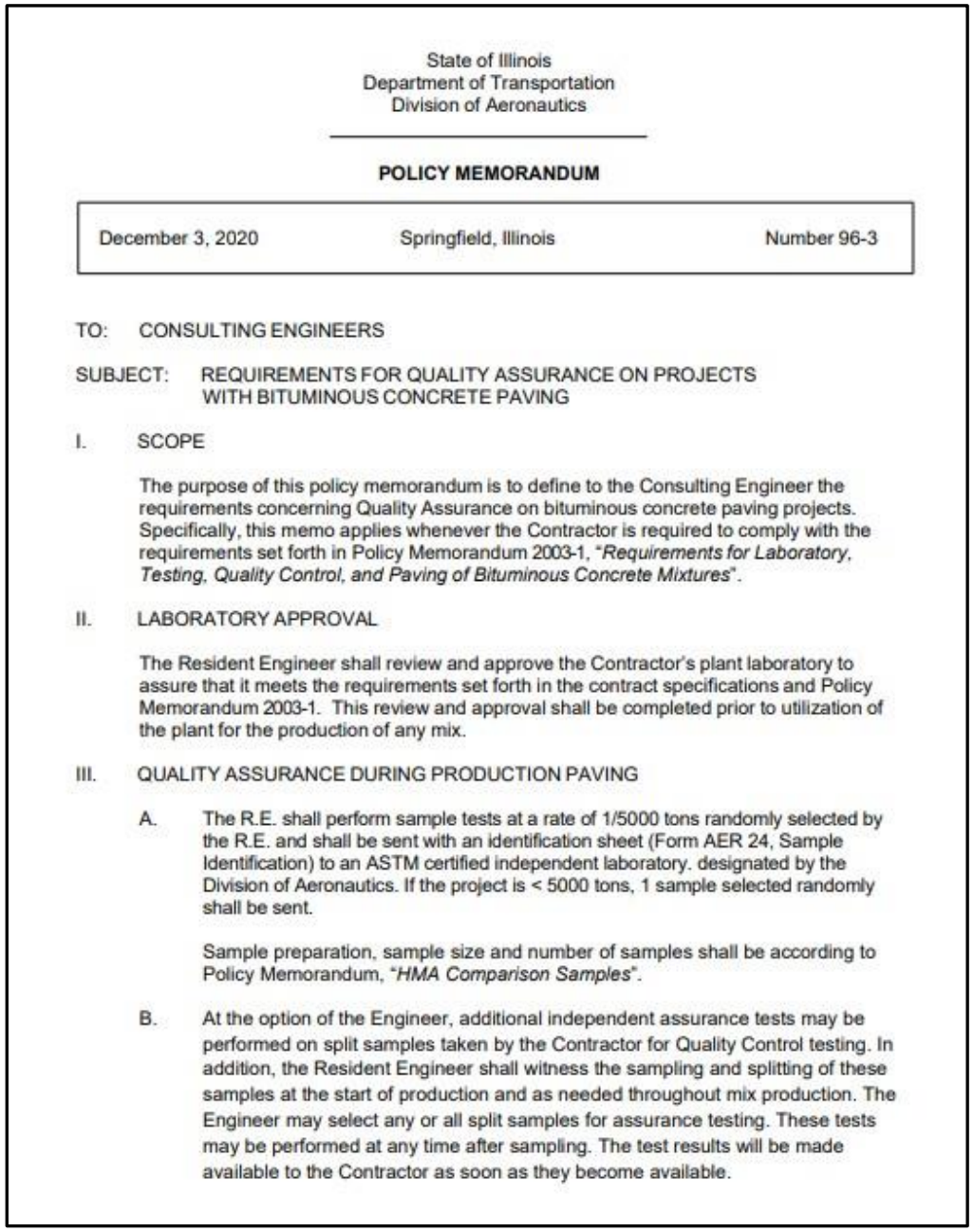
III. MIX DESIGN SUBMITTAL

Based upon data and test results submitted by the Contractor, the Illinois Division of Aeronautics (IDA) Engineer of Construction & Materials shall issue the final Job Mix Formula (JMF) approval letter that concurs or rejects the Contractor's proposed JMF. The Contractor will be required to perform the sampling and laboratory testing and develop a complete mix design, according to the following guidelines: Mix design submittals should be submitted to IDA, Construction/Material Section, Attn: Certification and Mixtures Engineer. Note: Quality Control (QC) Managers shall

Policy Memorandum 96-3

Requirements for Quality Assurance on Projects with Bituminous Concrete Paving

- 2014 and 2020 versions on website
- Addresses:
  - Laboratory Approval
  - Quality Assurance During Production Paving
  - Acceptance By Engineer



State of Illinois
Department of Transportation
Division of Aeronautics

POLICY MEMORANDUM

December 3, 2020	Springfield, Illinois	Number 96-3

TO: CONSULTING ENGINEERS

SUBJECT: REQUIREMENTS FOR QUALITY ASSURANCE ON PROJECTS WITH BITUMINOUS CONCRETE PAVING

I. SCOPE

The purpose of this policy memorandum is to define to the Consulting Engineer the requirements concerning Quality Assurance on bituminous concrete paving projects. Specifically, this memo applies whenever the Contractor is required to comply with the requirements set forth in Policy Memorandum 2003-1, "*Requirements for Laboratory, Testing, Quality Control, and Paving of Bituminous Concrete Mixtures*".

II. LABORATORY APPROVAL

The Resident Engineer shall review and approve the Contractor's plant laboratory to assure that it meets the requirements set forth in the contract specifications and Policy Memorandum 2003-1. This review and approval shall be completed prior to utilization of the plant for the production of any mix.

III. QUALITY ASSURANCE DURING PRODUCTION PAVING

A. The R.E. shall perform sample tests at a rate of 1/5000 tons randomly selected by the R.E. and shall be sent with an identification sheet (Form AER 24, Sample Identification) to an ASTM certified independent laboratory. designated by the Division of Aeronautics. If the project is < 5000 tons, 1 sample selected randomly shall be sent.

Sample preparation, sample size and number of samples shall be according to Policy Memorandum, "*HMA Comparison Samples*".

B. At the option of the Engineer, additional independent assurance tests may be performed on split samples taken by the Contractor for Quality Control testing. In addition, the Resident Engineer shall witness the sampling and splitting of these samples at the start of production and as needed throughout mix production. The Engineer may select any or all split samples for assurance testing. These tests may be performed at any time after sampling. The test results will be made available to the Contractor as soon as they become available.

Method I
Bituminous Surface & Base Course

- For Lesser Volumes of HMA no Control Strip is Required.
- Nuclear Gauge Testing & Acceptance: Two Random Tests For Each 500 tons placed
- Each Test is the Average of 5 nuclear gauge tests taken across the mat.
- One random mix sample from each 1,000 tons (extraction, max. specific gravity, air void)

2012 SPEC

- Method I
  2,500 tons and Under
  (per pay item)
- 93% Min. Mat Density
- Min. 1 set of Joint Cores.
  90% Min. Density from
  Average of 2 cores.

2020 SPEC

- Method I
  2,000 tons and Under
  (per pay item)
- 93% Min. Mat Density
- Min. 1 set of Joint Cores.
  90% Min. Density from
  Average of 2 cores.

2023 SPEC

- Method I
  2,000 tons and Under
  (per pay item)
- 92.8% Min. Mat Density
- Min. 1 set of Joint Cores.
  90.5% Min. Density from
  Average of 2 cores.

Control Strip
Bituminous Surface & Base Course

- For Greater Volumes of HMA a Control Strip is Required (Method II).

2012 SPEC (401/403-3.4)

- TEST SECTION
- Method II
  Over 2,500 tons/pay item
- 94% Min. Mat Density
- 200 to 300 Lineal Feet
- 4 sets of cores (each set averaged), plus one set from the growth curve.

2020 SPEC (401/403-3.5)

- CONTROL STRIP
- Method II
  2,000 tons/pay item and Over
- 94% Min. Mat Density
- Approximately 300 tons
- One set of cores (averaged) from each growth curve, plus joint core. One additional random set required.

2023 SPEC (401/403-3.5)

- CONTROL STRIP
- Method II
  2,000 tons/pay item and Over
- 94% Min. Mat Density
- At least 150 tons
- One set of cores (averaged) from growth curve, plus joint core. One additional random set required.

Control Strip
Bituminous Surface & Base Course

2012 SPEC (401/403-3.4)

- One Lane
- Usually one (1) Growth Curve
- No Longitudinal Cold Joint

2020/2023 SPEC (401/403-3.5)

- Two Lanes of same width/depth
- Two (2) Growth Curves (2020)
  One (1) Growth Curve (2023)
- Longitudinal Cold Joint – Cut back using same procedure to be used in production
- Joint at least 4 hours old or cooled to <160 °F
- Minimum Joint Density 90% (2020)
  Minimum Joint Density 90.5% (2023)

Production
Bituminous Surface & Base Course

500 tons = 1 sublot **2,000 tons = 1 lot**

Testing Done on Sublot Basis

2012 SPEC (401/403-3.4)

- 93% Min. Mat Density
- 90% Min. Joint Density

2020 SPEC (401/403-3.5)

- 93% Min. Mat Density
- 90% Min. Joint Density
- Joints exposed more than 4 hours or <175 °F
  - cut back maximum 3”
  - tack coat prior to placing additional asphalt against joint

2023 SPEC (401/403-3.5)

- 92.8% Min. Mat Density
- 90.5% Min. Joint Density
- Joints exposed more than 4 hours or <175 °F
  - cut back maximum 3”
  - tack coat prior to placing additional asphalt against joint

Quality Control
AER 14

ALL IDOT-LET PROJECTS

Illinois Department of Transportation

Bituminous Testing Summary

Print Form | Reset Form

Illinois Project No. | AIP Project No. | Airport

Producer | Mix Design No | Contractor

Remarks / Corrective Measures

Plan Quantity (Tons) | Number of Mix Samples Tests Required

Date Placed	Lot/ Sublot	Test Type [1]	QA/QC [3]		Percent Passing														
				Sieve:	1"	3/4"	1/2"	3/8"	#4	#8	#16	#30	#50	#100	#200	AC %	Gmb	Gmm	Void %
				JMF:															
		Mix Type:		Spec. % (±) [2]:	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A			

Notes
* Red, Bold, Italicized, and Underlined values fall out of the specified tolerance ranges.

1: SP=Stockpile CF=Cold Feed CB=Combined Belt HB=Hot Bins IO=Ignition EXT=Extraction

2: Tolerance difference allowed per the specifications.

3: Quality Assurance Tests are done by the Resident Engineer and Quality Control Tests are done by the Contractor.

I have reviewed the above test data and have taken appropriate action for any out of specification test results.

Name | Date

☐ Consultant ☐ Contractor

IDOT Aeronautics

HMA Payment

Payment is based on Acceptance Testing Results

- For 2012 Spec: 401-4.15 Surface Course and 403-4.13 Base Course

- For 2020 and 2023 Spec:
  401/403-6.1 Acceptance Sampling and Testing
  401/403-6.2 Acceptance Criteria
  401/403-6.3 Percentage of Material Within Specification Limits (PWL)

- For FAA Spec: 401/403-6.1 Acceptance Sampling and Testing
  401/403-6.2 Acceptance Criteria
  401-6.3 Percentage of Material Within Specification Limits (PWL)
  (No PWL for FAA 403)

2012 Spec Book
Bituminous Surface & Base Course

- Acceptance Method I (<2,500 tons)
  - Two Nuclear Density Tests each 500 tons
    (average of 5 tests across mat, 93% Density)
  - One Mix Sample each 1,000 tons
    Extraction, Maximum Specific Gravity, Air Void
  - One Core Set centered on Longitudinal Joint
    (90% Density)

2020 Spec Book
Bituminous Surface & Base Course

- Acceptance Method I *(<2,000 tons)*
  - Two Nuclear Density Tests each 500 tons
    (average of 5 tests across mat, 93% Density)
  - One Mix Sample each 1,000 tons
    Extraction, Maximum Specific Gravity, Air Void
  - One Core Set centered on Longitudinal Joint
    (90% Density)

2023 Spec Book
Bituminous Surface & Base Course

- Acceptance Method I (<2,000 tons)
  - Two Nuclear Density Tests each 500 tons
    (average of 5 tests across mat, *92.8%* Density)
  - One Mix Sample each 1,000 tons
    Extraction, Maximum Specific Gravity, Air Void
  - One Core Set centered on Longitudinal Joint
    (*90.5%* Density)

FAA Spec Book
Bituminous Surface < 3,000 tons & Base Course

- No Nuclear Density Testing for Small Quantity
  - PWL not required for <3,000 tons Surface Course
  - PWL not required for Base Course
  - Test sublots (400 – 600 tons) for:
    Air Voids 2.0% to 5.0%
    Surface Course Min. Mat Density 92.8%
    Base Course Min. Mat Density 92%
    Joint Density 90.5%

2012 Spec Book
Bituminous Surface & Base Course

- ACCEPTANCE METHOD II (2,500 tons & Over)
  - Percent Within Limits (PWL) for Air Voids
    (≥ 90% PWL will provide 100% payment)
    One core set each sublot (500 tons), take average.
  - One random mix sample from each 1,000 tons placed: Extraction, Maximum Specific Gravity, Gradation, Air Voids.
  - Joint Density, 90% Minimum. One core set every 2,500 tons, take average.
    Joint Density below 90% results in a 5% penalty on all production for the day representative of the core location.
  - Conformity with specified crown and grade, correct any variation from contract drawings that exceeds more than 0.5 inch.
  - Smoothness of Surface Course tested with 16-foot straightedge. Humps or depressions exceeding 0.25 inch shall be corrected.

2020/2023 Bituminous Surface & Base Course

(***AND*** FAA Spec Book - Surface)

- ACCEPTANCE METHOD II (2,000 tons & Over) ***FAA OVER 3,000 TONS***
  - Percent Within Limits (PWL) for Air Voids, Mat & Joint Density (≥ 90% PWL). Cores for each sublot used to calculate Lot PWL.
  - Pay Adjustment Schedule for Air Void and Mat Density when <90% PWL
  - Joint Density penalty 5% of Lot when PWL less than 71%
  - Grade, Cross-sections within 0.05 feet vertically and 0.1 feet laterally. Sublots that do not meet grade over 25% of the sublot will have 5% penalty.
  - Surface Course Only:
    New/Reconstructed Runway or Taxiway > 500'
    Profilograph Smoothness, average profile index <15 inches per mile per one-tenth mile.
    Deficiencies to be corrected.

2020 Spec Book
Bituminous Surface & Base Course

- ACCEPTANCE METHOD II (2,000 tons & Over)

Test Property	Pavement Specification Tolerance Limits	
	L	U
Air Voids (%)	Design Voids – 1.35	Design Voids + 1.35
Mat Density (%)	93.0[1]	--
Joint Density (%)	90.0	--

1. Applies to all asphalt mixes other than Leveling Course placed less than 1.25 inches thick.

2023 Spec Book
Bituminous Surface & Base Course

- ACCEPTANCE METHOD II (2,000 tons & Over)

Test Property	Pavement Specification Tolerance Limits	
	L	U
Air Voids (%)	Design Voids – 1.35	Design Voids + 1.35
Mat Density (%)	92.8[1]	--
Joint Density (%)	90.5	--

1. Applies to all asphalt mixes other than Leveling Course placed less than 1.25 inches thick.

FAA Spec Book
Bituminous Surface Course (P-401)

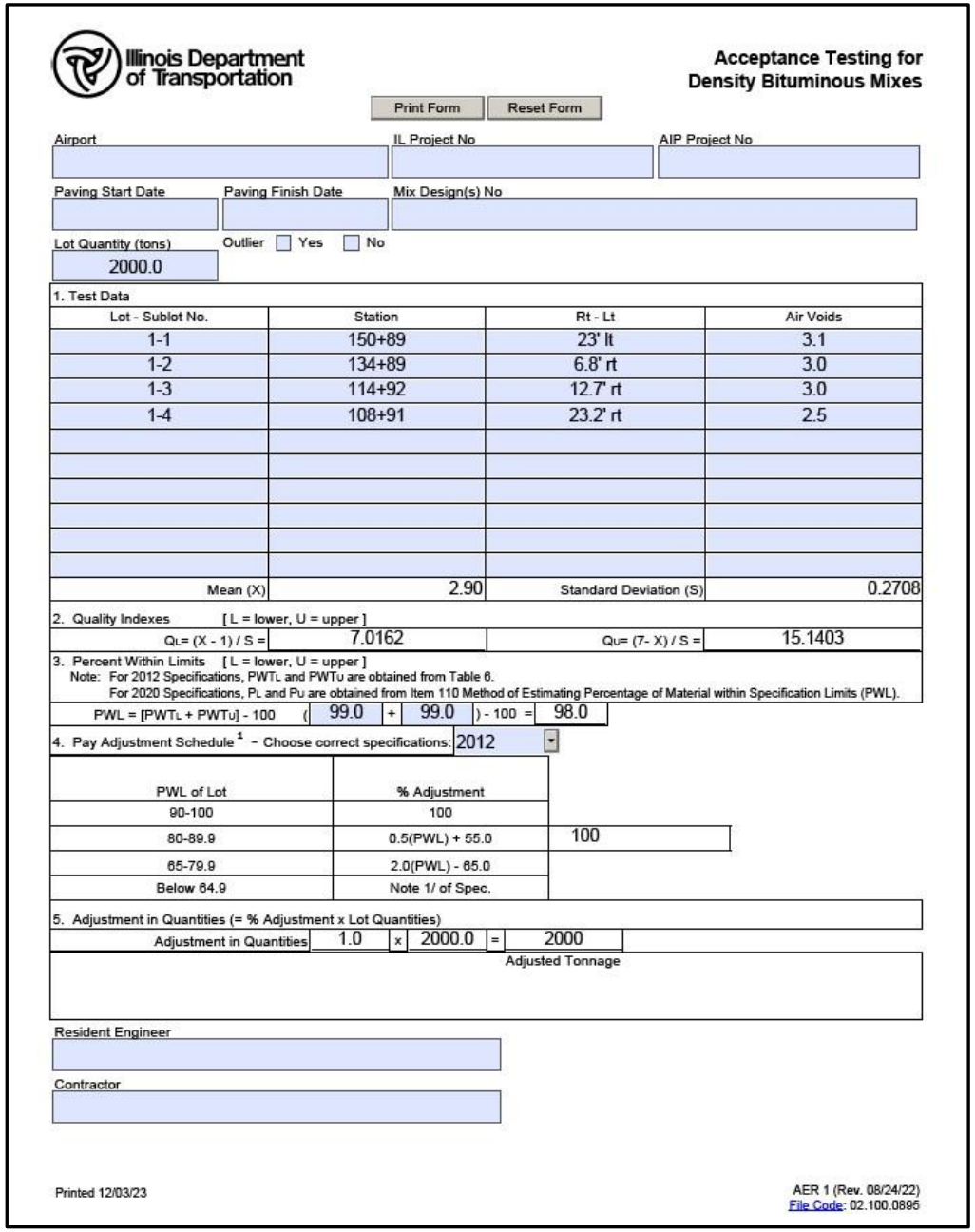
- 3,000 tons & Over

Test Property	Pavement Specification Tolerance Limits	
	L	U
Air Voids (%)	2.0	5.0
Surface Mat Density (%)	92.8	--
Base Mat Density (%)	92.0	--
Joint Density (%)	90.5	--

AER 1

Acceptance Testing for Density Bituminous Mixtures

- Form on website
- For 2012 and 2020/2023 Spec (drop down selector for specification)
- Input Air Void, Mat Density, and Joint Density sublot data on separate forms for each Lot
- Look-up table for Percent Within Tolerance (PWT_L & PWT_U)
  2012 Spec, 401-Table 6
- Look-up table for Percent Within Specification (P_L & P_U)
  2020/2023 and FAA Spec, Item 110



Illinois Department of Transportation

Acceptance Testing for Density Bituminous Mixes

Print Form | Reset Form

Airport | IL Project No | AIP Project No

Paving Start Date | Paving Finish Date | Mix Design(s) No

Lot Quantity (tons): 2000.0 | Outlier ☐ Yes ☐ No

1. Test Data

Lot - Sublot No.	Station	Rt - Lt	Air Voids
1-1	150+89	23' lt	3.1
1-2	134+89	6.8' rt	3.0
1-3	114+92	12.7' rt	3.0
1-4	108+91	23.2' rt	2.5
Mean (X)	2.90	Standard Deviation (S)	0.2708

2. Quality Indexes [L = lower, U = upper]

$Q_L = (X - 1) / S$ = 7.0162 | $Q_U = (7 - X) / S$ = 15.1403

3. Percent Within Limits [L = lower, U = upper]

Note: For 2012 Specifications, PWT_L and PWT_U are obtained from Table 6.
For 2020 Specifications, P_L and P_U are obtained from Item 110 Method of Estimating Percentage of Material within Specification Limits (PWL).

PWL = [PWT_L + PWT_U] - 100 (99.0 + 99.0) - 100 = 98.0

4. Pay Adjustment Schedule [1] – Choose correct specifications: 2012

PWL of Lot	% Adjustment	
90-100	100	
80-89.9	0.5(PWL) + 55.0	100
65-79.9	2.0(PWL) - 65.0	
Below 64.9	Note 1/ of Spec.	

5. Adjustment in Quantities (= % Adjustment x Lot Quantities)

Adjustment in Quantities: 1.0 x 2000.0 = 2000

Adjusted Tonnage

Resident Engineer

Contractor

Printed 12/03/23

AER 1 (Rev. 08/24/22)
File Code: 02.100.0895

AER 1 (detail)

ALL IDOT-LET PROJECTS

Mean (X)	2.90	Standard Deviation (S)	0.2708
2. Quality Indexes [L = lower, U = upper]			
$Q_L = (X - 1) / S$ =	7.0162	$Q_U = (7 - X) / S$ =	15.1403
3. Percent Within Limits [L = lower, U = upper] Note: For 2012 Specifications, PWT_L and PWT_U are obtained from Table 6. For 2020 Specifications, P_L and P_U are obtained from Item 110 Method of Estimating Percentage of Material within Specification Limits (PWL).			
PWL = [PWT_L + PWT_U] - 100	(99.0 + 99.0) - 100 =	98.0	
4. Pay Adjustment Schedule [1] – Choose correct specifications:	2012		

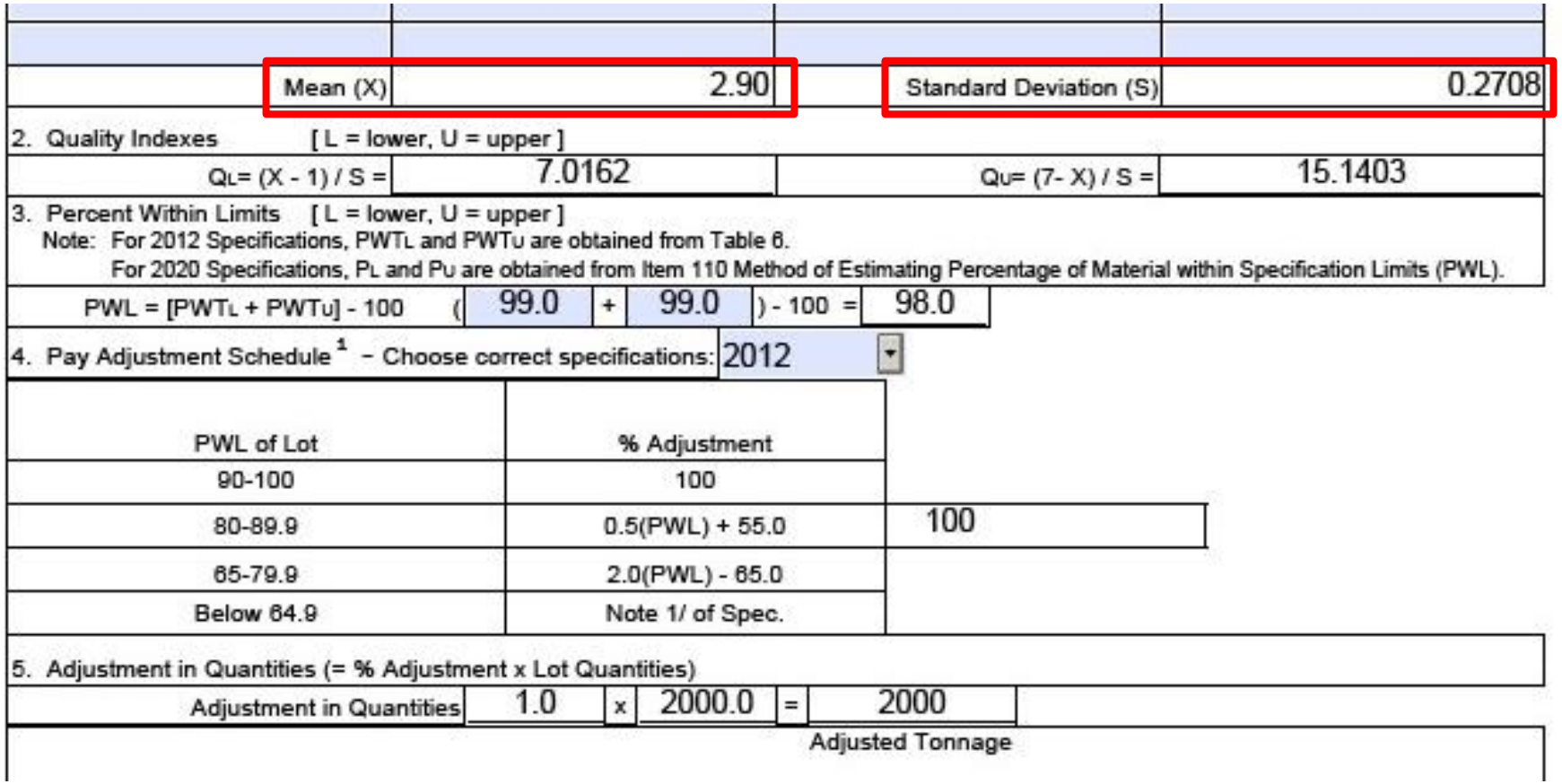
PWL of Lot	% Adjustment	
90-100	100	
80-89.9	0.5(PWL) + 55.0	100
65-79.9	2.0(PWL) - 65.0	
Below 64.9	Note 1/ of Spec.	

5. Adjustment in Quantities (= % Adjustment x Lot Quantities)					
Adjustment in Quantities	1.0	x	2000.0	=	2000
					Adjusted Tonnage

- Find calculated Q_L and Q_U values on Table
- For this case, n = 4

AER 1 (detail)

ALL IDOT-LET PROJECTS



Mean (X)	2.90	Standard Deviation (S)	0.2708

2. Quality Indexes [L = lower, U = upper]

Q_L= (X - 1) / S =	7.0162	Q_U= (7- X) / S =	15.1403

3. Percent Within Limits [L = lower, U = upper]

Note: For 2012 Specifications, PWT_L and PWT_U are obtained from Table 6.
For 2020 Specifications, P_L and P_U are obtained from Item 110 Method of Estimating Percentage of Material within Specification Limits (PWL).

PWL = [PWT_L + PWT_U] - 100	(	99.0	+	99.0	) - 100 =	98.0

4. Pay Adjustment Schedule [1] – Choose correct specifications: 2012

PWL of Lot	% Adjustment	
90-100	100	
80-89.9	0.5(PWL) + 55.0	100
65-79.9	2.0(PWL) - 65.0	
Below 64.9	Note 1/ of Spec.	

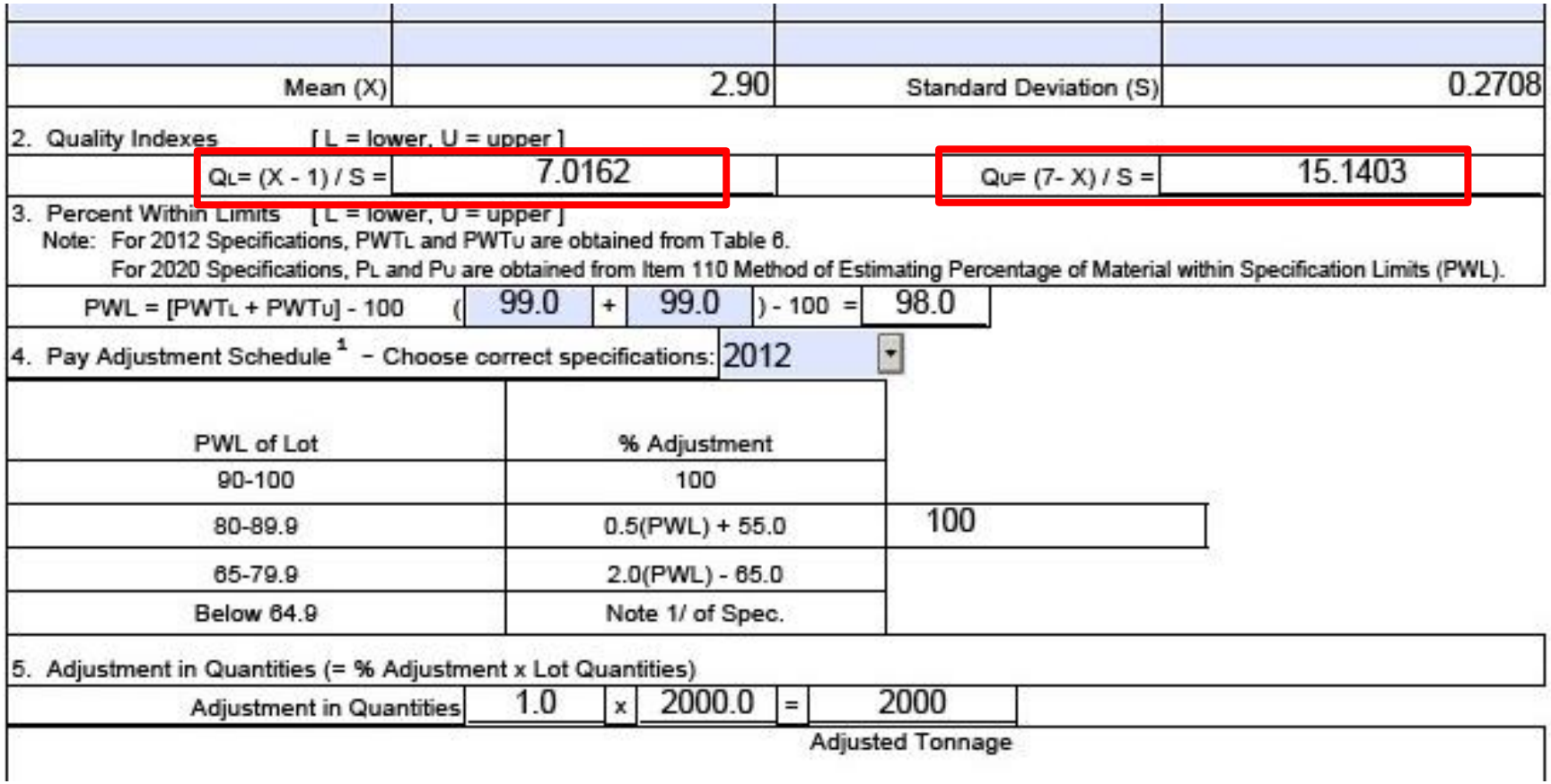
5. Adjustment in Quantities (= % Adjustment x Lot Quantities)

Adjustment in Quantities	1.0	x	2000.0	=	2000
					Adjusted Tonnage

- Find calculated Q_L and Q_U values on Table
- For this case, n = 4

AER 1 (detail)

ALL IDOT-LET PROJECTS



Mean (X)	2.90	Standard Deviation (S)	0.2708

2. Quality Indexes [L = lower, U = upper]

$Q_L = (X - 1) / S$ =	7.0162	$Q_U = (7 - X) / S$ =	15.1403

3. Percent Within Limits [L = lower, U = upper]

Note: For 2012 Specifications, PWT_L and PWT_U are obtained from Table 6.
For 2020 Specifications, P_L and P_U are obtained from Item 110 Method of Estimating Percentage of Material within Specification Limits (PWL).

PWL = [PWT_L + PWT_U] - 100	(	99.0	+	99.0	) - 100 =	98.0

4. Pay Adjustment Schedule [1] – Choose correct specifications: 2012

PWL of Lot	% Adjustment	
90-100	100	
80-89.9	0.5(PWL) + 55.0	100
65-79.9	2.0(PWL) - 65.0	
Below 64.9	Note 1/ of Spec.	

5. Adjustment in Quantities (= % Adjustment x Lot Quantities)

Adjustment in Quantities	1.0	x	2000.0	=	2000
					Adjusted Tonnage

- Find calculated Q_L and Q_U values on Table
- For this case, N = 4

AER 1 (detail)

ALL IDOT-LET PROJECTS

Mean (X)	2.90	Standard Deviation (S)	0.2708

2. Quality Indexes [L = lower, U = upper]

$Q_L = (X - 1) / S =$	7.0162	$Q_U = (7 - X) / S =$	15.1403

3. Percent Within Limits [L = lower, U = upper]

Note: For 2012 Specifications, PWT_L and PWT_U are obtained from Table 6.
For 2020 Specifications, P_L and P_U are obtained from Item 110 Method of Estimating Percentage of Material within Specification Limits (PWL).

$PWL = [PWT_L + PWT_U] - 100$	(	99.0	+	99.0	) - 100 =	98.0

4. Pay Adjustment Schedule [1] – Choose correct specifications: 2012

PWL of Lot	% Adjustment	
90-100	100	
80-89.9	0.5(PWL) + 55.0	100
65-79.9	2.0(PWL) - 65.0	
Below 64.9	Note 1/ of Spec.	

5. Adjustment in Quantities (= % Adjustment x Lot Quantities)

Adjustment in Quantities	1.0	x	2000.0	=	2000
					Adjusted Tonnage

- Find calculated Q_L and Q_U values on Table
- For this case, N = 4
- 2012 Spec selected

AER 1 Table Look-Up

ALL IDOT-LET PROJECTS

TABLE 6
TABLE FOR ESTIMATING PERCENTAGE OF LOT WITHIN LIMITS (PWL)
(STANDARD DEVIATION METHOD)
QUALTIY INDEX (QL or QU)

PERCENT WITHIN TOLERANCE	N=3	N=4	N=5	N=6	N=7	N=8	N=9	N=10	N=11	N=12
99	1.1541	1.4700	1.6714	1.8008	1.8888	1.9520	1.9994	2.0362	2.0656	2.0897
98	1.1524	1.4400	1.6016	1.6982	1.7612	1.8053	1.8379	1.8630	1.8828	1.8989
97	1.1496	1.4100	1.5427	1.6181	1.6661	1.6993	1.7235	1.7420	1.7566	1.7684
96	1.1456	1.3800	1.4897	1.5497	1.5871	1.6127	1.6313	1.6454	1.6566	1.6655
95	1.1405	1.3500	1.4407	1.4887	1.5181	1.5381	1.5525	1.5635	1.5721	1.5790
94	1.1342	1.3200	1.3946	1.4329	1.4561	1.4716	1.4829	1.4914	1.4981	1.5035
93	1.1269	1.2900	1.3508	1.3810	1.3991	1.4112	1.4199	1.4265	1.4316	1.4358
92	1.1184	1.2600	1.3088	1.3323	1.3461	1.3554	1.3620	1.3670	1.3709	1.3741
91	1.1089	1.2300	1.2683	1.2860	1.2964	1.3032	1.3081	1.3118	1.3148	1.3172
90	1.0982	1.2000	1.2290	1.2419	1.2492	1.2541	1.2576	1.2602	1.2623	1.2640
89	1.0864	1.1700	1.1909	1.1995	1.2043	1.2075	1.2098	1.2115	1.2129	1.2141
88	1.0736	1.1400	1.1537	1.1587	1.1613	1.1630	1.1643	1.1653	1.1661	1.1660
87	1.0597	1.1100	1.1173	1.1191	1.1199	1.1204	1.1208	1.1212	1.1215	1.1218

- From AER 1:
  $Q_L = 7.0162$
  $Q_U = 15.1403$
- $N = 4$

AER 1 Table Look-Up

ALL IDOT-LET PROJECTS

TABLE 6
TABLE FOR ESTIMATING PERCENTAGE OF LOT WITHIN LIMITS (PWL)
(STANDARD DEVIATION METHOD)
QUALTIY INDEX (QL or QU)

PERCENT WITHIN TOLERANCE	N=3	N=4	N=5	N=6	N=7	N=8	N=9	N=10	N=11	N=12
99	1.1541	1.4700	1.6714	1.8008	1.8888	1.9520	1.9994	2.0362	2.0656	2.0897
98	1.1524	1.4400	1.6016	1.6982	1.7612	1.8053	1.8379	1.8630	1.8828	1.8989
97	1.1496	1.4100	1.5427	1.6181	1.6661	1.6993	1.7235	1.7420	1.7566	1.7684
96	1.1456	1.3800	1.4897	1.5497	1.5871	1.6127	1.6313	1.6454	1.6566	1.6655
95	1.1405	1.3500	1.4407	1.4887	1.5181	1.5381	1.5525	1.5635	1.5721	1.5790
94	1.1342	1.3200	1.3946	1.4329	1.4561	1.4716	1.4829	1.4914	1.4981	1.5035
93	1.1269	1.2900	1.3508	1.3810	1.3991	1.4112	1.4199	1.4265	1.4316	1.4358
92	1.1184	1.2600	1.3088	1.3323	1.3461	1.3554	1.3620	1.3670	1.3709	1.3741
91	1.1089	1.2300	1.2683	1.2860	1.2964	1.3032	1.3081	1.3118	1.3148	1.3172
90	1.0982	1.2000	1.2290	1.2419	1.2492	1.2541	1.2576	1.2602	1.2623	1.2640
89	1.0864	1.1700	1.1909	1.1995	1.2043	1.2075	1.2098	1.2115	1.2129	1.2141
88	1.0736	1.1400	1.1537	1.1587	1.1613	1.1630	1.1643	1.1653	1.1661	1.1660
87	1.0597	1.1100	1.1173	1.1191	1.1199	1.1204	1.1208	1.1212	1.1215	1.1218

- From AER 1:
  $Q_L = 7.0162$
  $Q_U = 15.1403$
- N = 4
- Find number in N = 4 column closest in value (do Q_L and Q_U separately)

AER 1 Table Look-Up

ALL IDOT-LET PROJECTS

TABLE 6
TABLE FOR ESTIMATING PERCENTAGE OF LOT WITHIN LIMITS (PWL)
(STANDARD DEVIATION METHOD)
QUALTIY INDEX (QL or QU)

PERCENT WITHIN TOLERANCE	N=3	N=4	N=5	N=6	N=7	N=8	N=9	N=10	N=11	N=12
99	1.1541	1.4700	1.6714	1.8008	1.8888	1.9520	1.9994	2.0362	2.0656	2.0897
98	1.1524	1.4400	1.6016	1.6982	1.7612	1.8053	1.8379	1.8630	1.8828	1.8989
97	1.1496	1.4100	1.5427	1.6181	1.6661	1.6993	1.7235	1.7420	1.7566	1.7684
96	1.1456	1.3800	1.4897	1.5497	1.5871	1.6127	1.6313	1.6454	1.6566	1.6655
95	1.1405	1.3500	1.4407	1.4887	1.5181	1.5381	1.5525	1.5635	1.5721	1.5790
94	1.1342	1.3200	1.3946	1.4329	1.4561	1.4716	1.4829	1.4914	1.4981	1.5035
93	1.1269	1.2900	1.3508	1.3810	1.3991	1.4112	1.4199	1.4265	1.4316	1.4358
92	1.1184	1.2600	1.3088	1.3323	1.3461	1.3554	1.3620	1.3670	1.3709	1.3741
91	1.1089	1.2300	1.2683	1.2860	1.2964	1.3032	1.3081	1.3118	1.3148	1.3172
90	1.0982	1.2000	1.2290	1.2419	1.2492	1.2541	1.2576	1.2602	1.2623	1.2640
89	1.0864	1.1700	1.1909	1.1995	1.2043	1.2075	1.2098	1.2115	1.2129	1.2141
88	1.0736	1.1400	1.1537	1.1587	1.1613	1.1630	1.1643	1.1653	1.1661	1.1660
87	1.0597	1.1100	1.1173	1.1191	1.1199	1.1204	1.1208	1.1212	1.1215	1.1218

- From AER 1:
  $Q_L = 7.0162$
  $Q_U = 15.1403$
- N = 4
- Find number in N = 4 column closest in value (do Q_L and Q_U separately)
- Use Percent Within Tolerance or Limit from row

AER 1 (detail)

ALL IDOT-LET PROJECTS

Mean (X)	2.90	Standard Deviation (S)	0.2708
2. Quality Indexes [L = lower, U = upper]			
Q_L= (X - 1) / S =	7.0162	Q_U= (7- X) / S =	15.1403
3. Percent Within Limits [L = lower, U = upper] Note: For 2012 Specifications, PWT_L and PWT_U are obtained from Table 6. For 2020 Specifications, P_L and P_U are obtained from Item 110 Method of Estimating Percentage of Material within Specification Limits (PWL).			
PWL = [PWT_L + PWT_U] - 100	(99.0 + 99.0) - 100 =	98.0	
4. Pay Adjustment Schedule [1] – Choose correct specifications:	2012		

PWL of Lot	% Adjustment	
90-100	100	
80-89.9	0.5(PWL) + 55.0	100
65-79.9	2.0(PWL) - 65.0	
Below 64.9	Note 1/ of Spec.	

5. Adjustment in Quantities (= % Adjustment x Lot Quantities)					
Adjustment in Quantities	1.0	x	2000.0	=	2000
					Adjusted Tonnage

- PWT_L = 99.0
- PWT_U = 99.0
- Manually enter onto form
- Pay Adjustment Calculated for Lot

AER 1 (detail)

ALL IDOT-LET PROJECTS

Mean (X)	2.90	Standard Deviation (S)	0.2708
2. Quality Indexes [L = lower, U = upper]			
Q_L= (X - 1) / S =	7.0162	Q_U= (7- X) / S =	15.1403
3. Percent Within Limits [L = lower, U = upper] Note: For 2012 Specifications, PWT_L and PWT_U are obtained from Table 6. For 2020 Specifications, P_L and P_U are obtained from Item 110 Method of Estimating Percentage of Material within Specification Limits (PWL).			
PWL = [PWT_L + PWT_U] - 100	(99.0 + 99.0) - 100 =	98.0	
4. Pay Adjustment Schedule [1] – Choose correct specifications:	2012		

PWL of Lot	% Adjustment	
90-100	100	100
80-89.9	0.5(PWL) + 55.0	
65-79.9	2.0(PWL) - 65.0	
Below 64.9	Note 1/ of Spec.	

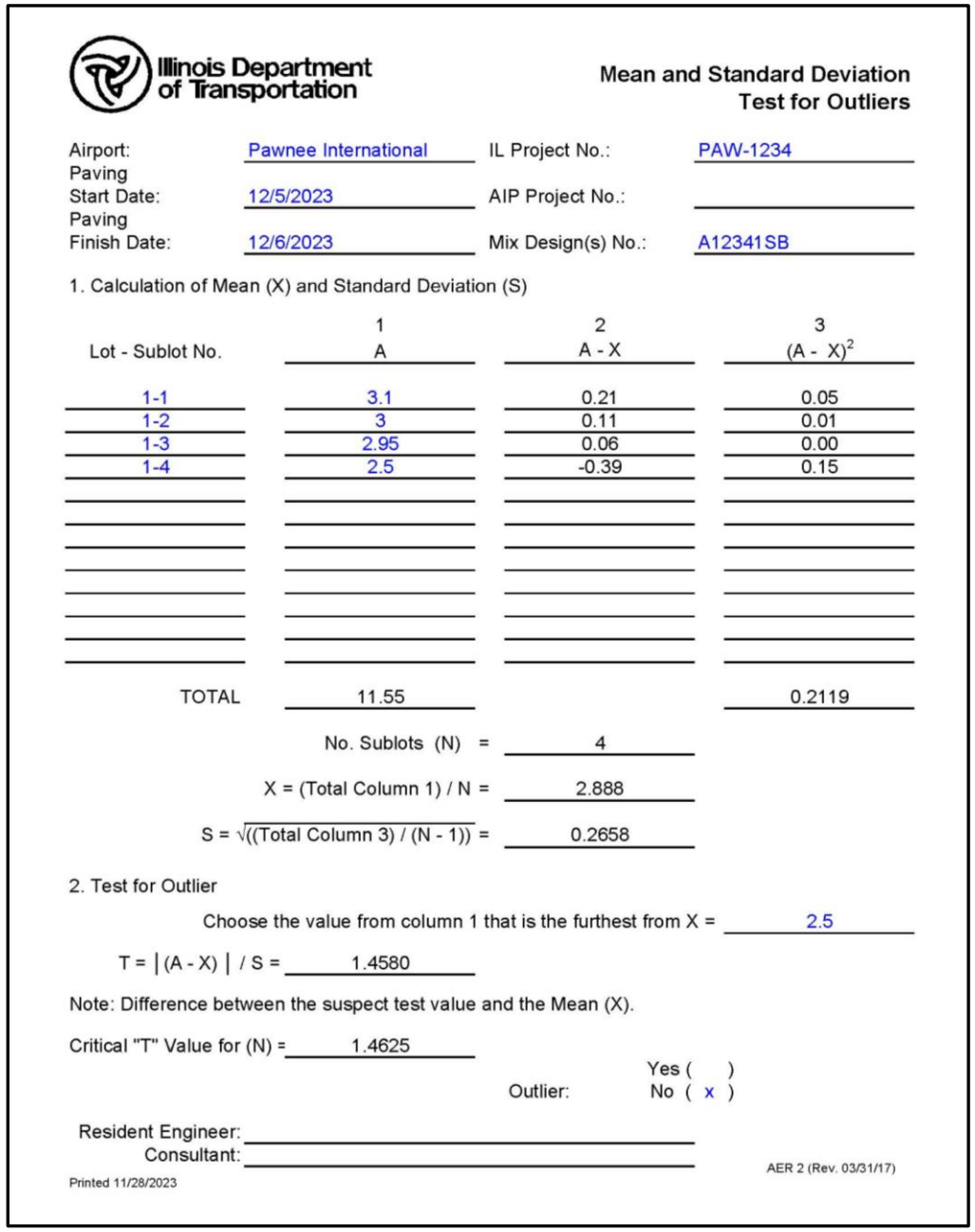
5. Adjustment in Quantities (= % Adjustment x Lot Quantities)					
Adjustment in Quantities	1.0	x	2000.0	=	2000
					Adjusted Tonnage

- PWL of Lot is 98.0
- Falls within range of 100% payment for Lot

AER 2

Mean and Standard Deviation Test for Outliers

- Form on website
- Based on ASTM E178 at a significance level of 5%
- Used for all Specs: 2012, 2020/2023, and FAA
- Just like AER 1: Input Air Void, Mat Density, and Joint Density sublot data on separate forms for each Lot
- Calculation must be less than Critical “T” Value for N
- Outliers are discarded, perform calculations using remaining test values



Illinois Department of Transportation

Mean and Standard Deviation Test for Outliers

Airport:	Pawnee International	IL Project No.:	PAW-1234
Paving Start Date:	12/5/2023	AIP Project No.:	
Paving Finish Date:	12/6/2023	Mix Design(s) No.:	A12341SB

1. Calculation of Mean (X) and Standard Deviation (S)

	1	2	3
Lot - Sublot No.	A	A - X	$(A - X)^2$
1-1	3.1	0.21	0.05
1-2	3	0.11	0.01
1-3	2.95	0.06	0.00
1-4	2.5	-0.39	0.15
TOTAL	11.55		0.2119

No. Sublots (N) = 4

X = (Total Column 1) / N = 2.888

$S = \sqrt{((\text{Total Column 3}) / (N - 1))}$ = 0.2658

2. Test for Outlier

Choose the value from column 1 that is the furthest from X = 2.5

T = | (A - X) | / S = 1.4580

Note: Difference between the suspect test value and the Mean (X).

Critical "T" Value for (N) = 1.4625

Outlier: Yes ( ) No (x)

Resident Engineer: _____

Consultant: _____

Printed 11/28/2023

AER 2 (Rev. 03/31/17)

IDOT Aeronautics

HMA Going Forward

The Future of HMA at Illinois Airports

- Half of all IDOT Let airport projects involve HMA. The other half is comprised of PCC Paving, Lighting & Navigation Aids, Electrical Vault Work, Fencing, Drainage, and Obstruction Removal.
- Simplification of Aeronautics HMA Specifications may result in more confidence and comfort for Contractors working at Illinois Airports. This may translate to more bidders on airport projects and more competitive project costs.
- One possible option: Use the FAA Spec on all projects. We already use the FAA Spec at Primary Airports. Phase out the State Airport Specifications.
- Another possible option: Get FAA approval to use IDOT Highways mixes at non-Primary Airports.
- Still too early to tell which path will be taken.

QUESTIONS?

William Eves, P.E.

Bureau Chief of Airport Engineering
Division of Aeronautics
Illinois Department of Transportation

William.Eves@illinois.gov
(217) 524-2362