Constructing Airfield Pavements with Federal Funds

Presented to: 2017 South Dakota Airports Conference
By: Carlton E. Lambiasi, P.E.
Date: March 29, 2017
Presentation Objectives

- Discuss the different ways to construct airports with federal funding
- Describe the FAA’s expectations for modifying FAA standards – including FAA’s point of view
- Process for submitting State Standard
What City/State claimed to have the first permanent, hard-surfaced runway in the United States?

Newark, New Jersey (October 1, 1928) – 1,600’

(Though some have argued Henry Ford built one earlier at Dearborn, Michigan)
FAA’s Review of Plans & Specs

Memorandum

Date: AUG 02 2016

To: All Airport Regional Division Managers

From: Michael J. O’Donnell, Director, Airport Safety and Standards, AAS-1

Subject: FAA Review of Construction Plans and Specifications for AIP funded Projects

Background:

This Memorandum provides information to Regional and Airports District Office (ADO) Program Managers (PMs) and Engineers about the FAA review of construction plans and specifications (P&S) for Airport Improvement Program (AIP) funded projects.

Summary of Changes:

The schedule for implementation of the Plans & Specifications (P&S) review was issued in December 2014. After going through one full year of P&S review and following extensive discussions at management level the following changes are being incorporated into the P&S Implementation Plan:

1. Clarification in memo about reviews for phased projects;
2. Appendix 1 has been expanded to more closely match the SOAR ODO/ACIP codes; and
3. Forms in Appendix 2 & Appendix 3 have been modified to include a block for name of whom completed the review.

“Verify conformance to FAA design and construction standards”
“...it is FAA policy that sponsors must use the specifications as written, with no changes from the specifications, except where explicitly allowed in the specification.”

“The sponsor must obtain an FAA modification to standards approval for any changes that is not specifically allowed, no matter how minor it may seem to the sponsor.”
Constructing Airfield Pavements with Federal Funds

- FAA Specification
  I.A.W. AC 150/5370-10

- FAA Approved Modified Specification
  I.A.W. FAA Order 5300.1F

- FAA Approved State Highway Spec.
  I.A.W. 49 U.S. Code § 47114

- FAA Approved State Standard
  I.A.W. 49 U.S. Code § 47105
In Accordance with AC 150/5370-10G

- Always AIP eligible
- Standards based on theoretical analysis of load distribution, analysis of experimental data, and studies of pavement performance under actual service conditions.
- Specification is derived from full scale tests from the 1940’s, specific to aircraft loadings (not vehicular).
- Full-time technical (PhD) level experts advancing airport pavement research.
- Coordination with other pavement experts (e.g. ACPA, Al)
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- FAA Approved State Standard
  I.A.W. 49 U.S. Code § 47105
Modifications to materials standards shall be made only when locally available materials cannot meet the requirements of that standard…

Modifications to construction methods standards shall be made only when they will result in cost savings and/or greater efficiency,…

Assurance that modifications to materials, construction or equipment standards will provide a product that will meet FAA standards for acceptance and that the finished product will perform for its intended design life…
MOS Process

- MOS submitted no later than at the time the Engineering Design Report.
- MOS is not to be submitted after bid or after awarded.
- MOS Approval/Disapproval varies on numerous factors.
NEAR FUTURE MOS SUBMITTALS VIA A-GIS
Common MOS Issues
MOS Submittal (At minimum)

- What, where, and why
  - What is being proposed
  - Where will this be used (i.e. airport diagram depicting area)
  - Why is this being proposed? (e.g. cost savings?)

- Assurance MOS will meet or exceed FAA’s. (any historical data, testing, etc...)

- Tracked changes provided

- Referenced documents provided

- FAAARFIELD report, if material specification is changed
MOS Resubmittal

TAXIWAY A MOS – FAA APPROVED IN 2010.

AIRPORT PROPOSING IDENTICAL MOS FOR TAXIWAY B IN 2017.

SINCE THE AIRPORT SPONSOR HAS PREVIOUSLY RECEIVED FAA APPROVAL, THERE IS NO NEED TO RESUBMIT TO THE FAA FOR TAXIWAY BRAVO’S PROJECT.
Unclear specification giving contractor too much flexibility

“The contractor will most likely pulverize the pavement in place and mix with the underlying base course in place.”

Modified specification is unclear…

- What is the procedure for construction of the project?
- Will the contractor understand how to execute the project?
- What are the before/after section details?
Avoid justifications without substance

Avoid:

- It’s cheaper!
- It’s local!
- It’s green!
- It’s more time efficient!
- It’s easier!

- It results in a better product based on contractor’s years of experience doing it “this way.”
Constructing Airfield Pavements with Federal Funds

- **FAA Specification**
  I.A.W. AC 150/5370-10

- **FAA Approved Modified Specification**
  I.A.W. FAA Order 5300.1F

- **FAA Approved State Highway Spec.**
  I.A.W. 49 U.S. Code § 47114

- **FAA Approved State Standard**
  I.A.W. 49 U.S. Code § 47105
(5) Use of state highway specifications.—

(A) In general.— The Secretary may permit the use of State highway specifications for airfield pavement construction using funds made available under this subsection at nonprimary airports with runways of 5,000 feet or shorter serving aircraft that do not exceed 60,000 pounds gross weight if the Secretary determines that—

(i) safety will not be negatively affected; and

(ii) the life of the pavement will not be shorter than it would be if constructed using Administration standards.
State Highway Specifications

- Have been permitted for < 60,000 pounds since 1976.

- State highway specifications have been developed specifically for use in construction of roads and highways using design considerations different from those developed for airport pavement.

- Highway specifications should be adopted as standards for airport construction **only** if the performance record under equivalent loadings and exposure has been satisfactory.

- When used on airport, the state highway specifications need to be modified to reflect airport work.

- Requires FAA approval
Pavement conforming to airfield specifications are generally more challenging to construct than typical state highway pavements.
Constructed to support a high volume of automobile and truck traffic.

- Low Wheel & Gross Loading
- Thousands of load repetitions per day.
- More prone to load associated distress types (e.g. rutting).
- Foreign object debris (FOD) is not a concern.

Construct to support a low volume of aircraft and vehicular traffic.

- High Wheel & Gross Loading
- < 100 of load repetitions per day.
- Cause of pavement distress is typically due to environment (e.g. sun, air, rain).
- FOD is a great concern.
Aircraft Weight vs. Time
4 Methods to Construct with Federal Funds

- FAA Specification
  I.A.W. AC 150/5370-10

- FAA Approved Modified Specification
  I.A.W. FAA Order 5300.1F

- FAA Approved State Highway Spec.
  I.A.W. 49 U.S. Code § 47114

- FAA Approved State Standard
  I.A.W. 49 U.S. Code § 47105
State Standards for Airport Development.— The Secretary may approve standards (except standards for safety of approaches) that a State prescribes for airport development at nonprimary public-use airports in the State. On approval under this subsection, a State’s standards apply to the nonprimary public-use airports in the State instead of the comparable standards prescribed by the Secretary under subsection (b)(3) of this section. The Secretary, or the State with the approval of the Secretary, may revise standards approved under this subsection.
State Standard Development

Advisory Circular 150/5100-13
Development of State Standards for Nonprimary Airports

Advisory Circular 150/5320-6
Airport Pavement Design & Evaluation

Advisory Circular 150/5370-10
Standards for Specifying Construction of Airports
Advisory Circular 150/5100-13

❖ Provides general policy
- FAA Approval
- Affected Standards
- Excluded Standards
- Revision of State Standards

❖ Provides methods for developing pavement design sections

❖ Provides minimum requirements for submittal...
1) Pavement section (thickness, material, and compaction requirements) proposed.
2) Quality Control and Acceptance plans
3) Method of measurement for each material
4) Basis for payment for each material.
Non-Aircraft Loadings

Designs should also consider the pavement section required to support the weight of maintenance and fueling equipment.
Current National List of Approved State Standards

APPROVED!

MICHIGAN

ILLINOIS

WISCONSIN
**Example of Submittal**

<table>
<thead>
<tr>
<th>Section Designation</th>
<th>Section Title</th>
<th>Illinois Standard Specs (April 2012)</th>
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</thead>
<tbody>
<tr>
<td>FAA AC 150.5379.10G</td>
<td>Scope of Work</td>
<td>Subsection: 40-03</td>
</tr>
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<td>Subsection: 40-03</td>
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</tbody>
</table>

**40-03 Omitted Items** The Engineer may, in the Owner’s best interest, omit from the work any contract item, except major contract items. 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 the subsection 90-04 titled PAYMENT FOR OMITTED ITEMS of Section 90.

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>Recommendation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paragraphs identical</td>
<td>No changes required</td>
<td></td>
</tr>
<tr>
<td>Paragraph contents similar</td>
<td>Keep IDOT paragraph</td>
<td></td>
</tr>
<tr>
<td>Keep IDOT paragraph with modifications.</td>
<td>Keep FAA paragraph</td>
<td></td>
</tr>
<tr>
<td>Keep FAA paragraph with modifications.</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- The use of “delete” in lieu of “omit” is based on the understanding of the following definitions:
  - Omit - 1. to leave out; fail to include or mention. 2. to forbear or fail to do, make, use, send, etc.
  - Delete - 1. to strike out or remove (something written or printed); cancel; erase; expunge.

**FINAL RECOMMENDED TEXT:**

40-03 **DELETED ITEMS** The Engineer may, in the Owner’s best interest, delete from the work any contract item, except major contract items. Major contract items may be deleted by a supplemental agreement. Such deletion of contract items shall not invalidate any other contract provision or requirement.

Should a contract item be deleted 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 delete such item. Payment for work performed shall be in accordance with the subsection 90-04 titled PAYMENT FOR DELETED ITEMS of Section 90.

**FAA Comments:**
- ADO/RO Comments: None
✓ FAA and State to work together on sample submittal.

✓ FAA approval process can be extensive.
  ✓ Procurement Specialists
  ✓ Civil Rights
  ✓ Pavement Technical Experts
  ✓ ADO ➔ Region ➔ HQs

✓ Use AC 150/5370-10 as your baseline. Not a highway spec.

✓ Explain to the FAA the benefit of the change.
Presentation Objectives

☑ Discuss the different ways to construct airports with federal funding

☑ Describe the FAA’s expectations for modifying FAA standards

☑ Process for submitting State Standard
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