



# ASPHALT TECHNOLOGIES, INC.



## TEST & EVALUATION REPORT

Golden Triangle Regional Airport - GTR  
FAA P-632 Preliminary Bituminous Pavement Rejuvenation Core Testing

September 30, 2015

**Report For:** Hi-Lite Airfield Services, LLC  
P.O. Box 460  
Adams Center, NY 13606

**Attn:** Jason D. Kellar

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**Sample Data / Information:**

| Identification     | Grade/Type             | Received Date | Source   |
|--------------------|------------------------|---------------|--|
| 1 Core ~6" Control | Untreated HMA          | 9/25/2015     | Hi-Lite Airfield Services<br>Golden Triangle Regional<br>Airport |
| 1 Core ~6" GTR 1   | Treated HMA 0.06 GPSY  |               |  |
| 1 Core ~6" GTR 2   | Treated HMA 0.075 GPSY |               |  |
| 1 Core ~6" GTR 3   | Treated HMA 0.05 GPSY  |               |  |

**Client:** Hi-Lite Airfield Services, LLC

**Project No's.:** HILT 15-02-01/04

**OBJECTIVE:** Determine the viscosity from complex modulus of asphalt binder after rejuvenation treatment at three different application rates to establish preliminary appropriate project rejuvenation product application rate for compliance of percent decrease in binder properties per FAA P-632, Table 2 protocols and specifications.

**CONCLUSIONS:** The binder properties reduction at all application rates met the requirements of FAA P-632, Table 2 – Pavement More Than Three (3) Years in Age by Complex Modulus.

**Table 1.** Preliminary Rejuvenation-Sealer Application Rate Determinations.

| PROPERTY  | TEST METHOD | SPECIFICATION | RESULTS: % DECREASE IN RECOVERED BINDER VISCOSITY |      |       |      |
|---|-------------|---------------|---|------|-------|------|
|   |             |               | AT APPLICATION RATES, GAL / YD. <sup>2</sup> :    |      |       |      |
|   |             |               | 0.05  | 0.06 | 0.075 |      |
| <b>FAA P-632, Table 2 Requirements</b>              |             |               |   |      |       |      |
| Complex Modulus, (1 rad/s), % Decrease <sup>1</sup> | 60°C        | AASHTO 315    | ≥ 40%   | 83.6 | 83.8  | 88.9 |
| Viscosity (η), % Decrease <sup>1</sup>              |             | AASHTO T315   |   | 83.6 | 83.8  | 88.9 |

<sup>1</sup>. % Change (decrease) from untreated core

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**DATA / RESULTS:**

**Table 2.** Weights and Measures Evaluation Specimens

| PROPERTY       |      | TEST METHOD | RESULTS: TOP 3/8" OF PRELIMINARY CORE TESTING – APPLICATION RATES |       |       |       |                             |       |       |       |                             |       |       |       |                              |       |       |       |
|----------------|------|-------------|---|-------|-------|-------|-----------------------------|-------|-------|-------|-----------------------------|-------|-------|-------|------------------------------|-------|-------|-------|
|                |      |             | 0.0, Untreated  |       |       |       | 0.05 gal / yd. <sup>2</sup> |       |       |       | 0.06 gal / yd. <sup>2</sup> |       |       |       | 0.075 gal / yd. <sup>2</sup> |       |       |       |
|                |      |             | 1   | 2     | 3     | 4     | 1                           | 2     | 3     | 4     | 1                           | 2     | 3     | 4     | 1                            | 2     | 3     | 4     |
| Diameter, in.  | Core | ASTM D 3549 | 5.75  | 5.75  | 5.74  | 5.74  | 5.74                        | 5.73  | 5.72  | 5.75  | 5.71                        | 5.71  | 5.72  | 5.74  | 5.73                         | 5.73  | 5.72  | 5.71  |
|                | Avg. |             | 5.74  |       |       |       | 5.74                        |       |       |       | 5.72                        |       |       |       | 5.72                         |       |       |       |
| Thickness, in. | Core |             | 0.359   | 0.356 | 0.403 | 0.374 | 0.367                       | 0.365 | 0.358 | 0.373 | 0.379                       | 0.349 | 0.362 | 0.409 | 0.360                        | 0.365 | 0.351 | 0.354 |
|                | Avg. |             | 0.373   |       |       |       | 0.366                       |       |       |       | 0.375                       |       |       |       | 0.358                        |       |       |       |
| Weight, g.     |      |             | 347.4   |       |       |       | 381.3                       |       |       |       | 330.2                       |       |       |       | 331.3                        |       |       |       |

**Table 3.** Extracted & Recovered Binder Properties from Top 3/8" of Pavement Specimens

| PROPERTY                                       | TEST METHOD | SPECIFICATIONS | RESULTS: TOP 3/8" GOLDEN TRIANGLE REGIONAL AIRPORT |        |       |       |       |
|--|-------------|----------------|--|--------|-------|-------|-------|
|  |             |                | Application Rate, gal. / yd. <sup>2</sup>          |        |       |       |       |
|  |             |                | 0.0, Untreated                                     | 0.05   | 0.06  | 0.075 |       |
| <b>FAA P-632, Table 2 Requirements</b>         |             |                |  |        |       |       |       |
| Complex Modulus (G*)<br>$\omega = 1$ rad/s, Pa | 60°C        | AASHTO T315    | Report   | 31.3   | 5.14  | 5.08  | 3.48  |
| Viscosity ( $\eta$ ), Pa·s                     |             |                |  | 31,300 | 5,140 | 5,080 | 3,480 |
| Phase Angle ( $\delta$ ), °                    |             |                |  | 67.3   | 79.2  | 78.9  | 78.5  |

**DISCUSSION:** The asphalt was extracted using ASTM D2172 Method A with toluene and recovered using ASTM D5404. The viscosity results were determined in accordance with AASHTO T315 at  $\omega = 1$  rad/s.

Tested by:   
Damian Jamroz – Paving Binder Technician

Date: September 30, 2015

Reviewed by:   
Sara Alzate – Pavement Services

Date: September 30, 2015