

BOWSER-MORNER, INC.

Delivery Address: 4518 Taylorsville Road • Mailing Address: P. O. Box 51 • Dayton, Ohio 45401 • 937/236-8805

Client: Asphalt Systems Inc.
2150 W. Michigan Street No. 232
Sidney, Ohio 45365

Attention: Mike Freisthler

Project: ASTM E-965 Pavement Macrotexture Depth, Anna, Ohio

Laboratory: Dayton **Report No.:** 1011-1533

Date of Report: October 20, 2011 **Job No.:** 155990

Report on:

Examination of Pavement Treated with Biorestor.

Bowser-Morner, Inc. was retained to measure the changes in the surface texture of an asphalt pavement treated with a Biorestor, mixture of agricultural oils and polymers. To this end ASTM E-965-96 (Reapproved 2006) was employed to measure the macrotexture of three sections of asphalt pavement on Ohio State Road 119, about six miles east of I75. That road was resurfaced in September 2010 using ODOT Surface Course Type I with PT70-22M binder.

Several days after the pavement was overlaid in 2010 three 500 foot long sections of the east bound lane were treated with Borestor asphalt sealer as follows.

Section I: Application rate 0.015 gallons per square yard in a shaded area.

Section II: Application rate 0.015 gallons per square yard in an open sunny area.

Section III: Application rate 0.020 gallons per square yard in an open sunny area.

Each of these 500 foot long section of pavement was tested using ASTM E965, Standard Method for Measuring Pavement Macrotexture Depth using A Volumetive Technique. Each of the three treated pavement areas was tested in both treated and untreated conditions in the outside wheel track. The test area for each treated section was about 30 feet inside the point where the treatment started and the test area for the companion untreated area was about 30 feet back from the start of the treated area.

The test method required the following:

1. Select test areas that are dry, homogeneous and free of unique, localized features such as cracks or joints.
2. Thoroughly clean area with stiff wire brush.
3. Brush cleaned area with soft bristle brush
4. Pre-measure samples of solid glass spheres of at least 1.5 cubic inches passing a No. 60 Sieve and retained on a No. 80 Sieve. Samples weighing 37.07 grams were pre-measured and placed in individual containers.
5. The glass spheres were poured on a pavement test area and carefully spread onto the cleaned surface which was rubbed in a circular motion using an ice hockey puck, until the voids were filled. The rougher the pavement surface, the smaller the area was covered.
6. The diameter of the area covered with the glass spheres was measured in four places and recorded. See photo 2 & 9.
7. Ten tests were conducted in each of the six test areas for a total of 60 individual tests on October 12, 2011.

The test area (See Photo 9)

Test Number

Test 1A Shaded Area Treated at 0.015 gal/sy

Test 1B Shaded Area Untreated

Test 2A Sunny Area Treated AT 0.015 gal/sy

Test 2B Sunny Area Untreated

Test 3A Sunny Area Treated at 0.020 gal/sy

Test 3B Sunny Area Untreated

The purpose of treating (sealing) asphalt pavements is to prolong the life of the pavement and this is accomplished by slowing the rate of hardening of the binder. If the rate of hardening is slowed, the life of the pavement is extended.

If in fact the rate of hardening is slowed, the ability of the pavement to not ravel, eg. not loose pieces of aggregate, is extended. If this assumption is true, then measuring the rate at which a pavement loses pieces of aggregate is an indication of pavement life.

The test method outlined in ASTM 965 was selected because in our judgment measuring the depth of the texture of the surface of the pavement provides a fair measure of the loss of pieces of aggregate from the mix.

Test Results

Test No.	Pavement Conditions	Surface Texture Depth
1A	Treated	0.752 mm
1B	Untreated	0.841 mm
2A	Treated	0.653 mm
2B	Untreated	0.750 mm
3A	Treated	0.597 mm
3B	Untreated	0.735 mm

Conclusion

We are the opinion these tests indicate there is less loss (11 to 21%) of aggregate from the treated areas than from the untreated areas in this one year old pavement. Note the significant increase in retention of pieces of aggregate in the section treated with 0.020 gal/sy versus the areas treated with 0.015 gal/sy.

In addition to the measured loss of aggregate in treated versus untreated areas, we observed that the center joint of the pavement was visually more pronounced in the untreated area than the treated area in all three test areas.

The testing was observed by Mr. Michael Freisthler, our client, and Mr. Robert Cummins, ODOT District 7 Highway Manager.

If you have any questions, please contact me.

Respectfully submitted,
BOWSER-MORNER, INC.

DAR/ddh
1-Client
1-File

Dennis A. Ream, E.T.
Vice President and Manager
Field Services Department