AN ABSTRACT OF A THESIS

FIELD COMPARISON OF HMA AIR VOID CONTENTS

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The standard acceptable test method for bulk specific gravity determination is AASHTO T 166, most commonly known as the Saturated Surface-Dry Method (SSD). One limitation on this test method is the 2% maximum allowable absorption for a sample. When SSD was adopted as the standard for asphalt cores, HMA mixes tended to be dense graded thus keeping water absorption below the maximum allowable. As newer, more open-graded mixes have been developed, absorption for most of these mixes exceeds 2% thus making SSD inaccurate. Recent studies have proven that T 166 is blind to the more numerous surface accessible voids that the new Superpave and Stone Matrix mixes contain. The Instrotek Corelok System has been proven to account for such voids and gives an accurate, precise G_{mb} value.

The purpose of this research was to determine the magnitude of the difference between the traditional SSD method and the newer Corelok method to see if and how soon changes need to be made in the design and construction of paving surfaces. Additionally, lab results were compared to Nuclear Density G_{mb} readings to determine how accurate in-situ testing procedures were.

Cores were taken from all four regions in the state of Tennessee and from every typically used mix type. The maximum specific gravity was determined for each mix tested. Each core was tested in-situ using a Nuclear Density gage. The cores were also tested with two replications of both T 166 and the Corelok method in the lab. A problem area within each Region was also tested to try to determine what might have caused the pavement distress. Two random samplings from the four TDOT Regions were also taken, each within a chosen lot.

The SSD method was proven to give a significantly different G_{mb} than the Corelok method in 93% of the core sample sets tested. This difference was significant for all mix types tested and within all four TDOT regions across the state of Tennessee.