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MACROTEXTURE MEASUREMENT BY ISSA TECHNICAL BULLETIN NO. 112 SAND BOX

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There is considerable concern over slurry macrotexture and the part it plays in friction characteristics of slurry seal and microasphalts. Macrotexture provides water escape channels at the tire-surface interface and is essential to prevent hydroplaning. Total wet friction coefficients however, are dependent on both macrotexture depth and microtexture. Macrotexture is related to gradation, particle shape and voids while microtexture is dependent entirely on the composition (graininess) of the aggregate.

Macrotexture measurements are made with a variety of methods. The most common is the ASTM E965 method "Measuring Surface Macrotexture Depth Using a Sand Volumetric Technique" or simply the "Sand Patch" test.

The ASTM E965 method measures a specific volume of ASTM C778 Ottawa sand (#100/#50 mesh) which is carefully spread into a circle using a hockey puck. Several measurements are made to obtain the average diameter of the sand patch and the texture depth is calculated using the formula:

$$MATXd = \frac{4V}{\pi D^2}$$

Where: MATXd = Average macrotexture depth (in. or mm.)
V = Sand volume (in^3 or mm^3)
D = Average sand patch diameter (in. or mm.)

This procedure is tedious and frequently requires more time than traffic will allow. To simplify and speed the measurement, we have used the ISSA TB 112 sand box technique and have made our first experimental correlation of sand box spread length with the sand patch test.

The ISSA sand box contains 60-62cc of sand. The box is placed on the pavement filled with sand, struck-off weighted with about 4 lbs. then drawn along the pavement until the sand is exhausted. The length of spread is measured and compared to the sand patch correlation graph. Total lapsed time is less than one minute. Simple enough.

An example is a Polymac surface applied in front of our shop in early October which serves a fair sized gravel operation, 3 redi mix firms and a hot mix plant. The original texture was uniform on both the exit (loaded) and entrance (empty) lanes. Here the texture measurements show clearly the effect of heavy loads vs. light loads on the consolidation of texture (read, rate of compaction).

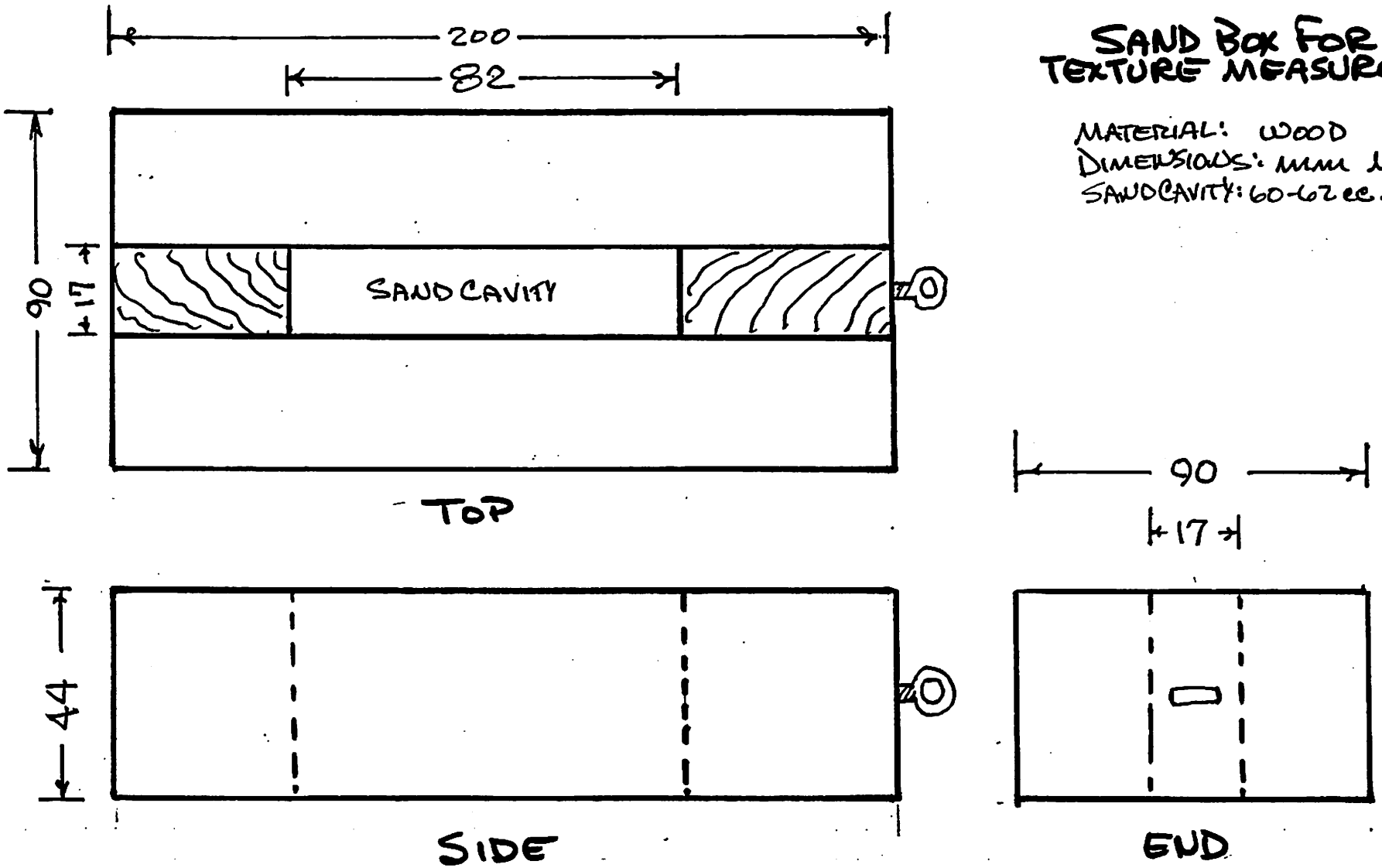
Our correlations are only preliminary and should have at least 40 or 50 sets. Additionally, we used ASTM C109 sand, lacking a supply of C778, sand which may affect the correlation results.

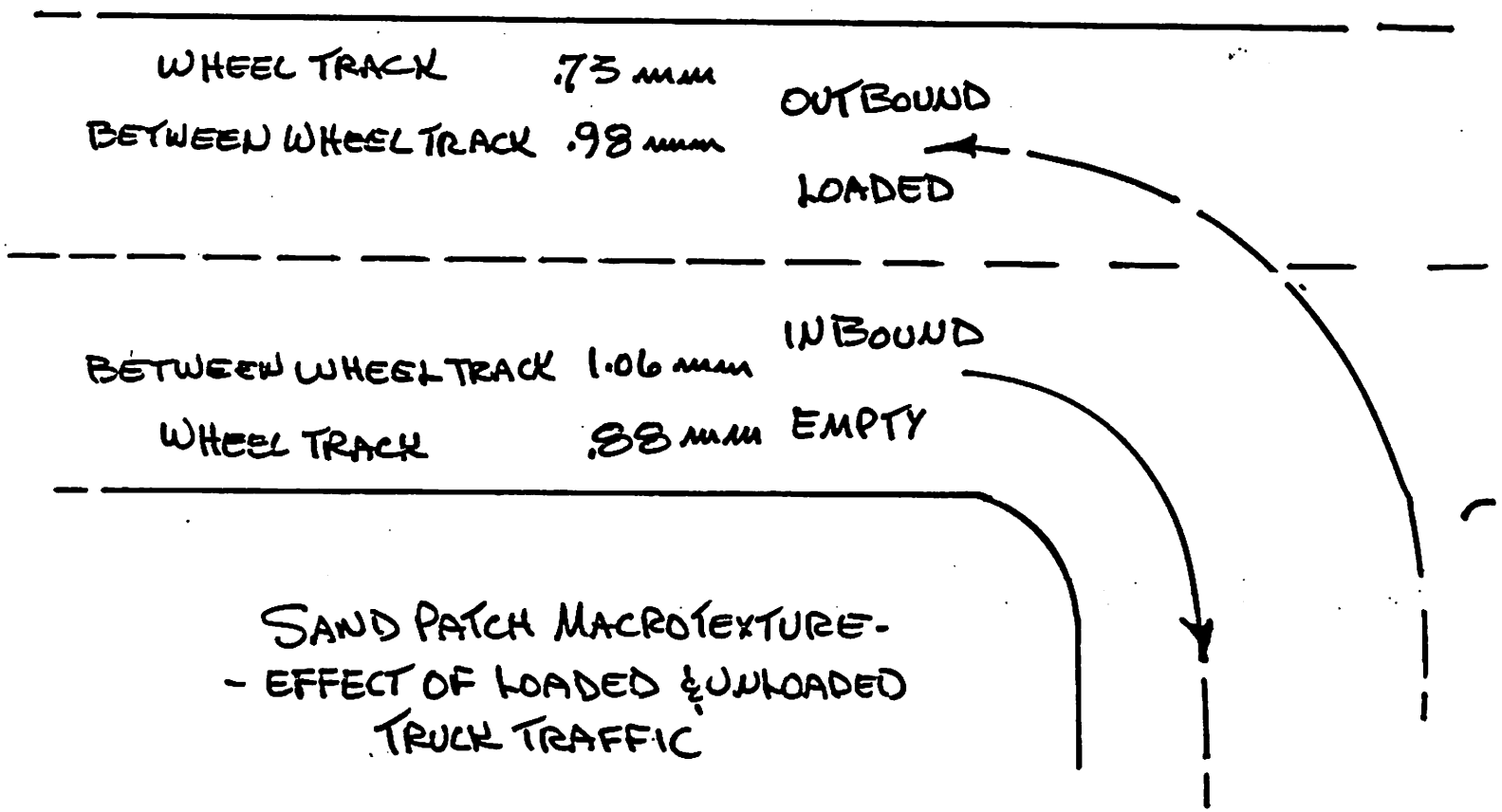
For those interested in field measurement of texture measurement not only for friction purposes, but also for compaction, vertical displacement and void closure, we suggest giving the ISSA sand box a try.

ISSA TECH. BULL. No. 112

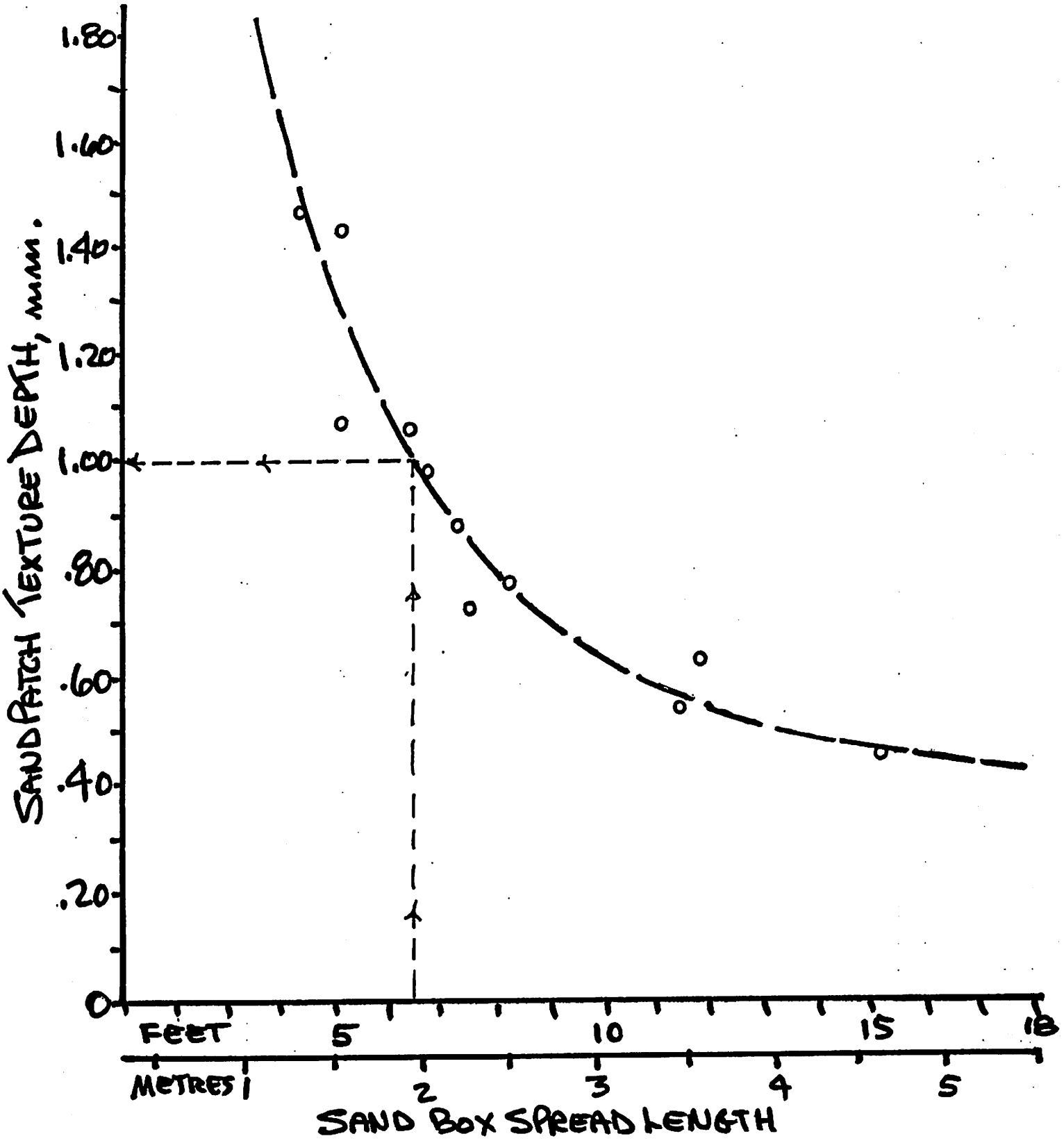
SAND BOX FOR TEXTURE MEASUREMENT

MATERIAL: WOOD
DIMENSIONS: mm NTS
SAND CAVITY: 60-62 cc.





SAND PATCH MACROTEXTURE-
- EFFECT OF LOADED & UNLOADED
TRUCK TRAFFIC



ASTM E-965 SAND PATCH MACROTEXTURE DEPTH CORRELATION WITH ISSA TECH. BULL. NO. 112 SAND BOX (ASTM C-109 OTTOWA SAND)

— PRELIMINARY CORRELATION — 2/91