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OFFICE MEMORANDUM



MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

May 12, 1975

To: L. T. Oehler
Engineer of Research

From: R. C. Mainfort

Subject: Progress Report of Research Project 71 E-49, "Development of Soil-Support Values and Coefficients of Relative Strength of Michigan Highway Support Materials." Research Report No. R-963.

The attached chart, showing a range of soil-support values and structural coefficients for various materials used to support Michigan highway pavements, summarizes a portion of the work performed to date on our overall research project in the area of soil-support and equivalency studies.

The data are based on modifications of the triaxial resilient modulus determinations, the methods of which were developed, primarily, by Ilham Al-Nouri, and represent the testing of some 125 samples of various materials and mixtures. The modulus values have then been correlated with AASHTO design charts. The objectives of this phase of the work were to:

- (a) Evaluate the test method as to feasibility and reasonableness of results.
- (b) Correlate the modulus values obtained with AASHTO Soil Support Values and obtain structural coefficients from AASHTO data.
- (c) Determine the reasonableness of results by comparison with AASHTO and additional literature presentations concerning the overall problems.

Based on this work, I feel that the modulus test is suitable for evaluating soil-support values of Michigan soils. The test has proven to be practical for laboratory use (but does require skilled technicians for sample preparation) and the test values are reasonably repeatable. All of the test values were obtained by averaging at least three samples of each material. Greatest difficulty was found in repeating test values for sands. This is probably due, however, to variations in gradation and the effect this can have on the characteristics of sands. Overall results appear to be reasonable and can be correlated with AASHTO values in a logical manner.

Josette Portigo currently is working on more theoretical aspects of the soil-support and equivalency problem and should develop information concerning variations in support values for different locations within the pavement structure as well as differences due to the quality and thickness of adjacent materials. The proposed contract with Michigan State University will give

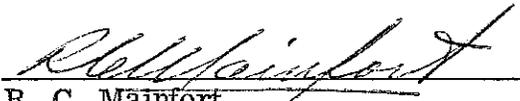
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us an additional check on our test method (through the use of more sophisticated testing equipment), present a further check with AASHTO data, and add to our theoretical background knowledge of the problems.

In addition to developing more soil-support data through the testing of additional field samples (particularly in the clay-loam area) our laboratory work will include studies of the effect that variations in moisture content can have on soil-support values. All of the samples tested so far have been at or near optimum moisture.

Although what I have presented here may appear to be an oversimplification of a very complex problem, I feel that more detailed studies will not result in significant changes of these values. The way the values are applied, however, may well change with further study.

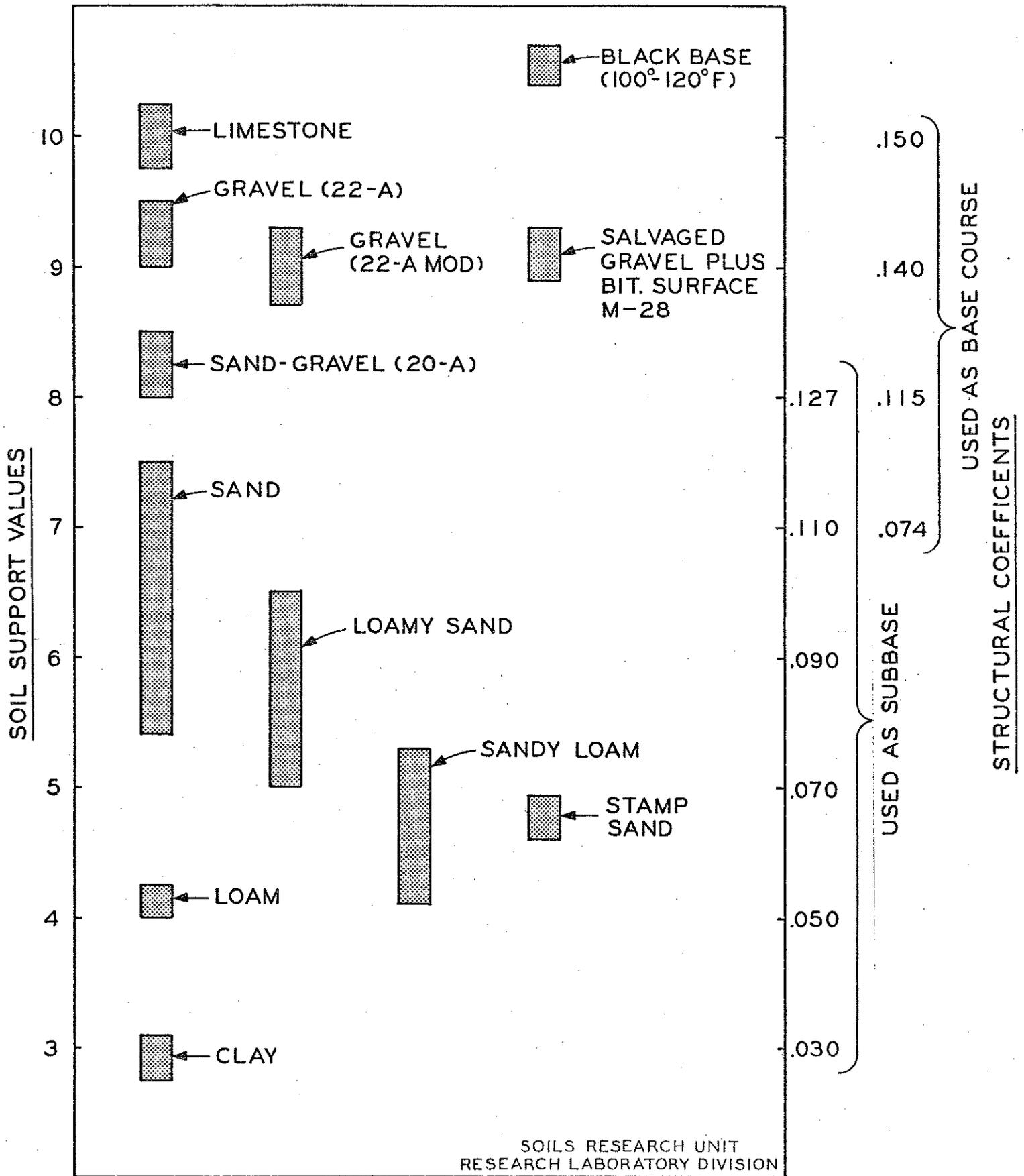
TESTING AND RESEARCH DIVISION



R. C. Mainfort
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RCM:bf

Attachment



Range of soil support values and structural coefficients for various materials.