



OFFICE MEMORANDUM

DATE: June 9, 1981

TO: L. T. Oehler
Engineer of Research

FROM: R. W. Muethel

SUBJECT: Petrographic Analysis of Coarse Aggregate Extracted from Bituminous Pavement Cores, M 55, Control Section No. 83021, 16035A
Research Project 78 TI-510, Research Report No. R-1172

On May 26, 1981, the Petrography and Hydrology Group received a sample of coarse aggregate from the Bituminous Technical Services Unit of the Testing Laboratory Section. Information accompanying the sample stated that the material had been extracted from bituminous pavement cores obtained from M 55, Control Section No. 83021, 16035A, Wexford County. Petrographic analysis of the material was requested by F. Carian.

Summary

Rock Class	Condition of Particles	Percent of Sample
Igneous	Few particles bit. -stained	13.4
Metamorphic	Few particles bit. -stained	6.1
Sedimentary	Many particles bit. -stained	80.5

Many particles in the sedimentary class were found to be deeply stained with bituminous material, indicating a porous condition.

A detailed tabulation of petrographic composition is presented in Table 1.

Detailed Petrography

Petrographic examination was conducted in general conformance with ASTM C295, "Petrographic Examination of Aggregates for Concrete." Representative portions—300 particles (see exception)—of the noted sieve fractions of the sample were identified

megascopically along with acid testing and a scratch test for hardness, and microscopically with a stereomicroscope. The following sheet contains observations of the condition of individual lithologies.

TESTING AND RESEARCH DIVISION

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Geologist

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RWM:bt

CONDITION OF PARTICLES

Igneous and Metamorphic Rocks

The igneous particles were found to be sound and unweathered to slightly weathered. A few of the particles were observed to be stained with bituminous material. The metamorphic particles were sound and unweathered.

Sedimentary Rocks

The sedimentary particles were found to be predominantly sound and unweathered. However, a considerable amount of the carbonate, sandstone, siltstone, and chert categories was observed to be deeply stained with bituminous material. Such deep staining is characteristic of porous, weathered aggregate.

TABLE 1
PETROGRAPHIC COMPOSITION

Rock Type	Sieve Fraction Analyzed			Computed Sample Composition
	3/4 to 1/2 in.	1/2 to 3/8 in.	3/8 to No. 4	
Granite	9.9	9.4	5.7	8.4
Diorite	0.7	---	---	0.2
Gabbro	3.7	2.3	2.0	2.7
Basalt	1.1	0.3	1.3	0.9
Felsite	0.4	2.0	1.3	1.2
Quartzite	3.0	3.4	2.3	2.9
Metasediments	1.1	3.0	5.0	3.0
Tillite	---	0.3	0.3	0.2
Limestone	21.8	21.7	25.7	23.1
Dolomitic Limestone	2.6	0.3	1.0	1.3
Dolomite	39.8	43.0	41.7	41.5
Sandstone	3.0	2.0	2.7	2.6
Siltstone	1.1	0.3	1.7	1.0
Chert	11.8	12.0	9.3	11.0
Totals, percent	100.0	100.0	100.0	100.0

NOTE: Computed sample composition is based upon counts of 300 particles contained in each of the sieve fractions noted, except for 271 particles in the 3/4-in. to 1/2-in. fraction.