

Sept. 30, 1952

TO: W. W. McLaughlin  
Testing and Research Engineer

SUBJECT: France Stone as a Material for Bituminous Concrete  
Surfacing. Research Project 51 A-13: Report No. 182

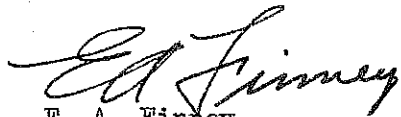
This report covers a field survey of eleven bituminous resurfacing projects in which France Stone from different sources was the predominant aggregate used in the surface course of all except one project which contained American Aggregate Corp. material from Green Oaks. This work is the continuation of a study requested by Mr. C. J. Olsen, Materials Engineer, to determine the service performance of different limestones in bituminous concrete resurfacing projects. A previous report (No. 179) concerning Lincoln Stone was presented on July 3, 1952.

The survey found all projects examined to be in very good condition with no outstanding evidence to indicate that the aggregates are not doing a good job. Pictorial evidence supporting this fact is attached.

Slight pitting was noted in certain instances, however, especially in or near a city, such as the projects on US-112 in or near Sturgis. This condition was also noted in the case of Lincoln Stone used in Battle Creek and Nashville and could be caused by excessive use of de-icing salts. The pictures show the cracked condition of surface aggregate but no significant tendency of the broken aggregate to become dislodged through frost action or traffic.

The survey was made on June 18-19-20 and August 6 and 14, 1952 by William C. Broughton and Thomas C. Holmes.

The Wallace Stone phase of this investigation will be completed shortly.



E. A. Finney  
Ass't. Testing & Research Engineer  
in charge of Research

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encl.

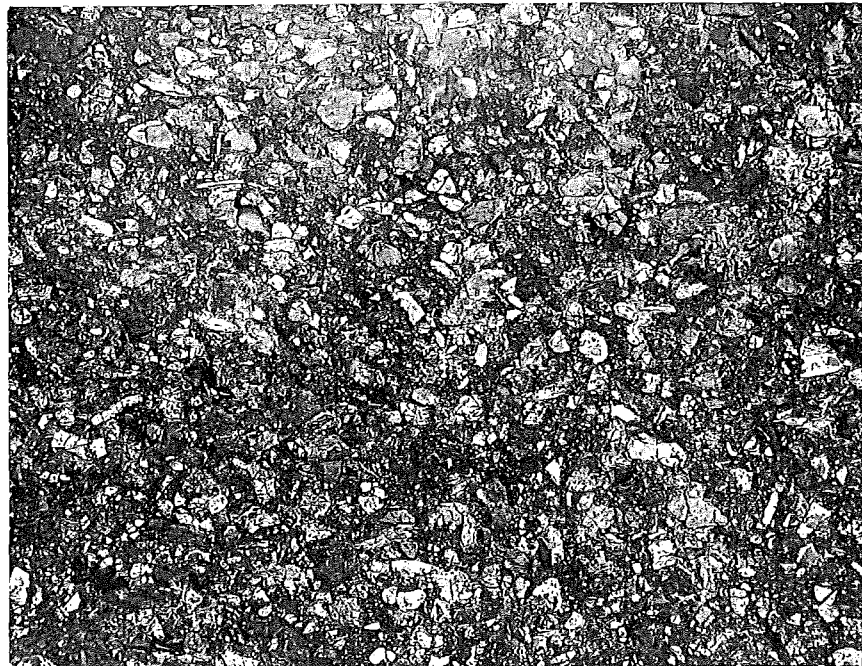
TABLE I

## SUMMARY OF DATA PERTAINING TO FRANCE STONE SURVEY

Fig. No.	Project No.	Year Const.	Length Miles	Coarse Aggregate	Specification and Source of Coarse Aggregate	Location	Condition
1	F 58-25, C7	1941	4.375	Gravel	26a-American Aggregate Corp., Green Oak	US-25 from Erie S. to State Line	No pitting
2	F 14-15, C6	1943	4.539	Gravel Limestone	26A&9A-Grand Rapids Gravel Co. No. 2 26A&9A-France Stone, Logansport Ind.	US-112 from M-205 E. to Union	No pitting
3	F 14-15, C7	1943	0.989	Gravel Limestone	26A&9A-Grand Rapids Gravel Co. No. 2 26A&9A-France Stone, Logansport Ind.	US-112 from Union East	Slight pitting
4	SNF 30-6, C4	1943	14.119	Limestone	24A&9A-France Stone, Waterville O.	US-112 from Jonesville NE to US-127	No pitting
5	SNF 30-6, C5	1943	2.260	Limestone	26A-France Stone, Waterville & Bloomville O.	US-112 from US-127 E. to County Line	No pitting
6	SNF 46-4, C13	1943	7.550	Limestone	24A&9A-France Stone, Waterville O.	US-112 from County Line E. to M-50	Very slight pitting
7	SNF 30-6, C7	1945	8.995	Limestone	26A-France Stone, Bloomville O.	US-112 from Jonesville SW to County Line	No pitting
8	F 78-8, C5	1950	3.933	Gravel Limestone	9A-Northern Indiana Sand & Gravel Co. 9a&26A-France Stone, Logansport Ind.	US-112 in Sturgis and East	Rough texture
9	M 78-7, C2	1950	1.267	Gravel Limestone	9A-Northern Indiana Sand & Gravel Co. 9A&26A-France Stone, Longasport Ind.	US-112 in City of Sturgis	Slight pitting
10	F 78-18, C2	1950	0.779	Gravel Limestone	9A-Northern Indiana Sand & Gravel Co. 9A&26A-France Stone, Logansport Ind.	M-78 from US-112 to N. City Limits, Sturgis	Slight pitting
11	F 78-8, C4	1950	4.329	Gravel Limestone	9A-Northern Indiana Sand & Gravel Co. 9A&26A-France Stone, Logansport Ind.	US-112 West from Sturgis	Slight pitting



A. Typical condition of surface. No pitting.

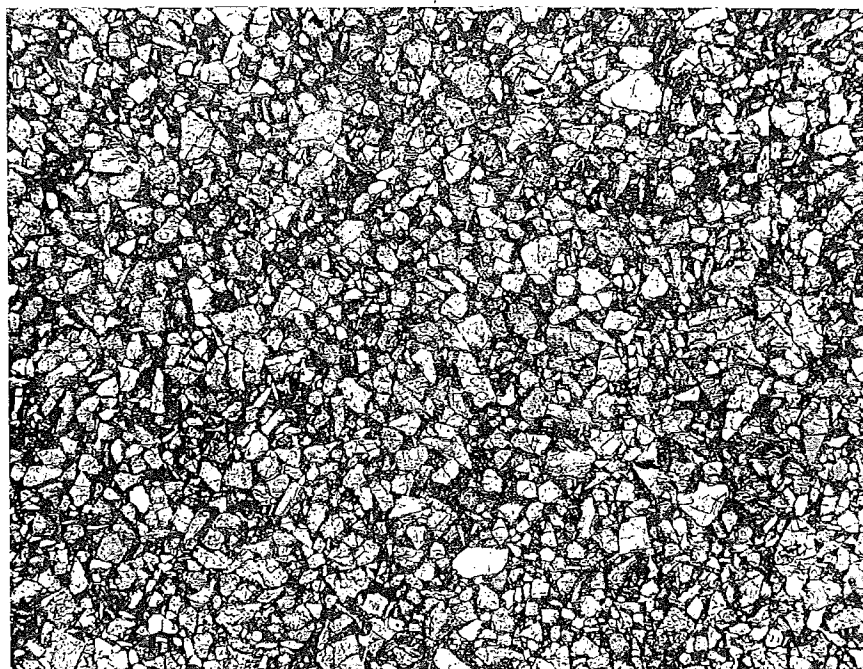


B. View of surface showing typical condition of aggregate.

France Stone 26A; F 58-25, C7 - 1941  
US-25 from Erie So. to state line



A. Typical condition of surface. No pitting.

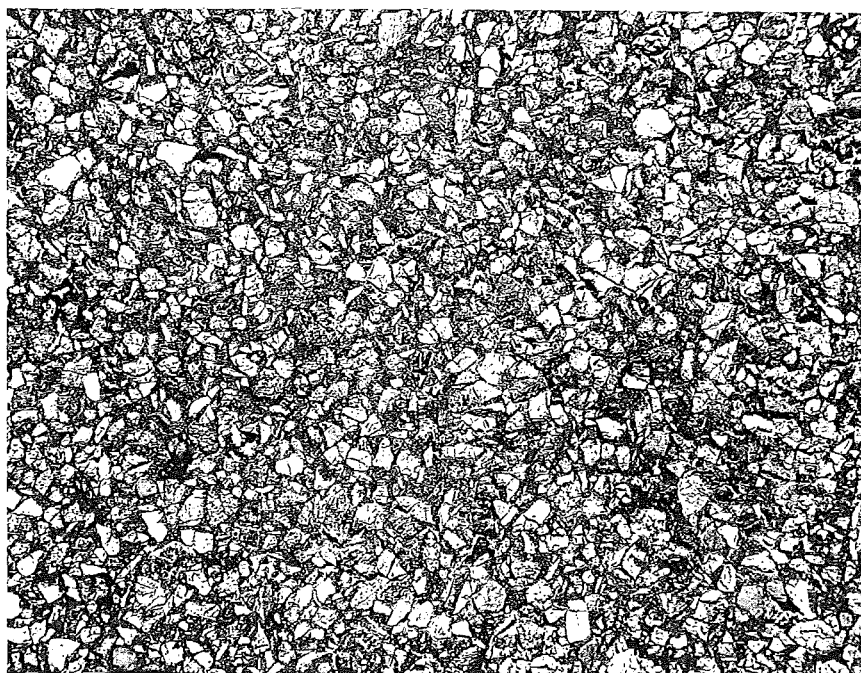


B. View of surface showing condition of aggregate.

France Stone 26A; F 14-15, C6 - 1943  
US-112 from M-205 East to Union

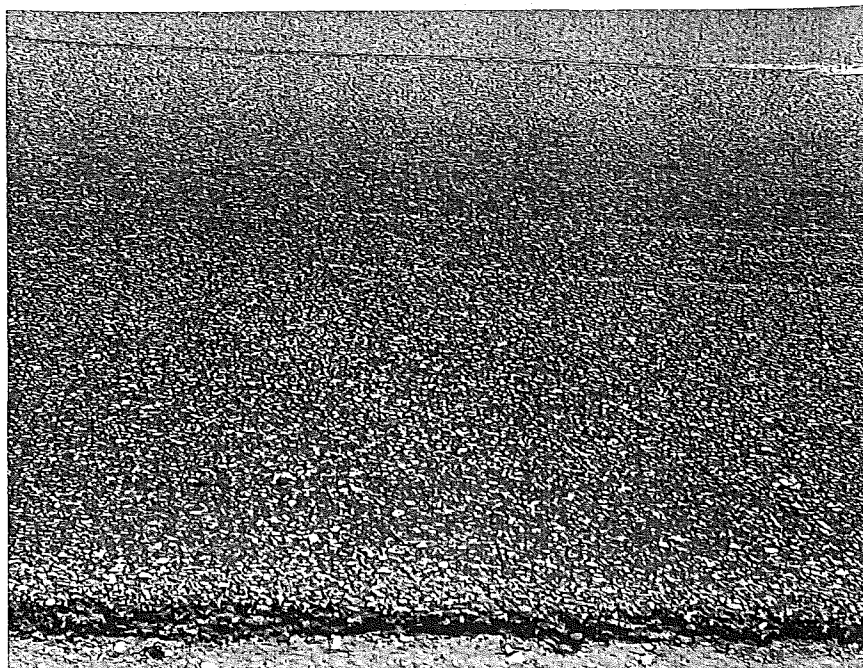


A. Typical condition of surface. Slight pitting.

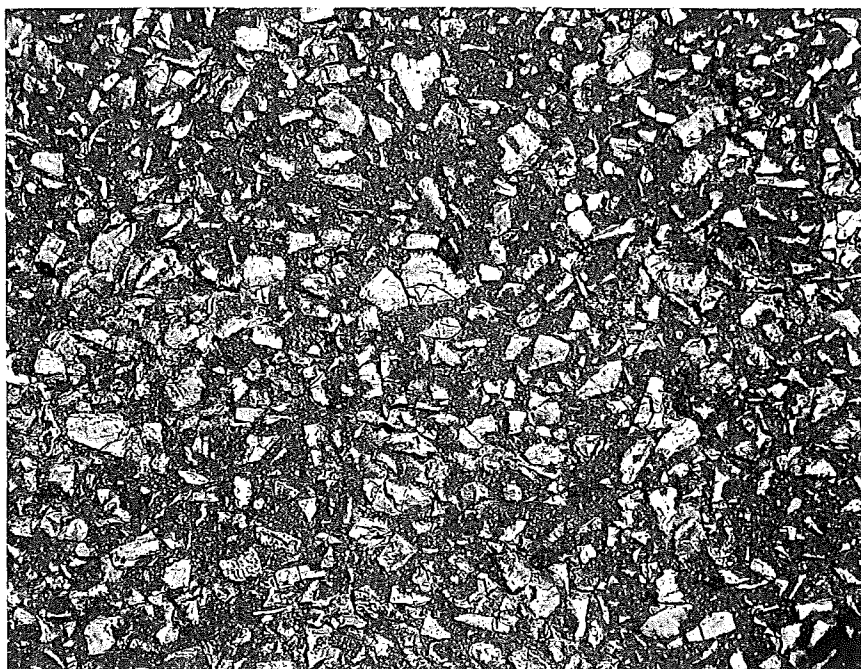


B. View of surface showing typical condition of aggregate.

France Stone 26A; F 14-15, C7 - 1943  
US-112 from Union East

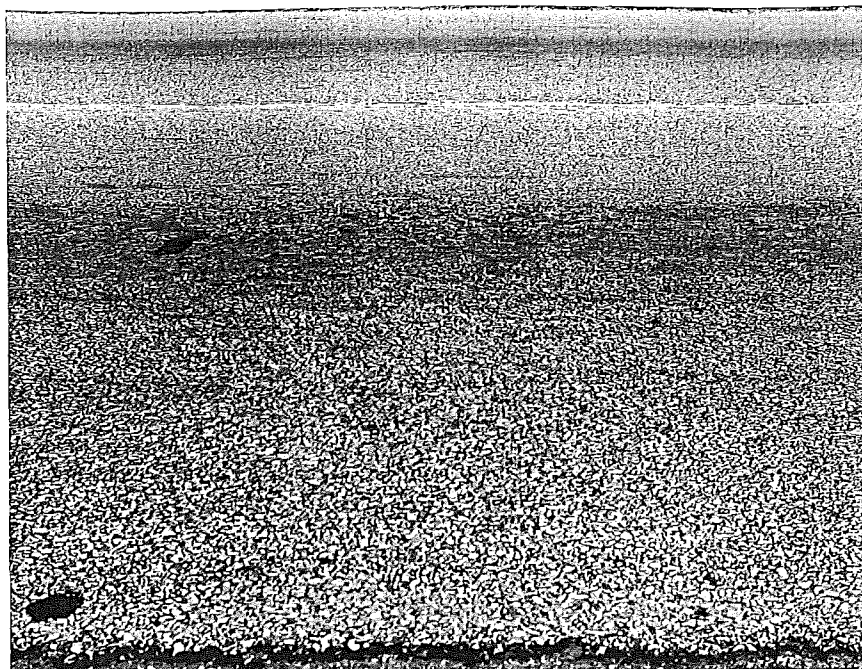


A. Typical condition of surface. No pitting.

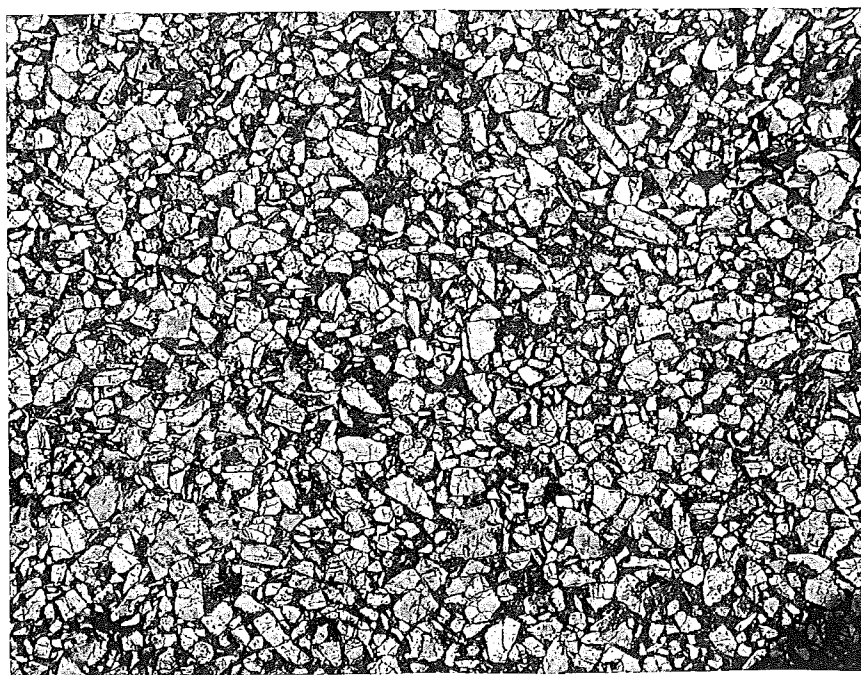


B. View of surface showing typical condition of aggregate.

France Stone 26A; SNF 30-6, 04 - 1943  
US-112 from Jonesville N.C. to US-127

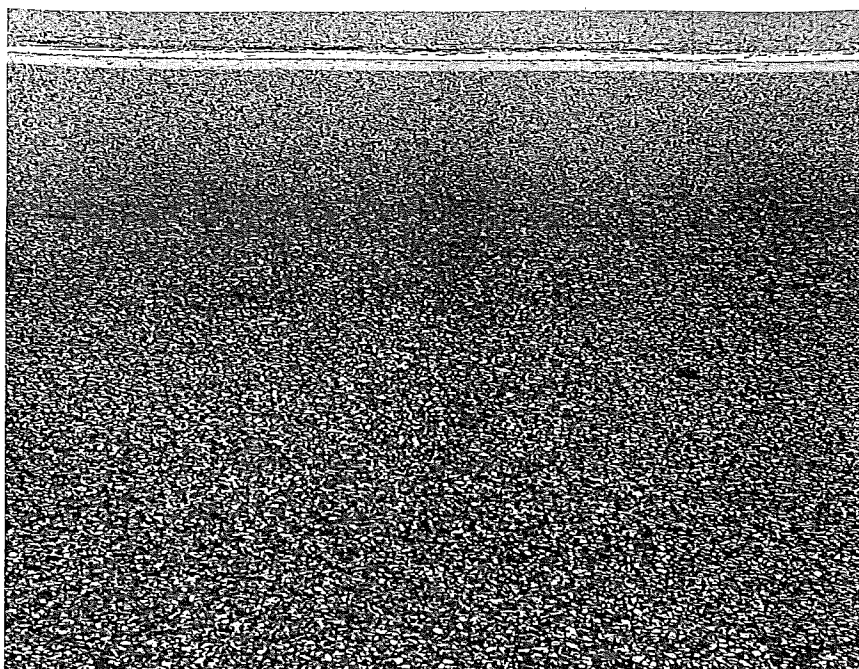


A. Typical condition of surface. No pitting.

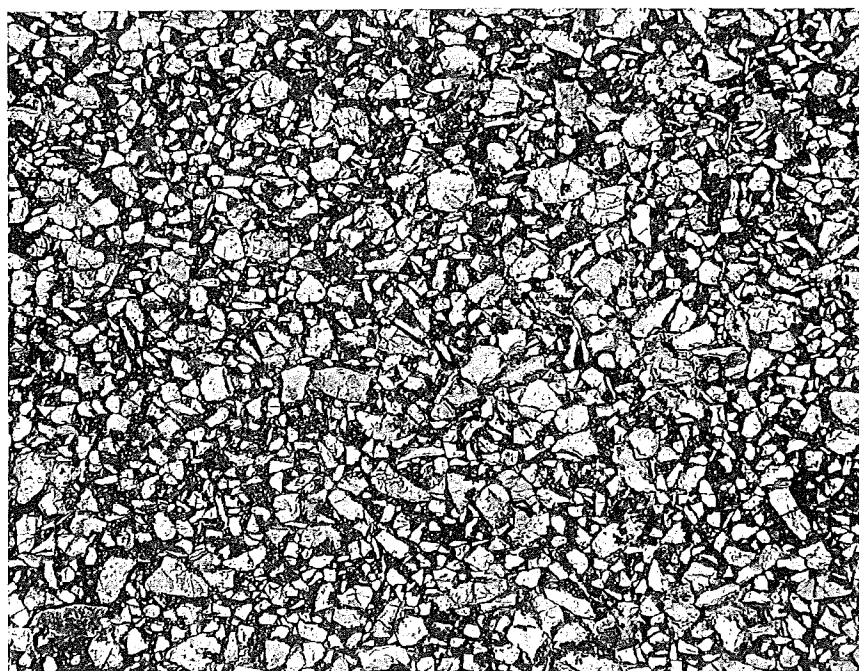


B. View of surface showing typical condition of aggregate.

France Stone 26A; SNF 30-6, 05 - 1943  
US-112 from US-127 East to Co. line



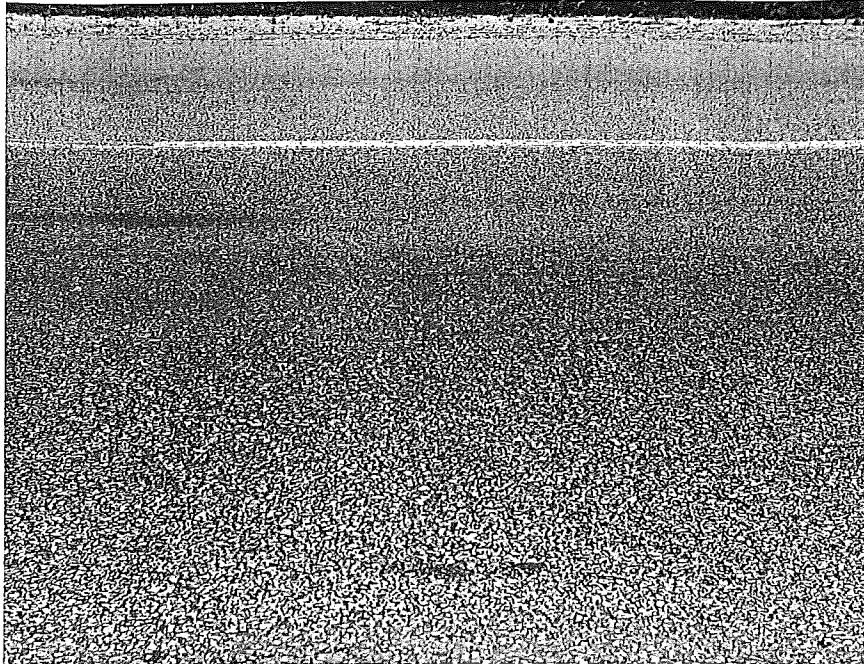
A. Typical condition of surface. Very slight pitting.



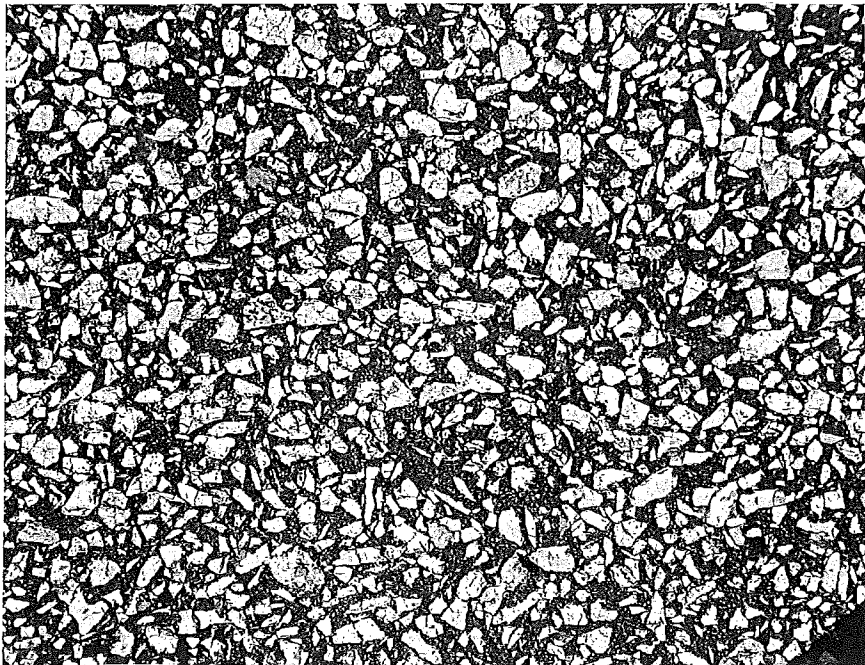
B. View of surface showing typical condition of aggregate.

France Stone 26A; SNF 46-4, C13 - 1943  
US-112 East from Co. Line to M-50



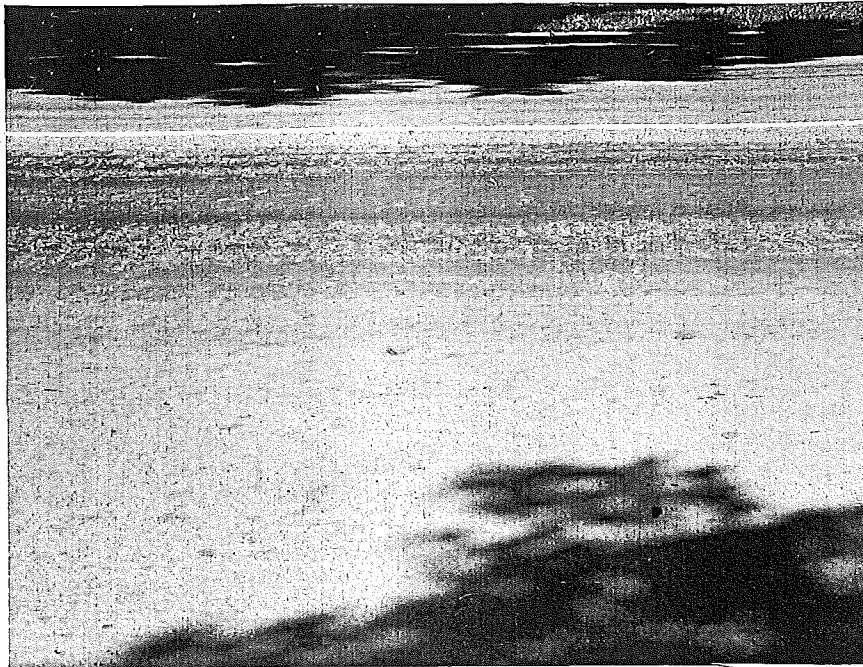


A. Typical condition of surface. No pitting.



B. View of surface showing typical condition of aggregate.

France Stone 26A; SNF 30-6, C7 - 1945  
US-112 from Jonesville S.W. to Co. Line

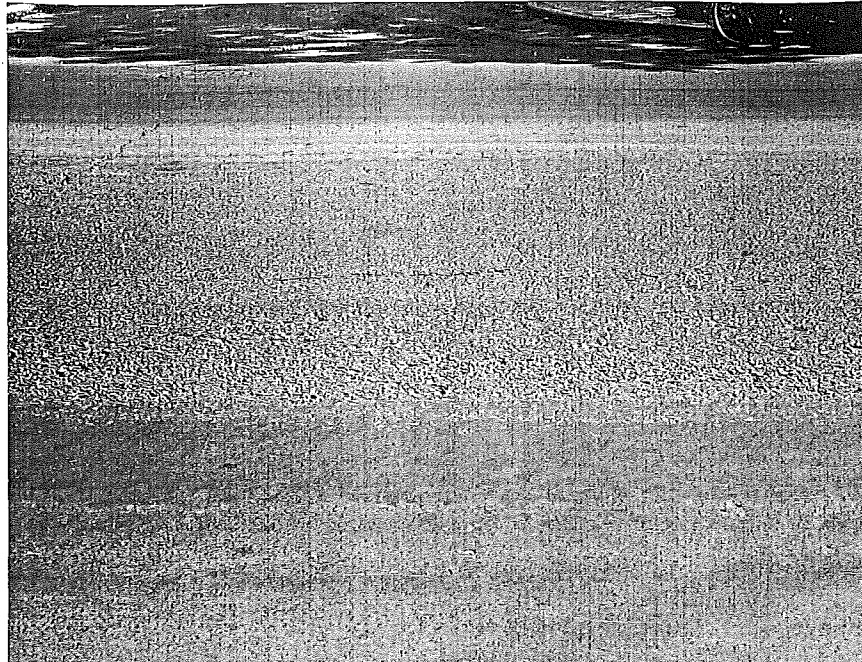


A. Typical condition of surface. Rough texture.

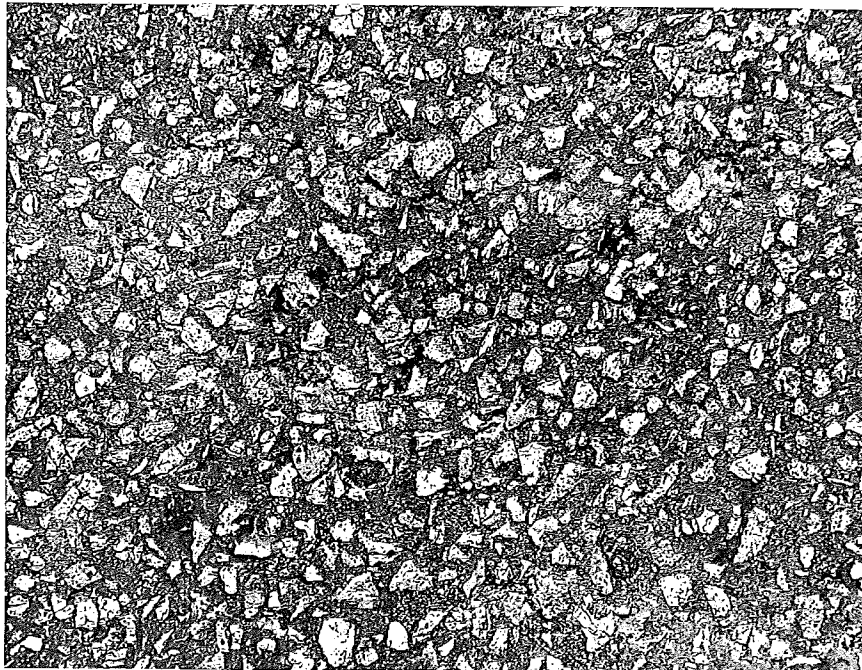


B. View of surface showing typical condition of aggregate.

France Stone 25A; Mod. F. 78-8, C5 - 1950  
US-112 in Sturgis and East

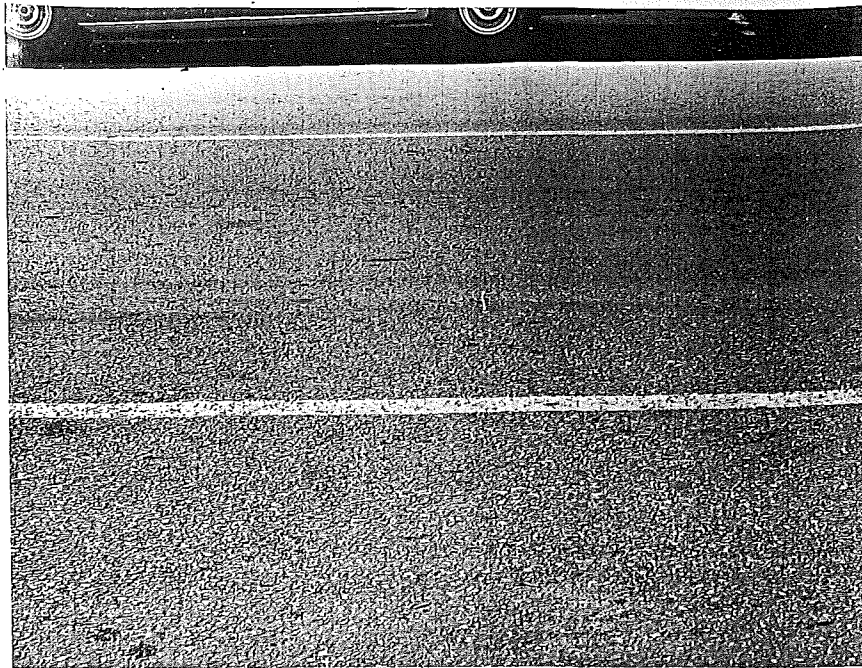


A. Typical condition of surface. Slight pitting.



B. View of surface showing typical condition of aggregate.

France Stone 25A; M 78-7, C2 - 1950  
US-112 in City of Sturgis



A. Typical condition of surface. Slight pitting.

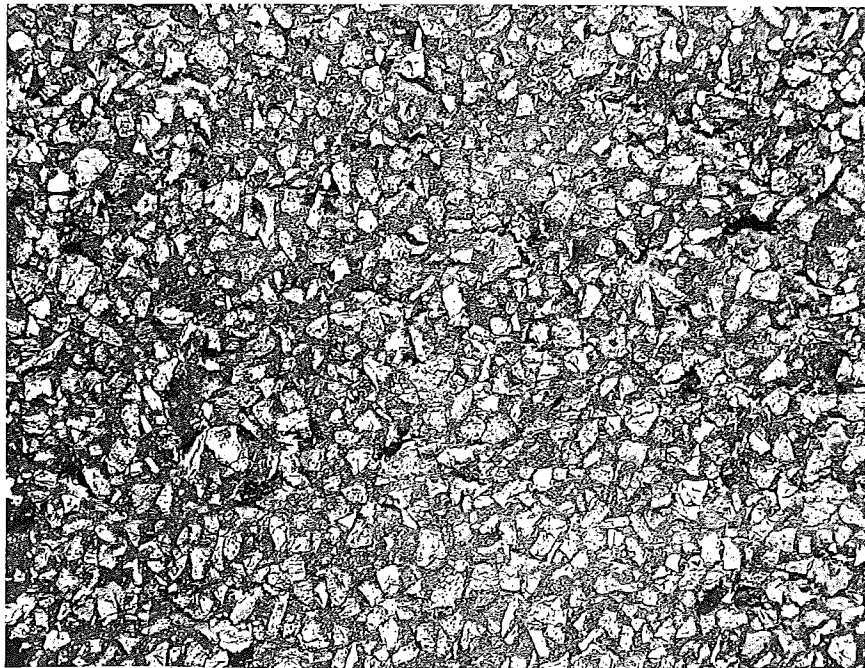


B. View showing typical condition of aggregate.

France Stone 25A mod.; F.78-18, G2 - 1950  
M-78 from US-112 to No. limits of Sturgis



A. Typical condition of surface. Slight pitting (raining).



B. View of surface showing typical condition of aggregate.

France Stone 25A mod.; F 78-8, C4 - 1950  
US-112 West from Sturgis