Sept. 30, 1952

TO: W. W. McLaughlin  
Testing and Research Engineer

SUBJECT: France Stone as a Material for Bituminous Concrete  

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  
Asst. Testing & Research Engineer  
in charge of Research

encl.
<table>
<thead>
<tr>
<th>Fig. No.</th>
<th>Project No.</th>
<th>Year Const.</th>
<th>Length Miles</th>
<th>Coarse Aggregate</th>
<th>Specification and Source of Coarse Aggregate</th>
<th>Location</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F 58-25, C7</td>
<td>1941</td>
<td>4.375</td>
<td>Gravel</td>
<td>26a-American Aggregate Corp., Green Oak</td>
<td>US-25 from Erie S. to State Line</td>
<td>No pitting</td>
</tr>
<tr>
<td>4</td>
<td>SNF 30-6, C4</td>
<td>1943</td>
<td>14.119</td>
<td>Limestone</td>
<td>24A&amp;9A-France Stone, Waterville 0.</td>
<td>US-112 from Jonesville NE to US-127</td>
<td>No pitting</td>
</tr>
<tr>
<td>5</td>
<td>SNF 30-6, C5</td>
<td>1943</td>
<td>2.260</td>
<td>Limestone</td>
<td>26A-France Stone, Waterville &amp; Bloomville 0.</td>
<td>US-112 from US-127 E. to County Line</td>
<td>No pitting</td>
</tr>
<tr>
<td>7</td>
<td>SNF 30-6, C7</td>
<td>1945</td>
<td>8.995</td>
<td>Limestone</td>
<td>26A-France Stone, Bloomville 0.</td>
<td>US-112 from Jonesville SW to County Line</td>
<td>No pitting</td>
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<tr>
<td>8</td>
<td>F 78-8, C5</td>
<td>1950</td>
<td>3.933</td>
<td>Gravel</td>
<td>9A-Northern Indiana Sand &amp; Gravel Co.</td>
<td>US-112 in Sturgis and East</td>
<td>Rough texture</td>
</tr>
<tr>
<td>9</td>
<td>M 78-7, C2</td>
<td>1950</td>
<td>1.267</td>
<td>Gravel</td>
<td>9A-Northern Indiana Sand &amp; Gravel Co.</td>
<td>US-112 in City of Sturgis</td>
<td>Slight pitting</td>
</tr>
<tr>
<td>10</td>
<td>F 78-18, C2</td>
<td>1950</td>
<td>0.779</td>
<td>Gravel</td>
<td>9A-Northern Indiana Sand &amp; Gravel Co.</td>
<td>M-78 from US-112 to N. City Limits, Sturgis</td>
<td>Slight pitting</td>
</tr>
<tr>
<td>11</td>
<td>F 78-8, C4</td>
<td>1950</td>
<td>4.329</td>
<td>Gravel</td>
<td>9A-Northern Indiana Sand &amp; Gravel Co.</td>
<td>US-112 West from Sturgis</td>
<td>Slight pitting</td>
</tr>
</tbody>
</table>
A. Typical condition of surface. No pitting.

B. View of surface showing typical condition of aggregate.

France Stone 26A; F 58-25, 07 - 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, 06 - 1943
US-112 from M-205 East to Union

Fig. 2
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, C4 - 1943
US-112 from Jonesville N.W. to US-127

Fig. 4
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

Fig. 5
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

Fig. 6
A. Typical condition of surface. No pitting.

B. View of surface showing typical condition of aggregate.

France Stone 26A; SNF 30-6, G7 - 1945
US-112 from Jonesville S.W. to Co. Line

Fig. 7
A. Typical condition of surface. Rough texture.

B. View of surface showing typical condition of aggregate.

France Stone 25A; Mod. F. 78-6, 05 - 1950
US-112 in Sturgis and East

Fig. 8
A. Typical condition of surface. Slight pitting.

B. View of surface showing typical condition of aggregate.

France Stone 254; M 78-7, C2 - 1950
US-112 in City of Sturgis

Fig. 9
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

Fig. 10
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

Fig. 11