Memo. to Dean D. V. Terrell
Director of Research

Under Item 9 of the Minutes of the Research Board Meeting held on January 27, reference was made to suggestions by Mr. Creal and Mr. Cutler that pressure measurements of air content be made on concrete being poured in bridges at Aberdeen and Brownsville. These suggestions arose after presentation of laboratory data in which air contents of supposedly normal Portland cement concrete were unusually high.

Pressure tests were made at the bridge projects by Mr. S. T. Collier on March 19-20, with the following results:

**ABERDEEN BRIDGE**

Stem of pier on Morgantown side of Green River (fourth pier from edge of river)

<table>
<thead>
<tr>
<th>Test No.</th>
<th>8 p.s.i.</th>
<th>15 p.s.i.</th>
<th>20 p.s.i.</th>
<th>30.5 p.s.i.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.30</td>
<td>1.35</td>
<td>1.40</td>
<td>1.40</td>
</tr>
<tr>
<td>2</td>
<td>1.15</td>
<td>1.20</td>
<td>1.20</td>
<td>1.25</td>
</tr>
<tr>
<td>3</td>
<td>0.90</td>
<td>1.00</td>
<td>1.00</td>
<td>1.05</td>
</tr>
<tr>
<td>Ave.</td>
<td>1.12</td>
<td>1.18</td>
<td>1.20</td>
<td>1.23</td>
</tr>
</tbody>
</table>

**BROWNSVILLE BRIDGE**

Base of Pier on North bank of Green River

<table>
<thead>
<tr>
<th>Test No.</th>
<th>8 p.s.i.</th>
<th>15 p.s.i.</th>
<th>20 p.s.i.</th>
<th>30.5 p.s.i.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.20</td>
<td>1.20</td>
<td>1.25</td>
<td>1.30</td>
</tr>
<tr>
<td>2</td>
<td>1.10</td>
<td>1.10</td>
<td>1.15</td>
<td>1.20</td>
</tr>
<tr>
<td>Ave.</td>
<td>1.15</td>
<td>1.15</td>
<td>1.20</td>
<td>1.25</td>
</tr>
</tbody>
</table>
It was not feasible to check these measurements with others made by the gravimetric method, however the consistency of results from determinations under different pressures give reasonable assurance of accuracy. In view of the contrast between these air contents which do not exceed 1.4 percent and some of those that ranged between 2 and 3 percent for supposedly similar concrete, there is a possibility that either cements from different sources vary considerably, or different shipments from any given source vary within a wide range.

As a matter of record, the aggregates and cements for the two projects, as reported by inspectors on the jobs, were from the following sources:

**Aberdeen**
- Cement - Lehigh Portland (bag)
- Coarse Aggregate - Limestone (No. 6) from Kentucky Stone Co. Quarry, Russellville
- Fine Aggregate - Sand from Owensboro

**Brownsville**
- Cement - Lehigh Portland (bag)
- Coarse Aggregate - Limestone (No. 6) from Local Quarry, 1/2 mile from Project
- Fine Aggregate - Sand from Louisville

Air content of the aggregates was 0.5 percent in each instance, and that was subtracted from the directly measured values to give the net air contents listed above.

L. E. Gregg  
Associate Research Engineer

cc: Research Board Members:  
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