Compressive strength of porous concrete used the aggregate of bottom ash

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I. INTRODUCTION

The latest earth environmental problem is risen worldwide. Realization change for concrete been using to construction material of them is appearing. That is, use as environment friendly construction material through the Environment trouble Ministry is expanded in concrete manufacture and use. Porous concrete of them is ability the material that has much continuous pore. This characteristic have speculation, sound absorption, and is used to quality of water specie opulence, sound-absorbing materials etc. And porous concrete is made material that use only coarse aggregate and paste without using fine aggregate.

Bottom ash is produced at thermoelectric power plant that is settled most reclamation and waste treatment and cause environmental problem thereby. But bottom ash is light weight, and has porosity and uses as light weight aggregate. Therefore, this study apply it is thing about porous concrete compressive strength that do bottom ash by aggregate.

II. Plans & Methods

Plans

Design of experiment of this study is same table 1, 2. Test Items is compressive, flexure, tensile strength on the Korea standards. And used material is cement and bottom ash, superplasticizer agent etc. Cement used normal portland cement, and the bottom ash used that happen at Chung chong-namdo S power plant.

Table 1 Plan of experiment

<table>
<thead>
<tr>
<th>Factors</th>
<th>Levels</th>
<th>Test Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregate size</td>
<td>2.5 ~ 5</td>
<td>Compressive</td>
</tr>
<tr>
<td></td>
<td>5 ~ 10</td>
<td>Flexure</td>
</tr>
<tr>
<td></td>
<td>2.5 ~ 10</td>
<td>Tensile</td>
</tr>
<tr>
<td>Method of tamping</td>
<td>Rod</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vibration</td>
<td></td>
</tr>
</tbody>
</table>

Table 2 Mix of experiment

<table>
<thead>
<tr>
<th>C/G (%)</th>
<th>W (%)</th>
<th>W (kg)</th>
<th>Unit volume (ℓ/m³)</th>
<th>Unit weigh (kg/m³)</th>
<th>Total volume</th>
<th>Ratio of void (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>21</td>
<td>81.9</td>
<td>124</td>
<td>494</td>
<td>1,087</td>
<td>700</td>
</tr>
</tbody>
</table>

Methods

Method of experiment is that inputes cement and water, superplasticizer and input B/A after do

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paste that makes mixing for 2 minutes by flow 20±2cm and produces specimen after mixing for 2 minutes.

III. Results & Discussion

Compressive strength
Display compressive strength by tamping method by aggregate grading. Compressive strength of vibrating compaction appeared greatly than rod tamping. As grading is high aggregate size sees by condition, compressive strength appeared greatly, and in the case of 2.5~10mm, grading is conjectured that robber is shown the highest level becoming equal.

Flexural strength
Display flexural strength by tamping method by aggregate grading. Occasion of vibrating compaction appeared greatly than rod tamping similarly with compressive strength. Also, if see by grading condition, flexural strength is big as grading is big, and in the case of grading 2.5~10mm, sudden strength difference appeared.

Tension strength
As grading is high if see by aggregate grading that display tension strength by tamping method by aggregate grading tamping method vibrating compaction strength greatly appear.

Acoustic absorptivity
3 levels by aggregate grading are result that measure Acoustic absorptivity of each frequency band using each Impideonseu. Absorption coefficient appeared high in 2.5  5, 5~10, 2.5~10mm total spot jamming (about 8000, 2500Hz). Appeared low in frequency 250, 1500Hz, but 2, 5~10mm's occasion is narrow interval of frequency that higher absorption coefficient appears than remainder occasion, and is conjectured that is the most profitable that absorption coefficient in loud sound station appears high.

![Fig. 1 Comp. strength of aggregate size](image1)

![Fig. 2 Flexural strength of aggregate size](image2)
IV. CONCLUSIONS

1. Occasion of vibrating compaction is conjectured compressive strength and bending strength, tension strength that appear greatly more than rod tamping as grading of aggregate is big. Specially, It can know 2.5~10mm occasion that appear more greatly that grading distribution is equal.

2. It is result that measure acoustic absorptivity of each frequency band to use Impideonseu. absorption coefficient appears low and need repletion at 2.5~5, 5~10, 2.5~10mm total low tone station.

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