

METHAWEE SRIWATTANAPONG : A STUDY OF LIGHTWEIGHT
CONCRETE ADMIXED WITH DIATOMITE AND PERLITE. THESIS
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LIGHTWEIGHT CONCRETE / NATURAL POZZOLAN / DIATOMITE /
PERLITE

The purpose of this study is to determine the mix of lightweight concrete admixed with diatomite or perlite having a unit weight of less than 2000 kg/m^3 and a 28 – day compressive strength of not less than 300 ksc. The control group concrete was designed at compressive strength 450 ksc. Diatomite or perlite was then used to replace cement or sand at 30, 40 and 50% by weight. The workability of the fresh concrete was controlled by keeping the slump at 8 – 10 cm. It was found that replacing cement with diatomite by 30 to 50% reduced the unit weight from 2267 kg/m^3 to $2176 - 2075 \text{ kg/m}^3$ and reduced the compressive strength from 455 ksc to 184 – 92 ksc. Replacing sand with diatomite reduced the unit weight in a similar manner ($2211 - 2014 \text{ kg/m}^3$) and the compressive strength was reduced in a similar manner (298 – 105 ksc). Replacing cement with perlite by 30 to 50% reduced the unit weight to $1848 - 1618 \text{ kg/m}^3$ and reduced the compressive strength to 114 – 11 ksc. Replacing sand with perlite gave a better result of unit weight between 1980 – 1741 kg/m^3 and compressive strength between 234 – 170 ksc.

To increase the compressive strength the concrete in the control group was increased by 25 and 50% for the next trial mixes and only sand was be replaced by perlite. For the 125% cement control group replacing sand with perlite by 30 to 50% reduced the unit weight from 2479 kg/m^3 to $2086 - 1917 \text{ kg/m}^3$ and reduced the

compressive strength from 857 ksc to 544 – 411 ksc. For the 150% cement control group replacing sand with perlite by 30 to 50% reduced the unit weight from 2458 kg/m³ to 2121 – 1783 kg/m³ and reduced the compressive strength from 861 ksc to 552 – 324 ksc.

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