ABSTRACT

A laboratory study was undertaken to investigate the effect of wet-dry (W-D) cycles on low quality aggregates stabilized with Class C fly ash (CFA). Resilient modulus ($M_r$), unconfined compressive strength (UCS), and modulus of elasticity ($E$) were used to evaluate this effect. Cylindrical specimens stabilized with 10% CFA, cured for 3 and 28 days, and subjected to different W-D cycles were tested. The $M_r$ values of 28-day cured specimens increased as W-D cycles increased up to 12, beyond which a reduction was observed. For 3-day cured specimens, the resilient modulus increased with the number of W-D cycles. Wetting and drying action produced a greater detrimental effect on 28-day cured specimens than on 3-day cured specimens. The resilient modulus values of 28-day cured specimens subjected to 30 cycles were approximately 5% lower than the corresponding $M_r$ values of specimens without any W-D cycles. The $M_r$ values of 3-day cured specimens subjected to 30 W-D cycles, however, increased approximately 55% compared to the corresponding $M_r$ values of specimens with no W-D cycles. Also, it was found that 12 to 30 W-D cycles could be considered adequate to have a noticeable negative effect on 28-day cured specimens; however, more than 30 cycles are needed for 3-day cured specimens. Additionally, the positive effect of curing time were more dominate on 3-day cured specimens, and the detrimental effects of W-D cycles were more influential on 28-day cured specimens.