An Introduction of a New Approach for Cement Content Determination of Pavement Recycling for Laboratory Inspection

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Presently, pavement recycling (PR) has been widely used due to it is cost effective and produces lower amounts of pollutants compared to that of the traditional pavement maintenance. The PR can conduct by excavating up the existing pavement and simultaneously mixing it with cement. Then, the blended materials can properly compactly use a roller compactor to create a new base layer. To achieve a design standard, the design cement content (c) is generally determined in laboratory tests by using a trial c values. At least four different c values are mixed with collected aggregate and then compacted and cured in a mold. After reached the curing time, the unconfined compression (UC) test is performed, and plotted as a relationship between c and the ultimate compressive strength (qu) to find the design value of c. However, the traditional procedure seems extravagant regarding materials, labor and time. Therefore, this presentation conveys the results of qu of cement treated with three different types of aggregates, which are including of 1) lateritic soil (LS); 2) crushed rock blended reclaimed asphalt pavement (CR); and 3) a mixture of crushed rock, reclaimed asphalt pavement and lateritic soil (CRL). Physical properties tests were performed, and the tests included grain size distribution and the Atterberg limits test. Based on the Unified Soil Classification System (USCS), the LS was a silty sand (SM), and the CR and CRL were classified as well graded sand (SW) and poorly graded silty sand (SP-SM) respectively, based on the USCS. The value of qu was evaluated through a series of the UC tests in the laboratory. The results and analysis indicated that the value of qu of the cement-treated coarse-grained materials was controlled by the plasticity index (PI) and the water to cement ratio (w/c). The lower the w/c, the greater the strength, while the higher the soil-plasticity, the more depressed the strength. Base on the results and analysis, this presentation proposed a new approach for cement content determination, where it requires less time and a smaller number of tests by using only two trials. The suggested procedure for c value determination is useful as it can save on sample numbers and the time taken and hence the overall cost