

ABSTRACT

The purpose of the study is to compare the ultimate compressive strength of concrete by the non-destructive test by DIGI-SCHMIDT 2 TEST HAMMER with digital output type with the destructive test by 2000 KN machine with digital output type and 1500 KN machine with scale load output type. 192 concrete specimens were collected from the construction project of the nine-floor compound building at the Rajabhat Institute Songkhla, Thailand. The cylindrical mold for concrete mixing for slabs and columns has a diameter of 15 cm and a height of 30 cm. Each set of 24 specimens had been collected for 8 times. At each time, they were divided into 4 sets of 6 items for testing. The non-destructive test was firstly done when the specimens were at the age of 3, 7, 14 and 28 days and 48 items per set were available. Then three of these tested specimens were examined by 2000 KN machine with digital output type and the other three were by 1500 KN machine with scale load output type. 24 specimens per set were available.

The result revealed that the value of the ultimate compressive strength of concrete (f_c') by non-destructive test by Digi-Schmidt 2 Test Hammer with digital output type is similar to the one of the destructive test by 2000 KN machine with digital output type as well as 1500 KN machine with scale load output type. When testing the specimens at the age 3 days, the non-destructive test has greater f_c' value than the destructive test between the percentage of 8.23 -13.37 %. On the contrary, when testing at the age of 7 - 28 days, the f_c' value of the non-destructive test was lower than the destructive one between the percentage of 0.83 - 8.83 %

The result was considered a reliable criterion. The difference of f_c' value between the non-destructive and the destructive tests was not more than 10 %. In conclusion, the non-destructive test by Digi-Schmidt 2 Test Hammer with digital output type can be effectively used for evaluating the test of the ultimate compressive strength of concrete at the age of 7-28 days. Furthermore, it was more convenient and faster than the destructive one.