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DETERMINATION OF DYNAMIC PHYSICAL PROPERTIES OF HIGH STRENGTH CONCRETE USING ULTRASONIC TESTER

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Abstract

The dynamic mechanical properties of concrete have received much less attention than the static mechanical properties, in spite of the fact that dynamic loading conditions are commonly encountered in civil infrastructure systems. This study provides a systematic non-destructive testing of concrete specimens (prisms and cylinders) to determine its dynamic mechanical properties using an ultrasonic pulse velocity tester (Model C368). These specimens contain various additives including micro silica, silica sand and fly ash. Also, the effect of the aspect ratio ***(L/D*** of these specimens will be taken into consideration. Forty eight concrete prisms and twenty four cylinders with aspect ratios ranging from 1 to 2.5 were prepared for this study from mix proportions that are applicable to normal weight concrete with an expected compressive strength of not less than 50 MPa. The predicted dynamic properties of concrete were compared with the results obtained from previous researches. Also, dynamic modulus of elasticity was compared with elastic modulus of elasticity.

Keywords: Dynamic modulus of elasticity; Dynamic modulus of rigidity; Poisson's ratio; Aspect ratio; Non-Destructive test; ultrasonic pulse velocity instrument.