

Dynamic Poisson's Ratio and Modulus of Elasticity of Pozzolana Portland Cement Concrete

Priyaranjan Pal*

Department of Civil Engineering, Motilal Nehru National Institute of Technology Allahabad, Uttar Pradesh 211004, India

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Abstract

An experimental investigation was carried out to determine the dynamic Poisson's ratio and modulus of elasticity of pozzolana Portland cement concrete. Large numbers of concrete cubes were prepared and tested in the laboratory for investigation. The destructive and non-destructive tests were conducted on concrete cubes at different ages. The destructive test was conducted to obtain the compressive strength of concrete cubes. Ultrasonic pulse velocity of cube specimens was derived according to IS 13311 (Part 1) and the transit time of longitudinal and shear waves transmission was recorded. The recorded values are used to determine the dynamic values of Poisson's ratio and elastic modulus of concretes. Based on experimentally obtained data and analysis, a few relationships are proposed to correlate the water/cement ratio, Poisson's ratio, elastic moduli and compressive strength of concretes. Several interesting findings are observed from the correlations of the coefficients while analyzed by regression analysis. This study helps to determine the static properties of concrete from the dynamic ones.

Keywords: Pozzolana Portland cement, Poisson's ratio, Modulus of elasticity, Ultrasonic pulse velocity, Mix proportion.

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* Corresponding author. E-mail address: prpal2k@gmail.com

Tel.: +919451071844; Fax: +915322545341

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