



## Redefining Existing Concrete Compressive Strength Acceptance Standard in Iran Concrete Code (ABA), by Experimental Data

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### Abstract

In Iran Concrete Code (ABA), the criteria for calculation of standard deviation ( $s$ ) are comprehensive and holistic. However, if it would be determined separately for each geographical area, significant changes could occur due to the use of concrete as one of the common materials. This paper analyses the criteria and redefines the acceptance standards for concrete compressive strength in ABA using experimental data available in Kohgiluyeh and Boyer-Ahmad and Fars provinces. The main hypothesis of the study is that using the statistical analysis of the test specimens for three categories C21, C30 and C35 in various projects located in Kohgiluyeh and Boyer-Ahmad and Fars provinces, extracting standard deviations, mean and the compressive strength of the specimens and their comparison with ABA proposed relationships and values, it is possible to propose new amendments for these areas in line with economic savings in national and international projects. In this study using the quantitative Strategy, library - Internet studies, field studies and in cooperation with the concrete labs, required information for 4878 concrete specimens was collected from the above-mentioned areas. By analysing the acceptance regulations for the specimens based on ABA and comparing the standard deviation of these data with the formulas of the regulations, significant results were obtained for the standard deviation factor correction and finally some formulas were suggested for the acceptance of the concrete specimens.

*Keywords:* Concrete Compressive Strength; Acceptance Standards; ABA; Iran Concrete Code.

### 1. Introduction

Given the importance of quality in terms of strength and reliability of concrete and reinforced concrete structures, the concrete quality control is one of the most important programs that is addressed in general quality control structures. Due to increasing demand for concrete and that it needs lesser cost than other materials as well as easy availability throughout the world; structural concrete have the great importance. By considering the importance and extent of studies required for the concrete, addressing such an issue is one of the most important operation in engineering branches .since concrete is a major material in constructions throughout the world, and huge monies are spent for design and implementation of concrete structures, safety is the most important aspect, particularly because concrete structures form a large part of essential infrastructure in many countries. Therefore, when constructing structures, sufficient control and care is needed in terms of durability and enough strength against malicious threats such as earthquakes, wind and other factors such as corrosion against chemicals. Strength assessment of existing concrete structures is often based on calculation models developed for design of new structures [1]. Large institutions perform experiments in form of designs and projects on concrete in terms of physical and chemical characteristics. The results of them are analyzed in terms of considering regulations, standards and constraints for the design, concrete mix and its acceptance. Concrete performance and flow, strength to environmental conditions and compatibility with the compressive strength test are effective in

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