

Compressive Strength of Clay Brick Masonry

Saman A. Aryana¹ and John H. Matthys²

Abstract:

Minimum probable compressive strength of clay masonry is presented in the Specification for Masonry Structures, reported by the Masonry Standards Joint Committee (MSJC), as a function of the mortar type and the compressive strength of the unit employed to construct the masonry. The majority of the data that are the basis of the current values for clay masonry were generated in studies done prior to 1970. Due to significant changes in materials and procedures since that time frame, there is a need to gather and study more recent data that are representative of the materials available in the marketplace today, explore various potential influencing factors, and determine how significantly these factors affect masonry compressive strength. The results of this study can lead to enhancement of the current design tables, and establish areas where more research and testing are required.

Clay brick masonry prism test data since 1980 was collected in a database. Several factors that potentially affect the prism compressive strengths were identified (independent variables) and their effects were statistically analyzed. Relationships between the prism compressive strength and the independent variables and the interactions between the independent variables were explored. Statistical tools such as type III sum of squares were used to determine the independent variables that could be excluded from the regression models. A simplified model was developed that enables reliable prediction of fifth quantile compressive strength values of clay masonry assemblages within a prescribed range of unit compressive strengths based on mortar type and unit compressive strength.

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¹ Former Graduate Student, University of Texas at Arlington, Arlington, Texas.

² TMS Honorary Member, PhD, Professor of Civil Engineering, University of Texas at Arlington, Arlington, Texas.