# Lateral Force Transfer in Post-Tensioned Slab to Shear Wall

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## Abstract

In post-tensioned concrete construction used for high-rise buildings, bridges and so on, the effects of slab shortening due to concrete shrinkage and post-tensioning compression should be considered in the design of the structure, otherwise cracking will develop. Various connection details are used in the industry to mitigate the cracking. One permanent Release-Connection involves wrapping the vertical dowel that connects the slab and wall with a compressible material for the portion that is in the slab. The behavior of this connection has not been investigated in the literature. The current research aims to evaluate the capacity of this permanent release detail to transfer shear forces, when the wall and diaphragms that are released are part of the lateral force resisting system. In order to analyze the observations of previously performed full-scale tests, extra information (data) was required. To obtain this data, it was decided to stablish a testing-rig on Marietta campus, Kennesaw State University (KSU) and get undergraduate students involved to perform experiments. Several tests were performed on four specimens and valuable results were obtained. In construction applications, it is assumed that the friction between the two layers separated with a bond breaker is zero, and the compressive material would not provide resistance under lateral loading. This study, however, indicated that a friction coefficient ($\mu$) of approximately 0.4 can be developed between two surfaces despite having a bound breaker, and that the compressible material has a potential to resist some lateral loads. The results of this study will help to better evaluate the behavior of this type of Release-Connection and will result in an enhanced design of post-tensioned slabs that can reduce the cracking of the concrete.

**Keywords:** Concrete; Post-tensioned; Shrinkage; Cracking; Release-Connection, Friction