INTERNATIONAL BUILDING CODE COMPLIANT ANCHOR APPROVALS

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Abstract
Greater understanding of post-installed anchors installed in hardened concrete has emerged from extensive product testing and research during the last 25-years. Consequently, new design provisions have been developed enabling the Structural Engineer to increase the efficiency of an anchor without compromising the safety of the connection. The new design concept recently introduced in the US results in added failure mode transparency by allowing the Structural Engineer to determine the connection capacity based on the failure mode offering the least resistance. As the number of municipalities adopting the 2003 IBC (International Building Code) in the United States grows, an increasing number of Structural Engineers will be designing anchorage to concrete according to the new provisions. This article provides an overview of the new testing and evaluation concept for the performance and classification of post–installed fastening systems. The general content and layout of new approvals issued by ICC-ES are explained and benefits are highlighted by contrasting old and new approvals.

1. Introduction

The evolution from allowable stress design (ASD) to strength design (SD) is not new to the American Structural Engineering community. Analogous to the adoption of a new concrete design procedure in the late sixties and to some extent steel design today, anchorage to concrete is undergoing a similar design transformation. Greater understanding of anchor behavior in concrete has emerged from extensive product testing and research during the last 25-years. Consequently, new design provisions have been developed which enables the Structural Engineer to increase anchor efficiency without compromising the safety of the connection. The new design concept provides added failure mode transparency by allowing the Structural Engineer to determine the governing connection capacity based on the failure mode which offers the least

resistance. A typical example of a fastening situation the engineer might encounter in his daily work is shown in
Fig. 1: design of a group of four anchors, located close to a free edge. The new design concept allows for a realistic and economical approach when taking into account the various effects such as spacing and edge distance on the load carrying capacity.

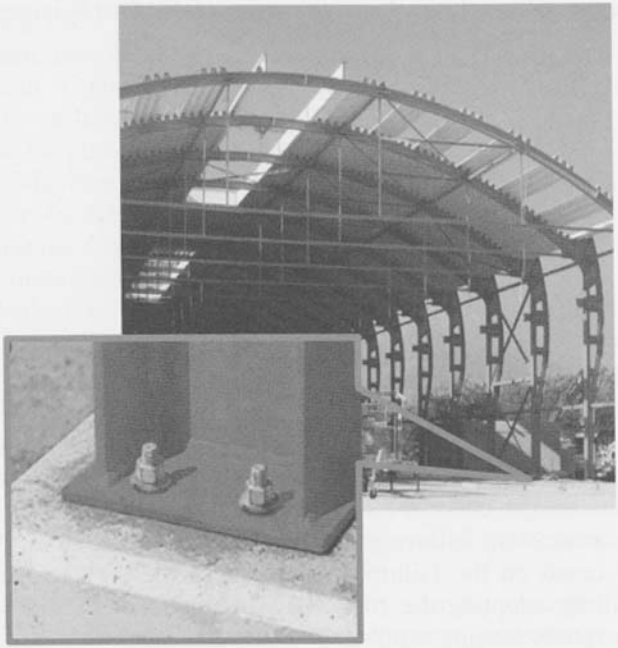

Fig. 1: Typical fastening situation