

Tapping Into the Anchor Market

The Increasing Popularity of Heavy Duty Screw Anchors
By Ian C. Murphy

In 1966, the first wedge anchor design was invented. The wedge anchor design quickly gained worldwide acceptance and became the most commonly used type of mechanical concrete anchor, and remains so today. However, the heavy-duty screw anchor—a relatively new type of concrete and masonry anchor—is quickly replacing the wedge-anchor as the premier product used in many steel or wood to concrete or masonry anchoring applications. Although the first heavy duty screw anchor was invented and patented in Europe in 1991, this new generation of concrete and masonry anchor has only been widely available in the United States for the past 6 years. It already has replaced approximately 20% of wedge anchor sales.

Gaining Acceptance

Heavy-duty screw anchors are quickly gaining popularity among specifiers and end users because they:

- Are faster and easier to install. Since screw anchors can be installed with an impact wrench, they usually install within seconds, not minutes like wedge anchors which need to be hammered in and torqued by hand.
- Can be installed near edges. Although wedge anchors are commonly installed close to edges, the expansive forces that they apply to the substrate during setting and under load can cause the substrate to crack or fail prematurely. Because they do not place significant expansion forces on the substrate, heavy duty screw anchors, such as Simpson Strong-Tie Anchor Systems' Titen HD™, can be used much more reliably in reduced edge distance applications. This feature has made these anchors popular for anchoring perimeter sill plates in residential construction where anchors are installed 1-3/4 inches from the edge of the slab.

- Can be removed. Anytime a fixture that is anchored by a wedge anchor needs to be removed, the end user must either torch or grind off the protruding portion of the stud or pound the stud down flush with the concrete (assuming the hole was drilled deep enough to do so during installation). Not only is this time consuming, but it also renders the hole unusable. Screw anchors can be easily unthreaded from the substrate, allowing easy removal of the fixture. In addition, some screw anchor manufacturers allow their anchor to be re-threaded into the same hole without any reduction in performance.
 - Install more reliably and are easier to inspect. Torquing a wedge anchor to the manufacturer's specified installation torque is critical to its performance and therefore must be verified. The setting of screw anchors is not torque dependant. Essentially, if the head of a screw anchor is in contact with the fixture, it is set correctly.
 - Have a very low profile when installed. Unlike screw anchors, wedge anchors usually have a section of the threaded stud protruding past the nut creating a potential tripping hazard.
- Because of these features, screw anchors are expected to continue to take over applications previously addressed with the wedge anchor. In addition, ICC Evaluation Service has recently updated acceptance criteria to allow the use of heavy duty concrete screws under the 2003 IBC. This should only increase the acceptance and specification of this new anchor type. It seems technology has, in some respects, caught up with the wedge anchor and the result will be anchorages that offer superior performance along with faster installation. ■

Ian C. Murphy is a Product Manager for Simpson Strong-Tie Anchor Systems.

BOOKCASE

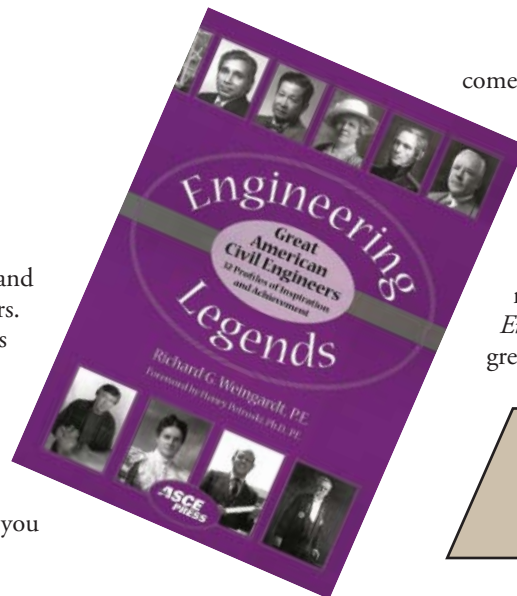
book reviews and news

Engineering Legends

Great American Civil Engineers
By Richard G. Weingardt
ASCE Press

Reviewed by Jim DeStefano

Engineering Legends chronicles the lives and accomplishments of 32 extraordinary engineers. You are introduced to engineering giants such as Benjamin Wright, the chief engineer of the Erie Canal, D.B. Steinman, the suspension bridge genius, Fazlur Kahn, the skyscraper innovator, T.Y. Lin, the father of prestressed concrete and Hardy Cross, the charismatic educator. Through this book you



come to understand not just their technical feats, but their personalities and what made them tick. You come away feeling as though you have actually met them.

Structural engineers often lack an appreciation of the heritage of our profession. Very few of us have engineering heroes or role models who we strive to emulate in our careers. *Engineering Legends* is a book that can inspire greatness in each of us. ■

Jim DeStefano is the Principal of the structural engineering firm DeStefano Associates and is a Partner in the firm of Coastal Engineering Partners.