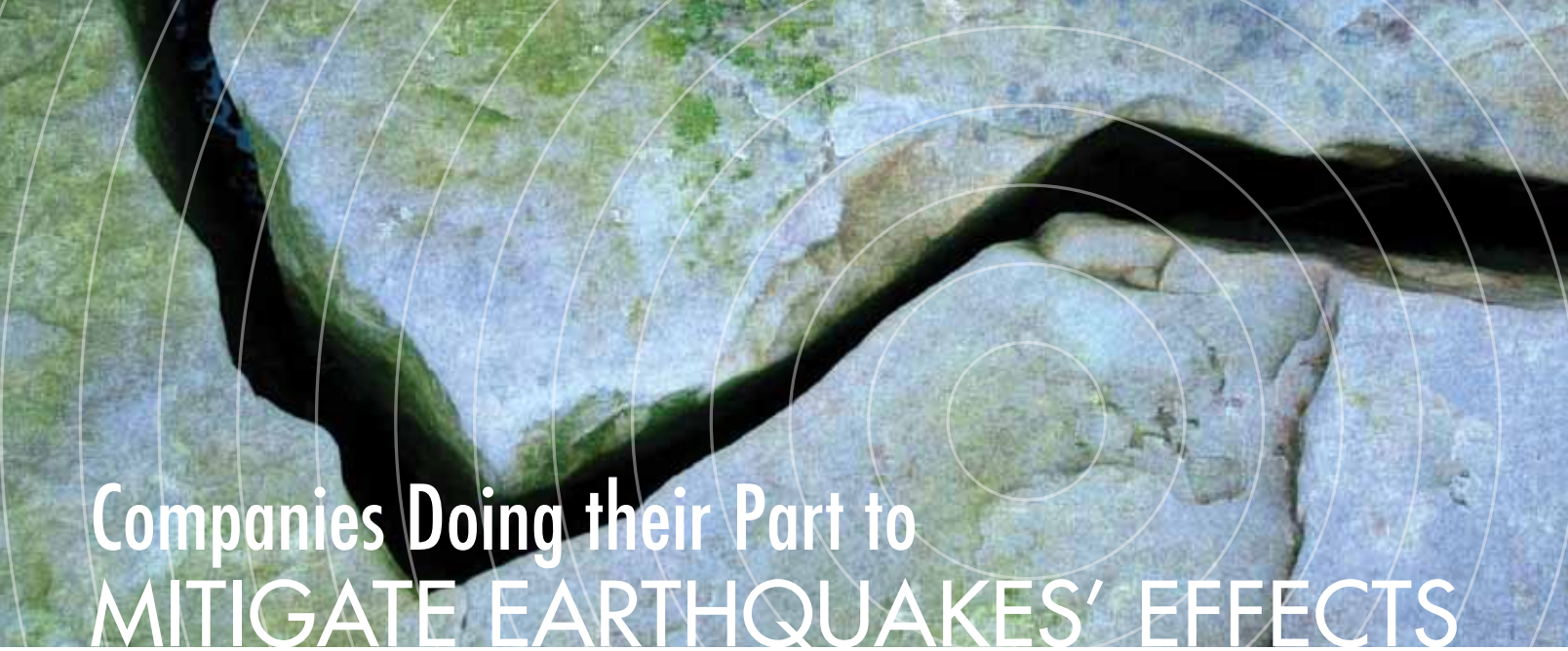

Companies Doing their Part to MITIGATE EARTHQUAKES' EFFECTS

By Larry Kahaner

The 8.2 magnitude earthquake that hit Chile in April, along with the resulting tsunami, killed six people; two of them succumbed to heart attacks. Contrast this to the February, 2010, 8.8 magnitude earthquake in which 500 Chileans died. Although no two earthquakes are exactly the same – geographically or otherwise – increases in planning and code enforcement helped to lower this year's quake death toll, according to government officials.

"They're a seismically active region of the world and they are very good at implementing their building codes similar to California," John Bellini, a Denver-based geophysicist at the U.S. Geological Survey told CNN. "Because of that, you would see less damage than in other places that have poorer building codes... that's probably one of the reasons there haven't been as many casualties as there could have been from a magnitude earthquake of this size."

Chilean President Michelle Bachelet, said: "This is a great example to all of us that when we work together in an adequate manner, and we when we follow the plans that have been established in the region, we work well."

Many companies also are involved in earthquake mitigation through products and services. The Fyfe Company, along with their construction arm, Fibrwrap Construction, both part of Aegion Corporation (**www.aegion.com**) headquartered in St. Louis, Missouri, has a broad reach of business, serving public sector, private sector and utilities. Renee Hernandez, Director, Sales & Marketing, Fyfe/Fibrwrap, says: "At this time, the industry's main area of growth is in the private sector, specifically for multi-use building, gypsum residential, parking structures, and commercial buildings that require a change of use or strengthening solution. The West Coast, primarily California, has a broader acceptance for the TYFO and Fibrwrap systems. The development possibilities are wide open in the East Coast, with aged architecture and endless strengthening possibilities. FYFE/Fibrwrap has offices near the major cities to support the growth and establish partnerships with progressive construction experts."

Hernandez adds: "Fyfe/Fibrwrap enhances the structural capacity of existing structural elements by providing additional strengthening, rehabilitation and repair (including seismic retrofit), pipe rehabilitation, structural preservation, comprehensive force protection, blast mitigation, corrosion related repair and rehabilitation, additional loading and environmental protection."

The company works with customers that require strengthening or rehabilitation including structures, infrastructure and facilities. They work in industrial facilities, waterfront structures, government facilities, transportation infrastructure, high rise buildings, gypsum homes and parking structures. "Our customer base expands throughout the progression of the project, starting with the engineers, architects and owners while also partnering with the general contractor and design-build firm. We provide sustainable solutions to all sectors within the construction industry," says Hernandez.

Victor Reyes, Division Director, Fyfe says that he would like SEs to know about TYFO Composite Anchors. "The TYFO Composite Anchors expand the uses of the TYFO Composite Systems. By working concurrently with the TYFO Composite Systems, the Composite Anchors allow the Composite Systems to not only transfer forces into existing systems, such as slab, column and beams, but also through obstructions such as drag forces on the top of a slab with a wall in the way." He says that for specific applications, it was necessary to increase the allowable design stress of FRP composite systems for shear strengthening for beam and wall applications under static and seismic loads. "This was achieved through the creation of the TYFO Composite Anchors, which are made of the same material as the TYFO Composite Systems. Both large-scale and small-scale testing has shown that using the same material provides continuity and allows the Composite Systems to achieve higher design stresses for both static and seismic loads. From these tests it was shown that the use of the TYFO Composite Anchors not only transfers loads from the Composite System into the structural system, but also contributes to the structural system to continue to behave as a ductile system under seismic loads." (See ad on page 22.)

Taylor Devices (**www.taylordevices.com**) in North Tonawanda, New York, manufactures damping devices for absorbing dynamic energy to protect building and bridge structures from earthquakes and unwanted wind vibrations, according to Craig Winters, a Seismic Products Sales Manager. He says that customers range from engineers to contractors to owners of any infrastructure.

"Taylor Devices is currently involved in research for the use of these uniquely adaptable devices for smaller wood-frame structures and houses," says Winters. Taylor dampers were tested on a full-scale, 4-story wood building at the University of California at San

Diego. The house was strengthened with better connections in its frame members; a light steel moment frame and wood shear walls on the upper floors were added. Nine small fluid dampers were installed on the first floor only. The dampers were built into 4- x 8-foot modular panels and driven via Taylor Devices' patented Toggle Brace Systems. "The results so far have been excellent, even though the dampers are small and only placed on the first floor." Two short videos about the tests that Winters recommends watching can be found at **www.youtube.com/watch?v=0O6DZ3dqh3c** and **www.youtube.com/watch?v=25hCATGKSbI**.

Adds Winters: "SEs should understand that these are not new devices. They are simply an adaptation of our existing, patented toggle brace technology into a new use, for building structures previously not considered candidates for our technology. It was always thought that wood-frame structures were too light and not 'tied-together' well enough to benefit from the advantageous use of our Fluid Viscous Dampers. This has changed with the new research, and the patented toggle brace mechanisms for these applications…. Owners of existing infrastructure seem to be leaning towards performance improvement using low-cost structural improvements to their existing structures, which can easily be accommodated with the use of Taylor dampers and technology." (See ad on page 24.)

At SidePlate Systems (**www.sideplate.com**) in Laguna Hills, California, the latest news is that the company's connections are now listed as prequalified moment connections in the ANSI/AISC 358-10 standard. "This followed a thorough examination by AISC's Connection Prequalification Review Panel (CPRP) over two years," says Jason Hoover, Industry Outreach Executive, Eastern Regional Business Manager. "SidePlate's prequalifications go beyond those of other moment connections. These include HSS beams, biaxial connections, and the deepest allowable moment frame beams (W40). The ANSI/AISC 358-10 *Commentary* also provides the history and evolution of SidePlate connections that will be helpful for engineers looking for more background."

He notes that SidePlate connections have been prequalified by ICC-ES, DoD, OSHPD, DSA and other agencies for many years, but having AISC's approval is the 'gold standard.' "More jurisdictions are starting to reference this AISC prequalification, so we felt it would give engineers more confidence and make their lives easier without having to worry about additional reviews and approvals."

Hoover says that healthcare construction has been SidePlate's biggest sector historically, along with commercial, institutional, and government buildings. "Specifically, we work directly with structural engineers during design phase, then with the fabricator, erector, and contractor during construction." He adds: "Our business is strong, and our customers seem to be getting busier as well. In particular, the West Coast has picked up quite a bit versus 2013, but the difficult winter has slowed down many projects in the Midwest and the eastern United States. Healthcare is steady, and we're starting to see more commercial office building projects starting up."

Hoover would like to clear up some false impressions about SidePlate. "There are still misconceptions that we manufacture a product, but we are a specialty design firm and our connections are built by the project's steel fabricator. The other big misconception is that a SidePlate connection is simply a 1:1 comparison with

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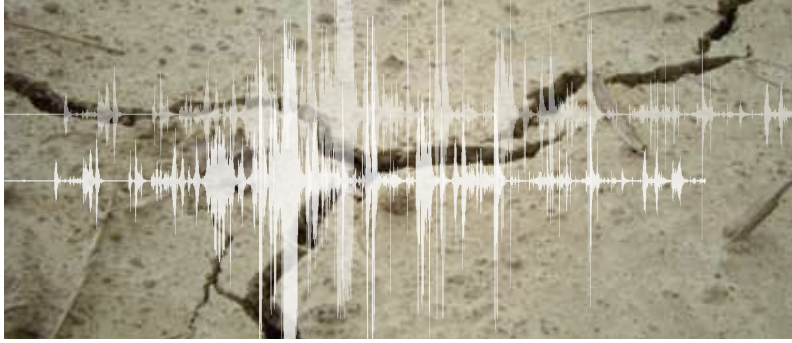

other types of connections. Our connection stiffness changes the entire lateral system, so lighter member sizes can be used and it's a holistic improvement on the structure."

DECON (**www.deconusa.com**) is the original North American manufacturer of STUDRAILS and has recently become a subsidiary of JORDAHL GmbH, which for more than 100 years has manufactured high quality connection and reinforcement products for use in the international construction industry, according to Frank Metelmann, President of JORDAHL. "We supply two market leading brands, DECON punching shear concrete reinforcement products and JORDAHL anchor channels for structural and architectural concrete connections. Our products are globally recognized for quality and engineering excellence, and are widely specified internationally for use in both public and commercial building projects including high-rise buildings, offices, hospitals, schools, transportation structures, and stadiums."

Metelmann says that the company's customers span the entire building industry. "Both STUDRAILS and JORDAHL anchor channels are specified by structural engineers. STUDRAILS are typically purchased by general contractors or concrete subcontractors. This can also be true for JORDAHL anchor channels, but they are very versatile in their application and are very often also purchased by curtain wall contractors, architectural metal contractors, elevator companies, steelwork contractors, and precast concrete manufacturers."

As for new offerings, Metelmann outlines three of them. First is JORDAHL anchor channels which have new design software. JORDAHL EXPERT software is the first anchor channel software based on the *International Building Code* (IBC), and the *International Residential Code* (IRC), and ICC-ES AC 232, he says. Second are BIM files for the range of JORDAHL anchor channels. The BIM files enable modeling of these products using the Revit platform. Third is the new IAPMO Uniform ES Report. "The new IAPMO Uniform ES Report for JORDAHL anchor channels is the first independent performance and quality assurance evaluation report for anchor channel products in North America," says Metelmann. "These offerings were based on a perceived requirement from structural designers and code officials to provide independently verified standards of design and quality assurance into the anchor channel market. We see BIM as a continuing evolution of building design and are pleased to also enable the easy inclusion of anchor channels into building planning using this medium."▪