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*Arizona's Timeless Magazine*

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# CONTRIBUTORS



**MO EHSANI**  
ARTICLE ON PAGE 37



**JEFF KRONENFELD**  
ARTICLE ON PAGE 31

**M**o Ehsani received B.S., M.S., and Ph.D. degrees from the University of Michigan before joining the department of Civil Engineering at the University of Arizona in 1982. He pioneered the repair and retrofit of civil structures with Fiber Reinforced Polymer (FRP) materials in the 1980s and holds some 20 patents in that field.

Ehsani is a Fellow and Life Member of the American Society of Civil Engineers (FASCE) and a Fellow of the American Concrete Institute (FACI). He has served as President of the Structural Engineers Association of Arizona, is a registered professional engineer in 20 states, and is a licensed contractor in Arizona and California. *CNN*, *National Public Radio*, *The History Channel*, and *Engineering News-Record* have featured his expertise in strengthening structures, particularly related to earthquakes, terrorist attacks, and other potential structural disasters. He received the 2014 Arizona Technology Leader of the Year Award.

In 2010, Dr. Ehsani left the University of Arizona as a Professor Emeritus to devote himself to QuakeWrap, and FRP Construction, two companies that he founded that specialize in the repair and retrofit of structures with FRP. The companies offer turnkey design/build solutions to their international clients.

You may run into Ehsani on a local hiking trail if you don't find him in his favorite gym at 5 a.m. ✂

**J**eff Kronenfeld is a journalist, fiction writer, and screenwriter based out of Tempe, Arizona, where he lives with his wife and cat. He recently released *Dog Years*, a 32-page graphic novel exploring mass incarceration in the U.S. using anthropomorphic dogs as illustrations. The story follows Kurt Vilkas through a two-year prison sentence, where he faces violent gangs, sadistic guards, and the demons of his past.

After earning an English degree from ASU, Jeff has volunteered with community organizations like *Four Chambers Press* and *Iron City Magazine*, where he still serves as fiction editor. His articles have been published in *Discover Magazine*, the *Phoenix New Times*, *Vice*, and many other outlets.

Jeff received a Simon Rockower Award for excellence in news reporting from the American Jewish Press Association in 2018. His fiction has been published in *So It Goes*, the *Literary Journal of the Kurt Vonnegut Museum and Library*, *Ripples in Space: A Sci-Fi Journal*, *Little Somethings Press*, and other outlets.

His screenwriting credits include a Second Rounder in ScreenCraft Film Fund Fall 2022, a quarterfinalist in the 2020 Big Break Screenwriting Contest, Diversity Category, co-writer of the Best Film at the Dinerwood Short Film Festival in 2016, and a Desert Nights, Rising Stars Writers Conference Fellow in 2021. ✂

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# COLUMNS MADE EASY: REUSABLE CONCRETE FORM FOR ALL SHAPES AND SIZES

MO EHSANI

Circular columns are frequently used in the construction of buildings and bridges. Utility contractors often need to build a circular foundation to support light poles, transmission towers, and the like. Conventional formworks for casting new concrete columns and foundations are bulky to ship and store and offer little adjustment in shape or size.

Forming existing columns in repair projects is also a difficult task. The existing floor and beams above prevent the use of conventional disposable cardboard tubes because they cannot be slipped over the column.

To overcome these challenges, the author has developed a new type of reusable form that offers unique advantages for the construction of new columns and the repair of existing columns and foundations.

## FRP Laminate Form

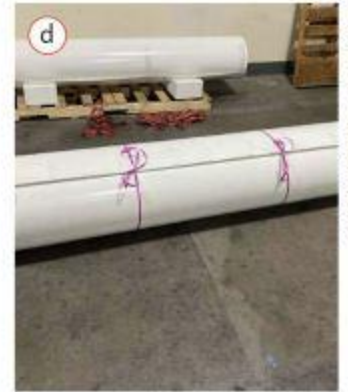
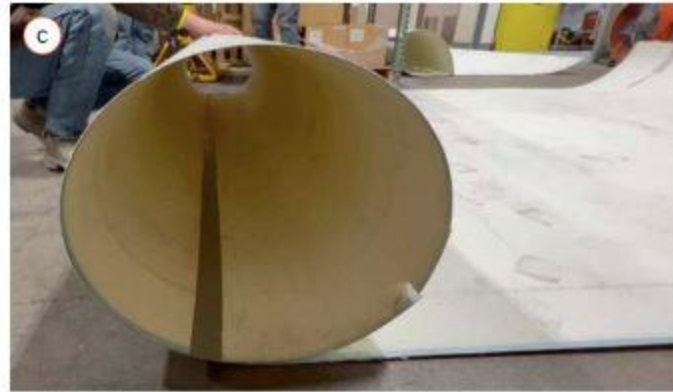
The new product is made of Fiber Reinforced Polymer (FRP). Using specialty equipment, glass fibers are impregnated with vinyl ester resin and subjected to heat and pressure to make very thin laminates. For brevity, the product will be referred to as FRP Laminate Form (FLF). The laminates have a uniform thickness that varies from 0.045 to 0.075 inches, depending on the product style.

FLF is manufactured in rolls up to 102 inches wide. A typical roll may include 500 lineal feet of FLF. These high-strength laminates weigh only between 0.3 to 0.5 lb/ft<sup>2</sup>. The light weight allows for easy handling. The unique design of the laminate provides a perfect balance between a smooth finish surface and enough friction to prevent sliding/slippage of the surfaces.

## How To Use FLF

The behavior of FLF is based on principles of belt friction. For casting new columns or footings, a length of laminate 2-3 times the perimeter of the column being formed is cut. The coiled laminate is strong enough to resist the internal pressure of the freshly cast concrete by friction alone without any external support. However, a few ties can be used to prevent the coil from unraveling. Once the concrete is placed and cured, FLF is removed, cleaned, and saved for future use. The smooth surface of FLF leaves no unsightly spiral marks.

To repair an existing column, spacers are supplied that can be attached around the column with zip ties. These will determine the width of the annular space. FLF



Images Courtesy of Amanda Aubitor

is wrapped around the existing column and spacers, and its ends are secured with ties or duct tape. Once the concrete hardens, FLF can be removed, washed, and saved for forming columns of different shapes and sizes in the future.

FLF can be used to create tubes of infinite shapes and sizes. The only limitation is to make sure that a minimum bend radius of 1 inch is maintained at the corners to avoid damaging the laminate. In non-circular shape cases, the laminate is coiled to form an ellipse. To make sure that the overall size of the ellipse does not change during the placement of concrete, a frame can be used to support the FLF. The adjustable horizontal supports known

**Above:** Creating a form: (a) roll of FLF, (b) mark the perimeter, (c) coil the laminate, (d) secure with tie, (e) FLF installed and concrete placed, (f) removing the laminate after the concrete hardens, (g) cleaning and saving the laminate for future use, and (h) smooth concrete finish with no spiral marks.

as scissor column forming clamps are available from most formwork supply houses. These clamps must be installed such that they touch the vertex and co-vertex of the ellipse.

The system presented in this article is the subject of US Patent Application # 16/993,102, filed by the author in August 2020. A video showing this product is available online at: [tinyurl.com/MoTubes](https://tinyurl.com/MoTubes).

More info at: [www.MoTubes.com](http://www.MoTubes.com)