



Case Study: "The Silver Flow"

Composites Design Proves that the Sky is the Limit

In 2015 domestic and international auto shows focused heavily on lightweighting through the integration of composites within vehicular structural design. However, few attendees were even aware that composites were also pushing architectural designs skyward in the exhibition areas prior to the introduction of next generation production vehicles.

In November of 2014, Dimensional Communications Inc. unveiled a 17,000 square foot exhibit space to showcase Mercedes-Benz USA's 2015 worldwide lineup of luxury vehicles. The space was filled with vehicles, technical displays, lounge spaces and lighting features. Hanging above the space was a custom designed display named the "The Silver Flow," made up of 125 individually pultruded fiberglass lamellas.

In 2013, Daimler AG called on the marketing and branding exhibition veterans at Dimensional Communications Inc., with over 50 years of custom build and branding expertise, to develop the U.S. version of The Silver Flow. Panels in the European display were made of aluminum, which were too heavy for certain U.S. event spaces and could only be used once before needing replacement. Daimler AG requested Dimensional Communications Inc. make a version for American shows that could last at least five years and travel to different shows for repeated use.

The team at Dimensional Communications Inc. wrestled with the European design, ultimately deciding weight and durability could be achieved by using Strongwell's pultruded FRP at custom lengths ranging from 4 to 20 feet. Each custom FRP component measured 16 inches in height and 2 inches in thickness.

This alternative option of integrating a lower-cost fiberglass design also reduced the need for custom connections and supports for setting up the display while maintaining a weight well below the structural roof threshold of each convention center.

By painting the lamellas, the fiberglass version of The Silver Flow resembles its aluminum European counterpart while saving weight, simplifying installation, and being durable enough to endure multiple auto shows. Each lamella fin was custom designed, painted with an aluminum look finish and specifically fitted within the architectural design, allowing setup and tear down to take less than two days. ●



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Case Study: STRONGDEK™

Composites Aid in the Refurbishment of a Historical Bridge

Multiple cities have recently begun to implement revitalization initiatives to bring new life to parks and recreation programs. Jefferson City is one of the cities in Missouri which has begun to attract current and potential residents to its parks through the refurbishment of its trails to runners, walkers and mountain bike riders. Frog Hollow Nature trail is a natural, three-mile trail designed for a more advanced runner or bike rider. As the city planned to refurbish and reconnect the trail with adjoining trails and recreation areas they came across a

structurally-deficient steel bridge which was deemed unsafe for pedestrians and non-motorized vehicles.

As the City of Jefferson Parks & Recreation Commission investigated options, the Westfall Company, Inc. introduced the commission to composite options to aid in the refurbishment of the flooring materials on the bridge. In a previous high profile commercial application, STRONGDEK™ was



installed at the Perdido Beach Resort and has endured over twelve years of continuous salt water exposure, and even a few hurricanes. Each American-made STRONGDEK™ panel is made from materials that will not rust, rot, chip or mildew. Panels measure 12" wide and in lengths to form a continuous solid surface with their interlocking design and screw like fasteners. The strength of each panel lies in the built-

in intermediate ribs which provide extra stiffness and strength.

End users, along with the Westfall Company, agreed that STRONGDEK™ was the right material for this installation due to its low maintenance, easy installation, and lightweight transport for installation purposes. The combination of composites and steel structure gave the bridge a new lease on life while preserving the historical design of the pedestrian bridge for the residents of Jefferson City, Missouri. ●



Case Study: STRONGRAIL®

Composites Help when Welding and Steel Can't

America's Port, more commonly known as the Port of Los Angeles, occupies 7,500 acres of land and water with over forty miles of waterfront. Econo Fence, Inc. selected STRONGRAIL® fiberglass architectural handrail system for a leading container terminal operator and stevedore customer located in the Port of Los Angeles, California. Over 1,700 linear feet of handrail were used to serve as a safety perimeter fence to separate pedestrians from electrified rail tracks.

STRONGRAIL® was primarily chosen because of the fiberglass handrail's low electrical conductivity and high strength. Upon

looking at options, Econo Fence also took into consideration the customer's proximity to the coastline. While STRONGRAIL® fence offers an aesthetically pleasing solution which prevents pedestrians from gaining direct access to the electrified rails, it also will provide years of maintenance-free service due to its noncorrosive properties.

The STRONGRAIL® style selected was black 2" square rails with 1" square pickets. The fence sections connected using STRONGRAIL® square tube posts and caps. Installation of the lightweight fiberglass handrail went smoothly, a very important consideration when working between live track lines where freight trains carry over \$1 billion worth of cargo daily. The project encompassed over 200 (8' long section) panels and 206 posts with internal base plate assemblies. Econo Fence was able to install the fence in its entirety within three days, as the base plates were installed first, followed by post and fence sections.



The installers noted that although the up-front costs were higher than steel fencing, the costs associated with having two certified welders/iron workers and painters to weld, grind, modify, and paint the fencing more than made up for the material cost difference.

The end user and installers were both complementary of the results and commented that the installation looked and felt complete with zero concerns of strength or durability. ●



Spotlight on Strongwell Talent



Jaime Landon
Environmental, Health & Safety
Specialist - Mexico

Jaime Landon has joined Strongwell as EHS Specialist for STRONGWELL S. de R.L. de C.V., reporting to the Plant Manager. A native of San Antonio Tepetitlan, Mexico; Jaime received his Bachelors of Environmental Technology from Universidad Tecnológica General Mariano Escobedo in 2006. Later Jaime received his second bachelor's degree of Industrial Engineering from Instituto Universitario Tecnológico de los Trabajadores in 2011. Jaime was most previously employed in Villacero as EHS National Coordinator.



Chris Lancaster
Regional Sales Manager - Region G

Chris Lancaster has been promoted to Regional Sales Manager in Region G. Chris will report directly to the Vice President of Sales and Engineering, and will be responsible for the states of Louisiana, Arkansas, Oklahoma, Texas, New Mexico and Arizona, as well as Mexico. His office location will remain in the Bristol facility. Chris began his career with Strongwell in 1997 as the Molded Grating Supervisor. From there he moved into the role of Fabrication Supervisor, then as Fabrication Manager over Structural Fabrication and Cooling Tower, and then Manufacturing Manager.



Angela C. Barr
Chief Financial Officer

Angela C. Barr has accepted the position of Chief Financial Officer. Angie will continue to report to the President & CEO and will be responsible for leadership of all corporate finance and accounting operations. Angie began her career with Strongwell in 1998 as Accounts Payable Administrator for the Bristol and Highlands facilities. She advanced through Staff Accountant and Cash Management positions and most recently served as Virginia Operations Controller. Angie graduated from Lincoln Memorial University with a Bachelor's degree in Business Administration, concentration in Accounting.



John Thompson
Cost Accountant - Virginia
Operations

John Thompson has accepted the position of Virginia Operations Cost Accountant. In his new role John will report to the Chief Financial Officer. John began his career with Highlands Operations in March 2015 as a pultrusion operator and was promoted to 2nd shift supervisor in June 2015. John graduated from the University of Virginia's College at Wise in 2014 with a B.S. in accounting and was a member of the football team and the fraternal organization Kappa Sigma.



Erik Barker
Regional Sales Manager - Region O

Erik Barker has accepted the position of Regional Sales Manager for Region O. Erik will report directly to the Vice President of Sales and Engineering, and will be responsible for the states of Wisconsin, Minnesota, North and South Dakota, Montana, Wyoming, Idaho, Washington, Oregon, and Alaska, as well as the provinces of Manitoba, Saskatchewan, Alberta, and British Columbia in Canada. His office will be in Chatfield. Erik comes to Strongwell with over eleven years of sales experience in a variety of markets as well as a Bachelor's Degree in Business Administration/Marketing and an MBA.



Jaime Hernandez
Production Control / Shipping &
Receiving Coordinator - Mexico

Jaime Hernandez has joined Strongwell as Production Control / Shipping & Receiving Coordinator for STRONGWELL S. de R.L. de C.V. Jaime will report to the Plant Manager and will coordinate the shipping and receiving activities, production planning and inventory control for the Mexico facility. A native of Piedras Negras, Coahuila; Jaime received his Bachelor of Electronic and Instrumental Engineering from Tecnológico de Nuevo Leon in 1995. Jaime was most previously employed in Kinetec Nidec as Logistic Supervisor.



Ray Reuning
Regional Sales Manager - Region A

Ray Reuning has joined Strongwell as the Regional Sales Manager for Region A. Ray will report to the Vice President of Sales and Engineering and will have responsibility for the states of Pennsylvania, New Jersey, New York, Connecticut, New Hampshire, Massachusetts, Vermont, Rhode Island, and Maine, as well as the provinces of New Brunswick, Nova Scotia, and Quebec in Canada. His office will be in Bristol. Ray attended Mars Hill University and East Tennessee State University. He comes to Strongwell with a proven sales track record and over 28 years of experience.



Sandra Fancher
Controller - Minnesota & Mexico
Operations

Sandra Fancher has joined Strongwell as the Controller for Minnesota & Mexico Operations. Sandra will report directly to the Vice President of Minnesota and Mexico Operations. Sandra will work closely with the Minnesota and Mexico Accounting departments. Sandra comes to Strongwell with over 20 years' experience in Corporate accounting both in publicly held and non-profit environments. She is CPA licensed, has a Bachelor of Science degree – Business Administration / Bachelor of Science – Accounting Magna cum laude from Viterbo University, La Crosse, Wisconsin.



Lydia Sinemus
Environmental, Health & Safety
Manager - Virginia Operations

Lydia Sinemus has been hired as the EHS Manager for Virginia Operations. Lydia graduated with highest honors from East Tennessee State University earning a Bachelor's of Science degree in Geology, and minoring in Environmental Health. She then expanded her education with a Master's Degree in Environmental Health. Lydia has a wide range of experience in the private and public sectors, and has even served as an adjunct professor at Virginia Highlands Community College.



Scott Holmes
Project Engineer - Bristol

Scott Holmes has joined Strongwell in the position of Project Engineer. Scott previously worked at Power Distribution Products in Chilhowie, Virginia where he held the position of Mechanical Designer. He brings fifteen years of experience in the engineering field to the Strongwell team. Scott has Bachelor of Science in Engineering Technology from East Tennessee State University. Scott is well versed in Autodesk Inventor, machine shop flow, and process automation.



Efrain Santos
Accounting Analyst - Mexico

Efrain Santos has joined Strongwell as Accounting Analyst for STRONGWELL S. de R.L. de C.V. Efrain will report to the Accounting Manager and will be supporting accounting and financial activities. A native of Ciudad Valles, San Luis Potosi; Efrain received his Bachelor's in Accounting and graduated with honors from Universidad Metropolitana de Monterrey in 2014. Efrain was previously employed at RC Express (a logistic company) as General Accountant and KPMG (an accounting firm) as Auditor.



Gail Stout
Administrative Assistant - Bristol

Gail Stout has accepted a position as an Administrative Assistant. Gail will report to the Pricing Manager. She will be assisting with quotes, maintaining customer price sheets, performing sales data analysis, CRM management and assisting the Sales Department with various duties. Gail has been working at Strongwell as a contract employee assisting with switchboard and CRM efforts. Gail has an Associate's Degree in Business Administration and is completing work on her Bachelor's Degree.



Jim Hanson
Human Resource and Safety
Administrator - Minnesota Operations

Jim Hanson has been promoted to Human Resource and Safety Administrator for Minnesota Operations. In this new role, Jim will report directly to the Vice President of Minnesota and Mexico Operations, and will be responsible for all human resource and safety responsibilities for the Minnesota operations. Jim began his career with Strongwell in 1994 as a fabricator. Jim took on the responsibilities of Safety Coordinator in 1999.



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What's in this Issue:



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Spotlight on Strongwell Talent



Crossing Old Spans



Literature Updates



Bridge Durability Study Crossing Old Spans

The 73-year-old Greene County Bridge on Farm Road 148 near Springfield, Missouri was deemed "structurally deficient" after its steel reinforced deck's load rating had dropped from 10 tons to only 4.3 tons. To remedy this problem, Greene County decided to replace the bridge girders and deck. Redecking, with steel reinforcement, typically takes 2-3 weeks. In 2005, the redecking portion of this project was completed in only five days and with an estimated 75% less labor cost using Strongwell's GRIDFORM™ system.



GRIDFORM™ was designed to replace steel rebar with FRP in reinforced concrete bridge decks. GRIDFORM™ is comprised of a double layer of pultruded fiberglass grating bars separated by FRP shear connectors with nylon bolts and FRP plate bonded to the bottom of the grating panels, completing the pre-assembled stay-in-place concrete form. Expansion joints utilized a silicone joint system to eliminate the need for any type of steel in the bridge deck.

GRIDFORM™ eliminates many of the procedures associated with steel reinforced bridge decks. The light weight, high strength system removes time-consuming and labor intensive steps such as setting bottom forms and tying rebar.

Another major advantage of GRIDFORM™ is its resistance to corrosion. Unlike steel rebar, FRP does not corrode, which greatly



reduces bridge maintenance and extends the life of bridge decks. By implementing broader use of alternative systems such as GRIDFORM™, municipalities can save money and time and provide a longer-lasting end product.

After more than ten years in service, Greene County reports there have been no issues with the bridge deck's performance from abnormal cracking or deficiencies resulting from FRP components. County administrators and Strongwell engineers have been very pleased with GRIDFORM™'s capabilities as a concrete bridge deck reinforcement system. ●



Literature Updates:

- *DURAGRATE® Made in the USA Brochure (I&M)*
- *SAFPLANK HD™ Specification*
- *COMPOSOLITE® Secondary Containment System Installation Guidelines*
- *Bridge Components Brochure*
- *Decking Fasteners Flyer*
- *Fiberglass Decking Systems Brochure*
- *Design Manual Sections: 13 (M), 3 (I&M)*
- *Tool Handle Brochure*

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