PROFILE
STRONGWELL NEWS & APPLICATIONS • SUMMER 2015

Case Study: EXTREN®

FRP Honors the Resiliency of the Sea Scouts

The mission of the Sea Scouts has been unchanged since the group's formation in 1919. The Boy Scouts of America's Sea Scout program offers nautical education and high adventure aquatic activities to introduce youth to leadership, citizenship and teamwork, while fostering nature and marine studies.

To expand its offerings and capabilities, the Sea Scouts recently opened a $40 million facility with a 50-slip marina on Galveston Island in Texas. This new 10-acre facility contains a pool, foot paths and eco-friendly gardens to accommodate an expected 20,000 annual visitors. It also sits directly across from Moody Gardens, a popular educational and tourist destination on the island, and the site of a custom fiberglass reinforced polymer (FRP) ADA-compliant handrail installation from Strongwell in 2003.

This Sea Scouts facility is unique from most buildings in the area due to its exterior circulation corridors and vertical stair towers which ensure open views from virtually every area of the structure. The intent of this design is to encourage people to experience the facility outdoors. The structure was also designed to provide sufficient protection against category IV hurricanes, including the facility's doors and windows.

To protect the scenic views, FRP was chosen to provide a structural perimeter louvered wall system. The wall is structural, but also acts as a shade, while also constantly allowing natural lighting through the building's corridors. The louvered walls consist of EXTREN® 8" wide flange beams, 6" channels and 8" custom louvers. FRP was chosen over materials such as wood and metal due to FRP's superior performance in the corrosive coastal environment, lighter weight and better UV performance over the traditional materials. Also, with the entire building pursuing a LEED Platinum certification most of the grounds and areas had to be extremely low maintenance.

Texas is home to 24 LEED Platinum certified projects. Three of those projects were built by Jacob White Construction, the overseer of this Sea Scouts facility. Jacob White Construction wanted to achieve its fourth LEED Platinum certification with this elaborate, 70,000 square foot building. Jacob White Construction outfitted this facility with meeting areas, dorms and community rooms which provide top notch educational and research facilities for its guests.

The large amount of FRP used on this project will provide years of continuous valuable service with little to no maintenance to ensure the building's long-term life cycle. ●

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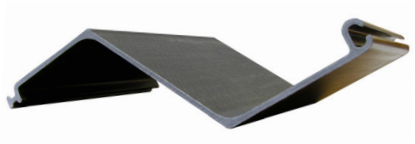
Case Study: UltraComposite™

Composite Sheet Pilings Alter Course of Erosion



Seabrook Harbor has over 400 years of maritime history and function along the New Hampshire Atlantic coastline. Over time the harbor's economic benefits were slowly being hindered due to erosion and risks associated with increased silt levels from the Blackwater River.

The U.S. Army Corps of Engineers and the National Shore-Line Erosion Control Development and Demonstration Program arrived at a solution which would repair the breach between the shore and sand flats. Water from the river had to be diverted from the town utilizing a cofferdam-like structure on the north side of the harbor, while river dredging and dredge spoils also had to be implemented.

The walls of the structure were anchored with a galvanized steel tie-back system with 18" rods and connecting turnbuckles on 6' centers and two 10' channels. UltraComposite™ UC 30 sheet piling was driven 15' - 20' into the ground to protect against potential scour.

To drive the UltraComposite™ UC 30 sheets, Reed & Reed Construction used an ICE 216 vibratory hammer hanging from a crane. 160 sheets or 240 feet of bulkhead were completed daily.

UltraComposite™ 17' and 27' sheet piling was chosen in the place of steel because hydro-dynamic models were built to measure theoretical solutions and calculations.

UltraComposite™ UC 30 is exclusively produced in Strongwell's ISO 9001:2008 and ISO 14001:2004 facilites. With service and monitoring, the project has reclaimed clam flats, reintroduced recreational activities, fishing and diverted the river to its previous course. The walls, which by design are completely submerged during high tide, have put an end to the shoreline erosion and periodic flooding of the town. In addition, the harbor is only scheduled to be dredged every five years instead of yearly translating into reduced spending on behalf of the state and municipality. ●

Case Study: DURAGRID® HD

Composites Help Steer Towards Wireless Roads Ahead

Strongwell's pultruded fiberglass DURAGRID® HD-4000 2.5" grating panels are installed as a trench cover at the Utah State University (USU) Electric Vehicle and Roadway (EVR) research facility in Logan, Utah. The EVR serves as the vehicle systems integration facility for the Center for Sustainable Electrified Transportation (SELECT). Magnetic transfer plates are housed beneath the grating which charge electric vehicles in motion.

DURAGRID® HD-4000 provides ample support for vehicle loadings while protecting the magnetic transfer charging plates on the electrified quarter mile test track. This project benefits from FRP's advantages of being light weight, high strength, nonconductive and electromagnetic interference-free.

The Utah State University technology has been licensed to Wireless Advanced Vehicle Electrification (WAVE) for stationary wireless charging of buses in public transit systems. The Utah Transit Authority (UTA) operates a 40-foot all-electric bus in Salt Lake City using the WAVE 50kW wireless charging system, allowing the bus to operate a full duty cycle of over 140 miles per day. The USU SELECT research team is now expanding the technology at the EVR Facility to cover a more dynamic system suitable for in-motion charging of passenger vehicle.

These research thrusts have the potential to change the current perspectives on transportation. In order to do so, researchers must have continuous access to the wireless charging pads at the EVR test track. Durable, lightweight, heavy duty DURAGRID® HD pultruded grating panels support the repetitive traffic demands and provide flexibility for research and development of improved charging pad technologies. The panels offer 40% open space to allow for debris and rainwater to disperse. DURAGRID®'s nonconductive and electromagnetic interference-free characteristics make it a safe and reliable material of choice to house, access and protect the USU SELECT charging pads. ●

Durability of Fiberglass Fencing Proven with Time

Since the late 1990's, hotels and commercial businesses alike have invested in Strongwell's fiberglass FRP fencing and exterior railings to save on maintenance and replacement costs. A popular offering in FRP fencing is made from 2" SAFRAIL™ and 1-1/8" EXTREN® square tube, custom pultruded and fabricated to resemble wrought iron, aluminum or steel. The result is an attractive and long-lasting alternative to metal that is corrosion resistant and doesn't need painting.

This national hotel chain began using Strongwell's fiberglass fencing in 1999 and continues to select fiberglass for its lower installed costs, low maintenance and ease of assembly. The hotel's "tried and true" FRP fencing has been used in many new construction and renovations, primarily for perimeter fencing and exterior railings on balconies, stairs and around pools.

FRP fencing is durable and long-lasting, important considerations for value with the family owned and operated chain, which has over 100 hotels in 20 states and has been consistently rated as "Highest in Guest Satisfaction among Mid-Scale Hotel Chains" by J.D. Power for the past consecutive nine years.

As a commitment to quality and lower life cycle costs through reduced maintenance, hotels, apartment and condominium complexes, as well as numerous other commercial and residential facilities have switched to FRP fencing for an attractive, high-quality product to replace traditional metal fencing. ●

Spotlight on Strongwell Talent

Angie Barr

Strongwell Corporation Secretary and Treasurer - Bristol

Angie Barr has been promoted to the position of Strongwell Corporation Secretary and Treasurer. Angie began her career with Strongwell in 1999 as Accounts Payable Administrator. Since then, she has held positions of increasing responsibility within the Corporate Finance department, most recently as Virginia Operations Controller with responsibility for the Bristol and Highlands facilities. She holds a B.B.A. degree with an Accounting concentration from Lincoln Memorial University.

Dustin Kimball

Process Engineer - Chatfield

Dustin Kimball has joined Strongwell in the position of Process Engineer for the Chatfield location. Dustin began his Strongwell journey in November 2014 as an Engineering Intern. He is a recent graduate of Winona State University and holds a Bachelor of Science in Composite Materials Engineering.

Te-Kai Shu

Social Media and Business Development Manager - Bristol

Te-kai Shu has been promoted to Social Media and Business Development Manager. In addition to his existing role of managing Strongwell's social media efforts and overseeing the day-to-day activities in the Strongwell Media Center, Te-kai now also researches new business opportunities to support Sales. Te-kai has been with Strongwell since 2007 when he started as a pultrusion operator. He is a graduate of Emory & Henry College where he earned a B.S. degree in Political Science.

Jeremy Smith

Process Engineer - Bristol

Jeremy Smith has joined Strongwell in the position of Process Engineer for Bristol. He was an Engineering Intern with Strongwell from December 2014 to January 2015. Jeremy comes to Strongwell with two degrees: an Associates of Science in Science from Mountain Empire Community College and a Bachelor of Science in Engineering with a minor in Green Engineering from Virginia Tech.

Harley Stanberry

3rd Shift Supervisor - Highlands

Harley Stanberry has accepted the position of 3rd shift Supervisor for the Highlands location. Harley began his career at Strongwell in March 2004 as a pultrusion operator and in 2007 he was promoted to pultrusion lead.

John Thompson

2nd Shift Supervisor - Highlands

John Thompson has accepted the position of 2nd shift Supervisor for the Highlands location. John began his career at Strongwell in March 2015 as a pultrusion operator. 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.

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What's in this Issue:

Breaking Molds with STEM, Robotics and Composites

In April 2015, 60 high school F.I.R.S.T (For Inspiration and Recognition in Society and Technology) robotics competition students, along with staff members of Hardin Valley Academy, placed runner-up in the Tesla Subdivision of the FIRST® Robotics Competition (FRC®) World Championships in St. Louis. This team advanced to this level by placing first in their regional competition in February. This team collaborated five nights a week and on weekends with mentors from Oak Ridge National Laboratory (ORNL) to perfect their creation with regards to the timed task of stacking boxes.

One of the co-captains of the RoboHAWKtics team, Sierra Palmer, joined the team as a freshman and over the years her passion in STEM fields grew. The dynamics of the team also changed within those years as females now make up almost half of the team.

The RoboHAWKtics team took a risk this year to become the first team to use a fully 3-D printed robot in the competition along with Strongwell pultruded robotic lift arms. Their robot was named "BAAMbot" because it was printed at ORNL's Manufacturing Demonstration Facility on the Big Area Additive Manufacturing Printer.

The team's risks of utilizing 3D print technology and composites, and breaking traditional molds through STEM, generated huge rewards with regards to conversations about light weight, high strength building materials, the role of STEM in schools and gender equality. ●

Literature Updates:

Introduction to EXTREN®

Commonly Asked Questions

Design Manual Sections:

- 3 (Imperial & Metric)
- 6 (Imperial & Metric)

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