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Case Study: Custom Pultrusions, EXTREN®, FIBREBOLT®, DURASHIELD®, DURAGRATE®, & SAFRAIL™

Towering Above Design

Measuring almost 200 feet in height, the world's largest freestanding FRP tower was part of a 40-year R&D utility initiative in transmitting wireless energy. The structure meets ASCE 7-10 design specifications and is capable of withstanding wind speeds of up to 115 mph.

With the exception of the clevis plates and a few stainless-steel braces, the tower was fabricated and constructed entirely with pultruded fiberglass products made by Strongwell. The majority of structural components were custom designed shapes with high strength reinforcements. Bespoke tooling was designed to pultrude each of the shapes using a vinyl ester resin. In areas where pultrusion would not suffice, hand-layup processes were used.

The complex, lattice-style vertical structure measures almost 20 stories. On the account of strength, the 1/2" thick plates possess a lengthwise pin bearing strength of 30,000 psi. The 3/4" and thicker plates





possesses a lengthwise and crosswise pin bearing strength of 20,000 psi. Each of the column section's planar shear strength was measured at 7,250 psi.

The interior supports are comprised of wide flange beams, intermediate columns, and corner columns. Individual corner columns in this structure are attached with about 40 threaded FRP hex nuts. Intermediate columns contain about 70.

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Over 28,000 FRP threaded hex nuts, 13,400 linear feet of threaded rods, and almost 30,000 linear feet of DURASHIELD® was used for exterior cladding. The weight of those three items totaled almost 260,000 lbs. of composites.

The use of RF-transparent FRP minimized signal losses. Being outdoors, ultraviolet degradation and corrosion resistance were also factors in material choice selection. In fact, no other structural

material was capable of meeting the structural loads and transparency requirements.

The end user reported that they were pleased with the project timeline and material performance. The structure was erected onsite in phases due to internal access and safety structures (handrail, ladders, cages, and landings) being simultaneously installed. Weight reduction played a major role as each fabricated section had to be hoisted, stacked, and fastened to one another. ●





Strongwell New Hires



Michelle Cline Corporate Credit Analyst

Michelle will handle the Accounts Receivable collection process and maintain customer accounts corporately. She will

also be responsible for the invoicing process for Virginia Operations. Prior to her tenure at Strongwell, Michelle worked with the U.S. Small Business Administration helping businesses affected by the pandemic work through the Economic Injury Disaster Loan (EIDL) process.

Karla Luque Human Resources Assistant - Mexico

Karla will support administrative activities for the Mexico facility. A native of Cd Madero, Tamaulipas, Karla received her

Bachelor of Engineering from Universidad Tecnológica de Altamira. Karla was previously employed as HR Coordinator for a manufacturer in Monterrey where she gained experience in administrative support and human resources activities.



Jennifer Mrozek Purchasing Agent - Chatfield

Jennifer has worked in purchasing for the past eight years. She enjoys the hands-on customer service side of purchasing,

working with both large and small companies.





Jeff will oversee the 2nd shift operations at the Chatfield facil-

ity. Jeff comes to Strongwell with 23 years of supervisory experience in manufacturing. He is also a 15-year veteran of the United States Navy.

Kyle Petersohn Process Engineer - Chatfield



Kyle holds a Bachelor of Science in Mechanical Engineering from the University

of Wisconsin - Platteville. Most recently, Kyle worked for a plastic thermoforming company in Wisconsin as a 6S/Lean Intern.

Strongwell Promotions

Gilbert Valadez Accounting Manager - MN Operations

Matt Jacobson 3rd Shift Production Supervisor - Chatfield

Robert Moore Fabrication Coordinator - MN Operations

Mac Stricklin Fabrication Shop Supervisor - Bristol

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Literature Updates:

- Strongwell Company Portfolio
- Bridge Components Brochure
- Availability List (I+M)
- EXTREN[®] Fabrication & Repair Manual

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Case Study: COMPOSOLITE[®], EXTREN[®], & DURASHIELD[®]

Composites are Flush with Decomposition Toilets

For years, national parks, state parks, Forest Service, and Bureau of Land Management in remote areas have struggled with ways to effectively handle waste management. In most instances, parks have installed pit style and occasionally tried traditional composting toilets.

Both systems have proven to be ineffective in long-term applications due to transport logistics, odors, accessibility, occupational hazards, environmental concerns, and lack of effective decomposition in composting toilets due to constant ammonia exposure from the mixing of urine with feces.

Since 2013, Toilet Tech Solutions (Toilet Tech) has been researching and installing environmentally-friendly waste reduction management systems throughout North America. Toilet Tech developed a proven product with a urine diversion system capable of separating solid and liquid waste regardless of how or who uses the toilet. By means of an inclined in-toilet conveyor belt, human solid waste can be collected for transport (Waste Away) or



decomposed in situ by native soil bugs in an open bottom vault (Decompose - most similar to how a composting toilet is purported to work) without any bulking agent, mixing, or extra work of any kind. By separating human waste streams, the system mimics the natural way in which the ecosystem processes animal waste, urine by soil and plant root uptake of nutrients, and solid waste by invertebrate consumption, resulting in a highly efficient, low maintenance, no odor, natural waste elimination process.

Due to the careful placement of these structures in remote front country and backcountry locations, the company turned to pultruded composites for ease of onsite fabrication, portability (flat pack pallet shipping), flexibility in design, and overall durability.

It recently installed "The Grand Poobah" in a National Forest in California. This four-season shed-style structure was



constructed and erected in just a few days by a small team. The walls of this heavyduty flagship composting toilet were fabricated with COMPOSOLITE[®]. Additional cladding and structural support components were fabricated with EXTREN[®]. As an added bonus for durability, this structure was also designed to endure for years to come the wallowing behavior of bison.

Since the installation of the toilet, the forest has been "flush" with positive reviews of the structure, which is on par for the other 300+ toilets Toilet Tech has installed from Alaska to Patagonia.

Let Us Promote Your Project

Did you use Strongwell products in a project you want to showcase? We are always looking for applications that demonstrate the benefits of pultruded FRP and show how versatile our products are.

To get started, fill out the form here:

www.strongwell.com/submit-case-study



Looking for PDH Credits? Learn About FRP!



Would you and your team like to learn more about: the pultrusion process, pultruded FRP, how to specify, or take a deep dive into something more specific?

We're here to help!

Strongwell can offer Professional Development Hours (PDH) for free presentations offered by our experienced Sales Directors and Structural Engineers, and topics can be customized to meet your need.

Contact us to schedule: info@strongwell.com



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Case Study: EXTREN[®] & DURAGRID[®]

Beachfront HOA Waves Goodbye to Wooden Structures

Port Aransas, TX, is a city located off the Gulf of Mexico just north of Padre Island. The city is well known to tourists for its fishing potential and quaint beaches.

Within the city, an 86-unit beachfront condominium named "The Dunes" recently needed to once again replace a beach access ramp, platforms, and pool railings. In the past, these collective structures have always been constructed with pressure treated lumber.



Over a span of a few years, the environmental pressures from the Gulf Coast caused warping and rotting of the structures. Even with routine sealing, the constant exposure to ultraviolet light also created small fractures within the fibrous material of lumber.

In short time spans, each iteration of the wooden structures became unsightly and required complete refurbishment. Prompted initially by elevated lumber prices, the home-owner's association (HOA) of the condominium elected to search for a more durable material suited for the first phase of its exterior space renovation plans.

The HOA contacted Strongwell to assist in the correct procurement of materials along with test information. Decades of testing have proven that fiberglass products are unmatched when it comes to UV weatherability. As a result, multiple shapes of EXTREN® Series 525 were used to construct the handrail, structural supports, and posts. Slip-resistant and ADA-compliant DURAGRID® was used as the walking surface throughout to ensure decades of corrosion resistance.

At the completion of the project, the HOA president expressed appreciation from all of the condo owners on the aesthetics, overall product value, and expected durable performance of fiberglass products.



