PROFILE
STRONGWELL NEWS & APPLICATIONS • SPRING 2023

Case Study: DURAGRID®

FRP Appeals to Pier Community

In the year 2020, the Gulf Panhandle was hit with frequent hurricanes. The states of Louisiana, Alabama, and Florida endured numerous encounters of heavy rain, high winds, and storm surges.

One of the hurricanes made landfall near the Gulf Shores of Alabama with winds exceeding 100 mph. The high winds resulted in the destruction of homes and businesses. Multiple marinas experienced the loss of boats that were either destroyed or tossed ashore.

In addition, many of the wooden walking surfaces of docks, piers, and marinas were damaged or missing multiple decking boards.

This was the case with one pier located in a beach resort near the Florida state line. The pier structure serves as part of a network of walking paths connecting the marsh area with the boat dock.

After a thorough post-storm inspection, it was determined that the pier had structurally compromised walking surfaces throughout certain sections of the structure. When examining options for walking surfaces, the resort decided that the replacement cycle of wood and elevated costs of maintenance was no longer a feasible option.

The resort requested that the new walking surface be resistant to ultraviolet degradation, corrosion, slippage, and pests. Durability was an important factor to ensure many years of maintenance-free service. With decades of proven performance, DURAGRID® I-4000 was introduced as an economical material for the pier's walking surface that met all the resort's requests.

In total, over 7,100 square feet of DURAGRID® pultruded grating was installed at this pier. Since the installation, multiple resort members have commented how this material has significantly improved the design and function of the pier.

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Case Study: EXTREN®

FRP Plate Simplifies Robotic Path

As the demands on distribution warehouses continue to grow, so does the dependence upon warehouse operators to manage order fulfillment through new processes. In most instances, indirect and direct fulfillment costs may run from 50-60% of the total cost per order.

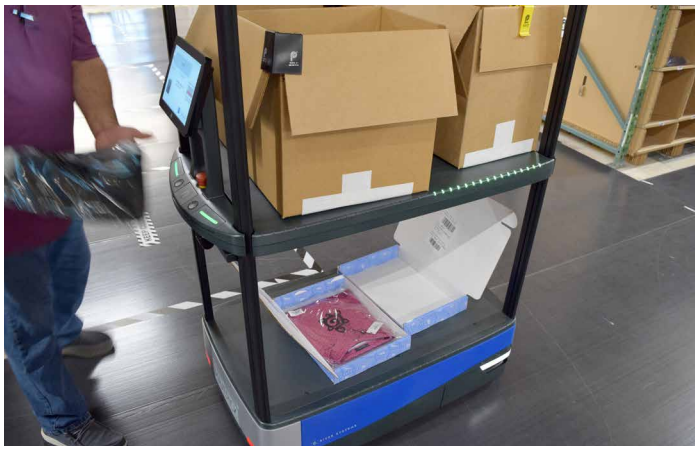
That was the case at a clothing warehouse distribution facility located in Bristol, Tennessee. It recently expanded its base of operations through the renovation of a larger commercial building. With its expansion plans in place, phase one was to increase distribution capacity.

To assist with this process, the owner/operators of this facility looked at upgrading order fulfillment processes through the use of mobile robots.

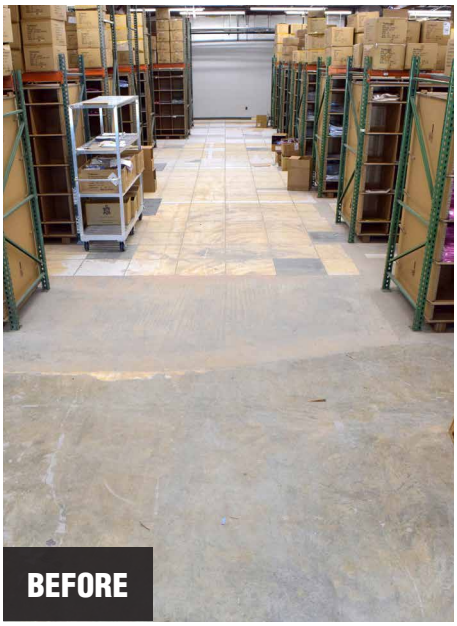
Specifically, the company sought to use autonomous mobile robots (AMRs). These types of robots use sensors, artificial intelligence, and software to intelligently move around without human intervention. These particular robots were designed to aid in accurate and efficient order fulfillment.

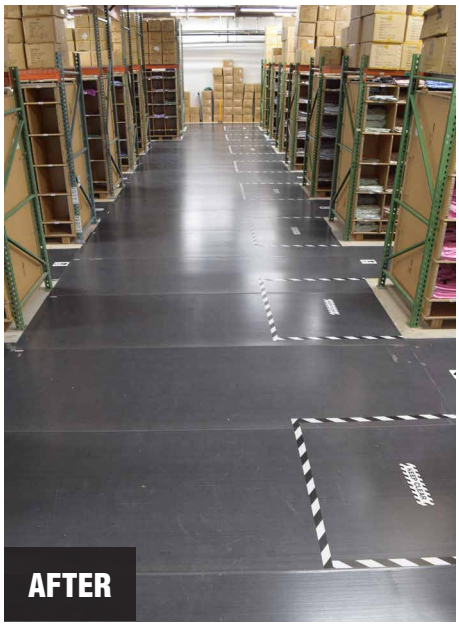
To accommodate the AMRs, the facility needed to upgrade its flooring to be compatible with the robot's sensors and electronic equipment. The flooring material needed to be at least 4' in width, offer a smooth surface, and be EMI/RF transparent. A drop-in-place option over the existing subfloor was favored over a completely new floor to minimize interruptions to daily fulfillment operations. In total, over 300 panels of 1/8" EXTREN® flat sheet were supplied to the customer to meet this flooring need.

Over a period of two days, a three-member contractor team was able to lay out, fabricate, and adhere all of the flat sheet panels via silicone adhesive throughout the distribution area.



At the conclusion of the installation, the end user and the contractors were impressed by how light and easy the panels were to transport, cut to size, and install. Prior to the introduction of the robots, staff members were able to pick 3,000 - 5,000 units a week. With current staffing levels, the robots and humans can now tandemly pick 30,000 units a week. ●





Strongwell Promotions

Bhyrav Mutnuri
Director, Research & Development - Corporate

Brian McQueen
Machine Shop Supervisor - Bristol

Curtis Pippin
Maintenance Supervisor - Bristol

Dave Long
Drafting Lead - Chatfield

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- *Decking Fasteners Flyer*
- *Grating Field Fabrication Guide*
- *Offshore Guardrail/Handrail Flyer*

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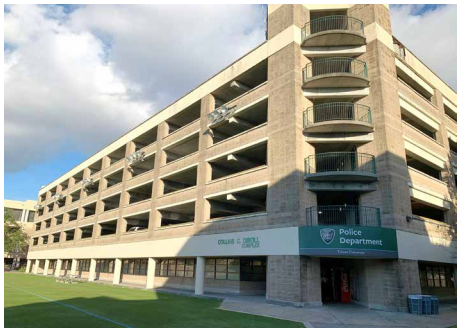
30 Year Durability Report

FRP Parking Garage Guardrail

In 1994, the architectural firm of Kesells Diboll Kessels (KDK) designed the Tulane University Parking Garage. Within the garage, Strongwell's composites were used to tackle a challenging maintenance problem affecting all open area parking garages.

When used, steel guardrails in these applications are prone to rust quickly and are difficult to replace as they are attached to concrete. Understanding that this structure was going to be a heavily used asset in an area with limited and restricted parking, the firm wanted a non-metallic solution that could adhere to the architectural design standards of the University while limiting future maintenance costs.

The firm had previous experience in designing with fiberglass walkways within corrosive environments and knew that fiberglass would serve as an excellent long-term alternative to steel guardrails prone to corrosion. Considering lifetime maintenance costs, initial product costs, and installation costs associated with steel guardrails made FRP cost competitive with steel. In addition, the composite rail provided high impact resistance, high corrosion resistance and would never need to be repainted due to rusting.



The main body of the composite guardrail is a 6" x 1/4" round tube pultruded in a special color to match the accent colors used on adjacent Tulane University buildings. 1/4" FRP plates made by hand lay-up capped the ends of each tube. Each guardrail is attached to a fiberglass stanchion embedded within the structure.

The design required accurate stanchion placement to match joints within the stone walls of the parking garage. This internal connection is what makes rusted steel guardrails so difficult and impractical to replace, eventually rendering them safety hazards.

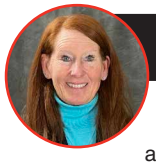
According to the contractor, Brice Building, the 3,400 lineal feet of guardrail was easily installed by two workers. It was noted at the time of the install that using steel guardrails would have required a crane and more manpower.

Still in use today, the 820-car parking structure is part of the Collins C. Diboll Complex on Tulane's Uptown Campus. The guardrails have provided almost 30 years of continuous service with little sign of wear to the stanchions, end caps, or tubes. ●

Strongwell New Hires

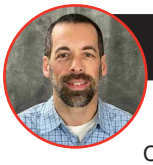
Alex Ittner
Customer Service Associate - Chatfield

Alex will handle Chatfield-related customer service matters. Alex was recently employed at a local school as an AmeriCorp member, serving preschool students with social and emotional learning, and skill building.



Wendy Kohler
Human Resources Manager - Chatfield

Wendy grew up on a dairy farm in northern Minnesota and started nursing school while in high school. She graduated and began her career at the University of Minnesota in the ICU. She quickly learned that, although patient care was amazing, her passion was in the HR side of the workings at the hospital. Wendy graduated with her bachelor's degree while working full-time for a large long-term healthcare organization where she supported sites in 11 states.



Craig Evers
Accounts Payable / Payroll Administrator - Chatfield

Craig grew up in Southeast Minnesota and received his associate's degree in Accounting from Rochester Community and Technical College. He also has a bachelor's degree in Business Management from Mid-Continent University in Kentucky, where he lived for five years.

Josh Shelton
R&D Engineer - Bristol

Josh will be conducting research and development activities including qualifying new materials and processes, designing, analyzing, and testing composites materials and structures, and documenting test results. Josh holds a degree in Mechanical Engineering from Tennessee Tech University. Prior to his tenure at Strongwell, Josh focused primarily on aluminum injection molding processes at various local manufacturers.

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What's in this Issue:

*The **Profile Newsletter*** is published by the Strongwell Corporate Marketing Department. To subscribe to the e-newsletter, please visit **www.strongwell.com/godigital**. Previous editions of *The Profile Newsletter* may also be found online at **www.strongwell.com**. | Editor: Barry Myers Production/Reporting: Brian Godwin & Te-Kai Shu

Case Study: EXTREN® & SAFPLANK®

A Superior Trail Deserves Likewise Materials

Over the years, structural FRP products have become more prevalently used by the engineering community in the design of new and refurbishment builds of pedestrian bridges.

Basis of design, life cycle analyses, and engineering resources have shown that composites are a cost effective and durable choice for the pedestrian bridge market.

As a result, Areté Structures has installed dozens of bridge structures with various resin matrices throughout the country.

Recently, Strongwell provided material to Areté Structures for a pedestrian bridge project near Gran Marais, Minnesota.

Located within this area is the Superior Hiking Trail. The contiguous trail travels through a combination of public and private lands from Wisconsin to Ontario, Canada.

A private nonprofit association worked with the United States Forestry Service to replace an older bridge with failing abutments (the ground substructure of a bridge providing vertical and horizontal support).

Both vested parties desired a structure designed with long term durability. Areté Structures sister company, Areté Engineers, designed an FRP bridge measuring 50' in length and 4' in width.

The structural supporting members for this truss-style bridge are all EXTREN® 500 Series. The flooring material used was SAFPLANK®, an interlocking decking system with a nonskid coating.

The ADA-compliant bridge has 42" high railings with a mid-rail safety channel. The excellent strength-to-weight ratio of fiberglass provides impressive design load capabilities with its diagonal truss and diagonal horizontal cross bracing. This bridge is capable of handling of up to 90 PSF for live pedestrian loads, 35 PSF for wind loads, and 40 PSF for snow loads.

Volunteers, friends of the organization, and hikers have been complimentary of the new bridge and its promising capabilities to ensure decades of safe accessibility with uninterrupted use.