

### **Case Study:** **UltraComposite™ UC 95 Profile Sheet Piling** **Composite Pilings Protect Platinum LEED Site from Flooding**

In 2011, Sacramento Municipal Utility District (SMUD) began construction on its East Campus Operations Center, a net zero Platinum LEED® energy site containing a five-story office building, fuel and storage areas, maintenance space, shops and felt parking. Platinum LEED® (Leadership in Energy and Environmental Design) designation is the highest issued by the U.S. Green Building Council.

The worksite, prior to construction, was located in a flood risk area and required a flood wall. SMUD and the project's engineers, Bohler Engineering, wanted a versatile solution which was non-corrosive, possessed an extended life cycle and reduced carbon foot print while contributing to the site's durability. The product they selected was CMI'S UltraComposite™ UC 95 profile sheet piling.

Installation Contractor Blue Iron, Inc. utilized sheets which were 30 feet in length. A medium weight excavator with a vibratory hammer was responsible for the driving of 100 feet of wall length daily into the rocky and challenging soil



at depths of 17 feet with 13 feet exposed for flood protection.

CMI's UltraComposite™ UC 95 profile sheet piling was manufactured in Strongwell's ISO 9001:2008 and ISO 14001:2004 certified manufacturing facility to ensure consistent high quality, design strength, durability, cost and sustainability. By using UC 95, CMI was able to reduce both product and installation costs while generating further interest in the utilization of American-made composite sheet piling. ●

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## Case Study: SAFPLATE®, COMPOSOLITE®, and EXTREN®

### Composites Offers a Fastbuild Track for Railway

A set of platforms at a busy Hampton Court station in London, England have received a new look with Strongwell products. Pipex px®, an international distributor of Strongwell products, helped the owner and operator of the United Kingdom's rail infrastructure, Network Rail, revamp existing worn-beyond-repair concrete station platforms by supplying and fabricating a structural FRP deck over a timber glulam beam frame.

Strongwell's SAFPLATE®, bonded to COMPOSOLITE®, along with EXTREN® angle, were chosen to replace the surface of approximately 312 feet of concrete platforms at the station. The SAFPLATE® provided a non-slip, gritted walkway while maintaining the aesthetic properties of the station. The state of the art installation also provided a gritted "bright white" edge and a tactile strip to aid visually impaired commuters. Additionally, panels were fitted to accommodate lighting posts which ran centrally through the station's platform.

Supply, fabrication and installation of the platforms were all cost-effective and time-saving. The destruction of the old concrete platform and the installation of the new timber glulam deck with FRP surface went much easier and quicker than expected, according to installers. The successful and speedy installation reduced disruption for the high volume of travelers the station endures daily.

The platforms have a life expectancy of 60 years and were designed as a modular system that can be added to in the future. With such success, plans for similar renovations within the Network Rail line are currently underway. ●



## Case Study: DURADEK®

### Fiberglass Grating Streamlines Safety for Rail System

Network Rail owns more than 2,500 railway stations covering over 20,000 miles of track and 40,000 bridges and tunnels within the United Kingdom. Network Rail chose to improve safety and cut maintenance costs by replacing concrete walkways and structures with fabricated DURADEK® walkways and shunter patios adjacent to the train tracks. The installation was a major achievement for the rail industry and exemplifies the overall acceptance and use of composite materials.

Pipex px® incorporated a design which limited disruption for Network Rail, drastically reducing installation time by incorporating off-site prefabrication and only working through the weekends, in ten hour intervals, to ensure minimal disruption to the public and to the rail link. 1 1/2" DURADEK® I-6000 was the material of

choice due to its non-conductive properties, outstanding corrosion resistance and durability against nature's elements. The anti-skid grit surface of the FRP offered a great contrast to the worn concrete structures and walkways, both of which were hazardous during heavy rain and in the winter.

The fiberglass shunter patios and walkways have eliminated all concerns regarding the pitting and spalling of the previous concrete structures and are expected to last at least sixty years, according to Pipex px® estimates. ●



# Technical Case Study: DURAGRID®

## Pultruded Vinyl Ester Grating Durability

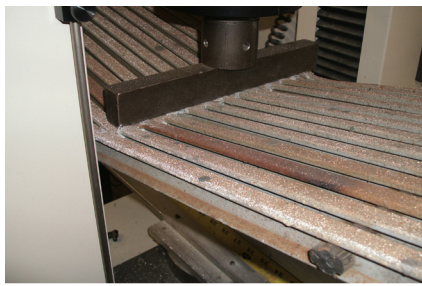
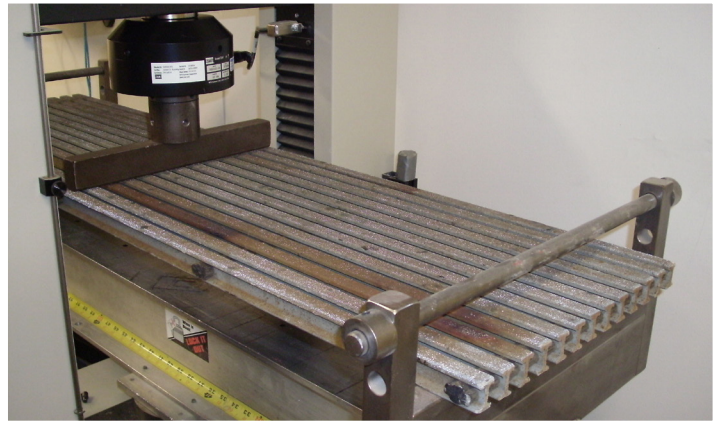
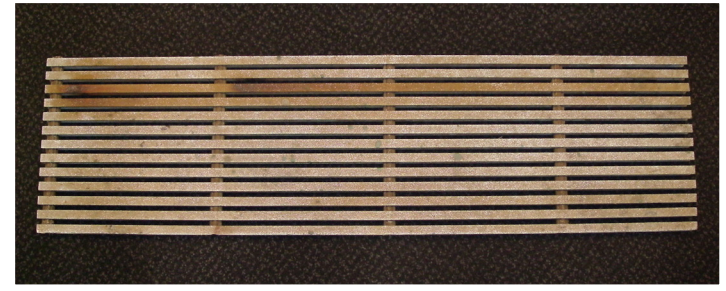
Strongwell's DURAGRID® VE (vinyl ester) pultruded grating was installed in 1994 on a large metropolitan bridge in Camden, New Jersey. A 46" (117 cm) long sample from this installation was recently obtained for a strength, stiffness and durability study. The test was performed on a randomly selected piece of I4000- 1" (2.54 cm) panel.

The panel was subjected to a three-point bend test, to failure, on a 42" (107 cm) span, and then retested to measure deflection and any remaining strength. Upon failure at the test peak load of 6,527 lbs. (2,961 kg), the same panel was tested to determine what load would cause the industry-recognized 1/4" (.635 mm) deflection. In this case, it was 55 lb. At a 200 lb (90.7 kg) load, deflection measured 1.30" (3.3 mm), but the panel supported the weight.

### CONCLUSION:















Strongwell products, including DURAGRID® VE pultruded grating, have been produced in conformance with quality standards that ensure the products meet, or exceed, published load table values at the time of production. This durability study demonstrates that DURAGRID® VE pultruded grating strength will meet and exceed industry recognized, in-service design loads,

for a 20-year, and counting, service life. Measured stiffness decreases are expected to be negligible. DURAGRID® VE pultruded grating is a structural alternative to steel and aluminum





grating especially when long-term durability is a concern. Additional benefits include fabrication requiring fewer tools, lighter in weight, measured strength against impact, measured fire resistance and strength retention at increased service temperatures, and a measured decrease in maintenance. Strongwell has worked to continually improve product strength, durability and impact resistance of DURAGRID® VE pultruded grating. ●

## Literature Updates:

 Corrosion Resistance Guide	 Strongwell Specifications	 Compare DURAGRID® I-6500 Flyer	 Fiberglass Grating Brochure (imperial)
 SAFRAIL™ Ladder and Cage Brochure	 SAFRAIL™ Industrial Handrail Brochure	 DURAGRID® R-8300 Grating Flyer	 Fiberglass Grating Brochure (metric)
 EXTREN® Brochure	 Strongwell Company Portfolio	 DURAGRID® R-7300 Grating Flyer	 DURAGRID® Phenolic Brochure
 COMPOSOLITE® Brochure		 DURASHIELD® Brochure	

## Design Manual Updates:

	<b>IMPERIAL VERSION:</b> - Section 3 - Section 8 - Section 12 - Section 13 - Section 14
	<b>METRIC VERSION:</b> - Section 3 - Section 12 - Section 13 - Section 14 - Section 15





## Team Member Update



### Danny May

*Shift Facilitator - Highlands*

Danny May was recently promoted to Shift Facilitator (third shift) for the Highlands Facility.

Danny has been with Strongwell since 2007 and served in several roles. Most recently before this promotion he was a Pultrusion Lead.

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# PROFILE

Strongwell News & Applications

## Considering Alternative Materials to Lower Maintenance and Costs

According to the U.S. Federal Highway Administration's publication of "Corrosion Costs and Preventative Strategies in the United States", metallic corrosion affects every U.S. industry sector to generate \$138 billion in costs. Out of that cumulative figure, almost \$18 billion can be directly attributed to production and manufacturing.

Maintenance-free industrial materials reduce maintenance and safety concerns, allowing plant managers and maintenance staff to focus on increasing operational efficiency. Strongwell recently assembled a case study-based handrail guide on fiber reinforced polymer (FRP) rails, which demonstrates:

- How a highly abrasive coal preparation plant in Illinois went from replacing carbon steel every two years and stainless every six years to FRP rails and walkways which are still in place over sixteen years later.
- Why round FRP handrail was chosen over traditional materials to build an OSHA-compliant bridge fender handrail system in Florida.
- Why Latin America's second largest petroleum company chose FRP over steel to provide safe access to living quarters on its offshore platform while saving weight and preventing corrosion.
- The structural and aesthetic features and benefits of round, square and channel top handrail systems offered by Strongwell.
- How FRP addresses specific corrosive materials and environments.
- The differences in installation and fabrication of FRP handrail as a replacement for traditional materials (steel/aluminum) or as a new installation.
- How FRP complements safety management through its low thermal and electrical conductivity.

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