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TRONGWELL

# Case Study: EXTREN<sup>®</sup> & FIBREBOLT<sup>®</sup> Fiberglass Turrets Still Crown the Orlando Skyline 30 Years Later

Within the urban skyline landscape of Orlando, Florida, four 35' high x 35' square fiberglass turrets flank one another atop the SunTrust Bank Building, providing Orlando's tallest building with an architecturally inspired spire crown.

Originally conceived over 30 years ago as steel and aluminum decorations, the fiberglass turrets of EXTREN® structural shapes and FIBREBOLT® fiberglass studs and nuts housed 20' high antennae for first responders' communication. As an industry leader, Strongwell's fiberglass structural products comprehensively gained L.A.R.R. approval. This certification allowed the developer to alter the metallic design to composites due to composites transparency to radio signals.

Each turret has four windows with the frames fabricated from EXTREN® Series 525. Three sides have 27' high x 5' wide windows and one side has a 10' high x 5' wide window. Each fiberglass superstructure is covered in custom molded fiberglass panels.

All-fiberglass structural members were prefabricated and shipped to the site. Structures were almost completely assembled on the ground and lifted to the rooftop via crane. Workers were then able to bolt the fiberglass base plates to steel base plates on the roof.

Since 1988, Florida has endured over 100 tropical depressions and hurricanes. The fiberglass turrets were designed by project architects, Owens, Skidmore & Merill to accommodate hurricane winds common in Florida.

"We spent all of this money to make the towers distinctive, then we would have had to put antennae on the corners and it would have ruined the design and view," said Julio Maggi, Construction Manager for the \$130 million building developed by Lincoln Property Company. The city required the antennae to be installed because the 441' height of the building would have interfered with critical radio signals.

Over the past three decades, the developer reports that they continue to utilize the internal space of the aesthetic superstructure to conceal signal amplifiers and perform little to no maintenance on the superstructures. Maintenance workers reported the only efforts they put forth are to check the tightness of bolts every few years or after significant weather events.







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In 2015, Pipex px<sup>®</sup> supplied and fabricated two FRP bridges in Scotland. One bridge is located in the Craigendunton Reservoir, covering approximately 24 acres and providing drinking water as well as supporting a recreational trout fishery. The other bridge is located in the Loch Craig Reservoir, covering 65 acres. Both footbridges serve as vital points for valve access to each individual reservoir. Over the years, the challenging environment of Scotland brought unwarranted aesthetic and safety concerns to each of the steel footbridges which were in place.

The water and sewage provider wanted a cost effective and durable structural alternative to steel. Pipex px<sup>®</sup> and an engineering firm worked together to design, fabricate, and install two almost identical bridges constructed entirely with FRP profiles.

Upon completion, the Craigendunton Reservoir Footbridge measured 45' long x 4' wide x 5' high. The Loch Craig Reservoir Bridge came in slightly shorter, measuring 40' long x 4' wide x 5' high. Pipex px<sup>®</sup> assembled the bridges at its Glasgow facility for quality assurance and then disassembled them for delivery.

Both bridges were built to ensure corrosion resistance and structural durability using EXTREN<sup>®</sup> structural tubes, angles, and plates. SAFPLANK<sup>®</sup> fiberglass planking with an epoxy, anti-skid surface was used as a long-lasting pedestrian flooring solution. With the robust engineering services of Pipex px<sup>®</sup>, the design life expectancy of both bridges is expected to be more than 60 years.



# Spotlight on Strongwell Talent



### Nathan Bean Plant Manager - Highlands

Nathan Bean has been promoted to the position of Plant Manager - Highlands. Nathan has been with Strongwell since 1998 when he

began his career as a pultrusion operator. Since his initial employment date, Nathan has held progressively responsible positions including Supervisor, Operations Coordinator and most recently, Logistics Manager - Virginia Operations.



Billy Harlow, Jr. Logistics Manager - Bristol

Billy Harlow, Jr. has been promoted to the position of Logistics Manager - Bristol. Billy began his Strongwell career in

1997 as a pultrusion operator. In 2011, he was promoted to the Supervisor position at Highlands and in 2013, he assumed the position of 2<sup>nd</sup> Shift Supervisor - Bristol.



### Sheena Kayton 2<sup>nd</sup> Shift Supervisor - Bristol

Sheena Kayton has been promoted to the position of 2<sup>nd</sup> Shift Supervisor - Bristol. Sheena

will report to the Director of Virginia Manufacturing Operations. Sheena has worked for Strongwell since 2007 as a Pultrusion Operator.



#### Josh McCroskey Continuous Improvement Engineer - Bristol

Josh McCroskey has accepted the new position of Continuous Improvement Engineer. This position

w i I I facilitate process improvements within Strongwell's Virginia Operations by utilizing Lean Manufacturing, Six Sigma, and Constraint Management methodologies. Josh will provide technical consultation to the Sales and Marketing activities on existing and new product opportunities. In this new role, Josh will leverage his expertise to partner with all department heads to drive continuous improvement initiatives. Josh has worked for Strongwell since 2006.

> Xavier Martinez Divisional Finanace / Accounting Manager - Mexico

Xavier Martinez has joined Strongwell as Divisional Finance / Accounting Manager for STRONGWELL S. de R.L. de C.V. Xavier

will report to the Controller for Minnesota/ Mexico Operations and will coordinate the accounting function for the Mexico facility. A native of Veracruz, Xavier received his Bachelor's in Accounting & Finance with specialty in Management and graduated from Universidad de las Americas (UDLA) in Puebla in 2014. Xavier was previously employed at General Electric as General Accountant and Xerox Company as Financial Senior Analyst.



### Mark Haynes

Customer Service Account Manager - Bristol

Mark Haynes has accepted the position of Customer Service Account Manager. Strongwell has numerous, impactful opportunities to

grow sales, and Mark will be a great asset in securing incremental top line revenue. Mark began his career with Strongwell in 1995 and has held several different positions within the company. After roles in Highlands as Shift Facilitator and Manufacturing & QualityAdministrator, Mark moved to Bristol where heserved as Production Materials Planner, Shipping and Receiving Manager, Special Projects Account Manager, and Customer Logistics Manager. Most recently, Mark has led the efforts in Abingdon as the Manager, Highlands Manufacturing.

#### Shannon Lambert Environmental Health and Safety Technical Assistant - Bristol

Shannon Lambert has accepted the position of Environmental,

Health and Safety Technical Assistant. Shannon will report to the Manager, Virginia Operations Human Resources and EHS. Shannon has worked for Strongwell since 2006 as a Maintenance Master Mechanic. Prior to coming to Strongwell, Shannon gained valuable knowledge performing safety audits, writing technical procedures, and working with ISO implementation and 5S compliance. Shannon obtained his Associates Degree in Engineering Technology from Southwest Virginia Community College and his Journeyman Maintenance Technician Certification from the Commonwealth of Virginia Apprenticeship Council.



### Case Study: DURAGRID<sup>®</sup>

# FRP Supports Turnkey Solution for Gas Monitoring Stations







### Gerald Dollar Pultrusion Superindendent - Bristol

Gerald Dollar has accepted the position of Pultrusion Superintendent. This is a new position at Strongwell that reports to

the Director of Virginia Manufacturing Operations. Gerald has worked for Strongwell since 1981. He started his career as a 3<sup>rd</sup> shift trainee and progressively worked his way through the ranks. Through the years, Gerald has demonstrated his knowledge of all aspects of the pultrusion operation.



#### Alberto Estrada Maintenance / Facility Engineer -Mexico

Alberto Estrada has accepted the position of Maintenance/ Facility Engineer. Alberto will report

to the Plant Manager in the Mexico facility. Alberto began his Strongwell career in 2016 as Production Supervisor. He has 15 years of experience in maintenance.



### Esteban Ortiz Pultrusion Supervisor - Mexico

Esteban Ortiz has accepted the position of Production Supervisor. Esteban will report to the Plant Manager in the Mexico

facility. Esteban began his Strongwell career in April, 2016 as Lead Operator. Prior to coming to Strongwell, Esteban gained valuable experience in the pultrusion process, this helped in the startup of the Mexico facility.



Ty DeJager Process Engineer - Bristol

**Ty DeJager** has joined Strongwell as Process Engineer. Ty is a recent

chemical engineering graduate of the University of Tennessee. Previously, Ty worked in the Strongwell lab as an engineering intern. He also has worked for Diamond Vogel Paints in Orange City, Iowa as an engineering intern.

## Literature Updates:

- SAFPLANK HD® Brochure
- Fiberglass Decking Systems Brochure
- STRONGDEK<sup>™</sup> Flyer
- DURADEK<sup>®</sup> Brochure (I&M)
- DURAGRID<sup>®</sup> Brochure (I&M)
- Design Manual (I&M) Sections:
  11, 12, 14, 16

Visit www.strongwell.com for the latest resources.

For decades it has been well known throughout the hydrocarbon community that natural gas is plentiful. The task of extraction has been cost-prohibitive for many companies until new safety and technological related advances were made through joint publicprivate entity partnerships.

With fracking and horizontal drilling as the main extraction processes of natural gas, mobility has been a key driver for energy companies as they install gas monitoring stations throughout the country.

A full service turnkey engineering, manufacturing, and construction contractor for the natural gas industry located in the Appalachian Basin worked with GEF Inc. to broaden applications with FRP composites for the gas transmission, production, distribution, and gas storage companies within the U.S.

One such application has been the manufacturing of skid mounted natural gas monitoring stations. The stations are shipped throughout the country and typically measure 12' in width and 25' in length. Each platform is outfitted with DURAGRID<sup>®</sup> I-6000 pultruded fiberglass grating measuring 1-½" in thickness, with a gritted top.

The answer was threefold when they were asked why they transitioned from steel to FRP for their platforms.

Due to shipping costs and mobility concerns, DURAGRID<sup>®</sup> reduced the overall weight of each skid making it easier to ship as well as move around for fabrication and site use. With multiple years of servicing the natural gas industry, the turnkey natural gas contractor quickly realized that corrosion was becoming

an overwhelming issue at these extraction sites due to environmental exposure. Steel was rusting too quickly, demanding safety and maintenance downtimes. As an added benefit of FRP being non-conductive, an operational environment which is nonsparking added greater fire safety value for these monitoring stations.





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### What's in this Issue:



Fiberglass Turrets Still Crown the Orlando Skyline 30 Years Later



When Steel Falls Short



FRP Supports Turnkey Solution for Gas Monitoring Stations



Spotlight on Strongwell Talent



Literature Updates



Composites Aid Coagulation and Flocculation Processes



# **Case Study: Baffle Panels** Composites Aid Coagulation and Flocculation Processes

Coagulation and flocculation play vital roles in the primary treatment phase of water and wastewater treatment prior to sedimentation and filtration processes.

During primary treatment phases, baffle panels are typically introduced for underwater flow controls. Prior to the introduction of composites, baffle panels were constructed with traditional materials such as steel, concrete, and sometimes wood. All of these materials have short lifespans as constant water volumes expose these materials to high percentages of chemical and organic matter, leading to accelerated corrosion and rot. This results in deteriorating functional capacities.

With the introduction of pultruded fiberglass, Strongwell's Baffle Wall systems have demonstrated the ability to yield maximum potable water and wastewater treatment flow during the process of coagulation. As not all FRP is created equal, Strongwell's FRP possesses leading industry qualities such as







high corrosion resistance, excellent strength-toweight ratio, and UV resistance for both outdoor and disinfection applications.

In a water treatment facility in South Carolina, redwood baffle panels and concrete slabs had deteriorated beyond repair. Concerned with life cycle costs attributing from ongoing maintenance, the facility engineers decided to replace all of the traditional baffle panels with FRP in multiple phases over an 18-month period.

Engineers have begun to utilize lightweight FRP baffle panels for underwater flow control applications. In addition, the longer life cycle of the FRP and new design systems give engineers great flexibility in both new and retrofit projects for aeration chambers, contact chambers, and retention basins.

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