PROFILE
STRONGWELL NEWS & APPLICATIONS • SPRING 2020

Durability Study: DURAGRID®

Decades Later: Still Better than New Steel

In 1979, DURAGRID® I-4000 1" (formerly DURADEK®) grating was installed on Shell's offshore platform Ellen. The platform was destined for the Beta Field off the shore of southern California. Now, with over 40 years of use, the nearly 10,000 square feet of grating continues to show an excellent return on investment for current operators, Beta Offshore.

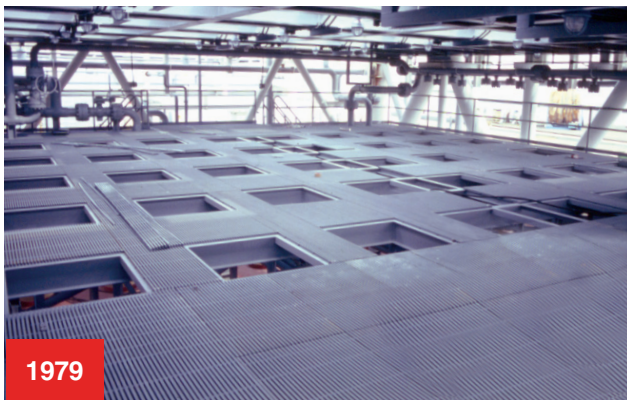
Anti-skid DURAGRID® has always been known for excellent durability and the 40-plus year exposure on Ellen has had little to no effect on the grating. Even accidental sandblasting and paint overspray has not noticeably degraded the grating's performance.

Previous reports indicated that abuse from the platform's SSV's (surface safety valves) and performing acid jobs have never been a problem. Workers experience less fatigue and a better kneeling environment with DURAGRID® pultruded grating.

When asked in 2010 about the lifespan of the grating on the platform, the Facility Superintendent at that time stated, "The grating looks to be in great shape. The surface shows very little wear and tear."

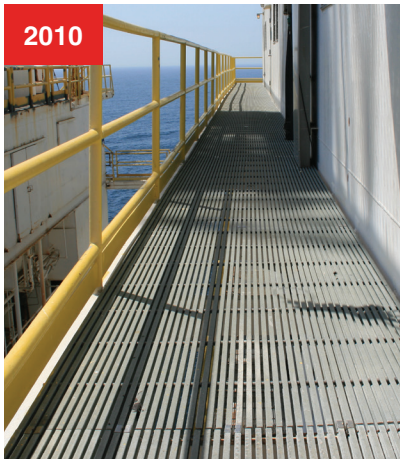
In 2020, Strongwell was able to acquire and examine a portion of the original grating for flexural testing. The removed panels were taken from the area directly outside of the galley on the offshore rig. Upon visual inspection, the grating had some cosmetic wear with no visual signs of glass exposure.

As one of the first generation designs, the panels were assembled with 3/8" FRP rods and polypropylene bushings to achieve proper bar spacing. Today's designs utilize a 3-piece mechanically locked and bonded cross rod design to achieve optimal bearing bar support with peak performance.



With over 40 years of daily exposure to weather and pedestrian traffic, the grating still retained over 80% of its flexural modulus and 80% of its maximum load capability from its published load tables. As tested against the published data for that particular series of grating, the extracted sample maxed out at 3,385 lbs.

Too often, the industry concentrates on short term costs. Now, decades later, the decision to go with DURAGRID® has proven to be a better return on investment than even new steel. ●



Span, L=42"		DURAGRID® I-4000 1" Grating		New Steel Grating†	
		Original Published Properties	Properties After 40 Years of Offshore Service	1.5"	1"
Modulus, E		4.88 x 10^6 psi	4.0 x 10^6 psi	29 x 10^6 psi	
Max Load	10 bar panels	4,122 lb*	3,385 lb	1,218 lb	541 lb
	9 bar panels	3,710 lb*	2,901 lb		
Allowable Load		1413 psf	1132 psf	696 psf	309 psf

*Prorated value - I-4000 series has 12 bars per foot of width. †From ANSI/NAAMM Metal Bar Grating Manual MBG 531-17.

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Case Study: EXTREN®, DURAGRID®, & SAFRAIL™

Harsh Winters Present Durability Challenges

As a northern Canadian province, Saskatchewan experiences temperature extremes throughout the course of any given year. In addition, the province has a great deal of water, with roughly 10% of its area either a river or one of almost 100,000 lakes!

Saskatchewan's proximity to the Arctic Circle yields exceptionally frigid winters. An exposure combination of year-round wind, sun, and water exposure means that all exterior structural materials must remain durable.

Recently, a potable water pumping station located on a reservoir within the City of Regina, Saskatchewan, needed to replace a stairway that was originally constructed out of carbon steel. With concerns about carbon steel's short life span, overall performance, and installation costs, the operator wanted to consider an alternative to lower life cycle costs.

The pumping station's location and aggressive slope presented challenges to support the welding and lifting of any metallic option, making FRP an ideal choice. ICON Construction worked with the City of Regina's engineers to design and fabricate a composite pultruded option, which could endure many years of temperature swings and environmental changes without corrosion or maintenance.

Outfitting this stairway are an assortment of Made in the USA pultruded products. The structural supporting members are comprised of EXTREN® structural channels and angles. The stair treads utilized DURAGRID® I-6000 1-1/2" with a medium grit coating for excellent slip resistance. For ascending and descending support, both SAFRAIL™ square handrail and ADA-compliant round grab rail were complemented with toe plates.

Regarding installation, within three days, the stairway was fabricated and installed on location for pumping station access. The installers and customer were both pleased with the functionality and brevity of construction of this overall project, which is expected to provide decades of useful service. ●

Case Study: SAFSTRIP®

SAFSTRIP® Offers Underground Support

Below a multi-story apartment complex in Ontario, Canada, resides an underground parking garage which recently underwent a concrete support renovation.

Located within a high-density neighborhood, the complex is dependent on the parking garage for its residents, so long-term parking disruptions were not an option for this support renovation.

After the owners and engineers evaluated the condition of the concrete, Antonio's Excavating and General Contracting worked on the logistics of installing SAFSTRIP®, spacing of fasteners, equipment placement, and surface preparation.

As a pultruded composite, SAFSTRIP® has high bearing and longitudinal properties and is designed to strengthen the flexural capacity on the tension face of concrete girders, slabs, and decks. While being drilled during installation, SAFSTRIP® will not split or delaminate due to its composite design.

SAFSTRIP® design is unique for a composite because it was initially designed with the support of the U.S. Army Engineer Research and Development Center and the University of Wisconsin Structures and Materials Testing Laboratory. Market pressures demanded an efficient process to increase the load capacity of individual bridges through the use of a mechanically-fastened fiber reinforced polymer (MF-FRP).

For portability, SAFSTRIP® can be shipped in rolls up to 100 ft. in length. This ensures that installers have greater flexibility in cutting pieces to exact length in the field.

With the parking garage having only six feet of height clearance, both the installers and customer were impressed at how quickly and easily SAFSTRIP® was installed with a small team and minimal onsite equipment. This renovation provided the necessary improvements to the concrete structure allowing many additional years of service before a full restoration will be required.

Spotlight on Strongwell Talent

Doug Edwards

Customer Relations Manager - Corporate

Doug Edwards has been promoted to Customer Relations Manager, reporting to the Corporate Director, Marketing. In addition to maintaining his role as primary customer contact for Region B, Doug will also take on the additional responsibility of providing training, coaching, and leadership of the entire team of Corporate Sales Account Managers. Doug began his career with Strongwell in 2007 in the Shipping and Receiving department, and was promoted to Manager of that department in 2013. He transferred to the Corporate Sales team in 2017 as a Corporate Sales Account Manager.

Barry Myers

Corporate Director, Marketing

Barry Myers has been promoted to Corporate Director, Marketing, reporting to the President and CEO. Barry will continue to have management responsibility for all marketing, advertising, technical literature, mass media productions, public relations, press releases, and the Strongwell website. He has taken on the additional responsibility of providing leadership for corporate customer relations as the Customer Relations Manager position will become a direct report to Barry. Barry received his MBA from Milligan College. He also holds a Bachelor of Science degree in Business and Accounting from Lee University. He began his career with Strongwell in 2012.

Tammy Hutton

Buyer - Virginia Operations

Tammy Hutton has accepted the position of Buyer, Virginia Operations. In her new role, she will report to the Virginia Operations Purchasing Manager. Tammy has many years of purchasing experience in a manufacturing environment. Most recently, she served as the Purchasing/Maintenance, Repair, and Operations (MRO) Buyer for a large compressor manufacturer, using the experience she gained from her previous roles in assembly, shipping, and receiving. She is currently working towards her Associate's Degree in Business Management at Virginia Highlands Community College.

Lisa Wilson

Corporate Benefits & Hourly Payroll Manager

Lisa Wilson's title has changed to Corporate Benefits & Hourly Payroll Manager in an effort to better define her duties within the Human Resources Department. Lisa's primary duties will include administering Strongwell's benefits program by providing assistance for employees and benefit interpretation as needed. She will also continue to ensure accurate processing of payroll for all hourly employees and act as the liaison for Strongwell's payroll and benefits service provider. Lisa has been with Strongwell since 2000 and has held progressively increasing positions of responsibility within the Human Resources department. Before coming to Strongwell, Lisa worked in the insurance field and brings vast knowledge of benefit interpretation.

Laura Smith

Human Resources Specialist - Virginia Operations

Laura Smith began working with Strongwell in September 2019 as a contract employee, assisting with various tasks as an HR Clerk. We are excited to have Laura join us full time as a Strongwell employee. Laura brings extensive administrative and human resources experience. Primarily she has worked in the healthcare field, specifically assisted living facilities, where she served as an executive director in the Kingsport and Bristol areas. Laura has a Bachelor of Business Administration degree from East Tennessee State University, and she earned a Master Certificate in Human Resource Management from Villanova University.

Christy Wood

Purchasing Specialist - Virginia Operations

Christy Wood has joined the Purchasing team in the role of Purchasing Specialist, with a focus on buying Maintenance, Repair, and Operating supplies. She was previously working with Strongwell's Customer Service Team as a Corporate Accounts Associate. Christy brings more than 22 years of experience in the telephony business in various roles such as administrative assistant, switch programming, number portability, reporting and analysis and project management.

Carrie Bowers

Continuous Improvement Project Engineer - Virginia Operations

Carrie Bowers has accepted the position of Continuous Improvement Project Engineer reporting to the Director of Virginia Operations. Carrie will drive the improvement of processes and systems throughout Strongwell, and implement programs that will have continuing long-term benefits. This position is responsible for monitoring and improving organizational processes with the aim of making them as efficient as possible, implementing new process technology in manufacturing, and coordinating new product introductions throughout operations while working with Sales and R&D.

Jeremy Smith

Engineering Services Coordinator - Virginia Operations

Jeremy Smith will assume the position of Engineering Services Coordinator reporting to the Director of Virginia Operations. He will coordinate process engineering projects through Design/Drafting, Machine Shop, and Machine Build to ensure successful, on-time delivery. In addition, the Maintenance Department will report directly to Jeremy.

Literature Updates:

- *COMPOSOLITE® Brochure*
- *Design Manual Sections:*
  - *12 (I+M), 15 (I+M)*
- *DURAGRATE® Brochure*
- *Baffle Panel Brochure*
- *FRP Specifications: Baffle Wall Panel Products and Fabrications*

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February 2020 Email

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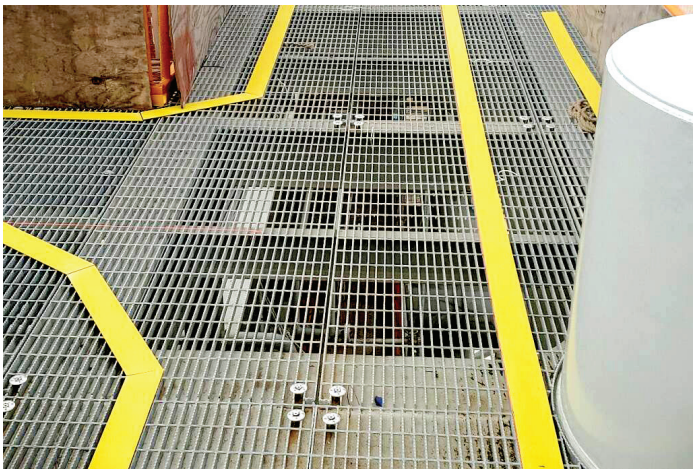
What's in this Issue:

Case Study: Custom Phenolic Strip

Fiberglass Highlights the Lines of Safety



Workplaces and places of businesses adhere to the emergency planning protocol of at least two exit routes to comply with safety exit standards. This ensures that alternate routes are available for the evacuation of employees and other occupants in the event of an emergency.

In large industrial settings, the quantity of available exit routes becomes dependent on the number of employees, building size, and floorplans.

As a best practice approach to clearly identify exit routes, the use of cautionary paint, lighting, or clear labeling is encouraged to identify escape routes.

In this particular case study, Strongwell's custom phenolic plate was integrated within a steel grating flooring system on an offshore hydrocarbon extraction rig. The end user needed a solution to clearly highlight an egress walkway that also serves as one of many escape/exit routes. The initial approach was to apply industrial safety yellow paint to the steel grating. As this was an exterior walkway, concerns regarding paint adhesion, durability, reapplication, and fading required a more robust and long-lasting solution.

The installer decided to utilize composites. Multiple pieces of 1/8" x 4" x 120" narrow phenolic sections of pultruded fiberglass were coated with safety yellow paint and treated with a urethane coating. As an added anti-slip safety measure, the plate was also treated with a surface grit coating to ensure multiple years of maintenance-free service dedicated to cautionary safety.

Once delivered, the installers were able to fabricate to size and mechanically attach the narrow plates to the steel grating via Hilti hold downs.

Upon completion, the end user and installer were both impressed by the overall ease of fabrication and assembly of these safety markers. ●

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