



## UNIVERSITY OF ILLINONIS AT URBANA-CHAMPAIGN

### Department of Civil and Environmental Engineering

Newmark Civil Engineering Laboratory, MC-250  
205 North Mathews Avenue  
Urbana, IL 61801-2352

## FGI Expands Summer Internship Program

By: Timothy D. Stark, University of Illinois at Urbana-Champaign,  
Jennifer Miller, University of Illinois at Urbana-Champaign,  
Billy Hernawan, University of Illinois at Urbana-Champaign,  
Raymond Pu, University of Illinois at Urbana-Champaign, &  
Abdou Diouff, University of Illinois at Urbana-Champaign

The Fabricated Geomembrane Institute (FGI) at the University of Illinois at Urbana-Champaign (UIUC) expanded its student internship program to three companies and six interns during the summer of 2017. The first year of the internship program in 2016, one intern worked for Colorado Lining International (CLI) at various sites in the United States. The main objectives of the program are to introduce future civil engineers to the field of geosynthetics field, civil engineering construction, and provide a connection between possible future employers and the many undergraduate (~2,400) and graduate students (~1,200) at the UIUC. This past summer, CLI re-hired Guo Cheng, a graduate student studying geotechnical engineering in the Department of Civil and Environmental Engineering (CEE) at the UIUC, plus three additional summer interns: Billy Hernawin (see Figure 1), also studying geotechnical engineering in CEE at the UIUC, Raymond Pu (see Figure 1), studying transportation engineering in CEE, and Xin Li, studying structural engineering in CEE. In addition to CLI, Owens Corning (OC) participated in the FGI's Internship Program by hiring Abdou Diouff (see Figure 1), a graduate student studying Construction Management in CEE. Finally, the Layfield Group hired Elsa Wingardh, (see Figure 4), who is also studying Construction Management in CEE at the UIUC student, to work at their San Diego, California fabrication facility. These six interns spent between seven (7) and thirteen (13) weeks learning about all aspects of geomembrane fabrication, testing, installation, design, estimation, quality control, and quality assurance. In addition, they learned about other geosynthetic products that are typically installed with geomembranes, such as cushion geotextiles, geonets, drainage composites, and geosynthetic reinforcement.

While at CLI's corporate headquarters in Parker, Colorado, Billy Hernawin, Guo Cheng, Xin Li, and Raymond Pu worked on factory fabrication of geomembrane panels including welding, patching, and both destructive and non-destructive testing of the completed panels. They were also introduced to all levels of CLI staff and leadership. While in the fabrication facility, Raymond, Guo, Xin, and Billy were instructed on proper geomembrane seam welding techniques and guidelines. The interns were also exposed to hands-on field experience with basic operations, including: site cleaning, unrolling and unfolding the geomembrane panels, preparing the panels for welding, performing air channel and vacuum testing of the field seams, and recording and archiving all of the roll numbers and inventory.

At the Owens Corning (OC) facility in Granville, Ohio, Abdou Diouff gained valuable hands-on experience in the research and testing of geosynthetic materials and for a variety of applications. As an intern, one of Abdou's first projects was to conduct tests to quantify the interface friction or shear strength of the RhinoMat and RhinoSkin woven-coated polyethylene geomembrane products. These results were used to analyze the suitability of their existing products for a range of slope angles, and assist in developing new geomembranes for the geomembrane market to accommodate steeper slopes. Abdou was also tasked with evaluating the use of earth anchors for ballasting exposed geomembrane covers from wind uplift on top of closed landfills. Developing a design methodology to utilize an anchor design for wind uplift mitigation was an important and large project for Abdou. Finally, Abdou traveled to Mississippi to attend a Geosynthetic Materials Association (GMA) organized meeting with the Mississippi Department of Transportation, U.S. Army Corps of Engineers Research and Development Center, and local engineers. During this meeting, the GMA contingent updated attendees on new specifications, geosynthetic products, and applications with these end users.

Finally, Elsa Wingardh spent ten (10) weeks over the summer at Layfield's fabrication facility in beautiful San Diego, California. Elsa gained valuable exposure to the business aspects of a construction company while working in the Design and Estimating Department at Layfield. Once a project request was received from the sales department, Elsa assisted in providing an in-depth analysis of the specifications, quantifying the project, pricing costs, such as labor, materials, sub-contractors, equipment, and fabrication costs, and creating a final project budget proposal. To assist with preparing the final budget proposal, Elsa visited several job sites to gain sufficient experience about the work being performed so she could contribute to developing the necessary construction materials. Layfield also treated Elsa to several fun activities during the summer, including bowling, horse racing at Del Mar Race Track, and attending Layfield's summer picnic at Rohr Park in Chula Vista, California.

The FGI is already working on their 2018 Summer Internship Program and hopes to see it expand even further. The internship program has been a great assistance to the FGI research activities at the UIUC because the interns return with hands-on experience of the testing, installation, and quality control aspects of geomembranes.



Figure 1: Left to Right: Raymond Pu, Abdou Diouff, Billy Hernawan, Civil and Environmental Engineering Students in front of the Newmark Civil Engineering Laboratory, home of the FGI, at the University of Illinois at Urbana-Champaign

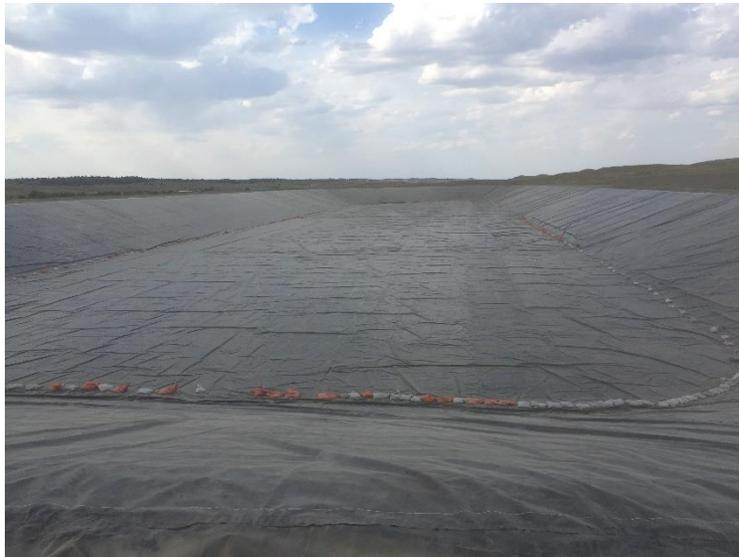


Figure 2: Photo of geomembrane installed for hog waste pond in Broken Bow, Nebraska, taken by Raymond Pu while being a summer intern with CLI.



Figure 3: Billy Hernawan (L) and Raymond Pu (R) getting hands-on experience on a CLI job site during their summer internship.



Figure 4: Elsa Wingardh developing a project budget proposal at Layfield during her summer internship.

The FGI is dedicated to advancing the use of fabricated geomembranes through education, research, and technology transfer. The FGI is a consortium of manufacturers, fabricators/installers, designers, regulators, and material suppliers of fabricated geomembranes. For more information on the FGI, please visit [www.fabricatedgeomembrane.com](http://www.fabricatedgeomembrane.com).