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International Association of Geosynthetic Installers

IAGI Newsletter

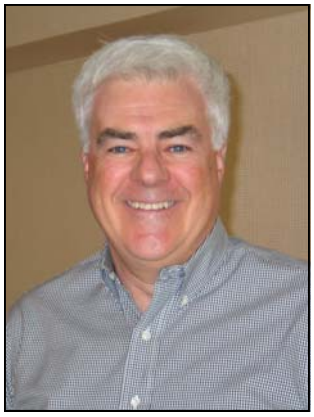
A Note from IAGI's President - Dennis W. O'Brien

My term as President is nearing its end. Even though I will no longer be President I will remain on the Board as Immediate past President. As a member of the board for several years it has been gratifying to see IAGI's progress from the Certified Welding Technician, HDPE, Reinforced and PVC, program to the roll out of the Approved Installation Contractor. Both of these programs have established the credibility of IAGI as an industry organization.

I would like to personally thank the past and present IAGI board members who have worked on the development and implementation of these programs.

When you receive your ballot, please make sure that you consider that these people will be on the board for two years representing you and IAGI. It is important as IAGI members to fill out the ballot and return it promptly to make your opinion heard.

The summer was busy for everyone and we hope that business has treated you well. Please contact Laurie Honnigford, IAGI Managing Director at iagi@iagi.org or +651-554-1895 if you have any questions regarding IAGI or are interested in nominating someone for the 2008/2009 IAGI Board.



Dennis W. O'Brien

Inside this issue:

Industry News

Concord Geotechnical announces their move to a new, larger headquarters facility in New Hampshire. All correspondence can be sent to:

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IAGI currently has affinity programs with Yellow, YRC Regional Transportation and Office Max. IAGI Members and their companies receive discounts on the many different goods and services that each company provides.

For more information about this or other Yellow services contact your IAGI / Yellow Association Solutions Representative, Mike Ramsey at **1.800.458.3323 ext 5728**. You can also enroll at **Enrollhere.net** to take advantage of your discount today.

GeoAmericas 2008 update

GeoAmericas 2008, the First Pan-American Geosynthetic Conference and Exhibition, continues to gather steam. GeoAmericas will be held March 1-5th, 2008 in Cancun, Mexico. Conference organizers of this bilingual event are excited for this historic industry milestone. The conference includes short courses, tradeshow, training lectures, technical sessions and many extra curricular activities to enjoy the Mexican culture and scenery.

IAGI will be presenting a bilingual (Spanish and English) Training Lecture titled "The Good, the Bad and the Ugly: What does a geomembrane installation look like?" This session is directed toward engineers, government officials, inspectors and welding technicians. Session objectives include educating attendees on containment design details that result in a good installation and those details that compromise the quality of the installation; what good seams; pipe boots, patches and trenching looks like; a hands-on practicum on what inspectors should look for in a good installation; and a discussion of design details that cause problems during installation and ways to avoid those types of design items.

IAGI's session will consist of both lecture and hands on demonstrations.

In addition to the Training Lecture, IAGI will be holding its Annual General Assembly a the Conference. More information on time and date of the General Assembly will available in the winter issue of the IAGI Newsletter.

For more information about the GeoAmericas 2008 Conference, please visit: www.geoamericas.info.

If you would like additional information on the General Assembly or the IAGI Training Lecture, please contact Jilien Harvey, IAGI Project Manager at +651-554-1895 or jilien@honnigford.com

Newsletter Advertising Space Changes

Take advantage of advertising space within each IAGI Newsletter. IAGI publishes a newsletter four times a year. Ads must be business card size and camera ready—jpg format is preferred. The cost per ad is $110.00 for IAGI members and $210.00 for non members. Each company that advertises within the newsletter must pre-pay the advertising space prior to the newsletter going to print. An advertising contract will now be required to place an ad.

If you are interested in placing an ad or the upcoming publication schedule, please contact Jilien Harvey, IAGI Project Manager at +651-554-1895 or jilien@honnigford.com

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Upcoming IAGI Board Elections

It is that time of year again— the IAGI Board Elections. This go around, there are four open positions. We currently have a short list of candidates. If you are interested in nominating someone, please contact IAGI staff no later than October 1, 2007. The ballot for the new board will be sent out the middle of October and will be due back by November 26th. The new board will be introduced in the December IAGI newsletter.

Voluntary leaders are responsible for the direction of the organization. The board governs, develops policy and sets a course for the future. Maintain focus on the mission and strategic goals and give staff procedural directives for all initiatives. Functions of the Board:

- Governance
- Policy and Position Development
- Visionary-Future focus Fiduciary

#1 Lie regarding being on an Association Board: "You won't have to do anything when you get on the board!"

IAGI' Board needs members who can give time to the further the goals of IAGI. IAGI Board members take an active role in guiding the organization's future.

If you are interested in nominating any additional candidate for the board, please contact Jilien Harvey , Project Manager at +651-554-1895 or jilien@honnigford.com by October 15, 2007.

Welders Obtain IAGI Certification

Congratulations to **Atlantic Lining, Nilex, Headwater Lining and National Lining** and who sponsored Certified Welding Technician testing of their welding technicians in their employment.

IAGI developed a welder's certification program so installers could define standards of proficiency, recognize the knowledge, experience and skills of installers, and reward those who qualify with industry recognition.

Engineers benefit from IAGI's Certified Welding Technicians (CWT) program because it verifies that the welders on their job have experience in welding. Additionally, they can specify that the polyethylene geomembrane welders are certified for the type of welding they will perform. The CWT program certifies welders for both extrusion and fusion welding methods.

For further information, contact Laurie Honnigford, Managing Director, IAGI at +1-651-554-1895 or e-mail iagi@iagi.org.

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PVC Geomembrane Used At Colorado Power Plant

by John Heap, Colorado Lining, International

Known for its high winds, severe storms and intense summer heat, eastern Colorado presented some challenges for the project of capping waste residue from coal slurry ponds at Pawnee Power Station, a plant located in Brush, Colorado.

With over 70 acres of ponds and landfill areas, this facility has required an extensive use of geomembranes in containment applications. The first ponds were lined in 1982 by Schlegel Lining Technology utilizing a 100 mil HDPE. Beginning in 2002, the material that had served the clients needs over the past 20 years was in need of replacement. The material was one of the first generations of HDPE used in the United States and showed good long term resistance to UV, although, some stress cracking was noticed along the edges of the seams. The seams were made with extrusion welds due to the installation taking place prior to the development of wedge welding technology, currently used in the industry.

Climate challenges and site-specific requirements made it necessary for Utility Engineering, the selected engineering company for the project, to carefully consider lining companies for the job. Utility Engineering considered three bidders for the low-bid project. Because it had the most responsive proposal and has been involved in the construction and maintenance program at Pawnee Power Station over 15 years, Colorado Lining International (CLI) was selected for the project.

"We were involved in the design phase and were the only lining company at the pre-bid, and therefore we understood the project well enough to assist the dirt contractors in the timing and sequencing of the project during the bid phase," Pat Elliot, CLI, said. "We also had strong relationships with the dirt contractors from previous projects at Pawnee and other sites as well."

Confident and experienced after completing several other large caps using LLDPE, PVC and GCL, the lining company worked closely with Utility Engineering to determine the most suitable materials for the project. Proper execution of this multiphase and multiyear project required sludge removal from three storage ponds into a double lined HDPE cell, and the re-lining of the original three ponds with a double lined system. Each layer was electronically leak tested and certified prior to the filling of the ponds.

Upon review of the site specific requirements, it was concluded that a PVC geomembrane was the best option for the new cap. The deciding factors included:

1. The three dimensional elongation characteristics of PVC provided excellent physical properties to cope with the differential settlement that will occur in the cap section. PVC has the ability to elongate over 400 percent and handles the extremes of capping applications better than any geomembrane on the market.
2. The liner could be fabricated in panels built to size for the footprint of the cap. Each panel was laid out on CAD and was labeled to fit the cross section of the cap. This sped up the installation process and reduced field seams by over 80 percent in comparison with a 22.5' wide LLDPE product.
3. The use of dual track fusion welds and subsequent air pressure testing allowed for the testing of long length field seams with non-destructive means. The flexibility of the PVC also allowed the installer and engineer to verify peel strength along the full length of the seam - not just in a 3' section every 500' as with other capping materials.

Fabrication of the new PVC liner began in mid-June 2006. Eight CLI employees and four local laborers worked on the project from start to finish. The schedule required production days of over 100,000 SF which was attainable with the large panels of PVC.

The liner was shipped to the power plant for installation at the end of June. The liner

PVC Geomembrane Used At Colorado Power Plant—contd.

company's experience with eastern Colorado's high winds and summer afternoon storms greatly aided the discussion on whether to use PVC over a PE in regard to the tricky weather conditions.

"We have completed several projects at the same location using HDPE, which was a challenge when experiencing severe winds recorded up to 92 mph," Elliott said. "With PVC's flexibility, it is much easier to deploy on high wind days and the large fabricated panels allowed us to complete large areas quickly to avoid damage to the sub-grade by rain." PVC maintains excellent frictional characteristics with sub-grade which keeps the leading edge from being picked up as readily as other options that do not have the same flexibility. The project progressed during the heat of the summer, and several days were over 100 degrees. The crew was careful to prevent safety hazards for the crew such as heat exhaustion and dehydration. They also had to monitor welding temperatures and speed in the extreme heat in order to maintain high quality QA standards. The summer schedule required the crew to start at 5:00-5:30 so much of the project could be completed before workers had to face the extreme heat of the day.

One difficulty encountered during installation involved the cap cross section. This part of the liner had a difficult edge tie that included a GCL and a perimeter ditch. Installers had to cut the double lined HDPE pond liner out of the anchor trench and fold it back onto the cap in order to line over it with the PVC to get drainage outside of the containment.

"Most of the construction was similar to current PVC construction plans," Elliott said. "The use of the dual track fusion weld made the QA/QC effort much easier and definitely more comprehensive. The unique tie in procedure was difficult but manageable."

Because Elliott feels they are superior and allow for more comprehensive QC, wedge welded seams were used instead of an adhesive weld on this project. "The engineer was skeptical of PVC adhesive welds because he was the most familiar with HDPE," Elliott added. "The wedge welding and air pressure testing gave him the confidence in the PVC and its installation methods to be comparable to HDPE".

"Utility Engineering's lead engineer Rich Schnier was a pleasure to work with on this project," Elliott commented. "His leadership and willingness to work with contractors made a difficult task much easier to complete. Rich's work ethic and ability to make touch decisions when faced with challenging problems makes him a consummate professional."

Shortly after this project was completed Schnier announced his intention to retire. "We will miss working with an engineer of Rich's capability and wish him the best in his retirement," Elliott said. The project was completed ahead of schedule on July 28, 2006, and was under budget.

It has since been re-vegetated with a native grass blend that is common on the eastern plains of Colorado. It now looks like the rest of the prairie surrounding the plant.

Conclusion

New Clean Air Regulations from the EPA and our current energy crunch are changing the face of our power industry. The critical need for proper containment and capping of coal ash landfills, and slurry ponds is a major challenge for this industry and for our country.

The geosynthetic industry is taking on this challenge by continuing to develop products, installation techniques, and designs that will assist in keeping our waterways and air clean for future generations.

For additional information regarding this article, please contact Jilien Harvey, The Honnigford Group, LLC at Jilien@honnigford.com

This article originally appeared in the May/June 2007 issue of Land and Water Magazine. To learn more about the publication, visit www.landandwater.com.

New Members

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Ertech is committed to providing a total package for earthworks, liner supply, fabrication and installation. With over twenty years experience in the design and construction of projects utilising geosynthetics, we can offer our clients engineered solutions to any liquid retention problem.

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Based in Dubai, and partnered with a number of international design, manufacturing and research companies, Geotech offers a wide range of products and services in the geosynthetics industry.

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Membrantec S.A. mainly provides installation and commercialization services for Geomembranes, Piping and Geotextiles, backed by strict adherence to Quality Control and Environmental Prevention procedures and standards through a solid Commerical, Operational, Technical and Administrative infrastructure.

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Newsletter Distribution Change

The IAGI Newsletter is published four times annually and is an important IAGI member benefit. The publications contain the latest news on the work of our association as well as information about what's happening with our member companies the industry as a whole.

With increasing technology and the need for information to be available where you want it, when you want it and the increase in postage, IAGI's Board decided that beginning with the 4th Quarter 2007 newsletter, the IAGI newsletter will be sent to all members in electronic format via e-mail.

Any staff of IAGI member companies can receive an electronic copy of the newsletter. Prior to the newsletter being sent out, a form will be sent to each primary contact at your organization to list all contacts you wish to receive the newsletter electronically.

Geomembrane CQA—Let's poke some holes: Installment 4

by Glenn T. Darilek, P.E.

This series provides some hypotheses related to geomembrane CQA with the invitation to poke holes in these "pincushions." The previous pincushion and the responses are:

Pincushion 11 – Destructive seam testing should be used to evaluate the weld quality, not seam strength. The mode of failure of the sheet (ductile vs. brittle failure adjacent to the seam) is more important than the strength measurement.

Ian Peggs, Ph.D. - There is no way to assess the quality of the seam bond quality by performing a strength test (shear or peel), because the sheet next to the weld will always fail before the bond strength can be adequately challenged. This is quite evident by the fact that the minimum specified shear tensions in specifications such as GRI GM19 increase in proportion to geomembrane thickness despite the fact that the bond we are trying to evaluate is independent of thickness. In fact, if we "do the math" we will find that a 40 mil seam fails in the adjacent material at only 7.3% weld efficiency, 60 mil at 11%, 80 mil at 14.5%, and 100 mil at 18% efficiency. Surely anyone can make a weld with an efficiency exceeding 20%. So let's just look for ductile breaks adjacent to the weld to confirm that the welding process has not made the material brittle where stress concentrating notch geometries occur.

Ron Frobel - This pincushion is only partially true and is dependent on the type of geomembrane material. For example, for PVC geomembrane, a minimum strength of 80% of the parent material tensile strength may be required as an attainable value whereas HDPE will require only yield in the upper or lower sheet regardless of attainable tensile strength.

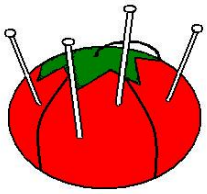
Sean P. Currie, P. Eng - I was involved in one project where we encountered destructive tests failing for seam strength, in particular for shear testing. In the first 23 destructs of the project, 10 of the destructs failed for value (i.e. they had FTB breaks) for either shear or peel. Based on the low strength values, we initiated an investigation which led us to determine that some very notable inconsistencies in liner thickness were to blame. The installer was not the problem, the material being installed was.

Richard Thiel, P.E. - I have never had a seam fail strength that would not have failed for some other reason, such as peel. On the other hand, I have observed seams gloriously pass the strength requirements that were brittle, and even though they passed the project specifications, I failed them. Based on this, I considered deleting strength requirements from my specifications and just require ductility in the shear test, and near-zero peel in the peel test. After considering this question for over a year and discussing it with others, I found that others have experienced a few (very few) circumstances where the sheet was thin, either because of manufacturing or due to excessive grinding, and it failed the strength requirement yet passed the ductility requirement. Based on this, I have settled on requiring both strength and ductility for the shear test. For the peel test we end up recording the strength anyway, but I don't know if the peel strength is of any real value. I would be curious to know if anyone thinks that it is.

Thank you to the responders. Now here is a new pincushion to consider:

Pincushion 12 – Seams essentially never fail in service, and the emphasis on destructive testing of geomembrane seams for strength, has focused attention away from the most prevalent and significant problem, which is holes in the installed geomembrane.

Please provide your very brief responses to glenn@llsi.com. Responses will remain anonymous if requested.



AIC Update

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The AIC program has been successfully running for more than a year. Currently, there are seven companies that have achieved AIC status.

After many requests and consideration taken for the growing international contingent, the AIC will now be available to countries outside the US and Canada. The parameters are slightly different as each country has modifications to the current AIC application process. Therefore, the applicants can only submit their AIC status for bids within the country in which they apply.

Application forms and more information will be available online by October 1, 2007. If you have any questions, please contact Laurie Honnigford, IAGI Managing Director at +1 651-554-1895 or iagi@iagi.org

Current AIC Companies

American Environmental Group LTD

Atlantic Poly Liners, Inc.

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Colorado Lining International

Environmental Fabrics, Inc.

Layfield Environmental Systems LTD

Taylor Geosynthetics Inc.

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