Volume 5, Issue 2 Spring 2005

International Association of Geosynthetic Installers

IAGI Newsletter

A Note from IAGI's President - John "Robbie" Robinson

The IAGI Certified Welding Technician Program is continuing to gain momentum. As April 2005, more than 23 companies have invested in getting their welding technicians certified. Currently, more than 232 technicians hold polyethylene certification. The many companies using Certified Welding Technicians demonstrate that their company is serious about its commitment to meeting high standards of field performance. It also gives companies who have a lot of welders a good indicator about the training of their technicians.

This being said, it is also true that engineers and designers still have questions regarding this program – and not enough of them are including the requirement for certified welders in their specifications.

Because of this, IAGI has engaged in a marketing campaign to get the use of certified welding technicians included in specifications. Through the marketing campaign IAGI is asking the installers to help educate the engineering community about the advantages of having IAGI Certified Welding Technicians (CWT) on their jobsites. A new brochure has been developed for installers to give to engineers, owners and other end users. This brochure tells these users about the CWT program and gives them verbiage that can be added into their project specifications. Copies of this brochure will be sent to all companies who employ Certified Welding Technicians. To request copies of this brochure, please contact the IAGI office and we will send them to you

John "Robbie" Robinson

Inside this issue:

Our Thanks

IAGI would like to thank "Demo"Dave Mc Laury, Demtech, Placeville, CA, for the work he has done to revise the IAGI Proctor Manuel used in Certification Testing. These clarifications make the proctor manuel more user friendly and improves the overall certification process.

You can download the revised version from the www.iagi.org website.

Industry News

Yellow Transportation

Yellow Transportation named the #1 company in our industry in the *Fortune* "Most Admired Companies" issue for the second year in a row. James L. Welch, Yellow Transportation President and CEO commented, "Our efforts have led to a number of honors;... however, the most important endorsements come from you, our valued customers, who return to us day after day for transportation solutions." Corporately, IAGI members saved a whopping $68,094.00 in 2004 on 85 shipments.

TRI / Environmental

TRI / Environmental announced that Ms. Jacqueline Dettman was hired as Project Development Manager.

In addition to Jacqueline, TRI welcomed Mr. John Allen (no relation to TRI's Sam Allen) as Assistant Director of their Geosynthetic Interaction Program.

Sam Allen, TRI, was elected as Chairman of the ASTM D35 Committee on Geosynthetics.

PGI / CETCO Short Courses a Tremendous Success

The PVC Geomembrane Institute (PGI) and CETCO teamed up to offer a new short course entitled "Constructing with GCLs and PVC Geomembranes" in Denver, Colorado and Cheyenne, Wyoming last month. The courses were "well attended with inquisitive audiences," according to Tim Stark, lead instructor and Technical Director for PGI. With a combined attendance of more than 100 people, these short courses were a tremendous success.

The attendees of this course had many positive comments. Some of the attendees stated that: "Presenters were very knowledgeable; comparisons between PVC liners and other liners were helpful", and, "I found this extremely helpful to hear about the use of PVC geomembranes and GCLs". Attendees also demonstrated why they are interested in such an informative course with comments like: "Great enthusiasm for the subject matter by all participants" and "Good overview of materials and their effectiveness."

The first course took place on March 7, 2005 in Denver, Colorado at the Denver Merchandise Mart. The second took place on March 8, 2005 in Cheyenne, Wyoming at the Little America Hotel. This course focused on how GCLs and PVC geomembranes can be used together as a composite liner. Attendees left this course with a broad knowledge of what is required to properly design, specify and construct liner and/or cover systems with GCLs and PVC geomembranes.

The next course schedule is being planned at this time. If you are interested in offering this course in conjunction with your educational event, please contact PGI. For more information on future courses visit www.pvcgeomembrane.com

Newsletter Ad Space Available

Advertising space is available in each IAGI newsletter. Ads must be business card size and camera ready—jpg format is preferred. The cost per ad is $55 for IAGI members and $110 for nonmembers.

To place an ad, contact Anne Steacy, IAGI Treasurer. She can be reached at 713-432-0322 or via email at anne@steacy.org

Reverse Logistics

Shifting Gears

"Sometimes it's the wrong size. Sometimes it's damaged or defective. Sometimes it's an attempt to con a retailer into paying an unwarranted refund. Regardless of the cause, the results are the same: costs and headaches for companies that must handle damaged, defective, returned or unsold goods." (excerpt from: Shifting Gears, BY DAVID BIEDERMAN, 7 February 2005, Journal of Commerce, with permission to reprint.)

"This backward flow of goods is called reverse logistics, and it's big business. Among non-grocery retailers, the top 30 U.S. companies average $53 billion a year in returned goods, according to the Center for Logistics Management at the University of Nevada. Wal-Mart alone handles $6 billion a year in returned goods.

Despite its importance, reverse logistics is the black sheep of supply-chain management. Compared with the "forward" logistics of moving goods to store shelves or factories, reverse logistics is messy, complex and unglamorous. For managers, it's seldom the route to executive promotion.

Many companies still view reverse logistics as a necessary evil, a cost of doing business. They'd have a different attitude if they understood what it costs them, said Dale Rogers, chairman of the Reverse Logistics Executive Council and director of the Center for Logistics Management.

Rogers said the average annual return rate for general merchandise is 6 percent. For mass merchandisers, it ranges from 4 to 15 percent; catalogue retailers, up to 18 percent; electronics distributors, about 10 percent; and auto parts and consumer electronics, around 5 percent.

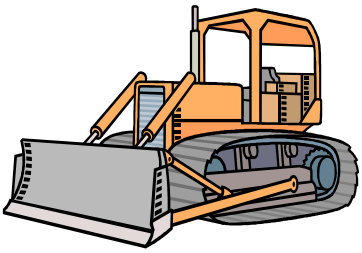
Companies often underestimate how much they lose through inefficient handling of returns. Rogers said companies often apply the same formulas for inventory-carrying costs to reverse and forward logistics. He said that's a big mistake - such costs are comparatively minor for new products, but about 100 percent for many returned goods.

Returned goods are expensive for shippers. There are costs for transportation, inspection, testing, restocking and repacking. Reverse logistics is also a management challenge. Unlike new goods in nice, neat, bar-coded packages, returned goods often look like a teenager's closet - they come back in bags, shoeboxes and crushed packages. They usually come in small quantities from multiple locations. They require additional handling and judgment on whether the goods are salvageable."

If your mind pictures the pile in the back corner of your warehouse, there is peace of mind in store for you. **IAGI'S** transportation solutions partner, **Yellow Transportation**, has Return Goods Management specialists ready to handle the details for you and make your reverse logistics processes hassle-free. Call **1-800-458-3323**, **ext. 3482**, for more information.

IAGI/Yellow Transportation Adds Value to Your Membership and Helps You Sleep Well at Night.

Friction Angle Testing: a brief summary



If the material supply decision is made immediately prior to planned installation, the rush to mobilize to the site often conflicts with the time-dependent test procedures associated with interface friction testing.

Introduction

Installers and contractors are sometimes required to assume responsibility for documenting that purchased geosynthetic lining system components meet the job-specific slope stability requirements. This is generally accomplished via large-scale interface friction testing using the specific geosynthetic materials and soils to be deployed at the site. Among the many challenges associated with this activity are the following.

If the material supply decision is made immediately prior to planned installation, the rush to mobilize to the site often conflicts with the time-dependent test procedures associated with interface friction testing.

If and when generated test results fail to demonstrate stability as defined by the design engineer or specification, the contractor/installer is often forced to enter into and participate in conversations regarding slope design and stability with which they have a) no control, and b) little time for.

History has shown that many times test parameters specific to the desired interface friction test are assumed by the design engineer yet not always translated successfully to the written specification governing all testing activity. When this occurs, unfortunate consequences almost always result. At best, valuable time is lost as the specific test parameters desired are researched and discovered through phone calls, e-mails, etc. At worst, the test parameters are defined without the design engineer's input, and the generated test results are not responsive to the original design.

Item three is often what we, at TRI/environmental have the most success at responding to via a clear understanding of the many features of an interface friction test and the considerations that are inherent in these features. From experience, it is clear that the test parameters selected for a given interface friction test will impact the final result. There are many valuable resources in the literature to address proper and responsive testing and appropriate specification of interface friction characteristics. Sections below provide a brief summary of parameters that should be defined before interface friction testing can begin.

Test Configuration

What's on top? What's on bottom? What superstratum and substratum are used? Are these "typical" materials or "job-specific"? These questions are paramount in any testing program and can contribute to success of hydration, measured values, clamping, and overall relevancy of results. While the materials composing the specific interface are almost always specified, these other parameters are sometimes left to the laboratory. While good laboratories, given the testing objectives, can and do offer insight into effective gripping, material placement, and all other set-up conditions, it is always smart to be as detailed as possible in establishing the parameters thus assuring the desired test.

Normal Compressive Loads

While a single load-dependent shear strength can be confirmed under specific conditions with a single test, typical interface friction testing involves the evaluation of shear strengths over a job-specific range of normal compressive loads represented by three stresses. No friction test can be performed without an applied normal compressive load and this load, or range of loads, must be specified before work may begin. Shear strengths and interface slide behavior are very dependent on normal compressive load and it's important that the load range specified is not so large as to negate the rele-

vance of any regression (or linear friction angle determination). Alternatively, numerous regressions may be performed to represent different parts of the load – shear stress envelope. Testing laboratories will observe and document all post-tested specimens and detail failure planes and modes. These observations may serve to identify normal load ranges that are large enough to encapsulate more than one failure mode.

Conditioning / Hydration Prior to Shearing

Almost all interface friction testing is performed in a hydrated state. GCL's and soils are assumed to become hydrated in most cases with the possible exception of when they are encapsulated between two geomembranes. There are two methods of hydration. The first method is to hydrate (and consolidate) the GCL or soil under the normal stress at which the specimen will be subjected to during shearing. This method is used when one estimates that the field loading will be largely applied before the GCL or soil has time to significantly hydrate. The second hydration method is to hydrate the GCL or soil at a small nominal stress (in the range of 1 psi) until the specimen is fully hydrated. After hydration the specimen is then placed under the full normal stress under which shearing will occur. The sample is allowed to consolidate and is then sheared.

Note that there is one significant caution when the specimen is hydrated under a low normal stress and then consolidated under a moderate to high normal stress (above 30 psi). Significant swelling of a GCL can occur when hydrated under a low normal stress. If moderate to high stress is applied quickly to the swelled specimen, significant bentonite can "squeeze out" from the GCL into the interface resulting in low measured shear strengths characteristic of an interface smeared with wet bentonite. This may not be representative of field conditions. In these cases a step loading procedure is often specified. One may start with a relatively low normal stress and increase the normal stress by doubling the previous stress. The stress increments are typically applied twice a day. The interface is observed after completion of the shearing phase and inspected for any bentonite that has squeezed out during the test.

These hydration procedures should be considered when specifying a test because the methodology that is followed may impact final results.

Displacement Rate

During shearing of a hydrated GCL or low permeability soil, the stress conditions in the material will increase. This will initially cause an increase in the pore water pressure. This increase will dissipate over time. If the displacement rate is slow enough to allow for the dissipation of excess pore water pressures during the shearing portion of the test, then the test is termed drained. If the displacement rate is too fast to allow the pore water pressure to dissipate then the test is termed undrained. One case is not "right" and the other "wrong". The drained case is usually preferred in our industry since the pore water pressure is known to be negligible. If the test is performed in the undrained condition, the pore water pressure influence is variable and unknown. There is no definitive answer as to whether one condition produces consistently higher results than the other, although most experience indicates that drained conditions will generally produce higher results.

Many test specifications require that a specific strain rate be followed. The good news about this inclusion is that the testing laboratory job is simplified by doing what's required by the specification. However, the ASTM test procedures that govern this testing have specific rules that govern strain rates that may sometimes conflict with the specified strain rate. Successful pore water pressure dissipation is addressed in the test standards and may be assured by determining and using the appropriate strain rates. This is often not done, especially if default or inappropriately specified strain rates are incorporated into the governing specification. Sometimes, this results in unintended undrained tests, depending on the nature of material being tested. Regardless, the decision regarding strain rates to be used in friction testing benefit from a conversation be-

There is no definitive answer as to whether one condition produces consistently higher results than the other, although most experience indicates that drained conditions will generally produce higher results.

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New Members

IAGI extends a warm welcome to the following new members:

CETCO Lining Technologies
Donald L. Carine
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Web: www.cetco.com/LT
A leading manufacturer and innovator of Geosynthetic Clay Liners (GCLs). Since 1990, over a billion square feet of Bentomat® and Claymax® GCLs have been installed in numerous projects throughout North America. Along with a full line of geotextiles, CETCO offers the TexDrain® family of geonets and geocomposite drainage blankets. Our new EasyRoller® GCL Deployment System speeds installation by three times the normal rate, minimizes labor and ultimately saves money.

Headwater Lining, LLC
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Web:
www.headwaterlining.com

Primary Systems, Inc.
Christopher Cassidy
3831 16th Street SE
Calgary AL T2G 3R7
Canada
Tel: 403-508-9984
Fax: 403-508-9985
Installers of membranes, floating cover, concrete embedment and the like.

2005 Course Offerings

Geosynthetics Institute GRI-19 Conference

The next Geosynthetics Institute GRI-19 Conference will be held 14-16 December 2005 in Las Vegas, Nevada. This conference will be held in conjunction with the North American Geosynthetics Society (NAGS). Contact Marilyn Ashley at 610-522-8440 or visit www.geosynthetic-institute.org.

Geosynthetic Institute (GSI) Course Offerings:

Thursday, August 4, 2005
Geosynthetics in Transportation/Geotechnical Applications

Friday, August 5, 2005
Geosynthetic Reinforced Wall and Slopes

Thursday, August 11, 2005
Geosynthetics in Waste Containment Applications

Friday, August 12, 2005
Quality Control/ Quality Assurance of Geosynthetics

Each course is valued at 0.8 CEUs (8 hours).

For more information regarding these courses log onto www.geosynthetic-institute.org/summerr2005.htm

Friction Angle Testing: continued

tween the laboratory and design engineer to assure generated test results are responsive to the design engineer's objectives for stability evaluation.

The interface test is necessarily complex in its many test parameters and job-specific features. This complexity is often at odds with the rapid-turnaround time requirements of construction schedules and materials acquisition. The good news is that qualified and responsive laboratories exist to assist in the confirmation of slope stability. It is always important, however, that a commitment to meet the design engineer's test objectives is made, and that all work together to assure relevant and meaningful test results. It is also important to constantly plan for the time associated with this testing.

Why would the contractor / installer be responsible for this assurance? I don't pretend to know or offer an answer to this question. However, experience has shown that this scenario does exist sometimes, and ignoring the work associated with assuring a proper interface friction test is much more ominous than working to assist a successful one. And success in this regard, is achievable.

Sam Allen *is Vice President & Division Manager at TRI Geosynthetic Services, Austin, TX. Sam can be contracted at +512-243-2101 or 800-880-8378 or Sallen@tri-env.com*

References

Bemben, S.M. and D.A. Schultze, 1993, "The Influence of Selected Testing Procedures on Soil/ Geomembrane Shear Strength Measurements," Proc. Geosynthetics '93, Vancouver, Canada, IFAI, p. 619-631

Gilbert, R. B., Scranton, H. B. and Daniel, D. E. (1997), "Shear Strength Testing for Geosynthetic Clay liners" Testing and Acceptance Criteria for Geosynthetic Clay Liners, ASTM STP 1308, L. W. Well, Ed., American Society for Testing and Materials, pp. 121-138

Obermeyer, J. E., Gilbert, R. B., Sebesta, M. E. and Allen, S. R. (2003), "Drained Shear Testing on Clay-Geomembrane Interfaces," Geotechnical Conference/North American Geosynthetics Society Conference, Winnipeg, Canada, Sept. 29-Oct. 1, (on CD; no page numbers).

DEMO DAVE'S CORNER

TRICKS OF THE TRADE – EXTRUSION WELDING:

Let's face it, extrusion welding is a necessary component of PE and some PP liner installations, it is also a pain in the neck, back, and wallet! In this continuing series of articles, I will use my column to share a few "tricks" I've learned over the years that probably won't save the pain in the neck or back but might help save time and money.

TRICK NUMBER 5:
Angle of the Dangle

Before starting a weld that requires tight turns or vertical welds, remember to always start off in the most uncomfortable position. This will help prevent being tired AND uncomfortable at the end of the weld.

Most technicians like to lean the extrusion welder back to promote forward movement which is not a bad thing. Just be careful! If you lean back too far the pre-heat air will have to travel a longer distance and it will deflect off the liner surface. These are both bad things because proper pre-heat is one of the most important aspects of welding.

In my future newsletter columns I will share tips on the following aspects of extrusion welding:

Welding Rod Management

Extension Cord Management

Vacuum Testing

Please feel free to call Demo Dave McLaury with questions, comments, and suggestions regarding this or future articles. Telephone: (530)-621-3200 or demo-dave@demtech.com.

IAGI Company Recognition Program

First Draft Available for Comment

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IAGI has been working on the Company Recognition Program for the past year. The goal of the program is to recognize those companies who meet a minimum level of professionalism, ethics and business practices, further the growth of the geosynthetics industry and advance better quality workmanship.

IAGI is developing this standard of performance based upon dialogs with installers, suppliers, outside experts in the containment field and government officials who are involved in the geomembrane business. The Recognition program is a living document and the criteria will be updated periodically based upon feedback from members, consultants, legal council and changes in best management practices in the industry.

The first draft of the program and the application form are now available for public review and comment. IAGI members can retrieve this information from the IAGI's ftp site. To log on to this website open the browser on your computer. Type in: ftp://iagi.org/ReviewDocs. Please be aware that you cannot have www or http in the address line. You will get the login screen once you type in the address above. Username is: *IAGIGuest* and the password is: *proinstall*. You will find two draft documents there for your review. Please take a moment to look these over and offer comments to IAGI by 30 May 2005. Send your comments to Laurie Honnigford at iagi@iagi.org or fax: 651-450-6167.

This program is being designed for installers and by installers. The input from the IAGI membership and others in the industry is vital to developing a successful and relevant program.

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