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Share What You Know! Environmental Connection 2014 Call for Presentations Due May 31, 2013.
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IECA mission: Connect, educate and develop the worldwide erosion and sediment control community.

Environmental Connection is the quarterly magazine (published January, April, July and October) for members of the International Erosion Control Association (IECA). Our goal is to present industry and association news, highlight member contributions to society and promote the exchange of scientific and technical information. Each issue of Environmental Connection includes peer-reviewed articles on a wide variety of timely erosion and sediment control topics, as well as regular features that provide thought-provoking accounts of people, programs and issues in the erosion and sediment control profession.

Environmental Connection welcomes submission of articles of interest to erosion and sediment control professionals at all levels. Complete instructions to authors are published online at www.ieca.org.

IECA membership: Individuals receive Environmental Connection by being members of IECA. Professional membership costs $170 USD. Call 800.455.4322 or go online to www.ieca.org for more information.

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Attendees Enjoy Packed Expo Hall and Top-Notch Education in San Diego

Wow, another conference behind us! Thank you to all of our sponsors, exhibitors, presenters, moderators, attendees, staff and volunteers. We appreciate all of the positive feedback we received regarding the education sessions and special events. We also are pleased so many of you noticed the new adjustments we made and will continue to make so that Environmental Connection is successful year after year - just wait until we get to Nashville in 2014!

Even though the temperatures were cooler than anticipated, San Diego was a beautiful place to host our annual conference. Even Town and Country Resort grounds were beautifully landscaped and well-kept. While we agree it was a challenge to find your way around the resort the first couple of days, it was part of our efforts to help direct attendees and exhibitors to their destinations by using directional signage. In fact, someone even went home with one of our banners. (We would love to have that back, by the way…) In addition to signage, we had staff members stationed around the property to help alleviate any confusion.

Performing Above the Standard

We had more than 1,500 attendees, which was slightly down from last year’s conference in Las Vegas, but still on track with the past few years during these trying economic times. The exhibit hall was smaller by design, but was packed with quality vendors and eager attendees. We even had a booth waiting list, and were fortunately able to squeeze in...
Leadership Involvement

Nearly every committee and Chapter met at the conference, even Region Two leadership made ground for future plans. The new International Regional Council (IRC) had their first face-to-face meeting and are well on their way to forging their leadership position in the future. Of course, the Region One Board met and set the foundation for exciting endeavors this year.

some exhibitors last-minute.

Our keynote address by Barry Fagan gave many of us a lot to think about as he challenged us. Many said that he truly set the tone for the conference. He asked us to consider our connections and the possibilities of performing above the standard, instead of accepting what we have been told is the best management practice. Yes, that would be risky, but without risk, we minimize the rewards as well. The golf tournament, although cold for the golfers, was enjoyed by all. It gave participants a chance to network with other industry professionals, play in a friendly competition and even win cash in our scramble game. The beach bash also was a hit this year! This celebration helps gives us a closing to the week’s events. Many of you took part in the photo booth. Looking forward, we will continue the momentum to help make next year’s closing bash even more entertaining.

Again, all of us at IECA - staff, leadership, sponsors and members - appreciate your support and attendance at our conference. While not everyone who attends our conference is a member, we couldn’t do it without our members’ commitment. For that, we gratefully thank you.

Included here are some photos that highlight this highly successful conference – enjoy! And we’ll see you next year in Nashville, Tenn. 

The photo booth at the CPESC Beach Bash was a huge hit.

IECA member Peter McRae treated the University Partner students to a sailing trip. The students came from all over the country and served as moderators for the educational sessions.

This year’s Hydrodeo contestants with our Mat Inc. sponsors.

Members enjoy our CPESC Beach Bash closing celebration.
Erosion and Sediment Control Data Gets Interactive

The GeosIndex.com website is a free tool for the user that publishes geosynthetic and erosion and sediment control product data in a user-friendly and customizable format. It can help professionals in the industry use data to find comparable options and solutions for diverse site situations.

The website GeosIndex.com launched in 2012 with a mission to publish geosynthetic and erosion and sediment control product data in user-customizable tables. Major product categories such as erosion control materials, drainage materials and geotextiles are included. Site users can select a material category and then narrow the table by selecting only the fields (or criteria) on which they want to compare products.

For example, for erosion control materials, one can include UV stability data (ASTM D4355) but exclude tensile strength (ASTM D6818); or include functional longevity but not thickness (ASTM D6525). The results returned can then be sorted high-low or low-high, products can be highlighted so one can follow them while sorting by different data columns, and the data can be exported in a common spreadsheet format. Links to manufacturer specification sheets also are included.

Find Various Options – Free!

The website, which is free for the user, helps project personnel meet specifications on a couple of important levels. Not only might one find a product suitable to a particular site, based upon the material performance requirements in the specification, but also it helps designers, contractors, regulators and even product distributors identify comparative options, which is often an essential component for site approval. To select product X, you may need to prove that it is as good as and perhaps better than products Y and Z. The GeosIndex database is a tool to assist that process, allowing one to view the comparative data in a single window or on a single page rather than having to sort through binders, multiple websites and long reports. The data on GeosIndex also may be updated at any time, so the most current data can be included.

By Chris Kelsey

Chris Kelsey is the editor of Geosynthetica.net. He writes on construction, engineering, environmental issues and sustainability. He can be reached at chris@geosynthetica.net.
Though it is still in its early phase of growth, GeosIndex.com has hundreds of products and has served thousands of users. ISO-related data is planned for 2013, as are additional product categories and company/product listings. Some of the manufacturers currently listing products include East Coast Erosion Control, Fiberweb (Typar), Geo Products, GSE Environmental, Huesker, Maccaferrì, NAUE America, Propex and Tensar North American Green.

It is important to note that web applications, like software, are tools in the project process; but they are never substitutions for proper due diligence.

GeosIndex’s data and a how-to-use video may be viewed at www.geosindex.com.
Customers across North America have been asking for an American made alternative to coir logs, and American Excelsior Company has answered with the development of Curlex® Blocs.

Success through innovation...
Not bad for a 125-year-old company.
Studies Provide Insight on Post-Construction Runoff Control Using Soil

The purpose of this column is to provide knowledge to readers of Environmental Connection by summarizing the latest results of relevant research. The sources mostly are referenced science and engineering journals, which means the information has been reviewed by other scientists and engineers before being published. The reader should interpret the results relative to his or her experiences.

Many professionals in our business have one foot in construction site practices and the other foot in post-construction stormwater controls. The latter is receiving a great deal of attention with funding for research and in papers featured in scientific journals.

A recent paper describes a relatively new tool for handling runoff from impervious areas. The tool, called “biphasic bioretention system,” as the authors refer to it, is a patented system that includes an initial saturated zone that overflows into an unsaturated zone. Both zones are planted with species that thrive in those environments.

The system the researchers installed was designed to handle a 1-hour, 10-year recurrence storm draining off 69.5 m² of impervious surface. Reductions in peak flows were 88%, and runoff volumes were 54% for heavy (>12 mm) rains, with discharge delays of about three hours.

In simulated storm water spiked with known pollutants (nitrate, phosphate and herbicides dicamba, glyphosate and 2,4-D), removal rates were 78-99%. The researchers indicated that this was shown to be quite a bit higher than a typical underdrain rain garden in a previous study. The relatively high nitrate removal was attributed to the saturated conditions in the first zone, based on reductions found in effluent from that zone. The phosphate and herbicide removal was achieved through absorption on the soil medium, which was estimated to be viable for 4-11 years for the phosphate, depending on loading rates.

The lawn areas in this neighborhood were highly compacted by heavy equipment. The yards, as shown up close in the second photo, were scraped to final grade and sodded in the front yards and seeded with straw in the back yards. The sod had to be watered constantly due to the restricted root growth in the compacted soil, and the seed and straw washed away during the first storm. Infiltration rates were measured at close to zero in the lawns.
Resource for Improving Construction Site Soil

While we are thinking about post-construction practices, a thorough set of recommended practices for improving soils on construction sites has been published by the Toronto (Canada) and Region Conservation Authority3. They first make their case by reviewing numerous published studies, which found significant reductions in runoff from areas that were treated with some combination of tillage and soil amendments. Then, the authors borrow heavily from guidance documents from many U.S. states and numerous organizations and synthesize the information into a small 66-page handbook.

Compost is a key ingredient in their recommendations for turf, planting bed and tree pit preparation. Several appendices include a number of forms for calculations, testing and inspections. As the authors state in the Foreword, this handbook was designed for contractors, designers, engineers, permitting and inspection agencies. Check it out at http://www.sustainabletechnologies.ca > Publications > Preserving and Restoring Healthy Soil: Best Practices for Urban Construction.

References
Join us in Music City, Nashville, Tennessee for Environmental Connection 2014 on February 25-28, 2014 as a presenter. Presenting for IECA gives you the ability to share insights and content with your peers, enhance your professional development, learn from your colleagues and gain recognition for your advancements in the field.

Even if you’ve never presented before, you will find many advantages to speaking at Environmental Connection, IECA’s annual conference. In addition to expanding your knowledge and developing new professional skills, you will be joining a distinguished group of respected erosion control professionals.

Who Should Submit?

Erosion and sediment control professionals are encouraged to submit an abstract to have the opportunity to teach a course at the 2014 conference.

Contractors: Demonstrate effective approaches of installation, equipment, innovations and business management.

Design Professionals: Describe new approaches to design challenges, present case studies on difficult projects or explain the latest design tools.

Government Personnel: Provide information on regulatory policy or demonstrate the economic and environmental benefits of your programs.

Researchers/Inventors: Present the data that advances new technology, explores new concepts and challenges traditional approaches.

Academia: Students, professors and department chairs who provide the latest research and advancements in erosion control and water quality.

Manufacturers: Describe the latest advancements in product technology and applications.

Educational Tracks

IECA has developed four educational tracks in which abstracts will be organized for review (these tracks replace our technology sections). You will be asked to select a track during the submittal process.

- Erosion and Sediment Control
- Stormwater Management
- Surface Water Restoration
- MS4 Management

Types of Presentations

- Technical Paper
- Case Study
- Workshop
- Forum/Panel Discussion
- Full and Half Day Courses
- Poster
- Product Practicum

Interested in Submitting an Abstract?

Complete details for all presentation types are posted on IECA’s website, along with deadline dates, at http://www.ieca.org/membership/getinvolved/submittals/opportunities.asp. You can contact our Education Department as well by calling the IECA office at 800-435-4322 or 303-640-7554.

Hot Topics for 2014

- Proper installation of rain gardens and other green infrastructure topics
- Oil and Gas Successful Re-Vegetation Practices
- Permanent BMPs for Roadway and Utility Projects
- Bio-Technical Remediation for High Volume and Velocity Channels
- Bio-Technical Slope Stabilization
- The Connection between Environmental Engineering, Storm Water and Erosion Control
- Science and Methodologies Behind Low Impact Development and Sustainable Development
- MS4/Municipal Codification for LID/Sustainable Development
- The Use of Flocculants: Their Implementation for Sediment Control and Regulatory Implications
Thank You Corporate Partners

IECA thanks its year-round Corporate Partners who support our efforts to provide education, resource information and business opportunities for professionals in the erosion and sediment control industry.

The IECA Corporate Partner Program is a great way to gain increased exposure to thousands of erosion control professionals, stormwater members and distributors who represent the majority of decision-makers in erosion control purchases.

The Corporate Partner Program offers your organization visibility throughout the year through four different levels of sponsorship. If your company is interested in learning more about partnership opportunities, please contact IECA at 800-455-4322 or 303-640-7554.
Five Field Practices To Improve Sediment Pond Effectiveness

By Dr. Jim Spotts, CPESC

After 27 years as a soil scientist and program manager within several federal agencies, Dr. Spotts formed a private consultancy, Southeast Environmental Consultants LLC (SEC) that plans and manages cost-effective erosion and sediment control activities required on construction sites. The company’s technical expertise is unmatched in providing a full range of services, including site plans, BMP installation and GASEWCC training, site inspections and NPDES discharge monitoring. SEC has developed equipment such as rising-stage samplers, Polynators, FLOC-FLAPS and stream gauges to solve site-specific problems. An active member of the International Erosion Control Association, Dr. Spotts has presented to national, state and local audiences on erosion and sediment control problems and solutions.

This article provides five common-sense tips that will help erosion and sediment control professionals make sediment ponds work efficiently and effectively. For more information on this topic, access IECA’s eLearning archived webinar course by Dr. Spotts, “What’s a Contractor to Do When the Sediment Pond Does Not Work?” which can be accessed at this link: http://www.ieca.org/education/elearninghome.asp.

Anyone who has seen a sediment pond during a rainfall event knows just how Mother Nature really works. She does not follow all of the books, papers, discussions and opinions that explain how to make sediment ponds work best. Only after careful observation of ponds during rainfall events will you discover five sensible practices that can make your sediment capture more effective.

1. **Dry ponds vs. wet ponds.** Ponds that always are filled with water cannot receive additional runoff until the current volume is reduced. If this current volume is too “dirty” to release, the pond has more water than it can handle. It is a good idea to keep the volume of water in the pond to a minimum. This strategy enables adequate storage capacity to receive the next runoff event effectively.

Dry sediment pond, note the Faircloth Skimmer
2. **Provide an energy-dissipater system immediately upstream of the pond’s entrance.** Slowing the inflow at this point will prevent the “fire-hose” effect of flow that goes directly toward the outlet. The slower velocity will promote more particle settling.

3. **Provide baffles within the pond.** Any semi-porous obstacles will capture sediment before it reaches the outlet. The further up-pond you capture sediment, the easier it will be to remove it when required.

4. **Shoreline erosion.** Ponds always seem to have wind currents blowing across them. A wind velocity of three miles per hour across the surface will create a circulatory current that will keep silt and smaller-sized particles in suspension, preventing them from settling to the bottom. The same wind erodes soil at the water line, adding to the sediment already in suspension in the system.

5. **All of us have experienced problems with discharge systems.** Keep in mind that the cleanest water is at the surface. This is the water that should be discharged, NOT the water and sediment from the bottom. Gravel filters around perforated pipes quickly clog, raising the water level in the pond. This is another problem you don’t want. Any method you can use, such as the Faircloth Surface Skimmer, that will remove only the surface water, is highly desirable. Based on field observations, you too can create effective measures to control the sediment in your sediment pond. Give these simple tips a try. You have nothing to lose and everything to gain. And let me know your successes, so I can share them with others.

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**Protected slopes minimize erosion and trap sediment.**

**Baffles reduce energy and dissipate flow.**

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Branding - Your Company’s Most Valuable Business Asset

By Judith M. Guido

Judith M. Guido is chairwoman and founder of Guido and Associates, a leading industry consulting firm that has been successfully helping green companies grow their people and profits. Please send questions and contact her at jmguido@sbcglobal.net or by calling (818) 800-0135.

What is a Brand?

Most people believe that branding is a logo, tagline, slogan, spokesperson, product or a marketing campaign. While a logo is a brand-mark, and a tagline, slogan and marketing campaign are key elements of brand communications, they do not define “branding.” A brand is a product of thousands of experiences that a company creates by its employees, suppliers and customers, and the emotional feelings these groups develop as a result. It is an emotional “why-to-buy” your company’s products over those offered your competitor.

This does not mean “emotional” in a literal sense. It is not a specific creative execution or set of actual emotions that we want to elicit. Instead, the term “emotional” why-to-buy (brand) is differentiated from a “rational” why-to-buy (features/benefits). It is an efficient and effective way to build awareness, preference, usage and loyalty through imagery and attitudes, rather than through a literal price/feature sales proposition. This branded approach aligns the company with values that consistently are persuasive and relevant. Properly branded, prospective customers and others confronted with many erosion control choices will choose your brand, if for no other reason (and there may be many) than because they simply feel better about your company than the alternatives.

Serving as a Tiebreaker

One of the best examples of the power of an emotional why-to-buy brand is the Apple computer. A well-understood and established brand serves as a tiebreaker for customers facing parity offering. Apple enjoys a considerable lead in pricing, market share and margins in the computer, smart phone and tablet categories, because of its extraordinarily strong brand. Customers faced with the choice of buying these products have a multitude of options, any one of which can have the same features - and in some cases, even more - than their Apple equivalents. Some of these alternatives even enjoy significant pricing advantages.

So why does Apple outperform competitors with equal or better features and pricing? Because customers faced with equal offerings just feel better about Apple. That’s because Apple has communicated its equities, performance and innovation with such specificity and consistency that consumers automatically give Apple the edge in the purchasing decision - and pay more for a product of equal capability. Key attributes of branding are familiarity (name awareness) and favorability, which is measured by your overall reputation, plus the strength of your team and the willingness of stakeholders to “invest in” or buy your product or service. There are four key phases of branding. Phase one is the intelligence or discovery phase, which involves due diligence, so that you can understand your key stakeholder’s image of your brand. The next phase is brand strategy, which defines the essence of your brand and makes it tangible, so that your entire company can rally behind it. Next, comes the communications phase, which most people recognize, as it brings the brand to life via logos, words, icons and pictures. And lastly, phase four is managing your brand, which helps you build equity, revenues and stay the course over an extended period of time.

Your brand is your most valuable asset. Build it, protect it and manage it and all of your stakeholders will benefit.
Impacts of Erosion

**FIRST PLACE**
Unmitigated hydromodification: Some natural systems are more prone to impacts than others, and this one had multiple impacts.

Taken and Submitted by: Tory Walker
Location: Oso Creek, San Juan Capistrano, CA
Date/Year: January, 2010

**SECOND PLACE**
Erosion in North Cove, WA where a house has fallen into the Pacific Ocean.
Taken and Submitted by: Jeff Rudolph
Location: Gaylord, WA
Date/Year: February, 2012

**THIRD PLACE**
Pump station floor washed away by a nearby stream.
Taken and Submitted by: Katia M. Delgado
Location: Arecibo, Puerto Rico
Date/Year: November, 2012
IECA would like to thank those who submitted photos into the 16th Annual Photo Contest. This year featured more than 90 entries! Preliminary voting occurred on Facebook, where fans were invited to help narrow down the entries by liking or commenting on their favorite photos. Twenty-three photos were chosen as finalists. These photos were on display at Environmental Connection 2013 in San Diego. More than 500 attendees voted, and the winning photos in each category will be featured in the next issues of Environmental Connection. Visit IECA’s web site at http://www.ieca.org/photogallery/ to view all of the 2013 winners and entries.

**Technology In Action**

**FIRST PLACE**
Apex Erosion Control sprays a 900-foot long steep slope during fire remediation.

Taken and Submitted by: Dori Larna
Location: Pocatello, ID
Date/Year: November, 2012

**SECOND PLACE**
Retention pond/sediment trap on a low volume road.
Taken and Submitted by: Aloisio R. Pereira
Location: Belo Horizonte, Mina Gerais State – Brazil
Date/Year: July, 2012

**THIRD PLACE**
An AeroTech plane drops hydromulch slurry over the hills of Santa Barbara, CA during the Jesusita Fire.
Submitted by: Dori Larna • Photographer: Mathew Smith
Location: Santa Barbara, CA • Date/Year: September, 2009
The International Regional Council (IRC) met for the first time at Environmental Connection 2013 in San Diego, Calif. this past February. During the meeting, the IRC decided that two SOIL Fund committees - one from each region - will be involved in project solicitation and evaluation of requests for support.

The application for SOIL Fund project support currently is a two-step process and involves the following:
1. A brief pre-application. If approved, that is followed by:
2. A more detailed application and budget.

Once this information is approved by both the R1 and R2 committees, the proposal will be submitted to the IRC for a final vote. The IRC felt that this thorough process will eliminate any potential for regional bias. The R1 committee includes Will Mahoney (chair), Tom Williams, Nicky Araujo and myself, Julie Etra. R2 is in the process of selecting their representatives.

When considering applications, the committees will be tasked not only with considering merit of the request, but also they will evaluate whether or not the SOIL Fund has adequate resources to support the project. Up to this point, personal cash donations, material donations, personal participation by IECA members, fundraising through the Silent Auction at the annual conference, golf tournaments, and the sale of lapel pins have supported SOIL Fund projects. Projects have been small in scale and low budget, as our limited resources don’t make it possible to be more involved with comprehensive projects.

A Growing Mission
To realize a greater role for the SOIL Fund worldwide, the IRC has agreed to hire Deborah Van Hoewyek as a periodic grant writer. Deborah, with a Ph.D. from Michigan State University, is very experienced in grant writing for small non-profits, and she has an excellent understanding of IECA’s mission and SOIL Fund goals, which are as follows:
1. To fund research that advances our knowledge of the impacts of erosion and the techniques to control it;
2. To fund erosion control education and applied technology;
3. To fund projects that improve the lives of those impacted by erosion and sediment.

To date, the SOIL Fund has funded a variety of projects that meet these goals. Members Tom Williams and Will Mahoney have worked on two different projects in Ecuador with Engineers Without Borders, with geotextile products supplied by member Ricardo Schmalbach. Easter Island received support for an agro-forestry restoration project, a project submitted by member Pablo García-Chevesich. The SOIL Fund also enabled member Doug Wimble to attend a LANDCON meeting in Beijing, China; and it supported R1 Ambassador Will Mahoney on his Erosion Control around the World travels – see his Blog for more at http://soilfundambassador.blogspot.

Currently, the SOIL Fund has received three proposals; although at the writing of this article, only one of those has received preliminary review by the R1 committee. Submitted by Iberoamerica Chapter members Beatriz Fernandez and Valentin Contreras from Granada, Spain, this project proposes an education program for olive farmers (see page 25 of the January 2013 edition of Environmental Connection magazine and Will Mahoney’s Blog for more information).

Fazlul Huq from Bangladesh has submitted a proposal for R2 to consider when they have their committee up and running. This project is very comprehensive and beyond the scope of what the SOIL Fund has supported to date, but perhaps this indicates where we are headed. It concerns environmental problems in the Bangshi River associated with effluent discharge from industries. In addition to being a human health issue, the discharge degrades the entire ecosystem. As submitted, the project is entitled “Improvement of Livelihood of the Communities Affected by Industrial Effluent in the Historic Bangshi River.”

The third project under preliminary consideration by R1 is the Cacaluta watershed restoration project on the Oaxacan Coast of Mexico. Fifty-five percent of the watershed is located in the Parque Nacional de Huatulco, with the remainder situated along the Cacaluta River outside of the Park. It is a unique watershed in that biological diversity is very high, but it also is threatened by land development, competing land uses and jurisdictions. Within the Park, the Zanate lagoon, which covers approximately seven hectares, has lost its water-holding capacity due to sedimentation from Hurricane Pauline in 1997 and adjacent altered land use, which includes road construction. The objective of this project is to restore the hydrology of the lagoon, in part by building small, reforested islands that also provide habitat for wildlife. The restoration plan has been adopted by the Parque Nacional, and it has a large interpretive and educational component. Although not directly related to the lagoon plan, there is potential for erosion control work and an educational program associated with the new electrical substation operated by the federal government (CFE, Comisión Federal de Electricidad) adjacent to the Park. The substation is certain to generate sediment-charged run-off to the wetland system – another opportunity for SOIL Fund and IECA member support.

We will continue to keep members posted on SOIL Fund projects - past, present and future. Please don’t hesitate to offer your ideas on worthy projects.

Thanks to support from the SOIL Fund, IECA member Pablo García-Chevesich was able to study the feasibility of restoring productivity on Easter Island after several centuries of land degradation by implementing basic rainwater harvesting techniques and erosion control practices. The photo is a panoramic view of infiltration trenches showing a variety of banana trees properly planted using different treatments. Photo credit Candace J. Black

These photos are from the proposed R1 Cacaluta water restoration project. The first photo shows Laguna Zanate with the substation in the background, and the second photo is of the watershed.

looking for an alternative to conventional check dams that is lightweight, easy to install, cost effective, and biodegradable? Nilex GeoRidge Bio® is a permeable plastic berm that is effective in reducing water velocity, spreading water over a wider area, trapping sediment, and aiding in re-vegetation. Compared to straw bales, rock check dams, wattles, and other synthetic devices, GeoRidge Bio® consistently delivers competitive erosion and sediment control results.

GeoRidge Bio® Biodegradable Check Dam

The simple, sustainable alternative.

georidge.com
Urban Development, Innovation and Erosion Control in India

**Background on My Visit**

During the February 2012 IECA conference in Las Vegas, Nevada, I spoke with C.R. Devaraj, President of IECA’s Indian Chapter. Devaraj is the Managing Director of Charankattu Coir Mfg. Co. located in the state of Kerala in southwestern India, and he was attending the conference to promote his company’s erosion control blankets made from local coconut and jute fibers.

I had one question for C.R. Devaraj: “Were I to visit India this year, could you recommend any projects I could see which successfully are employing erosion control techniques and products?” He immediately replied, “Yes, Lavasa.” He told me a bit about the project, and I looked at its website, where I learned that Lavasa is a planned community in the Western Ghats, a chain of low mountains east of Mumbai (Bombay) and near the city of Pune.

C.R. Devaraj provided me with contact information for Lavasa, and I eventually secured an invitation to visit the community from Krunal Negandhi, Lavasa’s Assistant Vice-President for Projects (Environment). I later learned that two IECA members had been directly involved with the project. C.R. Devaraj had supplied the erosion control products used at Lavasa -- the first time he actually had provided products for an Indian project. Also, Doug Wimble (Managing Director of Spraygrass in New South Wales, Australia and the new President of IECA’s Region 2) had provided consulting services for Lavasa’s erosion control efforts.

When I visited Lavasa in August 2012, Krunal Negandhi and his associates bombarded me with
a wealth of interesting information regarding the philosophy behind the project, its objectives, progress to date, specific erosion and sediment control measures, various other environmental measures, and other important information about the community. They also took me for several site tours to give me a first-hand look at the results of their efforts. It would take many pages to describe their initiatives with regard to sustainable native vegetation, solid waste management and recycling, sewage treatment, renewable energy, education, health care, light industry using local materials (bamboo) and tourism. I’ll focus on erosion and sediment control; but first, here is a summary of how Lavasa got started and what the project hopes to achieve.

A Very Brief History of Lavasa

In 1998, the government of India initiated a new Hill Station Policy to encourage the development of planned communities accessible to, but separated from, huge chaotic, unplanned, and relatively dysfunctional cities such as Mumbai. The idea for Lavasa was conceived by Mr. Ajit Gulabchand, the Chairman of Hindustan Construction Company. He envisioned a community which would integrate living, working and playing in harmony with nature.

Construction of Lavasa started in 2002. It is the first open (un-gated) community initiated under the Hill Station Policy. It also is India’s first city built and governed by a private corporation. The developers are trying to achieve environmental sustainability based on principles of the United Nations Environmental Program.

Lavasa has had its share of problems. Construction was shut down for a time, because clearances had not been granted by all the necessary departments of the notorious Indian bureaucracy. A July 2011 article in Atlantic Magazine criticized Lavasa for constructing housing that is too expensive for the average Indian. True enough, but I was shown modest low-cost apartments that are being provided for construction workers and other laborers. It seemed to me an improvement over communities like Aspen and Vail, Colorado, USA, where workers can’t afford local housing and have to commute to work an hour or more from trailer parks or crowded apartments where land is cheaper.

Erosion and Sediment Control at Lavasa

When work started at Lavasa in 2002, erosion and sedimentation had significantly degraded the mountainous landscape where slash and burn agriculture was the norm. Addressing these problems had been integrated into the community master plan. For example, there would be no construction on slopes greater than 1:3 (33% or 18.4). Existing green cover would be preserved where possible. Reforestation with indigenous species was planned for steep, denuded slopes. Measures would be introduced to raise the water table, providing needed moisture for re-vegetation efforts. Vegetated buffer zones would be created or maintained around streams to minimize sedimentation.

I saw a number of sites where these elements of the master plan have been implemented. Following in this article are photos and explanations of specific erosion and sediment control measures employed.

As shown in Photos 4 and 5, this steep soil dump (fill) slope above the city center has been transformed into a stable green carpet of trees and plants. They accomplished this work by first grading the slope into the undulating surface shown in photos 4 and 5. A jute bag toe wall was constructed at the base of the slope. The jute bags were filled with excavated (reused) soil and wrapped with geo-matting. Coconut coir mats were anchored to...
the slope above the jute bag wall. Vetiver (the tall grass in the photos) was planted at the base of the slope and immediately above the jute bag wall. Vetiver is famous for its long roots which counteract surface erosion. It is unable to reproduce itself, so it does not spread to areas where it is not wanted. The hillside was hydrosseeded with a mix containing paper mulch, wood fiber, water, seed of indigenous species, and guar gum binder with rice husks. It was seeded right after the monsoon rains started in the spring. Native trees were planted in scattered locations. A drip irrigation system was installed to help the plants and trees survive and thrive through the four month winter dry season.

Photo 6 shows reclamation work underway on a hillside. Note the jute bag wall with jute netting above on the steep hillside. As seen in Photo 7, biodegradable bamboo staples are used to anchor mats to the hillsides, and horizontal PVC pipes with filter media extend 0.9 meters (about 3 feet) back into a jute bag wall to permit ground water drainage, shown in Photo 8.

On hillsides, as in Photo 9, water absorbing trenches (WATs) (1 meter wide and 1 meter deep) and continuous contour trenches (CCTs) (0.6 meters wide and 0.6 meters deep) trap rain water and promote infiltration. Each trench has a maximum length of 3 meters (about 10 feet). In areas where the trenches have been excavated, groundwater levels are rising. They also use CCTs that drain to natural swales.

Artificial ponds and structures have been constructed along existing drainages, shown in Photo 10. These features reduce erosion by slowing down storm water runoff. They increase infiltration, retain some water in these intermittent streams during the dry season, and enhance the aesthetic character of landscape.

Lavasa’s “leisure trail” winds along a steep mountainside which was an eroded, barren wasteland prior to reclamation four years ago and is now covered by a dense and diverse young forest, as you can see in Photo 12. The pathway was constructed with soil jute bags wrapped with geomats and covered with gravel. The path is “stepped” to cut down on erosion.

Initially, the project team tended to rely on more traditional methods for slope stabilization, such as this gabion wall in Photo 13 next to a street. In recent years, they have been switching to more aesthetically-
Pleasing, environmentally-sustainable bioengineering techniques.

Photo 14 is a great example of bio-diversity enhancement. Approximately 600,000 indigenous trees and 700,000 stumps and shrubs have been planted. The aim is to create a diverse canopy structure of trees, shrubs and grasses. Lavasa hires local people to do the planting by hand. Farm yard manure and local mulches are used. Some areas also require geo-mats or coir mats, depending on slope and other factors. In Photo 14, the left side of the stream is reforested Lavasa property. The right side is owned by local farmers and has been cleared (slash and burn) for grazing. The grazing land is green, because the photo was taken in the middle of the rainy season. A close look reveals evidence of erosion on the recently grazed hillside. Lavasa personnel are working with local farmers to steer them away from slash and burn practices.

Lavasa has its own nursery, seen in Photo 15, where ornamental plants as well as native species for reforestation and erosion control get their start.

Lavasa may not be perfect, but they are trying to provide an innovative model for future urban development in India. We’ll have to check back in a few years to see how well they are succeeding.
With major operations in North America, Europe and Asia and more than 2,000 employees worldwide, Fiberweb, Inc., is one of the world’s largest and leading suppliers of high performance specialty materials. The list includes product reinforcements, thermoplastic films, meshes, nettings and nonwoven multipurpose fabrics which the company makes using a variety of manufacturing technologies, including various proprietary processes.

Of particular interest to erosion and sediment control professionals are the nonwoven materials developed and manufactured by the company’s Geosynthetics Division. In the United States, it operates under the name of Typar Geosynthetics. It makes Typar geotextiles at its plant in Old Hickory, Tennessee, not far from Nashville. It’s the only company in the United States to manufacture this material, which originally was developed by DuPont.

Typar is a 100 percent polypropylene, nonwoven fabric, with a 20 percent recycled content. Like other nonwoven geotextiles, it can be used in many construction, civil engineering and landscaping applications for separation, filtration, drainage, erosion control and ground stabilization.

In the case of erosion and sediment control, Typar geotextiles can be used in permanent applications to reinforce and stabilize stream banks, coastal shorelines, cut and fill slopes, submerged bridge piers and foundations and behind retaining walls. Also, it can be used as an armor system on slopes and in ditches to dissipate the hydraulic forces that cause erosion, while preserving the subgrade or fill soil behind it.

A Critical Difference

Unlike most geotextiles, Typar is made of continuously extruded polypropylene filaments, or fibers that are spun on a moving belt and then heat-bonded into a nonwoven fabric. “If you took a master roll of Typar from our production line and looked at it microscopically, you could follow a single filament from the beginning of the roll to the end,” says Brian H. Whitaker, PE, CPESC, technical manager for Typar Geosynthetics. “This continuous filament, thermally-bonded design provides a higher strength to weight ratio than standard nonwoven construction fabrics.”

Typar geotextiles offers several advantages over conventional materials, such as stone and sand, when used in typical construction practices, he notes. The easy-to-install fabric saves time and money by allowing the use of a thinner aggregate base. By maintaining the load-bearing capacity of base materials, the fabric’s stabilizing characteristics can reduce maintenance and increase a project’s longevity. This geotextile can extend the project’s life by separating subgrade soil and aggregate. Also, the permeable fabric allows water to flow through it freely, regardless of soil type or compaction, to stabilize the ground and filter fines.

Durability is another strength of Typar fabric, Whitaker adds. “Typar has a documented history of continuing to perform satisfactorily in the ground more than 35 years after installation,” he says. “We will be conducting a 40-year study this year, assisted by George Koerner with the Geosynthetic Institute (GSI).

A Multi-Purpose Selection

Typar Geosynthetics continues to grow as it expands the market for Typar fabrics and develops new products. Among those introduced in the past few years:

Porous paver

Made from UV-stabilized 100 percent recycled high density polyethylene, Bodpave 85 is a modular, interlocking cellular and porous paving grid for ground reinforcement, Whitaker says. It can be installed with either a grass or gravel-filled surface on car or bus parking lots, on access roads for emergency vehicles, aircraft taxiways and helipads and residential driveways and parking areas.
“It resists lateral movement, improves traction and allows expansion and contraction while promoting optimum grass growth, root protection and surface stabilization,” Whitaker says.

**Grass reinforcement meshes**

Grassprotecta is a heavy-duty polyethylene mesh that reinforces grassed surfaces, as growing through the openings of the material become intertwined with the mesh filaments. This creates a reinforced surface capable of withstanding vehicle loads, limiting damage to the site and reducing soil compaction, Whitaker reports. This product offers a permeable alternative to hard pavement in areas prone to wear, rutting and smearing, such as parking lots, pedestrian paths, light aircraft taxiways, equestrian surfaces and RV parks.

Similar in concept and design, Turfprotecta is a lightweight polyethylene mesh for reinforcing grassed surfaces, which experience occasional light vehicular or pedestrian traffic, like used car lots or access roads.

Both mesh products are designed for permanent or temporary applications and can be installed directly onto existing grass or an area to be seeded without excavating any soil.

**Versatile cellular confinement system**

Drawing on the strength and permeability of a geotextile, Typar Geocell GS features a honeycomb structure of cells, which can be used to contain various types of infill materials for slope protection and load support applications. Made from dark gray polypropylene/polyethylene bi-component fiber geotextile, the cell walls are permeable to water, air and nutrients, increasing stability and vegetative performance.

“One person can carry a compacted panel, which expands to the desired size and shape on site and can be re-used,” Whitaker says. “The individual units interlock with no complicated joints, and you can stack one unit on top of a filled unit to create a wall of the desired height.”

**Root and weed control options**

The company’s Biobarrier root and weed control systems combine a chemical and a physical barrier to manage vegetation growth. Both systems feature the slow, controlled release of a non-systemic herbicide long-used in food crop production and the strength and permeability of Typar geotextiles.

The Biobarrier Root Control System prevents roots from approaching the erosion control structure without impeding the flow of water, air or nutrients. Roots growing into the zone of inhibition are stopped, not just redirected, encouraging the plant to send energy to unimpeded areas of the root system, promoting healthy plant growth, Whitaker explains. Meanwhile, the unique geotextile design enables the system to flex and surround the structure, protecting it from root damage and extending its life.

The Biobarrier Weed Control System is designed to eliminate unwanted competition and maintenance costs. It prevents weeds from developing a strong root system in the mulch layer, while ornamental tree and shrub roots grow unimpeded below the herbicide-emitting fabric layer.

**Future Possibilities**

Meanwhile, Typar Geosynthetics continues to explore new product ideas even as it looks for new applications of its existing product lines.

“We’re looking at other applications and other markets for ways to expand the use of our products in solving erosion and sediment control problems,” Whitaker says. “Some of them go beyond requirements of current regulations to protect storm water quality.”

Over the past two years, for example, the company has tested different uses of its Typar Geocell products based on the permeability of the cell walls. “When filled with the right type of aggregate, we can build a structure that enhances the performance of conventional rock check dams by reducing turbidity levels in runoff,” Whitaker says. “Also, we’ve infilled the cells with hardwood mulch from trees removed on site as part of the construction project and built a structure that can be used in low-lying areas to complement silt fence in filtering sediment out of the runoff.”

Sustainability in the C-Suite:
Part One of Three

IECA’s members are as diverse as the field of erosion and sediment control and stormwater management. The companies they work for come in all shapes and sizes, and the roles they fill are as varied as the products out there. All of these businesses and their employees want to be around for the long-run. These days, environmental performance is key, and integrating a culture of sustainability into a company’s fabric is critical to continued viability. The first in a three-part series, this article examines various perspectives on who should lead the charge.

What role does the top floor play in improving companies’ environmental performance? The 1954 film, Executive Suite referred to the floor space occupied by a company president, well-known for his “one-man” governance of the firm. His untimely death triggers a round of struggles at the top, and the plot follows the machinations of would-be ascendants occupying the next level of management.

The term “executive suite” still refers to this prime office space, with the “C-suite” referring to its denizens – today’s standard triumvirate being the CEO, CFO and COO. These are the guys – and it’s usually men – who set a company’s strategy, coordinate activities and allocate resources across business units.

A Growing List of C’s

However, in the past 20 years, these C-somethings steadily have proliferated and now encompass a whole range of functional roles. A recent Harvard Business Review paper listed seven C-level jobs, including chiefs of information, marketing, finance, supply chain management and human resources, as well as general counsel and - head of the pack - the CEO. A cursory Google search reveals a whole lot more - including such oddities as “chief business architecture officer” and the truly silly “chief cleaning officer.”

So what criteria qualify one for entry into this august group? What strategic and operational skills are vital if the C-suite is to deliver and to improve both short and long-term performance in a world characterized by increasing financial, economic, political and environmental uncertainty?

Right now, 60 percent of companies in the Global 2000 are replacing their C-suiters – compared with a normal quarterly turnover of just 10-20 percent with many new recruits boasting novel leadership titles. Clearly these new C-suite positions are being created to fill a perceived gap in the skill set around the top table. It seems that in an uncertain world, representation is required from all areas of strategic and operational risk/opportunity.

Among the burgeoning new C-suite titles is another emerging group – chief visionary officer, chief strategy officer, chief innovation officer - and an expanding group of chief sustainability officers, CSOs.

Sustainability as the Big Picture

While the CEO is often characterized as the one person who sees how everything in the business fits together, there is growing evidence that sustainability best reveals such
an overview. That’s because it can help open the eyes of people from top floor to shop floor as to how the whole business operates – and in ways that make people learn new things.

This notion is backed by a growing body of research suggesting that “sustainability” is seen as key to a firm’s future. A recent survey by Boston Consulting Group showed most Fortune 500 companies have hired CSOs, with over 60 percent agreeing that sustainability increasingly is important for competitiveness, and they are committing more management time and investment to it.

Global management company Accenture has embarked on a year-long research program on sustainable organizations to invite debate on the role of the major C-suite functions (it has identified 10) and how each can help implement sustainability.

The underlying question is whether sustainability is better delivered from the C-suite via a dedicated CSO or by embedding sustainability into everything. Clearly, Accenture thinks that sustainability’s elevation to the C-suite indicates the need for an organization-wide mandate. This agrees with research showing that strong executive leadership is crucial for firms looking to improve their sustainability performance. Certainly, being able to deliver performance in a core business area is the key to the door of the C-suite.

As to what is core – I’ve identified a few questions that could help.

- Will it allow our operations and supply chain to demonstrate corporate responsibility in social, environmental and other ethical areas?
- Does it affect our relationship and reputation management?
  
So – what do you think? Should sustainability join the C-suite? Stay tuned for the next issue where Part Two will explore how to best promote sustainability within a company – from top to bottom; bottom to top or maybe from the middle – down and up!
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Bad Rap

*Photo shows major drainage failure that caused severe erosion along with an unsuccessful attempt to mitigate the problem with rip-rap.*

This photo won First Place in the Bloopers category for the 16th Annual Photo Contest at Environmental Connection 2013 in San Diego, Calif. this past February. Stay tuned for more Bloopers in upcoming issues!

*Photo submitted and taken by Laercio P. Costa in February 2011 in Mariana, Minas Gerais State, Brazil*

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