

## Principles of nature harnessed by man

*"I see Soxx™"*

I seem to see Soxx helping solve almost any issue in hundreds of applications. During the recent Annual Meeting of the American Ecological Engineering Society in Charleston, SC (see story on pg. 6), we sponsored a student competition with a 'Chopped' type of a theme (Chopped is a popular cooking show on Food Network where chefs work with surprise ingredients) in which students were challenged to design systems using only the tools provided. The appeal was overwhelming, but more importantly was how the process simulated real world ecological design challenges. We participate in these events so we can help develop the next generation of low impact development engineers to design sustainable resilient communities. Otherwise, how would these future engineers learn about Filtrexx® products?



This is important work because the majority of solutions that have been engineered to 'fix' natural systems like the Everglades have been drastic mistakes. Problems created by nature can be solved by nature but problems created by man are rarely actually solved by man, without the help of a natural system. In designing systems related to water, we are constantly focused on **Quantity** (how much

water is there to treat?), **Quality** (what is the pollutant to be removed and what is the concentration? What are the local benchmarks for compliance?), **Filtration** (this is different from barrier type BMPs—Filtrexx actually filters), **Energy Dissipation** (can this function in both construction and built out environments?), and finally **Vegetation Establishment** (for final closure of sites).

Every day, *I see Soxx* actually helping dissipate energy—in channels, on slopes, on beaches, and even pond edges. *I see Soxx* helping *contain* soil, sand, dredge, gravel, rock, growing media, filter media—for *filtering, growing, or stabilizing*. *I see Soxx* reducing quantity of water treated by slowing down off site migration and encouraging *infiltration*

when used as a low impact development tool. *I see Soxx* being used as the best possible fascia for any green wall system, allowing water to drain out from behind the Soxx, through it, therefore reducing in slope hydraulic pressure. *I see Soxx* fixing sudden erosion channels on highways, embankments, ravines, and other areas where they can be manually placed to grow vegetation, filter water, and dissipate energy of stormwater to reduce impact.

What is rewarding is the adoption of our technology by many engineering firms that are hiring designers like the students who recently participated in the Filtrexx Design Challenge in Charleston. I am inspired by the young, bright, very enthusiastic, passionate young professionals emerging from many top Universities (the leader, of course, being The Ohio State University!) *None* of these students were bashful about enacting change in the engineering world in their future careers. *All* of them were excited about Filtrexx technology, as was obvious from the competition, and all were seeing Soxx work everywhere.

Our multiple patents claim over 100 different applications, using over 60 fill materials, and more than a dozen types of mesh in a number of different size diameters and configurations. *Why shouldn't* our technology be considered in many, many applications? There are an untold number of possible combinations for using Filtrexx mesh + media + expertise + creativity to get solutions that work better than most CMPs (current management practices)...and that is Because Nature Can Do What Man Cannot®.

Should Filtrexx technology be considered for the ash cleanup problem? Prevention? How about pre- or post-hurricane stormwater management? We always challenge people who do not think Filtrexx technologies are appropriate in those situations: "What products are you using *now* and how are they working out for ya?" Containment of soil on levees may have prevented them from failing during Hurricane Katrina. Vegetation establishment on the new levees is paramount—Let Nature Do It®. If the engineering that went into the failed levees would have utilized more resilient products that Mimic Nature® to perform better, these catastrophic failures would never have happened.

As sea levels rise due to the effects of climate change, coastal resiliency grows more urgent, so I am not surprised by the level of interest the coastal communities have in Filtrexx technology—sand that is loose behaves much differently when contained. The world is a living research lab and we look forward to hearing from more of you about anything we should consider trying. Thanks for all your input, keep it coming! ♦

— Rod Tyler  
CEO, Filtrexx International

# Protecting Moore's Creek with a Filtrexx® LivingWall™

Albemarle County, Virginia

Stephen G. Werner, P.G.,  
Consultant, Draper Aden Associates

The Avon municipal landfill operated between the mid-1950s and early 1970s. Moore's Creek, a tributary to the Rivanna River, flows along the base of the closed landfill and for many years has eroded portions of the landfill slope. During periods of heavy precipitation and high stream flow, exposed wastes and soils have entered the stream.

The property was acquired by a developer to provide access to an adjacent shopping center. To obtain local approval to construct a road over the landfill, the developer voluntarily agreed to implement corrective measures stipulated by the Virginia Department of Environmental Quality that would reduce landfill impacts on the stream. The corrective measures included stabilizing an approximately 300-foot long section of 20 to 40-foot high landfill slope being eroded by Moore's Creek.

The slope is very steep (approximately 70% to near vertical), sparsely vegetated and contains layers of exposed landfill wastes. During normal rainfall soils from the barren slope wash into the creek. During periods of high flow the landfill toe is eroded, resulting in local slides of soil and waste into the creek. The additional stream sediment impacts the Rivanna River (a sediment TMDL stream) several miles downstream.

After reviewing hard armor and green alternatives for stabilizing the slope, the Filtrexx® LivingWall™ concept was selected. Filtrexx provided the design with assistance from The Earthworks Group (Murrells Inlet, SC) and Koth Consulting, P.C. (Powhatan, VA). The design consists of 180 feet of riprap filled gabions founded in the stream bed, extending approximately six feet above the normal stream flow elevation. Above the

gabions are four rows of 18-inch diameter seeded GroSoxx® at the base, followed by 12-inch diameter GroSoxx® placed up to the 100 year flood stage elevation.

Access to the work area was very difficult across extremely steep, heavily vegetated slopes. Brent Scarbrough & Company, Inc. (Fayetteville, GA) was the general contractor and Yard Works, LLC (Moseley, VA) was the Filtrexx® Certified™ Installer. Construction oversight was provided by Draper Aden Associates (Richmond, VA).

Work began in late August 2013, after receiving required permits from the Virginia Marine Resources Commission and Albemarle County, VA. To create a dry work area, stream flow was diverted using an Aqua-Barrier® inflatable dam immediately upstream and pumps were used to discharge the impounded water downstream. Trackhoe and loader equipment were used to shape the slope as necessary before placing a geotextile blanket on the slope surface. After preparing the gabion subgrade, riprap was poured from above the slope into a chute connected to a "rock box" at the toe of slope. A loader removed the riprap and placed it into individual in-place gabion baskets. Once the gabions were completed, Yard Works used a blower truck located above the slope to fill the Soxx™ with compost. Filtrexx® Lockdown™ Netting and duckbill anchors installed on 8-foot centers were used to secure every two rows of Soxx. Once the Soxx were installed, live stakes and plantings were set on 2-foot centers into the LivingWall. The wall was completed to approximately two feet above the 100-year stage. Since the slope was essentially vertical the final two feet, it was finished with either 8-inch Soxx or live stakes.

The LivingWall was completed in March 2014. During construction and since completion of the LivingWall there have been six 1.5 to 4-inch rainfall events. The LivingWall has performed as intended during the six high stream flow events.

For additional information contact Stephen G. Werner, P.G., Consultant, Draper Aden Associates; 804-869-2246 or swerner@daa.com. ♦

## Powerful testimony Pike County, PA

PPL (Pennsylvania Power and Light) is currently constructing the 71-mile Susquehanna-Roseland 500kV Transmission Line, which runs through Luzerne, Lackawanna, Wayne, Pike and Monroe counties, and continues into New Jersey. Compost filter sock has been specified for sediment control on the project.

Several electrical contractors worked on the project throughout its length, including Par Electrical Contractors (Kansas City, MO), who constructed the last 38 miles of the project. Previous contractors had used various, less stringent devices, county by county. Par Electrical Contractors wanted only the best products, so they partnered with their local Filtrexx® Certified™

Installer, East Coast Green to install Filtrexx Soxx for Sediment Control on the project.

"We started in November 2013, and worked throughout the winter," said Chauncey Webster, Owner of East Coast Green. "Sometimes we had to shovel through waist-deep snow to ensure the Soxx™ touched the ground, as designed.

Par chose Filtrexx® based on word-of-mouth. "We had always dealt with silt fence," said

"I was always a silt fence guy... I'm no longer a silt fence guy."

Robert Garvey, Environmental Manager for Par Electrical Contractors, Inc. "But the big downfall is the maintenance costs—the labor; the staples pop off; it's not backfilled properly." The company had tried the Soxx™ first on a small job and they liked it because, "there is no ground disturbance, and they are a lot less labor intensive to install."

"We really like the Filtrexx® Soxx™," said Garvey. They require less maintenance than silt fence. They are wind-resistant, heavy, and durable, and they filter sediment very well."

Garvey inspects the entire 71 miles of the transmission line at least once per week, and after every stormwater runoff event. "The Soxx are performing quite well," he says. "I would absolutely choose Filtrexx again."

"I was always a silt fence guy," he said in closing. "...I'm no longer a silt fence guy."

## Wetland protection Avon, OH

The Cleveland Clinic is one of the premiere hospitals in the U.S., and is strongly committed to sustainability. The company is in the process of converting a satellite medical facility to a hospital facility, which requires additional parking. Portions of the property are considered wetlands, so great care needed to be taken to mitigate any negative effects of land disturbance. Land clearing needed to be completed before April 1, when the Indiana Bat would begin returning to the area and looking for nesting grounds. The ground was frozen solid, so the use of silt fence to protect the wetland during construction was not an option.

Engineers had specified a burlap-based BMP for sediment control, but the excavator, Sitetech, Inc. suggested they use locally man-



After



Before

ufactured Filtrex® SiltSoxx™, citing that it is a comparable, but superior product. The design team agreed. Sitetech installed approximately 10,000 feet of 12-inch SiltSoxx™ around the perimeter of the future parking lot to protect the sensitive surroundings.

“Silt fence is difficult to use, especially where there are a lot of roots,” said Frank Jaram, project manager for Sitetech, Inc. “And in this case, the ground was still frozen.”

It’s not the first time Sitetech has used Filtrex® products. “We use Filtrex® SiltSoxx™ for its ease of maintenance, its longevity in the field, and its lack of failure.”

**Bank stabilization**  
Dewey Beach, DE

The Town of Dewey Beach, in Sussex County, Delaware experienced drainage problems along Bayard Avenue, resulting in flooding of the street and associated parking areas and yards. The untreated stormwater generated by the impervious surface contributed to pollution loadings, with a negative impact on the water quality of Rehoboth Bay.

After a thorough review of conceptual alternatives for addressing drainage, flooding and water quality problems along Bayard Avenue, the town announced engineering specifications aimed at mitigating the flooding. Envirotech Environmental Consulting, Inc. was retained, in conjunction with ECI Engi-

neering Planning Surveying, to create a Green Technology BMP for low impact development and coastal watershed management.

The plan included road grading, additional catch basins, a berm with an outfall structure/pumping station, and a drainage swale. The berm was created over an existing bulkhead, and stabilized with Filtrex® Compost Storm Water Blanket™ with Lockdown™ Netting and native vegetation. Outfall pipes convey water into this dissipation area. The existing non-functioning pipes located within the wetland were removed and a stream channel was created in their place. They created a drainage swale and stabilized it using Filtrex® Bank Stabilization made with 24” Soxx™.

The effect was 100% performance. Zero flooding has occurred within the watershed since construction was completed in April 2011 (except for flooding caused by a pump failure in 2012). The system even withstood the impact of Hurricane Irene in August 2011.



*Introducing*

**filtrex**<sup>®</sup>  
LivingWalls<sup>™</sup>

previously THE  
**LIVING**  
WALL  
COMPANY

**beauty | strength | sustainability**

Filtrex now offers a full line of LivingWalls<sup>™</sup> that combine Filtrex<sup>®</sup> Bank Stabilization<sup>™</sup> technology with innovative engineering from The Living Wall Company. Now together as one company, we offer a wide range of MSE and non-MSE solutions for slopes from 80 to 45 degrees of inclination, with varying degrees of design flexibility and planting options.



**GroSoxx<sup>®</sup>**  
instead of blocks



**Strap instead**  
of geogrid



**Compost GrowingMedia<sup>™</sup>**  
instead of backfill

### **Why choose a Filtrex<sup>®</sup> LivingWall<sup>™</sup>**

When you want a LivingWall, what you really want is the environmental performance of healthy plants living in- and covering a stable structure. That is not completed simply by providing pieces and parts. Our business model is to provide "mature" LivingWalls, which we achieve by being committed to the entire life cycle of these plant-based building systems.

**Schedule a lunch & learn today!**

Contact your Filtrex Regional Representative



# filtrex®

## LivingWalls™

beauty | strength | sustainability

Whether you are looking for a low-cost Soft Block™ solution or the most feature packed wall available, we have a LivingWall System to fit your structural needs and your project budget.

Attend the webinar to learn more or contact Filtrex to schedule a Lunch & Learn for your staff.



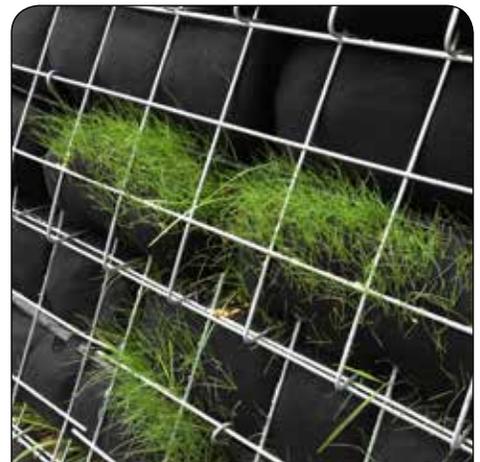
GroSoxx®

MSE	Materials	Slope	Height
	GroSoxx® Lockdown™ Netting	up to 2:1	No limit



GreenLoxx®

MSE	Materials	Slope	Height
✓	GroSoxx® Grid Compaction	up to 80°	Up to 6 ft



Trinity®

MSE	Materials	Slope	Height
✓	GroSoxx® Wire Fascia Straps Connectors Compaction	45-70°	No limit



EarthBloxx™

MSE	Materials	Slope	Height
✓	GroSoxx® Fascia Block Straps Connectors Compaction	50-70°	No limit



ELT Easy Green®

MSE	Materials	Slope	Height
	Pre-grown panels for interior or exterior use	Vertical	No limit



Green Living Fence

MSE	Materials	Slope	Height
	Galvanized steel grid panel pre-grown with ivy for interior or exterior use	Vertical	No limit

## New Filtrexx team members

**Rich Dunkel** joins Filtrexx as the Regional Representative for Florida. He has been involved in water issues throughout Florida since 1987. Through years of work in land and water advocacy Rich has developed relationships with state and municipal agencies, engineering firms, and developers, which will aid in business development in Florida. He understands the complexity and enormity of the water issues facing the state and appreciates the importance of Low Impact Development. Rich looks forward to promoting the value of compost based solutions. Rich is based in Mount Dora, Florida and is available at [rich.dunkel@filtrexx.com](mailto:rich.dunkel@filtrexx.com) or 352-551-0865.



**Chris Heiser** recently joined the team to develop business in Texas and Louisiana. He studied Construction Management at Texas Tech University and has 23 years of experience in the field, with an emphasis on the sales and construction of retaining wall systems. Chris is also a Certified Living Wall Specialist with an extensive knowledge in LivingWall Systems. Chris can be reached at [chris.heiser@filtrexx.com](mailto:chris.heiser@filtrexx.com) or 972-750-6869.



## Filtrexx sponsors coastal resiliency

University students from across the country put their education into application during the Filtrexx Student Design Competition at the 14th Annual Meeting of the American Ecological Engineering Society, hosted by Clemson University.

The competition reflected the conference theme: “Engineering Resiliency for Coastal Communities.” Students worked in multi-disciplinary groups to design a system using Filtrexx® Soxx™ to prevent coastal erosion while treating urban stormwater runoff for particulates and other harmful pollutants. Eight teams created and tested prototype designs in a simulated coastal environment. In a 4-foot by 8-foot box lined with plastic and filled with 4” of water and sand, their designs were tested against simulated waves and sediment-laden runoff. Sand, compost, and shredded hard-wood mulch were available for use as filter media. Designs were judged on the following criteria: 1) minimize the amount of sand movement from the “shoreline” in the design box, 2) optimization of permeability and filtration capacity of media for particulate pollutants, and 3) practicality.

The winning teams were comprised of students from Auburn University, the University of Maryland, Syracuse University, and the State University of New York College of Environmental Science and Forestry. Their designs showed minimal sand movement during the wave testing, had an acceptable level of permeability and pollutant filtering capacity, and considered practical issues of implementation. The students gained valuable real-world experience.

## Upcoming Webinars

Webinars are at 11:00 a.m.–Noon EDT and worth 1.0 PDH credit

**Aug. 6:** Filtrexx® LivingWalls™

**Aug. 13:** EnviroSoxx® for Targeted Pollutant Removal

**Sept. 17:** LID/Post-construction Water Quality Treatment

**Oct. 1:** Filtrexx® LivingWalls™

**Oct. 15:** Sediment Control

Information and registration at [www.filtrexx.com](http://www.filtrexx.com)

Filtrexx partnered with the University of Tennessee and Clemson University to hold the student design competition. Find out more about the American Ecological Engineering Society at <http://www.ecoeng.org/>.

## LivingWall™ Demo & Field Day

On May 16 Filtrexx held its first LivingWall™ Demo & Field Day in Canton, Georgia. The day-long event focused on our unique capabilities in low impact development applications, especially Filtrexx® LivingWalls™. The event was presented in partnership with the City of Canton, The American Legion, the Upper Etowah River Alliance, Stormwater Landscapes, Earth Products, LLC, Pennington Seed, and American Mulch & Erosion Specialists, Inc.

The morning programming began with Diane Minick, Watershed Director of the Upper Etowah River Alliance, with an explanation of utilizing infiltration/detention basins (AKA rain gardens) to trap and filter stormwater and pollutants.

The group then toured the Upper Etowah River Alliance grounds showcasing the 2009 installation of Filtrexx® Soxx™ and other BMP's including stormwater containment systems (infiltration basins under a



phytoremediation dry stream swale, cellular confinement system under the parking area, 500 gallon cistern and Soxx perimeter border and channel stabilization devices). These BMP's have stopped any further bank destabilization since their installation in 2009.

Mark Woolbright demonstrated the Trinity® LivingWall™ System components and capabilities. Derek Dean covered the ease of using Filtrexx LivingWalls with GroSoxx®.



Lunch was served followed by discussions of the EarthBloxx™ System and a closer look at an active streambank stabilization challenge behind The American Legion and Upper Etowah River Alliance buildings. The site presented a realistic environment in which to demonstrate these Living Walls for Severe Slope Stabilization.

Attendees were experienced professionals working in niches served by Filtrexx, bringing contextual relevance through the lively exchange of ideas, questions, and hands-on demonstrations of the answers.

The event was a great template for effective education in truly demonstrating how these LID applications are built and how they function to provide permanent stormwater management. We would like to extend a special thanks to The American Legion's Raymond C. Rollins, Commander Ninth District Department of Georgia.

If you would like to host a Filtrexx Demo & Field Day in your region, please contact your local Filtrexx Regional Representative.