Sustainable Solutions for Bank and Slope Restoration

Andy Carrigan

Central Region Manager & Living Walls

Filtrexx International

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Overview

- Issues
- Solutions
- Sustainability
- Our Story
- Filtrexx Solutions
- Projects
- System Benefits
- Impact

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Issues: Banks and Slopes

What's the problem here?

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Cause

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Movement of dislodged particles

- Wind, Water & Gravity
- Concentrated Flow
- Loss of vegetation
- Soil cohesion
- Soil loss

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Solutions

What's in your toolbox?

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Traditional Solutions

- Rock – Rip Rap
- Concrete
- RECP's – Blanket & TRM
- Cellular Confinement
- Gabion
- Wire Faced Systems
- Natural methods

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Sustainability

What makes a solution sustainable?

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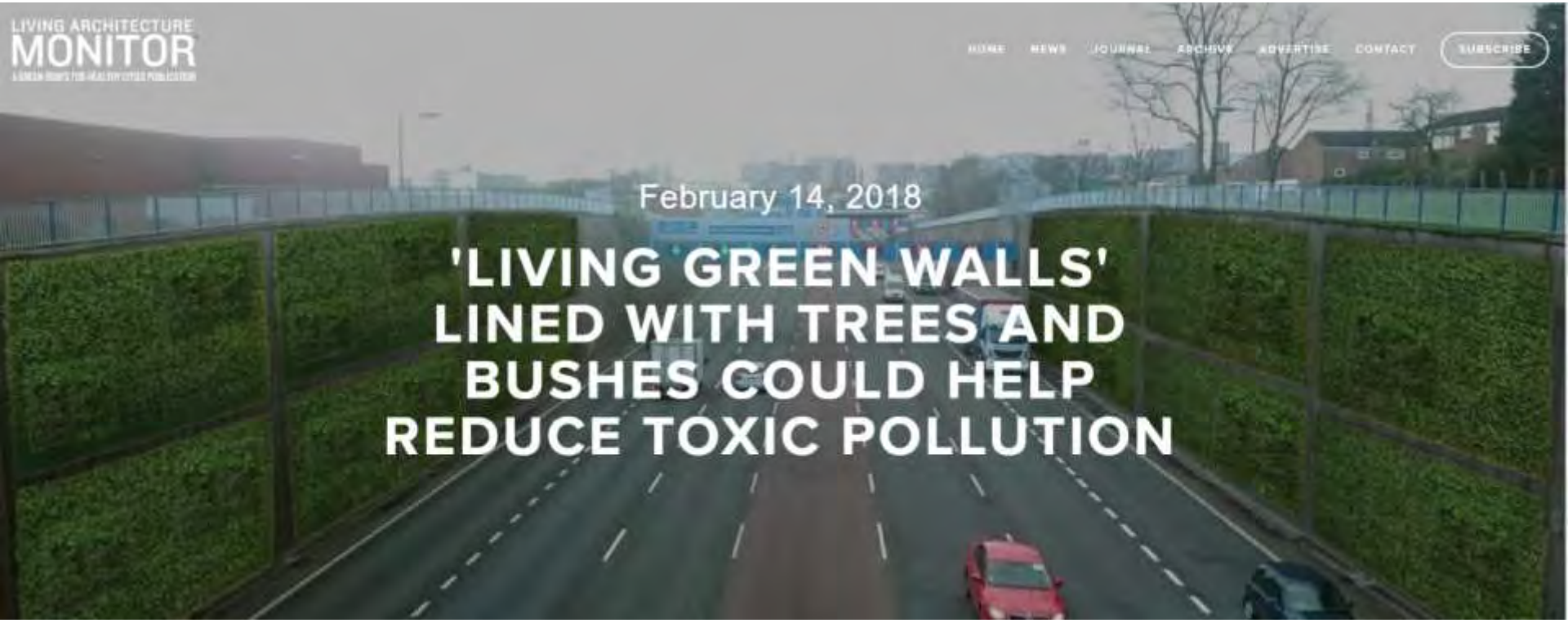
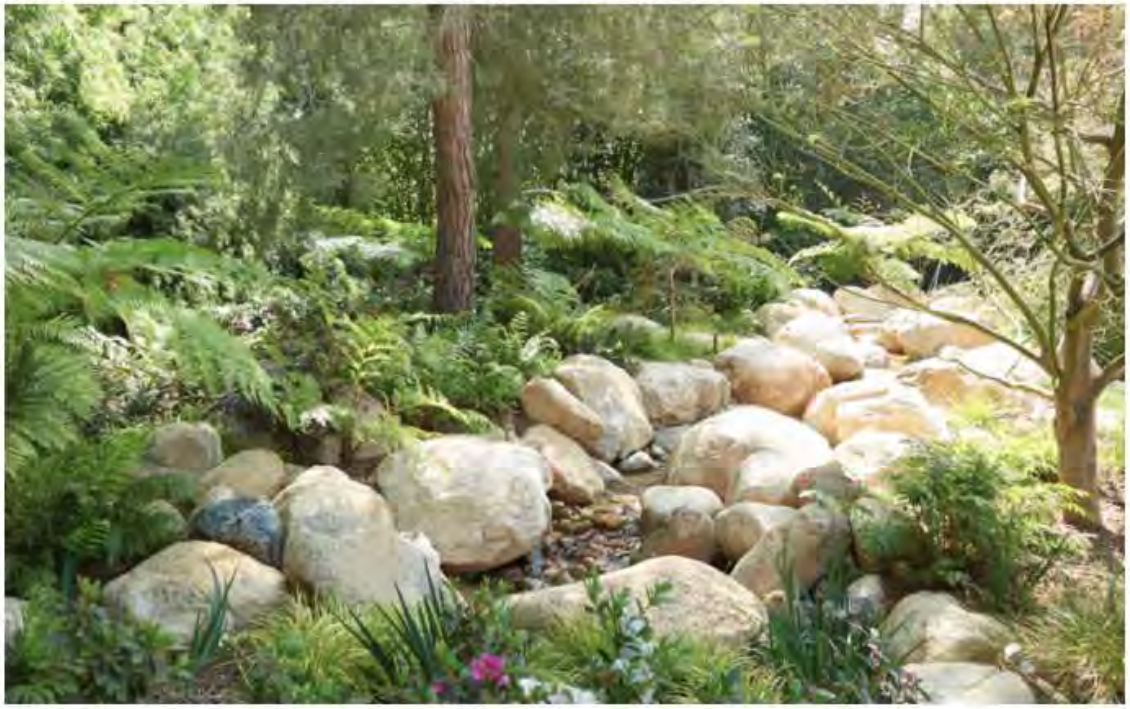
Sustainable Solutions

- Do not add to the problem
- Repurpose / Reroute / Renew
- Duplicatable
- Native Vegetation
- Add value


LIVING ARCHITECTURE
MONITOR
HOME
NEWS
JOURNAL
ARCHIVE
ADVERTISE
CONTACT
SUBSCRIBE
February 14, 2018
'LIVING GREEN WALLS' LINED WITH TREES AND BUSHES COULD HELP REDUCE TOXIC POLLUTION

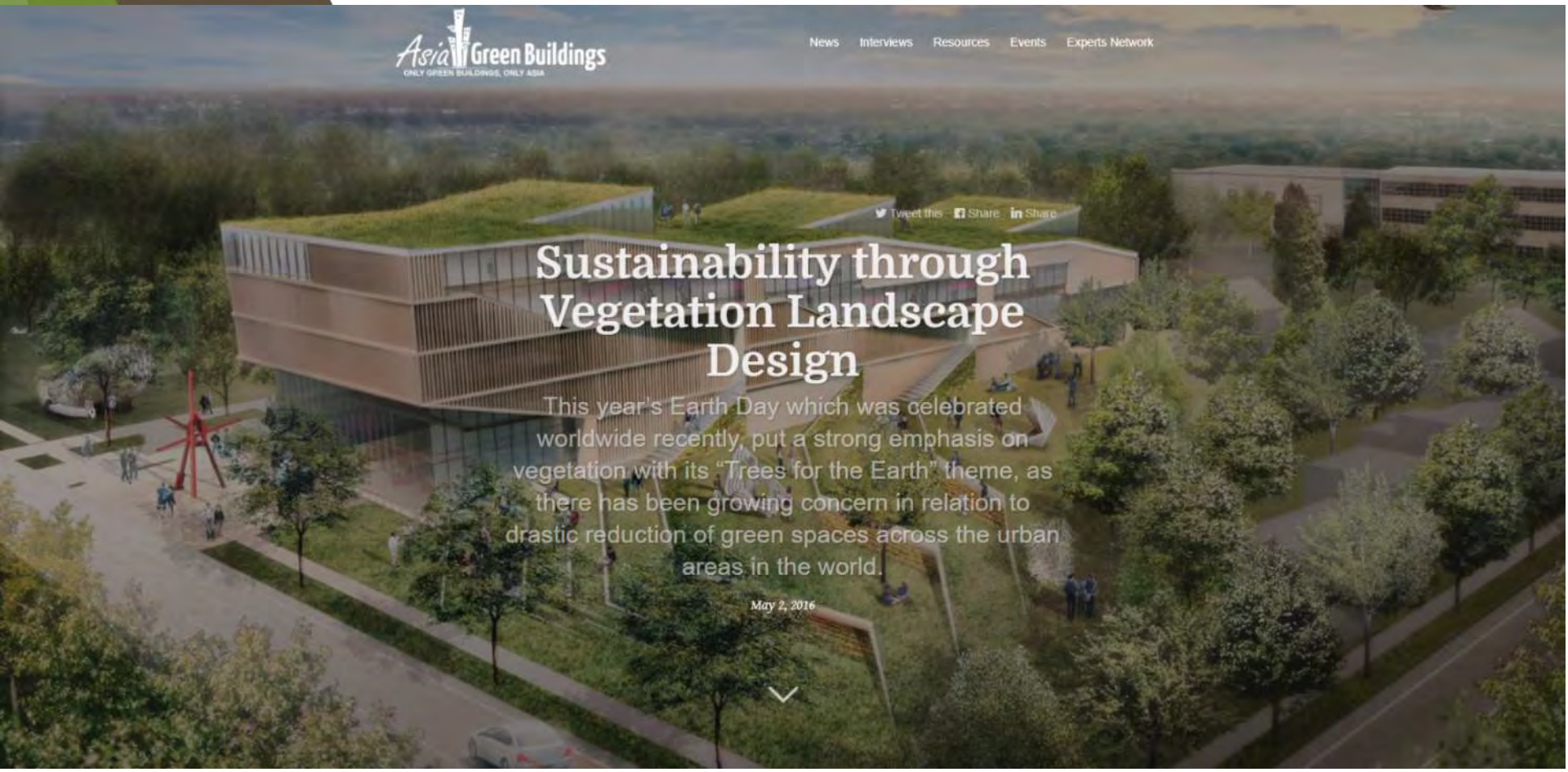
Professional Practice

SUSTAINABLE RESIDENTIAL DESIGN: APPLYING ECOLOGICAL DESIGN



Over the four-year construction period, the addition of hundreds of mature trees and countless flowering shrubs, perennials, and groundcovers, brought in a flood of nesting birds and insect pollinators. The transformation was evident to workers who had been at the site from start to finish. They went from seeing virtually no wildlife at the beginning to experiencing a cacophony of bird song at dusk and swarms of bees, butterflies, and moths bouncing from plant to plant as they came into bloom. The diverse plantings ensure staggered bloom times to keep pollinators busy year-round, and create niche habitats for many bird and small mammal species. The property is now a lush oasis for urban wildlife in an otherwise biologically monotonous neighborhood. ASLA 2016 Professional Residential Design Honor Award. Kronish House, Beverly Hills, California / Marmol Radziner

Plants are central to a functioning global ecosystem. Plants oxygenate the atmosphere and reduce atmospheric pollutants. Ecological restoration in both developed and developing countries is a primary strategy for mitigating the impacts of climate change. Native plant communities are not only key to the global ecosystem, but also crucial to environmental and human health at the residential and neighorhood scales.



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The Filtrexx Story:

1 part Compost – 1 part Mesh – 1 part Ingenuity

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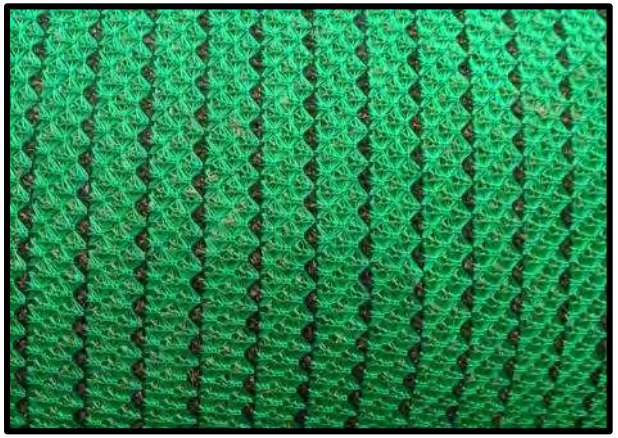
A simple recipe of recycled organics and biomimicry disrupts an industry through performance & environmental sustainability around the globe



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The Evolution of Filtrexx

Beneficial Reuse of Organics

- Filtrexx International Opens - 2002
- The Recipe = MESH + MEDIA + PATENT

Science

- Research, Testing, Engineering;
- Federal/State Approvals & Specs Developed for 25 Applications;
- Design Manual Published for Designers/Engineers;

Market Development

- In-House Marketing Drives National Attention;
- Training an International Network of 120+ Professional Installers;
- Creation of the Filtrexx Big Mac = The SiltSoxx™ Pallet;
- Rapid Growth of Manufacturing, Development, Distribution, and Sales.

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Green Infrastructure
(Erosion Control)
GreenLoxx®

Sediment
Control
SiltSoxx™

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Stormwater
EnviroSoxx®

ECOPRACTICES

High Performance SMP's for all phases of development

http://ecopractices.com/industry

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Compost Socks
Recycling and Low Impact Development Movement

WOOD
FOOD
LEAF Waste

CERTIFIED MEDIA

MESH
Compost Filter Socks
Compost Growing Socks

“Back to Nature”

Superior Results

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Growing Media™

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Filtrexx Solutions

Bank and Slope Restoration

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GreenLoxx Applications

- **MSE** (Mechanically Stabilized)
  - Up to 80°
  - Slope instability
  - Reinforcement – FLW Geogrid
  - Variable Set back
  - Compacted Fill
  - Typical retaining wall design
  - Engineered
  - Customized Seed
- **Non MSE**
  - Up to 50°
  - Stable slope
  - Wrap Soxx – FLW Geogrid
  - Soil Anchor system
  - Methodology
  - Soils Report
  - Anchored vegetative facing
  - Customized Seed

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GreenLoxx MSE

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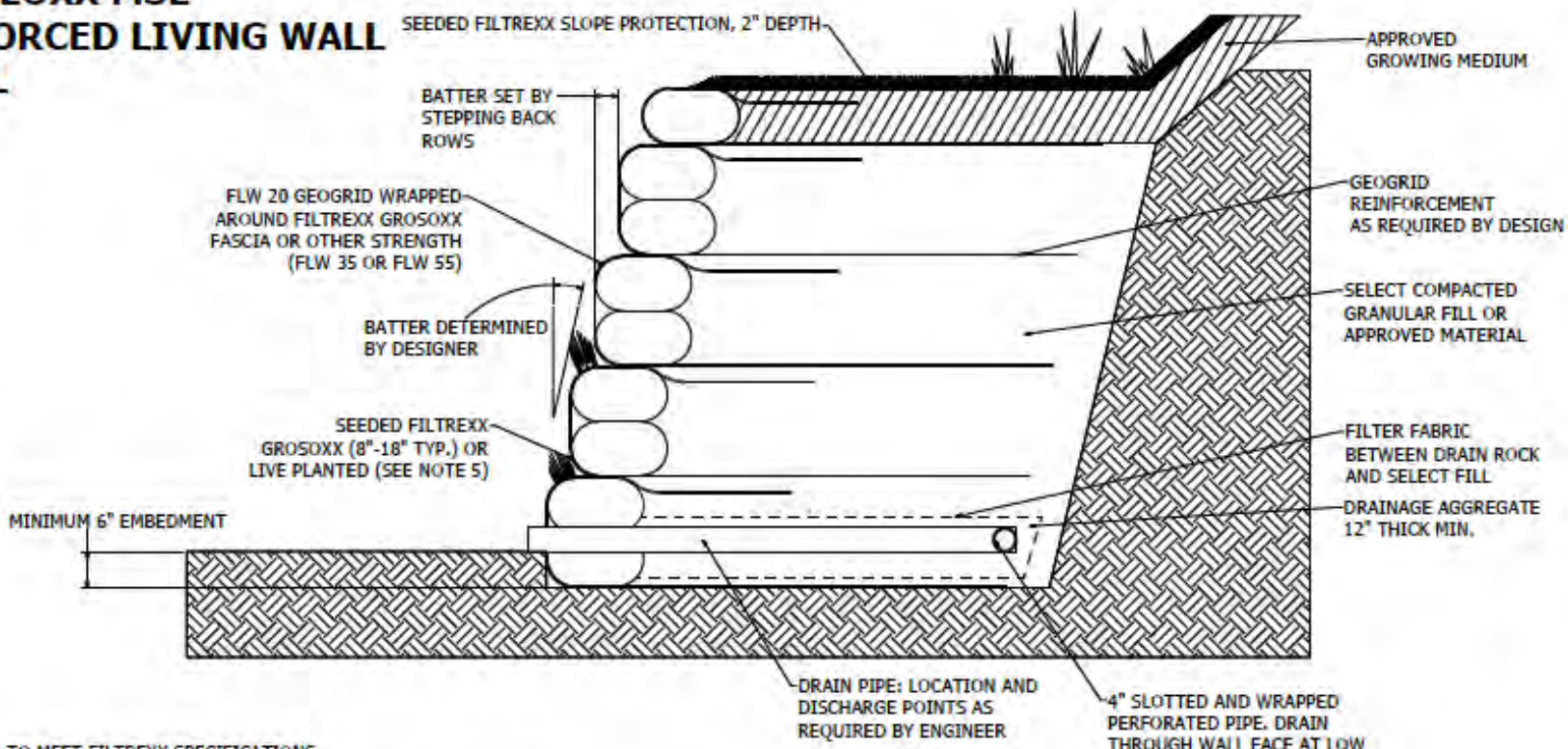
GREENLOXX MSE REINFORCED LIVING WALL DETAIL



NOTES:

1. ALL MATERIAL TO MEET FILTREXX SPECIFICATIONS.
2. GROSOXX FILL TO MEET APPLICATION REQUIREMENTS.
3. ALL GROSOXX TO BE SEEDED PER PANDSCAPE ARCHITECT'S SPECIFICATIONS.
4. BACKFILL TO BE PLACED PER ENGINEER'S REQUIREMENTS.
5. GEOGRID STRENGTH, LENGTH, AND VERTICAL SPACING TO BE DETERMINED BY ENGINEER. GEOGRID--NO STRANDS ARE TO BE CUT DURING PLANTING, ETC. WE RECOMMEND BI-DIRECTIONAL STRENGTH FOR CONSTRUCTION EASE.
6. NATIVE AND DRAINAGE BACKFILL TO BE SEPARATED BY NON-WOVEN FILTER FABRIC.
7. MAXIMUM HEIGHT RECOMMENDED: TEN FEET EXPOSED HEIGHT.

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THESE GRAPHIC REPRESENTATIONS ARE INTENDED FOR PRELIMINARY DESIGN PURPOSES ONLY AND ARE NOT TO BE USED FOR CONSTRUCTION WITHOUT THE SIGNATURE OF A REGISTERED PROFESSIONAL ENGINEER.

GREENLOXX MSE REINFORCED LIVING WALL DETAIL

SIZE D

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Myrtle Beach

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Gordon County, Georgia

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Streambank Project Profile

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GreenLoxx Non MSE

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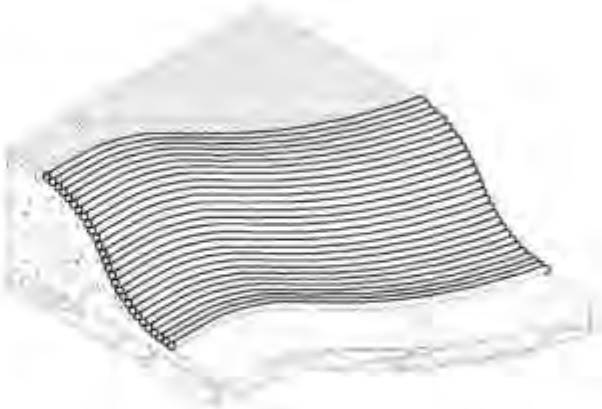
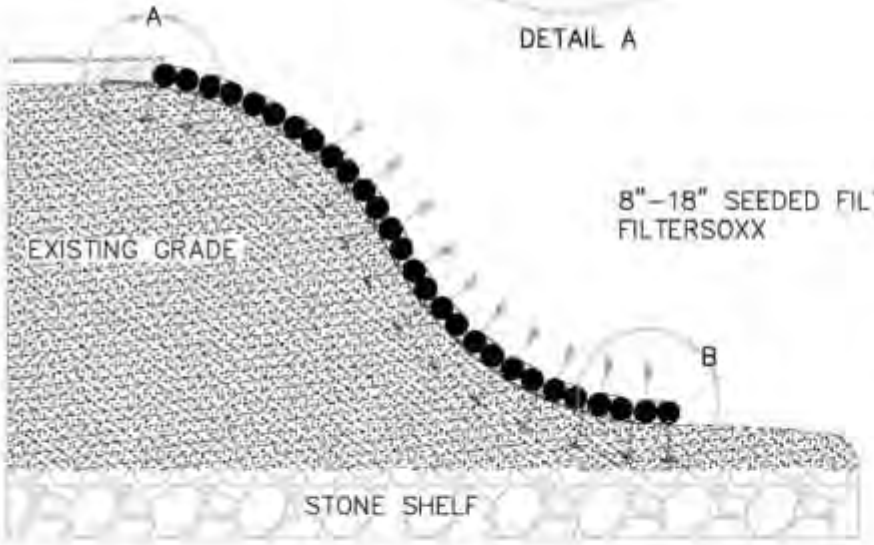
FLW 20 GEOGRID OR
OTHER DESIGN STRENGTH
(FLW 35 OR FLW 55)

GRIPPLE SOIL ANCHOR
3' MIN DEPTH OR OTHER
ANCHOR STRENGTH AS
PER ENGINEER

DETAIL A



LIVE WILLOW
STAKES OR
OTHER PLANT
MATERIAL FROM
SEED OR FROM
LIVE PLUGS



DETAIL B

*NO GRID STRANDS ARE ALLOWED TO BE CUT
IN ORDER TO INSERT PLANTS IN ANY CASE.

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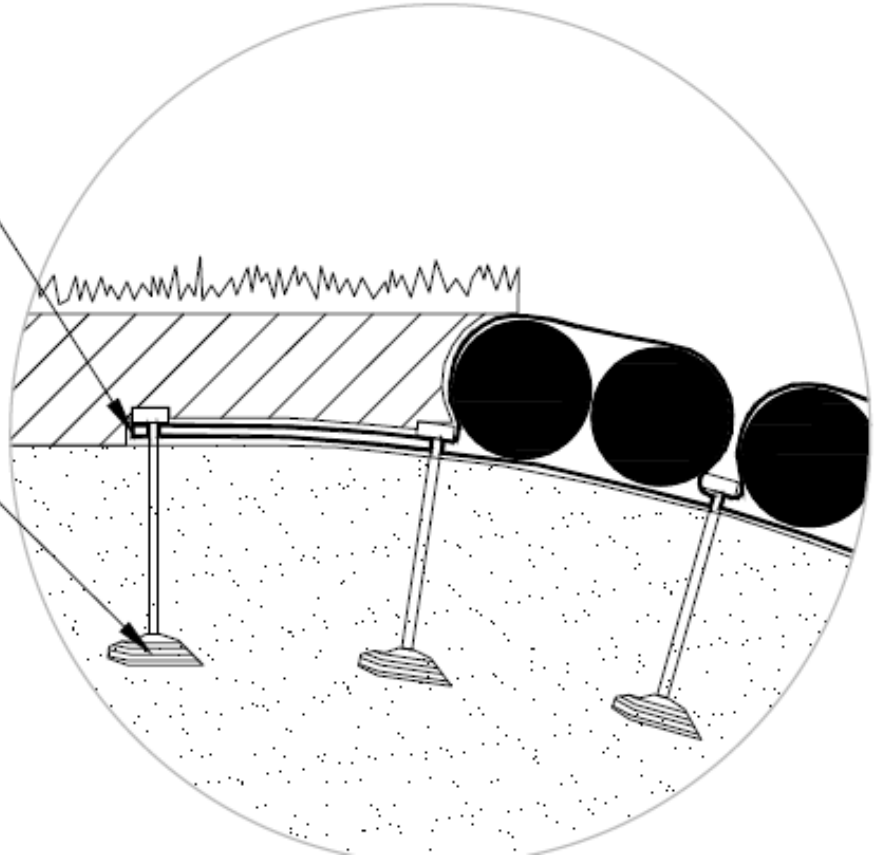
These graphic representations are intended for preliminary design purposes only and are not to be used for construction without the signature of a registered professional engineer.

SCALE:
NONE

GREENLOXX NON-MSE REINFORCED LIVING WALL DETAIL ISTYLE 1I

FLW 20 GEOGRID OR
OTHER DESIGN STRENGTH
(FLW 35 OR FLW 55)

GRIPPLE SOIL ANCHOR
3' MIN DEPTH OR OTHER
ANCHOR STRENGTH AS
PER ENGINEER



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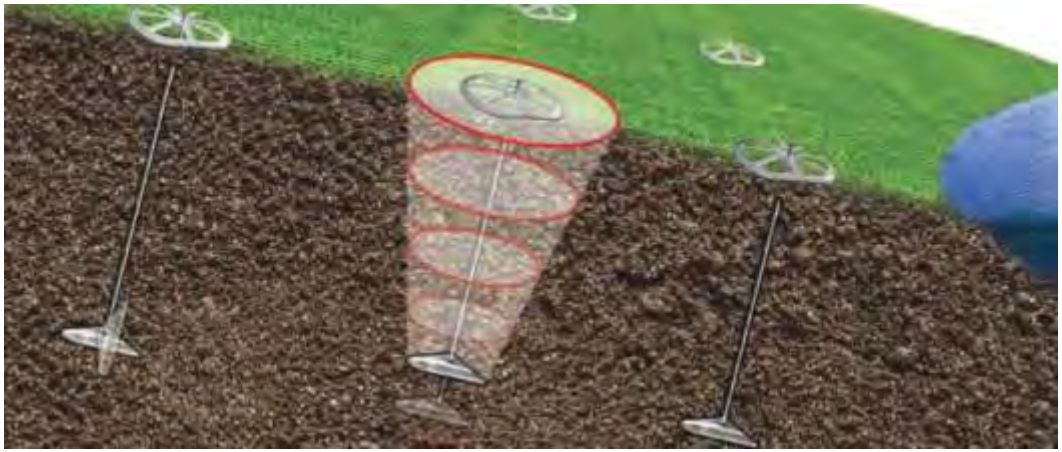
Non MSE Components



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Rocky River, Ohio

Lake Erie

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Richland Co. SC

Project Profiles

GreenLoxx in action around the country

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Harrisburg, PA

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Springfield, MO

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Phenix City, AL

Chattahoochee River

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Shorewood, WI

Lake Michigan

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St. Louis, MO

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Gilroy, CA

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System Benefits

Sustainable BMP’s and the impact

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System Benefits: SBMP's

- Redirecting Organics
- Carbon Impact
- Vegetation impact
- Heat Island Reduction
- Biodiversity and Habitat
- Native Pollinators
- Air Quality
- Stormwater Runoff Absorption

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Role of vegetation in sustainability of infrastructure slopes

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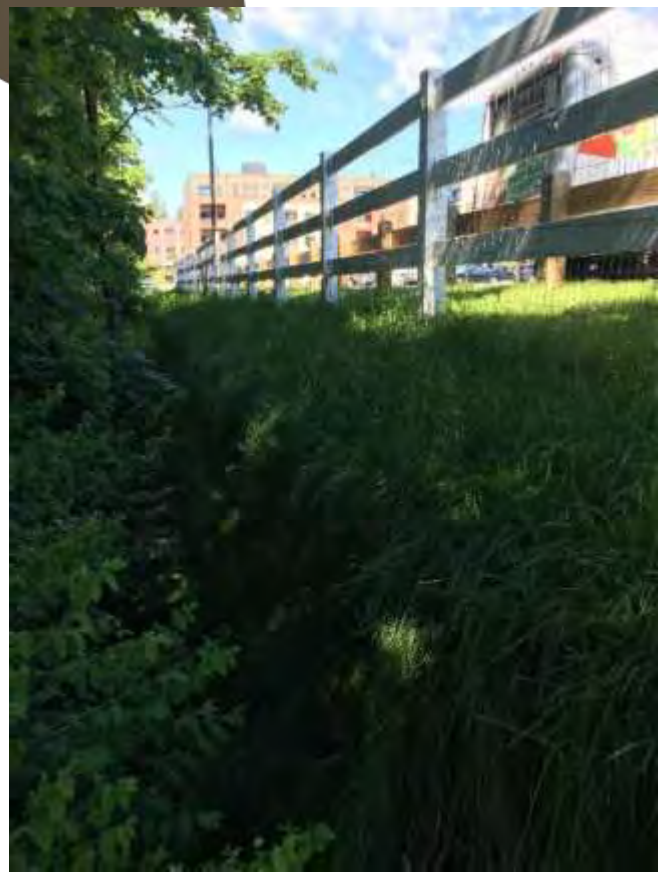
Keywords: embankments ; environment ; sustainability

Key: OA Open access content S Subscribed content F Free content T Trial content

Abstract

Many aspects of the performance of infrastructure slopes are affected by vegetation, but many are conventionally overlooked by engineers. This paper explores in detail the engineering aspects associated with vegetation on infrastructure slopes and the conflicts that must be managed in order to maintain safety and serviceability. It also examines the importance of roadside corridors as grassland habitats and the difficulties of managing and maintaining the diversity of species using safe and economic management practices. The biodiversity of roadside grassland habitats is discussed in this paper, but it is expected that these findings will offer general lessons for the vegetation management of infrastructure slopes.

Stormwater Absorption



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The Impact

Sustainability by the numbers

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Ecosystem Service Benefits of Filtrexx® Compost-Based Sustainable Management Practices (SMPs)

TechLink Research Summary #3335

Filtrexx International is committed to creating high performance environmentally sustainable products, not just for their intended applications, but across the entire supply chain from cradle to end use. At Filtrexx International we are moving beyond the concept of best management practices (BMPs), and have introduced the idea of a truly sustainable management practice (SMP). This is not just a short term commitment, it is part of our company mission statement.

Filtrexx Living Walls are Sustainable Management Practices

As part of our mission we strive to protect and restore natural capital, in order to maximize the ecosystem services and benefits they provide all of us. Natural Capital is the stock material within the environment which provide free ecosystem services that maintain our economic, environmental, and human health (examples: forests, biodiversity, and organic matter). Ecosystem Services include soil erosion control, storm water prevention and filtration, maintenance of natural cycles (water, carbon, nutrients), waste reduction, and climate regulation (regional and global). As an example, one tree (natural capital) can evapo-transpire 2.5 million gallons of water over its lifetime, regulating the water cycle and climate (ecosystem services). According to Economist Robert Costanza (1997), ecosystem services have a global economic value of $33 billion/year. Ecologist Carl Jordan (1998) adds, the closer we manage landscapes to their natural design the more we save on energy, inputs, hard infrastructure, and financial expenditure...working with nature takes advantage of services that are both free and efficient.

Filtrexx products are well known for their storm water quality benefits through natural biofiltration mechanisms, and now we would like to introduce you to why Filtrexx is leading the industry in sustainability and maximizing the benefits of ecosystem services provided by Filtrexx SMPs.

FilterMedia™ Compost for SiltSoxx™

Water Absorption, Conservation, & Treatment

With approximately 50% organic matter, a high porosity, and high relative surface area, compost has the ability to absorb significant volumes of water. Data extrapolated from published University research shows that each linear ft of 12 inch diameter SiltSoxx (which equates to 1 square foot of Living Wall) with GrowingMedia compost can absorb up to **4 gallons** of water (Faucette et al. 2005; Faucette et al 2007).

This information may be used to determine the potential volume of rainfall absorption and resulting storm water runoff reduction, or the volume of captured storm water that can be treated or used as irrigation if applied to the Filtrexx Compost-Based SMP. Each of these scenarios could be extremely beneficial in drought prone or water restricted areas, or where green infrastructure or green building programs have been implemented.

GrowingMedia™ Compost for GroSoxx™

Recycled Organics

Recycling organic waste by diverting these materials from landfills helps to preserve landfill space, prevents pollution from landfill leachate, and reduces carbon intensive greenhouse gases. The amount of organics recycled/diverted from the landfill per linear ft of 12 inch diameter SiltSoxx with FilterMedia compost: 1 **80 lbs** organics diverted from the landfill, while 1 linear ft of 12 inch diameter GroSoxx with GrowingMedia compost = **160 lbs** organics diverted from the landfill.

Carbon Footprint Reduction

Filtrexx Compost Based SMPs can have a significant impact on a project or sites carbon footprint. There are five key ways in which our products can significantly lower carbon footprint.

1. Methane Avoidance: this is the process in which methane gas is prevented from forming due to organic materials being recycled/diverted from the landfill through composting. Methane gas is 25 times more concentrated in carbon than carbon dioxide (e.g. 25 carbon dioxide equivalents or 25 CO_2e). For each linear ft of 12 inch GroSoxx with GrowingMedia compost we prevent **280 lbs** of CO_2e from going into the atmosphere, for SiltSoxx with FilterMedia compost we prevent **140 lbs** of CO_2e (Sakai, 2007).

2. Carbon Sequestration by Permanent Vegetation: this is the process of taking CO_2 out of the atmosphere when permanent/perennial vegetation is established in our system (not temporary vegetation). If the project is in the Eastern US the carbon removed from the atmosphere is **0.05 lbs**/linear ft of 12 in vegetated GroSoxx, and if it's in the Western US it is **0.02 lbs**/linear ft of 12 in vegetated GroSoxx (Chicago Climate Exchange, 2008).

3. Carbon Sequestration by Storing Carbon in the Soil: this is the process of using the stable carbon in compost, returning it to the soil, and creating a carbon sink (rather than source) as long term soil carbon. When compost is returned to the soil, part of the carbon in compost is considered active and part is considered passive. The scientific community is currently debating which parts should be considered as long term soil carbon contributing to carbon sequestration. Using only the passive carbon fraction (where there is greater scientific consensus) each linear ft of 12 inch GroSoxx will sequester **27 lbs** of CO_2 (California Environmental Protection Agency, 2011).

4. Transportation Reduction: when we source, manufacture, and utilize compost-based products locally we prevent carbon dioxide emissions due to reduction of transportation in shipping and freight. Many of our competitors source, manufacture, and ship their products from overseas or across the US. The US Green Building Council's LEED Rating and Certification Program also awards credits for choosing products that have low transportation and CO_2 emission profile. For each trucking mile reduced we prevent **4.0 lbs** of CO_2 from entering into the atmosphere (US Environmental Protection Agency, 2010). For every **4.7 tons** of CO_2 we prevent or remove from the atmosphere it is the equivalent of removing one mid-size car from the road for one year (US Environmental Protection Agency, 2010).

5. Transportation Reduction

To determine CO_2 reduction from transportation, you will need to determine the number of truckloads of SiltSoxx/GroSoxx and comparative product to be used, and the distance from the site of manufacture to project site location for both products.

Where:

$A = (B \div C) \times 4.2 \cdot (D \div E) \times 4.2$

A = CO_2 reduced (lbs)
B = Competitor product truckloads (#)
C = Competitor product distance from manufacturer to project site (mi)
D = Filtrexx product truckloads (#)
E = Filtrexx product distance from site of manufacturer to project site (mi)

NOTE: SiltSoxx values should be used for all applications that use FilterMedia compost; GroSoxx values should be used for all applications that use GrowingMedia compost.

Sustainable Management Practices Quick Reference Guide

Water Absorption Conservation (tools per rainfall event)

5 in SiltSoxx = 0.6 gal/ft
8 in SiltSoxx = 1.7 gal/ft
12 in SiltSoxx = 4 gal/ft
18 in SiltSoxx = 8 gal/ft
24 in SiltSoxx = 16 gal/ft

Recycled Organics Diverted

5 in SiltSoxx = 12 lbs/ft
8 in SiltSoxx = 31 lbs/ft
12 in SiltSoxx = 80 lbs/ft
18 in SiltSoxx = 160 lbs/ft
24 in SiltSoxx = 320 lbs/ft

5 in GroSoxx = 25 lbs/ft
8 in GroSoxx = 67 lbs/ft
12 in GroSoxx = 160 lbs/ft
18 in GroSoxx = 320 lbs/ft
24 in GroSoxx = 640 lbs/ft

Carbon Footprint

1. Methane Avoidance

5 in SiltSoxx = 22 lbs CO_2e/ft
8 in SiltSoxx = 59 lbs CO_2e/ft
12 in SiltSoxx = 140 lbs CO_2e/ft
18 in SiltSoxx = 280 lbs CO_2e/ft
24 in SiltSoxx = 560 lbs CO_2e/ft

5 in GroSoxx = 44 lbs CO_2e/ft
8 in GroSoxx = 118 lbs CO_2e/ft
12 in GroSoxx = 280 lbs CO_2e/ft
18 in GroSoxx = 560 lbs CO_2e/ft
24 in GroSoxx = 1120 lbs CO_2e/ft

2. Carbon Sequestered in Vegetation: Western/Eastern US

5 in GroSoxx = 0.003/0.007 lbs CO_2e/ft
8 in GroSoxx = 0.008/0.02 lbs CO_2e/ft
12 in GroSoxx = 0.02/0.05 lbs CO_2e/ft
18 in GroSoxx = 0.04/0.1 lbs CO_2e/ft
24 in GroSoxx = 0.08/0.2 lbs CO_2e/ft

3. Carbon Sequestered in Soil

5 in SiltSoxx = 4 lbs CO_2e/ft
8 in SiltSoxx = 11 lbs CO_2e/ft
12 in SiltSoxx = 27 lbs CO_2e/ft
18 in SiltSoxx = 54 lbs CO_2e/ft
24 in SiltSoxx = 108 lbs CO_2e/ft

5 in GroSoxx = 4 lbs CO_2e/ft
8 in GroSoxx = 11 lbs CO_2e/ft
12 in GroSoxx = 27 lbs CO_2e/ft
18 in GroSoxx = 54 lbs CO_2e/ft
24 in GroSoxx = 108 lbs CO_2e/ft

References

California Environmental Protection Agency. 2011. Method for Estimating Greenhouse Gas Emission Reduction from Compost Use Environmental Quality Water.

Chicago Climate Exchange. 2008. Agricultural Soil Carbon Offsets.

Costanza, R., R. d'Arge, R. de Groot, S. Farberk, M. Grasso, B. Hannon, K. Limburg, S. Naeem, R. O'Neill, J. Paruelo, R. Raskin, P. Sutton, M. van den Belt. 1997. The value of the world's ecosystem services and natural capital. Nature. 387: 253-260.

Faucette, B. C. Jordan, M. Shaw, M. Cabrera, D. Coleman, L. Hunt. 2005. Evaluation of Storm Water from Compost and Conventional Erosion Control Practices in Construction Activities. Journal of Soil and Water Conservation. 60(6): 288-297.

Faucette, L. B., J. Governo, C.F. Jordan, R. G. Lockaby, M. T. Adkins, and B. Cropper. 2007. Erosion control and storm water quality rates from plots with grass, sand, and compost blankets of varying particle sizes. Journal of Soil and Water Conservation. 62(6): 404-413.

Jordan, Carl. 1998. Working with Nature: Decision Management for Sustainability. Hardwood Academic Publishers.

Sakai, Yoshi. 2007. Approach to Biocharge Recovery. Environment Preservation Center, Kyoto University, Japan. Asia 3R Conference.

US Environmental Protection Agency. 2010. Greenhouse Gas Emissions from a Typical Passenger Vehicle. Office of Transportation and Air Quality. EPA-420-F-08-024.

US Environmental Protection Agency. 2010. GHG Equivalencies Calculator – Calculations and References. Energy and the Environment.

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Recycled Organics

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Water Absorption, Conservation, & Treatment

With approximately 50% organic matter, a high porosity, and high relative surface area, compost has the ability to absorb significant volumes of water. Data extrapolated from published University research shows that each linear ft of 12 inch diameter Soxx (which equates to 1 square foot of Living Wall) with GrowingMedia compost can absorb up to **4 gallons** of water (Faucette et al, 2005; Faucette et al 2007).

This information may be used to determine the potential volume of rainfall absorption and resulting storm water runoff reduction, or the volume of captured storm water that can be treated or used as irrigation if applied to the Filtrexx Compost-Based SMP. Each of these scenarios could be extremely beneficial in drought prone or water restricted areas, or where green infrastructure or green building programs have been implemented.

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GrowingMedia™ Compost for GroSoxx®

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2. Carbon Sequestration by Permanent Vegetation: this is the process of taking CO_2 out of the atmosphere when permanent/perennial vegetation is established in our system (not temporary vegetation). If the project is in the Eastern US the carbon removed from the atmosphere is **0.05 lbs**/linear ft of 12 in vegetated GroSoxx, and if it's in the Western US it is **0.02 lbs**/linear ft of 12 in vegetated GroSoxx (Chicago Climate Exchange, 2008).

3. Carbon Sequestration by Storing Carbon in the Soil: this is the process of using the stable carbon in compost, returning it to the soil, and creating a carbon sink (rather than source) as long term soil carbon. When compost is returned to the soil, part of the carbon in compost is considered active

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Sustainable Management Practices Quick Reference Guide

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(max. per rainfall event)
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12 in SiltSoxx = 140 lbs CO_2e/ft
18 in SiltSoxx = 280 lbs CO_2e/ft
24 in SiltSoxx = 560 lbs CO_2e/ft

5 in GroSoxx = 44 lbs CO_2e/ft
8 in GroSoxx = 118 lbs CO_2e/ft
12 in GroSoxx = 280 lbs CO_2e/ft
18 in GroSoxx = 560 lbs CO_2e/ft
24 in GroSoxx = 1120 lbs CO_2e/ft

2. Carbon Sequestered in Vegetation: Western/Eastern US
5 in GroSoxx = 0.003/0.007 lbs CO_2e/ft
8 in GroSoxx = 0.008/0.02 lbs CO_2e/ft
12 in GroSoxx = 0.02/0.05 lbs CO_2e/ft
18 in GroSoxx = 0.04/0.1 lbs CO_2e/ft
24 in GroSoxx = 0.08/0.2 lbs CO_2e/ft

3. Carbon Sequestered in Soil
5 in SiltSoxx = 4 lbs CO_2e/ft
8 in SiltSoxx = 11 lbs CO_2e/ft
12 in SiltSoxx = 27 lbs CO_2e/ft
18 in SiltSoxx = 54 lbs CO_2e/ft
24 in SiltSoxx = 108 lbs CO_2e/ft

5 in GroSoxx = 4 lbs CO_2e/ft
8 in GroSoxx = 11 lbs CO_2e/ft
12 in GroSoxx = 27 lbs CO_2e/ft
18 in GroSoxx = 54 lbs CO_2e/ft
24 in GroSoxx = 108 lbs CO_2e/ft

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Gilroy California

Project Environmental Impact - California Embankment

Wall Size: *90' long x 30' tall - filled with 12" Dia. GroSoxx / 2700 sf face / 40 courses x 90 lf = 3600 lf of Soxx permanently vegetated in the face*

Organics Diverted from Landfills: *576,000 lbs*

Potential Rainfall Absorption: *14,400 gallons*

Methane Avoidance: *1,008,000 lbs of CO2e*

Carbon Sequestration in Vegetation: *135 lbs of CO2*

Carbon Sequestration in soil: *97,200 lbs of CO2*

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Pennsylvania Roadway

Project Environmental Impact - Penn Roadway

Wall Size: *300' long x 8' tall - filled with 12" Dia. GroSoxx / 2400 sf face / 11 courses x 300 lf = 3300 lf of Soxx permanently vegetated in the face*

Organics Diverted from Landfills: *528,000 lbs*

Potential Rainfall Absorption: *13,200 gallons*

Methane Avoidance: *924,000 lbs of CO2e*

Carbon Sequestration in Vegetation: *120 lbs of CO2*

Carbon Sequestration in soil: *89,100 lbs of CO2*

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Wisconsin Residence

Project Environmental Impact - Wisconsin Lakefront

Wall Size: *100' long x 15' tall - filled with 12" Dia. GroSoxx / 1500 sf face / 20 courses x 100 lf = 2000 lf of Soxx permanently vegetated in the face*

Organics Diverted from Landfills: *320,000 lbs*

Potential Rainfall Absorption: *8,000 gallons*

Methane Avoidance: *560,000 lbs of CO2e*

Carbon Sequestration in Vegetation: *75 lbs of CO2*

Carbon Sequestration in soil: *54,000 lbs of CO2*

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South Carolina Streambank

Project Environmental Impact - SC Creekbank

Wall Size: *1000' long x 4' tall x 2 sides - filled with 12" Dia. GroSoxx / 8000 sf face / 18 courses x 1000 lf = 18,000 lf of Soxx permanently vegetated in the face*

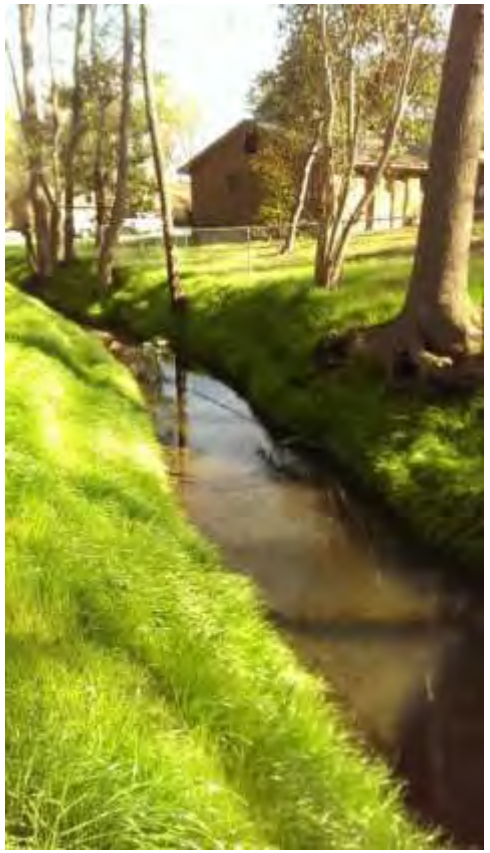
Organics Diverted from Landfills: *2,888,000 lbs*

Potential Rainfall Absorption: *72,000 gallons*

Methane Avoidance: *5,040,000 lbs of CO2e*

Carbon Sequestration in Vegetation: *400 lbs of CO2*

Carbon Sequestration in soil: *486,000 lbs of CO2*



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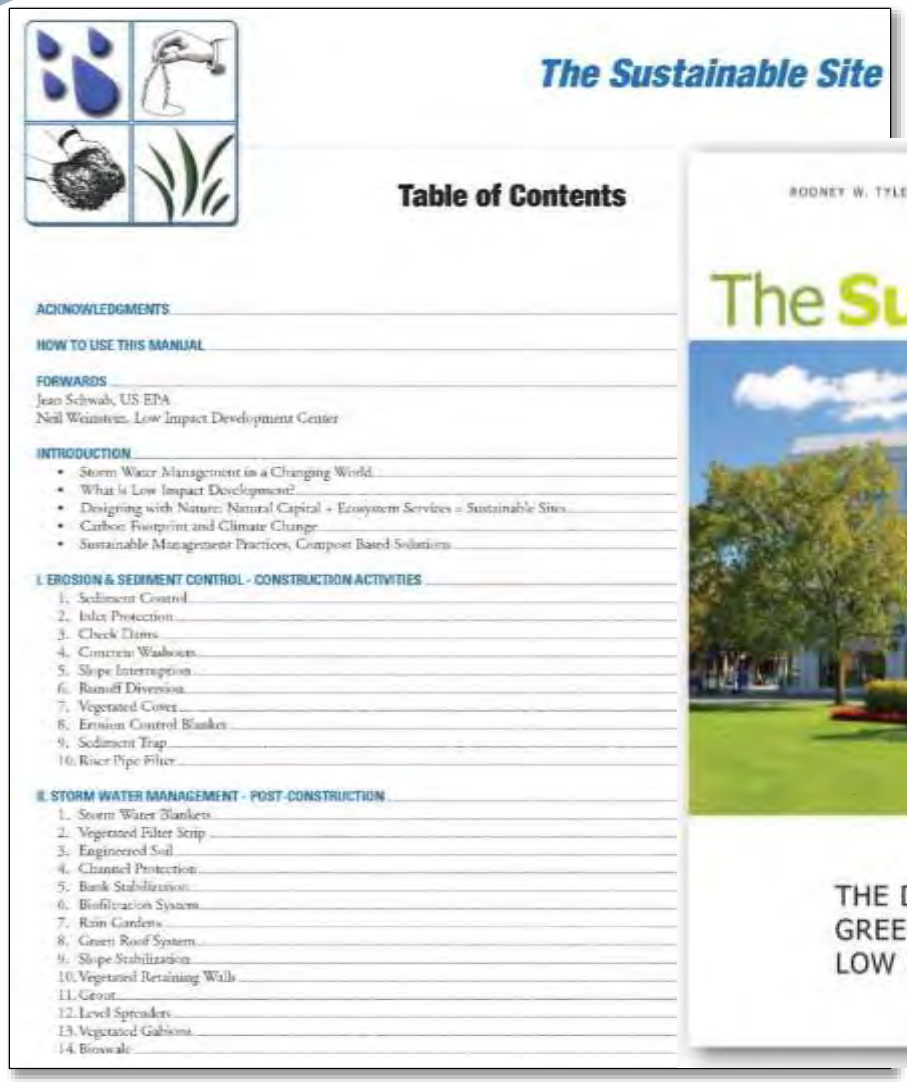
24 Compost-Based BMPs Inside



The Sustainable Site

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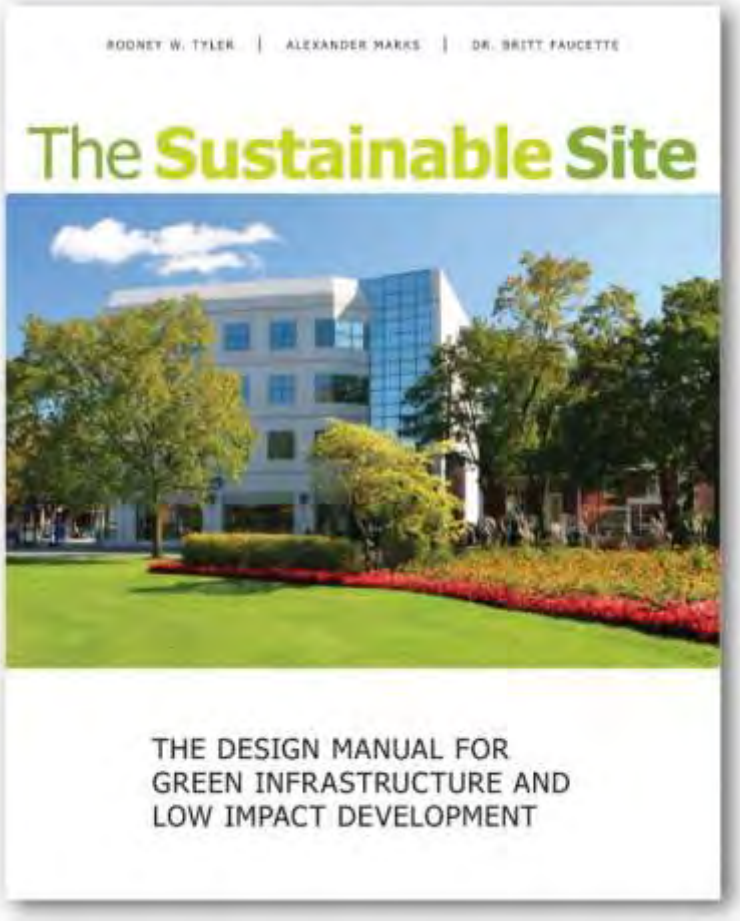

"…an essential tool for engineers, designers, architects, regulators, planners, managers, contractors, consultants, policymakers, builders, and water resource managers."

– Forester Press

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EcoPRACTICES®

Recognizing Responsibility

- Mission: Management of organics for maximum, verifiable, documentable environmental services benefits for our customers and the communities they serve.
- 3rd Party Verification Partner for Filtrexx product environmental benefits;
- Corporate Accountability: Sustainability trends, documentable environmental benefits of product use choices;
- EcoPractices verifies, documents, and reports Filtrexx sustainability benefits: CO_2e reduction, waste diverted from landfills/recycled.

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Filtrexx by the numbers

A company with a mission

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2017 Environmental Impact Through the Use of Filtrexx Products

775,731 tons of organic waste recycled/diverted from landfills

150,106 tons of sediment prevented from waterways

1,616,547 tons of CO_2 prevented from atmosphere

343,946 cars removed from highways/roadways

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Questions?

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