



**GEORGIA WATER &
ENVIRONMENTAL SERVICES**

**GREEN SUSTAINABILITY
MORE THAN JUST
TURFGRASS**

OBJECTIVES

- ▶ Provide engineers and architects with information to increase the quality of their design to fit the existing conditions of each project in terms of green sustainability, erosion and sedimentation control, and stormwater management.
- ▶ Connect engineers and architects to the resources available.

GREEN SOLUTIONS TO SUSTAINABILITY

- ▶ TURFGRASS SOD
- ▶ GRASS SEED
- ▶ SOIL³ ORGANIC HUMUS COMPOST
- ▶ DRIVABLE GRASS

TURFGRASS

► Types of Turfgrass Available

Zenith Zoysia

Leisure Time Zoysia

Emerald Zoysia

TifGrand Bermuda

TifTuf Bermuda

Tifway Bermuda

Tif-Blair Centipede

Mercedes St. Augustine

Elite Tall Fescue

Wintergreen Painted



WHY TURFGRASS SOD?



- ▶ Clean and Safe
- ▶ Economic Value
- ▶ Cleaner Air

Lawns trap ~12 million tons per year of dirt and dust.

Absorb global warming gasses, such as carbon dioxide. For instance, a golf course traps 1 ton of carbon per acre a year.

A 50' x 50' lawn (2,500ft²) releases enough oxygen for a family of four.

- ▶ Cooler Air

Significantly reduces air temperatures around the house by 10 to 20 degrees.

- ▶ Safer for pedestrians and athletes

WHY TURFGRASS SOD CONTINUED...

► Cooler Air

Significantly reduces air temperatures around the house by 10 to 20 degrees.

The front lawns of 8 houses have the cooling effect of about 70 tons of air conditioning.

That's amazing when the average home has an air conditioner with just a three or four ton capacity.

The average front lawn provides more than twice the cooling effect of the normal whole house air conditioner for the same house.

► Protect the Soil

Erosion control: lawns protect the soil from sediment loss.

An inexpensive and reliable way to protect from erosion: grass protects 8 to 15 times better than man-made materials and 10 times better than straw.



WHY TURFGRASS SOD CONTINUED....

Improves the soil: turnover of roots and leaf tissue adds organic matter to the soil.

► Protects our Water

Lawns provide high plant density (above and below ground in the blades and roots) that slows and reduces stormwater runoff.

They absorb rainfall and recharge groundwater.

Root systems clean and purify water.



FACTORS IN SELECTING THE RIGHT TURFGRASS

- ▶ Geographic Area
- ▶ Tolerances (Soil, Drought, Shade, etc.)
- ▶ Maintenance
- ▶ Cost
- ▶ Client Preference

TURFGRASS SELECTION TOOLS

- ▶ Southern Turfgrass Selection Chart
- ▶ Turfgrass Selector Tool

Use	Lawn ▼
Zone	Zone 2 ▼
Shade	Mostly Sun ▼
Water	Dry season watering ▼
Maintenance	Moderate maintenance ▼

Grass Variety	Match Percentage
Zenith <u>Zoysiagrass</u>	100
TifGrand <u>Bermudagrass</u>	100
TifBlair <u>Centipedegrass</u>	100
Emerald <u>Zoysiagrass</u>	100
Tifway <u>Bermudagrass</u>	85

<http://www.supersod.com/diy/turfgrass-selector.html>

TIFTUF TURFGRASS

- ▶ In development since 1993 at the University of Georgia, TifTuf turfgrass, formerly known as DT-1, emerged from a pool of approximately 27,000 types of grass that is proven to be drought tolerant.
- ▶ Uses approximately 38% less water than other grasses.
- ▶ Exhibits superior performance when compared to other short and long term drought tolerant grasses.
- ▶ Recovers health and color quicker than other grasses after a period of drought.
- ▶ Wear tolerance is superior to other grasses.



Tifway 419

TifTuf

TURFGRASS SEED

- ▶ Types of turfgrass seed
 - Zenith Zoysia
 - TifBlair Centipede
 - Elite Tall Fescue



Specifications found at <http://www.supersod.com/seeding-sodding-specifications/>

ZENITH ZOYSIA SEED



- ▶ Shade tolerant; a turfgrass that's widely adaptable to full sun or light shade
- ▶ Dark green blade
- ▶ Medium-textured turfgrass
- ▶ Makes a lawn with a dense growth habit
- ▶ Tolerant of extreme heat and cold; it's a well-adapted lawn from the southern coast to the upper transition zone
- ▶ Drought tolerant turfgrass
- ▶ It's a great replacement for Tall Fescue: Zenith Zoysia is more heat and drought tolerant than any Tall Fescue type
- ▶ Another reason Zenith is a great replacement for Tall Fescue is that due to the wide leaf blades, it resembles Tall Fescue more than any other Zoysia



ZENITH ZOYSIA SEED CONTINUED...

► Zenith Zoysia seed is ideal for:

Home lawns

Commercial landscapes

Golf courses (fairway, tee, or rough)

Sports fields

Roadsides

All sod and turfgrass needs from Miami to Baltimore and west to Kansas city and beyond



TIFBLAIR CENTIPEDE SEED



- ▶ Faster germination and much quicker coverage
- ▶ Available as Super-Wrapped Seed
- ▶ A turfgrass for full sun to partial shade
- ▶ TifBlair establishes as a drought-tolerant lawn
- ▶ Heat- and cold-tolerant turfgrass
- ▶ Slow-growing lawn; needs less mowing and is easier to mow
- ▶ Medium green, medium-textured turfgrass
- ▶ Stays greener longer in the fall and greens up earlier in the spring than common Centipede turfgrass
- ▶ TifBlair is the most environmentally-friendly, warm-season lawn

lowest maintenance requirements of all the quality southern lawn turfgrasses

lowest fertility requirements of all the lawn grasses; grows well on poor soils

TIFBLAIR CENTIPEDE SEED CONTINUED...

▶ TifBlair Centipede Centi-Seed is ideal for:

Large landscapes

Roadsides

Public and private parks

Home lawns

Throughout the South where maintenance budgets are small and turfgrass expectations high

A “non attractant” for Canada Geese and deer, for safety reasons, TifBlair is well suited for use around airports and highways.

All sod and turfgrass needs in Atlanta and beyond . . . Use in the middle to lower South (from the Transition Zone and south), from North Carolina to Florida and west to Texas

ELITE TALL FESCUE SEED

- ▶ A turfgrass adapted to sun or shade
- ▶ Most shade-tolerant of the turf grasses; all turf grasses need some sun to survive
- ▶ Establishes as a lawn that's tolerant of moderately moist soils
- ▶ A cool season turfgrass
- ▶ Dark green-colored blades
- ▶ Attractive medium-textured turfgrass
- ▶ Provides an excellently green-colored lawn year round
- ▶ Penkoted for disease resistance when germinating
- ▶ With Myco Advantage for stronger grass
- ▶ Water Star Qualified grass seed



ELITE TALL FESCUE SEED CONTINUED...

▶ Elite Tall Fescue seed is ideal for:

Fine residential lawns

Large corporate and commercial landscapes

Medians

Roadsides

Public and private parks

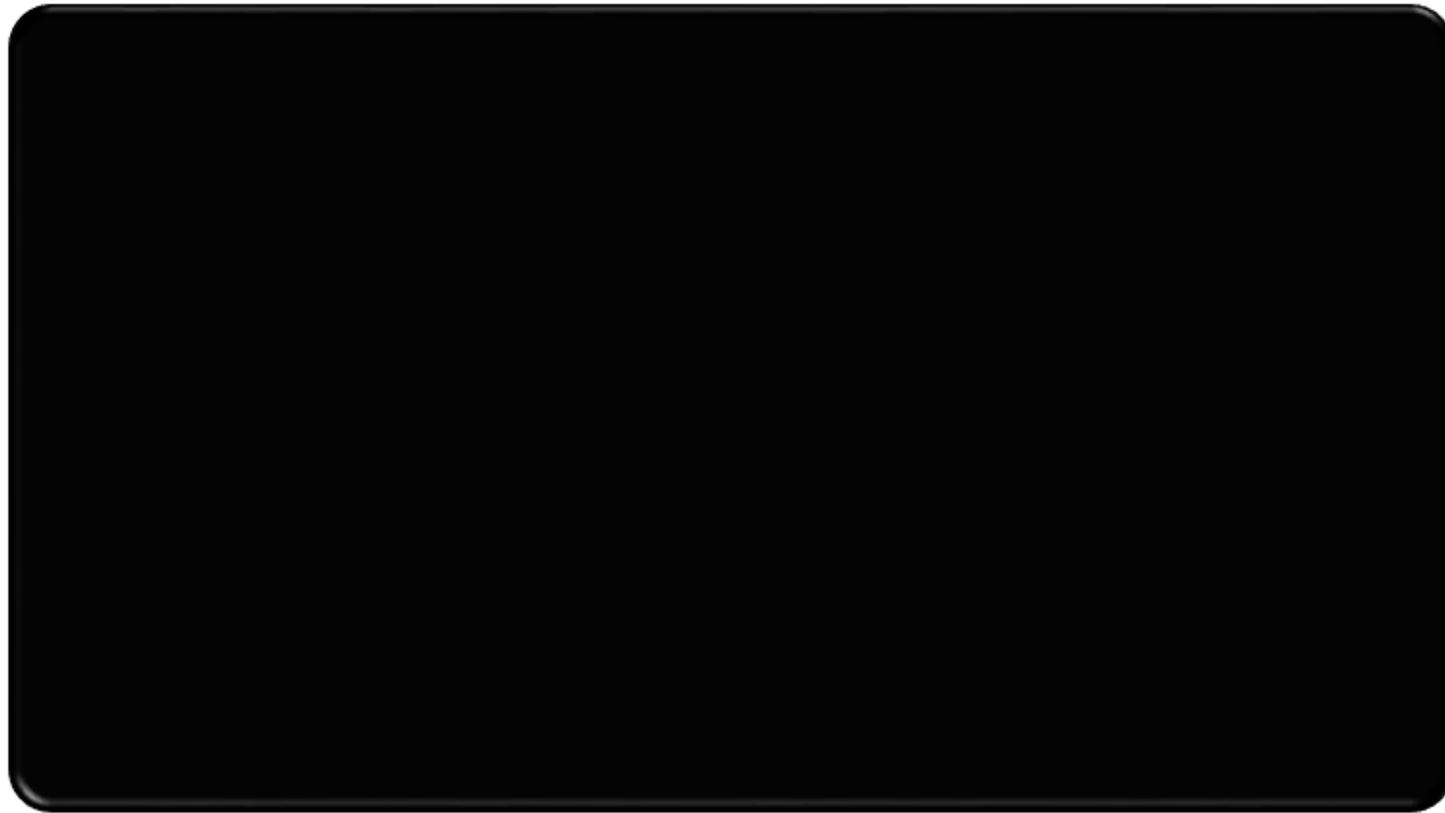
All sod and turfgrass needs throughout the upper South, from Atlanta to Charlotte to Raleigh and northwards

SOIL³ - ORGANIC HUMUS COMPOST



Soil3 Agronomy

HOW SOIL³ HUMUS COMPOST IS MADE



SOIL³ USES AND APPLICATIONS

- ▶ Garden Soil
- ▶ Laying New Turfgrass Sod
- ▶ Topdressing Existing Turfgrass
- ▶ Seeding a New Lawn
- ▶ Chemical Free Lawn Care
- ▶ Bed and Potting Soil
- ▶ Raised Beds
- ▶ Organic Growing Media (OMRI Listed)



SOIL³ HUMUS COMPOST CALCULATOR

Project Type
Overseeding a lawn ▼

Add a new
Rectangle ▼

+ Add Area

Width (in feet) Length (in feet)
25 50 ✕ Remove

✓ Calculate

Results
Total square footage: 1250
Requires 68 Small Bag(s) or 1.3 cubic yard(s) BigYellowBag(s)

www.soil3.com

PERMEABLE PAVERS

- ▶ Concrete pavers, or permeable paver blocks, are interlocking units which are partially pervious. Water drains through the areas between each block. These spaces can be filled with gravel or grass, and offer drainage and an attractive finish. Infiltration rates typically are 13-15% of total rainwater.
- ▶ The goal in using these types of pavers for stormwater control is to limit runoff at the source, reduce downstream erosion, and improve water quality by filtering pollutants in the substrata layers. In the case of both pervious and porous pavers, this is partially achieved within the paver before water enters the layers below. With permeable pavers, water is circumvented around the paver, and the filtering process begins between the pavers in the void space filled with select aggregates.

EXAMPLE - DRIVABLE GRASS

- ▶ It's a permeable, flexible, and plantable concrete pavement system, which is made in Atlanta.
- ▶ It's environmentally friendly and a beautiful alternative to poured concrete and asphalt.
- ▶ It's designed to flex and conform. It does not crack and break like rigid concrete or pop up and wear like plastic paving.
- ▶ It offers the same strength and durability as conventional pavers while offering permeability and flexibility.
- ▶ Unlike other concrete products, DRIVABLE GRASS® facilitates the growth of a continuous root system below the mats, promoting healthy turf while minimizing moisture evaporation.
- ▶ The concrete compressive strength is 5,000 psi.

DRIVABLE GRASS QUALIFIES FOR LEED CREDITS

- ▶ This permeable system offers a simple and reliable solution to storm water management through biofiltration, infiltration, and storage without losing valuable site area. Its permeable properties enable precipitation to infiltrate into the underlying soils, thus increasing on-site storm water storage and minimizing runoff. With the use of DRIVABLE GRASS® the traditional storm drains, hydrodynamic separators, filtration devices, and detention basins can be reduced or eliminated.
- ▶ The thin-profile, permeable, and flexible concrete paving system promotes superior root penetration and moisture containment beneath the product resulting in healthy turf.
- ▶ This plantable system also counts for required green space allowing for more usable land while reducing Heat Island Effect.

Storm Water Properties

Storm Water Properties	
Property	Value
Run off Coefficient (C)	
Aggregate Infill	0.1-0.6 *
Grass Infill	0-0.3 **
Infiltration Rate (K in/hr)	
Aggregate Infill	4-40 *
Grass Infill	2-4 **
NOTES: *Based on specifications **Based on amount and type of grass used	
Hydraulic Performance Testing per Colorado State University	
Velocity Limit without Stakes	6-7.4 ft/sec
Velocity Limits with Stakes	9.9 ft/sec
Maximum Stable Shear Stress	3.0 psf
Mannings Roughness Factor (n)	0.025 – 0.039
<i>All testing was performed without vegetation. Drivable Grass® can be planted or left un-vegetated. Selection of underlying fabric will be based on application, climate, and long-term performance requirements. Occasional staking and plant establishment will increase overall performance. See our website for complete testing report and design specifications.</i>	

DRIVABLE GRASS

SIZE AND WEIGHT

24" x 24" x 1 ½" mats

Approx. 45 lbs. per mat

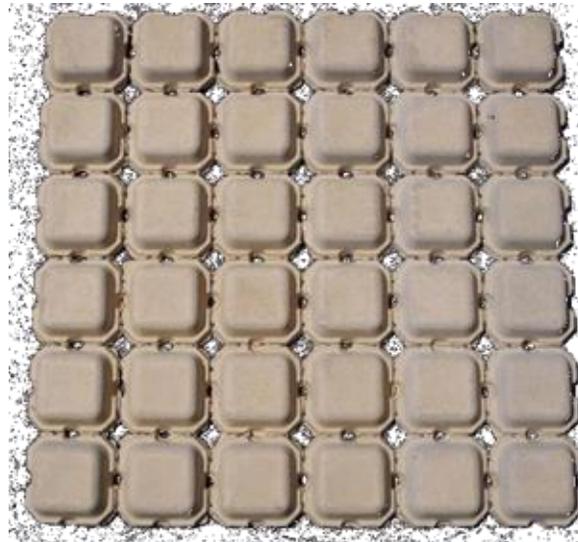
STRENGTH

- ▶ 5,000 psi concrete
- ▶ Load Support from Bearing Pads



FLEXIBILITY

- ▶ Polymerically Reinforced
- ▶ Control Joints allow Flexural Movement

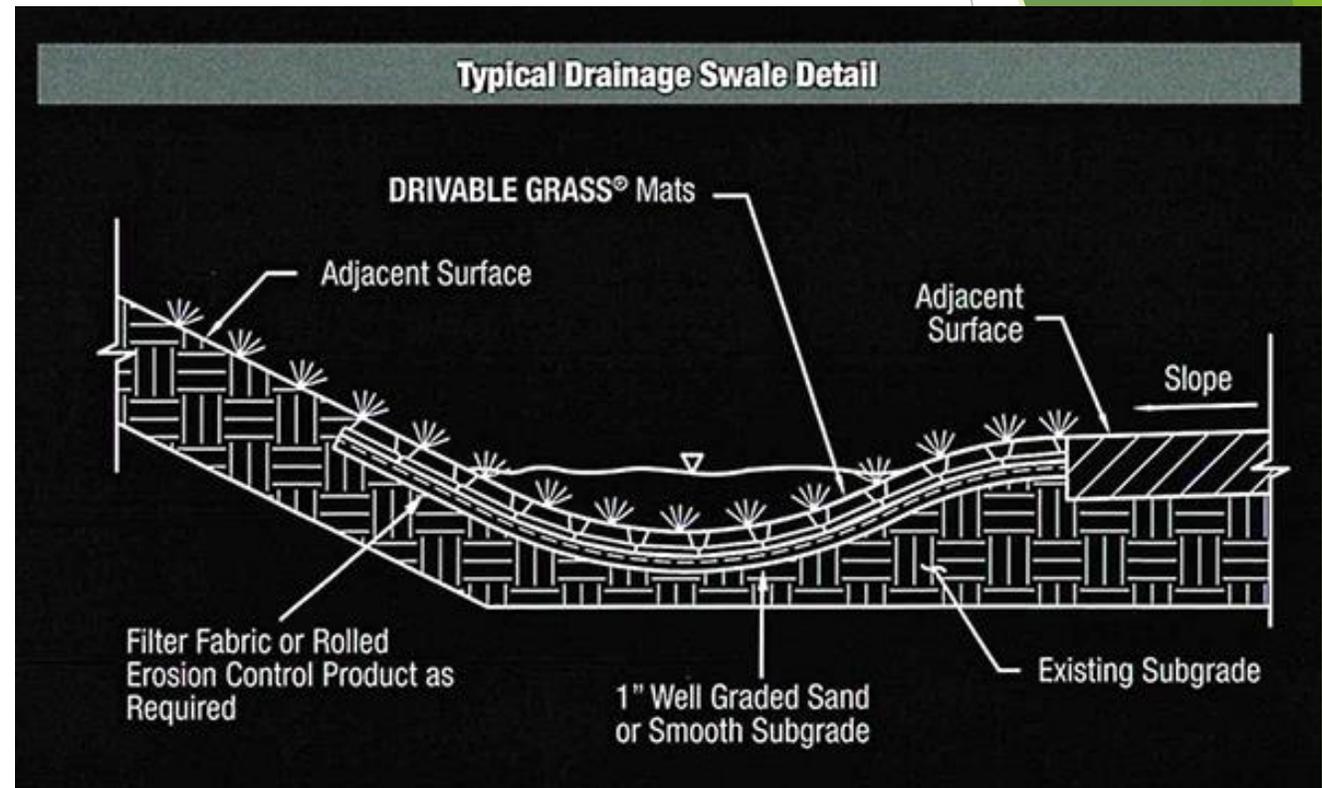


DRIVABLE GRASS USES AND APPLICATIONS

- ▶ Fire Lanes
- ▶ Parking Areas
- ▶ Roads
- ▶ Road Shoulder
- ▶ Driveways
- ▶ Access Roads
- ▶ RV and Boat Storage
- ▶ Access Easements
- ▶ Golf Cart Paths
- ▶ Bioswale Reinforcement
- ▶ Green Roofs
- ▶ Pathways
- ▶ Maintenance Yards
- ▶ RV Parks
- ▶ Boat Ramps
- ▶ Slope Armor
- ▶ Trickle Channels
- ▶ Stream Bank Installation
- ▶ Culvert Outlets
- ▶ Ditches and Drainage Channels

EROSION CONTROL AND DRAINAGE SWALE

- ▶ Allows flexibility and conformity to irregular ground surface contours along pre-defined linear grooves, while providing structural support
- ▶ Whether planted or non-planted, is the solution for a variety of applications for soil stabilization
- ▶ Ideal solution for erosion control protection when used in bio-swales, road shoulders, roadside swales, infiltration basins, small channels and ditches



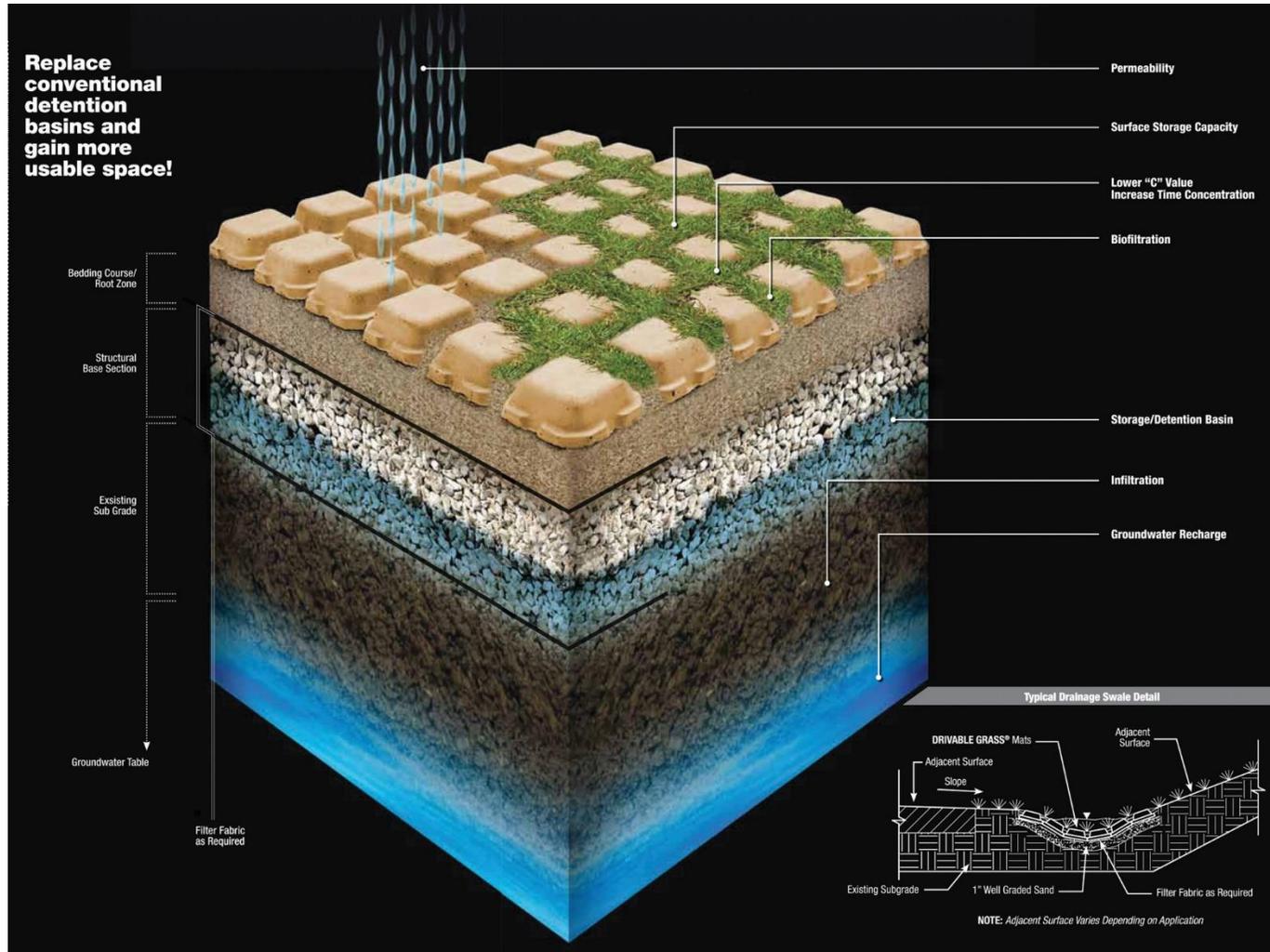
EXAMPLES OF BIOSWALE INSTALLATIONS



STORMWATER MANAGEMENT BENEFITS

- ▶ Drivable Grass[®] offers opportunity for storm water infiltration, bioretention, biofiltration, storage and rain water harvesting.
- ▶ Can reduce Total Suspended Solids (TSS) by up to 96%*
- ▶ Can reduce Total Phosphorus (TP) by 96%, Total Nitrogen (TN) by 65% and Heavy Metals by 86%*
- ▶ Can reduce Hydrocarbons up to 100%**
- ▶ LID Credits and LEED Points

STORMWATER MANAGEMENT CONTINUED...



STORMWATER MANAGEMENT SAMPLE CALCULATION

Assumptions:

- Product has been installed in accordance with the product specifications
- Infill & 2" bedding course leveling material (sand mix) is 75% well graded sand & 25% organic
 - void ratio of sand mix = $e_{\text{sandmix}} = 0.30$
 - infiltration rate $K_{\text{infill}} = 20$ in / hr (conservative estimate based on attached chart)
- compacted Misc. Aggregate Base layer (see note below for higher infiltration / storage requirements)
 - depth = 8"
 - void ratio of base = $e_{\text{base}} = 0.25$
 - infiltration rate $K_{\text{base}} = 6$ in / hr
- underlying sub-base (native material) is of low permeability
- Drivable Grass® mats are considered to be non-porous except for the void spaces at the bottom of the product (the infiltration rate of the Drivable Grass® mat is directly proportional to void space). The void space at the bottom of the Drivable Grass® mat is 12%.

STORMWATER MANAGEMENT SAMPLE CALCULATION CONTINUED...

Drivable Grass® Mat infiltration rate:

$$K_{dg} = (K_{infill} * e_{drivablegrass}) = (20 * 0.12) = 2.4 \text{ in / hr}$$

Where: K_{dg} = Infiltration rate of the Drivable Grass® mat (in / hr)
 K_{infill} = Infiltration rate of the Infill Material (sand mix in this case $k = 20$ in/hr)
 $e_{drivablegrass}$ = void space at the bottom of the drivable grass mat = .12

Storage Capacity of Drivable Grass® System

Storage capacity of the system is directly proportional to the volume and void ratio of the infill material and underlying base material

Surface storage: $V_{surface} = d * A_i * e_{sandmix} = 1 * 0.4 * 0.30 = 0.12 \text{ in}$ (will be higher with an established grass mowed 1" - 2" above Drivable Grass® surface)

Sand layer storage: $V_{levelinglayer} = d(\text{levelinglayer}) * e_{sandmix} = 2.0 * 0.30 = 0.60 \text{ in}$

Base layer storage: $V_{base} = d(\text{base}) * e_{base} = 8 * 0.25 = 2 \text{ in}$

Total Storage Capacity per unit area = $V_{total} = V_{surface} + V_{levelinglayer} + V_{base} = 2.72 \text{ in}$

DRIVABLE GRASS INSTALLATION



CONTACT INFORMATION

- ▶ For Turfgrass, Seed, and Drivable Grass

www.supersod.com

- ▶ For Soil³

www.soil3.com

- ▶ General Questions

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QUESTIONS?

