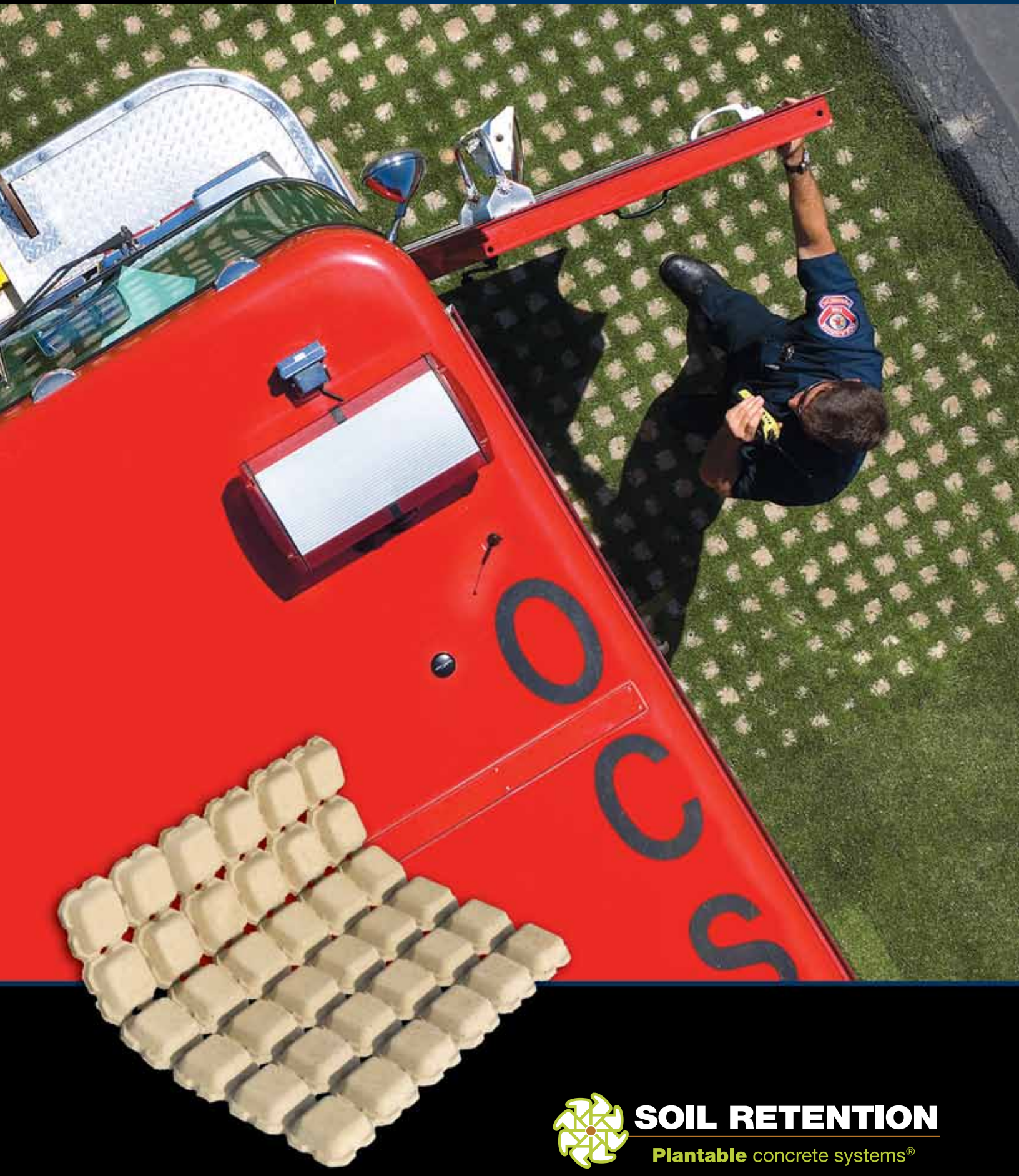
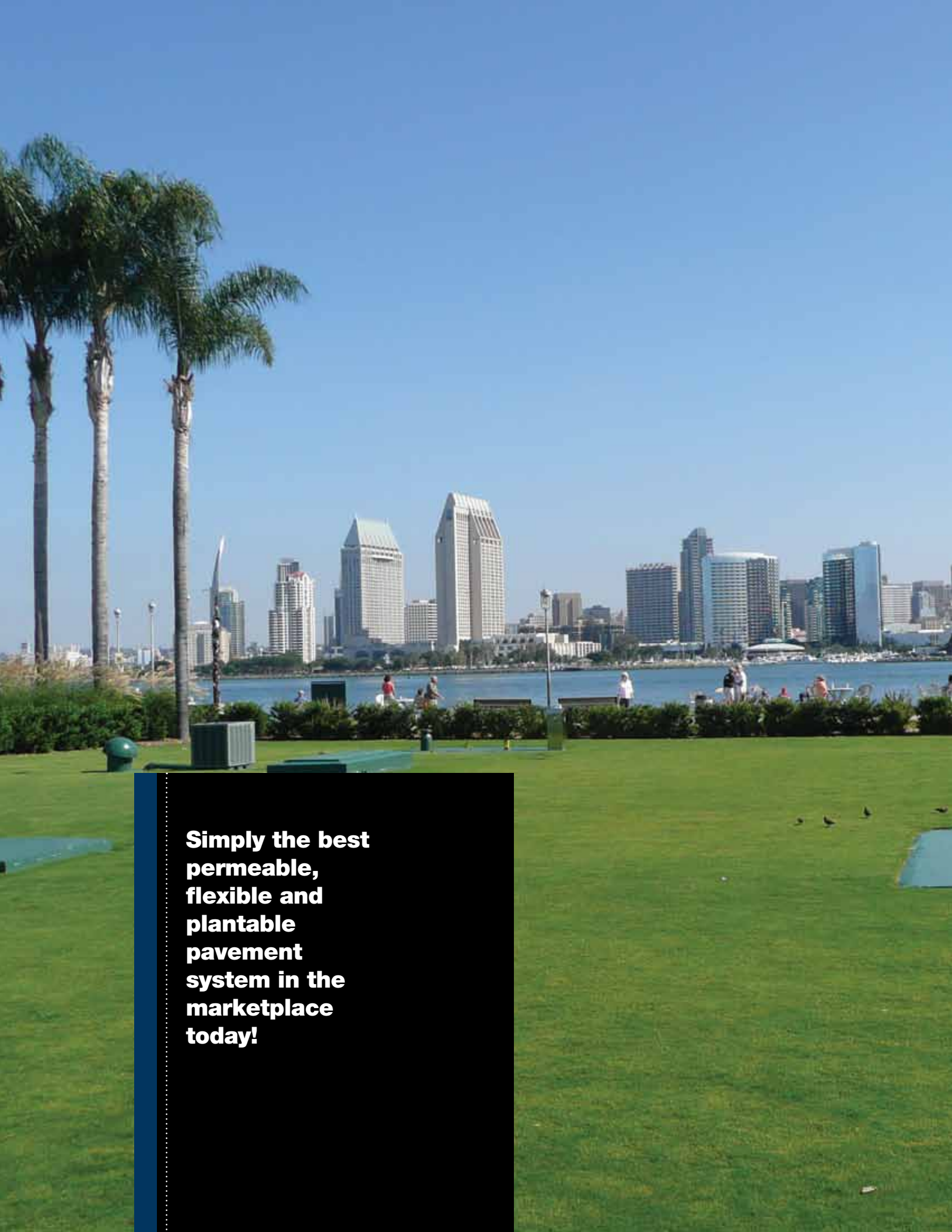
DRIVABLE GRASS®

Permeable, Flexible and Plantable Concrete Pavement System



SOIL RETENTION

Plantable concrete systems®



Simply the best permeable, flexible and plantable pavement system in the marketplace today!

DRIVABLE GRASS® is a permeable, flexible and plantable concrete pavement system that is environmentally friendly and a beautiful alternative to poured concrete and asphalt. **DRIVABLE GRASS®** offers the same strength and durability as conventional pavers while offering permeability, flexibility and infill options such as grass, gravel, sod, ground cover, sand, and other infill choices.

Unlike other concrete products **DRIVABLE GRASS®** facilitates the growth of a continuous root system below the mats, promoting healthy turf while minimizing moisture evaporation.

DRIVABLE GRASS® is designed with an engineered polymer grid which allows flexibility and conformity to irregular ground surface contours along pre-defined linear grooves, while providing the intended structural support. The geometry of **DRIVABLE GRASS®** allows for enhanced root penetration, infiltration and filtration of storm water into the underlying soil, increased on-site storm water storage, and minimization of site runoff. Even when saturated, **DRIVABLE GRASS®** maintains its load supporting characteristics. **DRIVABLE GRASS®** will not crack or break like rigid concrete, or pop up and wear like plastic paving.

COMMERCIAL APPLICATIONS

The perfect paving choice for a wide variety of applications!

- Access Easements
- Fire Lanes
- Parking Areas
- Driveways
- RV & Boat Storage
- Golf Cart Paths
- Bioswale Reinforcement
- Green Roofs
- Pathways
- Maintenance Yards
- RV Parks
- Boat Ramps
- Slope Armor
- Trickle Channels
- Stream Bank Installation
- Culvert Outlets
- Plastic Grid Replacement

DRIVABLE GRASS® is a prime example of the new generation of environmentally sustainable products that industry engineers and designers should specify. **DRIVABLE GRASS®** can be used in place of poured concrete and asphalt for a wide variety of applications including emergency and service vehicle access lanes, RV parking, and bioswale protection. It is designed for use in areas where a permeable, vegetated surface is beneficial or required. Its unique properties provide the perfect choice for a wide variety of applications. **DRIVABLE GRASS®** is the best solution for your permeable pavement design needs.

More and more homeowners today want to do their part to insure a better tomorrow!

Many homeowners today are looking for ways to reflect their environmental concerns in sustainable yet aesthetically pleasing home improvements. **DRIVABLE GRASS®** can be used for "green" driveways, side yard parking access, garden paths and permeable patios, providing a perfect opportunity to eliminate storm water runoff and reduce heat island effect.

RESIDENTIAL APPLICATIONS

ALTERNATIVE INFILLS

There are many reasons for choosing **DRIVABLE GRASS®** with an alternative infill. Whether it's environmental concern, an aesthetic choice, regional climate response or regulatory constraint, not everybody wants to grow turf grass.

Alternative infills basically divide into two classes: alternative planting and non-vegetated materials. Alternative plants for **DRIVABLE GRASS®** include ground covers and non-turf grasses. With alternative plants, the installation profile remains the same as with turf grass; a mix of sand and organic material above and below the mats to act as a rooting zone.

In some cases the plant material can be seeded like turf grass, while others may require hand installation of plant plugs in the void spaces between the mat pads or even the periodic removal of individual pads for installation of plant sizes up to a 4" pot. Watering requirements will depend on the plant material selected, but in most cases it will be significantly lower than for turf grass.

Non-vegetated infill choices include: crushed rock, sand, and artificial turf. With no water requirements, alternative infills can be selected for their specific properties to meet technical requirements. A one-inch layer of sand, without added organic material, is placed as a leveling base below the **DRIVABLE GRASS®** mats for non-vegetated infills. A filter weave fabric is placed over the sand, between the sand and the mat, to prevent scour and weed growth.

STONE

SAND

GROUND COVER

ARTIFICIAL GRASS

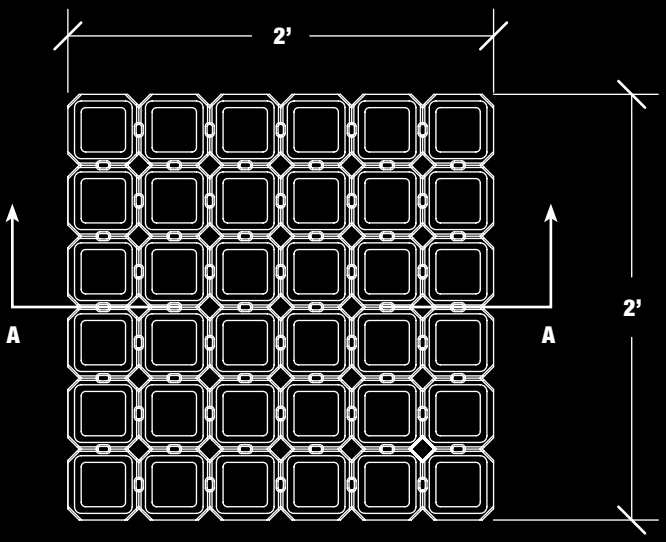
Where reduced water consumption is a consideration, DRIVABLE GRASS® can be installed using alternative infills.

Strength and Durability!

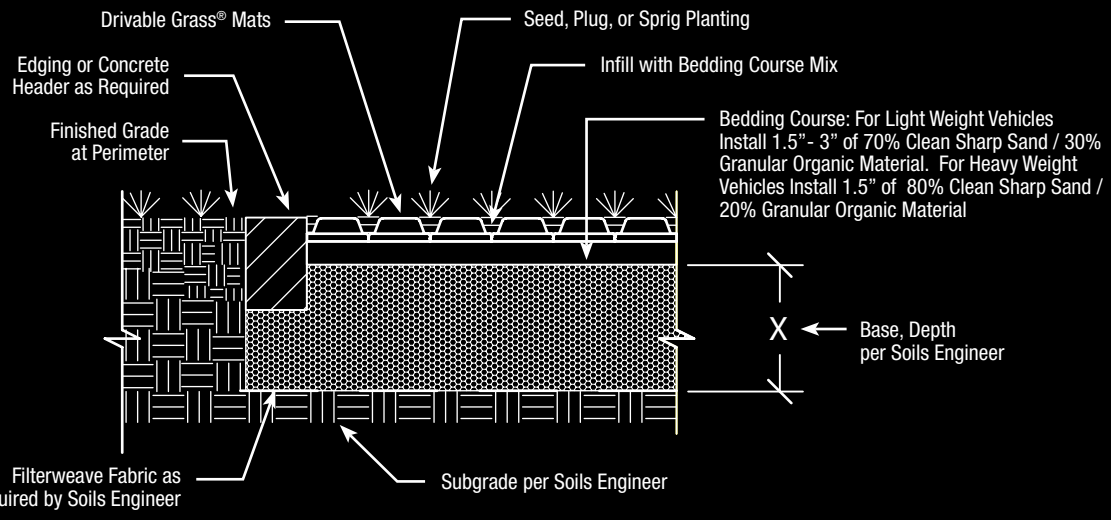
"Soil Retention's **DRIVABLE GRASS®** product was just the solution we were looking for. Providing the strength and durability we require while at the same time solving our run off water issue."

- Oceanside Fire Chief
Oceanside, CA

Plan View



DG1 Typical Heavy Traffic DRIVABLE GRASS® Detail SECTION A-A



DRIVABLE GRASS® Structural Design Guidelines

Subgrade	Gravels/Clean Sand	Sands	Clay/Silt
USCS Classification	GW - Well Graded Gravels GP - Poorly Graded Gravels GM - Silty Gravels GC - Clayey Gravels SW - Well Graded Sands SP - Poorly Graded Sands	SM - Silty Sands 6-10 SC - Clayey Sands	ML - Inorganic Silts of Low Plasticity CL - Inorganic Clays of Low Plasticity MH - Inorganic Silts of High Plasticity CH - Inorganic Clays of High Plasticity
Typical R- Value Range	30-70	10-40	5-15
Application	**Base Thickness (in.)**		
Firelane	6-8	6-10	10-12
Parking Lots Stalls	4-8	6-10	8-12
Parking Lots Traveled Way	6-12	8-14	12-16
Residential Driveways	0-4	2-6	6-10
Walkways	0	0	0-4

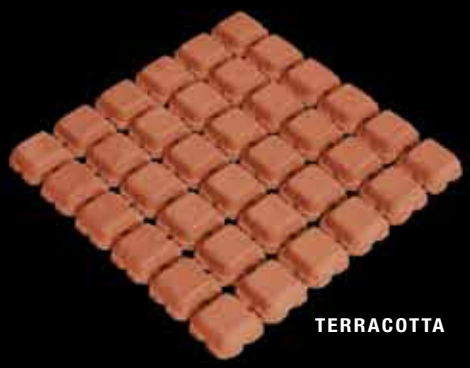
NOTE: These recommendations are to be used as a general guide. Refer to your Civil or Geotechnical Engineer for actual base thickness design. Recommendations were generated using Crushed Miscellaneous Base (CMB) as the typical base material, other types of base material can be used, CMB has a gravel factor of GF=1.1. Actual base thickness will be dependant on the Traffic Index (TI) and the Gravel Factor (GF) generated by the Engineer of Record for the project based on site specific conditions. Estimated Traffic Index (TI) values that were used for the generation of the recommended base thickness provided in the table are: Firelane TI=4.0, Parking stall TI=4.0, Traveled Way TI=5.5. Filter Fabric and subdrains may be required for soils with a low value of permeability and strength. Soils not recommended for use as subgrade material are the OL, OH, PT type soils. Storm water requirements may ultimately govern the design of the base thickness.

Easier to install than interlocking concrete pavers!

DRIVABLE GRASS® easily allows difficult installations such as vertical curves and grade breaks to be achieved. With its grid connected independent concrete pads, the mats are designed to flex and conform to irregular ground surface contours along predefined linear grooves without coming apart. Easily handled by one person, the 2' x 2' mats are quickly installed and don't require setting with a mechanical compactor. For additional information, visit our website at **www.soilretention.com**

BUFF/TAN

GREY



TERRACOTTA

Property	Value
Nominal Area LxWxH	24"X 24" X 1.5"
Gross Area of Each Mat	4 s.f.
Concrete Strength	5000 psi
Weight of Each Mat	45 lbs
Flexibility Min. Radius of Curvature	12 in
Plantable Area	60%, 100% For Sod
Concrete Surface Area	40%
Concrete Bearing Area	88%
Mats Per Pallet	60
Area Covered Per Pallet	240 s.f.
Color*	Buff/Tan, Grey, Terracotta

** Other Colors Available For Special Order*

LEED Credits and Potential Point Contributions

Section	Intent/Application	Example Uses	Credit	Points
Sustainable Sites				
Alternative Transportation	Parking Capacity	**DRIVABLE GRASS®** allows for overflow parking that would not count for excess of local zoning requirements	4.4	1
Site Development	Protect/Restore Habitat	Overflow Parking Stalls, Bioswale	5.1	1
Site Development	Maximize Open Spaces	Parking Stalls, Access Roads, Walkways /Pathways	5.2	1
Storm Water Design	Quantity Control	Bioswale, Trickle Channels, Parking Areas, Vegetated Roof	6.1	1
Storm Water Design	Quality Control Credit	Bioswale, Trickle Channels, Parking Areas, Vegetated Roof	6.2	1
Heat Island Effect	Non-Roof	Parking Areas and Access Roads	7.1	1
Heat Island Effect	Roof	Green Roof Pathways/Erosion Control	7.2	1
Water Efficiency				
Water Efficient Landscaping	Reduce by 50% or No Potable Water Use or Irrigation	Use as a permeable surface/filter to collect water which can then be used for landscaping Use with alternative infills or drought tolerant groundcovers or as part of a Xeriscape w/gravel infill for erosion control	1	2-4
Materials and Resources				
Recycled Content	10% / 20% (Post-Consumer + 1/2 Pre-Consumer)	45% Cement Replacement with Fly Ash in Concrete Mix	4	1-2
Regional Materials	10% / 20% Extracted Processed and Manufactured Regionally	We currently manufacture in several states. Please contact us for locations.	5	1-2
Innovation & Design Process				
Innovation in Design			1	1-5

BENEFITS

LOW IMPACT DEVELOPMENT (LID)
DRIVABLE GRASS® provides opportunities for storm water containment, biofiltration, infiltration and storage.

BEST MANAGEMENT PRACTICE (BMP)
Long term effective solutions such as armored bioswales and rain gardens.

LOWER RUNOFF COEFFICIENT "C"
Helps to reduce storm drain and inlet size.

BIOFILTRATION
Insects and microorganisms within the grass infill help to significantly break down pollutants in storm water.

PERMEABILITY
Reduces site runoff, promoting ground water recharge and onsite storage.

REDUCTION IN HEAT ISLAND EFFECT
Light color and grass surface reflects solar radiation helping to reduce regional heat gain.

COMPETITIVE ADVANTAGES

FLEXIBILITY WITHOUT MEMORY
Reinforcing grid and grooves in **DRIVABLE GRASS®** give it the ability to conform to uneven contours.

STRENGTH
Proven, real-life testing for extreme loading; not carefully crafted lab tests. Refer to our web site for printable reports.

DURABILITY
DRIVABLE GRASS® has a concrete compressive strength of 5,000 psi and low water absorption that limits wear and cracking.

WINTER CLIMATES
The design of **DRIVABLE GRASS®** allows it to flex with freeze/thaw cycles without cracking at the surface. Low moisture absorption and pad size/shape prevents cracking, spalling and catching edges. Snow melt infiltrates, but does not pond and re-freeze.

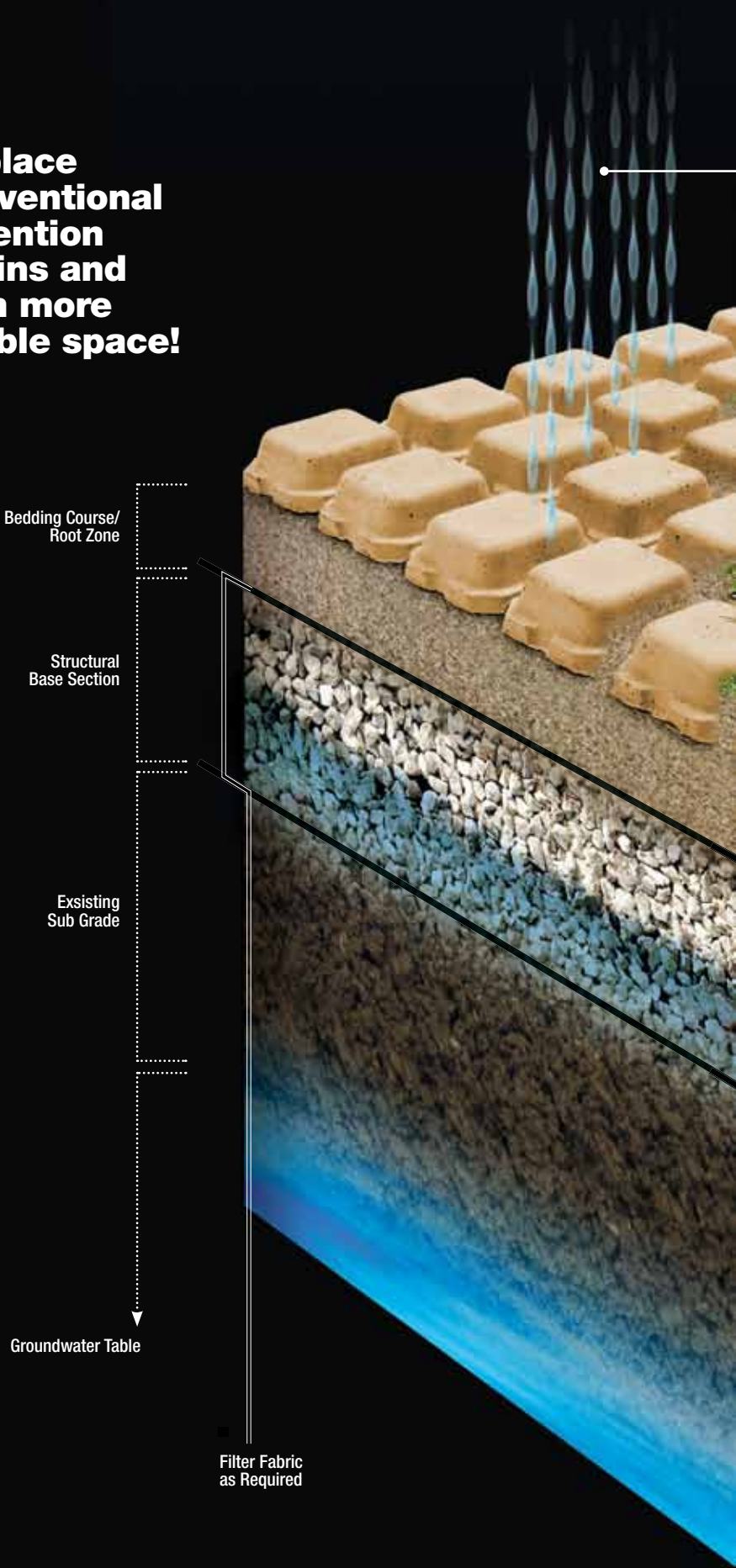
LESS EXCAVATION
Requires less removal of sub-base than traditional pavers or thick blocks.

QUICK EASY INSTALLATION
Installs in half the time of conventional pavers. Flexibility and design of the product offers significantly more forgiving placement compared to large rigid blocks.

ROOT PENETRATION
DRIVABLE GRASS® enables superior root penetration into the underlying bedding course, establishing a cohesive root zone below the mats.

STORM WATER MANAGEMENT

Replace conventional detention basins and gain more usable space!

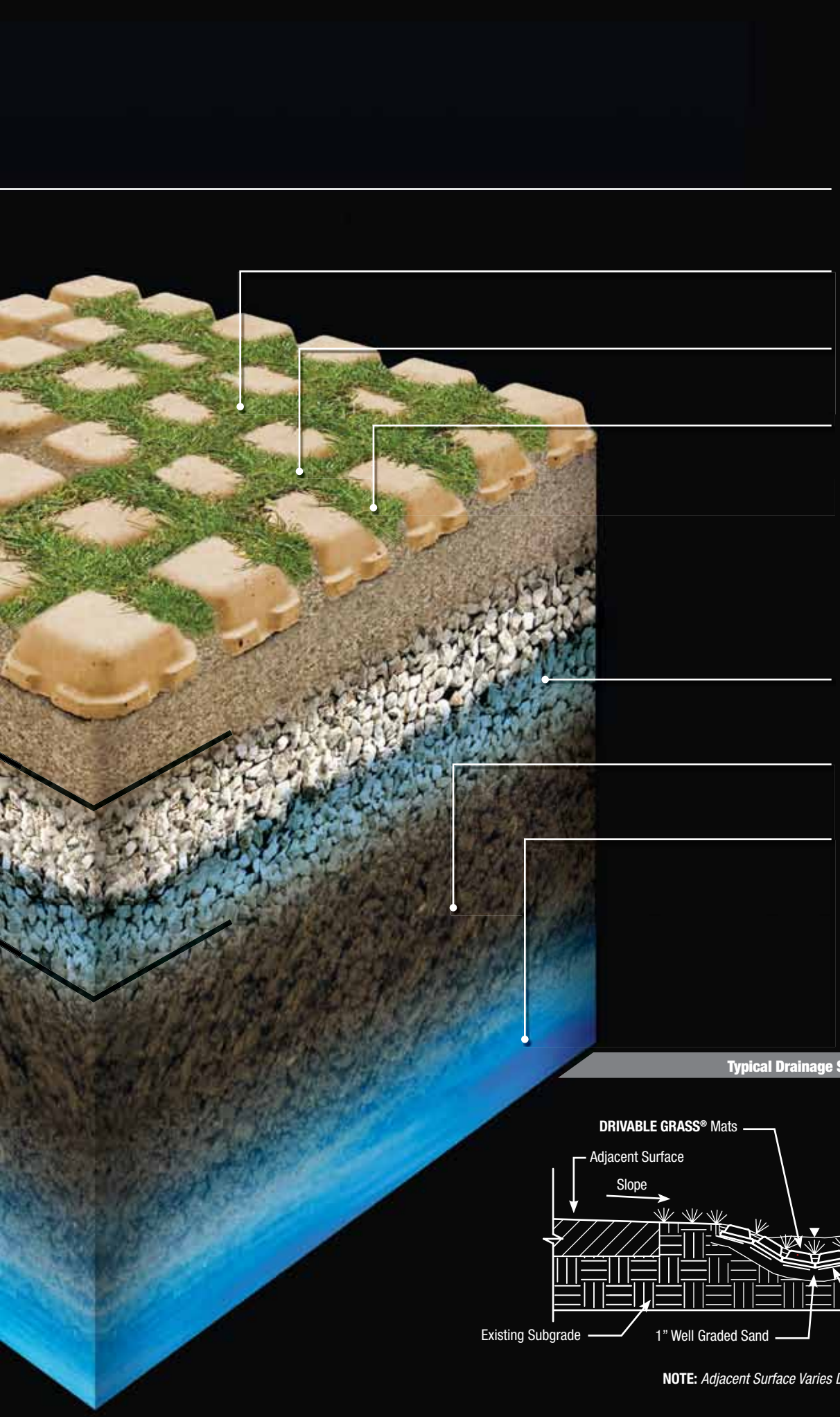


DRIVABLE GRASS® enables storm water to infiltrate into the underlying permeable base and exfiltrate to the native subgrade. When using open graded aggregates with a void space of 30-40% as base material, significant amounts of water can be collected and stored for reuse as irrigation through rain water harvesting techniques. Storm water is filtered by the turf grass and the biosystem that naturally occurs within the root zone soil. By employing this type of bioretention in permeable parking stalls, permeable swales and other rain garden strategies, **DRIVABLE GRASS®** can eliminate the need for storm drains, plastic boxes and conventional detention basins, offering a real cost value to projects.

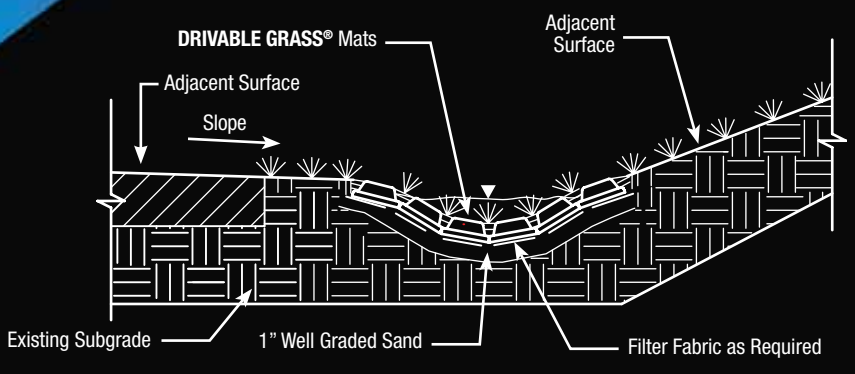
Storm Water Properties	
Property	**Value**
Run off Coefficient (C)	
Aggregate Infill	0.1-0.6 *
Grass Infill	0-0.3**
Infiltration Rate (K in/hr)	
Aggregate Infill	4-40 *
Grass Infill	2-4**
Manning's Roughness Factor (n)	- 0.025-0.03 */**

NOTES:
** Depends on size or shape of aggregate used as infill*
*** Based on specifications*

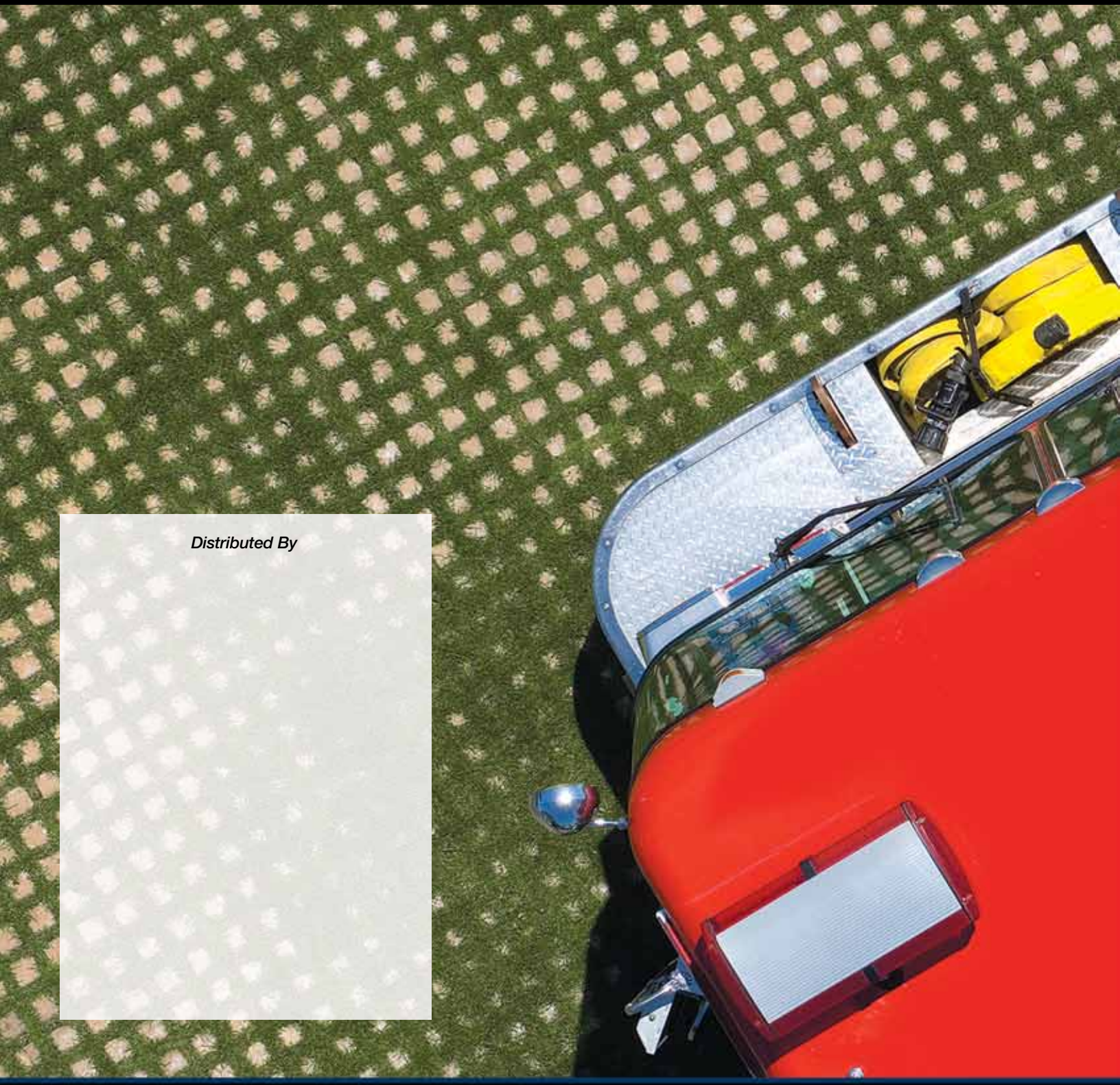
***DRIVABLE GRASS®** has been tested for hydraulic performance. For a complete listing of test results, please visit our website.*



Typical Drainage Swale Detail



NOTE: *Adjacent Surface Varies Depending on Application*



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