



STORMWATER SYSTEMS

MANAGEMENT & TREATMENT





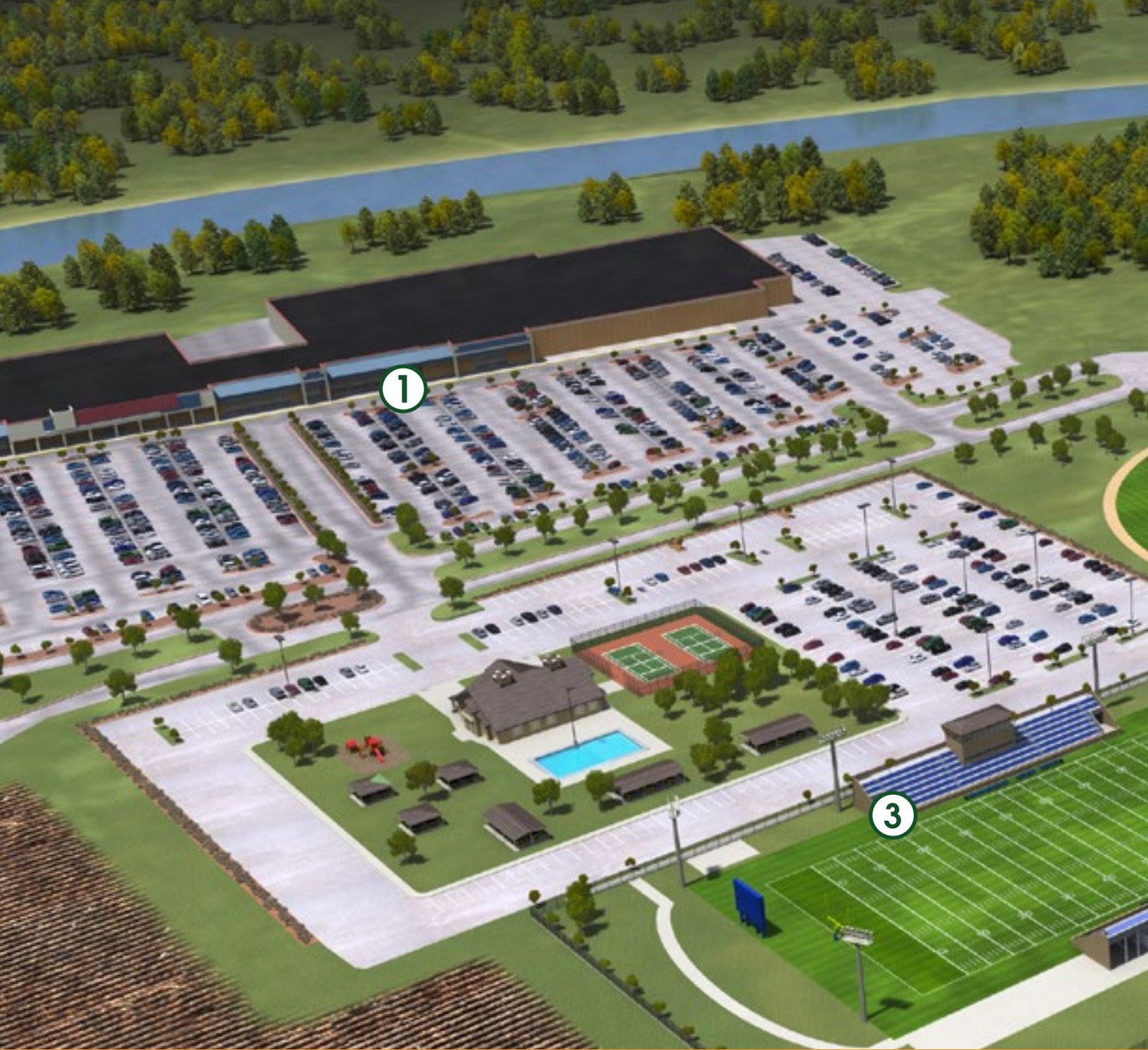
Innovative Stormwater Solutions

Stormwater runoff is generated when precipitation is obstructed from naturally reabsorbing into the ground through pervious surfaces, a problem that is perpetuated by rapid development. This untreated, unmanaged runoff can pose an environmental threat by carrying pollutants into waterways, causing flooding, and allowing for erosion of natural areas. The National Pollutant Discharge Elimination System is a permit program mandated by the Clean Water Act that works to minimize these effects on our environment by regulating runoff and promoting sustainability.

Brentwood has the ability to provide you with products and solutions that offer safe and effective stormwater management and treatment, while also addressing your most complex ecological and regulatory concerns. Our StormTank® product line has been flexibly designed to meet varying project demands, in addition to protecting our environment and creating developable space. Brentwood's innovative design, manufacturing standards, and product testing yield field-proven systems of the highest quality, recognized worldwide for superior performance and long-lasting service.

Contents

World of Stormwater	4
StormTank Shield	6
How the Shield Works	7
StormTank Module	8
Module Accessories	9
How the Module Works	10
Module Case Study	11
StormTank Pack	12
How the Pack Works	13
Brentwood Capabilities	14







World of Stormwater




The combination of global development, aging collection and treatment systems, and increased precipitation levels is driving government and industry leaders to expand and upgrade stormwater systems. With proper planning and implementation of stormwater management projects, the quality of our water resources can be protected and preserved for generations to come. Brentwood's StormTank® products are engineered to meet the most stringent industry performance standards and offer application flexibility, whether it's ensuring that pollutants are removed, groundwater tables are recharged, discharge rates are decreased, or potable water demand is reduced.



Applications:

-  Pretreatment
-  Detention
-  Infiltration
-  Reuse

Product:

-  StormTank® Shield
-  StormTank® Module
-  StormTank® Pack

1 COMMERCIAL

Subsurface systems increase development options, such as building expansion, for shopping centers and industrial parks.



2 RESIDENTIAL

Homeowners utilize stormwater systems as an eco-friendly means of collecting, recycling, and reusing water for purposes like landscaping.



3 RECREATIONAL

Whether it's a park or a golf course, subsurface systems are commonly used in recreational areas to collect stormwater for irrigational reuse.



StormTank[®] Shield

Brentwood's StormTank Shield provides a low-cost solution for stormwater pretreatment by reducing pollutant discharge through gross sediment removal and oil/water separation. Once the Shield is installed, any contaminants with a density less than water are prevented from exiting the inlet. This improves treatment efficiency by increasing the flow length and time of concentration vital to particle settling.

ANTI-SIPHON VENT

Vortexes and siphoning are prevented by the built-in vent, which requires no additional parts or connections.



ACCESS PORT

The access port and slim profile simplify the cleaning process and ensure that nothing obstructs the discharge.



HAND GRIP

The built-in hand grip makes the Shield easy to handle during the installation process.



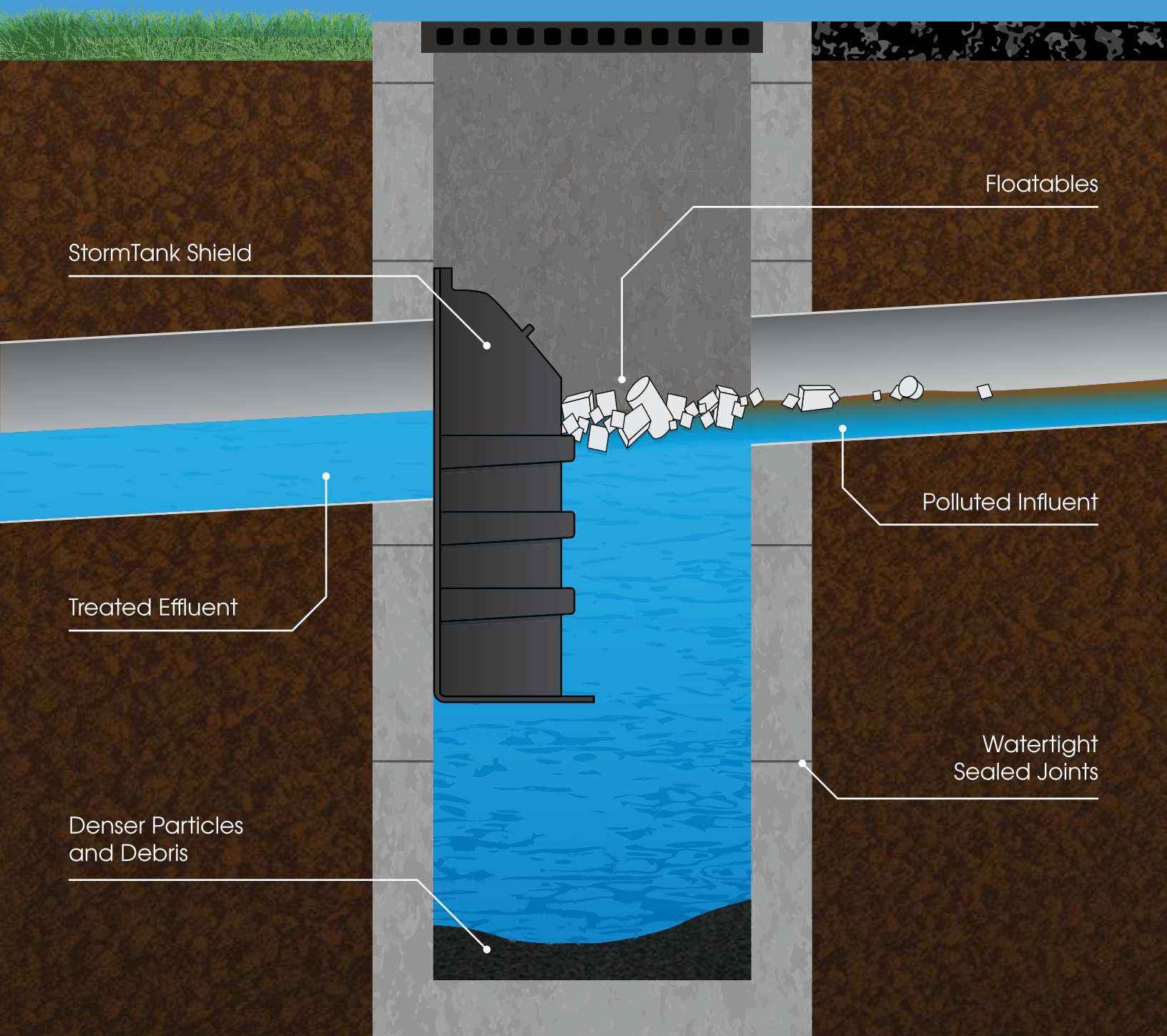
EASY INSTALLATION

Pre-drilled mounting holes allow the Shield to be easily fastened over the outlet pipe. Conveniently available in 18-, 24-, and 30-inch sizes.



How the Shield Works

The StormTank® Shield is designed to prevent floatables and oils entering a structure from directly exiting the outlet pipe. As runoff flows to the catch basin and enters the structure, it accumulates oil, debris, and sediment. These pollutants are often transported through the conveyance system and discharged into a storage system or directly into a stream. By installing the Shield, these floatables and oils are blocked from exiting the outlet pipe, allowing heavy sediment to settle in the sumped inlet and clean water to discharge out of the system.

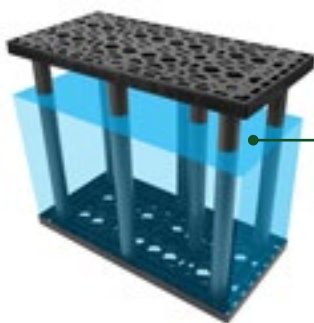
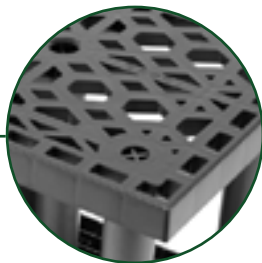


StormTank[®] Module

The Brentwood StormTank Module is a subsurface stormwater storage unit load-rated for use under surfaces such as parking lots, athletic fields, and parks. Its design provides maximum storage while minimizing the installation footprint to reduce construction costs and allow for utilization of valuable land. The Module is commonly used for detention, infiltration, and rainwater harvesting applications but can also be utilized for flood mitigation and bio-retention.

TOP & BOTTOM PANELS

The Module's top and bottom panels are injection molded from polypropylene. They are engineered for strength and uniformly distribute load to the columns.



HIGH VOID SPACE

The Module offers up to the largest void space of any subsurface stormwater management system currently on the market, with models providing as much as 97 percent.

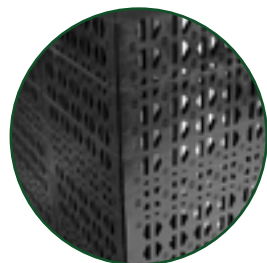
REINFORCED COLUMNS

Extruded from PVC and designed with reinforcing structural ribs, the Module's columns maximize strength. System stackability and variable column height accommodate tight site constraints.

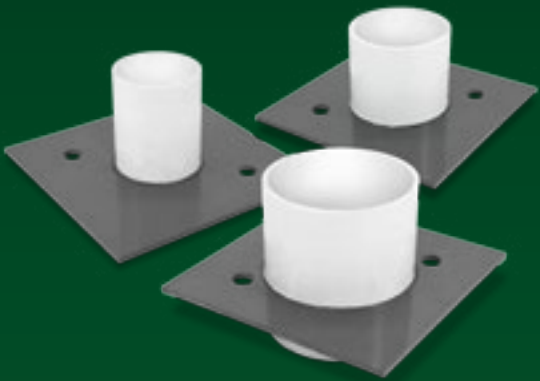
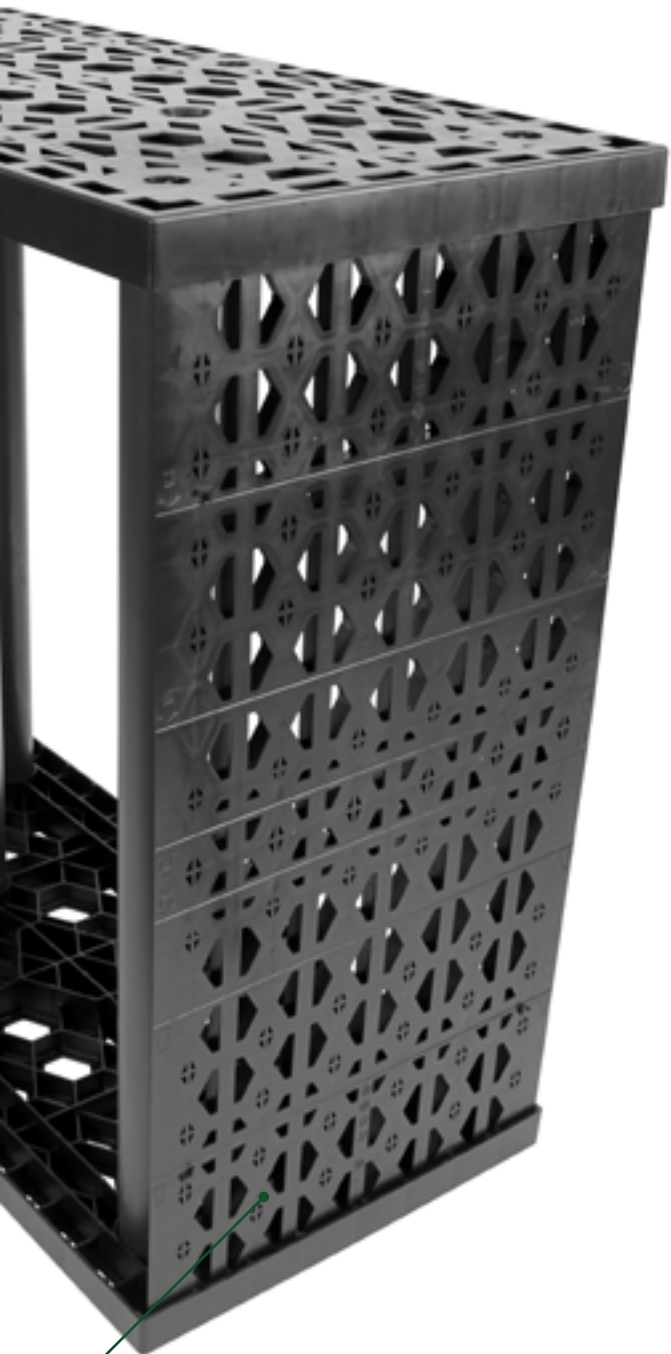


SIDE PANELS

Side panels are used around the perimeter of the Module system to prevent fill material from entering and are injection molded from polypropylene.

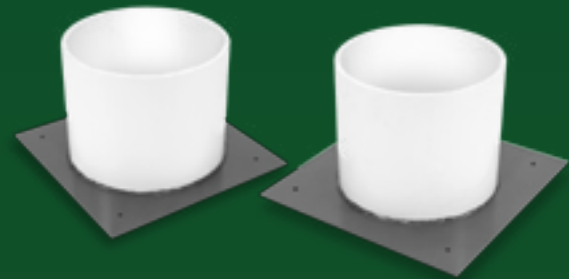


Available Height	Nominal Void Space
18 in (457 mm)	95.5%
24 in (610 mm)	96.0%
30 in (762 mm)	96.5%
33 in (838 mm)	96.9%
36 in (914 mm)	97.0%



OBSERVATION PORTS

Brentwood offers three observation port sizes to complement the open design by providing cleanability and ventilation. The ports are available in 6-inch (152 mm), 8-inch (203 mm), and 10-inch (254 mm) diameters.



INLET/OUTLET CONNECTIONS

Influent/effluent ports are used to provide an easy option for connecting to your drainage system. Brentwood manufactures two different sizes: 12-inch (305 mm) ports and 14-inch (356 mm) ports.

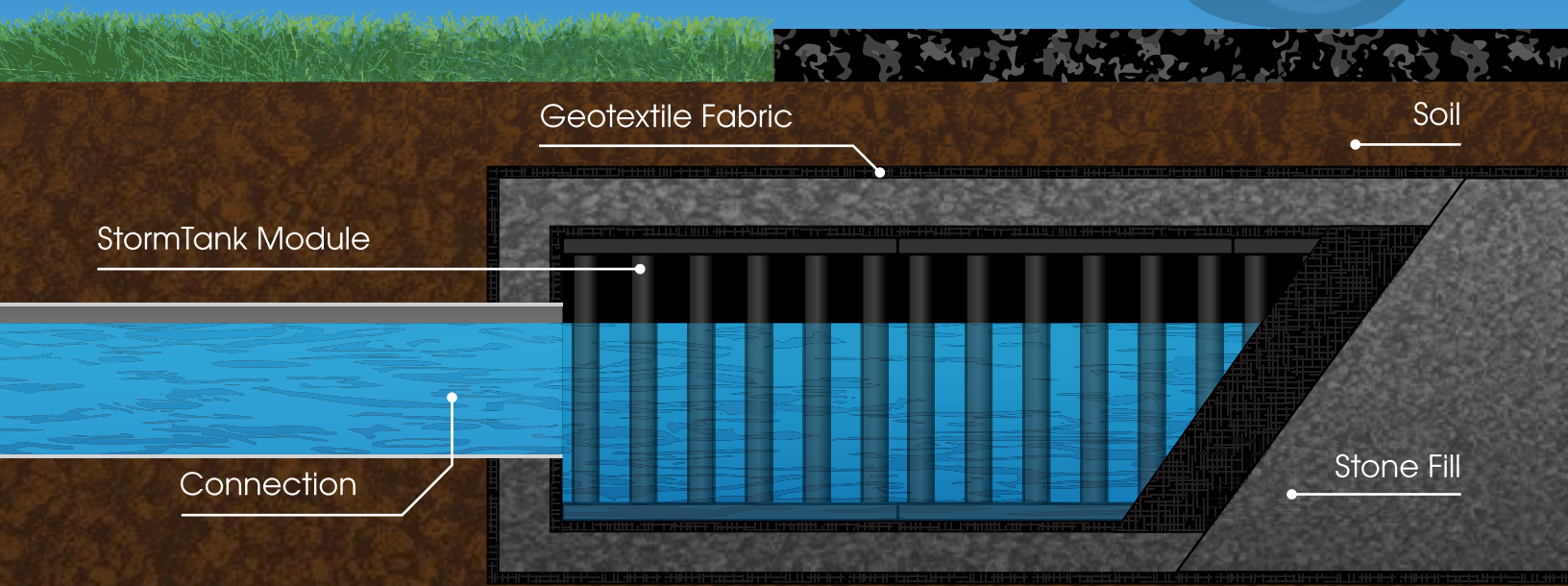


PORT KITS

Brentwood's port kits include the necessary port, flexible coupling or tap saddle, and surface box, leaving the contractor responsible only for the riser pipe.

How the Module Works

The StormTank® Module provides subsurface storage of runoff that is collected and conveyed to the system or infiltrated through the soil above. Then, the runoff is either stored for permeation into the surrounding native soil, slowly released to a nearby waterway, or recycled and reused.



Installation Overview



EXCAVATIONS

Stake out and excavate per approved plans. Finished grade should be level ($\pm 1\%$) and free of standing water, lumps, or debris.



SUBGRADE PREPARATION

Subgrade should be prepared and approved by the Engineer of Record to a minimum bearing capacity and compacted to a minimum 95% standard proctor density.



LEVELING BED

Place geotextile fabric with additional material to wrap the system. Then, place a 6-inch (152 mm) minimum of angular clean stone, vibrated or rolled to a maximum 1% slope.



MODULE PLACEMENT

Place geotextile fabric with additional material to wrap the modules. Mark the system footprint and place the modules side by side. Locate and install any connections.



SIDE BACKFILL

Wrap the modules with a layer of geotextile fabric. Uniformly backfill the sides with 12-inch (305 mm) lifts of angular clean stone.



TOP BACKFILL

Uniformly backfill with 12-inch (305 mm) lifts of angular clean stone. Compact with a plate vibrator and wrap entire system in a layer of geotextile fabric.



TOP COVER

Place clean fill as noted on the approved plan. Finish the surface with vegetative cover, asphalt, or concrete.



FINISHED SYSTEM

A completed system can be located under different ground covers and support up to HS-25 loading when installed per installation instructions.

Module Case Study

Dickinson College is the 16th oldest university in operation in the United States, dating back to 1773 when it was established as a grammar school. Over the years, Dickinson has seen a steady increase in its student and faculty population, recently prompting a major renovation of the school's aging athletic center.

Originally built in 1979, the Kline Fitness Center is a multipurpose hub, housing a gymnasium, a fitness center, a pool, and a climbing wall. Space was at a premium for Dickinson, as the facility is bound by a railway line and two roadways, so they were forced to propose an innovative expansion.

To meet the strict regulations for new construction, the project required the design of a stormwater management system. With limited area available for development, the installation of an above-ground system was not a plausible option. Fortunately, Centerpoint Engineering, Inc., and Cannon Design were able to integrate an underground solution.

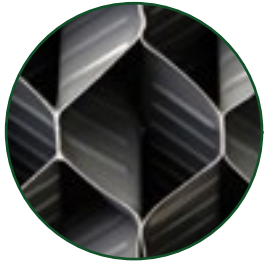
They decided to install a subsurface system along the face of the building and under the open canopy that lines the front of the building. The application of this innovative strategy helped to address tight constraints. As a trusted option, the engineers turned to Brentwood's StormTank® Module because its design allows for stacking and offers the largest void space of any stormwater storage structure on the market.

Successfully installed in the summer of 2013, a double-stacked system was utilized to meet the regulatory requirements for volume and rate, expand usable land, and offer the necessary cleanability. The basin provided more than 29,000 ft³ (821 m³) of stormwater storage, and the system design allowed for the easy incorporation of an impermeable liner to prevent infiltration. This innovative solution met the needs of the designer, owner, community, and regulatory agencies, while giving a proud university a new facility.



StormTank® Pack

The StormTank Pack is the light-duty solution for subsurface stormwater management. It provides a cost-effective alternative for non-load-bearing applications and is commonly utilized under landscaped areas such as parks, plazas, and backyards. The Pack is designed for optimum infiltration and integration in bio-retention and rainwater harvesting applications.



LARGE VOID SPACE

With its 95 percent void space, the Pack provides a substantial improvement over standard crushed stone structures, which only yield about a 40 percent void space.

EASY RUNOFF DISTRIBUTION

The Pack's crossflow configuration allows runoff to spread across the media as it enters the system, evenly distributing the runoff to the base.



STRUCTURAL INTEGRITY

Dedicated glue joints ensure precise and complete bonds throughout the entire pack and yield uniform flute sizes to enhance strength.



ADVANTAGES

✓ No Assembly

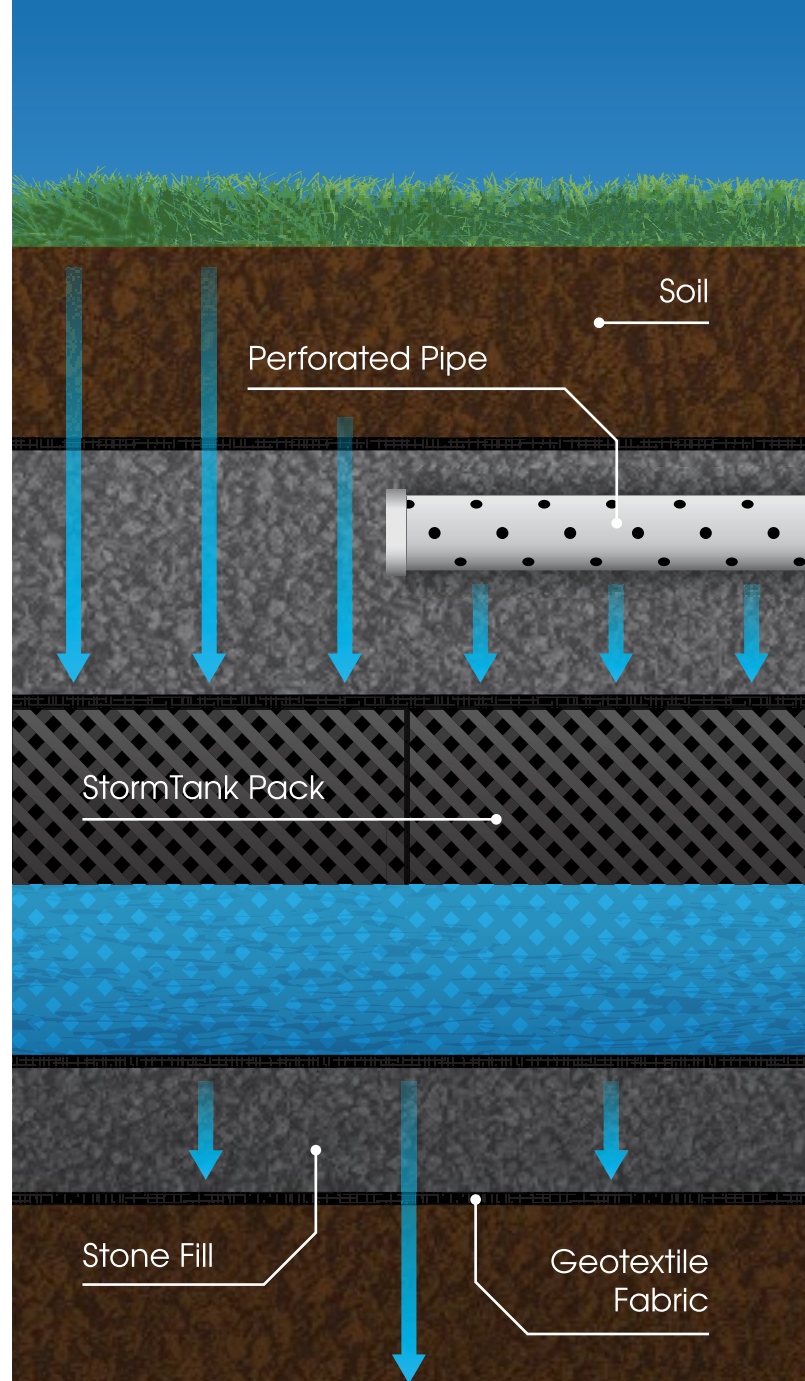
The Pack is shipped pre-assembled to the job site, providing for ease of installation and reduced labor costs.

✓ Layout Flexibility

To accommodate layout variations, the Pack can be cut to any length. It is standardly available in 12-inch (305 mm) and 24-inch (610 mm) heights.

✓ Easy Maintenance

The Pack is designed to prevent debris from entering the system, eliminating the need for cleaning.



How the Pack Works

The StormTank® Pack works much like the Module, allowing water to enter the system by means of infiltration or through a perforated pipe. Once the runoff hits the Pack, it spreads across the media surface and is evenly distributed to the base where it either permeates into the soil or collects for rainwater harvesting.

Brentwood Capabilities

At Brentwood, it's our job to make sure that you get maximum performance out of the stormwater management and treatment systems we supply. We emphasize customer service and support by partnering with you to extend the process beyond physical equipment supply and utilizing a custom approach to carefully assess each project. With a comprehensive knowledge of stringent industry standards and an in-depth understanding of diverse applications, Brentwood's engineers are capable of evaluating your site-specific goals to provide an efficient solution for handling stormwater runoff.



Research & Development

Brentwood works to meet the ever-increasing demands of the marketplace and solve the challenges facing our customers by continually developing innovative designs and enhancements that improve the product, as well as the process. Our quality assurance program includes full material property testing in accordance with ASTM material property standards, and our research and development engineers perform full part and process testing in order to quantify product performance. By consolidating resources such as engineering expertise, product design, and advanced quality initiatives, Brentwood can assure customers of a quality, reliable product.

Full-Scale Testing

Through a partnership with Queen's University's GeoEngineering Centre in Kingston, Ontario, Brentwood has conducted full-scale installation tests of single- and double-stacked Module systems to analyze short- and long-term performance. Side backfill materials tests were also performed to compare the usage of sand, compacted stone, and uncompacted stone. This ongoing partnership between Brentwood and Queen's University continues to be utilized for product testing and consistently provides successful results.

Layout Assistance

Brentwood's full staff of technical designers and skilled engineers can assist with taking each project from concept to realization. By supplying layout drawings and installation instructions with every quote, Brentwood works with customers to optimize systems for specific applications and ensure reliable performance.



Learn More at www.brentwoodindustries.com/stormwater

Visit the Brentwood website to find product details and see the StormTank systems in action.
Be sure to sign up for myBrentwood to access all product specifications and drawings.



Wheelbarrows & Mortar Products

Whether you're a landscaper, a contractor, or simply working in your backyard, Brentwood can supply you with professional-grade wheelbarrows and mortar products to make every job successful.



Marine Bulkhead

Brentwood's high-strength bulkheads, or seawalls, are engineered to withstand harsh marine environments and provide long-term erosion protection for waterfront properties.



Custom Molding

Brentwood offers application-specific thermoplastic molding solutions for a wide range of industries. With over 40 years of experience in thermoforming and injection molding, Brentwood has optimized all stages of the product realization process, from project initiation and engineering design to manufacturing and fulfillment.



About Brentwood

Brentwood is a global manufacturer of custom and proprietary products and systems for the construction, consumer, medical, power, transportation, and water industries. A focus on plastics innovation, coupled with diverse production capabilities and engineering expertise, has allowed Brentwood to build a strong reputation for thermoplastic molding and solutions development.

Brentwood's product and service offerings continue to grow with an ever-increasing manufacturing presence. By emphasizing customer service and working closely with clients throughout the design, engineering, and manufacturing phases of each project, Brentwood develops forward-thinking strategies to create targeted, tailored solutions.





BRENTWOOD INDUSTRIES, INC.

brentwoodindustries.com

stormtank@brentw.com

+1.610.374.5109

