

STORMBRAKE

INSTALLATION MANUAL

MODEL ID

LOCATION

SB SERIAL ID

PROTECTOR

PRODUCT OVERVIEW



SAVING NATURE.

As we confront climate change, it's clear that a collective shift in mindset is underway, with emerging initiatives like 'Resilient Cities', green roofing, and water-permeable surfaces leading the charge. These efforts, along with passive tree irrigation, combined stormwater management systems, and innovative purification technologies, are vital in conserving water and reducing urban flooding. However, the journey is far from complete.

Protector stands ready to tackle the challenges of flooding and drought, offering cutting-edge solutions like the Stormbrake water systems. These systems, in compliance with European standards, represent the forefront of underground water management, designed for a broad spectrum of applications. They promise efficient stormwater storage and infiltration, with durability testing ensuring a lifespan of 50 years or more, setting a new benchmark for long-term infrastructure resilience.

Protector Stormwater quality Improvement Devices, manufactured by the Australian-based manufacturer, Protector Australia, provide high quality solutions for stormwater treatment and management for fast and efficient installation and maintenance, needed for today's fast track building methods. Built to the highest specifications, the Protector Stormwater quality improvement device range of products designed within FRP tanks are designed and built to BS4994-1987 and ASME RPT1. Popular with councils, municipal, water authorities, civil and construction customers and incorporating state-of-the-art technology, our packaged Stormwater Quality Improvement Devices provide simple solutions to some of the most complex problems in the stormwater treatment industry.

Protector Stormwater quality Improvement Devices are designed to reduce operating costs and optimise operating and installation efficiency whilst providing the highest quality stormwater pollutant removal.

Protector's dynamic enterprise has roots in the industry that go back to over 40 years of engineering, design experience and product knowledge passed from generation to generation to where it is today. Protector Stormwater Quality Improvement Devices and treatment systems are renowned for their quality with painstaking attention to detail that has become the product and basis for the company's operation formed by years of experience and knowledge in the fibreglass and water industry. With all FRP parts being manufactured in Australia, you can be assured of the highest quality system.

Today Protector's plant, based in the picturesque Southern Highlands, comprises of modern 'state of the art' filament winding and computerised robots to ensure fast operations and precision from concept to completion. The basis for the company's operation, with continuous success, both yours and ours!

Fibreglass Reinforced Polymer are strengthened materials that shows higher resistance to the corrosion which makes them ideal to be implemented for the tanks. They can be exposed to the water for years without being corrupted. Light weight, being resistant to high temperature and easy on-site installation are some of the desirable features that FRP indicates. Furthermore, FRP plates have higher mechanical strength which enables them to carry higher loads compared to plastics.

Protector Australia has designed and manufactured SQID systems utilizing FRP in order to provide a quality product that is high in strength and have a long life with high corrosion resistance. Protector SQID systems have a better durability, and highly resistant to any impact and corrosion.

This document provides an in-depth and detailed collation of the technical information on the Protector Stormwater Quality Improvement Device range including its installation practices, suitable usage, advantages and limitations.

Information is also provided on the filtration system, its design and its maintenance.

INSTALLATION OVERVEIW



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TRANSPORT AND STORAGE

- Stormbrake modules are delivered stacked on pallets, with separate pallets for sidewall grids, supporting grids, and roof slabs.
- Store outdoors for no more than one year, protected from direct sunlight.
- Ensure solid and level ground for storage on-site.

SEPARATING PALLETS

- Use hoisting slings to separate stacked pallets before removing the half elements.

EXCAVATING PIT AND CREATING BEARING

- Excavate the pit as per design specifications.
- Create a horizontal level and stable bearing with a levelling layer of crushed stones, gravel, or sand.
- Compact and smooth this layer to achieve a level surface.

LAYING GEOTEXTILE

- Wrap the entire storage/infiltration system in geotextile with sufficient excess length to eventually wrap up the entire system.
- Ensure that the geotextile surface is completely closed, with no gaps during backfilling.

INSTALLATION

- Assemble Stormbrake modules with slight hand pressure to create a high tensile strength connection.
- Pre-assemble the modules inside or outside the excavation pit as per planning specifications.

USE 8-SHAPED CONNECTORS

- Secure modules in position during installation with connectors.
- Follow specific requirements for single-layer and multiple-layer installations.

INSTALLING SIDE PANELS

- Use side Panels to cover the tunnel ends of the system.
- Install them either in the centre of the modules or after all modules have been placed, depending on space availability.

LATERAL BACKFILLING

- Use non-cohesive, non-frozen earthwork material with a maximum grain size of 32 mm for backfilling.
- Distribute the backfill material evenly and compact it in layers of max. 30 cm using a compactor.

CREATING COVER SLW 60/HGV 60

- Cover the system as per design specifications, using non-cohesive compactable graded earthwork material with a maximum grain size of 32 mm.
- Under traffic areas, a minimum cover of 80 cm must be observed.

STABILITY ANALYSIS

- Ensure that storage/infiltration systems have sufficient load-carrying capacity against impacting soil and traffic loads.

For each of these steps, there are cautions and attentions to consider, such as avoiding using vibratory rollers and explosion rammers for compaction and ensuring that the geotextile is not pulled apart during backfilling.

SITE PREPARATION



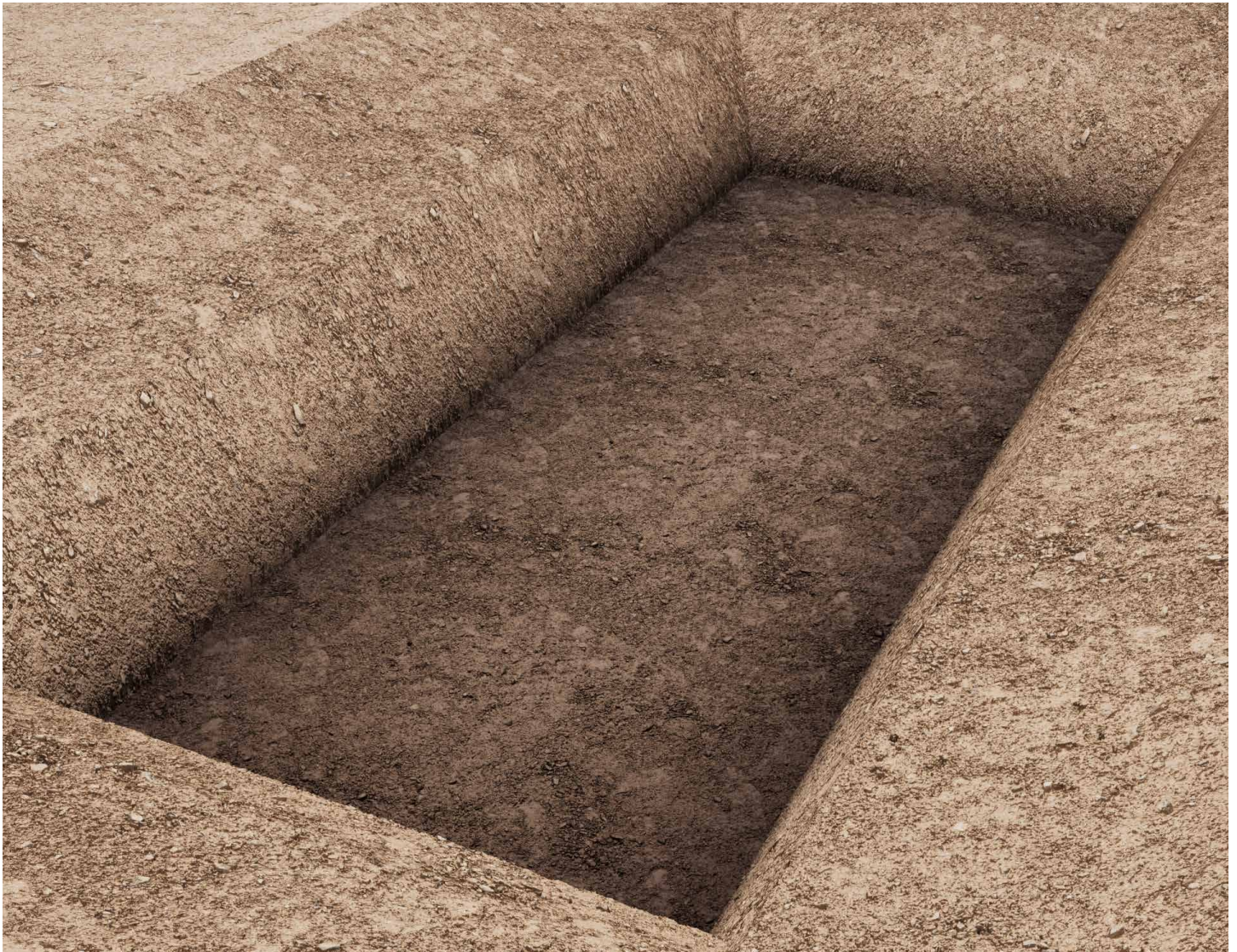
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INTRODUCTION

The Stormbrake module installation should comply with the standards given on our website. This standard ensures the long-term structural integrity of the modules for a service life of at least 50 years. Proper installation is crucial for the functionality and longevity of the system. Here are key steps:

SITE PREPARATION

The installation area must be cleared of any debris and the ground should be leveled. Assess the soil conditions to ensure they are adequate for the expected loads. The area should be excavated to the dimensions required for the Stormbrake modules.



The base is then leveled and compacted as necessary to provide a stable foundation for the system.

SITE PREPERATION



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Lay a crushed stone bed on the base to make the system is stable.

FOUNDATION LAYER GEOTEXTILE



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A non-woven geotextile layer should be laid over the leveled ground to prevent soil mixing and ensure filtration. A layer of crushed stone or gravel must be added on top and then compacted to provide a stable base.



FOUNDATION LAYER GEOTEXTILE



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Geotextile layer have to installed before the assembly of the modules. Choose a geotextile material that is compatible with the site’s environmental conditions and the intended use of the Stormbrake system (e.g., permeability, durability, and filtration properties).

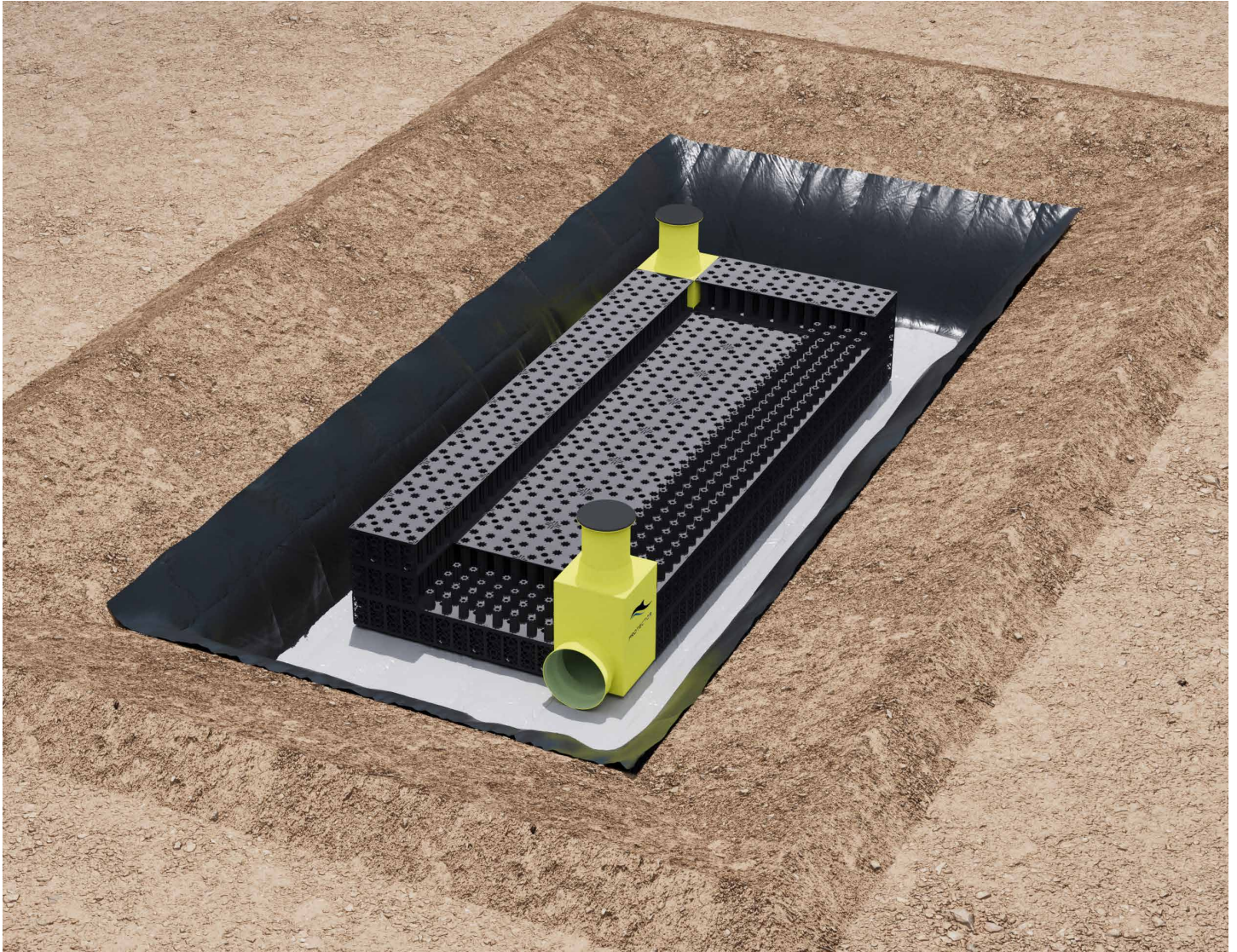


MODULE INSTALLATION



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Stormbrake modules should be placed on the foundation layer according to the designed layout. The modules must be level and securely interconnected. If the system is intended for storage, it's important to check the vertical and horizontal compressive strength, as per the long-term requirements.

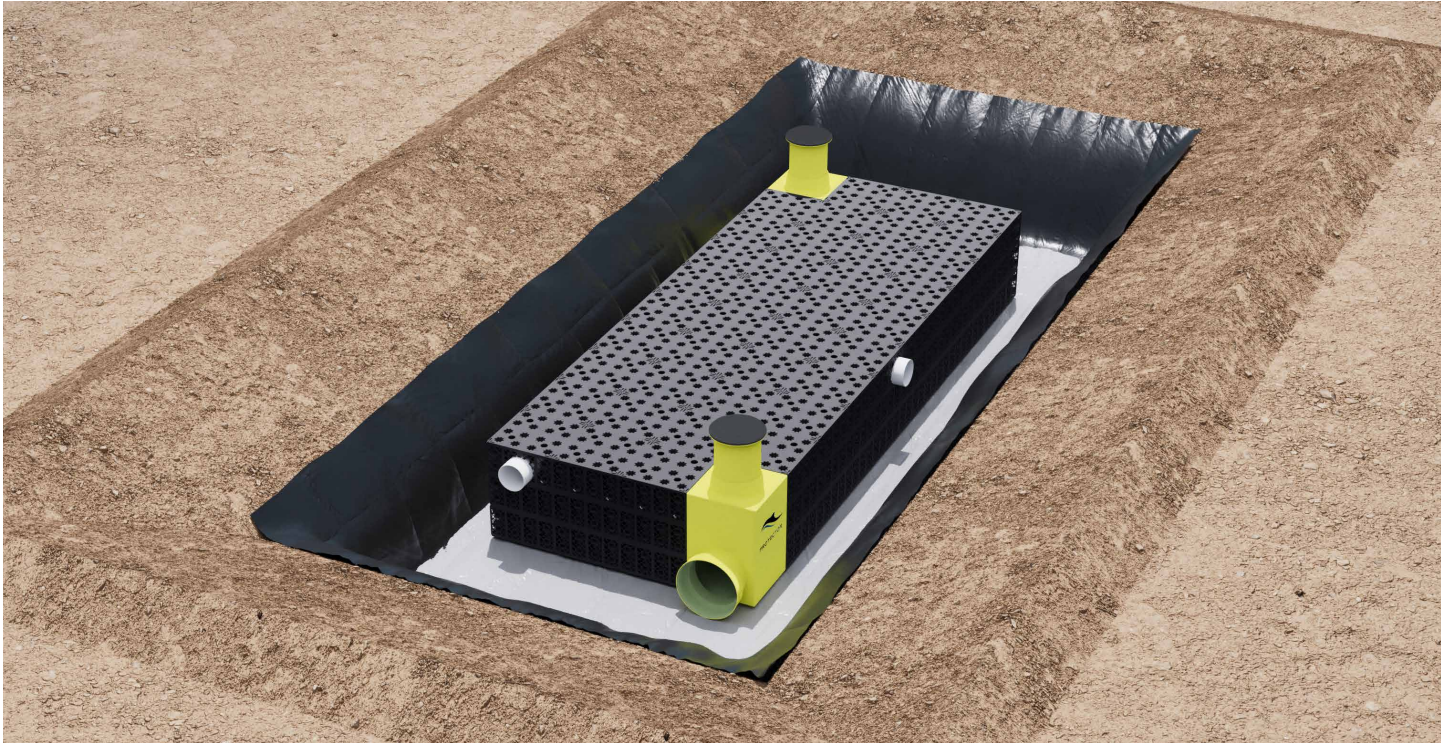


Once the foundation is ready, the observation shaft can be carefully lowered into position. Ensure it is perfectly vertical and aligned according to the site plan. The shaft may need to be secured with bolts or other fastening systems to the foundation to ensure stability. The covering system, which may include a lid or a more complex mechanism, should be installed according to the manufacturer's instructions. This may involve attaching the cover to the top of the observation shaft and ensuring it is secure and watertight.

MODULE INSTALLATION



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A bypass system to manage overflow. A significant feature of this system is the bypass mechanism integrated between the distribution start shaft and the distribution target shaft. This bypass serves as an overflow option in case of larger water volumes, ensuring that the system can handle excess water without compromising its operation or efficiency.



Once the system is in place, the extending geotextile fabric is folded over the top of the Stormbrake inspect blocks. In some cases, an additional layer of geotextile may be placed over the top before folding the sides over, ensuring the entire system is encapsulated.

MODULE INSTALLATION



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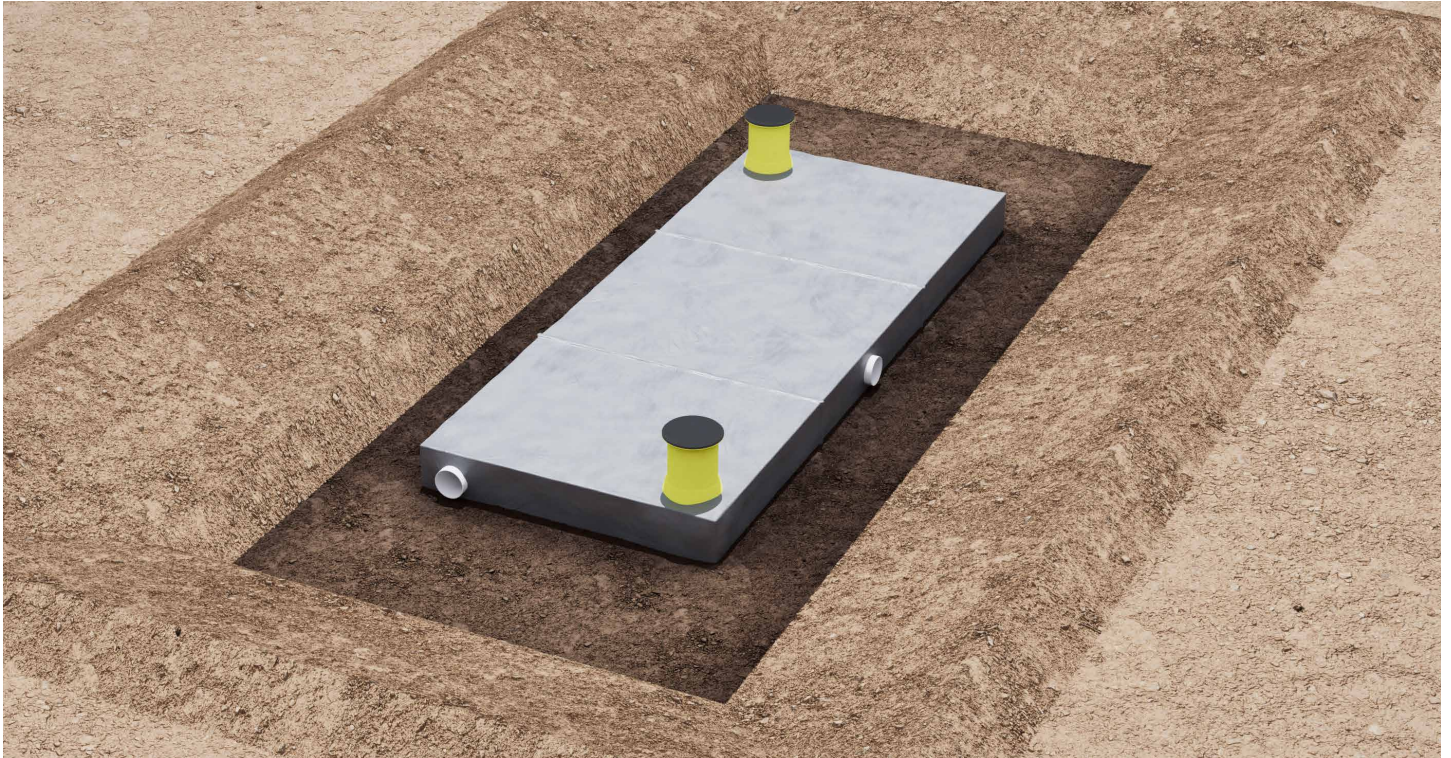
Connect Stormbrake with the distribution Pipes according to requirement of the design.

BACKFILLING

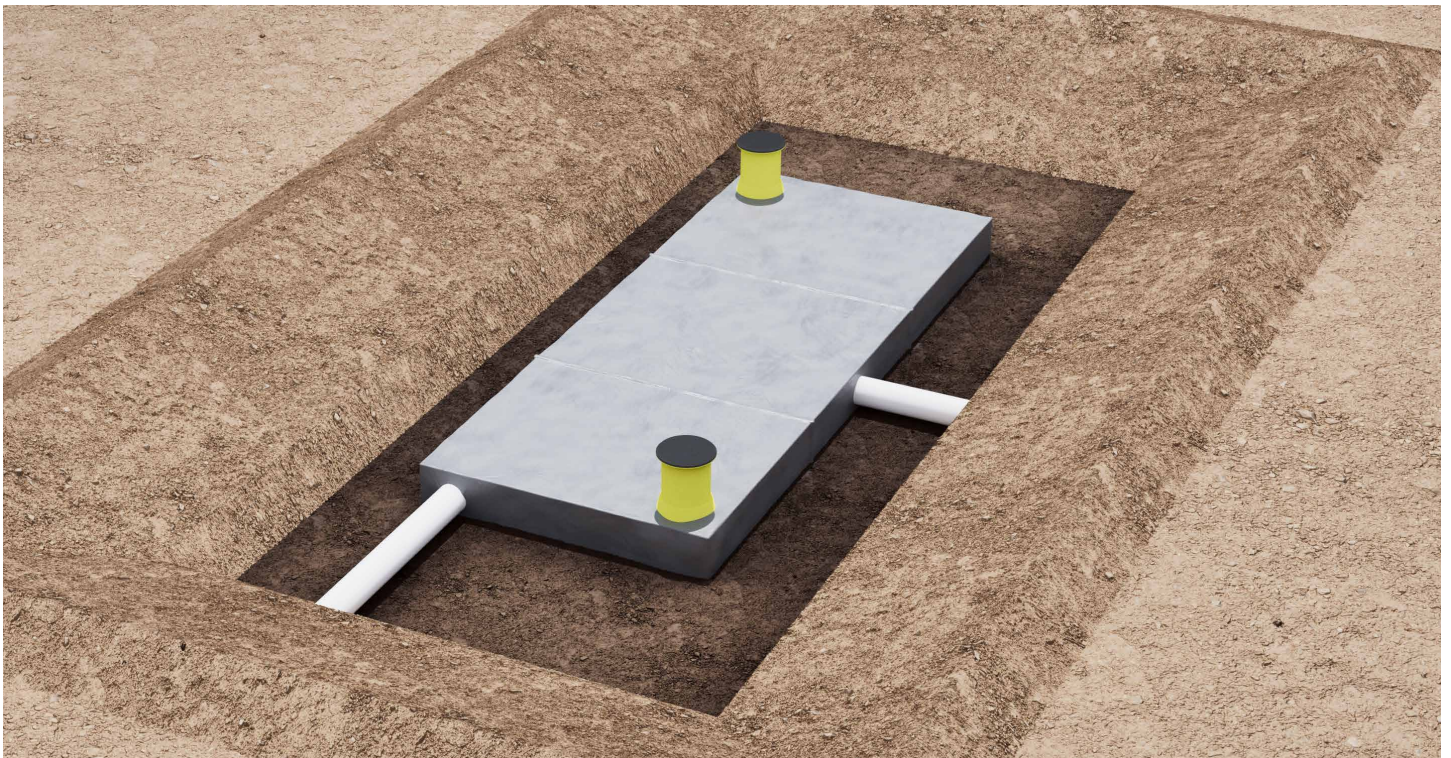


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Backfill the area around the installed modules with suitable materials, like clean gravel, and compact it in layers to prevent module displacement.



Keep systems and shafts protected from dirt. Do not remove covers until extension pipes and/or shaft covers are installed.



Install the required piping system before fully cover the whole module.

FINALIZATION

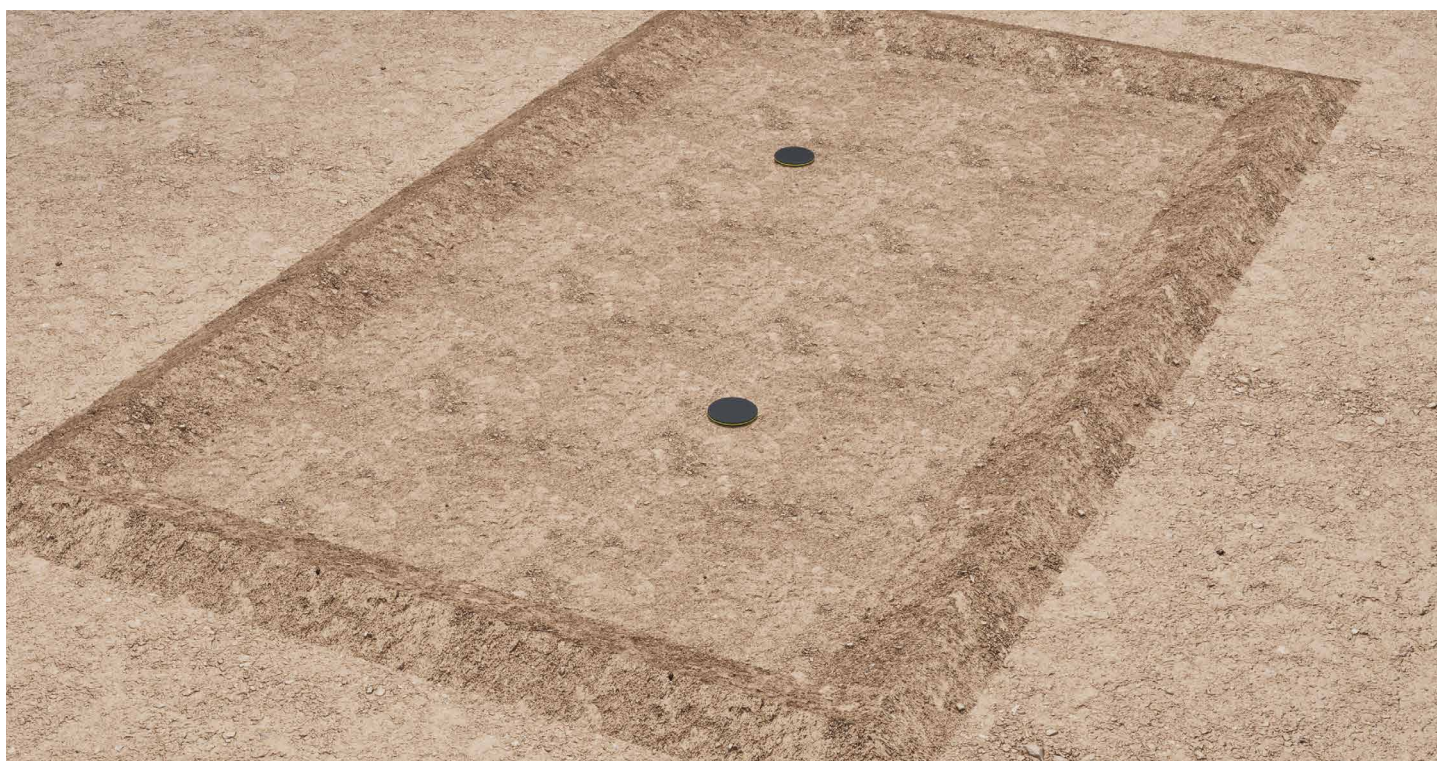


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After installing the necessary piping systems, cover the modules with geotextile and apply the final soil or pavement layer. This depends on the planned use of the area above the modules.



Backfill the area around the shaft with gravel or sand to provide additional support and drainage. Compact the backfill material properly to avoid any settlement.



FINALIZATION

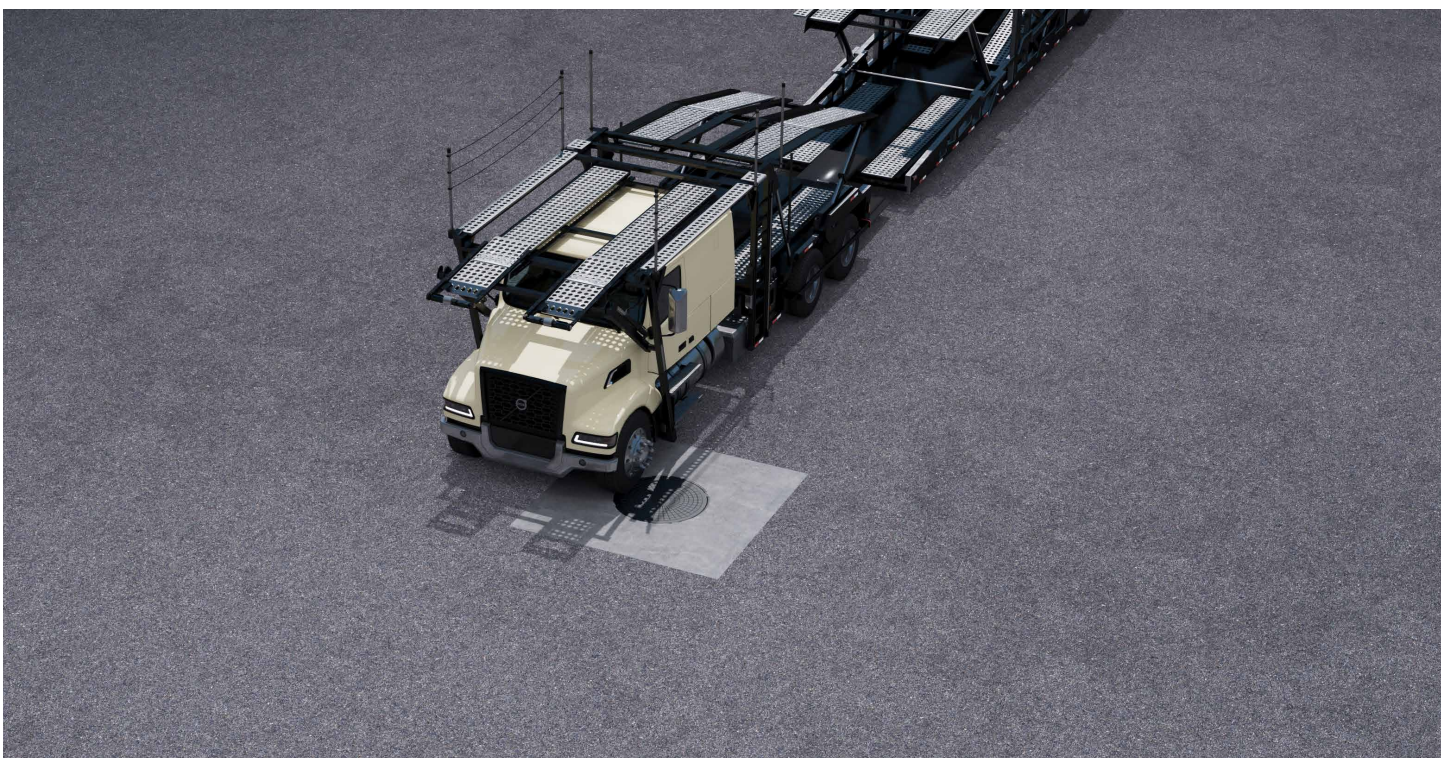


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Ensure that the covering system is safe and secure to prevent unauthorized access or accidents. Safety signage may also be installed around the shaft.



Conduct a thorough inspection of the installed observation shaft and covering system to ensure that everything has been installed correctly and is functioning as expected. Test the observation shaft for stability and the covering system for ease of use and



SYSTEM COMPONENTS



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Detailed visuals and descriptions of the system components, including the innovative QuadroControl shaft, provide a comprehensive overview of the product offerings. The Stormbrake storage/infiltration module with side panel, QuadroControl shaft, Adaptor, connectors and geotextile.

THE SIDE PANELS

Designed to enhance the application scope of stormwater management systems, particularly for projects with heightened requirements. It is an innovative solution for scenarios where there is groundwater presence outside the system or in cases necessitating multiple-layer systems with significant installation depths. Such conditions often lead to increased horizontal loads on the storage/infiltration system, thereby limiting the installation parameters.



8-SHAPED CONNECTORS

play a crucial role in stabilizing modular stormwater management systems by firmly securing the modules together. To ensure a stable and integrated structure, it's important to attach these connectors at specific points. Position the connectors on the top surface of each module, targeting the center of each edge that comes into contact with an adjacent module. This strategic placement not only maximizes the cohesion between the modules but also enhances the overall structural integrity of the assembled system, ensuring it remains securely interconnected under various conditions. This method of assembly is designed to facilitate a straightforward and efficient installation process, while providing a robust framework capable of withstanding environmental stresses.



OBSERVATION SHAFTS

Represents a versatile and essential component of modern stormwater management systems. Made from durable polypropylene, this inspection shaft is designed to seamlessly integrate within any storage or infiltration system. Shaft can be placed flexibly within the system's layout, providing strategic access points as needed. The height of the shaft adjusts according to the number of layers in the connected system, ensuring a tailored fit and seamless integration. This feature allows for the easy insertion of high-performance inspection and flushing equipment directly into the tunnel, facilitating regular maintenance and inspection tasks from above ground without compromising the system's integrity or operation. As the storage or infiltration system is constructed, the shaft is built up layer by layer, illustrating its modular design and ease of integration during various stages of construction. It comes complete with all necessary components for assembly, ensuring a straightforward setup process on site. This design not only enhances the functionality and accessibility of stormwater management systems but also underscores the adaptability and efficiency of incorporating such inspection shafts into comprehensive water management solutions.

GEOTEXTILE

Plays a significant role in stormwater management systems, specifically in the design and implementation of storage/infiltration modules.

Geotextile acts as a filtering and separating layer in these systems, ensuring that water can pass through while preventing soil and other particles from entering the storage modules. This helps to maintain the functionality of the system by preventing clogging and promoting efficient water infiltration or retention. By wrapping around the storage/infiltration modules, geotextile protects them from the surrounding soil, potentially harmful chemicals, or debris. This protection extends the life of the stormwater management system by mitigating the risk of damage or contamination.

SAFETY INSTRUCTIONS



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The safety instructions include the following important points.

QUALIFICATIONS

Staff responsible for installation, assembly, operation, maintenance, and repair must have the appropriate qualifications required for this kind of work. It is the responsibility of the builder to organize the authority, responsibility, and supervision of staff in detail.

OPERATIONAL SAFETY

The operational safety of the supplied system components is only assured if they are properly installed and used correctly. Technical threshold values must not be exceeded.

REGULATIONS AND STANDARDS

Various accident prevention regulations, safety regulations, and standards must be observed. These include regulations for construction work, technical wastewater systems, working in enclosed spaces of technical wastewater systems, handling biological working materials in such systems, and directives for working in tanks and narrow spaces. Standards mentioned are DIN 4124 for excavations and trenches, and DIN EN 1610 for the construction and testing of drains and sewers.

WARNINGS

Be aware of hazards from gases and vapours that could lead to suffocation, poisoning, or explosion; risks of falling; drowning; germ pollution and wastewater with sewage; and high physical and psychological stress during work in deep, narrow, and dark spaces.

DANGERS

Non-compliance with the operating manual can lead to considerable property damage, injury, or death.

CAUTION

Systems, pipes, and shafts are parts of an entire network. During any work on these components, the entire system must be taken into consideration. It is advised to avoid working during rain.

These safety instructions should be strictly followed to ensure the safety of all individuals involved in the handling and installation of these system

QA AND DOCUMENTATION



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QUALITY ASSURANCE

All materials and installation procedures should meet the requirements of the required standard. Modules must have standard-compliant marking for long-term compressive strength.

DOCUMENTATION

Maintain detailed records of the materials and installation process. Ensure that the compliance with the standard is documented, particularly concerning long-term compressive strength.

For specific details and instructions, it's important to refer to the project's engineering guidelines, standards, and safety protocols, or consult with a qualified engineer familiar with the project. If there's a specific aspect of the installation process you're interested in, or if you have further questions, please let us know!

CHECKLIST


PROJECT NAME		
DATE		
PREPARED BY		
STEPS	CHECK	MARK
INCOMING MATERIAL INSPECTION	Check all parts upon delivery and before installation for damage.	<input type="checkbox"/>
TRANSPORT TO CONSTRUCTION SITE	Use appropriate vehicles, load and unload under supervision.	<input type="checkbox"/>
UNLOADING THE LORRY	Use hoisting slings, not chains or ropes.	<input type="checkbox"/>
STORAGE AT CONSTRUCTION SITE	Store components on even ground, protect from UV if stored outside for long.	<input type="checkbox"/>
UPPER EMBEDDING & LATERAL BACKFILLING	Ensure compaction and load-bearing capacity.	<input type="checkbox"/>
TESTS BEFORE BACKFILLING	Check for proper installation, leak-tightness, damage, and insertion depth.	<input type="checkbox"/>
CUTTING THE EXTENSION PIPE	Cut the extension pipe to fit the support ring, remove any irregularities.	<input type="checkbox"/>
PLACING SHAFT COVERS	Use standard covers and concrete support ring, ensure load transfer to ground.	<input type="checkbox"/>

INSPECTION AND MAINTENANCE



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Inspections are crucial for ensuring the longevity and reliability of the underground drainage system. The Stormbrake modules are designed for easy inspection using CCTV, even when the system is full, allowing for regular checks and final acceptance. Each module features a unique cross-shaped tunnel, providing camera access in multiple directions for a comprehensive assessment of the system's interior. This design ensures that all elements, including load-bearing structures and geotextiles, can be inspected thoroughly.



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PROTECTOR

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07/03/2024 but the manufacturer reserves the right to
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