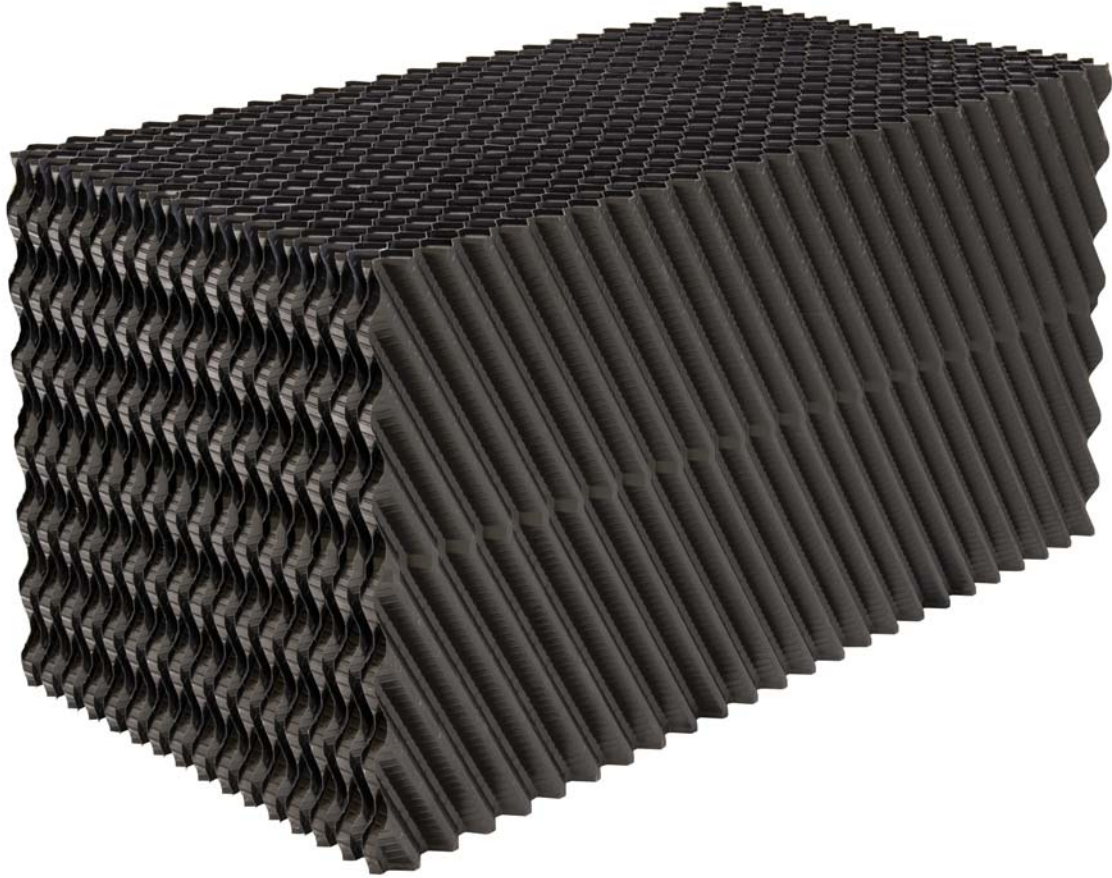




# INSTALLATION GUIDE



## **STORMTANK<sup>®</sup>** *Pack*

SITE PREPARATION & INSTALLATION INSTRUCTIONS

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## General Conditions

- Review installation procedures and coordinate the installation with other construction activities, such as grading, excavation, utilities, construction access, erosion control, etc.
- Engineered Drawings supersede all provided documentation, as the information furnished in this document is based on a typical installation.
- Coordinate the installation with manufacturer’s representative/distributor to be on-site to review start up procedures and installation instructions.
- Components shall be unloaded, handled and stored in an area protected from traffic and in a manner to prevent damage.
- Protect the installation against damage with highly visible construction tape, fencing, or other means until construction is complete.
- Ensure all construction occurs in accordance with Federal, State and Local Laws, Ordinances, Regulations and Safety Requirements.

## **1.0 Basin Excavation**

1. Stake out and excavate to elevations per approved plans. Excavation Requirements:
  - a. Sub-grade excavation must be a minimum of 6" (152 mm) below designed StormTank® invert.
  - b. The excavation should extend a minimum of 12" (305 mm) beyond the StormTank® dimensions in each length and width (an additional 24" [610 mm] in total length and total width) to allow for adequate placement of side backfill material.
  - c. Remove objectionable material encountered within the excavation, including protruding material from the walls.
  - d. Furnish, install, monitor and maintain excavation support (e.g., shoring, bracing, trench boxes, etc.) as required by Federal, State and Local Laws, Ordinances, Regulations and Safety Requirements.

## **2.0 Sub-Grade Requirements**

1. Sub-grade shall be unfrozen, level (plus or minus 1%), and free of lumps or debris with no standing water, mud or muck. Do not use materials nor mix with materials that are frozen and/or coated with ice or frost.
2. Unstable, unsuitable and/or compromised areas should be brought to the Engineer's attention and mitigating efforts determined prior to compacting the sub-grade.
3. Sub-grade must be compacted to 95% Standard Proctor Density or as approved by the Engineer of Record. If code requirements restrict subgrade compaction, it is the requirement of the geotechnical Engineer to verify that the bearing capacity and settlement criteria for support of the system are met. \*

*\* Minimum soil bearing capacity is required so that settlements are less than 1" through the entire sub-grade and do not exceed long-term 1/2" differential settlement between any two adjacent units within the system. Sub-grade must be designed to ensure soil bearing capacity is maintained throughout all soil saturation levels.*

## **3.0 Leveling Bed Installation**

1. Install geotextile fabric and/or liner material, as specified.
  - a. Geotextile fabric shall be placed per manufacturer's recommendations.
  - b. Additional material to be utilized for wrapping above the system must be protected from damage until use.
2. After the geotextile is secured, place a minimum 6" (152 mm) Leveling Bed.
  - a. Material should be a 3/4" (19 mm) angular stone meeting Appendix A – Acceptable Fill Material.
  - b. Material should be raked free of voids, lumps, debris, sharp objects and plate vibrated to a level with a maximum 1% slope.
3. Correct any unsatisfactory conditions.

## 4.0 StormTank® Pack Placement

1. Install geotextile fabric and/or liner material, as specified.
  - a. Geotextile fabric shall be placed per manufacturer's recommendations.
  - b. Additional material to be utilized for wrapping above the system must be protected from damage until use.
2. Mark the footprint of the packs for placement.
  - a. Ensure pack perimeter outline is square or similar prior to Pack placement.
  - b. Care should be taken to note any connections, ports or other irregular units to be placed.
3. Install the individual packs by hand taking care to avoid damage to the geotextile and/or liner material.
4. Upon completion of pack installation, wrap the packs in geotextile fabric and/or liner.
  - a. Geotextile fabric shall be wrapped and secured per manufacturer's recommendations.
  - b. Seal any ports/penetrations per Manufacturer's requirements

## 5.0 Side Backfill

1. Inspect all geotextile, ensuring that no voids or damage exists; which will allow sediment into the StormTank® system.
2. Adjust the stone/soil interface geotextile along the side of the native soil to ensure the geotextile is taught to the native soil.
3. Once the geotextile is secured, begin to place the Side Backfill.
  - a. Material should be a 3/4" (19 mm) angular stone meeting Appendix A – Acceptable Fill Material.
  - b. Backfill sides "evenly" around the perimeter without exceeding single 12" (305 mm) lifts.
  - c. Place material utilizing an excavator, dozer or conveyor boom. All material placement should occur with equipment located on the native soil surrounding the system.
  - d. Utilize a plate vibrator or shovel slice to settle the stone and provide a uniform distribution.

## 6.0 Top Backfill (Stone)

1. Begin to place the Top Backfill.
  - a. Material should be a 3/4" (19 mm) angular stone meeting Appendix A – Acceptable Fill Material.
  - b. Place material utilizing an excavator, dozer or conveyor boom (Appendix B – Material Placement).

**DO NOT DRIVE ON THE PACKS.**

2. Upon completion of Top Backfilling, wrap the system in geotextile fabric and/or liner per manufacturer's recommendations.
3. Install metallic tape around the perimeter of the system to mark the area for future utility detection.

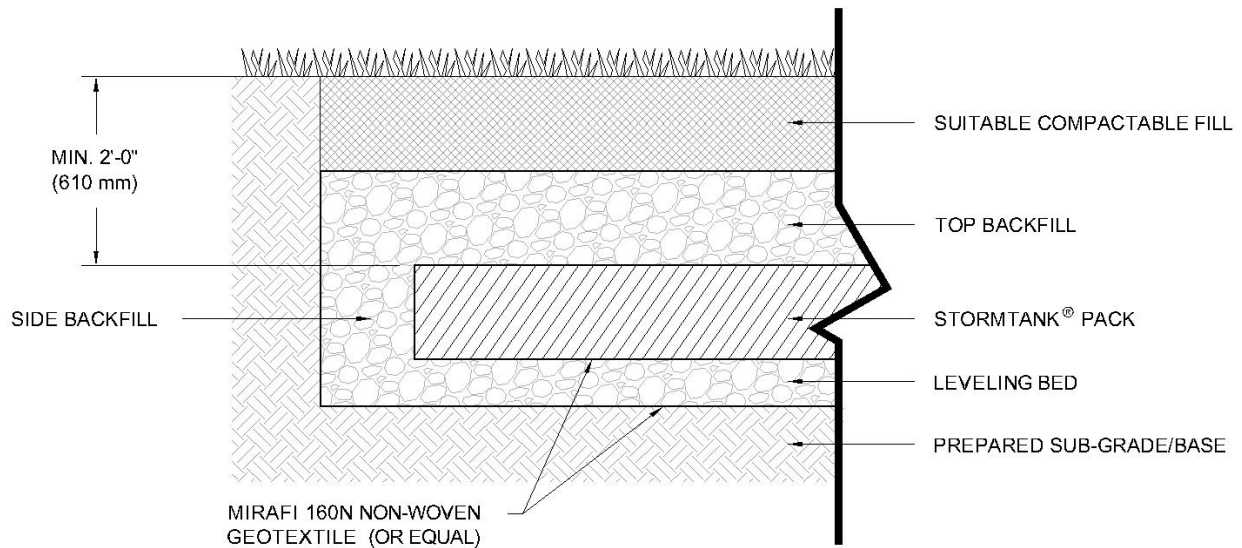
## **7.0 Suitable Compactable Fill**

*Following Top Backfill placement and geotextile fabric wrapping; complete the installation as noted below.*

1. Place fill onto the geotextile.
  - a. Maximum 12" (305 mm) lifts, compacted with a vibratory plate or walk behind roller to a minimum of 90% Standard Proctor Density.
  - b. The minimum top cover to finished grade should not be less than 24" (610 mm) and the maximum depth from final grade to the bottom should not exceed 11' (3.35 m).
2. Finish to the surface and complete with vegetative cover.

## Appendix A - Acceptable Fill Materials

Material Location	Description	AASHTO M43 Designation	ASTM D2321 Class	Compaction/Density
Finished Surface	Topsoil and Vegetate	N/A	N/A	Prepare per engineered plans.
Suitable Compactable Fill	Granular well graded soil/aggregate, earthen fill, maximum 4" particle size.	56, 57, 6, 67, 68 Earth	I & II III (Earth Only)	Place in max. 12" lifts
Top Backfill	Crushed angular stone placed between packs suitable compactable fill.	56, 57, 6, 67, 68	I & II	Plate compacted to provide evenly distributed layers.
Side Backfill	Crushed angular stone placed between earthen wall and packs.	56, 57, 6, 67, 68	I & II	Place in uniform 12" lifts around the system
Leveling Bed	Crushed angular stone placed to provide level surface for installation of packs.	56, 57, 6, 67, 68	I & II	Plate vibrated to achieve level surface.
* See Appendix B - Material Placement for limitations				



**Notes:**

1. All stone must be angular stone meeting ASTM D2321. Recycled concrete may be utilized when meeting acceptable Pgradation and ASTM standards.
2. The sub-grade is to be prepared to meet bearing and compaction requirements. Please see engineer of record's design.
3. Storage of materials such as construction materials, equipment, soils, etc. over the StormTank® system is strictly **prohibited**.
4. Please contact a Geotechnical Engineer and the Brentwood representative prior to utilization of any material not listed above.

## Appendix B - Material Placement Guidelines

Material Location	Placement Methods	Tired Equipment Limitations	Tracked Equipment Limitations
Finished Surface	Numerous methods may be utilized. Material dumping onto system should be limited unless otherwise noted.		
Suitable Compactable Fill	Utilize an excavator, skid loader or dozer to place material.	No DUMPING by dump trucks.	Low Ground Pressure equipment ONLY
Top Backfill	Utilize excavator bucket or stone conveyor, positioned off of system, to uniformly backfill on top of the packs. No DUMPING directly onto packs by dump trucks.	No DUMPING by dump trucks.	
Side Backfill	Utilize excavator bucket or stone conveyor, positioned off of system, to uniformly backfill. Stone to be placed in max. 12" (305 mm) lifts until stone reaches top of media.	No equipment is permitted on the packs during the side backfilling process.	
Leveling Bed	No limitations		

*Notes:*

1. *Storage of materials such as construction materials, equipment, soils, etc. over the StormTank® system is strictly **prohibited**.*
2. *Please contact a Brentwood representative/distributor prior to utilization of any equipment not listed above.*
3. *It is recommended that all backfilling operations be completed with low ground pressure vehicles such as mini excavators, skid steers, etc. **All** equipment is to access system by a level approach to the system.*