StormTech® Installation Guide
SC-160LP

StormTech SiteAssist

Required Materials and Equipment List

- Acceptable fill materials per Table 1
- ADS Plus and non-woven geotextile fabrics
- StormTech solid end caps and pre-cored end caps
- StormTech chambers
- StormTech manifolds and fittings

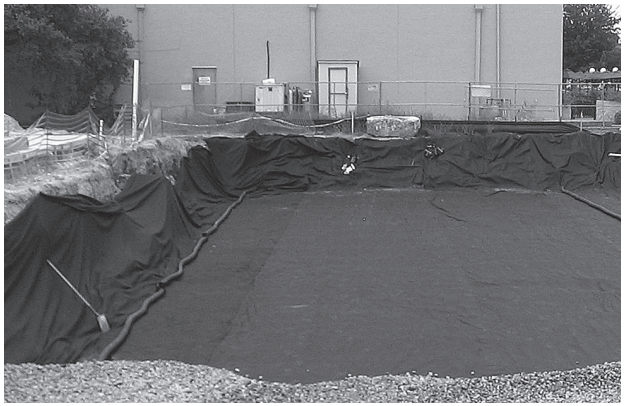
Important Notes:

A. This installation guide provides the minimum requirements for proper installation of chambers. Non-adherence to this guide may result in damage to chambers during installation. Replacement of damaged chambers during or after backfilling is costly and very time consuming. It is recommended that all installers are familiar with this guide, and that the contractor inspects the chambers for distortion, damage and joint integrity as work progresses.

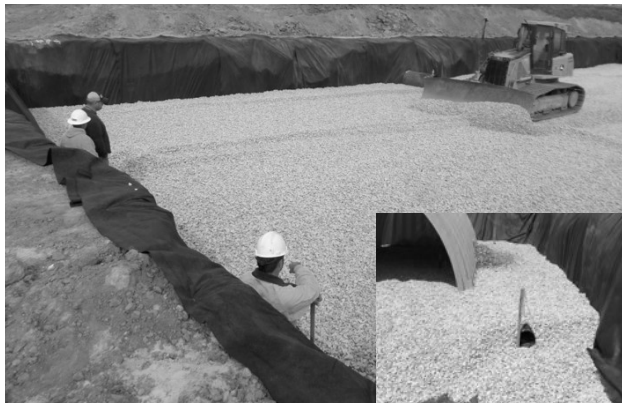
B. Care should be taken in the handling of chambers and end caps. Avoid dropping, prying or excessive force on chambers during removal from pallet and initial placement.

Requirements for System Installation

Excavate bed and prepare subgrade per engineer's plans.

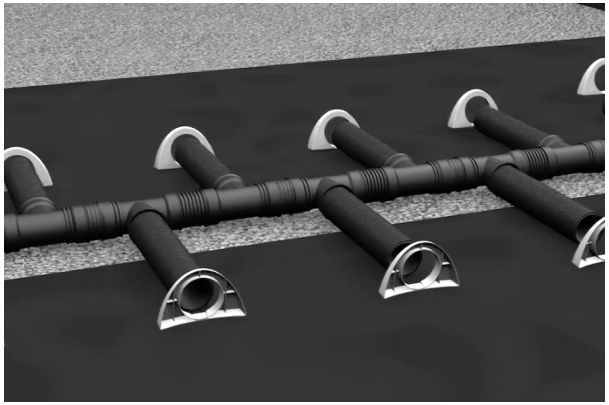


Place non-woven geotextile over prepared soils and up excavation walls. Install underdrains if required.

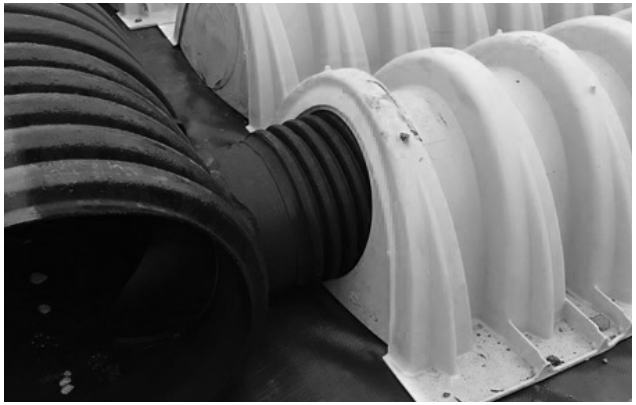


Place clean, crushed, angular stone foundation 150 mm (6") or 100 mm (4") with a single layer of Geogrid BX124GG. See plans for foundation stone design.Compact to achieve a flat surface.

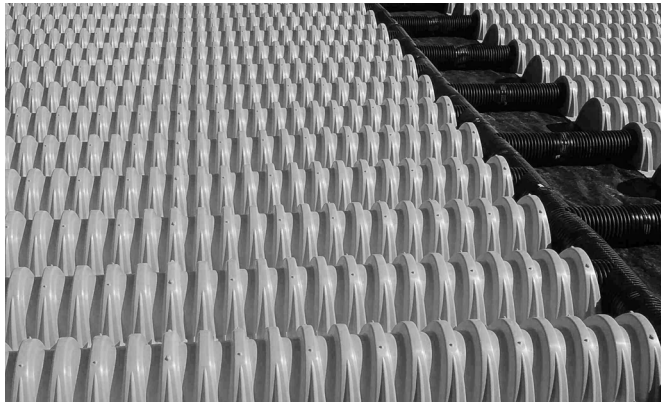
Manifold, Scour Fabric and Chamber Assembly



Install manifolds and lay out ADS Plus fabric at inlet rows [min. 3.8 m (12.5 ft)] at each inlet end cap. Place a continuous piece (no seams, single layer) along entire length of Isolator® Row(s) Plus.



Align the first chamber and end cap of each row with inlet pipes. Contractor may choose to postpone stone placement around end chambers and leave ends of rows open for easy inspection of chambers during the backfill process.

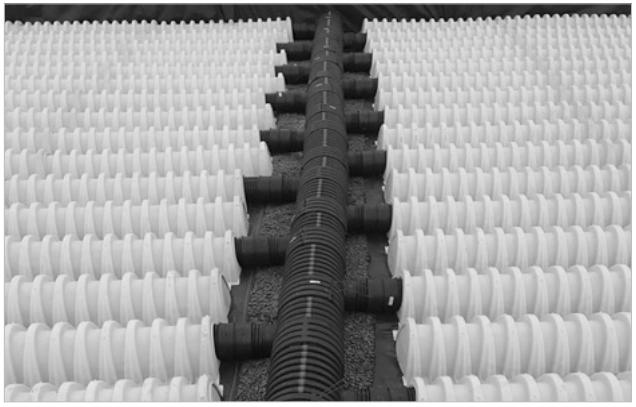


Continue installing chambers by overlapping chamber end corrugations. Chamber joints are labeled “Lower Joint – Overlap Here” and “Build this direction – Upper Joint” Be sure that the chamber placement does not exceed the reach of the construction equipment used to place the stone. No spacing is required between chambers.

Attaching the End Caps

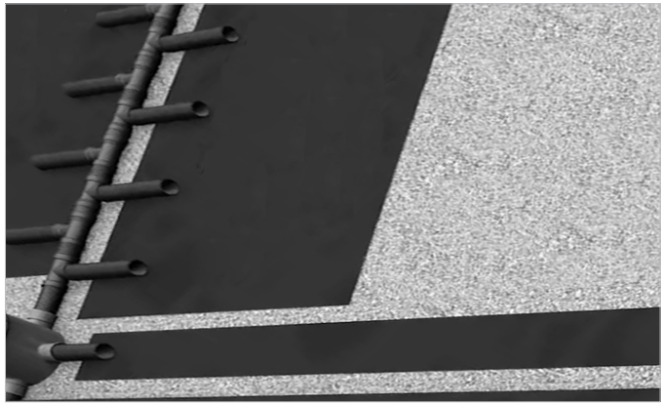
Lift the end of the chamber a few inches off the ground. With the curved face of the end cap facing outward, place the end cap into the chamber’s end corrugation.

Prefabricated End Caps



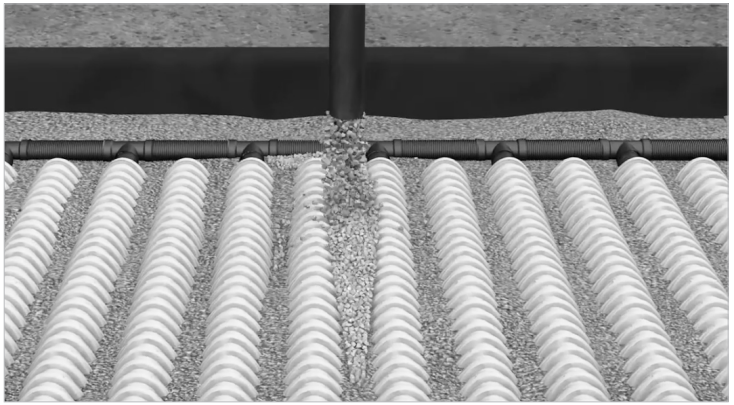
SC-160LP end caps can accept 200 mm (8”) or 150 mm (6”) manifold inlets. End caps can be ordered as an 200 mm (8”) open hole or can be cored in the field.

Isolator Row Plus

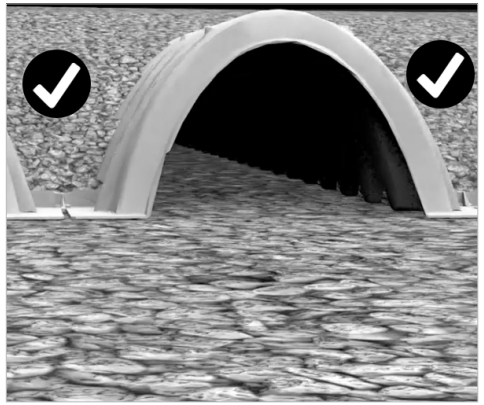


Place one continuous layers of ADS Plus fabric between the foundation stone and the Isolator Row Plus chambers, making sure the fabric lays flat and extends the entire width of the chamber feet.

Initial Anchoring of Chambers – Embedment Stone

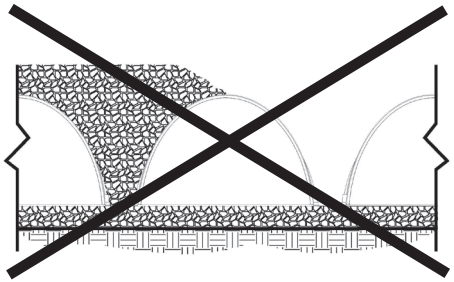


Initial embedment shall be spotted along the centerline of the chamber evenly anchoring the lower portion of the chamber. This is best accomplished with a stone conveyor or excavator reaching along the row.

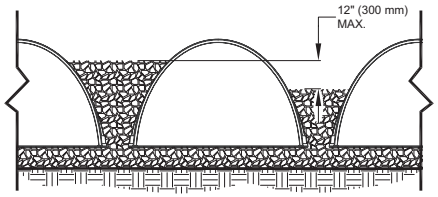


Care should be taken when backfilling not to damage the chambers. Please refer to the allowable construction vehicle loads on page 6.

Backfill of Chambers – Embedment Stone

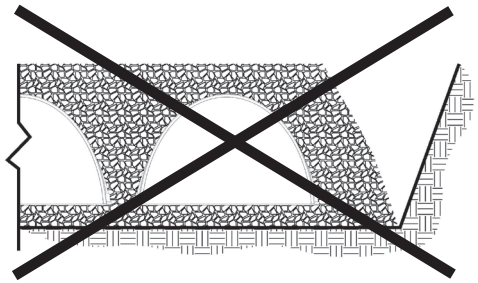


Uneven Backfill

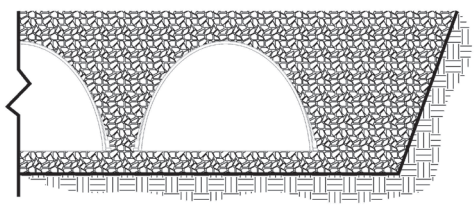


Even Backfill

Backfill chambers evenly. Stone column height should never differ by more than 300 mm (12”) between adjacent chamber rows or between chamber rows and perimeter.



Perimeter Not Backfilled



Perimeter Fully Backfilled

Perimeter stone must be brought up evenly with chamber rows. Perimeter must be fully backfilled, with stone extended horizontally to the excavation wall.

Backfill - Embedment Stone & Cover Stone

Continue evenly backfilling between rows and around perimeter until embedment stone reaches tops of chambers. Perimeter stone must extend horizontally to the excavation wall for both straight or sloped sidewalls.

Final Backfill of Chambers – Fill Material

Small dozers and skid loaders may be used to finish grading stone backfill in accordance with ground pressure limits in Table 2. They must push material parallel to rows only. Never push perpendicular to rows. StormTech recommends that the contractor inspect chambers before placing final backfill. Any chambers damaged by construction shall be removed and replaced.

Final Backfill of Chambers – Fill Material

Install non-woven geotextile over stone. Geotextile must overlap 600 mm (24") min. where edges meet. Compact each lift of backfill as specified in the site design engineer's drawings. Roller to travel parallel with rows.

StormTech Isolator Row Plus Detail

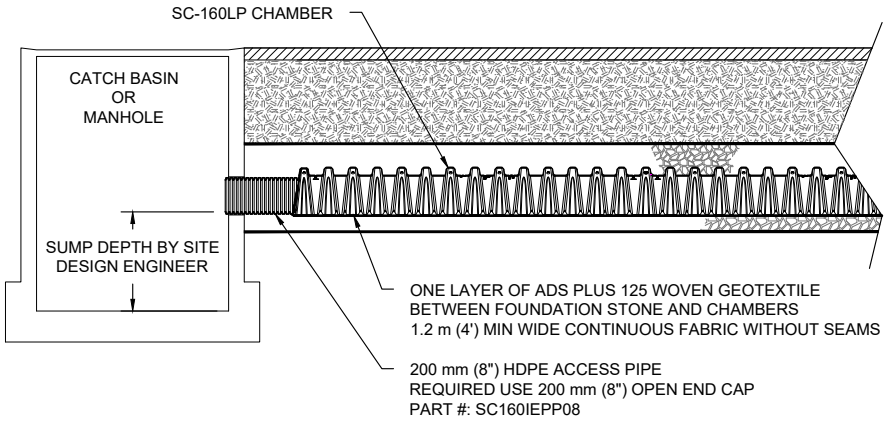


Table 1- Acceptable Fill Materials

Material Location	Description	AASHTO M43 Designation[1]	Compaction/Density Requirement
(D) **Final Fill:** Fill Material for layer 'D' starts from the top of the 'C' layer to the bottom of flexible pavement or unpaved finished grade above. Note that the pavement subbase may be part of the 'D' layer.	Any soil/rock materials, native soils or per engineer's plans. Check plans for pavement subgrade requirements.	N/A	Prepare per site design engineer's plans. Paved installations may have stringent material and preparation requirements.
(C) **Initial Fill:** Fill Material for layer 'C' starts from the top of the embedment stone ('B' layer) to 18" (450 mm) above the top of the chamber. Note that pavement subbase may be part of the 'C' layer.	Granular well-graded soil/aggregate mixtures, <35% fines or processed aggregate. Most pavement subbase materials can be used in lieu of this layer.	AASHTO M45 A-1, A-2-4, A-3 or AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	Begin compaction after min. 300 mm (12") of material over the chambers is reached. Compact additional layers in 150 mm (6") max. lifts to a min. 95% Proctor density for well-graded material and 95% relative density for processed aggregate materials. Roller gross vehicle weight not to exceed 12,000 lbs (53 kN). Dynamic force not to exceed 20,000 lbs (89 kN)
(B) **Embedment Stone:** Embedment Stone surrounding chambers from the foundation stone to the 'C' layer above.	Clean, crushed, angular stone or recycled concrete[4]	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	No compaction required.
(A) **Foundation Stone:** Foundation Stone below the chambers from the subgrade up to the foot (bottom) of the chamber.	Clean, crushed, angular stone or recycled concrete[4]	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	Place and compact in 150 mm (6") lifts using two full coverages with a vibratory compactor.[2, 3]

Please Note:

1. The listed AASHTO designations are for gradations only. The stone must also be clean, crushed, angular. For example, a specification for #4 stone would state: "clean, crushed, angular no. 4 (AASHTO M43) stone".
2. StormTech compaction requirements are met for 'A' location materials when placed and compacted in 150 mm (6") (max) lifts using two full coverages with a vibratory compactor.
3. Where infiltration surfaces may be comprised by compaction, for standard installations and standard design load conditions, a flat surface may be achieved by raking or dragging without compaction equipment. For special load designs, contact StormTech for compaction requirements.
4. Where recycled concrete aggregate is used in layers 'A' or 'B' the material should also meet the acceptable criteria outlined in ADS Technical Note 6.20 "Recycled Concrete Structural Backfill".

Figure 1- Inspection Port Detail

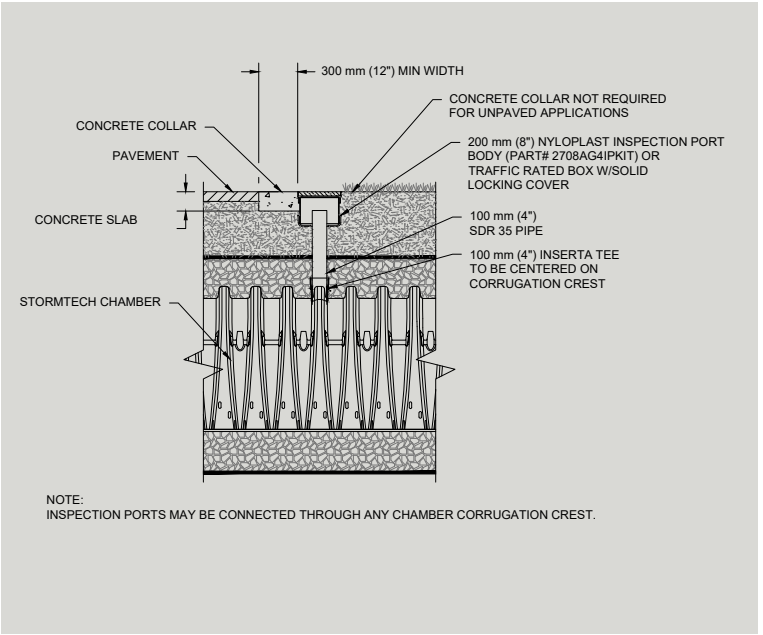
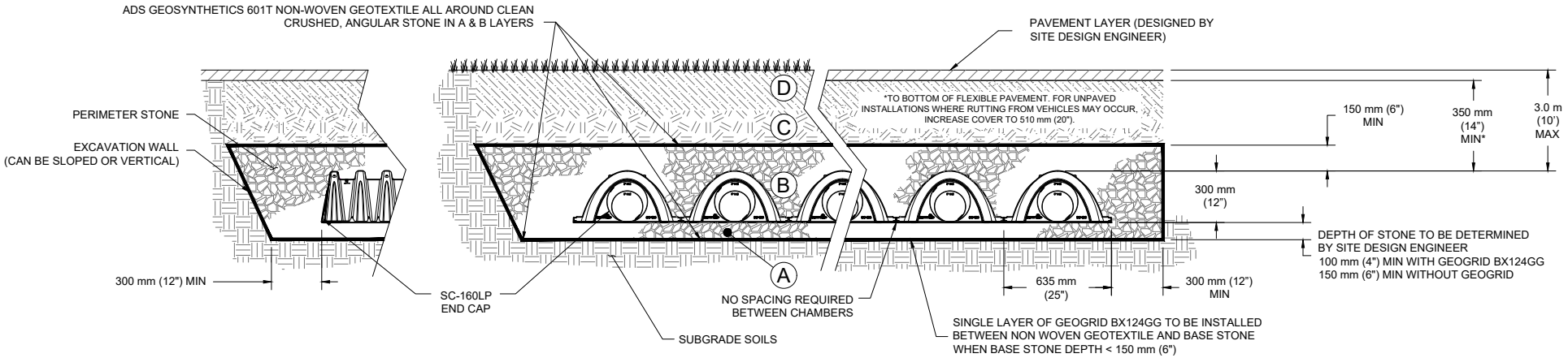


Figure 2 - Fill Material Locations



Notes:

1. 900 mm (36”) of stabilized cover materials over the chambers is recommended during the construction phase if general construction activities, such as full dump truck travel and dumping, are to occur over the bed.
2. During paving operations, dump truck axle loads on 350 mm (14”) of cover may be necessary. Precautions should be taken to avoid rutting of the road base layer, to ensure that compaction requirements have been met, and that a minimum of 350 mm (14”) of cover exists over the chambers. Contact StormTech for additional guidance on allowable axle loads during paving.
3. Ground pressure for track dozers is the vehicle operating weight divided by total ground contact area for both tracks. Excavators will exert higher ground pressures based on loaded bucket weight and boom extension.
4. Mini-excavators (< 3,628 kg/ 8,000lbs) can be used with at least 300 mm (12”) of stone over the chambers and are limited by the maximum ground pressures in Table 2 based on a full bucket at maximum boom extension.
5. Storage of materials such as construction materials, equipment, spoils, etc. should not be located over the StormTech system. The use of equipment over the StormTech system not covered in Table 2 (ex. soil mixing equipment, cranes, etc) is limited. Please contact StormTech for more information.
6. Allowable track loads based on vehicle travel only. Excavators shall not operate on chamber beds until the total backfill reaches 900 mm (3 feet) over the entire bed.

Table 2 - Maximum Allowable Construction Vehicle Loads[6]

Material Location	Fill Depth over Chambers mm (in.)	Maximum Allowable Wheel Loads		Maximum Allowable Track Loads[6]		Maximum Allowable Roller Loads
		Max Axle Load for Trucks kN (lbs)	Max Wheel Load for Loaders kN (lbs)	Track Width mm (in.)	Max Ground Pressure kPa (psf)	Max Drum Weight or Dynamic Force kN (lbs)
Ⓓ Final Fill Material	900 (36”) Compacted	142 (32,000)	71 (16,000)	305 (12”) 457 (18”) 610 (24”) 762 (30”) 914 (36”)	186 (3880) 126 (2640) 97 (2040) 81 (1690) 70 (1470)	169 (38,000)
Ⓒ Initial Fill Material	600 (24”) Compacted	142 (32,000)	71 (16,000)	305 (12”) 457 (18”) 610 (24”) 762 (30”) 914 (36”)	128 (2690) 90 (1880) 71 (1490) 61 (1280) 55 (1150)	89 (20,000)
	600 (24”) Loose/ Dumped	142 (32,000)	71 (16,000)	305 (12”) 457 (18”) 610 (24”) 762 (30”) 914 (36”)	114 (2390) 81 (1700) 65 (1370) 57 (1190) 51 (1080)	89 (20,000) Roller gross vehicle weight not toexceed 53 kN (12,000 lbs.)
	450 (18”)	142 (32,000)	71 (16,000)	305 (12”) 457 (18”) 610 (24”) 762 (30”) 914 (36”)	101 (2110) 72 (1510) 59 (1250) 52 (1100) 48 (1020)	89 (20,000) Roller gross vehicle weight not to exceed 53 kN (12,000 lbs.)
Ⓑ Embedment Stone	300 (12”)	71 (16,000)	NOT ALLOWED	305 (12”) 457 (18”) 610 (24”) 762 (30”) 914 (36”)	74 (1540) 57 (1190) 48 (1010) 43 (910) 40 (840)	89 (20,000) Roller gross vehicle weight not to exceed 53 kN (12,000 lbs.)
	150 (6”)	35 (8,000)	NOT ALLOWED	305 (12”) 457 (18”) 610 (24”) 762 (30”) 914 (36”)	51 (1070) 43 (900) 38 (800) 36 (760) 34 (720)	NOT ALLOWED

Table 3 - Placement Methods and Descriptions

Material Location	Placement Methods/ Restrictions	Wheel Load Restrictions	Track Load Restrictions	Roller Load Restrictions
		See Table 2 for Maximum Construction Loads		
Ⓓ Final Fill Material	A variety of placement methods may be used. All construction loads must not exceed the maximum limits in Table 2.	900 mm (36”) minimum cover required for dump trucks to dump over chambers.	Dozers to push parallel to rows until 900 mm (36”) compaced cover is reached.[4]	Roller travel parallel to rows only until 900 mm (36”) compacted cover is reached.
Ⓒ Initial Fill Material	Excavator positioned off bed recommended. Small excavator allowed over chambers. Small dozer allowed.	Asphalt can be dumped into paver when compacted pavement subbase reaches 450 mm (18”) above top of chambers.	Small LGP track dozers & skid loaders allowed to grade cover stone with at least 150 mm (6”) stone under tracks at all times. Equipment must push parallel to rows at all times.	Use dynamic force of roller only after compacted fill depth reaches 300 mm (12”) over chambers. Roller travel parallel to chamber rows only.
Ⓑ Embedment Stone	No equipment allowed on bare chambers. Use excavator or stone conveyor positioned off bed or on foundation stone to evenly fill around all chambers to at least the top of chambers.	No wheel loads allowed. Material must be placed outside the limits of the chamber bed.	No tracked equipment is allowed on chambers until a min. 150 mm (6”) cover stone is in place.	No rollers allowed.
Ⓐ Foundation Stone	No StormTech restrictions. Contractor responsible for any conditions or requirements by others relative to subgrade bearing capacity, dewatering or protection of subgrade.			