

# Appendix E


Construction Inspection Checklists; Sample Construction  
Site Inspection and Maintenance Log Book; Storm  
Chamber Manufacturer Specifications

# Bioretention Stormwater Management Practices Level 1 Inspection Checklist

<b>SMP ID #</b>		<b>SMP Owner</b>		<input type="checkbox"/> Private	<input type="checkbox"/> Public
<b>SMP Location (Address; Latitude &amp; Longitude)</b>					
	<b>Latitude</b>		<b>Longitude</b>		
<b>Party Responsible for Maintenance</b>	<b>System Type</b>			<b>Type of Site</b>	
<input type="checkbox"/> Same as SMP Owner <input type="checkbox"/> Other  _____	<input type="checkbox"/> Seasonal <input type="checkbox"/> Continuous Use <input type="checkbox"/> Other	<input type="checkbox"/> Above Ground <input type="checkbox"/> Below Ground	<input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Residential <input type="checkbox"/> State		
<b>Inspection Date</b>			<b>Inspection Time</b>		
<b>Inspector</b>					
<b>Date of Last Inspection</b>					




## BR Drainage Area

Look for areas that are uphill from the Bioretention cell.

<b>Problem (Check if Present)</b>	<b>Follow-Up Actions</b>
 <input type="checkbox"/> Bare soil, erosion of the ground (rills washing out the dirt)	<input type="checkbox"/> Seed and mulch areas of bare soil to establish vegetation. <input type="checkbox"/> Fill in erosion areas with soil, compact, and seed and straw to establish vegetation. <input type="checkbox"/> If a rill or small channel is forming, try to redirect water flowing to this area by creating a small berm or adding topsoil to areas that are heavily compacted. <input type="checkbox"/> Other:



**BR Drainage Area**

Look for areas that are uphill from the Bioretention cell.

Problem (Check if Present)	Follow-Up Actions
	<ul style="list-style-type: none"> <li><input type="checkbox"/> Kick-Out to Level 2 Inspection: Large areas of soil have been eroded, or larger channels are forming. May require rerouting of flow paths.</li> </ul>
 <ul style="list-style-type: none"> <li><input type="checkbox"/> Piles of grass clippings, mulch, dirt, salt, or other materials</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Remove or cover piles of grass clippings, mulch, dirt, etc.</li> <li><input type="checkbox"/> Other:</li> </ul>
 <ul style="list-style-type: none"> <li><input type="checkbox"/> Open containers of oil, grease, paint, or other substances</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Cover or properly dispose of materials; consult your local solid waste authority for guidance on materials that may be toxic or hazardous.</li> <li><input type="checkbox"/> Other:</li> </ul>



## BR Inlets

Stand in the Bioretention cell itself and look for all the places where water flows in. Often there will be multiple points of inflow to the practice.

Problem (Check if Present)	Follow-Up Actions
 <p><input type="checkbox"/> Inlets collect grit and debris or grass/weeds. Some water may not be getting into the Bioretention cell. The objective is to have a clear pathway for water to flow into the cell.</p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Use a flat shovel to remove grit and debris (especially at curb inlets or openings). Parking lots generate fine grit that will accumulate at these spots.</li> <li><input type="checkbox"/> Pull out clumps of growing grass or weeds and scoop out the soil or grit that the plants are growing in.</li> <li><input type="checkbox"/> Remove any grass clippings, leaves, sticks, and other debris that is collecting at inlets.</li> <li><input type="checkbox"/> For pipes and ditches, remove sediment and debris that is partially blocking the pipe or ditch opening where it enters the Bioretention cell.</li> <li><input type="checkbox"/> Dispose of all material properly where it will not re-enter the Bioretention cell.</li> <li><input type="checkbox"/> Other:</li> </ul> <div style="background-color: #f2f2f2; padding: 10px; margin-top: 10px;"> <p><input type="checkbox"/> Kick-Out to Level 2 Inspection: Inlets are blocked to the extent that most of the water does not seem to be entering the Bioretention cell.</p> </div>
 <p><input type="checkbox"/> Some or all of the inlets are eroding so that rills, gullies, and other erosion is present, or there is bare dirt that is washing into the Bioretention cell.</p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> For small areas of erosion, smooth out the eroded part and apply rock or stone (e.g., river cobble) to prevent further erosion. Usually, filter fabric is placed under the rock or stone.</li> <li><input type="checkbox"/> In some cases, reseeding and applying erosion-control matting can be used to prevent further erosion. Some of these materials may be available at a garden center, but it may be best to consult a landscape contractor.</li> <li><input type="checkbox"/> Other:</li> </ul> <div style="background-color: #f2f2f2; padding: 10px; margin-top: 10px;"> <p><input type="checkbox"/> Kick-Out to Level 2 Inspection: Erosion is occurring at most of the inlets, and it looks like there is too much water that is concentrating at these points. The inlet design may have to be modified.</p> </div>



## BR Ponding Area

Examine the entire Bioretention surface and side slopes

Problem (Check if Present)	Follow-Up Actions
 <ul style="list-style-type: none"> <li><input type="checkbox"/> Mulch (if used) needs to be replaced or replenished. The mulch layer had decomposed or is less than 1-inch thick.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Add new mulch to a total depth (including any existing mulch that is left) of 2 to 3 inches. The mulch should be shredded hardwood mulch that is less likely to float away during rainstorms.</li> <li><input type="checkbox"/> Avoid adding too much mulch so that inlets are obstructed or certain areas become higher than the rest of the Bioretention surface.</li> <li><input type="checkbox"/> Other:</li> </ul>
 <ul style="list-style-type: none"> <li><input type="checkbox"/> Minor areas of sediment, grit, trash, or other debris are accumulating on the bottom.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Use a shovel to scoop out minor areas of sediment or grit, especially in the spring after winter sanding materials may wash in and accumulate. Dispose of the material where it cannot re-enter the Bioretention cell .</li> <li><input type="checkbox"/> If removing the material creates a hole or low area, fill with soil mix that matches original mix and cover with mulch so that the Bioretention surface area is as flat as possible.</li> <li><input type="checkbox"/> Remove trash, vegetative debris, and other undesirable materials.</li> <li><input type="checkbox"/> Other:</li> </ul> <div style="background-color: #e0e0e0; padding: 10px; margin-top: 10px;"> <ul style="list-style-type: none"> <li><input type="checkbox"/> Kick-Out to Level 2 Inspection: Sediment has accumulated more than 2-inches deep and covers 25% or more of the Bioretention surface.</li> <li><input type="checkbox"/> Kick-Out to Level 2 Inspection: The Bioretention cell is too densely vegetated to assess sediment accumulation or ponding; see BR-4, Vegetation.</li> </ul> </div>


## BR Ponding Area

Examine the entire Bioretention surface and side slopes

Problem (Check if Present)	Follow-Up Actions
 <ul style="list-style-type: none"> <li><input type="checkbox"/> There is erosion in the bottom or on the side slopes. Water seems to be carving out rills as it flows across the Bioretention surface or on the slopes, or sinkholes are forming in certain areas.</li> <li><input type="checkbox"/> Source: Stormwater Maintenance, LLC.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Try filling the eroded areas with clean topsoil or sand, and cover with mulch.</li> <li><input type="checkbox"/> If the problem recurs, you may have to use stone (e.g., river cobble) to fill in problem areas.</li> <li><input type="checkbox"/> If the erosion is on a side slope, fill with clay that can be compacted and seed and mulch the area.</li> <li><input type="checkbox"/> Other:</li> </ul>
 <ul style="list-style-type: none"> <li><input type="checkbox"/> The bottom of the Bioretention cell is not flat, and the water pools at one end, along an edge, or in certain pockets. The whole bottom is not uniformly covered with water. See design plan to verify that bioretention surface is intended to be flat. Check during or immediately after a rainstorm.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Kick-Out to Level 2 Inspection: The problem persists or the erosion is more than 3-inches deep and seems to be an issue with how water enters and moves through the Bioretention cell.</li> <li><input type="checkbox"/> Kick-Out to Level 2 Inspection: The problem does not seem to be caused by flowing water, but a collapse or sinking of the surface (e.g., "sinkhole") due to some underground problem.</li> </ul> <ul style="list-style-type: none"> <li><input type="checkbox"/> If the problem is minor (just small, isolated areas are not covered with water), try raking the surface OR adding mulch to low spots to create a more level surface. You may need to remove and replace plantings in order to properly even off the surface.</li> <li><input type="checkbox"/> Check the surface with a string and bubble level to get the surface as flat as possible.</li> <li><input type="checkbox"/> Other:</li> </ul> <ul style="list-style-type: none"> <li><input type="checkbox"/> Kick-Out to Level 2 Inspection: Ponding water is isolated to less than half of the Bioretention surface area, and there seem to be elevation differences of more than a couple of inches across the surface.</li> </ul>


## BR Ponding Area

Examine the entire Bioretention surface and side slopes

Problem (Check if Present)	Follow-Up Actions
<div style="display: flex; align-items: flex-start;">  <div style="margin-left: 10px;"> <ul style="list-style-type: none"> <li><input type="checkbox"/> Water stands on the surface more than 72 hours after a rainstorm and /or wetland-type vegetation is present. The Bioretention cell does not appear to be draining properly.</li> </ul> </div> </div>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Kick-Out to Level 2 Inspection: This is generally a serious problem, and it will be necessary to activate a Level 2 Inspection.</li> </ul>


## BR Vegetation

Examine all Bioretention cell vegetation.

Problem (Check if Present)	Follow-Up Actions
<div style="display: flex; align-items: flex-start;">  <div style="margin-left: 10px;"> <ul style="list-style-type: none"> <li><input type="checkbox"/> Vegetation requires regular maintenance—pulling weeds, removing dead and diseased plants, replacing mulch around plants, adding plants to fill in areas that are not well vegetated, etc.</li> </ul> </div> </div>	<ul style="list-style-type: none"> <li><input type="checkbox"/> If you can identify which plants are weeds or not intended to be part of the planting plan, eliminate these, preferably by hand pulling.</li> <li><input type="checkbox"/> If weeds are widespread, check with the local stormwater authority and/or Extension Office about proper use of herbicides for areas connected with the flow of water.</li> <li><input type="checkbox"/> Even vegetation that is intended to be present can become large, overgrown, and/or crowd out surrounding plants. Prune and thin accordingly.</li> <li><input type="checkbox"/> If weeds or invasive plants have overtaken the whole Bioretention cell, bush-hog the entire area before seedheads form in the spring. It will be necessary to remove the root mat manually or with appropriate herbicides, as noted above.</li> <li><input type="checkbox"/> Re-plant with species that are aesthetically pleasing and seem to be doing well in the Bioretention cell.</li> <li><input type="checkbox"/> Other:</li> </ul> <hr/> <ul style="list-style-type: none"> <li><input type="checkbox"/> Kick-Out to Level 2 Inspection: You are unsure of the original planting design, or the vegetation maintenance task is beyond your capabilities of time, expertise, or resources. If you are unsure of the health of the vegetation (e.g. salt damage, invasives, which plants are undesirable) or the appropriate season to conduct vegetation management, consult a landscape professional before undertaking any cutting, pruning, mowing, or brush hogging.</li> </ul>


## BR Vegetation

Examine all Bioretention cell vegetation.

Problem (Check if Present)	Follow-Up Actions
 <p><input type="checkbox"/> Vegetation is too thin, is not healthy, and there are many spots that are not well vegetated.</p>	<p><input type="checkbox"/> The original plants are likely not suited for the actual conditions within the Bioretention cell . If you are knowledgeable about plants, select and plant more appropriate vegetation (preferably native plants) so that almost the entire surface area will be covered by the end of the second growing season.</p> <p><input type="checkbox"/> Other:</p> <hr/> <p><input type="checkbox"/> Kick-Out to Level 2 Inspection: For all but small practices (e.g., rain gardens), this task will likely require a landscape design professional or horticulturalist.</p>

## BR Outlets

Examine outlets that release water out of the Bioretention cell.

Problem (Check if Present)	Follow-Up Actions
<p><input type="checkbox"/> Erosion at outlet</p>	<p><input type="checkbox"/> Add stone to reduce the impact from the water flowing out of the outlet pipe or weir during storms.</p> <p><input type="checkbox"/> Other:</p> <hr/> <p><input type="checkbox"/> Kick-Out to Level 2 Inspection: Rills have formed and erosion problem becomes more severe.</p>
 <p><input type="checkbox"/> Outlet obstructed with mulch, sediment, debris, trash, etc.</p>	<p><input type="checkbox"/> Remove the debris and dispose of it where it cannot re-enter the Bioretention cell .</p> <p><input type="checkbox"/> Other:</p> <hr/> <p><input type="checkbox"/> Kick-Out to Level 2 Inspection: Outlet is completely clogged or obstructed; there is too much material to remove by hand or with simple hand tools.</p>



Additional Notes:

Inspector: \_\_\_\_\_

Date: \_\_\_\_\_

Complete the following if follow-up/corrective actions were identified during this inspection:

**Certified Completion of Follow-Up Actions:**

“I hereby certify that the follow-up/corrective actions identified in the inspection performed on \_\_\_\_\_ (DATE) have been completed and any required maintenance deficiencies have been adequately corrected.”

Inspector/Operator: \_\_\_\_\_

Date: \_\_\_\_\_

## Bioretention Stormwater Management Practices Level 2 Inspection Checklist

<b>SMP ID #</b>		<b>SMP Owner</b>		<input type="checkbox"/> Private <input type="checkbox"/> Public
<b>SMP Location (Address; Latitude &amp; Longitude)</b>				
	<b>Latitude</b>		<b>Longitude</b>	
<b>Party Responsible for Maintenance</b>	<b>System Type</b>		<b>Type of Site</b>	
<input type="checkbox"/> Same as SMP Owner <input type="checkbox"/> Other  _____	<input type="checkbox"/> Seasonal <input type="checkbox"/> Continuous Use <input type="checkbox"/> Other	<input type="checkbox"/> Above Ground <input type="checkbox"/> Below Ground	<input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Residential <input type="checkbox"/> State	
<b>Inspection Date</b>		<b>Inspection Time</b>		
<b>Inspector</b>				
<b>Date of Last Inspection</b>				

**Level 2 Inspection: BIORETENTION**  
**NOTE: Key Source for this Information (CSN, 2013)**

Recommended Repairs	Triggers for Level 3 Inspection
<b>Observed Condition: Water Stands on Surface for More than 72 Hours after Storm</b>	
<p><input type="checkbox"/> Condition 1: Small pockets of standing water</p> <p>Use a soil probe or auger to examine the soil profile. If isolated areas have accumulated grit, fines, or vegetative debris or have bad soil media, try scraping off top 3 inches of media and replacing with clean material. Also check to see that surface is level and water is not ponding selectively in certain areas.</p> <p><input type="checkbox"/> Condition 2: Standing water is widespread or covers entire surface</p> <p>Requires diagnosis and resolution of problem:</p> <ul style="list-style-type: none"> <li>• Clogged underdrain?</li> <li>• Filter fabric between soil media and underdrain stone?</li> <li>• Need to install underdrain if not present?</li> <li>• Too much sediment/grit washing in from drainage area?</li> <li>• Too much ponding depth?</li> <li>• Improper soil media?</li> </ul>	<ul style="list-style-type: none"> <li>• Soil media is clogged and problem is not evident from Level 2 inspection.</li> <li>• Level 2 inspection identifies problem, but it cannot be resolved easily or is associated with the original design of the practice.</li> </ul> <p><input type="checkbox"/> Level 3 inspection necessary</p>
<b>Observed Condition: Vegetation is sparse or out of control</b>	
<p><input type="checkbox"/> Condition 1: Original design planting plan seems good but has not been maintained, so there are many invasives and/or dead plants</p> <p>Will require some horticultural experience to restore vegetation to intended condition by weeding, pruning, removing plants, and adding new plants.</p> <p><input type="checkbox"/> Condition 2: Original design planting plan is unknown or cannot be actualized</p> <p>A landscape architect or horticulturalist will be needed to redo the planting plan. Will likely require analysis of soil pH, moisture, organic content, sun/shade, and other conditions to make sure plants match conditions. Plan should include invasive plant management and maintenance plan to include mulching, watering, disease intervention, periodic thinning/pruning, etc.</p>	<ul style="list-style-type: none"> <li>• Vegetation deviates significantly from original planting plan; Bioretention has been neglected and suffered from deferred maintenance.</li> <li>• Owner/responsible party does not know how to maintain the practice.</li> </ul> <p><input type="checkbox"/> Level 3 inspection necessary</p>
<b>Observed Condition: Bioretention does not conform to original design plan in surface area or storage</b>	
<p><input type="checkbox"/> Condition 1: Level 2 Inspection reveals that practice is too small based on design dimension, does not have adequate storage (e.g., ponding depth) based on the plan, and/or does not treat the drainage area runoff as indicated on the plan</p> <p>Small areas of deviation can be corrected by the property owner or responsible party, but it is likely that a Qualified Professional will have to revisit the design and attempt a redesign that meets original objectives or that can be resubmitted to the municipality for approval.</p>	<ul style="list-style-type: none"> <li>• More than a 25% departure from the approved plan in surface area, storage, or drainage area; sometimes less than this threshold at the discretion of the Level 2 inspector.</li> </ul> <p><input type="checkbox"/> Level 3 inspection necessary</p>

**Level 2 Inspection: BIORETENTION**  
**NOTE: Key Source for this Information (CSN, 2013)**

Recommended Repairs	Triggers for Level 3 Inspection
<b>Observed Condition: Severe erosion of filter bed, inlets, or around outlets</b>	
<p><input type="checkbox"/> Condition 1: Erosion at inlets</p> <p>The lining (e.g., grass, matting, stone, rock) may not be adequate for the actual flow velocities coming through the inlets. First line of defense is to try a more non-erosive lining and/or to extend the lining further down to where inlet slopes meet the Bioretention surface. If problem persists, analysis by a Qualified Professional is warranted.</p> <p><input type="checkbox"/> Condition 2: Erosion of Bioretention filter bed</p> <p>This is often caused by “preferential flow paths” through and along the Bioretention surface. The source of flow should be analyzed and methods employed to dissipate energy and disperse the flow (e.g., check dams, rock splash pads).</p> <p><input type="checkbox"/> Condition 3: Erosion on side slopes</p> <p>Again, the issue is likely linked with unanticipated flow paths down the side slopes (probably overland flow that concentrates as it hits the edge of the slope). For small or isolated areas, try filling, compacting, and re-establishing healthy ground cover vegetation. If the problem is more widespread, further analysis is required to determine how to redirect the flow.</p>	<ul style="list-style-type: none"> <li>• Erosion (rills, gullies) is more than 12 inches deep at inlets or the filter bed or more than 3 inches deep on side slopes.</li> <li>• If the issue is not caused by moving water but some sort of subsurface defect. This may manifest as a sinkhole or linear depression and be associated with problems with the underdrain stone or pipe or underlying soil.</li> </ul> <p><input type="checkbox"/> Level 3 inspection necessary</p>
<b>Observed Condition: Significant sediment accumulation, indicating an uncontrolled source of sediment</b>	
<p><input type="checkbox"/> Condition 1: Isolated areas of sediment accumulation, generally less than 3-inches deep</p> <p>Sediment source may be from a one-time or isolated event. Remove accumulated sediment and top 2 to 3 inches of Bioretention soil media; replace with clean material. Check drainage area for any ongoing sources of sediment.</p> <p><input type="checkbox"/> Condition 2: Majority of the surface is caked with “hard pan” (thin layer of clogging material) or accumulated sediment that is 3-inches deep or more</p> <p>This can be caused by an improper construction sequence (drainage area not fully stabilized prior to installation of Bioretention soil media) or another chronic source of sediment in the drainage area. Augering several holes down through the media can indicate how severe the problem is; often the damage is confined to the first several inches of soil media. Removing and replacing this top layer (or to the depth where sediment incursion is seen in auger holes) can be adequate, as long as the problem does not recur.</p>	<ul style="list-style-type: none"> <li>• More than 2 inches of accumulated sediment cover 25% or more of the Bioretention surface area.</li> <li>• “Hard pan” of thin, crusty layer covers majority of Bioretention surface area and seems to be impeding flow of water down through the soil media.</li> <li>• New sources of sediment seem to be accumulating with each significant rainfall event.</li> </ul> <p><input type="checkbox"/> Level 3 inspection necessary</p>

Notes:

Inspector: \_\_\_\_\_

Date: \_\_\_\_\_

Complete the following if follow-up/corrective actions were identified during this inspection:

**Certified Completion of Follow-Up Actions:**

“I hereby certify that the follow-up/corrective actions identified in the inspection performed on \_\_\_\_\_ (DATE) have been completed and any required maintenance deficiencies have been adequately corrected.”

Inspector/Operator: \_\_\_\_\_


Date: \_\_\_\_\_

# Disconnection & Sheetflow Stormwater Management Practices Level 1 Inspection Checklist

<b>SMP ID #</b>		<b>SMP Owner</b>		<input type="checkbox"/> Private
				<input type="checkbox"/> Public
<b>SMP Location (Address; Latitude &amp; Longitude)</b>				
	<b>Latitude</b>		<b>Longitude</b>	
<b>Party Responsible for Maintenance</b>	<b>System Type</b>		<b>Type of Site</b>	
<input type="checkbox"/> Same as SMP Owner <input type="checkbox"/> Other _____	<input type="checkbox"/> Seasonal <input type="checkbox"/> Continuous Use <input type="checkbox"/> Other	<input type="checkbox"/> Above Ground <input type="checkbox"/> Below Ground	<input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Residential <input type="checkbox"/> State	
<b>Inspection Date</b>		<b>Inspection Time</b>		
<b>Inspector</b>				
<b>Date of Last Inspection</b>				





**Table 2.4.1 D&S Drainage Area**

Visually inspect any surfaces in the drainage area.

Problem (Check if Present)	Follow-Up Actions
 <div style="margin-left: 100px;"> <input type="checkbox"/> Changes in flow; more runoff; runoff bypassing the practice           </div>	<input type="checkbox"/> For rooftop areas, make sure downspouts are still disconnected and conveying water into the treatment area. <input type="checkbox"/> Look for and remove any “dams” of sediment and grass clippings that prevent water from entering the treatment area as sheet flow. <input type="checkbox"/> Other:



**Table 2.4.1 D&S Drainage Area**

Visually inspect any surfaces in the drainage area.

Problem (Check if Present)	Follow-Up Actions
	<ul style="list-style-type: none"> <li><input type="checkbox"/> Kick-Out to Level 2 Inspection: Changes to drainage area size or amount of runoff due to construction, tillage, etc.</li> </ul>
	<ul style="list-style-type: none"> <li><input type="checkbox"/> For parking lots in the drainage area—sediment, grass clippings, or other debris has accumulated at pavement edge.</li> <li><input type="checkbox"/> Other:</li> </ul>
	<ul style="list-style-type: none"> <li><input type="checkbox"/> Kick-Out to Level 2 Inspection: Sediment is widespread and cannot be removed by manual sweeping.</li> </ul>
	<ul style="list-style-type: none"> <li><input type="checkbox"/> For parking lots in the drainage area—dips or damage at pavement edge caused flow to concentrate.</li> <li><input type="checkbox"/> Kick-Out to Level 2 Inspection: This will likely require special expertise to diagnose and fix pavement edge.</li> </ul>


**Table 2.4.2 D&S Level Spreader/Energy Dissipator**

Inspect the energy dissipator closely, during a rain event if possible.

Problem (Check if Present)	Follow-Up Actions	
	<input type="checkbox"/> Debris and/or sediment accumulated behind or around the level spreader.	<input type="checkbox"/> Remove debris and sediment by hand and ensure that the area behind the level spreader is relatively flat. Too much debris and sediment can cause runoff to bypass the level spreader structure.  <input type="checkbox"/> Other:
	<input type="checkbox"/> Sinking, cracking, sloughing, or other structural problem makes the energy dissipator no longer level.	<input type="checkbox"/> For stone/gravel spreaders, add new material or rake out as needed to make it even.  <input type="checkbox"/> Other:  <input type="checkbox"/> Kick-Out to Level 2 Inspection: Structural issues that cannot be easily fixed by hand

**Table 2.4.3 D&S Treatment Area**


Examine where flow enters the treatment area as well as the whole flow path. Look for signs of concentrated flow.

Problem (Check if Present)	Follow-Up Actions	
<input type="checkbox"/> Trash and/or debris in the treatment area	<input type="checkbox"/> Collect trash/debris and dispose of properly.	
	<input type="checkbox"/> Grass filter strip has grown very tall, to the point that runoff cannot easily enter or is getting concentrated.	<input type="checkbox"/> Mow filter strip twice a year or more frequently in a residential yard.



**Table 2.4.3 D&S Treatment Area**

Examine where flow enters the treatment area as well as the whole flow path. Look for signs of concentrated flow.

Problem (Check if Present)	Follow-Up Actions
<input type="checkbox"/> Sparse vegetation or bare spots	<input type="checkbox"/> For grassy areas, add topsoil (as needed), grass seed, mulch, and water during the growing season to re-establish consistent vegetation cover. <input type="checkbox"/> Other:
 <input type="checkbox"/> Rills or gullies are forming in treatment area where flow has become concentrated	<input type="checkbox"/> For minor rills, fill in with soil, compact, and add seed and straw to establish vegetation. <input type="checkbox"/> Other:  <input type="checkbox"/> Kick-Out to Level 2 Inspection: Rills are more than 2" to 3" deep and require more than just hand raking and re-seeding.

Additional Notes:

Inspector: \_\_\_\_\_

Date: \_\_\_\_\_

Complete the following if follow-up/corrective actions were identified during this inspection:

**Certified Completion of Follow-Up Actions:**

“I hereby certify that the follow-up/corrective actions identified in the inspection performed on \_\_\_\_\_ (DATE) have been completed and any required maintenance deficiencies have been adequately corrected.”

Inspector/Operator: \_\_\_\_\_

Date: \_\_\_\_\_

# Disconnection & Sheetflow Stormwater Management Practices Level 2 Inspection Checklist

<b>SMP ID #</b>		<b>SMP Owner</b>		<input type="checkbox"/> Private <input type="checkbox"/> Public
<b>SMP Location (Address; Latitude &amp; Longitude)</b>				
	<b>Latitude</b>		<b>Longitude</b>	
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<b>Inspection Date</b>		<b>Inspection Time</b>		
<b>Inspector</b>				
<b>Date of Last Inspection</b>				

## Level 2 Inspection – DISCONNECTION AND SHEETFLOW

Recommended Repairs	Triggers for Level 3 Inspection
<b>Observed Condition: Significant sediment on pavement that drains to disconnection area (e.g., grass strip)</b>	
<p><input type="checkbox"/> Condition 1: Sediment on parking lot is widespread</p> <p>Enlist a mechanical sweeper or vacuum sweeper to remove sediment across entire pavement surface. Pay special attention to downhill edges of pavement where more sediment may have accumulated.</p>	<ul style="list-style-type: none"> <li>• Sediment accumulation is so serious that it cannot be sufficiently removed with mechanical sweeper. May indicate a high sediment load from uphill in the drainage area that needs to be mitigated.</li> </ul> <p><input type="checkbox"/> Level 3 inspection necessary</p>
<b>Observed Condition: Pavement edge deteriorating</b>	
<p><input type="checkbox"/> Condition 1: Dips or damage at pavement edge causing runoff to concentrate</p> <p>Determine whether the damaged edge is causing significant enough concentration of runoff to warrant repair or regrading of the pavement.</p>	<ul style="list-style-type: none"> <li>• Edge must be patched or re-paved to make secure and level.</li> <li>• Parking lot not draining properly to the energy dissipator and treatment area.</li> </ul> <p><input type="checkbox"/> Level 3 inspection necessary</p>
<b>Observed Condition: Level spreader/energy dissipator</b>	
<p><input type="checkbox"/> Condition 1: Level spreader sinking or uneven</p> <p>If basic equipment can be used, prop up and secure any section of level spreader that is sinking. Regrade soil all around level spreader and add stone as necessary to prevent erosion and bypassing.</p> <p><input type="checkbox"/> Condition 2: Level spreader is broken</p> <p>These repairs can be simple for small, residential-scale practices, such as at a downspout. Ensure the level spreader is level across, keyed in to soil at the edges, and made of durable material that can withstand the flow of water running across it.</p> <p>Larger or more complicated level spreaders (e.g., concrete) will likely require specialized skill and equipment.</p>	<ul style="list-style-type: none"> <li>• Level spreader requires specialized equipment, regrading, or large amount of material to make level again.</li> <li>• Level spreader needs to be re-designed and replaced.</li> </ul> <p><input type="checkbox"/> Level 3 inspection necessary</p>

**Level 2 Inspection – DISCONNECTION AND SHEETFLOW**

Recommended Repairs	Triggers for Level 3 Inspection
<b>Observed Condition: Erosion in treatment area</b>	
<p><input type="checkbox"/> Condition 1: Rills from concentrated flow</p> <p>Inspect energy dissipator to see whether it needs to be improved to better spread out incoming flow. Regrade flow path to ensure that it is relatively flat (if minor). If major re-grading is needed, the treatment area may need to be redesigned and fixed with specialized equipment.</p>	<ul style="list-style-type: none"> <li>• Major rills and gullies</li> <li>• Treatment area needs to be re-designed and major grading needed.</li> </ul> <p><input type="checkbox"/> Level 3 inspection necessary</p>

Notes:

Inspector: \_\_\_\_\_

Date: \_\_\_\_\_

Complete the following if follow-up/corrective actions were identified during this inspection:

**Certified Completion of Follow-Up Actions:**

“I hereby certify that the follow-up/corrective actions identified in the inspection performed on \_\_\_\_\_ (DATE) have been completed and any required maintenance deficiencies have been adequately corrected.”

Inspector/Operator: \_\_\_\_\_

Date: \_\_\_\_\_

## Tree Planting Stormwater Management Practices Level 1 Inspection Checklist

<b>SMP ID #</b>		<b>SMP Owner</b>		<input type="checkbox"/> Private <input type="checkbox"/> Public
<b>SMP Location (Address; Latitude &amp; Longitude)</b>				
	<b>Latitude</b>		<b>Longitude</b>	
<b>Party Responsible for Maintenance</b>	<b>System Type</b>		<b>Type of Site</b>	
<input type="checkbox"/> Same as SMP Owner <input type="checkbox"/> Other  _____	<input type="checkbox"/> Seasonal <input type="checkbox"/> Continuous Use <input type="checkbox"/> Other	<input type="checkbox"/> Above Ground <input type="checkbox"/> Below Ground	<input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Residential <input type="checkbox"/> State	
<b>Inspection Date</b>		<b>Inspection Time</b>		
<b>Inspector</b>				
<b>Date of Last Inspection</b>				

### TP Watering

Inspect the trees to determine whether they need watering.

Problem (Check if Present)	Follow-Up Actions
<input type="checkbox"/> Soil is not moist to the touch and/or it has not rained in a week, and leaves/needles are starting to appear wilted/dry.	<input type="checkbox"/> Water trees deeply and slowly near the base. Soaker hoses and drip irrigation work best for deep watering of trees and shrubs. <input type="checkbox"/> Other:

### TP Mulch

Mulch should be applied in the late spring and during leaf fall. Check the depth of mulch regularly. Rake the old mulch to break up any matted layers and to refresh the appearance.

Problem (Check if Present)	Follow-Up Actions
<input type="checkbox"/> Mulch is too thin or thick (should be approximately 3" deep) or does not extend to tree canopy (or 5' radius if tree has a larger than 10' canopy reach).	<input type="checkbox"/> Add or remove mulch around tree canopy to maximum 5' radius but not within 3" of the bark. <input type="checkbox"/> If mulch is against the stems or tree trunks, pull it back several inches to expose the base of the trunk and root crown. <input type="checkbox"/> Other:

### TP Pruning

Examine the branches and tree shape.

Problem (Check if Present)	Follow-Up Actions
<input type="checkbox"/> Presence of suckers, dead or diseased branches, branches that interfere with pedestrian traffic	<input type="checkbox"/> Selective cutting <input type="checkbox"/> Prune to make the tree more aesthetically pleasing and remove disease. <input type="checkbox"/> Other:  <input type="checkbox"/> Kick-Out to Level 2 Inspection: Use an arborist or landscaper for more extensive pruning jobs.

Additional Notes:





Inspector: \_\_\_\_\_

Date: \_\_\_\_\_

Complete the following if follow-up/corrective actions were identified during this inspection:

**Certified Completion of Follow-Up Actions:**

“I hereby certify that the follow-up/corrective actions identified in the inspection performed on \_\_\_\_\_ (DATE) have been completed and any required maintenance deficiencies have been adequately corrected.”

Inspector/Operator: \_\_\_\_\_

Date: \_\_\_\_\_

# Tree Planting Stormwater Management Practices Level 2 Inspection Checklist

<b>SMP ID #</b>		<b>SMP Owner</b>		<input type="checkbox"/> Private <input type="checkbox"/> Public
<b>SMP Location (Address; Latitude &amp; Longitude)</b>				
	<b>Latitude</b>		<b>Longitude</b>	
<b>Party Responsible for Maintenance</b>	<b>System Type</b>		<b>Type of Site</b>	
<input type="checkbox"/> Same as SMP Owner <input type="checkbox"/> Other  _____	<input type="checkbox"/> Seasonal <input type="checkbox"/> Continuous Use <input type="checkbox"/> Other	<input type="checkbox"/> Above Ground <input type="checkbox"/> Below Ground	<input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Residential <input type="checkbox"/> State	
<b>Inspection Date</b>		<b>Inspection Time</b>		
<b>Inspector</b>				
<b>Date of Last Inspection</b>				

Level 2 Inspection: TREE PLANTING	
Recommended Repairs	Triggers for Level 3 Inspection
<b>Observed Condition: Appearance of fungus or pest damage</b>	
<input type="checkbox"/> Condition 1: Fungus, discoloration, browning leaves or holes in leaves  Check with arborist or other tree professional about the best way to proceed. This requires a Level 3 inspection.	<ul style="list-style-type: none"> <li>• Any concerns about how to address infestation or disease</li> </ul> <input type="checkbox"/> Level 3 inspection necessary
<input type="checkbox"/> Condition 2: Burrowing insects, holes  Check with arborist or other tree professional about the best way to proceed. This requires a Level 3 inspection.	

Notes:

Inspector: \_\_\_\_\_

Date: \_\_\_\_\_

Complete the following if follow-up/corrective actions were identified during this inspection:

**Certified Completion of Follow-Up Actions:**

“I hereby certify that the follow-up/corrective actions identified in the inspection performed on \_\_\_\_\_ (DATE) have been completed and any required maintenance deficiencies have been adequately corrected.”

Inspector/Operator: \_\_\_\_\_

Date: \_\_\_\_\_

# Sand and Organic Filter Stormwater Management Practices Level 1 Inspection Checklist

<b>SMP ID #</b>		<b>SMP Owner</b>		<input type="checkbox"/> Private
				<input type="checkbox"/> Public
<b>SMP Location (Address; Latitude &amp; Longitude)</b>				
	<b>Latitude</b>		<b>Longitude</b>	
<b>Party Responsible for Maintenance</b>	<b>System Type</b>		<b>Type of Site</b>	
<input type="checkbox"/> Same as SMP Owner <input type="checkbox"/> Other  _____	<input type="checkbox"/> Seasonal <input type="checkbox"/> Continuous Use <input type="checkbox"/> Other	<input type="checkbox"/> Above Ground <input type="checkbox"/> Below Ground	<input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Residential <input type="checkbox"/> State	
<b>Inspection Date</b>		<b>Inspection Time</b>		
<b>Inspector</b>				
<b>Date of Last Inspection</b>				

### SF Drainage Area

Look for both pervious and impervious areas that are uphill from the filter.

Problem (Check if Present)	Follow-Up Actions
<input type="checkbox"/> Bare soil, erosion of the ground (rills washing out the dirt; reference below)	<input type="checkbox"/> Seed and straw areas of bare soil to get vegetation established. <input type="checkbox"/> Fill in erosion areas with soil, compact, and seed and straw to establish vegetation. <input type="checkbox"/> If a rill or small channel is forming, try to redirect water flowing to this area by creating a small berm or adding topsoil to areas that are heavily compacted. <input type="checkbox"/> Other:

### SF Drainage Area

Look for both pervious and impervious areas that are uphill from the filter.

#### Problem (Check if Present)

#### Follow-Up Actions



- Bare soil, erosion of the ground (rills washing out the dirt)

- Kick-Out to Level 2 Inspection: Large areas of soil have been eroded, or larger channels are forming. May require rerouting of flow paths.



- Piles of grass clippings, mulch, dirt, salt, or other materials

- Remove or cover piles of grass clippings, mulch, dirt, etc.  
 Other:






- Open containers of oil, grease, paint, or other substances

- Cover or properly dispose of materials; consult your local solid waste authority for guidance on materials that may be toxic or hazardous.  
 Other:



## SF Inlets

Look for all the places where water flows into the filter practice.

Problem (Check if Present)		Follow-Up Actions
	<input type="checkbox"/> Inlets are collecting grit and debris or grass/weeds growing. Some water may not be getting into the filter practice.	<input type="checkbox"/> Use a flat shovel to remove grit and debris (especially at curb inlets or openings). Parking lots generate fine grit that accumulates at these spots. <input type="checkbox"/> Pull out clumps of growing grass or weeds and scoop out the soil or grit that the plants are growing in. <input type="checkbox"/> Remove any grass clippings, leaves, sticks, and other debris that is collecting at inlets. <input type="checkbox"/> For pipes and ditches, remove sediment and debris that is partially blocking the pipe or ditch opening where it enters the Filter practice. <input type="checkbox"/> Dispose of all material properly in an area where it will not re-enter the practice. <input type="checkbox"/> Other:  <input type="checkbox"/> Kick-Out to Level 2 Inspection: Inlets are blocked to the extent that most of the water does not seem to be entering the filter practice.
	<input type="checkbox"/> Some or all of the inlets are eroding so that rills, gullies, and other erosion are present, or there is dirt washing into the filter practice.	<input type="checkbox"/> For small areas of erosion, smooth out the eroded part and apply rock or stone (e.g., river cobble) to prevent further erosion. Usually, filter fabric is placed under the rock or stone. <input type="checkbox"/> In some cases, reseeding and applying erosion-control matting can be used to prevent further erosion. Some of these materials may be available at a garden center, but it may be best to consult a landscape contractor. <input type="checkbox"/> Other:  <input type="checkbox"/> Kick-Out to Level 2 Inspection: Erosion is occurring at most of the inlets and it looks like there is too much water concentrating at these points. The inlet design may have to be modified.
	<input type="checkbox"/> For an underground filter, water is ponding and doesn't seem to be getting through the filter.	<input type="checkbox"/> Kick-Out to Level 2 Inspection: This is generally a more serious problem and should be referred for a Level 2 Inspection because it will require opening up the filter vault to check for clogging.

### SF Filter Area (for Surface Sand Filters)

Examine the surface of the filter and the observation well, if present.

Problem (Check if Present)	Follow-Up Actions
 <p><input type="checkbox"/> Filter has grass and vegetation growing on more than 25% of the filter bed, threatening to clog the filter.</p>	<p><input type="checkbox"/> Vegetation growing in the filter bed should be removed either manually or with a water-safe herbicide (e.g., glyphosate without surfactants).</p> <p><input type="checkbox"/> Other:</p> <hr/> <p><input type="checkbox"/> Kick-Out to Level 2 Inspection: The filter seems clogged, or vegetation and weeds have proliferated past the point where the Level 1 person can manage it.</p>
<p><input type="checkbox"/> Minor amounts of sediment, grit, trash, or other debris are accumulating on the surface.</p>	<p><input type="checkbox"/> Use a shovel to scoop out minor amounts of sediment or grit, especially in the spring after winter sanding materials wash in and accumulate. Dispose of the material where it cannot re-enter the filter.</p> <p><input type="checkbox"/> If removing the material creates a hole or low area, rake the surface smooth and level.</p> <p><input type="checkbox"/> Remove trash, debris, and other undesirable materials.</p> <p><input type="checkbox"/> Other:</p> <hr/> <p><input type="checkbox"/> Kick-Out to Level 2 Inspection: Sediment (other than sand) has accumulated more than 2-inches deep and covers 25% or more of the surface of the filter area.</p>
 <p><input type="checkbox"/> There is erosion on the surface; water seems to be carving out rills as it flows across the filter surface, or sinkholes are forming in certain areas.</p>	<p><input type="checkbox"/> For minor areas of erosion, try filling the eroded areas with clean, coarse construction sand.</p> <p><input type="checkbox"/> Other:</p> <hr/> <p><input type="checkbox"/> Kick-Out to Level 2 Inspection: The problem persists or the erosion is more than 3-inches deep and seems to be an issue with how water enters and moves through the filter area.</p> <p><input type="checkbox"/> Kick-Out to Level 2 Inspection: The problem does not seem to be caused by flowing water but by a collapse or sinking of the surface (e.g., "sinkhole") due to some underground problem.</p>

**SF Filter Area (for Surface Sand Filters)**

Examine the surface of the filter and the observation well, if present.

**Problem (Check if Present)**



Water is still visible on the surface and/or the standpipe (if present) more than 72 hours after a rainstorm. The filter practice drains very slowly or is completely clogged.

**Follow-Up Actions**

Kick-Out to Level 2 Inspection: This is generally a serious problem, and it will be necessary to activate a Level 2 Inspection.

Additional Notes:



Inspector: \_\_\_\_\_

Date: \_\_\_\_\_

Complete the following if follow-up/corrective actions were identified during this inspection:

**Certified Completion of Follow-Up Actions:**

“I hereby certify that the follow-up/corrective actions identified in the inspection performed on \_\_\_\_\_ (DATE) have been completed and any required maintenance deficiencies have been adequately corrected.”

Inspector/Operator: \_\_\_\_\_

Date: \_\_\_\_\_

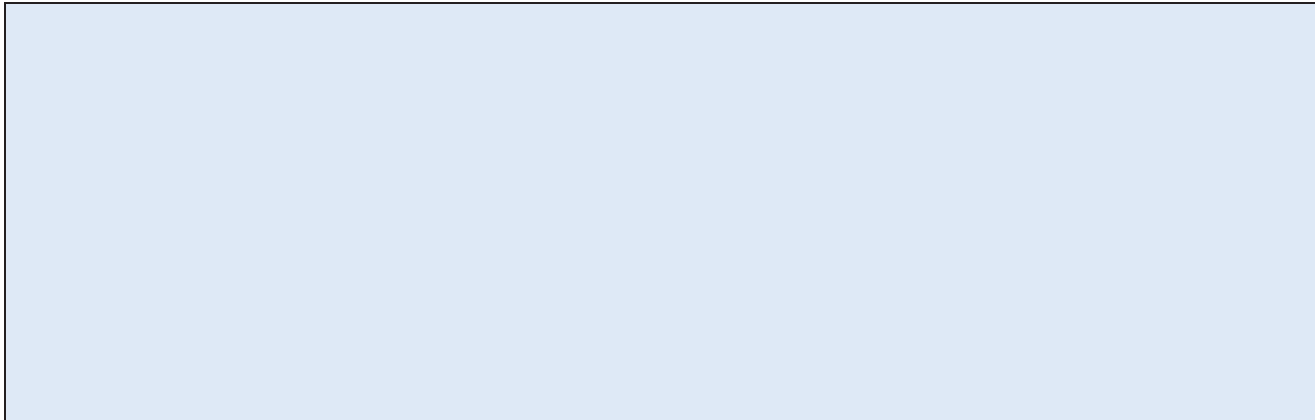
# Sand and Organic Filter Stormwater Management Practices Level 2 Inspection Checklist

<b>SMP ID #</b>		<b>SMP Owner</b>		<input type="checkbox"/> Private	<input type="checkbox"/> Public
<b>SMP Location (Address; Latitude &amp; Longitude)</b>					
	<b>Latitude</b>		<b>Longitude</b>		
<b>Party Responsible for Maintenance</b>	<b>System Type</b>			<b>Type of Site</b>	
<input type="checkbox"/> Same as SMP Owner <input type="checkbox"/> Other _____	<input type="checkbox"/> Seasonal <input type="checkbox"/> Continuous Use <input type="checkbox"/> Other	<input type="checkbox"/> Above Ground <input type="checkbox"/> Below Ground	<input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Residential <input type="checkbox"/> State		
<b>Inspection Date</b>		<b>Inspection Time</b>			
<b>Inspector</b>					
<b>Date of Last Inspection</b>					

**Table 3.12.1 Level 2 Inspection: SAND AND ORGANIC FILTERS**

Recommended Repairs	Triggers for Level 3 Inspection
<b>Observed Condition: Water Stands on Surface for More than 72 Hours after Storm</b>	
<p><input type="checkbox"/> Condition 1: Small pockets of standing water</p> <p>Use a soil probe or auger to examine the sand or filter profile. If isolated areas have accumulated grit, fine silt, vegetative debris, oily sludge or bad sand media, try scraping off top 3 inches of media and replacing with clean, coarse construction sand.</p> <p><input type="checkbox"/> Condition 2: Standing water is widespread or covers entire surface</p> <p>Look in the underdrain cleanout (if present) and use a tape measure to estimate the depth of water standing in the sand layer. Requires diagnosis and resolution of problem:</p> <ul style="list-style-type: none"> <li>• Clogged underdrain</li> <li>• Filter fabric between the sand layer and underdrain gravel OR on top of the sand filter layer (usually held in place by a thin layer of gravel)</li> <li>• Too much sediment/grit/vegetative debris/oily sludge washing in from drainage area</li> <li>• Too much ponding depth</li> <li>• Improper sand media</li> </ul>	<ul style="list-style-type: none"> <li>• Sand or organic media is clogged, but problem was not evident from Level 2 inspection.</li> <li>• Level 2 inspection identifies problem, but it cannot be resolved easily or is associated with the original design of the practice.</li> <li>• The problem seems to be filter fabric placement, but this is specified in the original design.</li> <li>• The entire filter media layer or filter cartridges need to be replaced.</li> <li>• The problem is associated with improper configuration of underdrain pipes or outlet structures.</li> </ul> <p><input type="checkbox"/> Level 3 Inspection necessary</p>

Notes:



Inspector: \_\_\_\_\_

Date: \_\_\_\_\_

Complete the following if follow-up/corrective actions were identified during this inspection:

**Certified Completion of Follow-Up Actions:**

“I hereby certify that the follow-up/corrective actions identified in the inspection performed on \_\_\_\_\_ (DATE) have been completed and any required maintenance deficiencies have been adequately corrected.”

Inspector/Operator: \_\_\_\_\_

Date: \_\_\_\_\_

# **CONSTRUCTION SITE INSPECTION AND MAINTENANCE LOG BOOK**

**STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM FOR CONSTRUCTION  
ACTIVITIES**

## **SAMPLE CONSTRUCTION SITE LOG BOOK**

### Table of Contents

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- I. Pre-Construction Meeting Documents
  - a. Preamble to Site Assessment and Inspections
  - b. Pre-Construction Site Assessment Checklist
  
- II. Construction Duration Inspections
  - a. Directions
  - b. Modification to the SWPPP

**I. PRE-CONSTRUCTION MEETING DOCUMENTS**

**Project Name** \_\_\_\_\_  
**Permit No.** \_\_\_\_\_ **Date of Authorization** \_\_\_\_\_  
**Name of Operator** \_\_\_\_\_  
**Prime Contractor** \_\_\_\_\_

**a. Preamble to Site Assessment and Inspections**

The Following Information To Be Read By All Person’s Involved in The Construction of Stormwater Related Activities:

The Operator agrees to have a qualified inspector<sup>1</sup> conduct an assessment of the site prior to the commencement of construction<sup>2</sup> and certify in this inspection report that the appropriate erosion and sediment controls described in the SWPPP have been adequately installed or implemented to ensure overall preparedness of the site for the commencement of construction.

Prior to the commencement of construction, the Operator shall certify in this site logbook that the SWPPP has been prepared in accordance with the State’s standards and meets all Federal, State and local erosion and sediment control requirements. A preconstruction meeting should be held to review all of the SWPPP requirements with construction personnel.

When construction starts, site inspections shall be conducted by the qualified inspector at least every 7 calendar days. The Operator shall maintain a record of all inspection reports in this site logbook. The site logbook shall be maintained on site and be made available to the permitting authorities upon request.

Prior to filing the Notice of Termination or the end of permit term, the Operator shall have a qualified inspector perform a final site inspection. The qualified inspector shall certify that the site has undergone final stabilization<sup>3</sup> using either vegetative or structural stabilization methods and that all temporary erosion and sediment controls (such as silt fencing) not needed for long-term erosion control have been removed. In addition, the Operator must identify and certify that all permanent structures described in the SWPPP have been constructed and provide the owner(s) with an operation and maintenance plan that ensures the structure(s) continuously functions as designed.

1 Refer to “Qualified Inspector” inspection requirements in the current SPDES General Permit for Stormwater Discharges from Construction Activity for complete list of inspection requirements.  
2 “Commencement of construction” means the initial removal of vegetation and disturbance of soils associated with clearing, grading or excavating activities or other construction activities.  
3 “Final stabilization” means that all soil-disturbing activities at the site have been completed and a uniform, perennial vegetative cover with a density of eighty (80) percent has been established or equivalent stabilization measures (such as the use of mulches or geotextiles) have been employed on all unpaved areas and areas not covered by permanent structures.

**b. Pre-construction Site Assessment Checklist**

**(NOTE: Provide comments below as necessary)**

1. Notice of Intent, SWPPP, and Contractors Certification:

**Yes No NA**

- Has a Notice of Intent been filed with the NYS Department of Conservation?
- Is the SWPPP on-site? Where? \_\_\_\_\_
- Is the Plan current? What is the latest revision date? \_\_\_\_\_
- Is a copy of the NOI (with brief description) onsite? Where? \_\_\_\_\_
- Have all contractors involved with stormwater related activities signed a contractor's certification?

2. Resource Protection

**Yes No NA**

- Are construction limits clearly flagged or fenced?
- Important trees and associated rooting zones, on-site septic system absorption fields, existing vegetated areas suitable for filter strips, especially in perimeter areas, have been flagged for protection.
- Creek crossings installed prior to land-disturbing activity, including clearing and blasting.

3. Surface Water Protection

**Yes No NA**

- Clean stormwater runoff has been diverted from areas to be disturbed.
- Bodies of water located either on site or in the vicinity of the site have been identified and protected.
- Appropriate practices to protect on-site or downstream surface water are installed.
- Are clearing and grading operations divided into areas <5 acres?

4. Stabilized Construction Access

**Yes No NA**

- A temporary construction entrance to capture mud and debris from construction vehicles before they enter the public highway has been installed.
- Other access areas (entrances, construction routes, equipment parking areas) are stabilized immediately as work takes place with gravel or other cover.
- Sediment tracked onto public streets is removed or cleaned on a regular basis.

5. Sediment Controls

**Yes No NA**

- Silt fence material and installation comply with the standard drawing and specifications.
- Silt fences are installed at appropriate spacing intervals
- Sediment/detention basin was installed as first land disturbing activity.
- Sediment traps and barriers are installed.

6. Pollution Prevention for Waste and Hazardous Materials

**Yes No NA**

- The Operator or designated representative has been assigned to implement the spill prevention avoidance and response plan.
- The plan is contained in the SWPPP on page \_\_\_\_\_
- Appropriate materials to control spills are onsite. Where? \_\_\_\_\_

## II. CONSTRUCTION DURATION INSPECTIONS

### a. Directions:

**Inspection Forms will be filled out during the entire construction phase of the project.**

Required Elements:

- 1) On a site map, indicate the extent of all disturbed site areas and drainage pathways. Indicate site areas that are expected to undergo initial disturbance or significant site work within the next 14-day period;
- 2) Indicate on a site map all areas of the site that have undergone temporary or permanent stabilization;
- 3) Indicate all disturbed site areas that have not undergone active site work during the previous 14-day period;
- 4) Inspect all sediment control practices and record the approximate degree of sediment accumulation as a percentage of sediment storage volume (for example, 10 percent, 20 percent, 50 percent);
- 5) Inspect all erosion and sediment control practices and record all maintenance requirements such as verifying the integrity of barrier or diversion systems (earthen berms or silt fencing) and containment systems (sediment basins and sediment traps). Identify any evidence of rill or gully erosion occurring on slopes and any loss of stabilizing vegetation or seeding/mulching. Document any excessive deposition of sediment or ponding water along barrier or diversion systems. Record the depth of sediment within containment structures, any erosion near outlet and overflow structures, and verify the ability of rock filters around perforated riser pipes to pass water; and
- 6) Immediately report to the Operator any deficiencies that are identified with the implementation of the SWPPP.



**SITE PLAN/SKETCH**

\_\_\_\_\_  
**Inspector (print name)**

\_\_\_\_\_  
**Date of Inspection**

\_\_\_\_\_  
**Qualified Inspector (print name)**

\_\_\_\_\_  
**Qualified Inspector Signature**

The above signed acknowledges that, to the best of his/her knowledge, all information provided on the forms is accurate and complete.

**Maintaining Water Quality**

**Yes No NA**

- Is there an increase in turbidity causing a substantial visible contrast to natural conditions at the outfalls?
- Is there residue from oil and floating substances, visible oil film, or globules or grease at the outfalls?
- All disturbance is within the limits of the approved plans.
- Have receiving lake/bay, stream, and/or wetland been impacted by silt from project?

**Housekeeping**

1. General Site Conditions

**Yes No NA**

- Is construction site litter, debris and spoils appropriately managed?
- Are facilities and equipment necessary for implementation of erosion and sediment control in working order and/or properly maintained?
- Is construction impacting the adjacent property?
- Is dust adequately controlled?

2. Temporary Stream Crossing

**Yes No NA**

- Maximum diameter pipes necessary to span creek without dredging are installed.
- Installed non-woven geotextile fabric beneath approaches.
- Is fill composed of aggregate (no earth or soil)?
- Rock on approaches is clean enough to remove mud from vehicles & prevent sediment from entering stream during high flow.

3. Stabilized Construction Access

**Yes No NA**

- Stone is clean enough to effectively remove mud from vehicles.
- Installed per standards and specifications?
- Does all traffic use the stabilized entrance to enter and leave site?
- Is adequate drainage provided to prevent ponding at entrance?

**Runoff Control Practices**

1. Excavation Dewatering

**Yes No NA**

- Upstream and downstream berms (sandbags, inflatable dams, etc.) are installed per plan.
- Clean water from upstream pool is being pumped to the downstream pool.
- Sediment laden water from work area is being discharged to a silt-trapping device.
- Constructed upstream berm with one-foot minimum freeboard.

**Runoff Control Practices (continued)**

2. Flow Spreader

**Yes No NA**

- Installed per plan.
- Constructed on undisturbed soil, not on fill, receiving only clear, non-sediment laden flow.
- Flow sheets out of level spreader without erosion on downstream edge.

3. Interceptor Dikes and Swales

**Yes No NA**

- Installed per plan with minimum side slopes 2H:1V or flatter.
- Stabilized by geotextile fabric, seed, or mulch with no erosion occurring.
- Sediment-laden runoff directed to sediment trapping structure

4. Stone Check Dam

**Yes No NA**

- Is channel stable? (flow is not eroding soil underneath or around the structure).
- Check is in good condition (rocks in place and no permanent pools behind the structure).
- Has accumulated sediment been removed?.

5. Rock Outlet Protection

**Yes No NA**

- Installed per plan.
- Installed concurrently with pipe installation.

**Soil Stabilization**

1. Topsoil and Spoil Stockpiles

**Yes No NA**

- Stockpiles are stabilized with vegetation and/or mulch.
- Sediment control is installed at the toe of the slope.

2. Revegetation

**Yes No NA**

- Temporary seedings and mulch have been applied to idle areas.
- 4 inches minimum of topsoil has been applied under permanent seedings

**Sediment Control Practices**

1. Silt Fence and Linear Barriers

**Yes No NA**

- Installed on Contour, 10 feet from toe of slope (not across conveyance channels).
- Joints constructed by wrapping the two ends together for continuous support.
- Fabric buried 6 inches minimum.
- Posts are stable, fabric is tight and without rips or frayed areas.

Sediment accumulation is \_\_\_% of design capacity.

**Sediment Control Practices (continued)**

2. Storm Drain Inlet Protection (Use for Stone & Block; Filter Fabric; Curb; or, Excavated; Filter Sock or Manufactured practices)

**Yes No NA**

- Installed concrete blocks lengthwise so open ends face outward, not upward.
  - Placed wire screen between No. 3 crushed stone and concrete blocks.
  - Drainage area is 1acre or less.
  - Excavated area is 900 cubic feet.
  - Excavated side slopes should be 2:1.
  - 2" x 4" frame is constructed and structurally sound.
  - Posts 3-foot maximum spacing between posts.
  - Fabric is embedded 1 to 1.5 feet below ground and secured to frame/posts with staples at max 8-inch spacing.
  - Posts are stable, fabric is tight and without rips or frayed areas.
  - Manufactured insert fabric is free of tears and punctures.
  - Filter Sock is not torn or flattened and fill material is contained within the mesh sock.
- Sediment accumulation \_\_\_% of design capacity.

3. Temporary Sediment Trap

**Yes No NA**

- Outlet structure is constructed per the approved plan or drawing.
  - Geotextile fabric has been placed beneath rock fill.
  - Sediment trap slopes and disturbed areas are stabilized.
- Sediment accumulation is \_\_\_% of design capacity.

4. Temporary Sediment Basin

**Yes No NA**

- Basin and outlet structure constructed per the approved plan.
  - Basin side slopes are stabilized with seed/mulch.
  - Drainage structure flushed and basin surface restored upon removal of sediment basin facility.
  - Sediment basin dewatering pool is dewatering at appropriate rate.
- Sediment accumulation is \_\_\_% of design capacity.

Note: Not all erosion and sediment control practices are included in this listing. Add additional pages to this list as required by site specific design. All practices shall be maintained in accordance with their respective standards.

Construction inspection checklists for post-development stormwater management practices can be found in Appendix F of the New York Stormwater Management Design Manual.



# MC-4500 CHAMBER

Designed to meet the most stringent industry performance standards for superior structural integrity while providing designers with a cost-effective method to save valuable land and protect water resources. The StormTech system is designed primarily to be used under parking lots, thus maximizing land usage for private (commercial) and public applications. StormTech chambers can also be used in conjunction with Green Infrastructure, thus enhancing the performance and extending the service life of these practices.

## STORMTECH MC-4500 CHAMBER (not to scale)

### Nominal Chamber Specifications

**Size (L x W x H)**  
52" x 100" x 60"  
1,321 mm x 2,540 mm x 1,524 mm

**Chamber Storage**  
106.5 ft<sup>3</sup> (3.01 m<sup>3</sup>)

**Min. Installed Storage\***  
162.6 ft<sup>3</sup> (4.60 m<sup>3</sup>)

**Weight**  
120 lbs (54.4 kg)

**Shipping**  
7 chambers/pallet  
11 pallets/truck

\*Assumes a minimum of 12" (300 mm) of stone above, 9" (230 mm) of stone below chambers, 9" (230 mm) of stone between chambers/end caps and 40% stone porosity.

## STORMTECH MC-4500 END CAP (not to scale)

### Nominal End Cap Specifications

**Size (L x W x H)**  
35.1" x 90.2" x 59.4"  
891 mm x 2,291 mm x 1,509 mm

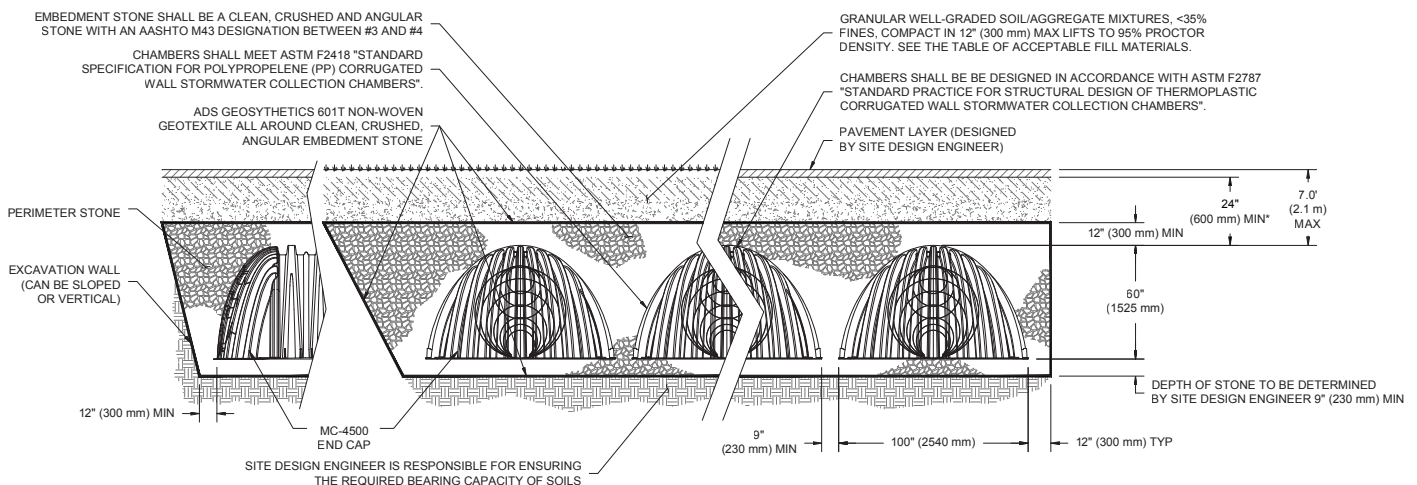
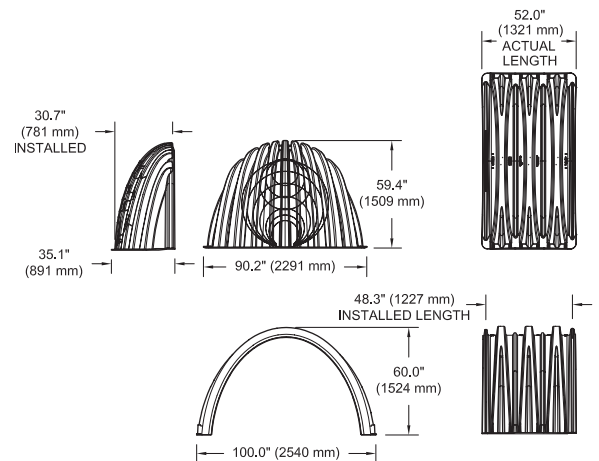
**End Cap Storage**  
35.7 ft<sup>3</sup> (1.01 m<sup>3</sup>)

**Min. Installed Storage\***  
108.7 ft<sup>3</sup> (3.08 m<sup>3</sup>)

**Weight**  
120 lbs (54.4 kg)

**Shipping**  
7 end caps/pallet  
11 pallets/truck

\*Assumes a minimum of 12" (300 mm) of stone above, 9" (230 mm) of stone below, 6" (150 mm) of stone perimeter, 9" (230 mm) of stone between chambers/end caps and 40% stone porosity.



\*MINIMUM COVER TO BOTTOM OF FLEXIBLE PAVEMENT. FOR UNPAVED INSTALLATIONS WHERE RUTTING FROM VEHICLES MAY OCCUR, INCREASE COVER TO 30" (750 mm).

## MC-4500 CHAMBER SPECIFICATIONS

### STORAGE VOLUME PER CHAMBER FT<sup>3</sup> (M<sup>3</sup>)

	Bare Chamber Storage ft <sup>3</sup> (m <sup>3</sup> )	Chamber and Stone Foundation Depth in. (mm)			
		9" (230 mm)	12" (300 mm)	15" (375 mm)	18" (450 mm)
MC-4500 Chamber	106.5 (3.02)	162.6 (4.60)	166.3 (4.71)	169.6 (4.81)	173.6 (4.91)
MC-4500 End Cap	35.7 (1.0)	108.7 (3.08)	111.9 (3.17)	115.2 (3.26)	118.4 (3.35)

**Note:** Assumes 9" (230 mm) row spacing, 40% stone porosity, 12" (300 mm) stone above and includes the bare chamber/end cap volume. End cap volume assumes 12" (300 mm) stone perimeter.

### AMOUNT OF STONE PER CHAMBER

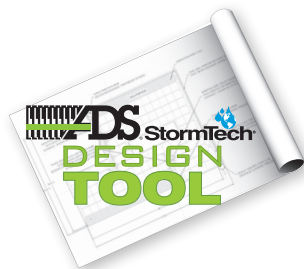
ENGLISH TONS (yds <sup>3</sup> )	Stone Foundation Depth			
	9"	12"	15"	18"
MC-4500 Chamber	7.4 (5.2)	7.8 (5.5)	8.3 (5.9)	8.8 (6.2)
MC-4500 End Cap	9.6 (6.8)	10.0 (7.1)	10.4 (7.4)	10.9 (7.7)
METRIC KILOGRAMS (m <sup>3</sup> )	230 mm	300 mm	375 mm	450 mm
MC-4500 Chamber	6,681 (4.0)	7,117 (4.2)	7,552 (4.5)	7,987 (4.7)
MC-4500 End Cap	8,691 (5.2)	9,075 (5.4)	9,460 (5.6)	9,845 (5.9)

**Note:** Assumes 12" (300 mm) of stone above and 9" (230 mm) row spacing and 12" (300 mm) of perimeter stone in front of end caps.

### VOLUME EXCAVATION PER CHAMBER YD<sup>3</sup> (M<sup>3</sup>)

	Stone Foundation Depth			
	9" (230 mm)	12" (300 mm)	15" (375mm)	18" (450 mm)
MC-4500 Chamber	10.5 (8.0)	10.8 (8.3)	11.2 (8.5)	11.5 (8.8)
MC-4500 End Cap	9.3 (7.1)	9.6 (7.3)	9.9 (7.6)	10.2 (7.8)

**Note:** Assumes 9" (230 mm) of separation between chamber rows, 12" (300 mm) of perimeter in front of the end caps, and 24" (600 mm) of cover. The volume of excavation will vary as depth of cover increases.



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For more information on the StormTech MC-4500 Chamber and other ADS products, please contact our Customer Service Representatives at 1-800-821-6710

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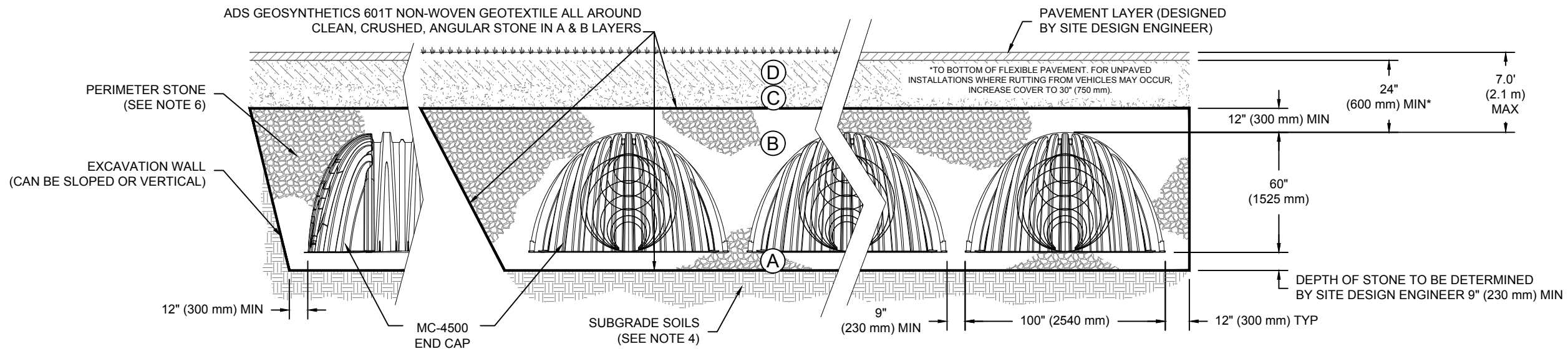
**Advanced Drainage Systems, Inc.**  
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 1-800-821-6710 [www.ads-pipe.com](http://www.ads-pipe.com)

## ACCEPTABLE FILL MATERIALS: STORMTECH MC-4500 CHAMBER SYSTEMS

MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	<b>FINAL FILL:</b> 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 PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	<b>INITIAL FILL:</b> FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	AASHTO M145 <sup>1</sup> A-1, A-2-4, A-3  OR AASHTO M43 <sup>1</sup> 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	<b>EMBEDMENT STONE:</b> FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE  AASHTO M43 <sup>1</sup> 3, 4	NO COMPACTION REQUIRED.
A	<b>FOUNDATION STONE:</b> FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE  AASHTO M43 <sup>1</sup> 3, 4	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. <sup>2,3</sup>

**PLEASE NOTE:**

- 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".
- STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
- WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR 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.



\*FOR COVER DEPTHS GREATER THAN 7.0' (2.1 m) PLEASE CONTACT STORMTECH

**NOTES:**

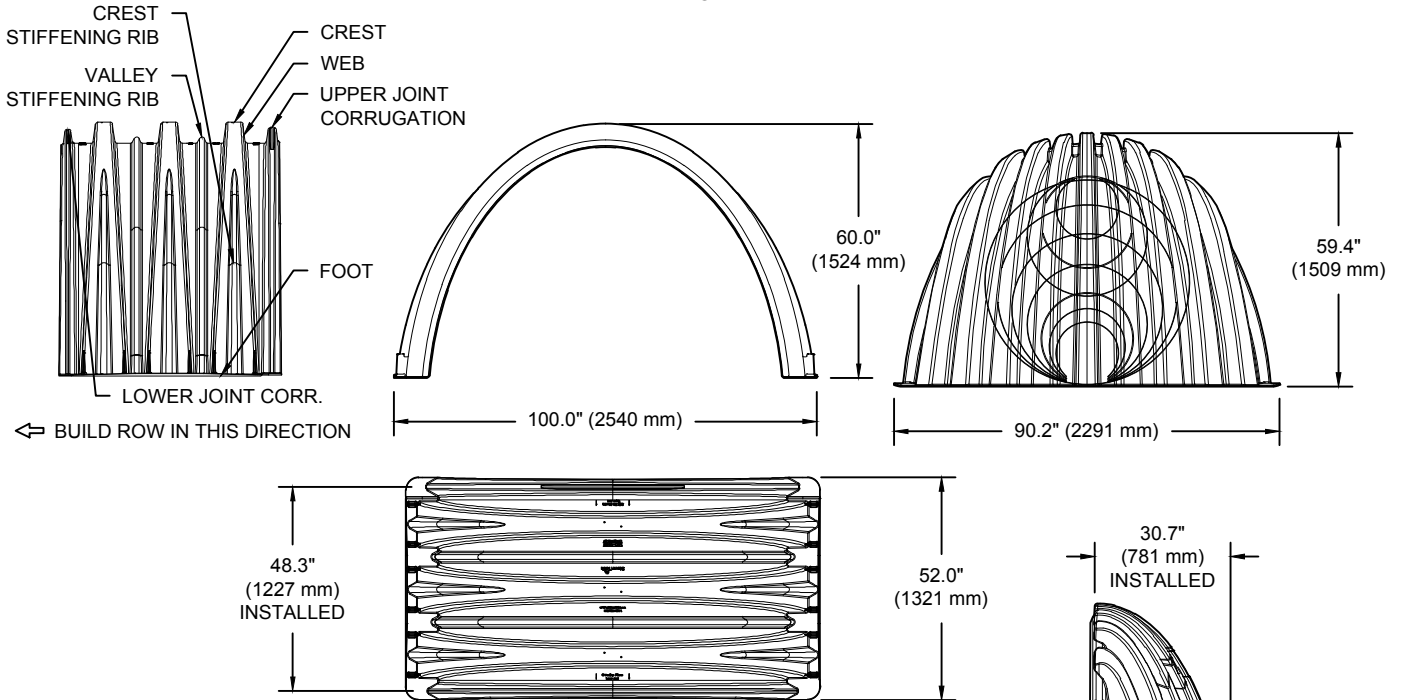
- MC-4500 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- MC-4500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
- THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
- PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
- ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.

<b>MC-4500</b>	<b>STANDARD CROSS SECTION</b>	DATE: 11/18/14	DRAWN: JLM	CHECKED: JLM
DESCRIPTION	CHK	DRW	REV	PROJECT #:
<p style="font-size: small; margin: 0;">70 INWOOD ROAD, SUITE 3   ROCKY HILL, CT   06067 860-525-8188   888-892-2694   WWW.STORMTECH.COM</p>				
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SHEET				
1 OF 1				



# MC-4500 TECHNICAL SPECIFICATION

NTS



### NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	100.0" X 60.0" X 48.3"	(2540 mm X 1524 mm X 1227 mm)
CHAMBER STORAGE	106.5 CUBIC FEET	(3.01 m <sup>3</sup> )
MINIMUM INSTALLED STORAGE*	162.6 CUBIC FEET	(4.60 m <sup>3</sup> )
WEIGHT	130.0 lbs.	(59.0 kg)

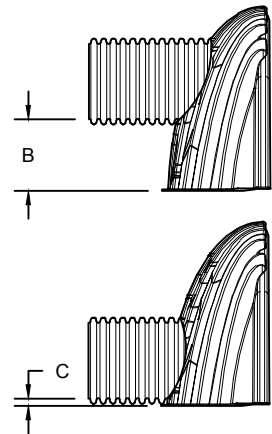
### NOMINAL END CAP SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	90.2" X 59.4" X 30.7"	(2291 mm X 1509 mm X 781 mm)
END CAP STORAGE	35.7 CUBIC FEET	(1.01 m <sup>3</sup> )
MINIMUM INSTALLED STORAGE*	108.7 CUBIC FEET	(3.08 m <sup>3</sup> )
WEIGHT	135.0 lbs.	(61.2 kg)

\*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION AND BETWEEN CHAMBERS, 12" (305 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY.

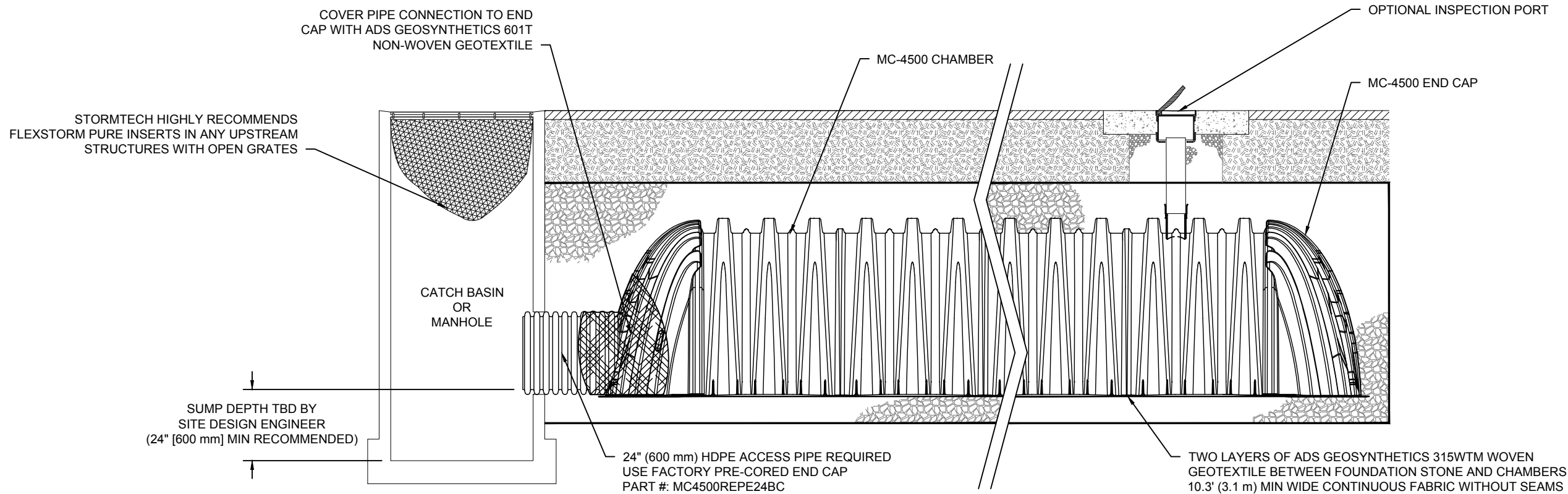
STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"  
 STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"  
 END CAPS WITH A WELDED CROWN PLATE END WITH "C"  
 END CAPS WITH A PREFABRICATED WELDED STUB END WITH "W"

PART #	STUB	B	C
MC4500REPE06T	6" (150 mm)	42.54" (1.081 m)	---
MC4500REPE06B		---	0.86" (22 mm)
MC4500REPE08T	8" (200 mm)	40.50" (1.029 m)	---
MC4500REPE08B		---	1.01" (26 mm)
MC4500REPE10T	10" (250 mm)	38.37" (975 mm)	---
MC4500REPE10B		---	1.33" (34 mm)
MC4500REPE12T	12" (300 mm)	35.69" (907 mm)	---
MC4500REPE12B		---	1.55" (39 mm)
MC4500REPE15T	15" (375 mm)	32.72" (831 mm)	---
MC4500REPE15B		---	1.70" (43 mm)
MC4500REPE18TC	18" (450 mm)	29.36" (746 mm)	---
MC4500REPE18TW		---	1.97" (50 mm)
MC4500REPE18BC		---	---
MC4500REPE18BW	24" (600 mm)	23.05" (585 mm)	---
MC4500REPE24TC		---	---
MC4500REPE24TW		---	2.26" (57 mm)
MC4500REPE24BC		---	---
MC4500REPE24BW	30" (750 mm)	---	---
MC4500REPE30BC		---	2.95" (75 mm)
MC4500REPE36BC		---	3.25" (83 mm)
MC4500REPE42BC		---	3.55" (90 mm)



CUSTOM PRECORED INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12-24" (300-600 mm) SIZE ON SIZE AND 15-48" (375-1200 mm) ECCENTRIC MANIFOLDS. CUSTOM INVERT LOCATIONS ON THE MC-4500 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm). THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHEST POSSIBLE FOR THE PIPE SIZE.

NOTE: ALL DIMENSIONS ARE NOMINAL



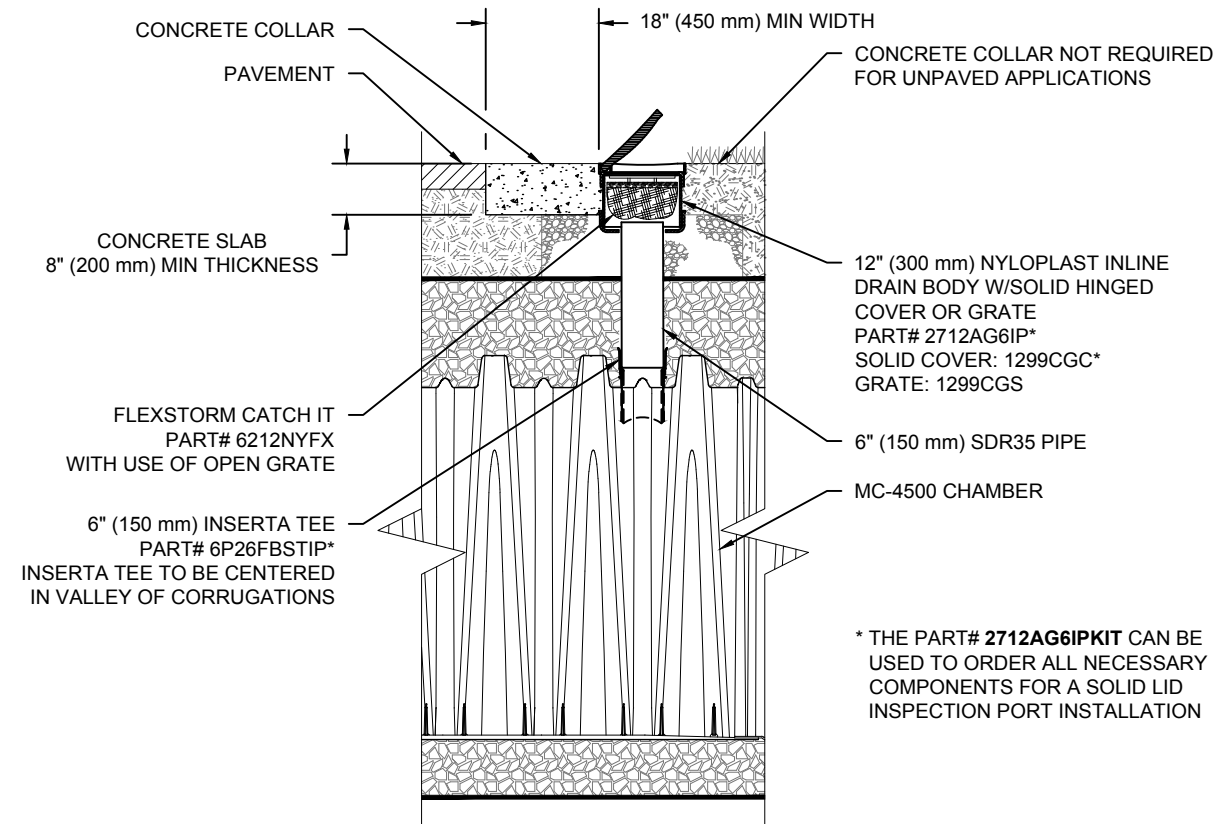
**MC-4500 ISOLATOR ROW DETAIL**  
NTS

**INSPECTION & MAINTENANCE**

- STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
    - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
    - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
    - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
    - A.4. LOWER A CAMERA INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
    - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
  - B. ALL ISOLATOR ROWS
    - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
    - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE
      - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
      - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
    - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- STEP 2) CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
  - B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
  - C. VACUUM STRUCTURE SUMP AS REQUIRED
- STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.
- STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

**NOTES**

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



**MC-4500 6" INSPECTION PORT DETAIL**  
NTS

REV	DRW	CHK	DESCRIPTION

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ISOLATOR ROW DETAILS  
MC-4500

DATE: 03/08/17  
DRAWN: JLM  
CHECKED: PROJECT #:

# Isolator<sup>®</sup> Row O&M Manual



## THE ISOLATOR<sup>®</sup> ROW

### INTRODUCTION

An important component of any Stormwater Pollution Prevention Plan is inspection and maintenance. The StormTech Isolator Row is a technique to inexpensively enhance Total Suspended Solids (TSS) removal and provide easy access for inspection and maintenance.

### THE ISOLATOR ROW

The Isolator Row is a row of StormTech chambers, either SC-160LP, SC-310, SC-310-3, SC-740, DC-780, MC-3500 or MC-4500 models, that is surrounded with filter fabric and connected to a closely located manhole for easy access. The fabric-wrapped chambers provide for settling and filtration of sediment as storm water rises in the Isolator Row and ultimately passes through the filter fabric. The open bottom chambers and perforated sidewalls (SC-310, SC-310-3 and SC-740 models) allow storm water to flow both vertically and horizontally out of the chambers. Sediments are captured in the Isolator Row protecting the storage areas of the adjacent stone and chambers from sediment accumulation.

Two different fabrics are used for the Isolator Row. A woven geotextile fabric is placed between the stone and the Isolator Row chambers. The tough geotextile provides a media for storm water filtration and provides a durable surface for maintenance operations. It is also designed to prevent scour of the underlying stone and remain intact during high pressure jetting. A non-woven fabric is placed over the chambers to provide a filter media for flows passing through the perforations in the sidewall of the chamber. The non-woven fabric is not required over the SC-160LP, DC-780, MC-3500 or MC-4500 models as these chambers do not have perforated side walls.

The Isolator Row is typically designed to capture the “first flush” and offers the versatility to be sized on a volume basis or flow rate basis. An upstream manhole not only provides access to the Isolator Row but typically includes a high flow weir such that storm water flowrates or volumes that exceed the capacity of the Isolator Row overtop the overflow weir and discharge through a manifold to the other chambers.

The Isolator Row may also be part of a treatment train. By treating storm water prior to entry into the chamber system, the service life can be extended and pollutants such as hydrocarbons can be captured. Pre-treatment best management practices can be as simple as deep sump catch basins, oil-water separators or can be innovative storm water treatment devices. The design of the treatment train and selection of pretreatment devices by the design engineer is often driven by regulatory requirements. Whether pretreatment is used or not, the Isolator Row is recommended by StormTech as an effective means to minimize maintenance requirements and maintenance costs.

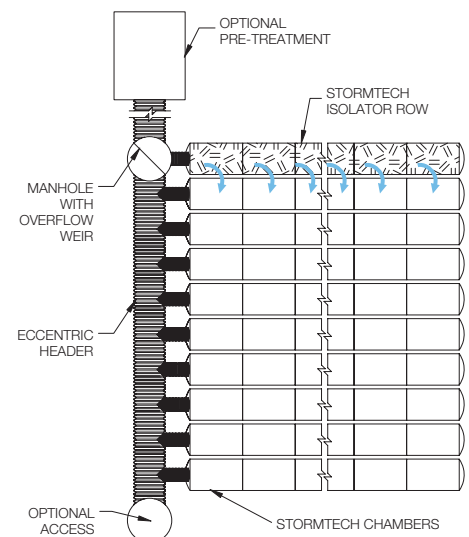
*Note: See the StormTech Design Manual for detailed information on designing inlets for a StormTech system, including the Isolator Row.*

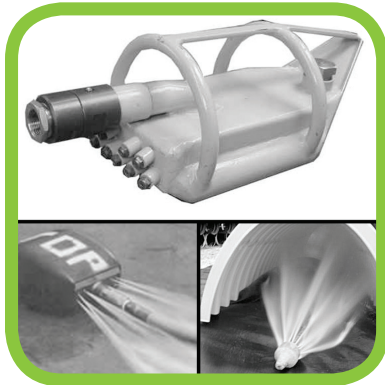


Looking down the Isolator Row from the manhole opening, woven geotextile is shown between the chamber and stone base.



StormTech Isolator Row with Overflow Spillway (not to scale)





## ISOLATOR ROW INSPECTION/MAINTENANCE

### INSPECTION

The frequency of inspection and maintenance varies by location. A routine inspection schedule needs to be established for each individual location based upon site specific variables. The type of land use (i.e. industrial, commercial, residential), anticipated pollutant load, percent imperviousness, climate, etc. all play a critical role in determining the actual frequency of inspection and maintenance practices.

At a minimum, StormTech recommends annual inspections. Initially, the Isolator Row should be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition.

The Isolator Row incorporates a combination of standard manhole(s) and strategically located inspection ports (as needed). The inspection ports allow for easy access to the system from the surface, eliminating the need to perform a confined space entry for inspection purposes.

If upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of sediment. When the average depth of sediment exceeds 3 inches throughout the length of the Isolator Row, clean-out should be performed.

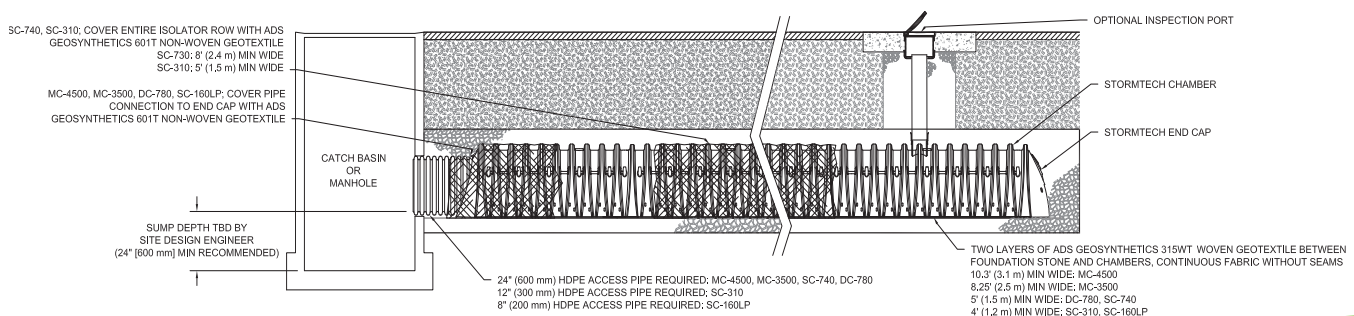
### MAINTENANCE

The Isolator Row was designed to reduce the cost of periodic maintenance. By “isolating” sediments to just one row, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided via a manhole(s) located on the end(s) of the row for cleanout. If entry into the manhole is required, please follow local and OSHA rules for a confined space entries.

Maintenance is accomplished with the JetVac process. The JetVac process utilizes a high pressure water nozzle to propel itself down the Isolator Row while scouring and suspending sediments. As the nozzle is retrieved, the captured pollutants are flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/JetVac combination vehicles. Selection of an appropriate JetVac nozzle will improve maintenance efficiency. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45” are best. Most JetVac reels have 400 feet of hose allowing maintenance of an Isolator Row up to 50 chambers long. **The JetVac process shall only be performed on StormTech Isolator Rows that have AASHTO class 1 woven geotextile (as specified by StormTech) over their angular base stone.**

### StormTech Isolator Row (not to scale)

*Note: Non-woven fabric is only required over the inlet pipe connection into the end cap for SC-160LP, DC-780, MC-3500 and MC-4500 chamber models and is not required over the entire Isolator Row.*



# ISOLATOR ROW STEP BY STEP MAINTENANCE PROCEDURES

## STEP 1

Inspect Isolator Row for sediment.

- A) Inspection ports (if present)
  - i. Remove lid from floor box frame
  - ii. Remove cap from inspection riser
  - iii. Using a flashlight and stadia rod, measure depth of sediment and record results on maintenance log.
  - iv. If sediment is at or above 3 inch depth, proceed to Step 2. If not, proceed to Step 3.
- B) All Isolator Rows
  - i. Remove cover from manhole at upstream end of Isolator Row
  - ii. Using a flashlight, inspect down Isolator Row through outlet pipe
    - 1. Mirrors on poles or cameras may be used to avoid a confined space entry
    - 2. Follow OSHA regulations for confined space entry if entering manhole
  - iii. If sediment is at or above the lower row of sidewall holes (approximately 3 inches), proceed to Step 2. If not, proceed to Step 3.

## STEP 2

Clean out Isolator Row using the JetVac process.

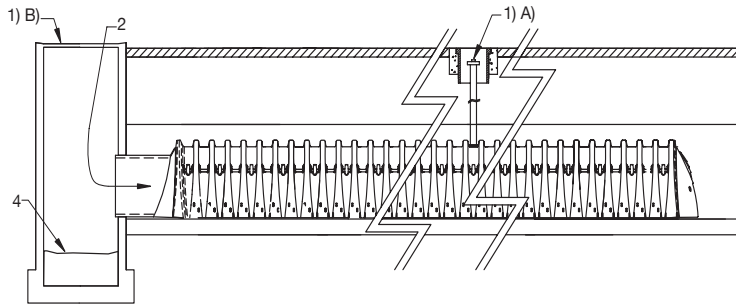
- A) A fixed floor cleaning nozzle with rear facing nozzle spread of 45 inches or more is preferable
- B) Apply multiple passes of JetVac until backflush water is clean
- C) Vacuum manhole sump as required

## STEP 3

Replace all caps, lids and covers, record observations and actions.

## STEP 4

Inspect & clean catch basins and manholes upstream of the StormTech system.



## SAMPLE MAINTENANCE LOG

Date	Stadia Rod Readings		Sediment Depth (1)-(2)	Observations/Actions	Inspector
	Fixed point to chamber bottom (1)	Fixed point to top of sediment (2)			
3/15/11	6.3 ft	none		New installation. Fixed point is CI frame at grade	DJM
9/24/11		6.2	0.1 ft	Some grit felt	SM
6/20/13		5.8	0.5 ft	Mucky feel, debris visible in manhole and in Isolator Row, maintenance due	NV
7/7/13	6.3 ft		0	System jetted and vacuumed	DJM

# StormTech Construction Guide

## REQUIRED MATERIALS AND EQUIPMENT LIST

- Acceptable fill materials per Table 1
- StormTech solid end caps, pre-cored and pre-fabricated end caps
- Woven and non-woven geotextiles
- StormTech chambers, manifolds and fittings

NOTE: MC-3500 chamber pallets are 77" x 90" (2.0 m x 2.3 m) and weigh about 2010 lbs. (912 kg) and MC-4500 pallets are 100" x 52" (2.5 m x 1.3 m) and weigh about 840 lbs. (381 kg). Unloading chambers requires 72" (1.8 m) (min.) forks and/or tie downs (straps, chains, etc).

### IMPORTANT NOTES:

A. This installation guide provides the minimum requirements for proper installation of chambers. Nonadherence 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. Use of a dozer to push embedment stone between the rows of chambers may cause damage to chambers and is not an acceptable backfill method. Any chambers damaged by using the "dump and push" method are not covered under the StormTech standard warranty.

C. Care should be taken in the handling of chambers and end caps. End caps must be stored standing upright. 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.



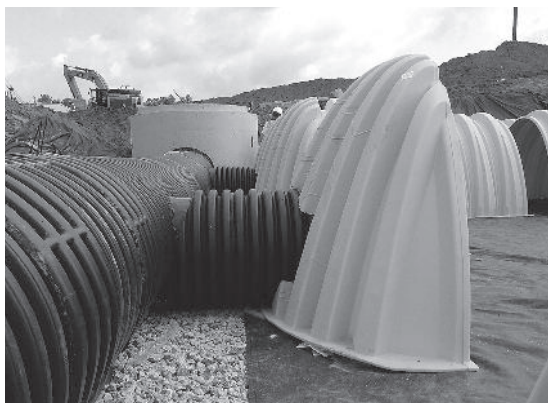
Place clean, crushed, angular stone foundation 9" (230 mm) min. Install underdrains if required. Compact to achieve a flat surface.

1

## Manifold, Scour Fabric and Chamber Assembly



Install manifolds and lay out woven scour geotextile at inlet rows [min. 17.5 ft (5.33 m)] at each inlet end cap. Place a continuous piece (no seams) along entire length of Isolator® Row(s) in two layers.

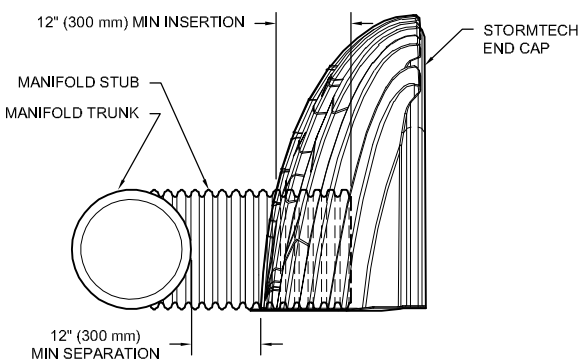


Align the first chamber and end cap of each row with inlet pipes. Contractor may choose to postpone stone placement around end chambers and leave ends of rows open for easy inspection of chambers during the backfill process.



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. Maintain minimum 9" (300 mm) spacing between rows. For the Isolator Row place two continuous layers of ADS Woven fabric between the foundation stone and the isolator row chambers, making sure the fabric lays flat and extends the entire width of the chamber feet.

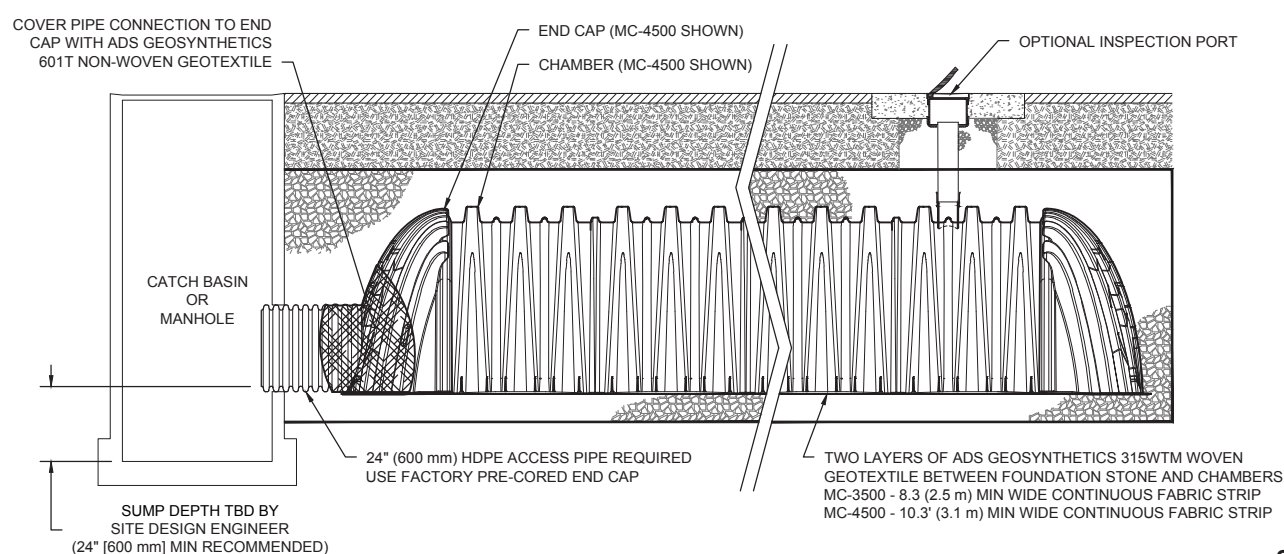
## Manifold Insertion



NOTE: MANIFOLD STUB MUST BE LAID HORIZONTAL FOR A PROPER FIT IN END CAP OPENING.

Insert inlet and outlet manifolds a minimum 12" (300 mm) into chamber end caps. Manifold header should be a minimum 12" (300 mm) from base of end cap.

## StormTech Isolator Row Detail

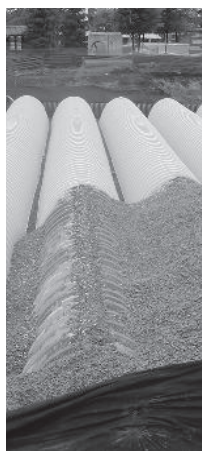


2

## Initial Anchoring of Chambers – Embedment Stone



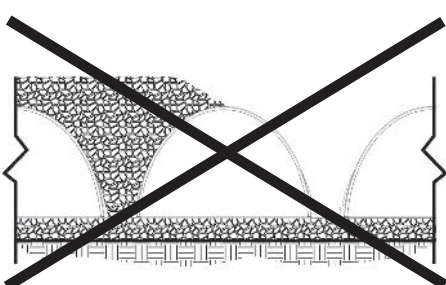
Initial embedment shall be spotted along the centerline of the chamber evenly anchoring the lower portion of the chamber. This is best accomplished with a stone conveyor or excavator reaching along the row.



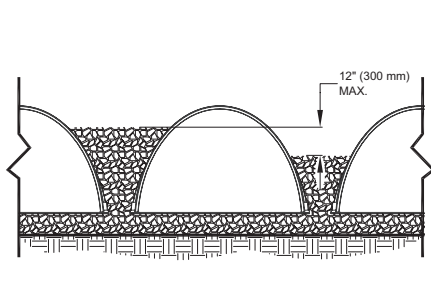
No equipment shall be operated on the bed at this stage of the installation. Excavators must be located off the bed. Dump trucks shall not dump stone directly on to the bed. Dozers or loaders are not allowed on the bed at this time.



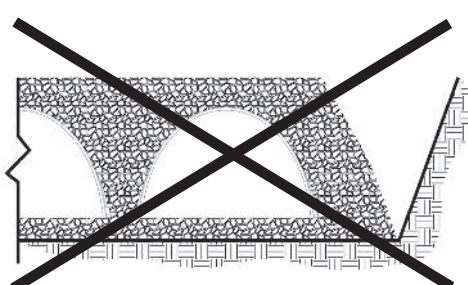
## Backfill of Chambers – Embedment Stone



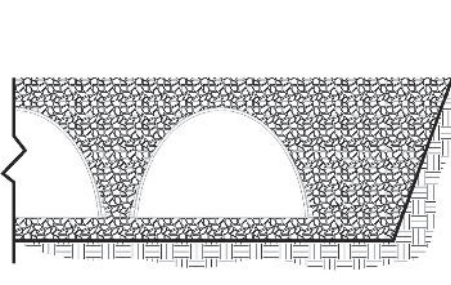
UNEVEN BACKFILL



EVEN BACKFILL



PERIMETER NOT BACKFILLED

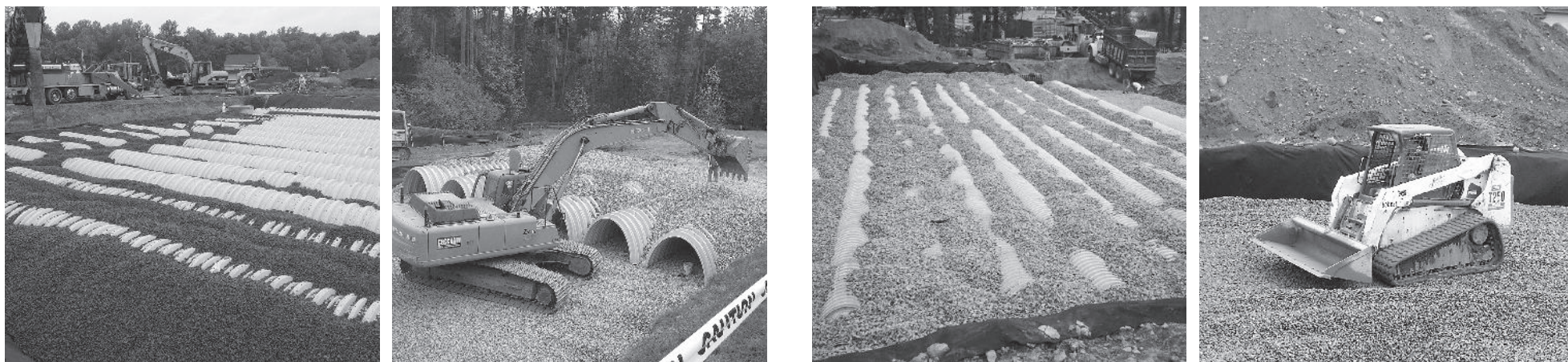


PERIMETER FULLY BACKFILLED

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

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

# Backfill of Chambers – Embedment Stone and Cover Stone



Continue evenly backfilling between rows and around perimeter until embedment stone reaches tops of chambers and a minimum 12" (300 mm) of cover stone is in place. Perimeter stone must extend horizontally to the excavation wall for both straight or sloped sidewalls. The recommended backfill methods are with a stone conveyor outside of the bed or build as you go with an excavator inside the bed reaching along the rows. Backfilling while assembling chambers rows as shown in the picture will help to ensure that equipment reach is not exceeded.

Only after chambers have been backfilled to top of chamber and with a minimum 12" (300 mm) of cover stone on top of chambers can skid loaders and small LGP dozers be used to final grade cover stone and backfill material in accordance with ground pressure limits in Table 2. Equipment must push material parallel to rows only. Never push perpendicular to rows. StormTech recommends the contractor inspect chamber rows before placing final backfill. Any chambers damaged by construction equipment shall be removed and replaced.

## Final Backfill of Chambers – Fill Material



Install non-woven geotextile over stone. Geotextile must overlap 24" (600 mm) in. where edges meet. Compact at 24" (600 mm) of fill. Roller travel parallel with rows.

## Inserta Tee Detail

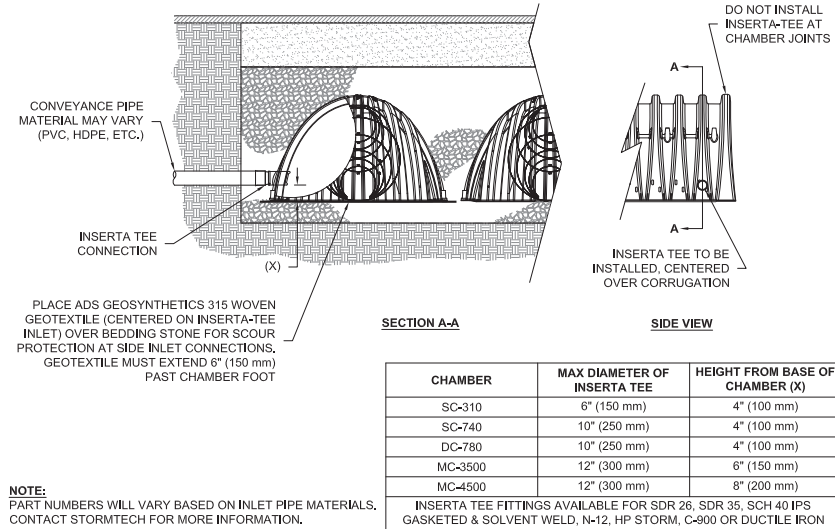
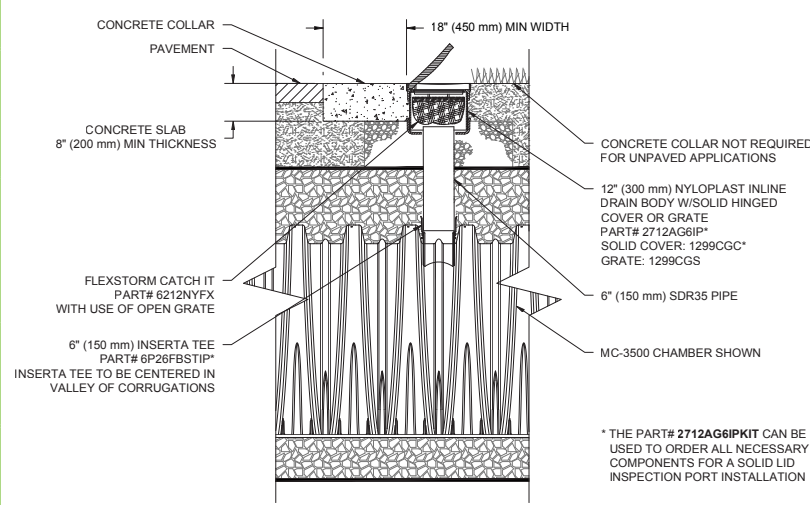


Table 1 - Acceptable Fill Materials

Material Location	Description	AASHTO M43 Designation <sup>1</sup>	Compaction/Density Requirement
<b>D) Final Fill:</b> 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.
<b>C) Initial Fill:</b> Fill Material for layer 'C' starts from the top of the embedment stone ('B' layer) to 24" (600 mm) above the top of the chamber. Note that pavement subbase materials can be used in lieu of this 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 M145 A-1, A-2-4, A-3 or AASHTO M431 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	Begin compaction after min. 24" (600 mm) of material over the chambers is reached. Compact additional layers in 12" (300 mm) max. lifts to a min. 95% Proctor density for well-graded material and 95% relative density for processed aggregate materials.
<b>B) Embedment Stone:</b> Fill the surrounding chambers from the foundation stone ('A' layer) to the 'C' layer above.	Clean, crushed, angular stone	AASHTO M43 <sup>1</sup> 3, 357, 4	No compaction required.
<b>A) Foundation Stone:</b> Fill below chambers from the subgrade up to the foot (bottom) of the chamber.	Clean, crushed, angular stone,	AASHTO M43 <sup>1</sup> 3, 357, 4	Place and compact in 9" (230 mm) max lifts using two full coverages with a vibratory compactor. <sup>2,3</sup>

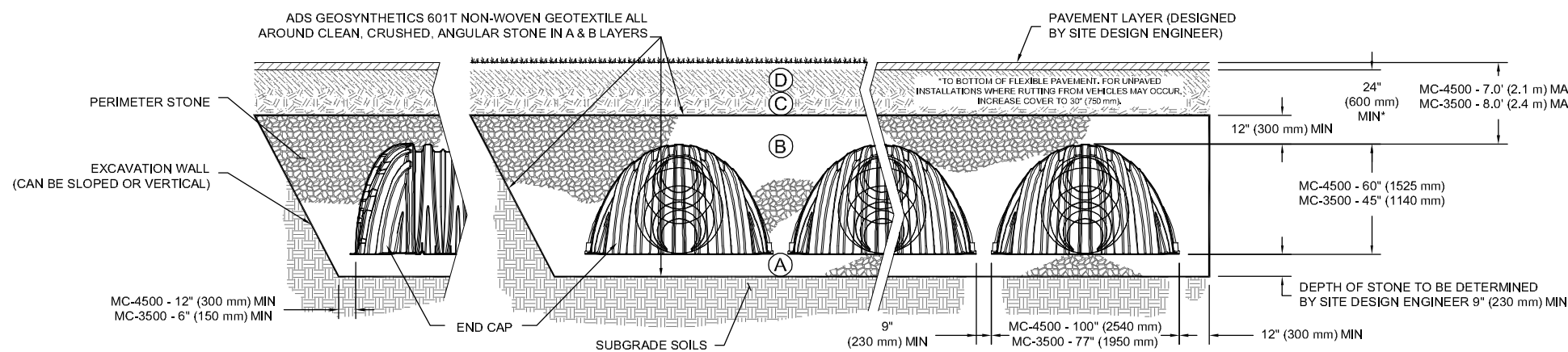
Figure 1- Inspection Port Detail



### PLEASE NOTE:

- 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".
- StormTech compaction requirements are met for 'A' location materials when placed and compacted in 9" (230 mm) (max) lifts using two full coverages with a vibratory compactor.
- 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.

Figure 2 - Fill Material Locations



### NOTES:

- 36" (900 mm) of stabilized cover materials over the chambers is required for full dump truck travel and dumping.
- During paving operations, dump truck axle loads on 24" (600mm) 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 24" (600 mm) of cover exists over the chambers. Contact StormTech for additional guidance on allowable axle loads during paving.
- 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.
- Mini-excavators (<8,000lbs/3,628 kg) can be used with at least 12" (300 mm) 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.
- StormTech does not require compaction of initial fill at 18" (450 mm) of cover. However, requirements by others for 6" (150 mm) lifts may necessitate the use of small compactors at 18" (450 mm) of cover.
- 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.
- Allowable track loads based on vehicle travel only. Excavators shall not operate on chamber beds until the total backfill reaches 3 feet (900 mm) over the entire bed. Excavators shall not operate on chamber beds until the total backfill reaches 3 feet (900 mm) over the entire bed.

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Table 2 - Maximum Allowable Construction Vehicle Loads<sup>6</sup>

Material Location	Fill Depth over Chambers in. [mm]	Maximum Allowable Wheel Loads		Maximum Allowable Track Loads <sup>6</sup>		Maximum Allowable Roller Loads	
		Max Axle Load for Trucks lbs [kN]	Max Wheel Load for Loaders lbs [kN]	Track Width in. [mm]	Max Ground Pressure psf [kPa]	Max Drum Weight or Dynamic Force lbs [kN]	
<b>D) Final Fill Material</b>	36" [900] Compacted	32,000 [142]	16,000 [71]	12" [305]	3420 [164]	38,000 [169]	
				18" [457]	2350 [113]		
				24" [610]	1850 [89]		
				30" [762]	1510 [72]		
				36" [914]	1310 [63]		
<b>C) Initial Fill Material</b>	24" [600] Compacted	32,000 [142]	16,000 [71]	12" [305]	2480 [119]	20,000 [89]	
				18" [457]	1770 [85]		
				24" [610]	1430 [68]		
				30" [762]	1210 [58]		
				36" [914]	1070 [51]		
				24" [600] Loose/Dumped	24,000 [107]		12,000 [53]
			18" [457]	1625 [78]			
			24" [610]	1325 [63]			
			30" [762]	1135 [54]			
			36" [914]	1010 [48]			
		18" [450]	24,000 [107]	12,000 [53]	12" [305]	2010 [96]	5,000 [22] (static loads only) <sup>5</sup>
				18" [457]	1480 [71]		
			24" [610]	1220 [58]			
			30" [762]	1060 [51]			
<b>B) Embedment Stone</b>	12" [300]	NOT ALLOWED	NOT ALLOWED	12" [305]	1100 [53]	NOT ALLOWED	
				18" [457]	715 [34]		
				24" [610]	660 [32]		
				30" [762]	580 [28]		
<b>A) Foundation Stone</b>	6" [150]	NOT ALLOWED	NOT ALLOWED	NOT ALLOWED	NOT ALLOWED	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		
<b>D) Final Fill Material</b>	A variety of placement methods may be used. All construction loads must not exceed the maximum limits in Table 2.	36" (900 mm) minimum dump cover required for dump trucks to dump over chambers.	Dozers to push parallel to rows. <sup>4</sup>	Roller travel parallel to rows only until 36" (900 mm) compacted cover is reached.
<b>C) Initial Fill Material</b>	Excavator positioned off bed recommended. Small excavator allowed over chambers. Small dozer allowed.	Asphalt can be dumped into paver when compacted pavement subbase reaches 24" (600 mm) above top of chambers.	Small LGP track dozers & skid loaders allowed to grade cover stone with at least 12" (300 mm) 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 24" (600 mm) over chambers. Roller travel parallel to chamber rows only.
<b>B) Embedment Stone</b>	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. 12" (300 mm) cover stone is in place.	No rollers allowed.
<b>A) Foundation Stone</b>	No StormTech restrictions. Contractor responsible for any conditions or requirements by others relative to subgrade bearing capacity, dewatering or protection of subgrade.			



## 17.0 Standard Limited Warranty



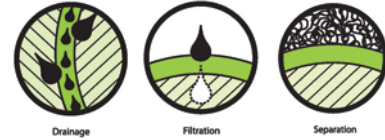
### STANDARD LIMITED WARRANTY OF STORMTECH LLC ("STORMTECH"): PRODUCTS

- (A) This Limited Warranty applies solely to the StormTech chambers and end plates manufactured by StormTech and sold to the original purchaser (the "Purchaser"). The chambers and end plates are collectively referred to as the "Products."
- (B) The structural integrity of the Products, when installed strictly in accordance with StormTech's written installation instructions at the time of installation, are warranted to the Purchaser against defective materials and workmanship for one (1) year from the date of purchase. Should a defect appear in the Limited Warranty period, the Purchaser shall provide StormTech with written notice of the alleged defect at StormTech's corporate headquarters within ten (10) days of the discovery of the defect. The notice shall describe the alleged defect in reasonable detail. StormTech agrees to supply replacements for those Products determined by StormTech to be defective and covered by this Limited Warranty. The supply of replacement products is the sole remedy of the Purchaser for breaches of this Limited Warranty. StormTech's liability specifically excludes the cost of removal and/or installation of the Products.
- (C) THIS LIMITED WARRANTY IS EXCLUSIVE. THERE ARE NO OTHER WARRANTIES WITH RESPECT TO THE PRODUCTS, INCLUDING NO IMPLIED WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE.
- (D) This Limited Warranty only applies to the Products when the Products are installed in a single layer. UNDER NO CIRCUMSTANCES, SHALL THE PRODUCTS BE INSTALLED IN A MULTI-LAYER CONFIGURATION.
- (E) No representative of StormTech has the authority to change this Limited Warranty in any manner or to extend this Limited Warranty. This Limited Warranty does not apply to any person other than to the Purchaser.
- (F) Under no circumstances shall StormTech be liable to the Purchaser or to any third party for product liability claims; claims arising from the design, shipment, or installation of the Products, or the cost of other goods or services related to the purchase and installation of the Products. For this Limited Warranty to apply, the Products must be installed in accordance with all site conditions required by state and local codes; all other applicable laws; and StormTech's written installation instructions.
- (G) THE LIMITED WARRANTY DOES NOT EXTEND TO INCIDENTAL, CONSEQUENTIAL, SPECIAL OR INDIRECT DAMAGES. STORMTECH SHALL NOT BE LIABLE FOR PENALTIES OR LIQUIDATED DAMAGES, INCLUDING LOSS OF PRODUCTION AND PROFITS; LABOR AND MATERIALS; OVERHEAD COSTS; OR OTHER LOSS OR EXPENSE INCURRED BY THE PURCHASER OR ANY THIRD PARTY. SPECIFICALLY EXCLUDED FROM LIMITED WARRANTY COVERAGE ARE DAMAGE TO THE PRODUCTS ARISING FROM ORDINARY WEAR AND TEAR; ALTERATION, ACCIDENT, MISUSE, ABUSE OR NEGLIGENCE; THE PRODUCTS BEING SUBJECTED TO VEHICLE TRAFFIC OR OTHER CONDITIONS WHICH ARE NOT PERMITTED BY STORMTECH'S WRITTEN SPECIFICATIONS OR INSTALLATION INSTRUCTIONS; FAILURE TO MAINTAIN THE MINIMUM GROUND COVERS SET FORTH IN THE INSTALLATION INSTRUCTIONS; THE PLACEMENT OF IMPROPER MATERIALS INTO THE PRODUCTS; FAILURE OF THE PRODUCTS DUE TO IMPROPER SITING OR IMPROPER SIZING; OR ANY OTHER EVENT NOT CAUSED BY STORMTECH. THIS LIMITED WARRANTY REPRESENTS STORMTECH'S SOLE LIABILITY TO THE PURCHASER FOR CLAIMS RELATED TO THE PRODUCTS, WHETHER THE CLAIM IS BASED UPON CONTRACT, TORT, OR OTHER LEGAL THEORY.



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## ADS GEOSYNTHETICS 0601T NONWOVEN GEOTEXTILE

### Scope

This specification describes ADS Geosynthetics 6.0 oz (0601T) nonwoven geotextile.

### Filter Fabric Requirements

ADS Geosynthetics 6.0 oz (0601T) is a needle-punched nonwoven geotextile made of 100% polypropylene staple fibers, which are formed into a random network for dimensional stability. ADS Geosynthetics 6.0 oz (0601T) resists ultraviolet deterioration, rotting, biological degradation, naturally encountered basics and acids. Polypropylene is stable within a pH range of 2 to 13. ADS Geosynthetics 6.0 oz (0601T) conforms to the physical property values listed below:

### Filter Fabric Properties

PROPERTY	TEST METHOD	UNIT	M.A.R.V. (Minimum Average Roll Value)
Grab Tensile	ASTM D 4632	lbs (kN)	160 (0.711)
Grab Elongation	ASTM D 4632	%	50
Trapezoid Tear Strength	ASTM D 4533	lbs (kN)	60 (0.267)
CBR Puncture Resistance	ASTM D 6241	lbs (kN)	410 (1.82)
Permittivity*	ASTM D 4491	sec <sup>-1</sup>	1.5
Water Flow*	ASTM D 4491	gpm/ft <sup>2</sup> (l/min/m <sup>2</sup> )	110 (4480)
AOS*	ASTM D 4751	US Sieve (mm)	70 (0.212)
UV Resistance	ASTM D 4355	%/hrs	70/500

PACKAGING	
Roll Dimensions (W x L) – ft	3.0/5.0/6.25/7.5/9.0/12.5 x 360 / 15 x 300
Square Yards Per Roll	120/200/250/300/360/500 / 500
Estimated Roll Weight – lbs	44/65/97.5/102/141/195 / 195

\* At the time of manufacturing. Handling may change these properties.



## ADS GEOSYNTHETICS 315W WOVEN GEOTEXTILE

### Scope

This specification describes ADS Geosynthetics 315W woven geotextile.

### Filter Fabric Requirements

ADS Geosynthetics 315W is manufactured using high tenacity polypropylene yarns that are woven to form a dimensionally stable network, which allows the yarns to maintain their relative position. ADS Geosynthetics 315W resists ultraviolet deterioration, rotting and biological degradation and is inert to commonly encountered soil chemicals. ADS Geosynthetics 315W conforms to the physical property values listed below:

### Filter Fabric Properties

PROPERTY	TEST METHOD	ENGLISH M.A.R.V. (Minimum Average Roll Value)	METRIC M.A.R.V. (Minimum Average Roll Value)
Tensile Strength (Grab)	ASTM D-4632	315 lbs	1400 N
Elongation	ASTM D-4632	15%	15%
CBR Puncture	ASTM D-6241	900 lbs	4005 N
Puncture	ASTM D-4833	150 lbs	667 N
Mullen Burst	ASTM D-3786	600 psi	4134 kPa
Trapezoidal Tear	ASTM D-4533	120 lbs	533 N
UV Resistance (at 500 hrs)	ASTM D-4355	70%	70%
Apparent Opening Size (AOS)*	ASTM D-4751	40 US Std. Sieve	0.425 mm
Permittivity	ASTM D-4491	.05 sec <sup>-1</sup>	.05 sec <sup>-1</sup>
Water Flow Rate	ASTM D-4491	4 gpm/ft <sup>2</sup>	163 l/min/m <sup>2</sup>
Roll Sizes		12.5' x 360' 15.0' x 300' 17.5' x 258'	3.81 m x 109.8 m 4.57 m x 91.5 m 5.33 m x 78.6 m

\*Maximum average roll value.