



JANET T. MILLS
GOVERNOR

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION



MELANIE LOYZIM
COMMISSIONER

February 24, 2023

Paul Iorio
StormTree
24 Corliss Street, Suite 9092
Providence, RI 02940

Dear Mr. Iorio:

This letter is to inform you that StormTree® System (STS) has been reviewed and accepted as an approved treatment alternative under the General Standards (Section 4.C.(2)) of the Stormwater Management Rules, Chapter 500). StormTree has provided the Department with (1) extensive information demonstrating how STS may be sized to provide full treatment of 90% of an average annual runoff volume without bypass (“Flow Through” treatment) and (2) testing data showing that the system provides pollutant removal equivalent to the Chapter 500 General Standards Best Management Practices “Volume” based treatment. This approval does not address the additional requirements for control of peak flow events outlined in the Flooding Standard Section 4.F of Chapter 500.

Therefore, the Department will review and approve, on a case-by-case basis, STS use to meet the pollutant removal requirements when the system is sized, installed, and maintained in accordance with the provisions that follow:

1. The structure may be a standard concrete box or concrete box set within soft-shell system that is filled with the StormTree engineered filter media, provided it is sized to meet the requirements of the General Standards (Section 4.C) and is installed, operated, and maintained in accordance with the manufacturer’s specifications.
2. The STS must be sized in accordance with the manufacturer’s Maine sizing guidelines outlined in the following table to treat 90% of the annual runoff volume without bypass (“Flow Through” treatment):

StormTree Model Number	Closed Sided		3 Open Sides		4 Open Sides		Outlet Pipe Size
	120"/hr Treatment Flow (CFS)	Impervious Drainage Area (Acres)	120"/hr Treatment Flow (CFS)	Impervious Drainage Area (Acres)	120"/hr Treatment Flow (CFS)	Impervious Drainage Area (Acres)	
ST-4X4	0.044	0.084	0.057	0.109	0.061	0.117	4"
ST-4X6	0.067	0.128	0.082	0.158	0.090	0.175	4"
ST-6X6	0.100	0.194	0.121	0.235	0.128	0.249	4"
ST-6X8	0.133	0.260	0.157	0.307	0.167	0.326	4"
ST-6X10	0.167	0.326	0.193	0.379	0.206	0.404	6"
ST-6X12	0.200	0.393	0.229	0.450	0.244	0.481	6"
ST-7X13	0.253	0.497	0.286	0.564	0.303	0.597	6"

*Applies to Base Series and Catch Basin Series only.

3. Alternatively, the runoff from the entire contributing drainage area, including all pervious areas, may be modelled to provide treatment of the 0.95" storm at the approved hydraulic loading rate of 120" per hour.
4. If water quality/channel protection volume (WQv) is required, the treated flow as well as the bypassed flow must be combined and directed to a detention system/structure that will store WQv consisting of the first 1.0 inch of runoff from impervious areas and 0.4 inch of runoff from lawns and landscaped areas, respectively. An external outlet control structure must control the flow out of the detention measure to release WQv between 24 hours and 48 hours.

If Flooding Standard Section 4.F of Chapter 500 applies, additional downstream detention may be required to meet the flow attenuation requirements of the standard.

5. The STS standard design does not include a solid bottom. Other versions include open sides. This would classify these devices as using infiltration after treatment unless specifically designed to collect and discharge flow with an impermeable liner. If used for infiltration, all aspects of Chapter 500 Appendix D must be met.
6. When designed with the grated inlet design, the STS incorporates an internal bypass and will not require an overflow inlet (see StormTree Catch Basin Series w/ Internal Bypass). The applicant must demonstrate that the proposed design meets all the manufacturer's specifications prior to submission for Department approval. Review and approval of the proposed design by the manufacturer will be sufficient to demonstrate conformance with the manufacturer's specifications and on-site installation must be monitored by the manufacturer's representative.

7. Prior to construction, a five-year binding inspection and maintenance contract must be provided for review and approval by the Department and must be renewed before contract expiration. The contract will be with a professional with knowledge of erosion and stormwater control, including a detailed working knowledge of the proposed system. The first year's maintenance must be provided by the manufacturer to ensure that the system is operating according to the established specifications.
8. The overall stormwater management design must meet all Department criteria and sizing specifications and shall be reviewed and approved by the Department prior to use.
9. Each project must be reviewed and approved by the manufacturer for proposed use, layout, and sizing of the system and for conformance with their design specifications. The system must be installed under the manufacturer's representative supervision.
10. This approval is conditional to on-the-ground experience confirming that the STS's pollutant removal efficiency and sizing are appropriate. The "permit shield" provision (Section 14) of the Chapter 500 rules will apply, and the Department will not require the replacement of the system if, with proper maintenance, pollutant removals do not satisfy the General Standard Best Management Practices.

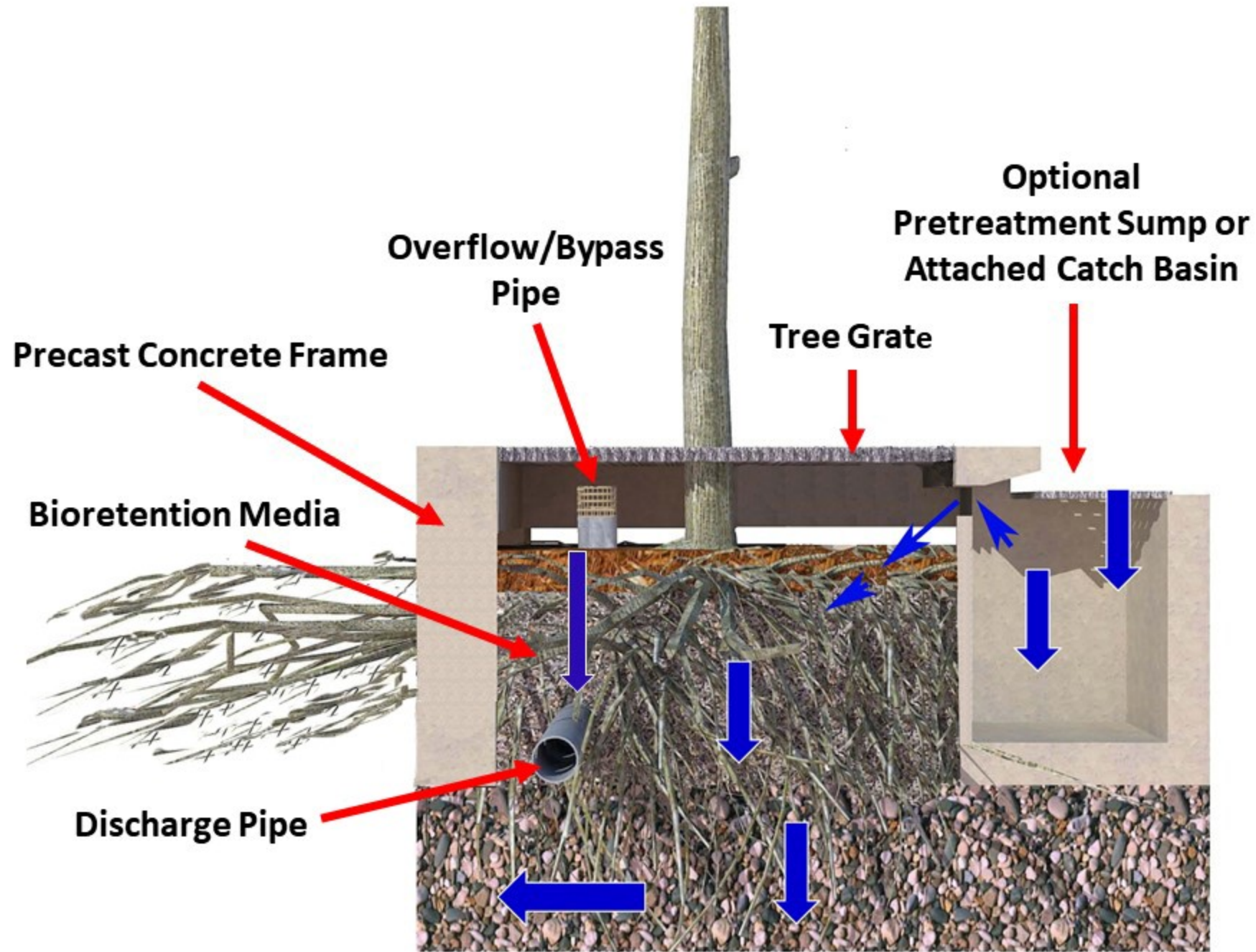
We look forward to working with you as these stormwater management structures are installed on new projects. Questions concerning this decision should be directed to myself or Jeff Dennis at (207) 215-6376.

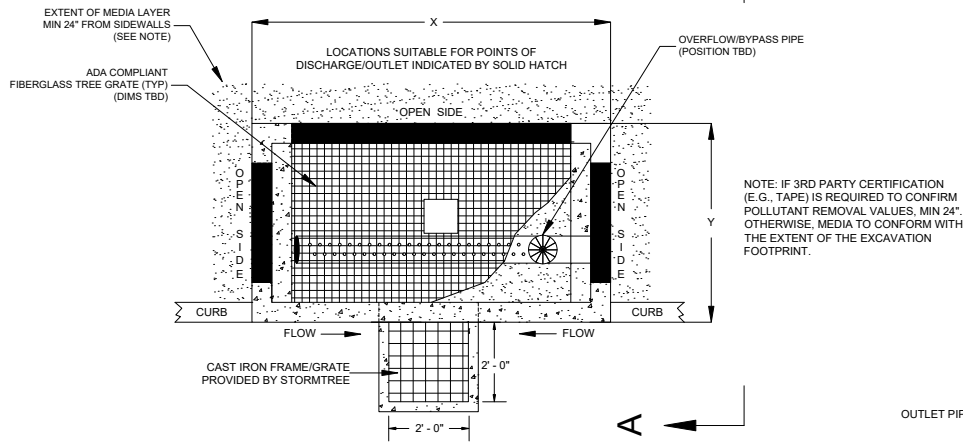
Sincerely,



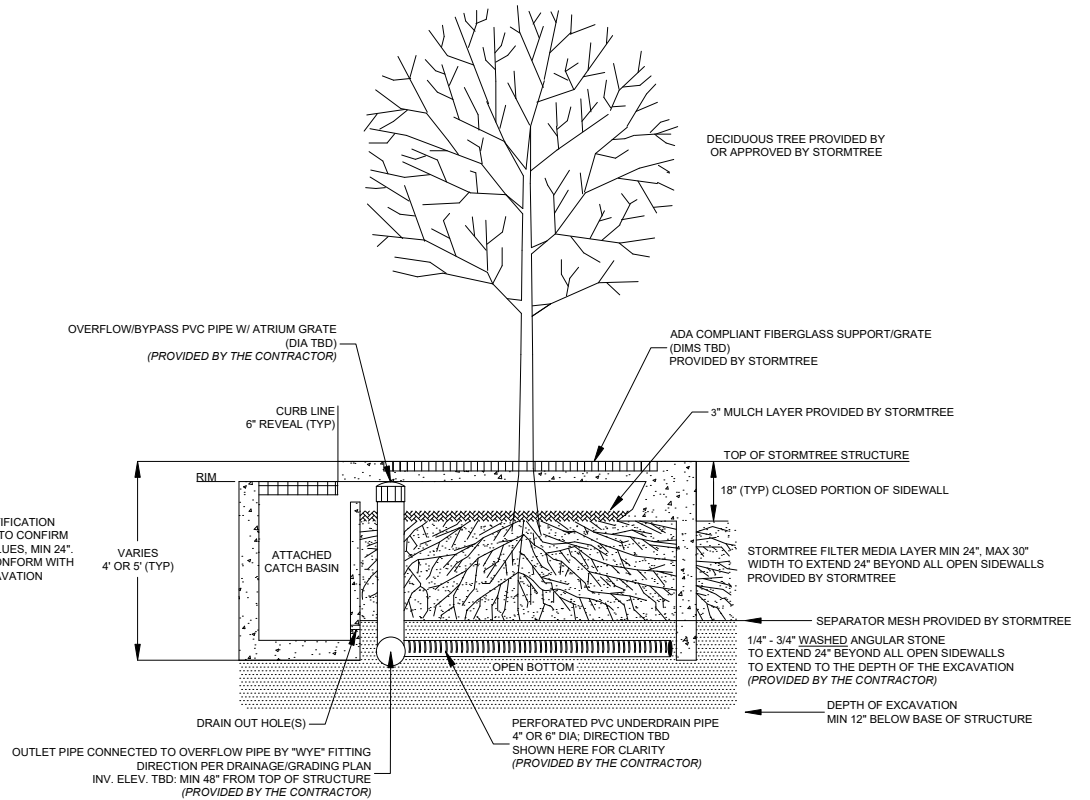
Kerem Gungor, P.E.
Stormwater Engineering Team Leader
Bureau of Land Resources
(207) 830-1002

cc: Wendy Garland, Maine DEP
Dawn Hallowell, Maine DEP





PLAN VIEW
NOT TO SCALE



SECTION A-A
NOT TO SCALE

STORMTREE[®]
CATCH BASIN SERIES
W/ INTERNAL BYPASS

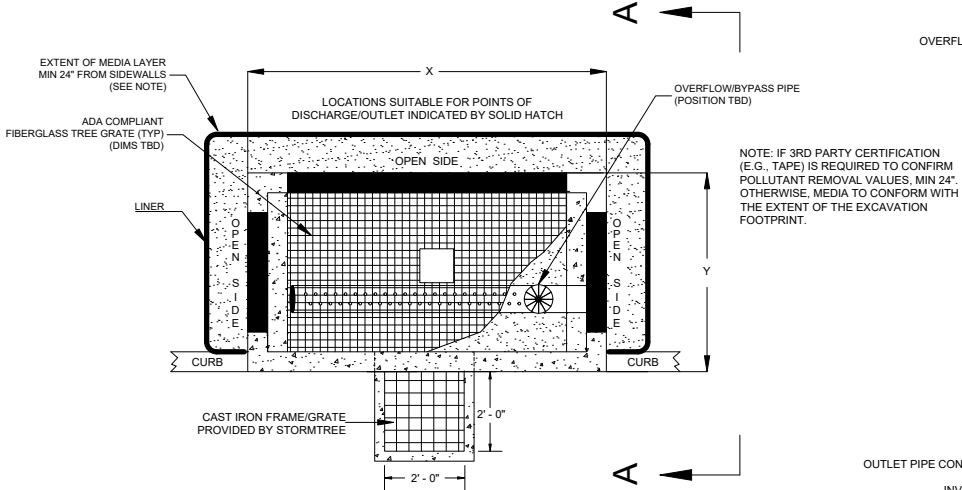
STORMTREE[®]



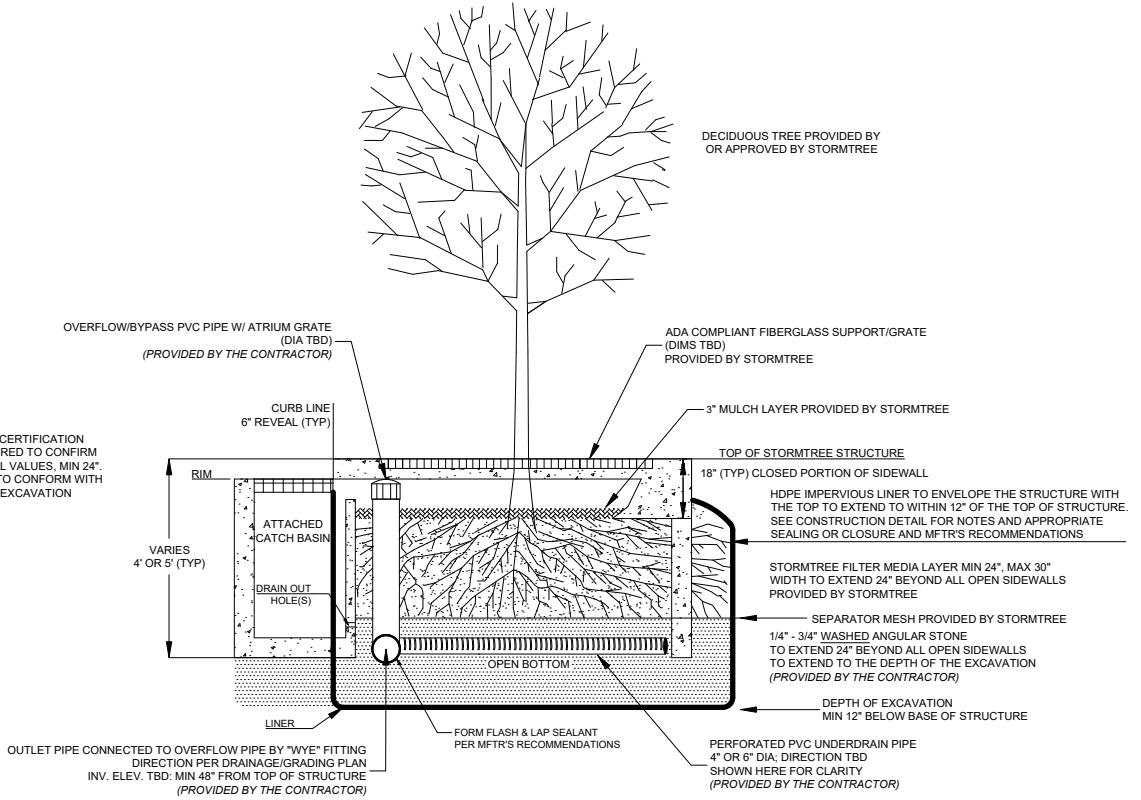
Thinking Outside the Concrete Box.™

24 Corliss Street, Suite 9092, Providence, RI 02940 (401) 626-8999 www.storm-tree.com


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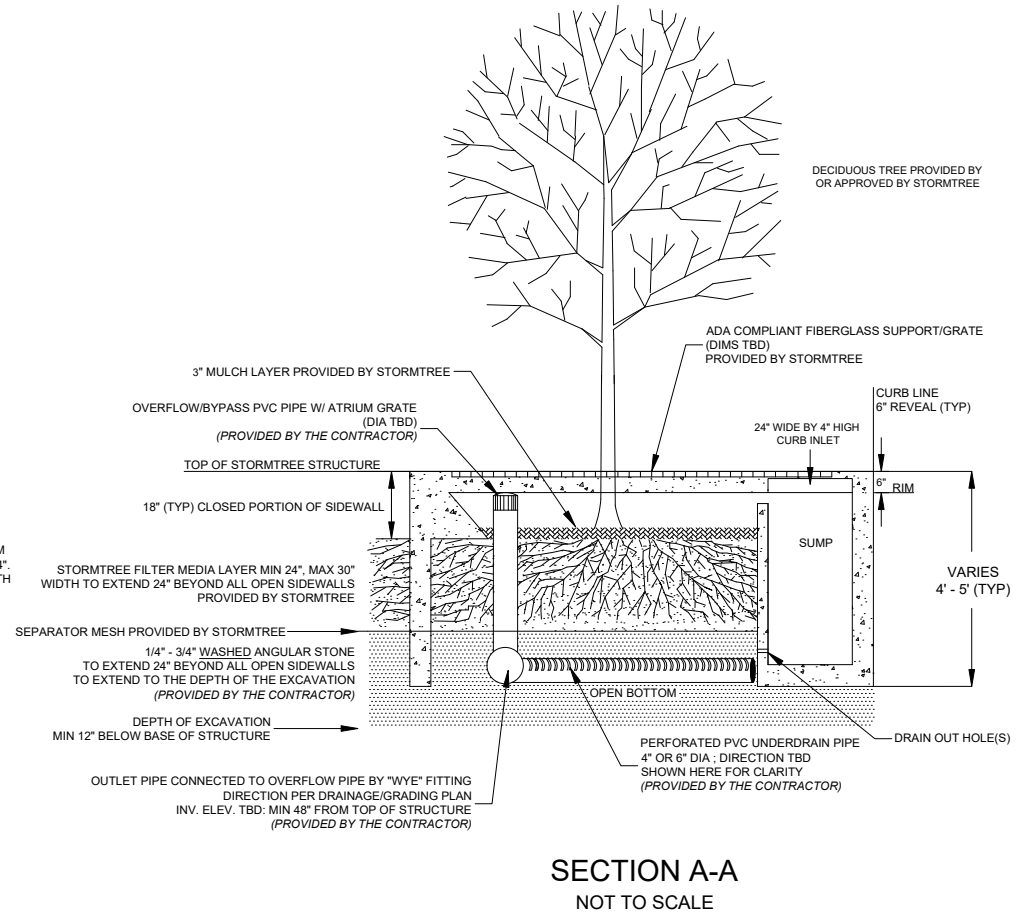
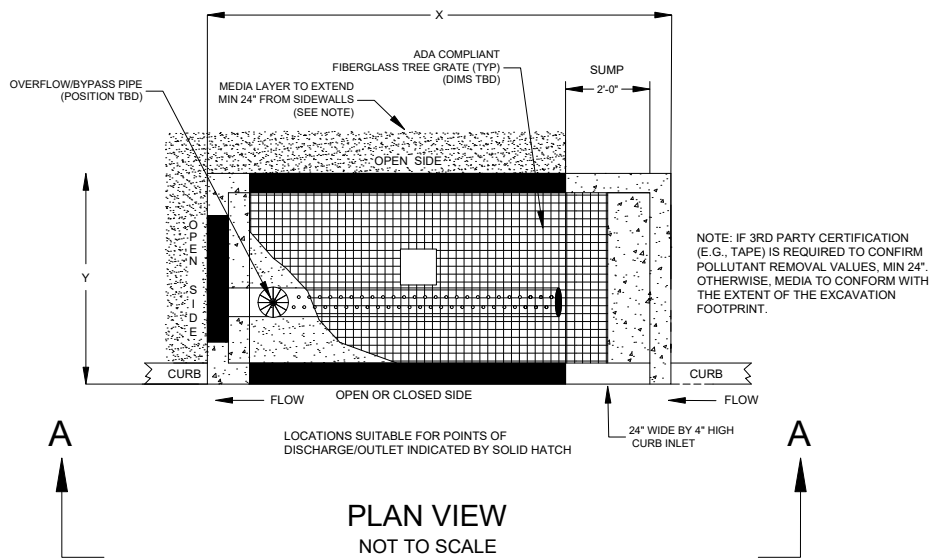


PLAN VIEW
NOT TO SCALE



SECTION A-A
NOT TO SCALE

<p><i>STORMTREE</i>[®]</p> <p>CATCH BASIN (LINER) SERIES</p> <p>W/ INTERNAL BYPASS</p>	<p>STORMTREE[®]</p>  <p>Thinking Outside the Concrete Box.™</p>
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STORMTREE[®]
INTERNAL SUMP SERIES
(LEFT/RIGHT/SHORT SIDE)
W/ INTERNAL BYPASS

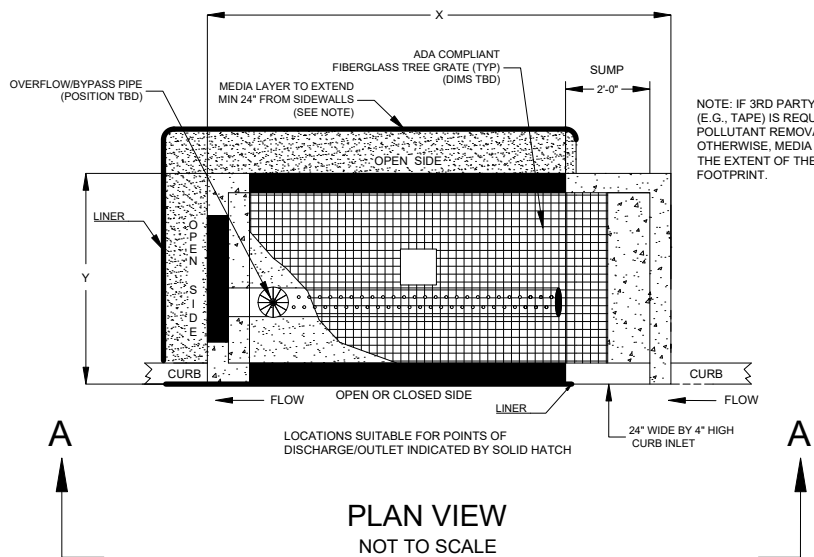
STORMTREE[®]



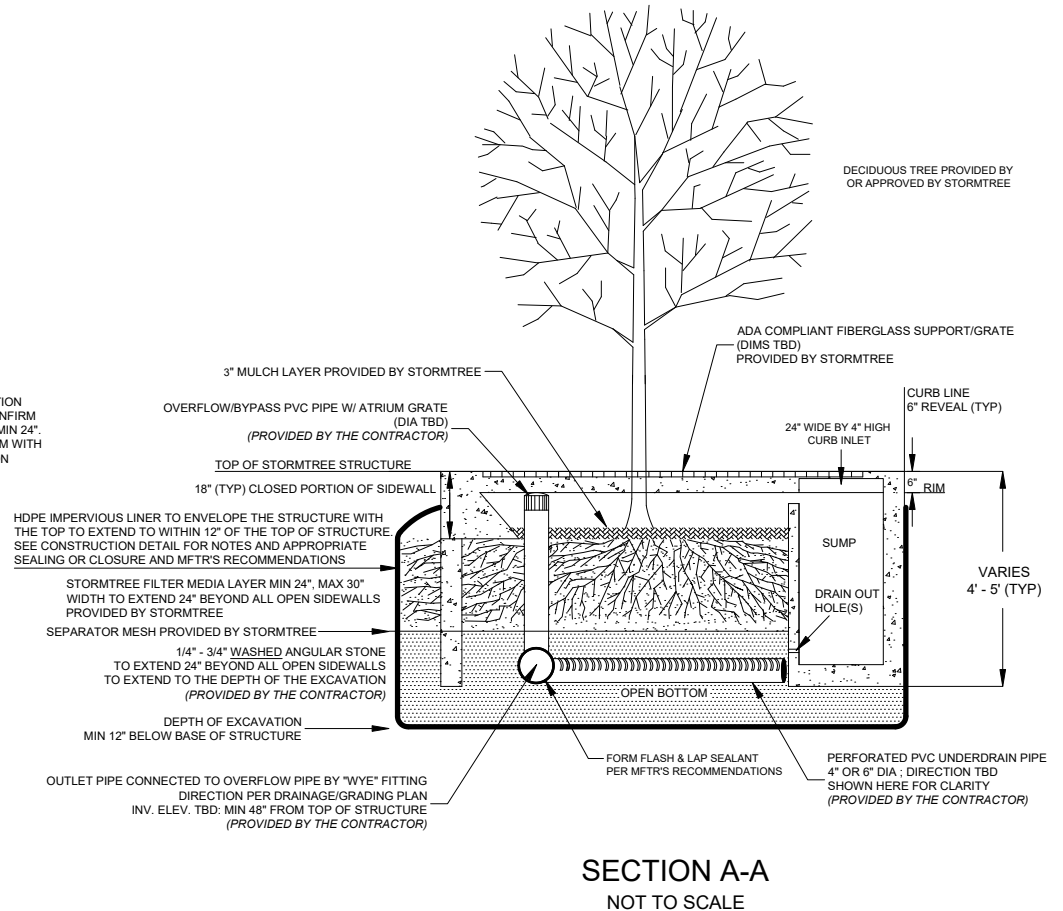
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NOTE: IF 3RD PARTY CERTIFICATION (E.G., TAPE) IS REQUIRED TO CONFIRM POLLUTANT REMOVAL VALUES, MIN 24". OTHERWISE, MEDIA TO CONFORM WITH THE EXTENT OF THE EXCAVATION FOOTPRINT.



STORMTREE[®]
INTERNAL SUMP (LINER) SERIES
(LEFT/RIGHT/SHORT SIDE)
W/ INTERNAL BYPASS

STORMTREE[®]



Thinking Outside the Concrete Box.

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Operation and Maintenance Plan StormTree Tree Filter System (Catch Basin Models)

The following Operation and Maintenance (O&M) Plan was prepared by StormTree to assist the designated owner/operator in providing for the successful long term operation of the tree filter system. It is understood that the O&M Plan will become effective immediately following construction and system installation. Maintenance will be performed as described and required by the owner/operator, assignee, or other third party entity.

Post Installation:

Following the installation of the tree filter (system), including backfilling the area surrounding the system to final grade, the system is considered to be “active” since water, sand, sediment, trash, etc. could potentially enter the system. Should the site not be secured, in that construction activities including grading, paving, or final landscaping have not been completed, the system could be impacted by large quantities of construction debris entering the system. This impact could compromise the system’s ability to function properly causing a reduction in infiltration efficiency and overall performance. It is **highly recommended** that the surface grating be covered with wood sheeting, non-woven filter fabric or other materials to restrict the movement of water (and debris) from entering the system until the site is fully secured.

Watering:

The engineered media of a tree filter system is very porous and designed to provide high water conductivity (infiltration) but also sufficient organic material to maintain essential water holding capacity to allow for successful plant growth. Due to the inherent high infiltration capacity of the media, particular attention is required to the installation of plant material and irrigation needs.

The ideal season to install plant material (e.g., trees, shrubs) is Fall (September 1 thru November 1); Spring (April 1 thru June 1) is also a preferred season to install plant material. The acclimation of plant material is most successful during these two seasonal periods. Following plant installation, and at least one month thereafter, it is recommended that twice weekly (deep) watering take place, particularly during periods of drought or minimal rain events. Slow release watering bags are also very beneficial.

If possible, avoid installing plant material during the heat of summer, between approximately June 1 and August 31, due to the potential for placing tremendous stress on plant material following transplanting. Daily watering over a period of several weeks may be required to prevent mortality and allow for the establishment of a healthy root system.

General Maintenance:

Maintenance should optimally be performed on a twice yearly basis: in fall after leaves have fallen; in spring, following all winter sanding operations. If winter sanding operations are not customarily performed as to impact the system, or minimal accumulation occurs, once yearly maintenance may only be necessary.

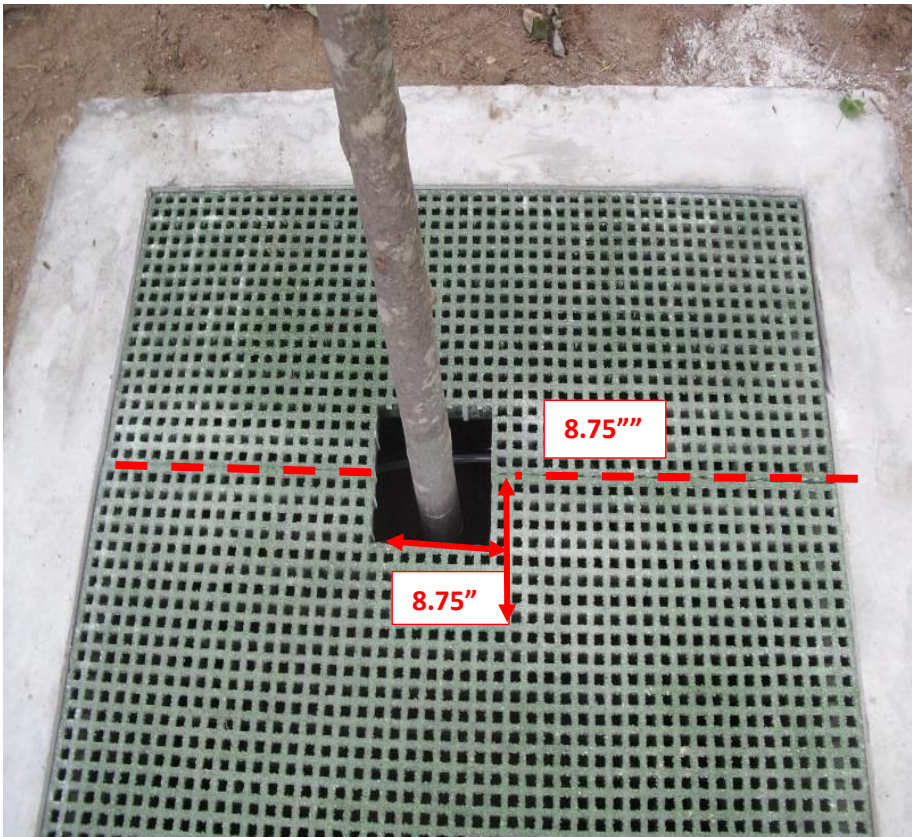
1. Remove any debris or trash from the concrete surface and/or grating.
2. Remove surface grating surrounding the tree and media bed; remove any visible debris and trash. Should any accumulated sands or sediment be observed on the media surface (including mulch layer), remove to ensure a loose and unobstructed media layer. If the system utilizes a fiberglass grate, refer to No. 5 for additional instructions.
3. Remove cast iron grate from catch basin. Evacuate accumulated debris, sands and sediment via vacuor or other equipment. If hand tools are to be utilized, shovel out as necessary. Replace grate and ensure stable positioning.
4. If overflow/bypass port and piping exist, remove any debris or obstruction surrounding the atrium grate or exposed inlet.
5. Fiberglass grate: Inspect the grate opening surrounding the tree trunk to determine if the exterior trunk is in contact with, or in close proximity to the grate. If so, with the use of a powered reciprocating saw, or other cutting device, increase the opening by removing portions of the grating material as necessary. Refer to the attached grate cutting specification for proper cutting technique.
6. Replace all grating and securely fasten any hardware. Sand and debris may have accumulated in the gap between the sides of the grate and the concrete ledge. Remove as necessary to allow for proper setting of the grate. **IMPORTANT: If the system utilizes a fiberglass grate, carefully return the grate to the notched ledge, paying careful attention to not allowing the grate to make contact with the trunk of the tree. Severe damage and death of the tree may result if the grate scrapes the tree's bark. DO NOT attempt to drop the grate into place from a standing position.**
7. Complete any required maintenance logs or paperwork.
8. Properly dispose of sands, sediment, debris, and trash.

After several years of operation, depending upon the extent and frequency of winter sanding operations and system maintenance, the system may experience excessive sand loading. This condition may require more thorough cleaning, and possibly renovation to include the removal of the top 4 to 6 inches of surface material (media/mulch), and subsequent replenishing. Although not a proprietary product, the engineered media is a specially blended mixture of several components formulated to maintain a specific infiltration capacity. The mixture materials are readily available from a sand & gravel facility and landscape nursery. The mulch is typically a coarsely shredded or chipped, (preferably) hardwood (e.g. larch, cedar) which can be sourced at many box stores, landscape nursery, or agricultural suppliers.

Please consult StormTree directly regarding media addition/replacement.

For additional information please contact StormTree (www.storm-tree.com) 401-626-8999.

ADA Compliant Fiberglass Grate Cutting Instructions



Top (Front) Side



Bottom (Reverse) Side

Assuming that the tree has been planted in final location. A circular or cut-off saw with commercial blade works well to cross cut (lateral with short side) the grate in two sections. Have the cross cut bisect the two sections in line with the opening (see red line in pic). If you look at the backside of the grate you will notice that it is made up of 1.25" (ID) square closed cells. When you cross cut the grate, try to cut one end along the closed cell so only one side will have open cuts.

When cutting the opening for the tree trunk, a sawzall/reciprocating saw works well. Once again, try making cuts to leave closed cells. If cut correctly, the sides that form the opening should be approximately 8.75" in length. It is important to try making cuts to form closed cells. Ragged cuts could damage the tree trunk. **It is also important that the trunk of the tree is centered within the cut opening to allow for expanded trunk growth to prevent premature chaffing.**





Operation and Maintenance Plan *for* StormTree® Tree Filter System (Internal Sump Models)

The following Operation and Maintenance (O&M) Plan was prepared by StormTree® to assist the designated owner/operator in providing for the successful long-term operation of the tree filter system. It is understood that the O&M Plan will become effective immediately following construction and system installation. Maintenance will be performed as described and required by the owner/operator, assignee, or other third party entity.

Post Installation:

Following the installation of the tree filter (system), including backfilling the area surrounding the system to final grade, the system is considered to be “active” since water, sand, sediment, trash, etc. could potentially enter the system. Should the site not be secured, in that construction activities including grading, paving, or final landscaping have not been completed, the system could be impacted by large quantities of construction debris entering the system. This impact could compromise the system’s ability to function properly causing a reduction in infiltration efficiency and overall performance. It is **highly recommended** that the throat entry and grating surface be covered with wood sheeting, non-woven filter fabric or other materials to restrict the movement of water (and debris) from entering the system until the site is fully secured.

Watering:

The engineered media of a tree filter system is very porous and designed to provide high water conductivity (infiltration) but also sufficient organic material to maintain essential water holding capacity to allow for successful plant growth. Due to the inherent high infiltration capacity of the media, particular attention is required to the installation of plant material and irrigation needs.

The ideal season to install plant material (e.g., trees, shrubs) is Fall (September 1 thru November 1); Spring (April 1 thru June 1) is also a preferred season to install plant material. The acclimation of plant material is most successful during these two seasonal periods. Following plant installation, and at least one month thereafter, it is recommended that twice weekly (deep) watering take place, particularly during periods of drought or minimal rain events. Slow release watering bags are also very beneficial.

If possible, avoid installing plant material during the heat of summer, between approximately June 1 and August 31, due to the potential for placing tremendous stress on plant material following transplanting. Daily watering over a period of several weeks may be required to prevent mortality and allow for the establishment of a healthy root system.

General Maintenance:

Maintenance should optimally be performed on a twice yearly basis: in fall after leaves have fallen; in spring, following all winter sanding operations. If winter sanding operations are not customarily performed as to impact the system, or minimal accumulation occurs, once yearly maintenance may only be necessary.

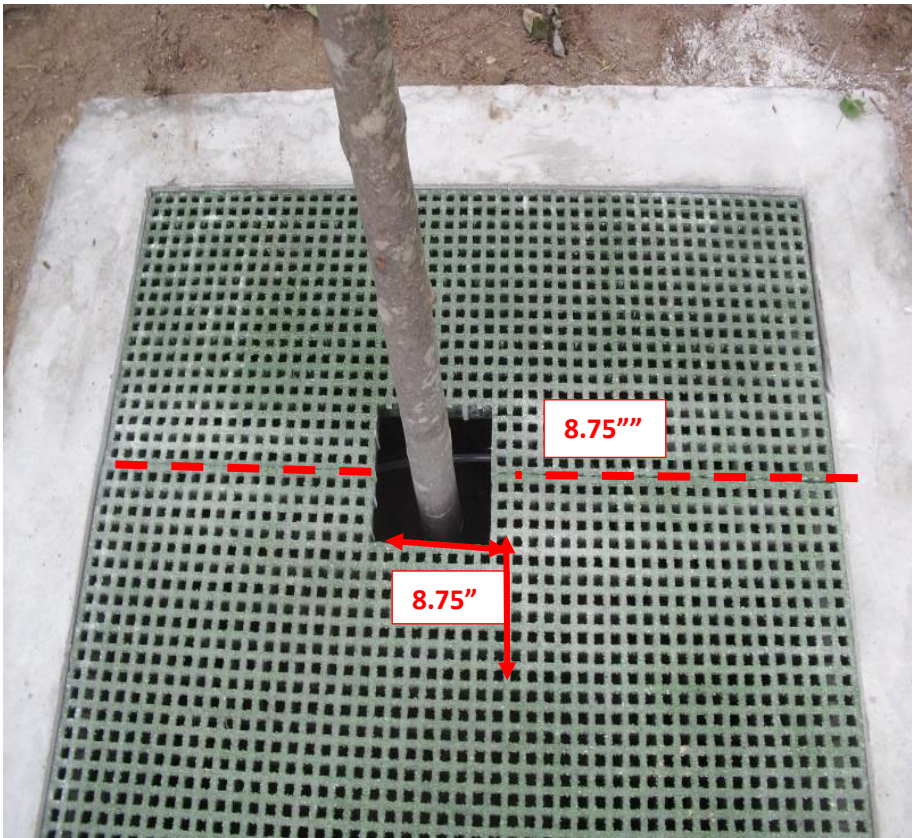
1. Remove any debris or trash from the concrete surface and/or grating.
2. Remove surface grating surrounding the tree and media bed; remove any visible debris and trash. Should any accumulated sands or sediment be observed on the media surface (including mulch layer), remove to ensure a loose and unobstructed media layer. If the system utilizes a fiberglass grate, refer to No. 5 for additional instructions.
3. Evacuate accumulated debris, sands and sediment within sump via vacuor equipment. If hand tools are to be utilized, shovel out as necessary.
4. If overflow/bypass port and piping exist, remove any debris or obstruction surrounding the atrium grate or exposed inlet.
5. Fiberglass grate: Inspect the grate opening surrounding the tree trunk to determine if the exterior trunk is in contact with, or in close proximity to the grate. If so, with the use of a powered reciprocating saw, or other cutting device, increase the opening by removing portions of the grating material as necessary. Refer to the attached grate cutting specification for proper cutting technique.
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7. Complete any required maintenance logs or paperwork.
8. Properly dispose of sands, sediment, debris, and trash.

After several years of operation, depending upon the extent and frequency of winter sanding operations and system maintenance, the system may experience excessive sand loading. This condition may require more thorough cleaning, and possibly renovation to include the removal of the top 4 to 6 inches of surface material (media/mulch), and subsequent replenishing. Although not a proprietary product, the engineered media is a specially blended mixture of several components formulated to maintain a specific infiltration capacity. The mulch is typically a coarsely shredded or chipped, (preferably) hardwood which can be sourced at many box stores or agricultural suppliers.

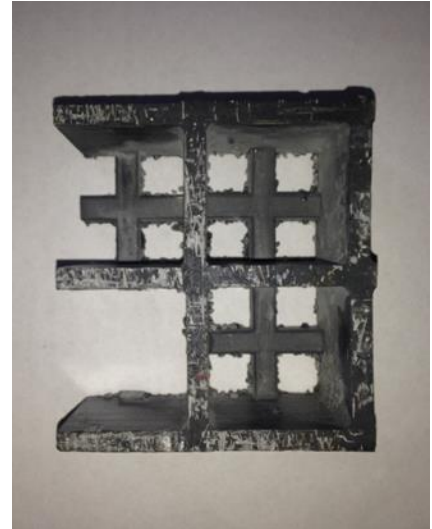
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