



CONTECH[®]
ENGINEERED SOLUTIONS



filterra[®]
Bioretention Systems

INSTALLATION MANUAL

V02

Support: 800-338-1122 | Fax: 513-645-7993

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FILTERRA® OVERVIEW

STORMWATER BIORETENTION FILTRATION SYSTEM



- Save valuable space with small footprint for urban sites.
- Improve BMP aesthetics with attractive trees or shrubs.
- Reduce lifetime cost with safer and less expensive maintenance.

Remove Pollutants and Comply with NPDES

The Filterra® Bioretention System is well-suited for the urban environment with high removal efficiencies for many pollutants such as petroleum, heavy metals, phosphorus, nitrogen, and TSS. Filterra is similar in concept to bioretention in its function and applications, with the major distinction that Filterra has been optimized for high volume/flow treatment and high pollutant removal. Filterra takes up little space (often 0.2% Filter Surface Area/Drainage Area) and may be used on highly developed sites such as landscaped areas, green spaces, parking lots and streetscapes; it is exceedingly adaptable and is the urban solution for Low Impact Development.

Stormwater runoff flows through a specially designed filter media mixture contained in a landscaped concrete container. The filter media captures and immobilizes pollutants; those pollutants are then decomposed, volatilized and incorporated into the biomass of the filterra system's micro-macro fauna and flora. Once the stormwater runoff flows through the media it continues into an underdrain system at the bottom of the container, where the treated water is discharged. Higher flows bypass the Filterra via a downstream inlet structure, curb cut or other appropriate relief.

Section A

Installation

Installation Guidelines

Installations Procedure

Filterra Standard Offline Curb Inlet Detail

Filterra with Terraflume Curb Inlet Detail

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Installation Guidelines for Filterra®

Delivery & Unloading/Lifting

1. Contech shall deliver the Filterra units to the site in coordination with the Contractor.
2. The Contractor will require spreader bars and chains/cables/straps, as well as lifting hooks to safely and securely lift box sections and top slabs. In some cases, lifting hooks may be available for rental or purchase. Contact your Contech Project Coordinator for more information.
3. The unit and top must be lifted separately.

Inspection

1. Inspection of the Filterra unit and all parts contained in or shipped outside of the unit shall be inspected at time of delivery by the site Engineer/Inspector and the Contractor. Any nonconformance to approved drawings or damage to any part of the system shall be documented on the Filterra shipping ticket. Damage to the unit during and after unloading shall be corrected at the expense of the Contractor. Any necessary repairs to the Filterra unit shall be made to the acceptance of the Engineer/Inspector.

Site Preparation

1. The contractor is responsible for providing adequate and complete site/inlet protection when the Filterra unit is installed prior to final site stabilization (full landscaping, grass cover, final paving, and street sweeping completed).
2. The contractor shall adhere to all jurisdictional and/or OSHA safety rules in providing temporary shoring of the excavation.
3. The Contractor or Owner is responsible for appropriately barricading the Filterra from traffic (in accordance with local codes).

Installation Guidelines for Filterra®

Installation

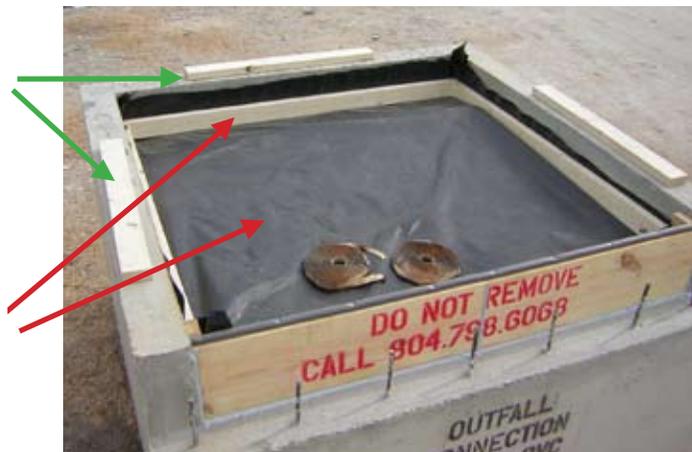
1. Installation Procedure for Sump Condition.
 - a. Filterra Standard Offline System: The Standard Offline system cannot be used as a standalone inlet. It will need effective bypass during higher intensity rainfall events. To test a proposed location, imagine the Filterra throat is completely blocked (so it would act like a typical curb and gutter). If this results in any ponding or pooling drainage, the placement is inappropriate.
 - b. Filterra Internal Bypass - Curb (FTIBC): FTIBC systems incorporating the Terraflume tray can be utilized as a stand-alone inlet and are typically installed in a sump condition.
2. Each unit shall be constructed at the locations and elevations according to the sizes shown on the approved drawings. Any modifications to the elevation or location shall be at the direction of and approved by the Engineer.
3. The unit shall be placed on the compacted sub-grade with a minimum 6-inch gravel base matching the final grade of the curb line in the area of the unit. The unit is to be placed such that the unit and top slab match the grade of the curb in the area of the unit. Compact undisturbed sub-grade materials to 95% of maximum density at +1% to 2% of the optimum moisture. Unsuitable material below sub-grade shall be replaced to site engineer's approval. Contact Contech for guidance where slope exceeds 5%.
4. Once the unit is set, the internal wooden forms and protective silt fabric cover must be left intact. The top lid should be sealed onto the box before backfilling, using a non-shrink grout, butyl rubber or similar waterproof seal. The boards on the top of the lid and boards sealed in the unit's throat must NOT be removed. The Supplier will remove these sections at the time of activation.
5. Outlet connections shall be aligned and sealed to meet the approved drawings with modifications necessary to meet site conditions and local regulations. The correct outlet will be marked on the Filterra box. Do NOT use plugged couplings marked "USE OTHER CONNECTION".
6. Backfilling should be performed in a careful manner, bringing the appropriate fill material up in 6" lifts on all sides. Precast sections shall be set in a manner that will result in a watertight joint. In all instances, installation of the Filterra unit shall conform to ASTM specification C891 "Standard Practice for Installation of Underground Precast Utility Structures" unless specified otherwise in contract documents.
7. It is the responsibility of the Contractor to provide curb and gutter and transition to the Filterra unit for proper stormwater flow into the system through the throat opening. A standard drawing of the throat and gutter detail is available on page 12. However, the plans and contract documents superseded all standard drawings. Flume variations are detailed in Section B of this manual. Effective bypass for the Filterra system is essential for correct operation (i.e. bypass to an overflow at lower elevation).

Installation Procedure

DO NOT remove protective boards or tree grates from the top slab.



Remove the shipping dunnage along the top of the box wall.



DO NOT remove wooden internal bracing or protective silt fabric.

DO NOT remove the protective throat board.



Curb and gutter details are provided on the protective throat board. On Filterra systems incorporating a Terraflume tray, the protective board is installed at the back of the Terraflume to allow runoff to bypass via the internal riser.



The contractor MUST provide all rigging and lifting apparatus, such as cables, chains, straps, and hooks. In some cases, lifting hooks may be available for rental or purchase. Contact your Contech Project Coordinator for more information.



The unit and top slab MUST be lifted separately. At this time you can remove the boards between the box and top.

It is the contractor's responsibility to provide suitable lifting equipment to off load the Filterra unit. Filterra units are designed to be off loaded using the contractor's spreader bar.



1. Unload or Remove Top from Unit

Unload the top slab and set it on the ground.



2. Unload and Set Box

Unload the Filterra box and set into the prepared hole with appropriate sub-grade.*

* Compacted sub-grade with a minimum of six inches of gravel base which must match the final grade of curb line the area of the unit.



3. Apply Butyl Tape Seal

Apply butyl tape seal along the top of the box section. Butyl tape seal is provided with every unit.

Filterra installed protective throat board and installed silt fabric must be left in place to protect the unit from construction sediment.



4. Set Top on Box

Set the top slab on the box.



5. Connect Outfall Pipe

The correct outlet will be marked on the Filterra box.

DO NOT use plugged couplings marked "USE OTHER CONNECTION".



6. Install Curb and Gutter

It is the responsibility of the Contractor to provide curb and gutter and transition to the Filterra unit for proper flow into the system through a 4" - 6" throat opening. Details for the throat opening on the Filterra Standard Offline system as well as Filterra systems incorporating the Terraflume are included on pages 12 and 13.



7. Provide Inlet Protection

It is the responsibility of the Contractor to provide inlet protection/sediment control and cleaning around each Filterra unit.

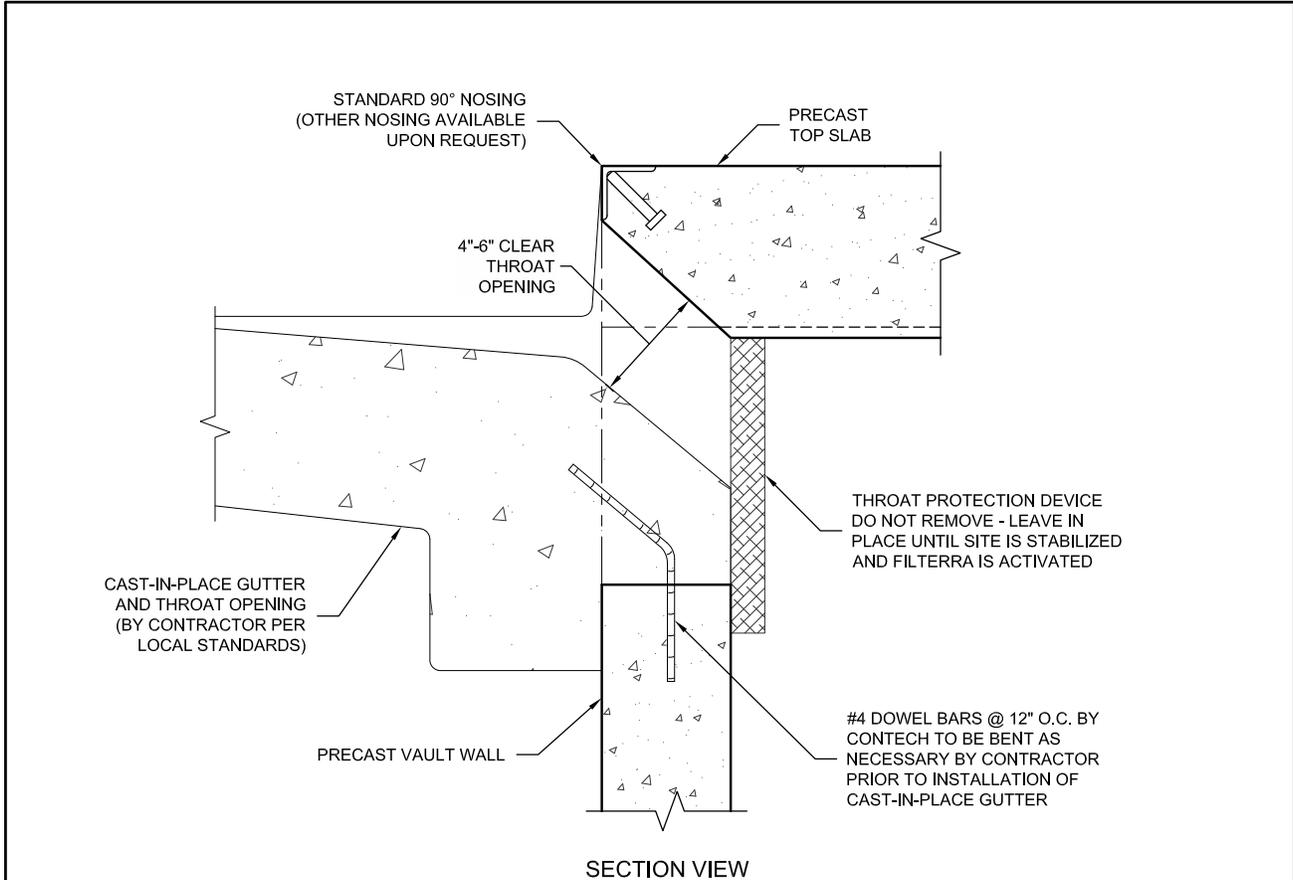


8. Activation

Activation is performed ONLY by Contech authorized personnel.

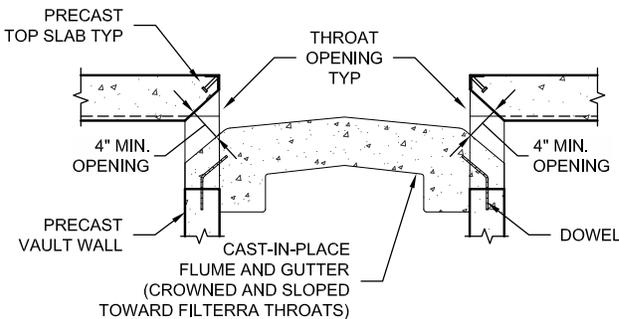
Activation can occur once the project site is fully stabilized (full landscaping, grass cover, final paving and street sweeping completed) and there is 4" - 6" throat opening.

Call 800-338-1122 to schedule your activation.

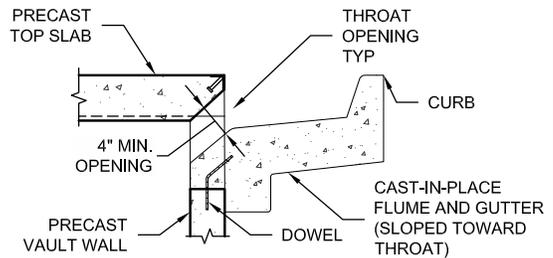


SECTION VIEW

STANDARD OFFLINE CURB INLET



CROWNED FLUME



REVERSE FLUME - SLOPED TOWARDS FILTERRA THROAT

SECTION VIEWS OF TYPICAL FLUME APPLICATIONS

SEE ABOVE FOR DETAILS NOT SHOWN



THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING U.S. PATENTS: 6,277,274; 6,569,321; 7,625,490; 7,425,267; 7,853,412. RELATED FOREIGN PATENTS.

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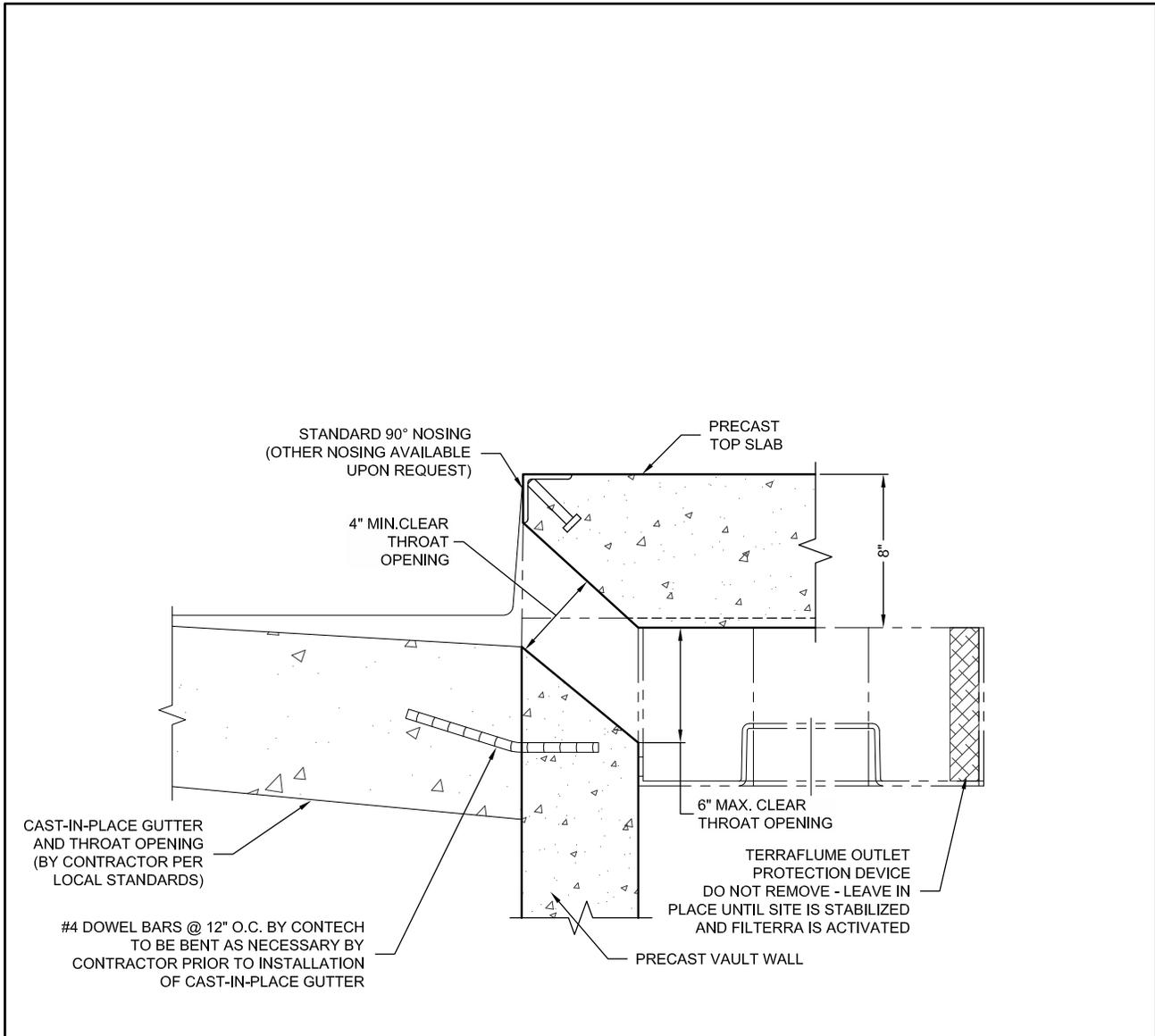
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FILTERRA STANDARD OFFLINE CURB INLET DETAILS

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SECTION VIEW

STANDARD CURB INLET WITH TERRAFLUME

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FILTERRA WITH TERRAFLUME
CURB INLET DETAIL

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Section B

Curb and Gutter

Standard Curb and Gutter with Inlet Bypass

Curb Cut or Grate Inlet Bypass

Single Sided Flume

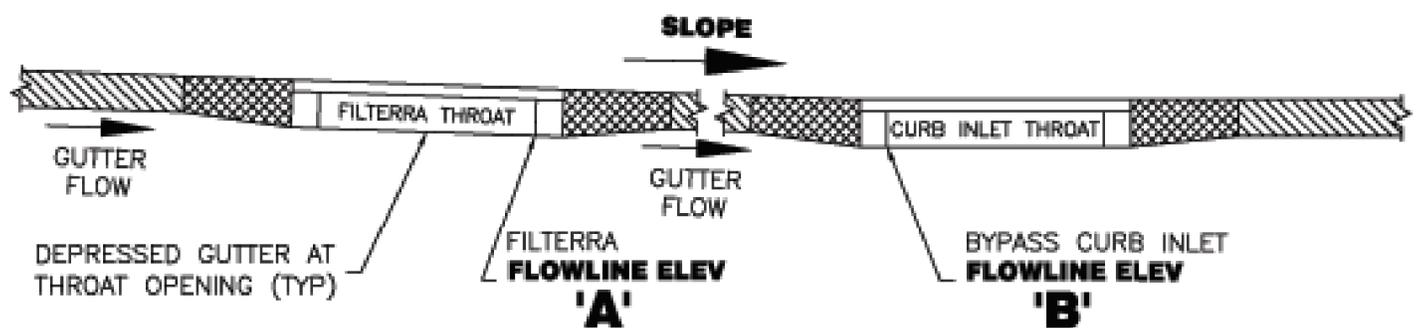
Double Sided Flume

Standard Curb and Gutter with Inlet Bypass



ELEV 'A' MUST BE HIGHER THAN ELEV 'B'

IMPORTANT
 FILTERRA FLOWLINE MUST BE AT A HIGHER ELEVATION THAN BYPASS FLOWLINE (DROP INLET OR OTHER)



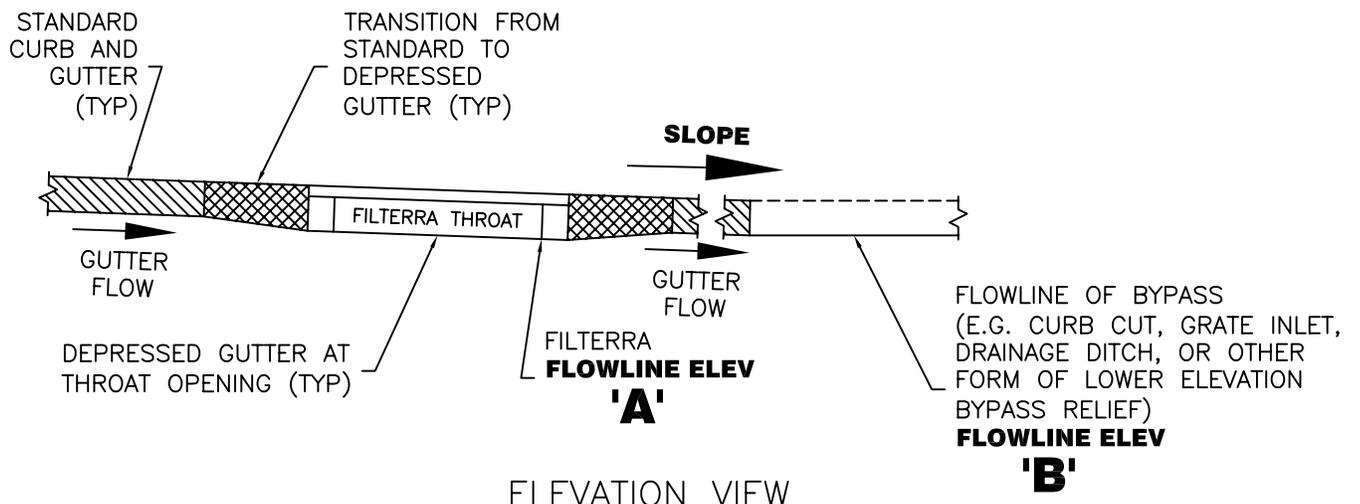
ELEVATION VIEW

Curb Cut or Grate Inlet Bypass

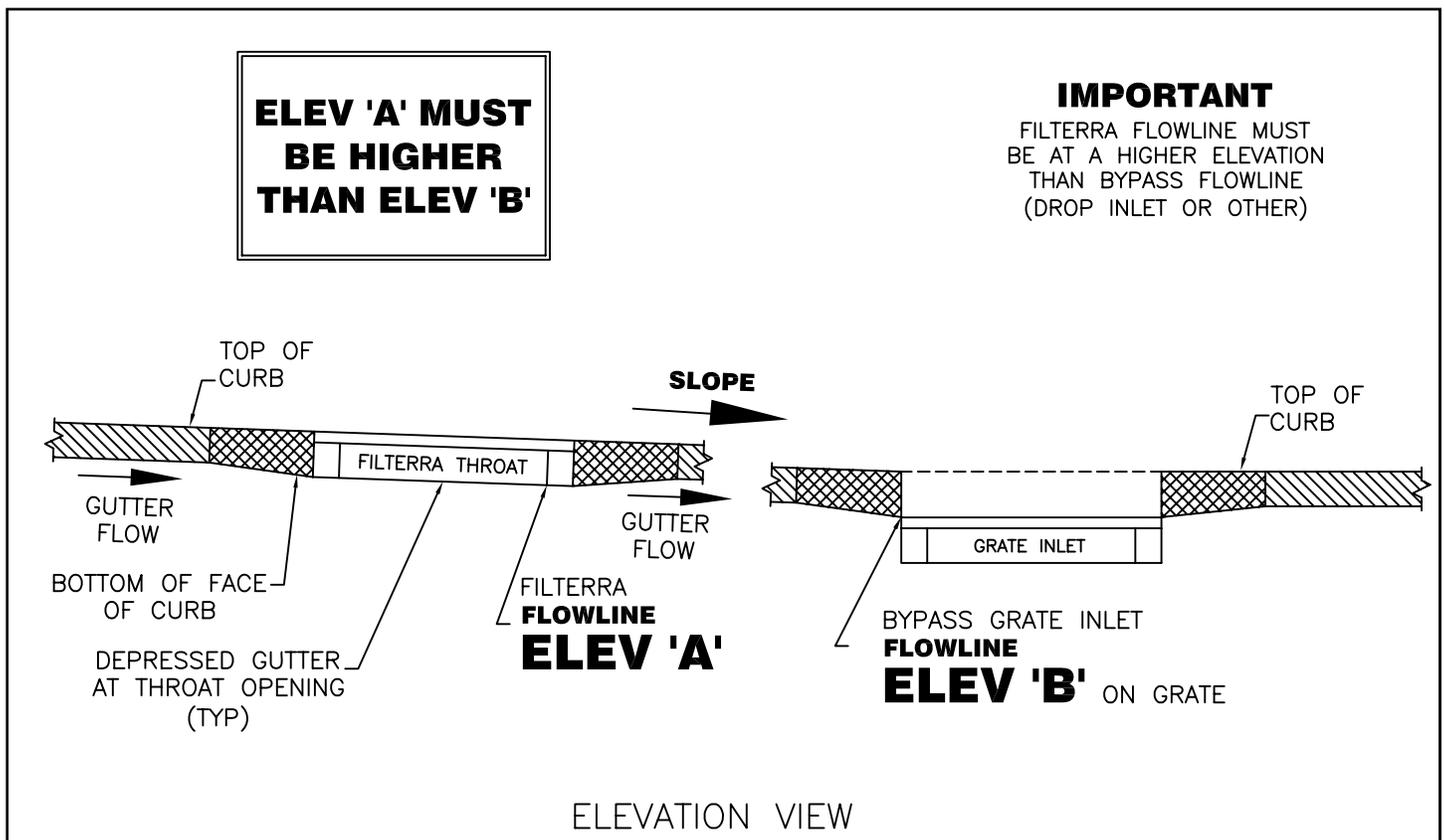


ELEV 'A' MUST BE HIGHER THAN ELEV 'B'

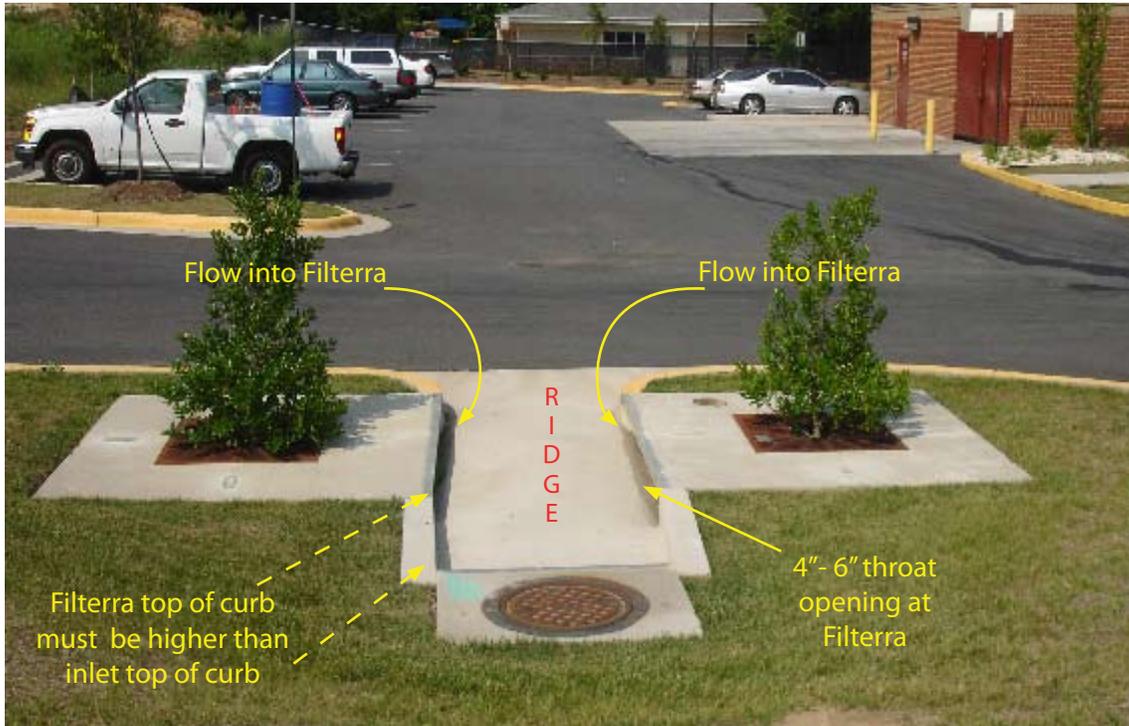
IMPORTANT
 FILTERRA FLOWLINE MUST BE AT A HIGHER ELEVATION THAN BYPASS FLOWLINE (DROP INLET OR OTHER)



Single Side Flume

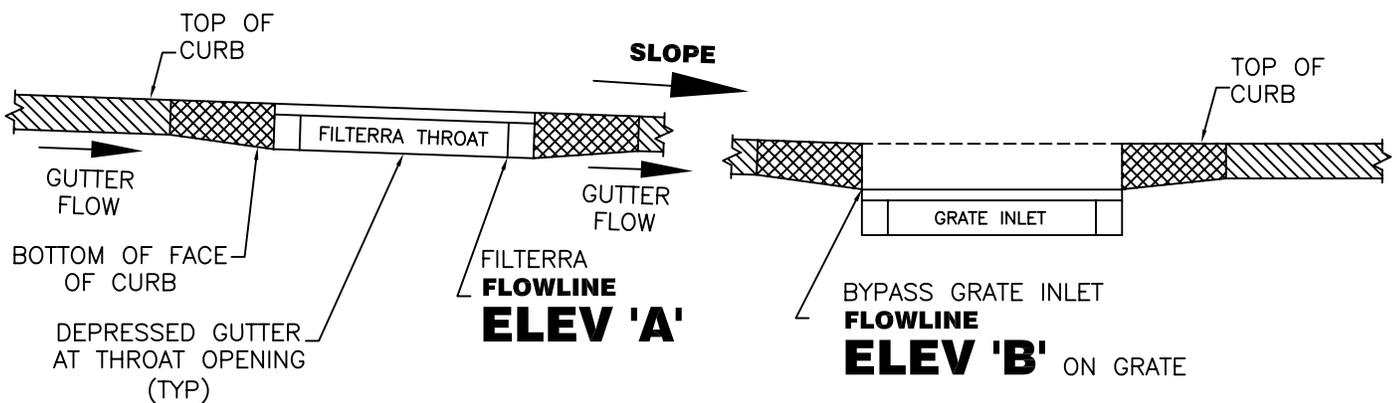


Double Side Flume



**ELEV 'A' MUST
BE HIGHER
THAN ELEV 'B'**

IMPORTANT
FILTERRA FLOWLINE MUST
BE AT A HIGHER ELEVATION
THAN BYPASS FLOWLINE
(DROP INLET OR OTHER)



ELEVATION VIEW



filtererra
Bioretention Systems

A Growing Idea in Stormwater Filtration

Bioretention
Plant/Soil/Microbe Complex
Removes Pollutants, TSS,
Phosphorus, Nitrogen, Bacteria,
Heavy Metals, Hydrocarbons, etc.

**Filtererra® Flow Line
at Higher Elevation
than Bypass Flow Line**

**New or Existing
Catch Basin,
Curb Cut or
Other Means of
Overflow Relief**

Curb and
Gutter

Clean-out

Storm Water Inflow
("First Flush")

Energy Dissipator
Stones

Treated Stormwater
Underdrain System

Filtererra® Concrete
Container

3" Mulch
Filtererra® Engineered
Media

High Flow Bypass