December 6, 2019

State Water Resources Control Board (SWRCB)
State Water Board Program, Division of Water Quality
PO BOX 100
Sacramento, CA 95812-0100
Attention: Leo Cosentini, Jaime Favila

SUBJECT: STORMEXX CLEAN TRASH CAPTURE SUBMISSION

Dear Sirs,

Filtrexx International (Filtrexx) in collaboration with Inventive Resources Inc (IRI) is pleased to submit this amendment to the application for the StormExx Clean Trash Capture (StormExx Clean) insert device (both curb and grate inlet configurations). This StormExx Clean application was already certified by the State Water Board on July 10th, 2018. After several discussions and meetings with the Mosquito and Vector Control Association of California (MVCAC) we have updated the design of our StormExx Clean curbside inlet configuration to provide acceptable access for mosquito and vector control technicians to inspect, sample and treat. This update does not change the StormExx Clean's hydraulic capability or filtration output of the curbside inlet configuration. The vector control access design update includes:

1. Offsetting filter housing to one side to allow better visual access to catch basin.
2. Enlarging the view/access port on the deflector piece.
3. Modifying the deflector for improved access.

The following details remain the same relative to both the StormExx Clean curb and grate inlet configurations that was previously certified by the State Water Board.

1. Polycarbonate retractable door.
2. Runoff still flows through deflector and into the filter housing.
3. Filter cartridge hydraulic and filtering capabilities remain the same
4. Hydraulic capacity and trash capture capabilities are unchanged.

We are submitting this revised application in accordance with the State Water Resources Control Board *Trash Treatment Control Device Application Requirement*s which includes the following seven elements:

1. Cover Letter
2. Table of Contents
3. Physical Description
4. Installation Information (Guidance)
5. Operation and Maintenance Information
6. Reliability Information
7. Field/Laboratory Testing Information and Analysis

The StormExx curbside inlet configuration has been updated where appropriate that illustrate the MVCAC preferred access portal. For ease of reference, the submission sections and pages that were revised to accommodate the comments and criteria by MVCAC Trash Capture review committee are summarized below.

Page/Section	**Reason Updated**
Page 11	Added language of size of opening of access port.
Page 35	Figure 4 Rendering added to illustrate clearance MVCAC recommended. Shows how authorized personnel can access during inspections, maintenance and treatment.
Page 36	Figure 5 Shop drawings modified to show improved access and configuration.
Page 37	Added Image 13, shows that bottom of catch basin is still visible. Shows how mosquito abatement staff can still perform inspection activities without interruption.
Appendix B	MVCAC Letter Added Summary Letter

As listed above, we are including MVCAC 12/6/19 letter of approval for both configurations of the StormExx Clean (see attachment B).

Thank you for your time in reviewing and considering this application. This application will be submitted electronically to Jaime Favila at Jaime.Favila@waterboards.ca.gov. and Mr. Leo Cosentini at Leo.Cosentini@waterboards.ca.gov. If you need additional information Britt Faucette and Evangelina Paoluccio can be contacted at the contact information below.

Respectfully submitted,
Filtrexx International and Inventive Resources Inc.

Britt Faucette, PhD, CPESC, LEED AP
Director of Research, Technical and Environmental Services
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Evangelina Paoluccio, P.E., QSD/P
Engineering Manager
Inventive Resources Inc.
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1.0 COVERLETTER

1.A General Description of Device

The StormExx Clean Trash Capture (StormExx Clean) catch basin insert device (both curb and grate inlet configurations) application was already certified by the State Water Board on July 10th, 2018. The StormExx Clean device is placed under a catch basin grate or curbside inlet to help remove trash, sediment, oil and contaminants from storm water runoff. Oil and contaminants are captured in a disposable cartridge. The vertical housing helps to allow for settling of incoming sediment for later disposal. Recently, a trash capture screen was added to the bypass to capture particles 5 mm and larger through the design flow rate and fulfill Trash Capture requirements adopted by the State Water Resources Control Board (State Water Board). The filter/absorber cartridge uses recycled products, essentially fighting pollution with pollution.

Although MVCAC had originally approved both configuration of the StormExx Clean on 7/12/19 the approval was contingent upon modifications to the curb inlet configuration. The MVCAC required a larger access port in the curb inlet configuration in order to provide adequate access for mosquito vector control inspections and treatment. The curb inlet configuration was re-designed and submitted to MVCAC for review. MVCAC has subsequently issued letters of approval for both configurations (grate and curb) dated December 6, 2019. These letter are included in Appendix B.

1.B Applicants Contact Information and Location

Filtrexx is a licensed manufacturer of the *original* patented Water Decontaminator and plans to manufacture and market as StormExx Clean TC. Currently, an upgraded version of the Water Decontaminator TCU is listed on the Certified Full Capture System List of Trash Treatment Control Devices. StormExx Clean TC and the Water Decontaminator TCU are similar comparable devices. The only differences in these two devices will be simple aesthetics based on marketing labels and items listed on page 27 (Section 3.K) of this report. Product testing and technical specifications are equal for both devices. This application is a collaboration between Filtrexx International and Inventive Resources Inc.

The StormExx Clean TC representative regarding this Trash Capture submission is included in Table 1A and 1B:

Table 1A- StormExx Clean TC Application Representative

Application Submission Representative:	Evangelina Paoluccio, P.E. QSD/QSP Inventive Resources Inc., Engineering Manager
Mailing Address:	5038 Salida Blvd / PO Box 1316 Salida, CA 95368
Company Telephone:	209-545-1663 Ext. 102 1-888-285-6158
Representative Email address:	evangelina@IRIproducts.com

The Filtrexx Company StormExx Clean TC representative contact is:

Table 1B- Filtrexx International Representative Information

Company Representatives:	Dr. Britt Faucette, Ph.D., CPESC, LEED AP Director of Research, Technical, and Environmental Services
Mailing Address:	244 Third Ave Decatur, GA 30030
Company Telephone:	404-687-8393
Representative Email address:	Britt.faucette@filtrexx.com

1.C Device Manufacturing Location

The StormExx Clean devices will primarily be manufactured at 6455 Automall Parkway in Gilroy, CA. The Filtrexx facility is located 147 miles southwest of Sacramento just south of San Francisco.

An outside secondary facility, Inventive Resources Inc (IRI), may be used for specialty/custom units located in Salida, CA. The IRI facility is located just north of Modesto in Salida California, at the address 5038 Salida Blvd, Salida CA 95368. IRI has a long term commitment with Filtrexx International and dedicated to the same principles in protecting the environment and offering the best solutions possible in water and erosion pollution.

1.D Brief Summary of any field/laboratory testing results that demonstrate the Device functions as described within the application.

A discussion of Field and Laboratory results that demonstrate the StormExx Clean TC functions as described is included in the Field/Laboratory Testing section towards the end of the report on page 40, Table 6. Flow rates based on controlled in-house testing rates vary and are dependent on site specific environmental conditions. Trash Capture cartridge filters have a maximum flow rate of 40 gal/min based on multiple in-house controlled tests. Once runoff flow reaches the cartridge filter maximum flow rate, pressure head increases, and water level would potentially reach the screened bypass. Screened bypass material is Stainless steel 3/16" (4.83mm) perforated metal screen. All debris will be contained in nominal 15-20 gallon housing and only liquid and small particles less than 4.83mm could potentially bypass through the 4.83mm screened bypass. The housing can hold up to 70-100 pounds of sediment before being compromised.

In-house testing was completed on a portable test stand for the screened material. A 3 inch diameter screened opening was placed at the bottom of a housing unit. The screened area

material was 3/16" (4.83mm) perforated metal sheet screen. The opening was covered with an energy dissipater to break up the entering water flow while letting full flow without jet streams to flow through the 3 inch screened opening. The flow rate from the hose was set when the water level in the bucket was steady at 3 inches in height above the screen. The testing flow rate was then directed to a five gallon container and a timer recorded the number of seconds to fill the 5 gallon container. Multiple tests were taken, and they were all at approximately 14.5 seconds. Based on 14.5 seconds to fill a five gallon container the flow rate was 20.69 gpm through the 3 inch screened opening. This further calculates to 421.72 gpm for 1 square foot of screen. This is conservatively rounded down to 400 gpm/sf of perforated screen. The screen design flow rate is 400 gallons per minute per square foot of screen. Table 6 presents maximum design flows through each of the models. Images 14 through 18 illustrate the test stand mechanism used for flow testing screen. More information on how the device works as described will be listed throughout this submission.

1.E Brief Summary of the Device limitations, and Operational, Sizing and Maintenance Considerations

A summary of the unit limitations, operation, and sizing and maintenance considerations is included starting on page 29 of this report.

Limitations include depth of catch basin to allow for sufficient pressure head and trash containment inside the filter housing and seasonal cleaning, preferably before the first flush and after leaves have dropped for the season. Areas with more wooded and denser tree canopy would require a more intense street cleaning regimen and leaf drop check to ensure the catch basin is free of leaf debris. Older catch basin may have rust present along the support lip, if that is the case, installers will need to use a steel brush to clean the area free of rust so device can sit evenly. (See Image 10)

A regular street cleaning and catch basin filter inlet inspection schedule is essential in ensuring optimum performance of this device. Maintenance frequency for the device will ultimately be determined by the site environmental and storm water runoff conditions present. Filtrexx recommends periodic inspections following installation to determine site specific maintenance and trash/pollutant loading characteristics. Typically, equipment needed to adequately perform maintenance includes basic hand tools including gloves, non-porous mat, heavy mil trash bags, broom, small shovel, manhole cover/grate handpick, trowel. Depending on the site of the device, traffic lane caution signs will be necessary; this will depend on local traffic guidance manuals. While doing maintenance it is good to have on hand one replacement cartridge in case a unit might need a replacement. Inspections of StormExx Clean TC devices should be conducted semiannually, and if needed cleaning maintenance can be scheduled as needed on each device installed. As mentioned previously, site environmental conditions vary at each area.

Advantages of this device include treating storm water at the street/inlet level, capturing trash, sediment and soluble, invisible pollutants. The StormExx Clean TC fits into any existing storm drain/catch basin system and its variable filter system is suitable for high or low water flow rates.

The StormExx Clean TC is easy to install and replacing treatment filter cartridges can be completed in minutes. Standard units are simple drop in units; custom sizes are available to suit low flow design rates to high rates. The advantages of a drop-in unit are a smaller clearance needed as well as even faster maintenance of the unit. A drop-in unit incorporates the funnel portion to the device, easing cleaning procedures and multiple component swap outs, saving valuable minutes of time. Special site-specific filter/absorber cartridges can be provided with the new trash capture features. Appendix A includes a sizing guide for properly sizing a catch basin with a StormExx Clean TC device.

1.F A description or list of locations, if any, where the device has been installed. Include name and contact information of as many as three municipality(s) purchasing device

Installations of the branded StormExx Clean TC device label are pending upon full SWRCB certification/approval. As stated previously, Filtrexx is a licensed manufacturer of the original Water Decontaminator and plans to manufacture and market the Water Decontaminator TCU as StormExx Clean TC.

Currently, the Water Decontaminator TCU is listed on the Certified Full Capture System List of Trash Treatment Control Devices and has its own list of already installed units in service. StormExx Clean TC and the Water Decontaminator TCU are equal devices. If requested, we can forward, under a separate cover, a listing of first generation Water Decontaminator devices that have been previously installed for historical purposes.

Filtrexx has sold and installed various branded devices throughout the United States in sediment control, pollution removal, storm water management, stabilization, living walls, farm and garden. Filtrexx hopes to expand its treatment train line to include StormExx Clean Trash Capture series for additional targeted storm water solutions.

The StormExx Clean Trash Capture series will be an upgraded version from the StormExx Clean device currently being marketed. The trash capture series will have 100% trash capture, screened overflows, weep holes and a self-closing access portal for agency inspections. The filter/absorber cartridge can be provided with site specific media. A small list of possible applications includes:

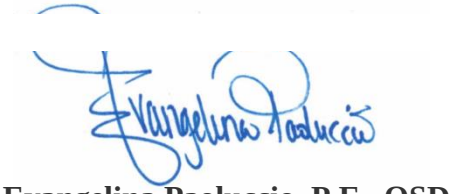
- Urban run-off
- Residential run-off
- Fire run-off
- Parking & Maintenance areas
- Oil & fuel spills
- Military bases
- Airports
- Sumps
- Industrial, Factories
- Equipment wash-down

1.G Certification Statement

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel

properly gather and evaluate the information submitted. Based on my inquiry of the person or persons that manage the system or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Britt Faucette, PhD, CPESC, LEED AP
Director of Research, Technical and Environmental Services
Filtrexx International



Evangelina Paoluccio, P.E., QSD/P
Engineering Manager

Inventive Resources Inc.

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD
TRASH TREATMENT CONTROL DEVICE APPLICATION

PREPARED BY
Britt Faucette PhD, CPESC, LEED AP
Evangelina Paoluccio P.E., QSD/P
Original Submission Certified by SWRCB on July 20, 2018
MVCAC Approval December 6, 2019
Amended Resubmission to SWRCB December 6, 2019

FOR
FILTREXX INTERNATIONAL
MANUFACTURER OF THE STORMEXX PRODUCT LINE

FOR SUBMISSION TO THE
CALIFORNIA STATE WATER RESOURCES CONTROL BOARD
TRASH IMPLEMENTATION PROGRAM
STORMEXX CLEAN TRASH CAPTURE DEVICE SUBMISSION

Table of Contents

3.0 PHYSICAL DESCRIPTION

The StormExx Clean TC is a patented, environmental product that is placed under a catch basin grate to help remove trash, oil and contaminants from runoff. It comes in both curb and gate inlet configurations. Debris 5 mm and larger are captured in the housing screen up to the design flow rate. During low flow conditions runoff flows through a disposable filter cartridge filtering out pollutants. The filter absorber cartridge uses recycled products essentially fighting pollution with pollution. Custom units are also available with the trash capture feature. For clarity, the term StormExx Clean TC will be used interchangeably with StormExx Clean Trash Capture to describe the trash capture unit in this application. Table1 has our representative contact information for any *technical* questions regarding the device. In most cases new units have a lead time of approximately three weeks; replacement cartridges are readily available, in stock and have minimal turnaround time.

Table 1- StormExx Clean TC Representative Contact Information
Trash Capture Device Application Submission

Company Representatives:	Britt Faucette, PhD, CPESC, LEED AP
Mailing Address:	244 Third Ave Decatur, GA 30030
Company Telephone:	404-687-8393
Representative Email address:	Britt.faucette@filtrexx.com

3.A Description of Device

The StormExx Clean TC device fits into any existing storm drain/catch basin system, as illustrated in Figure 1A and 1B, a standard inlet or as a curbside inlet. A variable filter system is suitable for high and low water flow rates. Water runoff flows through the gutter and into the storm catch basin; the water deflector directs flow straight into the device. All runoff, up to the design flow rate is captured within the perforated trash capture screen of the unit and filter cartridge. During rain events, water level in the housing will rise. The screened area of the unit can screen trash and release runoff with debris less than 5 mm in size. Any debris 5mm or greater will be captured in the housing and not be released into the storm drain. If a rain event occurs, greater than the design flow rate, simply the level of water will rise and bypass through the overflow air gap, untreated.

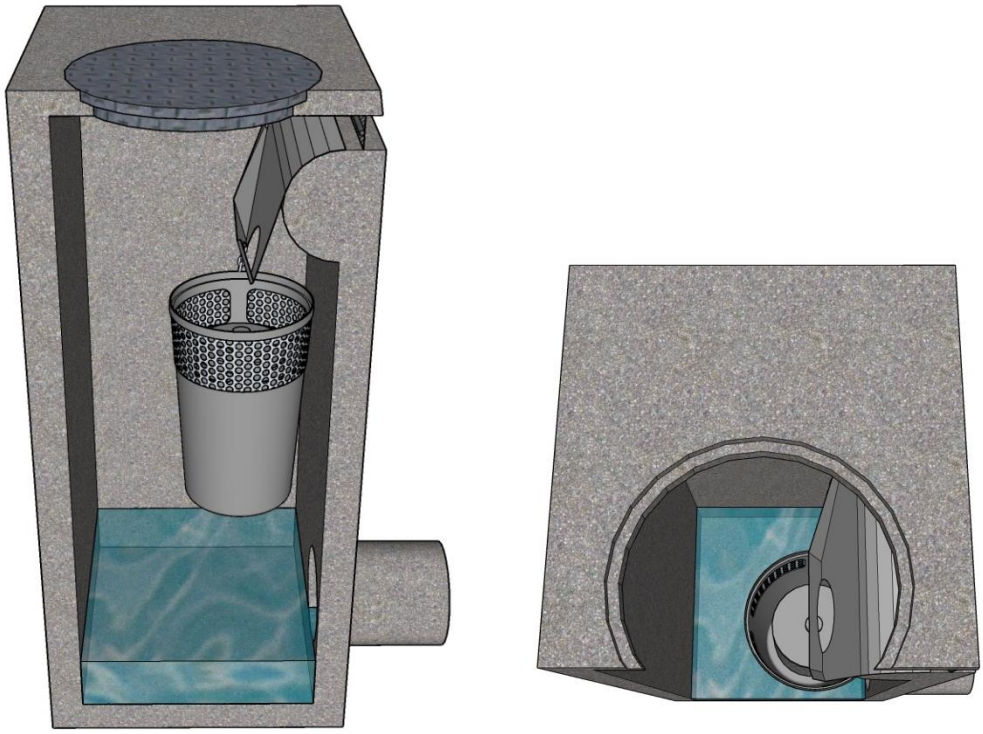
The run-off will undergo the following sequence through the device and trap particles that are 5 mm and larger in a typical rain event:

1. Low flow rates up to nominal 40 gpm will pass through the vertical filter/absorber cartridge where hydrocarbons, certain chemicals and fine sediment are captured in the

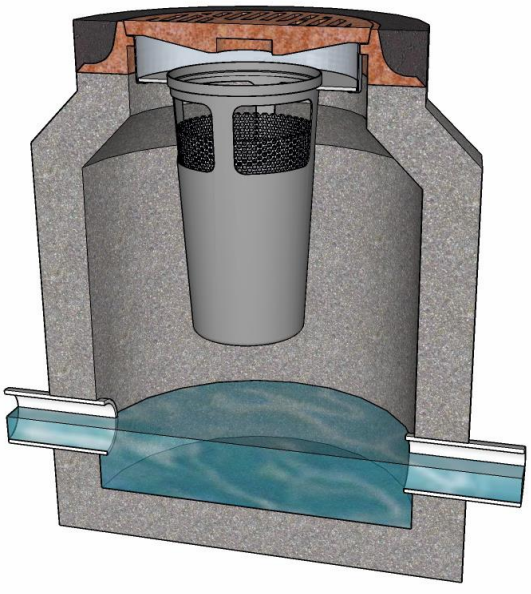
deep bed loading media of the disposable filter/absorber cartridge. As the filter cartridge becomes fouled, the water level will rise in the vertical housing and in rain events, up to the design flow rate, may pass through the 3/16" (4.83mm) trash capture screen located at the top of the device. (See Figure 1A and 1B)

2. Trash capture occurs when run off up to the design flow rate, flows through the device. Low flow rates pass through the filter cartridge leaving sediment and debris behind in the housing for later disposal. As sediment and trash accumulates the debris level increases. Treated flow will occur up to the design flow rate. The design flow will pass through the 3/16" perforated screen/plate, thus preventing trash 5 mm or greater to pass through the screen, retaining all trash and debris 5 mm or greater inside the device.
3. The unit should be inspected seasonally, especially before and after heavy leaf fall to ensure optimum performance. The housing unit should not have more than 6-8 inches of debris inside the bottom of the housing, before cleaning procedures need to be performed.
4. Normal street sweeping and regular semi-annual inspections of units should be made to insure that the device is in optimal condition to properly treat incoming runoff.
5. Replace filter cartridge every 12 months and it is best management practice to replace cartridges when sediment accumulation in the housing reaches 4-8 inches or slow flow is noticed during inspection. Site environmental conditions vary from area to area, in some cases, high rainfall flow areas where large amounts of sediment enter through the grate it may be necessary to change the filter cartridge up to 4 times a year. In low rainfall flow areas only one or two cartridge filter change-outs per year may be necessary. Change outs will be indicated during visual inspections of each device.

Figure 1A- StormExx Clean TC Schematic
StormExx Clean Trash Capture Device Application Submission

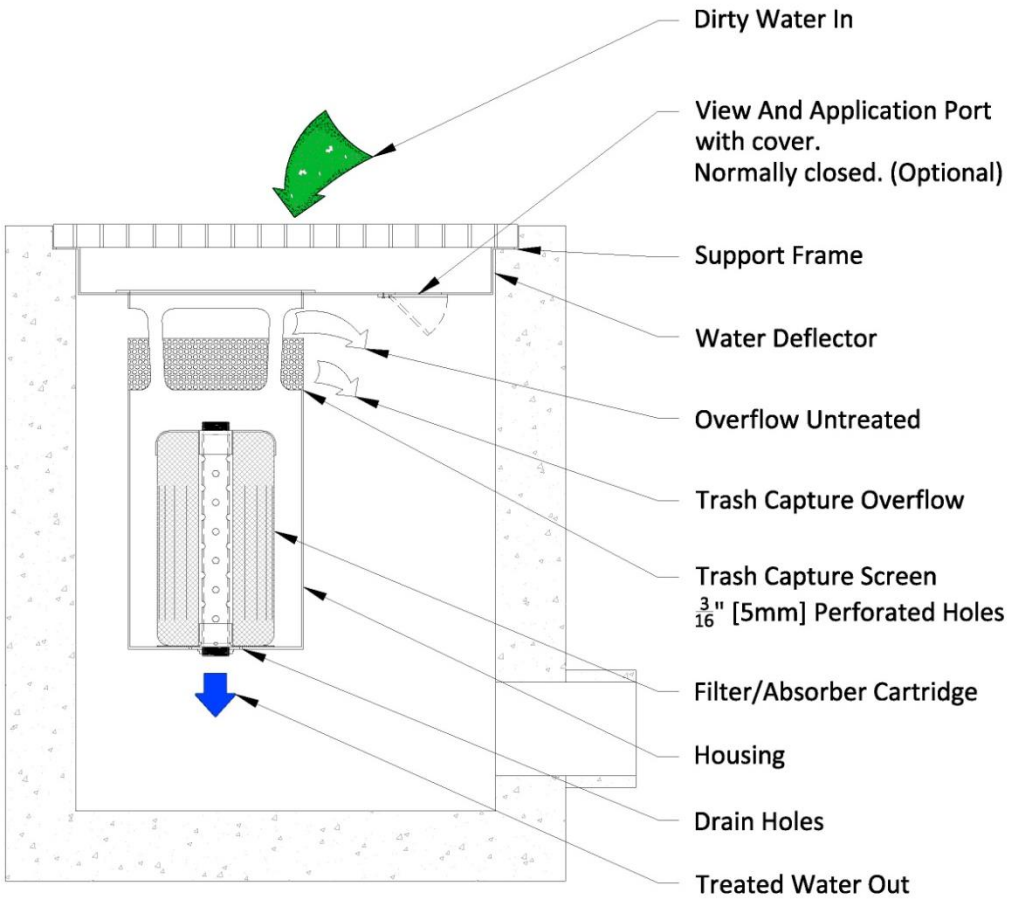


Curbside Inlet



Standard drop Inlet

Figure 1B- StormExx Clean TC Installation Schematic
StormExx Clean Trash Capture Device Application Submission



3.B Design drawings for all standard device sizes including dimensions and alternative configurations

Design drawings are attached to this application in Appendix A. Design drawings include dimensions and appurtenances for installation. Media mixes are not included in this report or exploded drawings of unit but can be provided in a supplemental confidential submission as some of that information would be proprietary. Previously installed older generation models have the capability of being easily retrofitted to trash capture models. Also included in Appendix A is a sizing guide for procuring a StormExx Clean TC, images of readymade units, access viewport images. The sizing guide requests a few simple measurements of the catch basin. StormExx Clean TC units are drop in connection as seen in Appendix A drawings. The advantages of a drop in unit are a smaller clearance needed as well as even faster maintenance of the unit. A drop in unit does not need the funnel portion to be removed during cleaning procedures, saving time.

3.C Photographs of Pre-Post installation examples

Images 1, 3, 4 and 5 show prior generation Water Decontaminator units that were taken out for general maintenance. Photographs of Pre-installation and Post-Installation of first generation Water Decontaminator TCU unit are included in this application. Image 6 show a StormExx Clean TC model TCU-6 ready to install.

3.C.1 Pre-Installation Examples

Image 1 is a first generation (Water Decontaminator) unit about to be installed.

Image 1: Installation of an original unit on a side inlet. (Unit can be easily modified to meet trash capture requirements)

Image 2: Lifting of grate in a parking lot with a special lifting mechanism.

3.C.2 Post-Installation Examples

Below are images 3 through 6 of completed installations, replacement cartridge change outs and units with trash/sediment accumulation. Image 3 does *not* show a model with an access viewport.

Image 3: Installation of a prior generation unit.

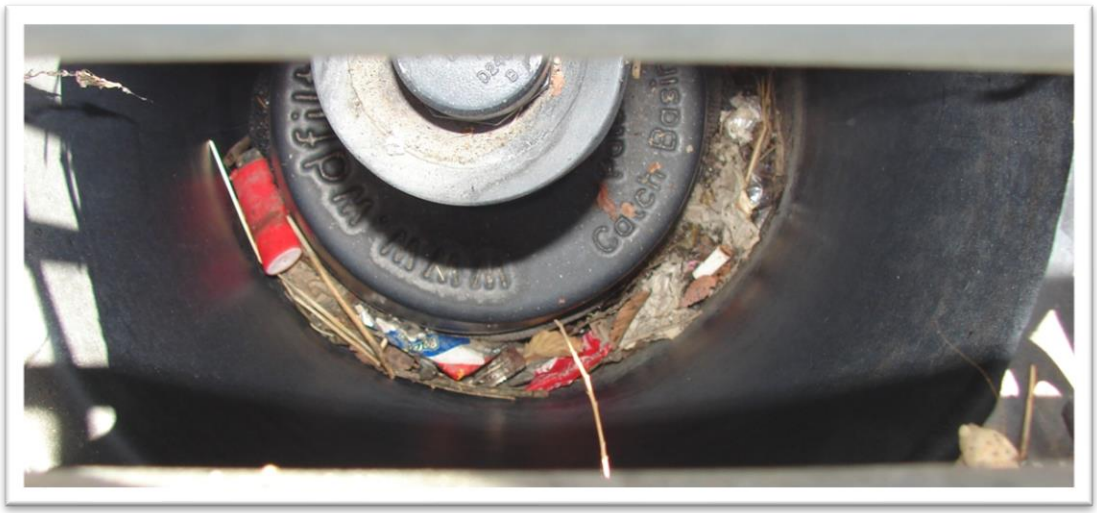


Image 4: Inspection of unit revealed some trash collection inside housing at approximately 3 inches in height within the unit.

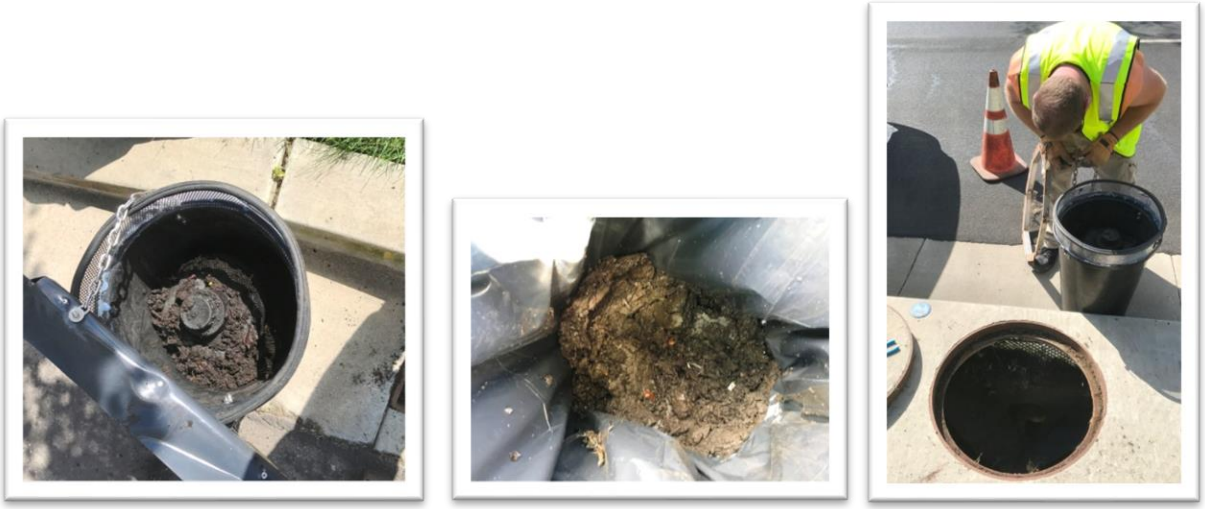


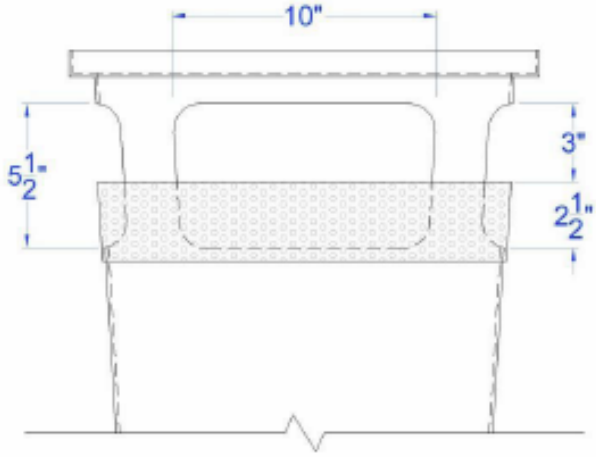
Image 5: Inspection and Cleaning of a side inlet with a previous generation Water Decontaminator Model #TCU-4. Leaves and sediment present and removed. Housing cleaned, sediment collected and disposed. Note special support frame. *(Deflector removed for visual purposes)*

Image 6: StormExx Clean TC units shown.

3.D Alternative Configurations

There are several models/configurations of the StormExx Clean TC. The StormExx Clean TC typically includes a support frame to suit the catch basin frame and grate; Funnels are either high density polyethylene (HDPE) material or stainless steel upon request. The funnel is used to deflect runoff into housing and filtration; Housings are nominal 15 gallons and can hold up to 70-100 pounds of sediment (10-15 gallons of trash/sediment). Images 5 and Appendix A illustrate a sample of the variations; not all the images pictured illustrate the support frame or deflector, just the housing and filter for demonstration/visual purposes. Appendix A has additional schematic information. *The model variations incorporate trash capture screen in the upper portion of the housing extending above the rim to accommodate larger design flow rates and two different types of secondary self closing access ports for Mosquito Abatement and Vector Control agents. The only difference between the models is the height of the trash capture screen, which allows for greater trash screen area.* Filter cartridge can be offset to one corner to allow for larger side access and for any inconsistencies in the storm drain, typical to older infrastructure (i.e ladder rungs, outcracking or seals). The unprotected overflow rate is the same for all three models. Figure 2 details the screen differences between each model.

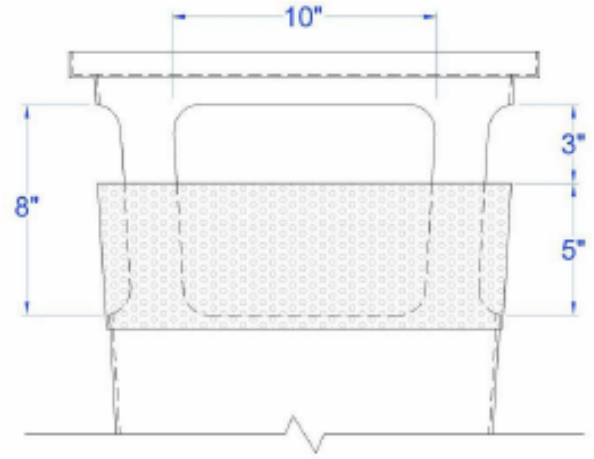
Figure 2- StormExx Clean TC Model Variations
StormExx Clean Trash Capture Device Application Submission



TCU-2

Trash screen area: 0.65 sf
Design flow rate: 0.58 cfs (260gpm)
Overflow area: 0.83 sf
Overflow flow rate: 1.84 cfs (824gpm)

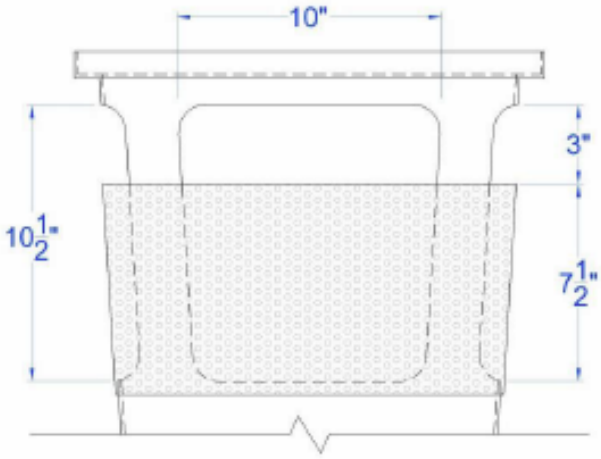
Four (4) holes (nominal)
5.5" high x 10" wide



TCU-4

Trash screen area: 1.3 sf
Design flow rate: 1.3 cfs (584gpm)
Overflow area: 0.83 sf
Overflow flow rate: 1.84 cfs (824gpm)

Four (4) holes (nominal)
8" high x 10" wide



TCU-6

Trash screen area: 1.96 sf
Design flow rate: 1.7 cfs (784gpm)
Overflow area: 0.83 sf
Overflow flow rate: 1.84 cfs (824gpm)

Four (4) holes (nominal)
10.5" high x 10" wide

Below are the proposed StormExx Clean TC device models with the new Trash Capture features. These models include the Prefix "TCU" which stands for Trash Capture unit. These units are drop in units. See model descriptions as follows:

- Model TCU-2 includes housing with a nominal 15" diameter top with four (4) 5.5" high by 10" wide holes in the upper portion of the housing. The lower 2.5" portion of the holes are covered with 3/16" (4.83mm) perforated strainer as shown on Image 7. This provides 0.65 sq ft. of 3/16" (4.83 mm) of the perforated strainer material to prevent particles 5 mm or greater to pass through. This trash capture screen helps retain collected debris up to 260 gpm or 0.58 cfs design flow rate. *Viewport opening is a nominal 6" opening, viewport allows Mosquito and Vector Control agents access to storm drain without removal of device to view conditions and deposit larvicide. When size and space availability permits, device will be offset and a larger viewport will be installed.* Viewport has a closing flap door that can be opened easily. Flap door sits flush and automatically retracts when not in use. This model is a drop in unit. The upper 3" by 10" wide portion of the 4 holes without screen provides 0.083 sf of unscreened overflow to accommodate 1.84 cfs (824 gpm).

- Model TCU-4 includes housing with a nominal 15" diameter top with four (4) 8" high by 10" wide holes in the upper portion of the housing. The lower 5" portion of the holes are covered with 3/16" (4.83mm) perforated strainer as shown on Image 7. This provides 1.3 square feet of 3/16" (4.83 mm) of perforated strainer material to prevent particles 5 mm or greater to pass through. This trash capture screen helps retain collected debris up to 584 gpm or 1.3 cfs design flow rate. *Viewport opening is a nominal 6" opening, viewport allows Mosquito and Vector Control agents access to storm drain without removal of device to view conditions and deposit larvicide. When size and space availability permits, device will be offset and a larger viewport will be installed.* Viewport has a closing flap door that can be opened easily. Flap door sits flush and automatically retracts when not in use. This model is a drop in unit. The upper 3" by 10" wide portion of the 4 holes without screen provides 0.083 sf of unscreened overflow to accommodate 1.84 cfs (824 gpm).

- Model TCU-6 includes housing with a nominal 15" diameter top with four (4) 10.5" high by 10" wide holes in the upper portion of the housing. The lower 7.5" portion of the holes are covered with 3/16" (4.83mm) perforated strainer as shown on Image 7. This provides 1.96 square feet of 3/16" (4.83mm) of perforated strainer material to prevent particles 5 mm or greater to pass through. This trash capture screen helps retain collected debris up to 784 gpm or 1.7 cfs design flow rate (See Image 6). *Viewport opening is a nominal 6" opening, viewport allows Mosquito and Vector Control agents access to storm drain without removal of device to view conditions and deposit larvicide. When size and space availability permits, device will be offset and a larger viewport will be installed.* Viewport has a closing flap door that can be opened easily. Flap door sits flush and automatically retracts when not in use. This model is a drop in unit. The upper 3" by 10" wide portion of the 4 holes without screen provides 0.083 sf of unscreened overflow to accommodate 1.84 cfs (824 gpm).

- Curbside inlet includes housing with a nominal 15” diameter top with four (4) 10.5” high by 10” wide holes in the upper portion of the housing. The lower 7.5” portion of the holes are covered with 3/16” (4.83mm) perforated strainer as shown on Image 7. This provides 1.96 square feet of 3/16” (4.83mm) of perforated strainer material to prevent particles 5 mm or greater to pass through. Curbside configuration attach to the side nearest to the inlet. *When you access through the manhole cover you have full access to catch basin as shown on Figure 1A and Image 13.*

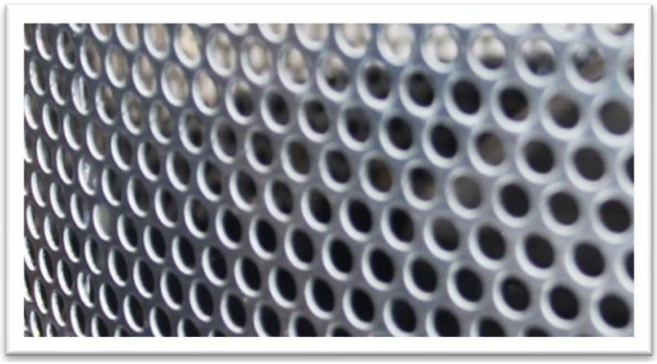


Image 7: 3/16" (4.83mm) screen.

Image 8: StormExx Clean TC, Model TCU-6

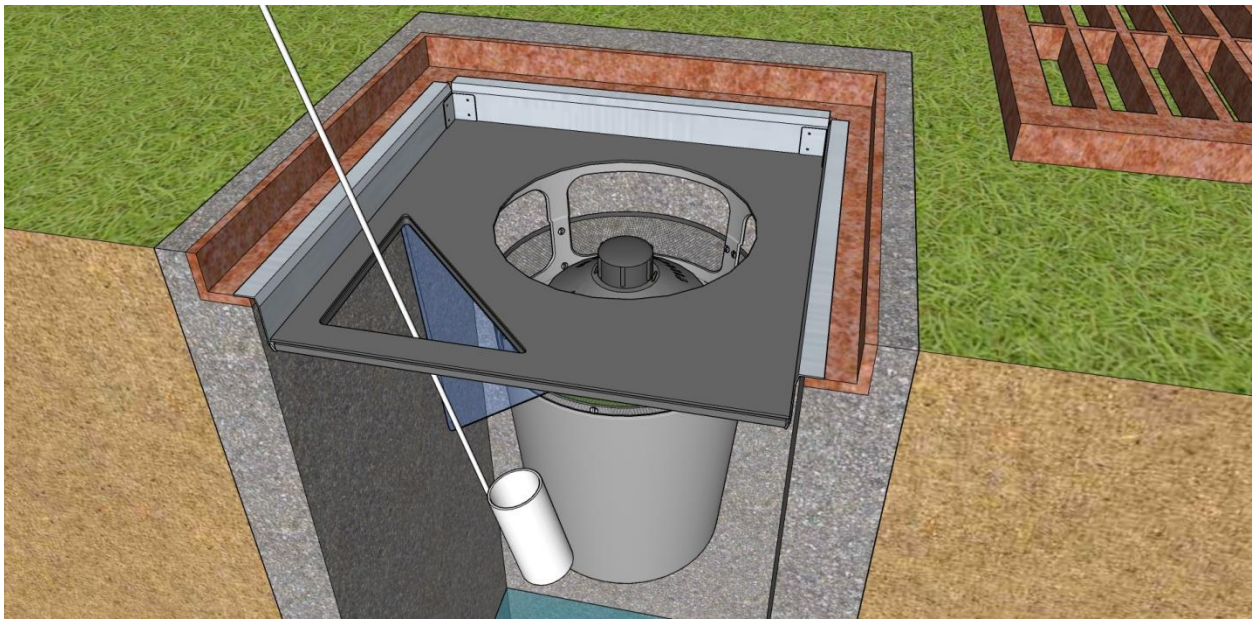


Image 9: Model TCU-2, shown without grate area for visual purposes.

3.E Engineering Plans/Diagrams for Typical Installation

Sizing guide, brochure and cut sheets for the StormExx Clean TC is included in Appendix A. Always follow appropriate safety precautions when installing and servicing catch basins. This includes personnel protection, traffic, and ventilation. Only experienced trained workers following OSHA's safety requirements should work around catch basins and manholes. Never leave a catch basin manhole uncovered and unsupervised. Place barrier cones at service area and appropriate traffic signage.

The StormExx Clean TC is easy to maintain and replacing treatment cartridges can be completed in minutes. Typical installation of a StormExx Clean TC unit includes:

- ✓ Remove catch basin grate. (Round or Rectangular)
- ✓ Remove any visible rust or debris from metal ring. (See Image 10)
- ✓ Check measurements of ring and filter unit.
- ✓ Place unit in catch basin frame.
- ✓ Replace grate.

Image 10: Installing unit, checking lip and removing rust.

At a minimum, semiannual inspections are recommended. During these inspections, monitoring sediment in the housing unit should be noted. Housings should be cleaned out when sediment and debris accumulation is more than eight (8) inches. Cleaning housings is relatively simple. Typical cleaning of a StormExx Clean TC unit includes:

- ✓ Place a non porous fabric and a heavy mil trash bag near the catch basin you will service.
- ✓ Sweep up around the catch basin any debris that might fall into the catch basin and place in trash bag.
- ✓ Remove grate.
- ✓ Lift housing out and place trash bag over the unit. Lift housing and let contents of housing fall into trash bag. Tie bags appropriately.
- ✓ If a new cartridge is needed, replace filter cartridge at this time. Fasten.

- ✓ Place grate cover securely back on catch basin.
- ✓ Remove and dispose of trash, sediment and spent cartridges in an approved manner.

3.F Device Maximum Trash Capture Capacity

Trash capture capacity is 10-15 gallons or approximately 70-100 lbs of trash and sediment. All sediment and trash is captured within the housing filter cartridge and trash capture screen. Images 11 and 12 are of original models with sediment accumulation at maximum capacity of pure sediment. These units were replaced after inspection with new filter cartridges. Most of these units had approximately 3-12 inches of sediment accumulation; the first unit to the left was completely full. Flow was not restricted and did not flood street. The full unit was located in an area with construction activity and sediment filled the unit up, the unit still allowed flow through the cartridge; however, the unit was very heavy and required extra maneuvering to pull out the unit. Typically the housing unit can be cleaned by dumping all the debris straight into a garbage bag, and using a hand trowel to scrape any residual debris inside the housing.

Image 11: Sediment accumulation on first generation units after one year.

Image 12: Decomposed leaves after the Fall season and leaf drop. This street was not properly street swept and all the leaves went down the catch basin and into the unit. This unit has a SS deflector.

High rainfall rate can cause flow rates to exceed the design flow rate of the unit. The trash capture will treat up to the design flow rate and excess flow will exit the overflow opening allowing untreated water to bypass filtration and exit through the overflow air gap. (See Figure 1B)

In some cases, an external, easily cleanable, leaf/ debris pre-strainer is provided at the curb opening of certain side inlet catch basins. These cover the lower portion of the inlet opening to still allow for high flow rates to overflow the pre-strainer. These pre-strainers help prevent leaves, grass, newspapers and larger debris from entering the catch basin. These pre-strainers may be removed after leaf fall in certain applications. Advantages of this device include treating storm water at the street/inlet level, capturing trash, sediment and soluble, invisible pollutants.

3.F.1 Internal Bypass Design

In a typical rain event, storm water flows through the funnel and into the device housing. Low flow rates are filtered through the filter cartridge, exiting via a screened internal perforated pipe. Flow rates up to the storm design flow rate will pass through the trash capture screen thereby preventing particles 5 mm or larger to pass through. An internal bypass in the unit is essential during high intensity rain/runoff events, the internal bypass directs a portion of flow greater than the storm design flow rate around the treatment chamber and over the internal bypass trash capture screened weir. There is no need for an external bypass chamber, thus minimizing the device footprint.

In addition, the StormExx Clean TC device includes several flow paths that cover (1) low flow rates that flow through a filter/absorber cartridge; (2) the design flow trash capture rate that flows through the 3/16” perforated trash capture screen; (3) untreated overflow, or internal bypass, for those flow rates above the design flow rate that flows through the air gap above the trash capture screen as follows:

1. Filter cartridge - Low flow rates up to 40 gpm (up to approximately 0.07 cfs) will first flow through a filter/absorber cartridge that is a nominal 10” diameter by 18” tall, located in the center of the housing and that slips over a 2” perforated vertical pipe that extends through the bottom of the housing. This cartridge provides a high degree of filtration for

fine sediment, hydrocarbons and chemicals. The cartridge has a fabric screen and contains approximately 1,200 cubic inches of deep bed loading proprietary filter media.

2. Trash capture capacity - The unit includes a 3/16" diameter trash capture perforated screen that prevents particles 5 mm or greater from passing through, up through the full design flow rate. The screen size area is based on a flow capacity of 400 gpm (0.89 cfs) per square foot of screen area. Each standard device model includes trash capture screen size, in square feet, and the rated design flow rate. This allows for selection of proper model device for different flow rates. When specified, custom larger size trash capture screens can be provided to accommodate higher flow rates. The standard housing holds up to 10-15 gallon capacity. Custom larger housings that contain 2 or 3 filter cartridges and higher volumes can be provided that include extended surface trash capture screens for very high flow rates. These are designed similar to the TCU-6 units but larger.
3. Internal bypass or Overflow - When a rain event provides a higher than design flow rate, the excess untreated flow, above the design flow rate will exit through the overflow opening air gap that is located above the top of the trash capture screen and the water deflector as shown on the product drawings.

3.G Device Hydraulic Capacity (flow in cfs) at its maximum trash capture capacity

The maximum device hydraulic capacity for all standard devices is presented in Table 2 below. The difference between models TCU-2 through TCU-6 is only the hydraulic capacity when the device is at full trash capture.

Table 2- StormExx Clean TC Device Hydraulic Capacity
StormExx Clean Trash Capture Device Application Submission

Model	Hydraulic Capacity	Viewport Type	Maximum Sediment/Trash Capture	Manufacturing Facility	Secondary Manufacturing Facility
TCU-2	260 GPM (.58 cfs)	Side Port	70-100 lbs (10-15 gallons)	Filtrexx International Gilroy, CA	Inventive Resources Inc. Salida, CA
TCU-4	584 GPM (1.3 cfs)	Side Port	70-100 lbs (10-15 gallons)	Filtrexx International Gilroy, CA	Inventive Resources Inc. Salida, CA
TCU-6	784 GPM (1.7 cfs)	Side Port	70-100 lbs (10-15 gallons)	Filtrexx International Gilroy, CA	Inventive Resources Inc. Salida, CA

3.H Material used to construct device

The StormExx Clean TC is made with a combination of High Density Polyethylene plastic (HDPE) and 304 stainless steel parts and appurtenances. HDPE is a highly durable, corrosion and weather resistant material. The 3/16" (4.83mm) diameter trash capture screen is 304 stainless steel equal to McNichols Co. perforated metal 3/16" hole diameter, ¼" hole spacing, 20 gauge, 51% open area or equal (See Image 7) or similar material. Table 3 presents screen material specifications.

Table 3 Screened Bypass Material Specifications
StormExx Clean Trash Capture Device Application Submission

Shape	Rectangular

Construction	Perforated
Hole Pattern	Staggered
Thickness/ Gauge	22 Stainless Steel (0.0291" thickness)
Thickness/ Gauge	20 Aluminum (0.0320" thickness)
Hole Diameter	0.1875"
Open Area	51%
Hole Center-to-Center	0.25"
Width	36"
Length	40"
Material	3003 Aluminum, 304 Stainless Steel or Plastic

3.I Conditions under which the Device re-introduces previously trapped trash

Lack of proper maintenance in removing captured sediment and trash before heavy rain events, especially those that exceed design flow rates, can re-introduce the captured trash to the storm drain piping system. This device may reintroduce previously trapped trash in the following ways:

1. Maintenance worker error.
2. Not properly sweeping area before removing grate and device can potentially introduce debris into system.
3. Sediment buildup that is greater than capacity can cause debris to not be caught in housing.
4. A heavy rain event that is greater than design capacity of storm drain.
5. A device that has been damaged and poorly repaired.
6. An ill fitted device.
7. Unauthorized tampering of unit.

3.J Estimated Design/Service Life of the Device

Life expectancy for HDPE material is conservatively 50 years, but due to the nature of the application estimated service life for the device is 10-15 years before major overhaul of a full device replacement. Historically original first generation units installed in 2005 (Water Decontaminator) have shown no signs of wear on linkage, housing and appurtenances. Filter cartridges have a service life of 3-36 months and are recommended to be replaced on an annual basis. In some cases, areas that practice good housekeeping, routine street sweeping, appropriate landscaping practices and minimal sediment disruptions, during inspections filter cartridges were deemed in excellent condition (clean, optimal flow through cartridge etc.) and have been kept in place for longer than 12 months with manufacturer approval. Obviously high service areas (high tree canopy, propensity of runoff, undeveloped areas and construction zones) will have units that will require more frequent maintenance. Although no StormExx Clean TC branded units have been installed to date, first generation Water Decontaminator units have been in service since 2005 and no recorded replacements due to wear/tear on the housing have been reported with the exception of annual filter cartridges change outs. Due to variations from sites, Filtrexx does not offer any warranties on any of their products. Terms and Conditions require periodic street cleaning and seasonal inspection of storm drains to visually see sediment/trash buildup and if necessary, remove trash inside the housing unit. Appendix D lists Inspection, Use and

Maintenance checklist for the StormExx division of catch basin inserts, and this applies to the StormExx Clean TC device as well.

3.K Substantially similar to currently listed Certified Devices

This device is substantially similar to several devices that are currently listed on the certified devices list. Table 4 presents these similar devices and listed differences including material, structural assembly and any differences that impact performance of the StormExx Clean TC versus the substantially similar devices listed. As mentioned previously, Filtrexx has a licensed to manufacture the Water Decontaminator, and is currently marketing the original Water Decontaminator as StormExx and hope to introduce the StormExx Clean Trash Capture as an updated version that meets Trash Implementation Program guidelines in California.

Table 4- Substantially Similar Certified Devices
StormExx Clean Trash Capture Device Application Submission

Model	Similar	Differences
Inventive Resources Inc. *Water Decontaminator TCU*	• Both are a cartridge/screen type with a housing that collects and holds trash/debris. • Support frame that fits under grate, attached to housing • Has the ability to be offset to accodomate a larger access portal. • Can be used for new and existing catch basins. • Made of similar materials and similar priced. • Drop in unit, makes it easy to replace cartridge, clean housing. • Both have replaceable filter cartridge • Provisions for vector control accessibility.	• Has sales team throughout California and the United States. • Drop in unit only, not chained. • Composted based media for filter cartridge • Drop in unit allows for ease in maintenance, saving labor time.
Revel Environmental Manufacturing Inc *REM-1 Triton BioFlex Drop Inlet Trash Guard*	• Both are a cartridge/screen type with a housing that collects and holds trash/debris. • Support frame that fits under grate, attached to housing • Can be used for new and existing catch basins. • Made of similar materials, similar priced. • StormExx Clean TC is simple to clean and replace filter cartridge.	• REM unit has a large center opening for overflow, while StormExx Clean TC has a perforated screen above the housing for trash capture treating, up to the design flow rate. • StormExx Clean TC has a deflector to direct all runoff into housing. • StormExx Clean TC has a 3/16" (4.83mm) mesh trash capture screen that extends above the top of the housing rim perimeter. • StormExx Clean TC cartridge/absorber is 10" diameter by 18" tall and contains approximately 1200 cubic inches of filter media. Custom and site specific cartridges are available. • StormExx Clean TC low flow runoff passes through deep bed loading media cartridge and through a perforated pipe in the center of the cartridge and water exits out the bottom of the housing. The REM unit allows filtered

KriStar Enterprises Inc. *KS-8HF Flow Gard®Perk Filter*	• Replaceable cartridge for filtering low flow rates, a trash capture screen above the top rim of the cartridge for trash capture. • Made of similar materials. • Both have a large air gap between the support deflector and top edge of the trash capture screen that extends above the top of the housing. • StormExx Clean TC is simple to clean and replace filter cartridge.	water to mix with the overflow water in the center of the cartridge. • Provisions for vector control accessibility. • Price point for StormExx Clean TC is a fraction of this equivalent device. • StormExx Clean TC can be used on both new and existing catch basins, while this equivalent device requires a special vault/catch basin in order to work. • Provisions for vector control accessibility.

Installations and servicing of the StormExx Clean Trash Capture version of this device are pending until full certification is issued by State Water Resources Control Board (SWRCB) and Mosquito and Vector Control Association of California (MVCAC). .

Filtrexx offers maintenance and service contracts through a partnership with Inventive Resources Inc., a licensed engineering contractor, to provide the option for municipalities on servicing brand units and specialized designs. IRI has installed and services thousands of Water Decontaminator branded catch basin units, throughout California and is ready to install StormExx brand catch basin devices.

4.0 INSTALLATION INFORMATION

Catch basins with shallow depths can be provided with custom sizes to accommodate the frame type, be it round or rectangular, along with modified size filters, trash capture screens to allow head clearance. Custom size and shape units can be provided for other special applications. Appendix A includes a sizing guide to properly procure a StormExx Clean TC unit.

4.A Installation Considerations

When preparing an installation, it is best practice to sweep around the perimeter of the catch basin to not introduce debris into the drainage system. All debris that is swept up should be disposed of in an approved manner. Collected leaves, grass clippings, sediment, debris and spent filter cartridges that are not considered hazardous may be disposed of in on-site trash bins if approved by client. Cartridge disposal shall be in accordance with applicable rules and local regulations.

The StormExx Clean TC unit is easily customizable; we stock a variety of sizes. Typically, a unit configuration is similar to that shown in Appendix A drawings. All standard StormExx Clean TC units include support framing to suit the catch basin frame, filter and housing. Standard housings are nominal 15 gallons capacity and can hold up to 100 pounds of sediment. Filter /Absorber cartridges include a variety of filter Media and may include recycled forest products, activated carbon, fine fiber poly, composted materials and oil sorbents. Approximately 1,200 cubic inches of filter media is included in the cartridge. The nominal 10” diameter by 18” tall cartridge covered in a fabric mesh screen includes a perforated drain pipe in the center to allow cartridge treated water to exit the bottom of the housing. Weep drain provisions in the

bottom of the housing prevent standing water in the housing. Custom units can be provided in almost any size to suit the application. Allow up to 40 gpm flow rate for the standard filter/absorber cartridge.

4.B Device Installation Procedures

Installation is simple and can be completed within minutes. Typical installation procedures include:

1. Place a non porous fabric and a heavy mil trash bag near the catch basin you will service.
2. Sweep up around the catch basin any debris that might fall into the catch basin and place in trash bag.
3. Remove grate.
4. Insert frame into catch basin. (frame comes already chained to housing, drop in unit simply slips into funnel)
5. Place grate cover securely back on catch basin.
6. Remove and dispose of trash, sediment swept in an approved manner.

Appendix C has a checklist for cleaning and inspecting StormExx brand catch basin devices.

4.C Methods for diagnosing and correcting installation errors

Environmental conditions vary in all sites; therefore no catch basin filter device is perfect, limitations due exist. These limitations include depth of catch basin to allow for sufficient pressure head and trash containment inside the filter housing and seasonal cleaning, preferably before the first flush and after leaves have dropped for the season. Areas with more wooded and denser tree canopy would require a more intense street cleaning regimen and leaf drop check to ensure the catch basin is free of leaf debris.

Older catch basin may have rust present along the support lip, if that is the case, installers will need to use a steel brush to clean the area free of rust so device can sit evenly. (See Image 10)

A regular street cleaning and catch basin filter inlet inspection schedule is essential in ensuring optimum performance of this device. At a minimum, catch basin insert filters should be inspected to make sure that they are not full, or cartridges spent before the first flush and after heavy leaf fall. Cartridges should be replaced approximately every twelve months, preferably right before the start of the rain season. The most important times to have the catch basins cleaned are in the Fall and Spring. Leaves and other debris fall through the grates into the catch basin filter throughout the year, but more so after the winter months and during the fall when the trees are losing their leaves. Regular inspections and cleaning will minimize the amount of sediment and debris in the housing. Removing the captured leaves and grass before they decompose greatly extends the filter/absorber cartridge life. Sediment collected in the housing should be removed before it reaches 8 inches in height.

5.0 OPERATION AND MAINTENANCE INFORMATION

Maintenance frequency for the device will ultimately be determined by the site environmental and storm water runoff conditions present. All locations are different and offer a variety of environmental influences.

5.A Device Inspection Procedures and Inspection Frequency Considerations

Inspections of StormExx Clean TC devices should be conducted semiannually by the municipal district maintenance staff. Filtrexx International and IRI began conducting research to test the performance limitations of its products in a number of other storm water and erosion control applications. Over the years Filtrexx has learned the following for improving performance and extending service life of its products:

1. Encouraging the street sweeper to remove sediment, landscaping debris, leaves and grass clippings in the roadway leading to the catch basins. This helps extend the life of the filter cartridge and reduces sediment build up in the housing.
2. Making service inspections during leaf fall and removing leaves before they decompose extends filter life. The best time for inspections is before leaf drop and before rain season.
3. On installations at new construction areas, construction materials, plaster and landscaping debris can quickly cause the standard filter/absorber cartridge to plug up. A fine mesh construction strainer, in place of the standard cartridge can be placed over the riser pipe during the active construction period and replaced with a filter/absorber cartridge when construction is complete. The housing may need to the emptied of sediment several times during the construction period. An external fine mesh strainer fabric may also be temporally placed over the grate for certain periods of construction.
4. Established sites may have very little sediment and debris entering the catch basins. Keeping roadways clean reduces service costs.
5. Industrial sites may have very specific needs that include high levels of zinc from truck tires, fencing and metal roofing; or oil and grease from vehicles; or dust and chemicals from processing activities. In these cases, consulting with client in advance can lead to providing site specific media in the filter/absorber cartridges; or temporary berms or pads around grates; and special trash capture needs.
6. Even through the filter/cartridge look clean after a year it is recommended that annual replacement occur to ensure maximum efficiency in keeping contaminants out of the storm drain system.
7. Video inspections of storm drain piping where prior generation models has been used show virtually no sediment or trash accumulation in the pipelines. Previous to installation of these inserts, the storm drain pipelines required very costly cleaning and often times required road closures while vactor trucks were mobilized on the site.
8. Observations of a number of catch basin inserts typically show vast differences in accumulation of sediment and debris. Due to roadway slopes, distance between basins, angle of roadway and many other factors, it causes some catch basins to receive very high flow rates with high levels of sediment while others receive a fraction of the flow and sediment. The higher flow catch basins may require more frequent inspection and cleaning.

9. If a storm distribution system is needing CCTV inspection or a procedure requiring a Vactor Truck, the unit can easily be removed to allow for access for maintenance activities.
10. If simple access is needed, a larger viewport/access panel has been added to the deflector/top portion to allow for maneuverable access by municipal service operators and mosquito/vector agents.

Appendix B has a sample Inspection log sheet that may be useful in monitoring inspections, maintenance and cartridge replacement change outs. Several municipalities also translate this data into their GIS database and can easily query locations were inspections are due.

5.B Maintenance Procedures including necessary equipment and materials

We recommend periodic inspections following installation to determine site specific maintenance and trash/pollutant loading characteristics. Typically, equipment needed to adequately perform maintenance on the StormExx Clean TC unit includes basic hand tools including nonporous mat, heavy mil trash bags, broom, small shovel, manhole cover/grate handpick, trowel. While doing maintenance it is a good to have on hand one replacement cartridge in case a unit might need a replacement. If inspections tag a device full with the threshold of sediment, cleaning maintenance can be conducted. If sediment or trash accumulation is observed inside the housing during an inspection, housings should be cleaned out when sediment and debris accumulation is approximately four (4) to eight (8) inches. Cleaning the housing is relatively simple, as illustrated in images 4 and 5 previously. Typical cleaning of a StormExx Clean TC unit includes:

1. Place a nonporous fabric and a heavy mil trash bag near the catch basin you will service.
2. Sweep up around the catch basin any debris that might fall into the catch basin and place in trash bag.
3. Remove grate.
4. Lift housing out and place trash bag over the unit. Lift housing and let contents of housing fall into trash bag. Tie bags appropriately.
5. If a new cartridge is needed, replace filter cartridge at this time.
6. Place grate cover securely back on catch basin.
7. Remove and dispose of trash, sediment and spent cartridges in an approved manner.

All StormExx units have company/reorder information on the device. It is good practice to always have extra replacement cartridges onsite in case one is needed. To order replacement cartridges, see company information from Filtrexx attached on the units, or by contacting your local Filtrexx representative through www.filtrexx.com

5.C Effects of delayed maintenance on device

Every location has different environmental conditions. Areas with heavier tree canopies such as residential areas tend to have far more leaf drops. Maintenance is a key to have optimal performance in our devices. If maintenance is delayed or ignored sediment will accumulate.

Many of the first generation units (Water Decontaminator) have been in service for over twelve (12) years with a semiannual maintenance schedule and replacement of filter cartridges as needed. There have been no significant issues to any of the units installed in the last twelve years. Unit housing, appurtenances and links have all held up well and are structurally sound. No clogging has ever been reported. These units were historically inspected twice a year, and if needed, were cleaned at the time of inspection; filters were replaced at least every twelve to thirty six months, as needed. Areas with heavier trash and sediment accumulation often times see more frequent cartridge replacements and areas with no debris are clean. Filtrexx International recommends annual and semiannual filter replacements depending on site conditions. Obviously, construction sites heavy tree canopied areas, and areas with limited street sweeping will likely require more frequent filter cartridge replacement and housing maintenance.

5.C.1 Structural Integrity

As mentioned at the beginning of this section, periodic inspections are important in ensuring optimum performance of this device. The housing should be inspected and cleaned out whenever eight inches of sediment is accumulated. In normal scenarios, inspections should be conducted twice annually, and housing should be cleaned out at least once per year. If slow flow is observed, replace filter cartridge. The StormExx Clean TC device is designed to hold up to 100 lbs. of sediment and debris. If excessive weight is encountered in the unit, this can compromise the support frame and risk deforming support frame. In addition, it is more difficult to retrieve an excessively heavy device for cleaning and may require a lifting mechanism for retrieval or a two person lift team.

5.C.2 Performance

If excessive sediment is encountered, it can greatly decrease flow through system therefore impacting performance of unit. Areas with heavy construction activities are encouraged to abide by cleaning practices included increased street sweeping as heavy sediment greater than 15 gallons/100 lbs can potentially blind a unit. No flooding issues have been noted. No filter blinding issues have been noted in previous models.

5.C.3 Odors

To date, no odor issues have been noted by any of our first generation installations or during service maintenance.

5.D Device maintenance and Vector Control Accessibility

Public health and safety are a major component of storm water management. Flooding, Design integrity and mosquito management is essential for public safety and prevention of disease transmission. To date, no vector issues have been noted. However, that does not mean that periodic maintenance should be overlooked. Our team performed some minor modifications to the StormExx Clean TC to accommodate more accessibility and least amount of labor required to reach the catch basin below. Modifications targeted included accessibility for inspection, sampling and treatment for mosquito and vector technicians. The StormExx TC Clean filter housing will be offset, when feasible to allow for a large viewing portal. The retractable door

viewing portal will open downward as shown on Figures 3 & 4, allowing for inspection from above the grate. If for some reason municipal crew needs access to the storm drain for inspections, CCTV or vactor truck operations the trash capture device can easily be removed in its entirety within a few minutes as illustrated in the installation and maintenance instructions in Attachment C.

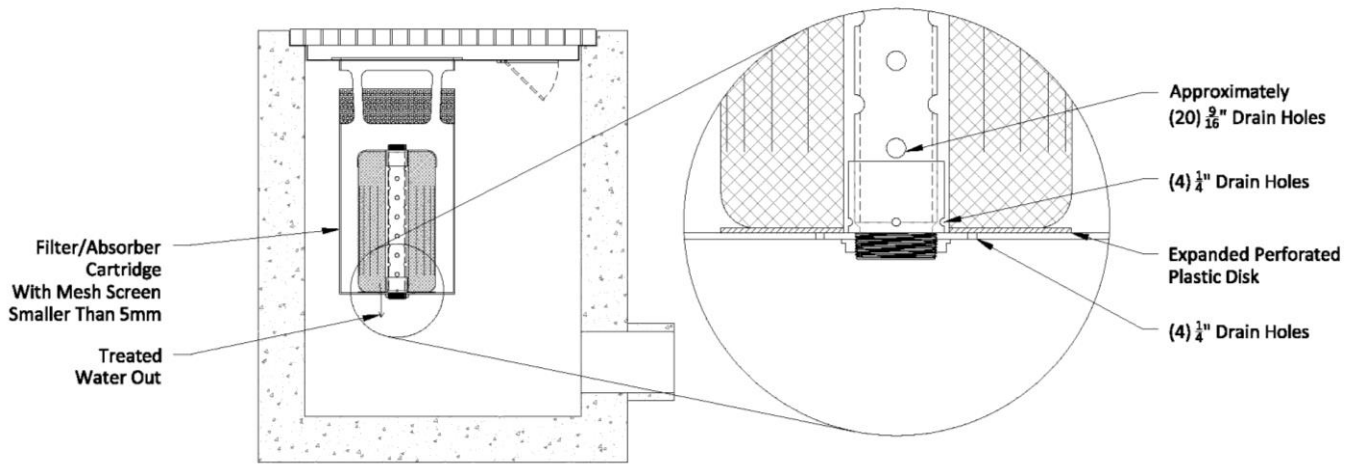
5.D.1 Vector Breeding, Accessibility by Mosquito Vector Control Personnel

Weep and Drain holes in the bottom of the housing help prevent standing water in the housing should the filter cartridge become plugged. This prevents unwanted mosquito and vector issues associated with standing water in the housing. If accumulation of trash and debris, particularly caked sediment is not seasonally cleaned, this can cause reduced flows. Weep and drain holes are designed into the housing to minimize standing water and breeding grounds for mosquito and other vector issues. Redundant drainage holes are placed on the standpipe of the housing unit as shown in Figure 3 to minimize stagnant water and continual drainage no matter the height of trash accumulation. Drainage holes within standpipe are approximately four (4) 1/4 inch and twenty (20) 9/16 inch, all at varying heights. Additional screened drainage holes at the bottom of the housing, below the filter cartridge also ensure complete evacuation of runoff water. It is very important to follow a periodic inspection of devices to ensure no stagnant water. Our trash capture devices are designed to drain completely following a storm event and not hold stagnant water. In most cases, housings have drained completely within minutes after a rain event.

Authorized maintenance workers can easily remove the StormExx Clean TC device to provide service to a catch basin, no special tools are required, simply lift grate to access device and remove 20-lb filter cartridge or clean the housing. A second option is to simply access viewport on the side of the unit. Space permitting, the StormExx Clean TC device can be offset to one side and the access viewport will have an approximate clearance of 6” to accommodate sampling with tools such as a larvae dipper cup as illustrated in Figure 4. The access viewport allows Mosquito and Vector Control agents’ access into the storm drain without removal of device to view conditions and deposit larvicide without impeding normal mosquito abatement procedures inside the catch basin or the trash capture device, see Figure 4. Viewport/access port images are also attached to Appendix A in the images section. Viewport has a flap door that can be opened easily. Flap door sits flush and retracts when not in use. Appendix A has screenshots of a video file that was submitted to Mosquito and Vector Control Association of California (MVCAC) for visual purposes on access for the curb inlet and also general accessibility.

The trash capture device will not hold water if proper maintenance conditions are followed. Figure 5 illustrates the different models available that offer the access viewport with automatic retractable flap door. Appendix A includes cut sheets for the device in-situ.

Figure 3- Mosquito Abatement and Vector Control Accessibility- Drain Holes
StormExx Clean Trash Capture Device Application Submission



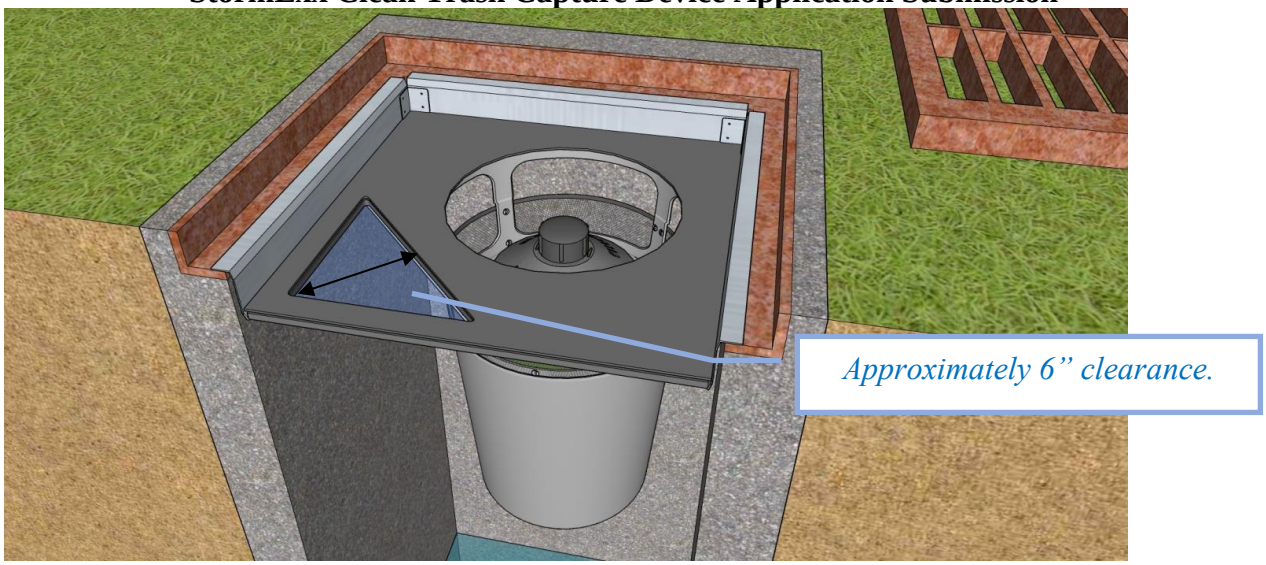
5.D.2 Letter from the Mosquito Vector Control Association of California or the local mosquito vector control district

A package with StormExx Clean TC information was been submitted to Mosquito and Vector Control Association of California (MVCAC) Trash Capture Review team and has received approval based on the amended changes to this application. The MVCAC letter of approval is included in Appendix B in addition a copy of this report will be sent to MVCAC for their records.

5.E Repair procedures of structural device components

Any structural issues of device should be addressed to Filtrexx International the manufacturer. In most cases a replacement can be sent immediately or instructions on field repairs can be provided. Depending on the location, a representative may be able to stop by and remediate the issue. A Filtrexx representative can be contacted at 877-542-7699.

Figure 4-Mosquito Abatement and Vector Control Accessibility-Sampling Clearance StormExx Clean Trash Capture Device Application Submission



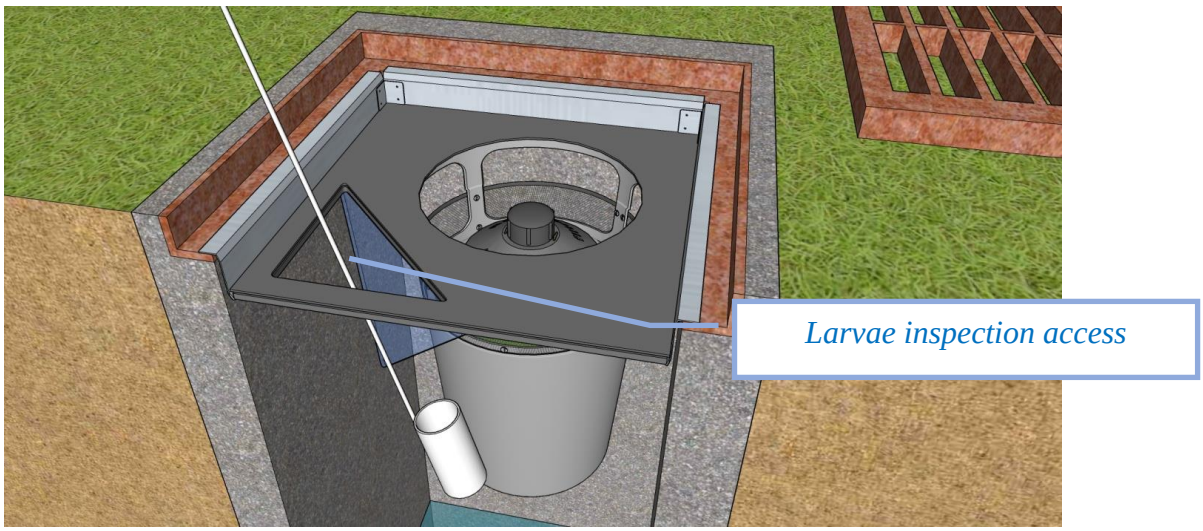
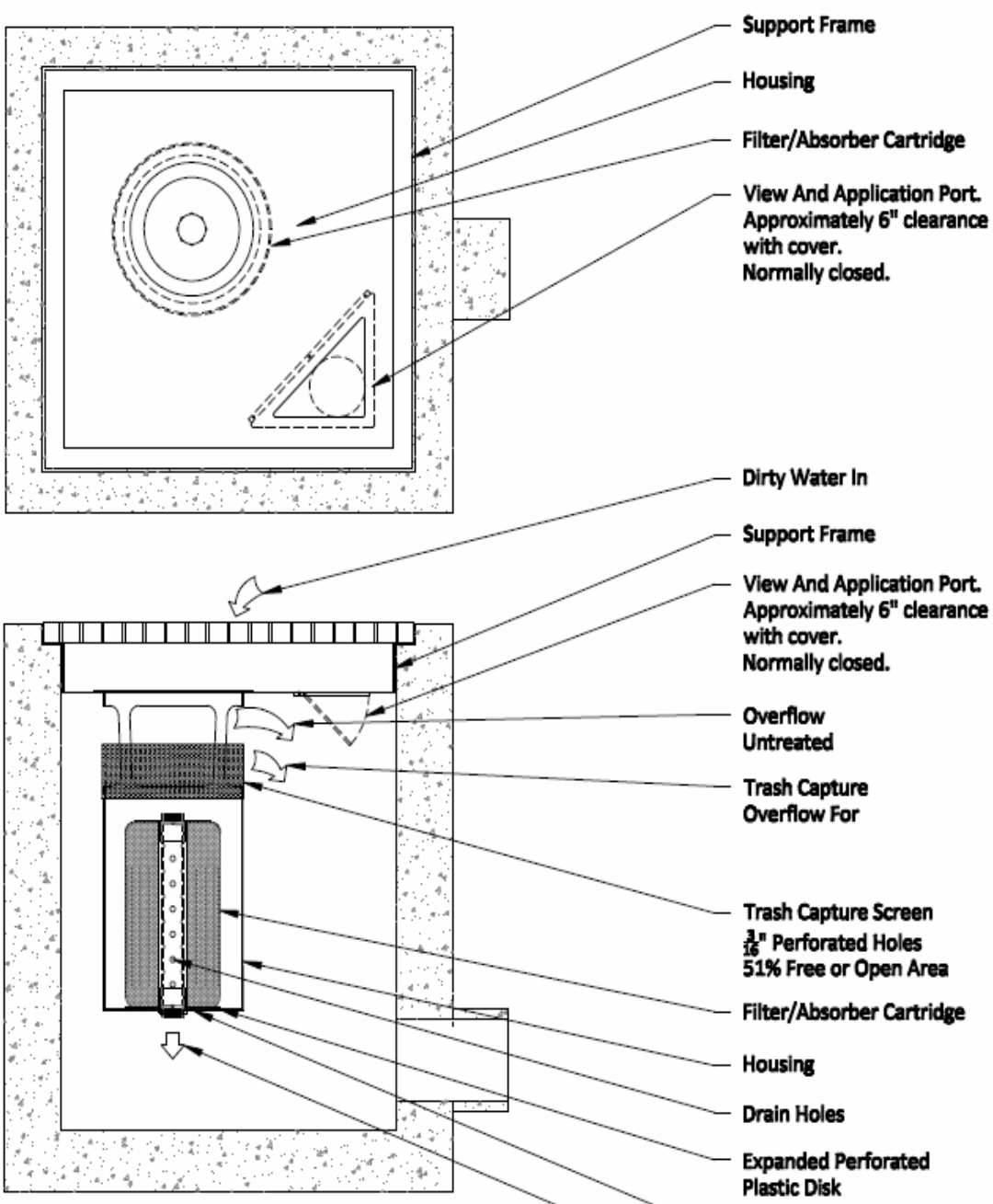


Figure 5-Mosquito Abatement and Vector Control Accessibility- Access Viewport StormExx Clean Trash Capture Device Application Submission



NOTES:

1. All dimensions are nominal size in inches.
2. Support frame can be made to fit catch basins from 12" to 48".
3. Trash capture screen height changes depending on model number.*
4. Access area shall be approximately 6" clearance, whenever feasible.

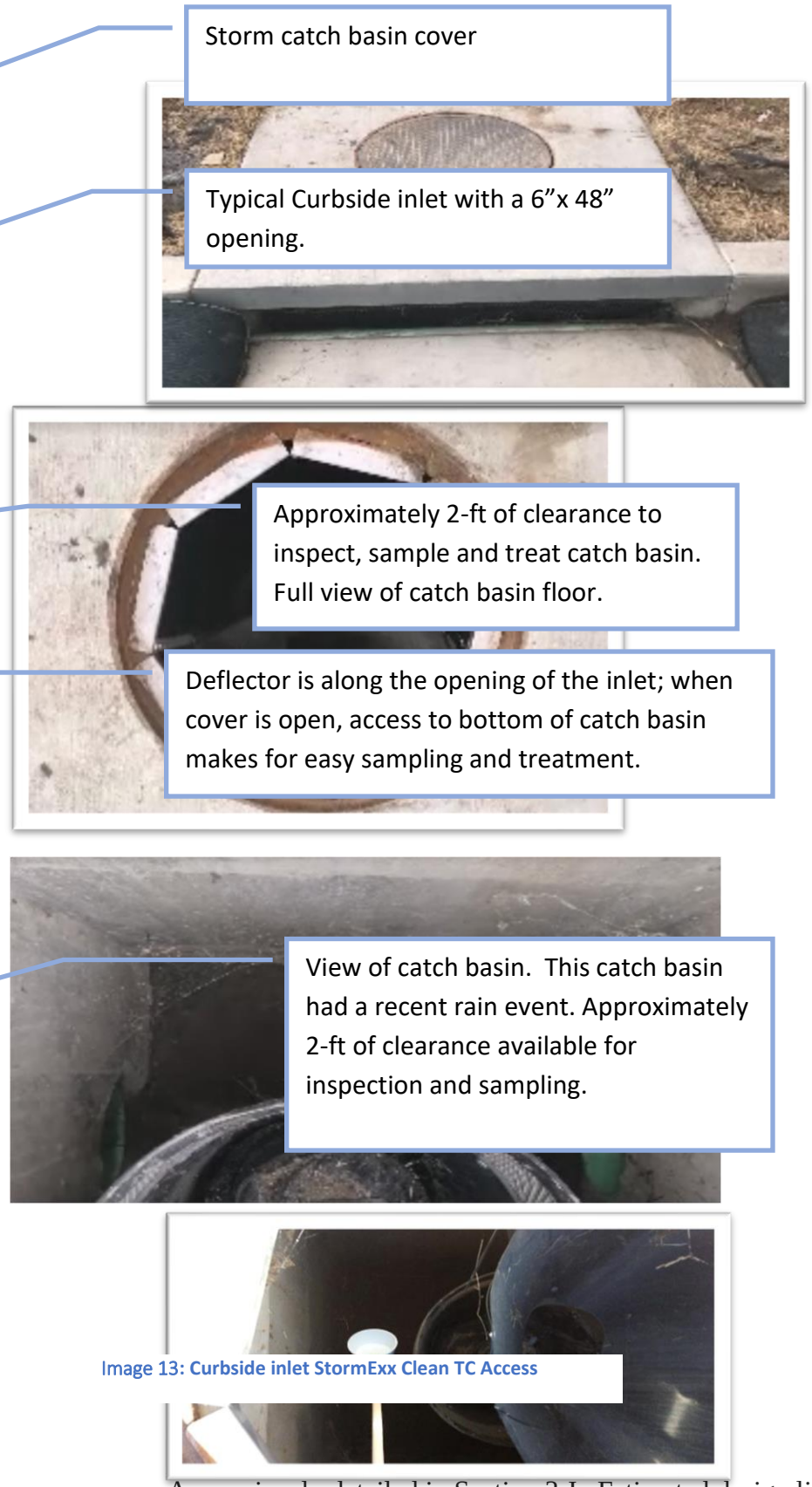


Image 13: Curbside inlet StormExx Clean TC Access

6.0 Reliability

6.A Estimated Design Life of Device Components Before Major Overhaul

As previously detailed in Section 3.J. Estimated design life of the StormExx Clean TC device is 10-15 years before a major overhaul. The design life is dependent on incoming runoff, debris type and periodic maintenance of the unit.

6.B Device Sensitivity to loading other than trash

On installations at new construction areas, construction materials, plaster and landscaping debris can quickly cause the standard filter/absorber cartridge to plug up. A fine mesh construction strainer, in place of the standard cartridge can be placed over the riser pipe during the active construction period and replaced with a filter/absorber cartridge when construction is complete. The housing may need to be inspected and emptied of sediment several times during the construction period. An external fine mesh strainer fabric may also be temporarily placed over the grate for certain periods of construction if appropriate.

Although this device can be used as a best management practice, limitations do exist. There is no ideal device that can capture trash and sediment without periodic maintenance. This device has been designed to reduce sediment; hydrocarbon and high degree of trash capture during the low flow or first flush rain events. The 1200 cubic inches of deep bed loading filter media within the cartridge can filter up to 40 gpm. The housing allows heavy sediment and particles to settle to the bottom for later cleaning and disposal. In heavy sediment and leave drop prone areas pre-strainers have been used to help keep leaves and grass out of the unit because they tend to blind filter surfaces when they decompose. Areas with a high concentration of fine clay in the sediment also tend to shorten cartridge life, requiring more frequent replacement.

In residential areas, not all property owners or tenants rake leaves and bag them. Filtrexx has no control on landscaping or construction activities of residents. However, leaves can go through the StormExx Clean TC device and be screened into the housing with no performance issue. The device can take up to 70-100 lbs of sediment which is approximately 10-15 gallons in volume with no issue to the structure or performance integrity. If device fills up with the maximum sediment, the unit has a bypass 3/16” (4.87mm) screen that runoff up to the design flow rate will pass through. It is recommended and referenced in the maintenance guide that the unit be inspected seasonally to ensure that excessive sediment or trash accumulation is not present.

6.C Warranty Information

Due to environmental condition variations at different sites, Filtrexx International does not offer warranty on its products, with the exception of manufacturer defects. Additional Inspection, Use and Maintenance information is included in Appendix C.

6.D Client Support Information

Filtrexx products are typically delivered and/or installed by local Filtrexx representatives. Filtrexx can provide technical support when sizing and ordering devices. A third party general contractor can easily install trash capture devices and provide inspection and maintenance. StormExx Clean TC units are lightweight, easy to install, easy to service and easy to replace the filter absorber cartridge so municipalities and clients can service the units with their own maintenance crew. Local Filtrexx representatives can provide on-site demonstration on installation, maintenance and cleaning procedures, in most cases these demonstrations are brief as installation only takes a few minutes and requires minimal basic tools. If an issue arises, Filtrexx is available by email and telephone or an in person visit with a local sales representative,

see Table 5 for general contact information, our customer care team will place in contact with a local representative.

Table 5- Filtrexx International Client Support
StormExx Clean Trash Capture Device Application Submission

Mailing Address:	61 North Cleveland Massillon Road, Suite E Akron, Ohio 44333
Company Telephone:	877-542-7699 Toll free 234-466-0810 Fax
Representative Email address:	info@Filtrexx.com

7.0 Field/Lab Testing Information and Analysis

Below are a few testing results that demonstrate the StormExx Clean TC device functions as described.

7.A Laboratory Test Method

Flow rates based on controlled in-house testing rates vary and are dependent on site specific environmental conditions. Cartridge filters flow rate range from 40 -60 gal/min based on multiple in-house controlled tests. Conservatively, maximum filter cartridge flow is set to 40 gpm. Once runoff flow reaches cartridge filter maximum flow rate, pressure head increases, and water level would potentially reach the screened bypass. Screened bypass material is Stainless steel 3/16" (4.83mm) perforated metal screen.

Housing units are a nominal 24 inches in height and screened bypass start at the top of the housing. If a housing/filter cartridge, for any reason, were to completely be blinded the flow would reach the screened bypass. The screened bypass (See Image 1) can accommodate up to 400 gallons per minute per square foot of screened area.

In house testing was completed on a portable test stand. A 3 inch diameter screened opening was placed at the bottom of a housing unit. The screened area material was 3/16" (4.83mm) perforated metal sheet screen. The opening was covered with an energy dissipater to break up the entering water flow while letting full flow without jet streams to flow through the 3 inch screened opening. The flow rate from the hose was set when the water level in the bucket was steady at 3 inches in height above the screen. The testing flow rate was then directed to a five gallon container and a timer recorded the number of seconds to fill the 5 gallon container. Multiple tests were taken, they were all at approximately 14.5 seconds. Based on 14.5 seconds to fill a five gallon container the flow rate was 20.69 gpm through the 3 inch screened opening. This further calculates to 421.72 gpm for 1 square foot of screen. This is conservatively rounded down to 400 gpm/sf of perforated screen. The screen design flow rate is 400 gallons per minute per square foot of screen. Table 6 presents maximum design flows through each of the models available in the trash capture series. Images 14 through 18 illustrate the test stand mechanism used for flow testing screen.

Table 6- Design Flow Rates Through Bypass Screen
StormExx Clean Trash Capture Device Application Submission

Model[a]	Hydraulic Capacity
TCU-2	260 GPM (.58 cfs)
TCU-4	584 GPM (1.3 cfs)
TCU-6	784 GPM (1.7 cfs)

[a] *Custom units can be provided to suit larger design flow rates. Specify desired trash capture design flow rate, based on a 400 GPM per square foot of trash capture screen. Shop drawings will be provided in advance of construction.*

Image 14: 3/16" Screen at 3 inch diameter opening.

Image 15: Energy Dissipater added to top of opening to avoid jet flow.

Image 16: Laboratory clock

Image 17: Testing Stand with air gap.

Image 18: Water flowing out of screen at 20.69 gpm

7.B Pollutant Removal

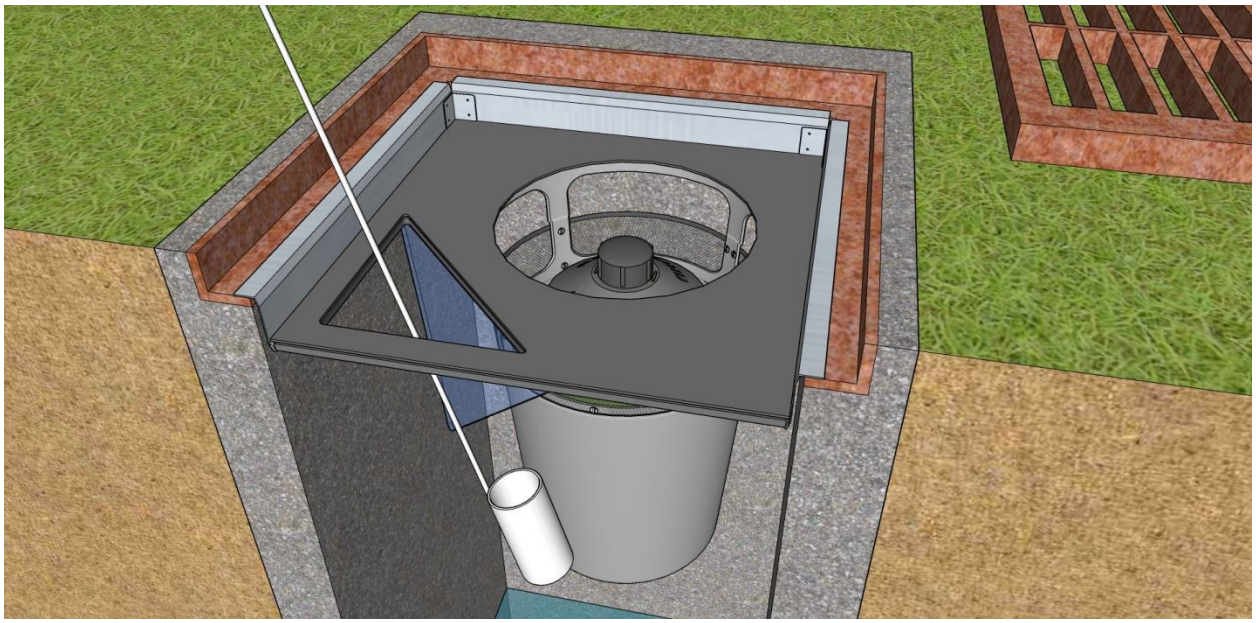
Pollutant removal is different at all locations. The filter cartridge can reduce pollutants entering the catch basin. Filtrexx International proprietary media mixes have the ability to bind fine sediments, petroleum hydrocarbons, heavy metals, pesticides, herbicides, and other pollutants, reducing their leachability, transport in runoff, and absorption by plants and introduction in water

bodies. Appendix E has laboratory results of percentage removal of different parameters based on ongoing laboratory results.

APPENDIX A
Drawings, Sizing Guides and Access Port Images

Images of drop in StormExx Clean TC variations

Images of Viewport/Access Portal for Inspections and Mosquito Abatement and Vector Control Use

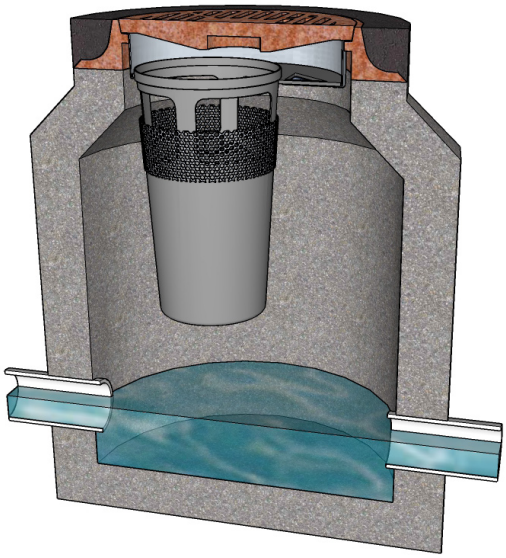


StormExx Clean Trash Capture

Trash Capture Catch Basin Insert

Patented

www.Filtrexx.com

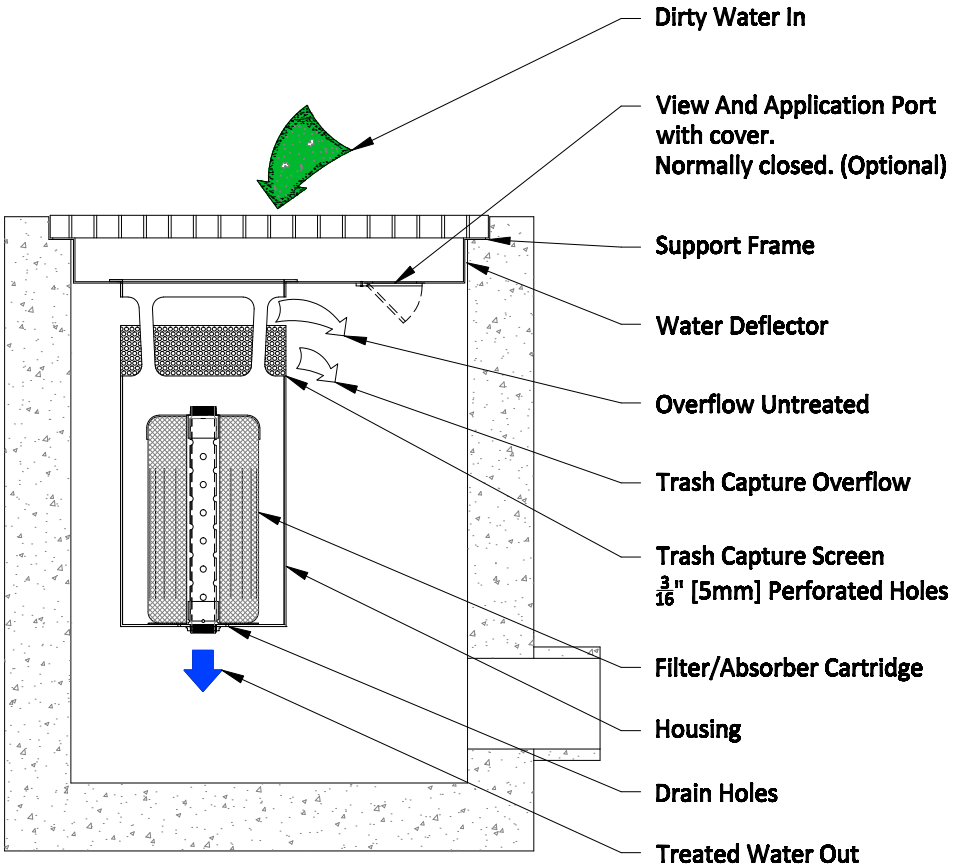


The StormExx Clean Trash Capture series is a patented, environmental product that is placed under a catch basin grate to help remove trash, sediment, oil and contaminants from run off. Oil and contaminants are captured in a disposable cartridge. The absorber cartridge uses recycled waste products, essentially fighting pollution with pollution.

Applications:

- Urban run-off
- Roadways
- Parking lots
- Industrial sites
- Manufacturing
- Maintenance areas

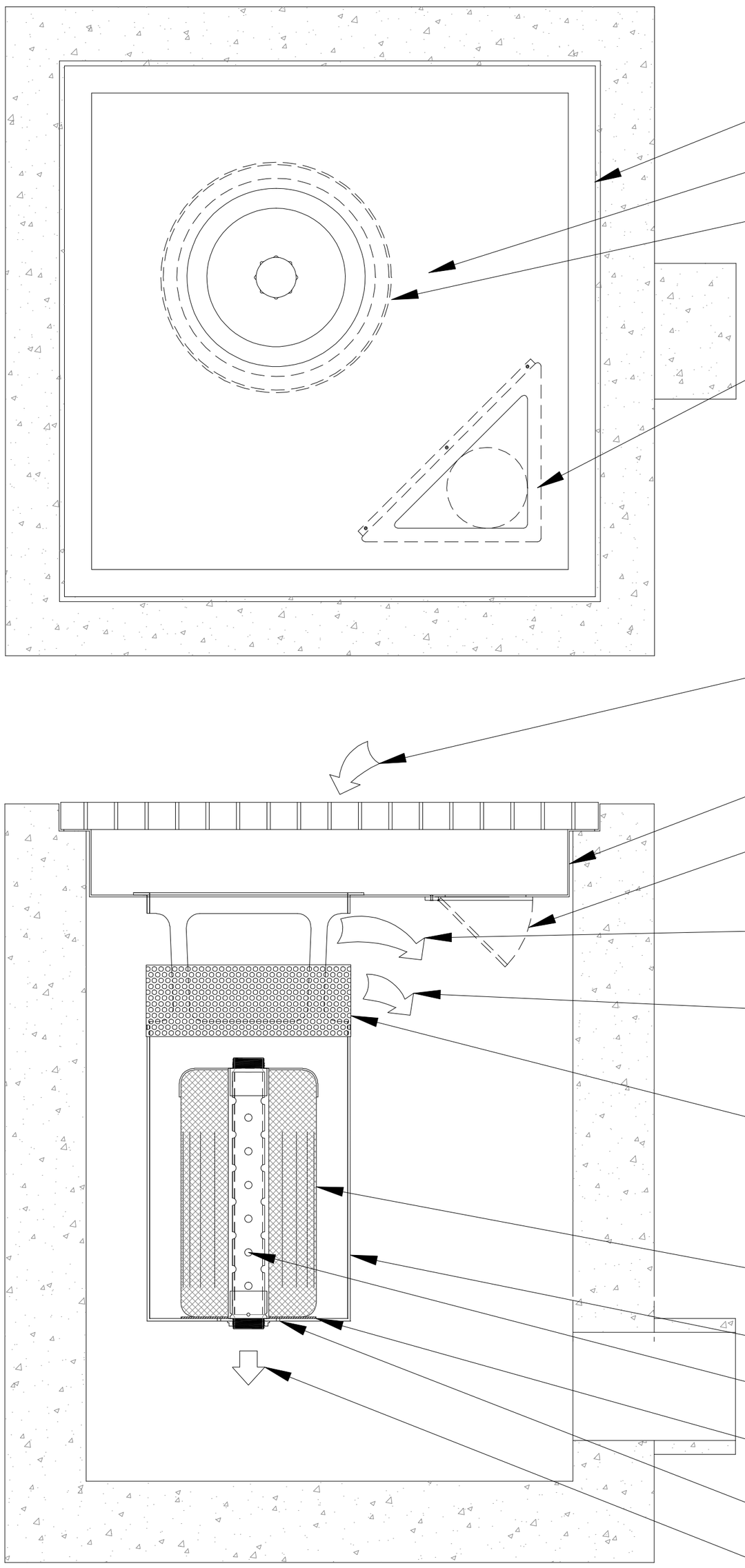
Helps clean parking lot run-off, catch basins, ponds, sumps and spills. Cleans storm run-off by screening sediment, debris and other solids into a sediment trap. Oils and chemicals are absorbed in a disposable cartridge.



*Model TCU-2, 4, 6, 6V

The StormExx Clean Trash Capture series is engineered and patented for the treatment of stormwater run off. We design our filters to meet or exceed stormwater best management practices (BMP's) and best available technology (BAT).

FILTREXX
61 N Cleveland Massillon Rd, Suite E
Akron, Ohio 44333
TEL 877-542-7699 (toll free)
FAX 234-466-0810 (fax)
info@filtrexx.com



NOTES:

1. All dimensions are nominal size in inches.
2. Support frame can be made to fit catch basins from 12" to 48".
3. Trash capture screen height changes depending on model number.*
4. Access area shall be approximately 6" clearance, whenever feasible.

Model	Flow (GPM)	Flow (CFS)
TCU-2	260	0.58
TCU-4	548	1.30
TCU-6	784	1.70

StormExx
Clean

Trash Capture

Drop Side Viewport

filtrexx® SUSTAINABLE TECHNOLOGIES

877-542-7699
info@filtrexx.com
www.filtrexx.com

DRAWING NO.

DATE 08-09-19

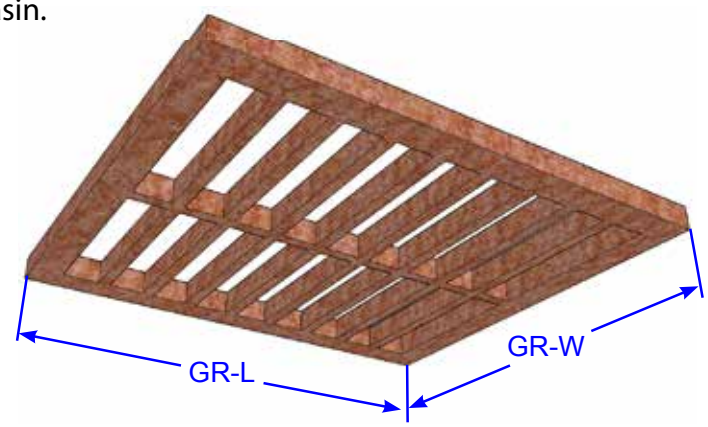
Sheet 1 of 1

StormExx®
CATCH BASIN FILTER SYSTEM

Sizing Guide: Four Sided Support

StormExx Clean Trash Capture

The following information is required for proper installation of the StormExx® catch basin filter system.
Please measure all required dimensions of grate and catch basin.



Company: _____

Jobsite (if different from above): _____

Contact Name: _____

Phone: _____

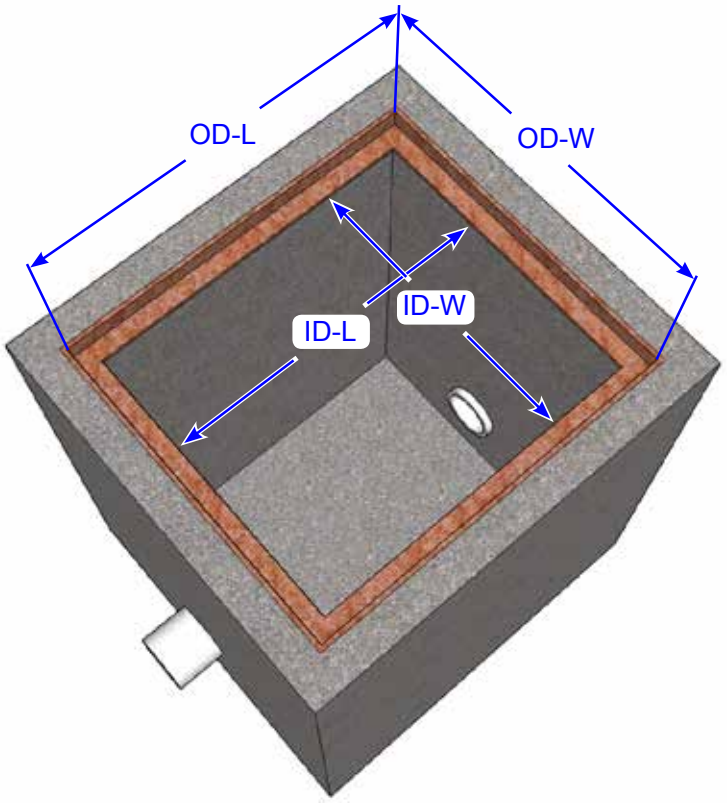
Email: _____

Ship To: _____

Address: _____

City: _____

State, Zip: _____



Rep Name: _____

Rep Phone: _____

Rep Email: _____

Inlet ID: _____

GR-L: Grate length: _____

GR-W: Grate width: _____

OD-L: Outside length of lip: _____

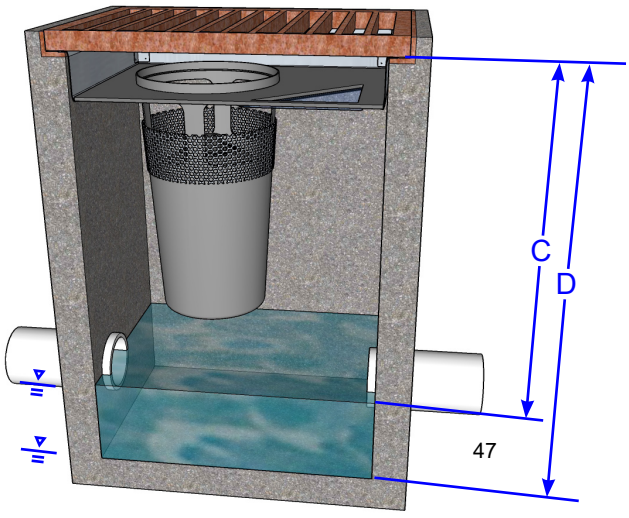
OD-W: Outside width of lip: _____

ID-L: Inside length of opening: _____

ID-W: Inside width of opening: _____

D: Depth to outflow pipe: _____

E: Depth of catch basin: _____



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Attachment 47
877-542-7699
info@filtrexx.com | filtrexx.com/stormexx

StormExx®
CATCH BASIN FILTER SYSTEM

Sizing Guide: Two Sided Support

StormExx Clean Trash Capture

The following information is required for proper installation of the StormExx® catch basin filter system.
Please measure all required dimensions of grate and catch basin.

Company: _____

Jobsite (if different from above): _____

Contact Name: _____

Phone: _____

Email: _____

Ship To: _____

Address: _____

City: _____

State, Zip: _____

Rep Name: _____

Rep Phone: _____

Rep Email: _____

Inlet ID: _____

GR-L: Grate length: _____

GR-W: Grate width: _____

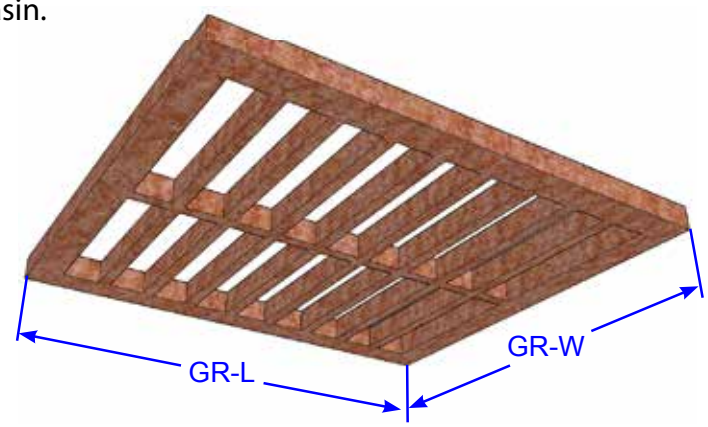
OD-L: Outside length of lip: _____

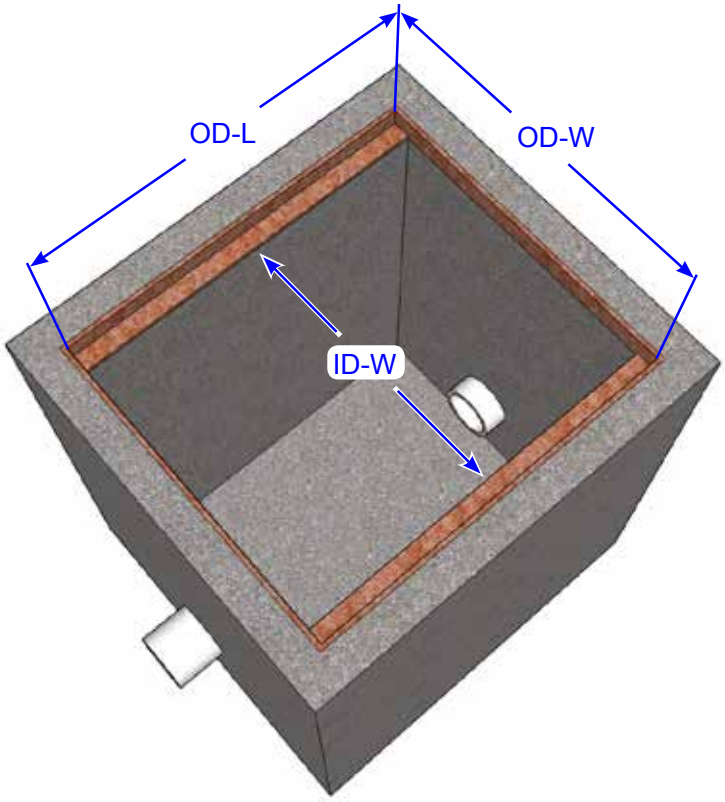
OD-W: Outside width of lip: _____

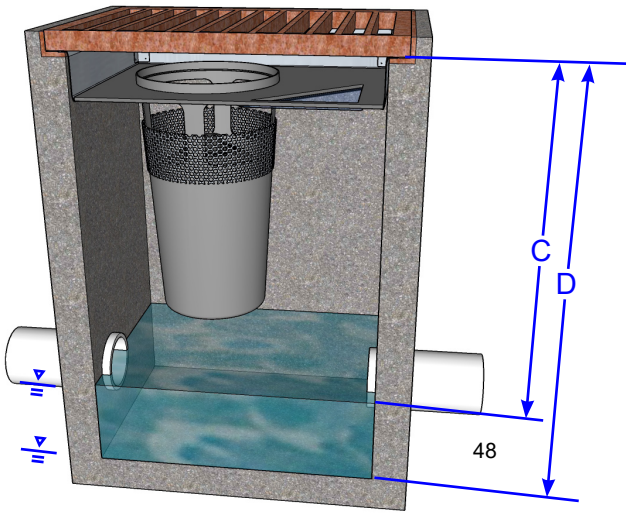
ID-W: Inside width of opening: _____

D: Depth to outflow pipe: _____

E: Depth of catch basin: _____







filtrexx® Attachment
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877-542-7699
info@filtrexx.com | filtrexx.com/stormexx

StormExx®
CATCH BASIN FILTER SYSTEM

Sizing Guide: Round Grate Support

StormExx Clean Trash Capture

The following information is required for proper installation of the StormExx® catch basin filter system. Indicate whether grate style is 1, 2 or 3. Then measure all required dimensions of grate and catch basin.

Company: _____

Jobsite (if different from above): _____

Contact Name: _____

Phone: _____

Email: _____

Ship To: _____

Address: _____

City: _____

State, Zip: _____

Rep Name: _____

Rep Phone: _____

Rep Email: _____

Inlet ID: _____

Cover Style (1, 2, or 3): _____

OD: Outside diameter of lip: _____
(For tapered frames measure smallest diameter at base of frame.)

ID: Inside diameter of opening: _____

A: Drop ring diameter: _____
(Measure largest diameter at top of ring. Does not apply to style 1 covers)

B: Drop ring depth: _____
(Does not apply to style 1 covers.)

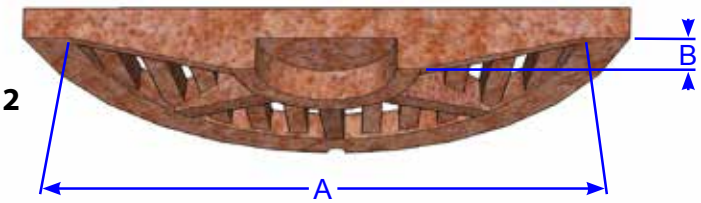
C: Depth to outflow pipe: _____

D: Depth of catch basin: _____

1

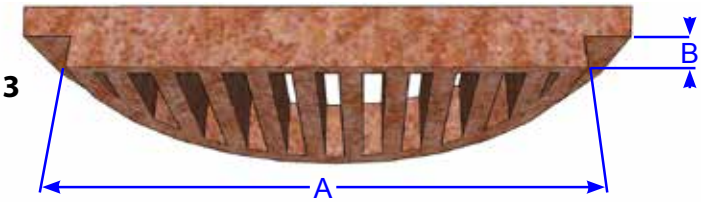
Flat Grate

2

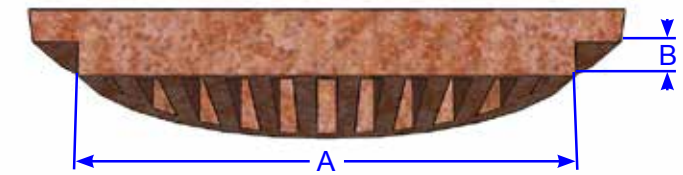


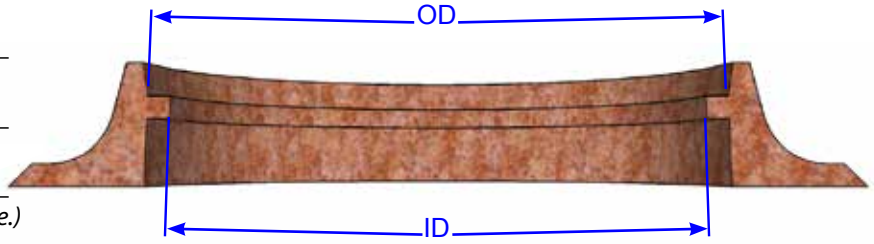
Tapered Drop Ring

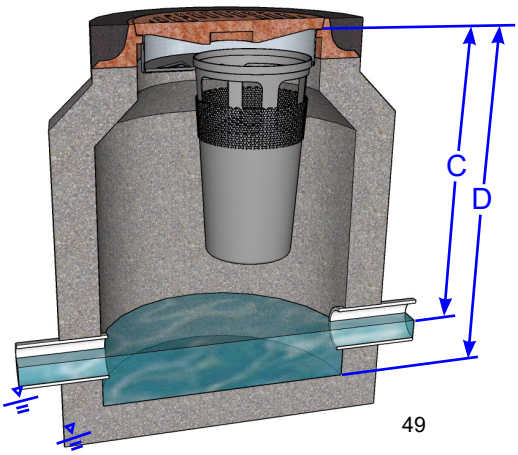
3



Square Drop Ring







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Attachment

877-542-7699
info@filtrexx.com | filtrexx.com/stormexx

SPECIFICATION SECTION: ____ Date: ____

STORM WATER TREATMENT – STORMEXX® CLEAN CATCH BASIN INSERTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the Inserts for use at existing storm water catch basins in roadways, parking lots and paved areas of the housing development and other areas as indicated on the plans and specifications. The Inserts are for the capture and removal of sediment and hydrocarbons from storm water run-off.

1. Retrofit existing Catch Basins where indicated on plans with the Catch Basin Inserts. Provide Size and Type as required.
2. Provide and install the Catch Basin Inserts where indicated on drawings.
3. Provide and install the Catch Basin Inserts in other Drain grates and Catch Basins where indicated on drawings.

1.2 DEFINITIONS

A. SS: Stainless Steel, type 304
B. HDPE: High-density polyethylene plastic.
C. PE: Polyethylene plastic.
D. PP: Polypropylene plastic.

Inserts shall include pre-manufactured HDPE housing, SS support system, filter cartridge, water deflector and leaf pre-strainer at inlet. Inserts shall be in accordance with the following requirements including other sizes and shapes necessary to accommodate non-standard catch basins including shallow depth units or where shown.

1.3 SUBMITTALS

A. Product Data: For each type of Catch Basin Insert (INSERTS) indicated, include materials of fabrication, dimensions, rated capacities, operating characteristics and general service requirements. Prior to bidding or use, manufacturer or INSERTS supplier shall provide design criteria information for effective use in this application.

B. Shop Drawings: For each Type and size of Catch Basin requiring an Insert:

1. Basin and grate or opening size include Manufacturers suggested INSERT Type.

C. Record Drawings Submittal: Upon completion of project provide an AutoCAD drawing showing all Inserts installed at Catch Basin #s on a copy of site plan provided. Provide closest house address number or identification number, if applicable.

1.4 PROJECT CONDITIONS

A. Interruption of Existing Storm Drain Systems: Do not interrupt services to facilities occupied by City or others unless permitted under the following conditions:

1. Obtain Encroachment Permit, if required by client, prior to providing any installation or on site.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Manufacturers: Subject to compliance with requirements, provide products in accordance with the performance specifications in this section.

Provide Manufacturer name, address and contact information.

2.2 INSERTS shall be specifically designed for treating storm water and the capture of sediment, hydrocarbons and other contaminants. INSERTS shall include all components and trim for a complete installation at each Type catch basin as indicated on drawings. Each Insert shall include a replaceable filter / absorber cartridge with filter media having a combined total volume of approximately 1,200 cubic inches of filter media and other features as indicated on the Manufacturer's data sheets including the following components:

A. Filter Media. Shall meet Filter Media specifications as designated by the manufacturer that target specific pollutants such as sediment, hydrocarbons, heavy metals, nutrients or bacteria.

B. Catch Basin Insert (INSERTS) Features and Characteristics include:

1. Filter Cartridge Size: Nominal 10” in diameter by 18’ high with center perforated HDPE tube. Storm water flows through media horizontally or longer on a downward path through the filter/absorber cartridge before exiting the perforated tube. The cartridge shall slip over a perforated internal drain tube that exits through the bottom of the housing. The cartridge shall contain approximately 1,200 cubic inches of various absorbent material arranged primarily in layers as noted above. The outer surface of the cartridge shall be covered with a poly strainer fabric. Cartridge shall be easily removable for replacement. Drain tube with perforations may extend above filter/absorber portion to allow a minimum flow rate to deter standing water if unit becomes plugged or blinded.

2. Nominal Flow Rate: 15-40 GPM, through clean filter/absorber cartridge. Unit features a large overflow opening area and space between housing, deflector and catch basin that allows for high overflow rates with minimum restriction during storm conditions. Overflow capable of passing several hundred GPM

3. Nominal Flow Rate with Pre-Strainer: Where leaves and other surface material are anticipated, a pre-strainer can be used. Flow restriction can occur when pre-strainer is restricted or plugged.

4. Housing: HDPE solid housing suitable for full height sediment containment and shall be nominal 15 gallons retention size. Smaller size capacity may be used on shallow catch basins. A perforated tube shall be incorporated within the housing to allow the filter/absorber cartridge to slip on for easy replacement. A locking screw-on-cap keeps cartridge in place during use. Use modified or shorter housing (with less storage, flow and filtration) where depth of catch basin is shallow or to suit basin.

5. Deflector: Each INSERT shall be fitted with a custom deflector that directs incoming water from the grate inlet to the housing. Materials include HDPE or poly sheet and or Type 304 SS sheet and frame.

C. Catch Basin INSERT Capacity and Characteristics: (For Standard 10x18 size.)
   1. Housing and frame material: HDPE and or stainless steel.
   2. Number of filter cartridges: One.
   3. Storage Capacity: Nominal 15 gallons.
   4. Outlet Drain Pipe Size: 2".
   5. Volume of filter materials: Approximately 1,200 cubic inches total.
   6. Installation Position: Vertical with air gap above housing for overflow.
   7. Special frame size may be used with two housings for a greater flow rate.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install Catch Basin INSERT in accordance with manufacturers installation instructions where indicated on plans.

B. Install SS supports to suit each Type 1, 3 or other type Catch Basin as required and set top of housing at proper level to maintain overflow feature. Modify supports to suit each actual frame size and type. Remove excess non-structural concrete at frame rim that interferes with catch basin frame.

C. Install water deflectors at inlet of each catch basin to suit each Type and size Catch Basin in order to deflect incoming water into unit housing. Coordinate with grate type and inlet opening size.

END OF SECTION 02086

3.2 SERVICE AND MAINTENANCE (ADD ALTERNATE No. 1)

A. Add Alternate to proposal: Provide costs for one (1) year of Service and Maintenance for all installed Inserts. Includes separate costs for filter replacement.

B. Service and Maintenance Plan Includes periodic inspection and or cleaning of all pre-strainers and grate areas at least every 90 days including sediment removal from housing and filter replacement when necessary. Additional drive through inspections during leaf fall and after storm events is suggested. Depending on local environmental conditions, nearby building construction and other factors, the owner and service provider may need to develop site specific service and maintenance as required for each site.

C. Quarterly Service Schedule: Minimum general service requirements.

Fall or early winter: (One Inspection) Inspect, clean pre-strainers, remove sediment in housing as required, dispose of sediment, replace cartridge, replace or repair damaged components, and clean grate area.

Note: Owner shall provide for street sweeping and general roadway and parking lot cleaning and notify service provider of any additional service needs

D. Notes and Condition:
Obtain Encroachment Permit from City or client prior to providing any Installation or service work on site if requested.

Contractor shall visit site and verify each catch basin insert for size and Type including rectangular grates and side inlet types prior to providing a proposal. Allow for variation and other conditions that may require special construction.

Coordinate installation of Inserts in new construction areas where Building Contractors provide construction strainers and sediment barriers over grates.

Service and maintenance work shall substantially follow the City Standards or manufacturers recommendation for Maintenance and Service of Catch Basins.

Standard Catch Basin INSERT cleaning for street and parking lot applications: Clean and dispose of all collected leaves, grass, sediment, gravel, debris, hydrocarbons and other collected material along with filter cartridges and place in trash containers on site for trash pick-up and disposal service by others in pre-approved landfills. Note: For industrial sites and other applications where chemicals or other contaminants require incineration or other forms of disposal, owner shall arrange for disposal in an approved manner and pay all disposal costs involved. Follow all applicable codes and local regulations.

END OF SECTION

Screenshot Images of StormExx Access Viewport Video submission

(video showsCurbside inlet configuration)

Standard Configuration



From left to right, top to bottom: Nozzle hose accessing viewport through grate, technician lifting grate to illustrate nozzle inside viewport for inspection.



From left to right: Curbside inlet has ample room to view bottom of catch basin, no obstructions.

APPENDIX B
Approval Letter from Mosquito and Vector Control Association of California (MVCAC)

MVCAC
Mosquito and Vector Control Association of California

One Capitol Mall, Suite 800 • Sacramento, CA 95814 • p: (916) 440-0826 • f: (916) 444-7462 • e: mvcac@mvcac.org

December 6, 2019

Evangelina Paoluccio
Inventive Resources, Inc
5038 Salida Blvd
Salida, CA 95368

Via email evangelina@iriproducts.com

Dear Ms. Evangelina Paoluccio,

Thank you for the submission of StormEXX Clean Trash Capture Device (Curb Inlet) for review by the Mosquito and Vector Control Association of California pursuant to the SWRCB Trash Treatment Control Device Application Requirements. The Association has reviewed the conceptual drawings for Storm EXX Clean Trash Capture Device (Curb Inlet) and verifies that provisions have been included in the design that allow for full visual access to all areas for presence of standing water, and when necessary, allows for treatments of mosquitoes.

While this verification letter confirms that inspection and treatment for the purpose of minimizing mosquito production should be possible with the Storm EXX Clean Trash Capture Device (Curb Inlet) as presented, it does not affect the local mosquito control agency's rights and remedies under the State Mosquito Abatement and Vector Control District Law. For example, if the installed device or the associated stormwater system infrastructure becomes a mosquito breeding source, it may be determined by a local mosquito control agency to be a public nuisance in accordance with California Health and Safety Code sections 2060-2067.

"Public nuisance" means any of the following:

1. Any property, excluding water, that has been artificially altered from its natural condition so that it now supports the development, attraction, or harborage of vectors. The presence of vectors in their developmental stages on a property is prima facie evidence that the property is a public nuisance.
2. Any water that is a breeding place for vectors. The presence of vectors in their developmental stages in the water is prima facie evidence that the water is a public nuisance.
3. Any activity that supports the development, attraction, or harborage of vectors, or that facilitates the introduction or spread of vectors. (Heal. & Saf. Code § 2002 (j).)

Declaration of a facility or property as a public nuisance may result in penalties as provided under the Health and Safety Code. Municipalities and the vendors they work with are encouraged to discuss the design, installation, and maintenance of stormwater trash capture devices with their local mosquito control agency to reduce the potential for disease transmission and public nuisance associated with mosquito production.

Sincerely,

Bob Achermann,
MVCAC Executive Director

MVCAC
Mosquito and Vector Control Association of California

One Capitol Mall, Suite 800 • Sacramento, CA 95814 • p: (916) 440-0826 • f: (916) 444-7462 • e: mvcac@mvcac.org

December 6, 2019

Evangelina Paoluccio
Inventive Resources, Inc
5038 Salida Blvd
Salida, CA 95368

Via email evangelina@iriproducts.com

Dear Ms. Paoluccio;

Thank you for the submission of StormEXX Clean Trash Capture Device (Grate Install) for review by the Mosquito and Vector Control Association of California pursuant to the SWRCB Trash Treatment Control Device Application Requirements. The Association has reviewed the conceptual drawings for Storm EXX Clean Trash Capture Device (Grate Install) and verifies that provisions have been included in the design that allow for full visual access to all areas for presence of standing water, and when necessary, allows for treatments of mosquitoes.

While this verification letter confirms that inspection and treatment for the purpose of minimizing mosquito production should be possible with the Storm EXX Clean Trash Capture Device (Grate Install) as presented, it does not affect the local mosquito control agency's rights and remedies under the State Mosquito Abatement and Vector Control District Law. For example, if the installed device or the associated stormwater system infrastructure becomes a mosquito breeding source, it may be determined by a local mosquito control agency to be a public nuisance in accordance with California Health and Safety Code sections 2060-2067.

"Public nuisance" means any of the following:

1. Any property, excluding water, that has been artificially altered from its natural condition so that it now supports the development, attraction, or harborage of vectors. The presence of vectors in their developmental stages on a property is prima facie evidence that the property is a public nuisance.
2. Any water that is a breeding place for vectors. The presence of vectors in their developmental stages in the water is prima facie evidence that the water is a public nuisance.
3. Any activity that supports the development, attraction, or harborage of vectors, or that facilitates the introduction or spread of vectors. (Heal. & Saf. Code § 2002 (j).)

Declaration of a facility or property as a public nuisance may result in penalties as provided under the Health and Safety Code. Municipalities and the vendors they work with are encouraged to discuss the design, installation, and maintenance of stormwater trash capture devices with their local mosquito control agency to reduce the potential for disease transmission and public nuisance associated with mosquito production.

Sincerely,

Bob Achermann,
MVCAC Executive Director

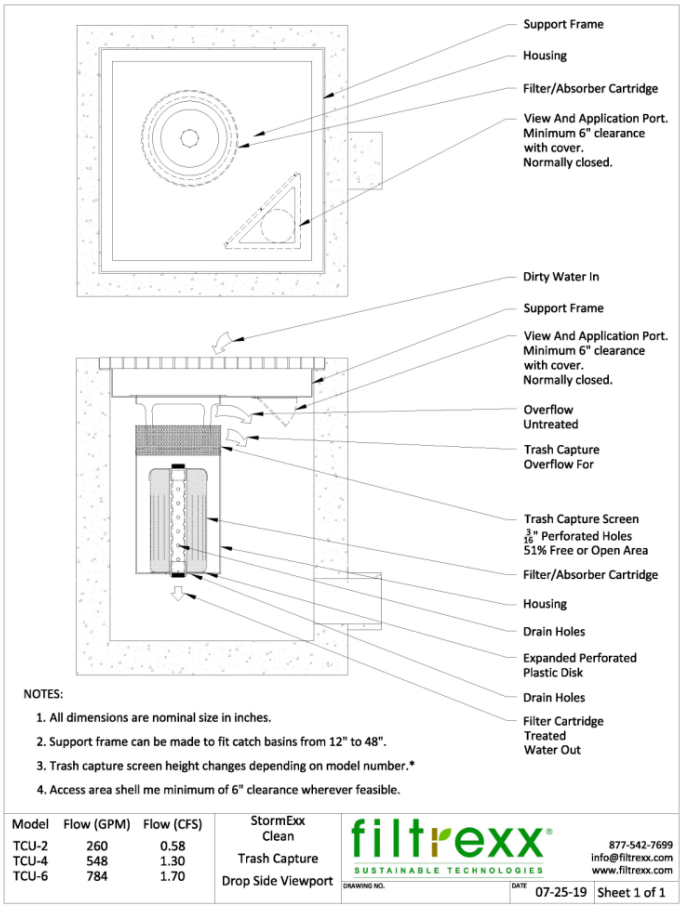
StormExx Clean TCU has been approved by the State Water Control Regional Board (State Water Board) on 7/2018. Storm Ex Clean TCU has been approved tentatively by Mosquito Vector Control Association of California (MVCAC) with some conditions of approval as follows:

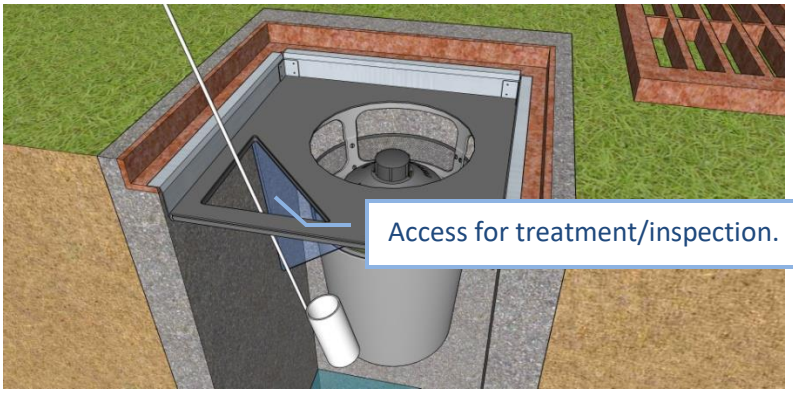
1. Viewport currently opens outward and in order to perform larval inspections it would require lifting the grate. Conditional approval includes portal door to open towards the inside of the storm drain (downward). It would need to be spring retractable or similar method in order to close the viewport and not allow trash 5mm or greater to enter per requirements of the trash capture mandates.

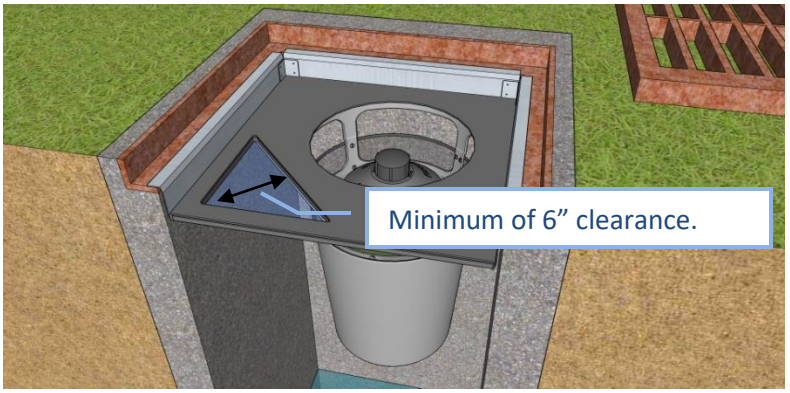
The difference between the current approved design by the State Water Board and the conceptual design conditionally approved by MVCAC is described below.

Element	State Water Board	MVCAC
Viewport size	2-4”round or square size	Opening with the apex at 6”, when feasible.
Viewport door	Opens downward	Opens upward (they request to open down).
Housing location	Housing is centered	Housing is offset to allow for a larger MVCAC access for inspections/treatment when feasible.

Below are two exhibits that depict the device MVCAC has conditionally approved.







APPENDIX C
Inspection, Use and Maintenance
Cleaning, Maintenance, Filter Replacement Log (Sample)

Location	*ID*	*Install Date*	*Installation Notes*	*Service 1, Date*	*Service 2, Date*	*Filter Change, Date*	*Service Notes*	*Filter Change Notes*

Full Version

StormExx® CLEAN Catch Basin Inserts
Checklist for – Inspection / Use / Maintenance

StormExx® catch basin inserts are used to intercept storm water as it passes through the grate. Heavy sediment items settle to the bottom of the housing and the collected water starts to rise and pass through the filter cartridge. As the rainfall rate increases the water level may rise to the top of the cartridge. The treated flow rate at this point may be up to 65 gpm. During high rainfall flow events excess untreated water will overflow the housing.

Note: The most concentrated contaminants in storm water generally occur at the beginning of each rain event. This may be considered the first flush and may be the first 10 percent on storm water entering the grate. Each site and installation may vary widely as to exposure to sediment, construction debris, landscaping and other pollutants. With periodic site inspections the proper care and maintenance frequency may be determined for a proper service schedule.

The StormExx® inserts should be inspected during each season before and after rain events to insure that the insert filter assembly is ready to accept and treat storm water run-off.

- Keep the grate area, within 6' of grate area, clean and free of leaves, grass clippings, sediment and debris to minimize these contaminants from entering the unit housing. This is especially important during leaf fall season as decaying leaves on the filter cartridge can shorten filter life.

- Periodic visual inspections involve looking through the grate to see if any standing water exists. The collected water should drain through the filter cartridge that is designed for deep bed loading. As it becomes blinded or plugged with sediment the flow rate capability will be reduced. Replace filter cartridge if standing water is in the housing.

- In high rainfall flow areas where large amounts of sediment enter through the grate it may be necessary to change the filter cartridge up to 4 times a year. In low rainfall flow areas only one or two cartridge filter change-outs per year may be necessary.

- If sediment reaches a height of 6" to 8" above bottom of the 24" housing, the sediment should be dumped and the filter cartridge replaced.

- Collected leaves, grass clippings, sediment, debris and spent filter cartridges that are not considered hazardous may be disposed of in on-site trash bins if approved by client. Cartridge disposal shall be in accordance with applicable rules and regulations.

Short Version

StormExx® CLEAN Catch Basin Inserts
Checklist for – Inspection / Use / Maintenance

- Keep the grate area clean and free of leaves, grass clippings, sediment and debris to minimize these contaminants from entering the unit housing. This is especially important during leaf fall season as decaying leaves on the filter cartridge can shorten filter life.

- Periodic visual inspections involve looking through the grate to see if any standing water exists. Replace filter cartridge if standing water is in the housing.

- Where large amounts of sediment enter through the grate it may be necessary to change the filter cartridge up to 4 times a year. In low rainfall flow areas only one or two filter cartridge change-outs per year may be necessary.

- If sediment reaches a height of 6” to 8” above bottom of the 24” housing, the sediment should be dumped and the filter cartridge replaced.

- Collected leaves, grass clippings, sediment, debris and spent filter cartridges that are not considered hazardous may be disposed of in on-site trash bins if approved by client. Cartridge disposal shall be in accordance with applicable rules and regulations.

APPENDIX D
Filter Cartridge Pollutant Removal and Laboratory Data

Appendix D
StormExx Clean Trash Capture Device Application Submission
Filter Cartridge Pollutant Parameter Removal

	Influent	Effluent	Reduction Percentage
TSS, mg/L	27	1.2	96%
	24	11	54%
	15	12	20%
	16	10	38%
	59	36	39%
	39	8	79%
	42	32	24%
	708	29	96%
	52	26	50%
	52	13	75%
	90	64	29%
	90	45	50%
	84.0	42.0	50%
	31.0	29.0	6%
	Influent	Effluent	
Aluminum, mg/L	1.9	0.4	79%
	1.03	0.509	51%
	4	2.2	45%
	4	1.3	68%
	3.2	1.8	44%
	1.4	1.2	14%
	3	0.75	Note: influent and benchmark values
	Influent	Effluent	
Copper, mg/L	1	0.5	50%
	1	0.19	81%
	0.93	0.85	9%
	1	0.83	17%
	0.02	0.01	50%
	0.25	0.0636	
	Influent	Effluent	
Iron, mg/L	1.7	0.47	72%
	0.507	0.288	43%
	5.6	3.1	45%

	5.6	2	64%
	5.3	2.8	47%
	2.4	2	17%
	4.49	1	
	Influent	Effluent	
Zinc, mg/L	0.28	0.15	46%
	0.561	0.292	48%
	0.562	0.185	67%
	0.562	0.256	54%
	0.28	0.14	50%
	0.28	0.056	80%
	0.35	0.24	31%
	0.27	0.22	19%
	0.13	0.087	33%
	1.19	0.117	
	Influent	Effluent	
Oil and Grease, mg/L	16	9.2	43%
	22	12	45%
	8.7	3.7	57%
	30	15	

filtrexx®
SUSTAINABLE TECHNOLOGIES

EnviroSoxx® & StormExx®
Targeted Stormwater Solutions

- Above & below ground stormwater solutions for passive treatment train
- Uses natural materials to target pollutant loads in stormwater runoff




Treatment Train Advantages

- Easy to install, maintain, and replace
- Fits any existing storm drain system–round or rectangular
- Customized replacement programs available
- Ready to spec into your project's plans

Removal Rates[1]

- Bacteria: Up to 99%
- Nutrients: Up to 92%
- Hydrocarbons: Up to 99%
- Metals: Up to 73%

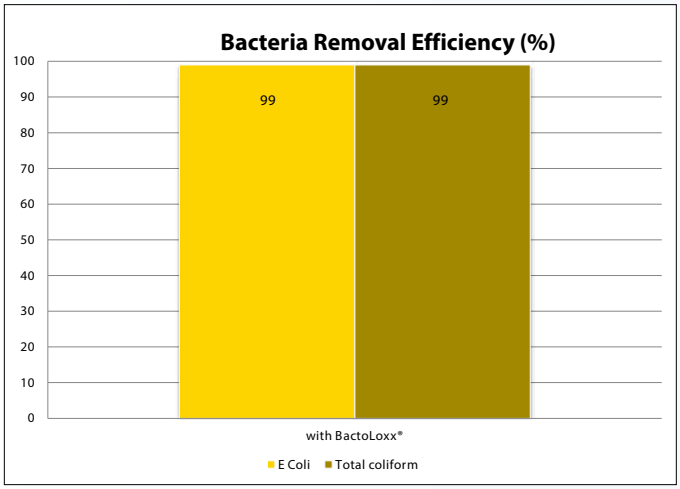
Mesh Identification for Multiple Additives

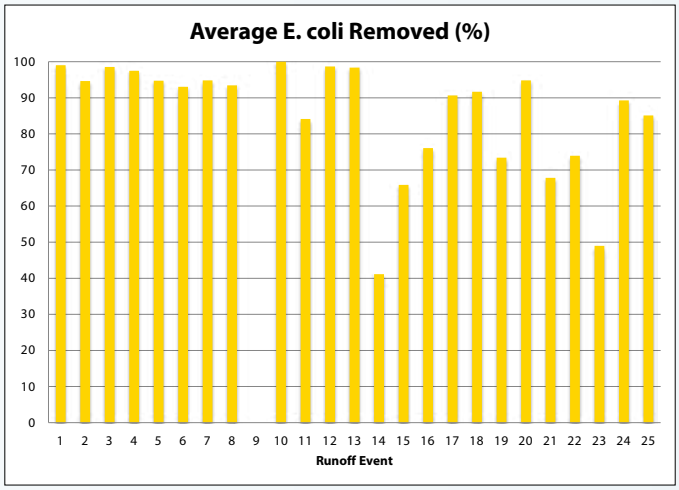
Filtrexx Environmental Sustainability Benefits

Filtrexx EnviroSoxx uses **locally recycled organic materials** inside of photodegradable or biodegradable mesh. Diverting these organic materials from landfills and applying them to the soil means a reduction in greenhouse gas emissions. **For every 1,000' of 8" EnviroSoxx used, 33,000 lbs of organic materials are diverted and your carbon footprint is reduced by 70,000 lbs CO_2e.** This is the equivalent of offsetting the greenhouse gas emissions of **7 passenger vehicles** driven for one year.[2]

Sources: [1]Removal rates for EnviroSoxx based on third-party research, actual removal rates may vary and are dependent on site specific environmetal conditions[1]. [2]Filtrexx TechLink #3335.

BactoLoxx® Additive





BactoLoxx is used to reduce coliform bacteria loads in stormwater runoff, particularly around sensitive watersheds and receiving waters, near TMDL (303d) listed water bodies, pet parks, animal feeding operations, and urban watersheds where bacteria in runoff is an issue.

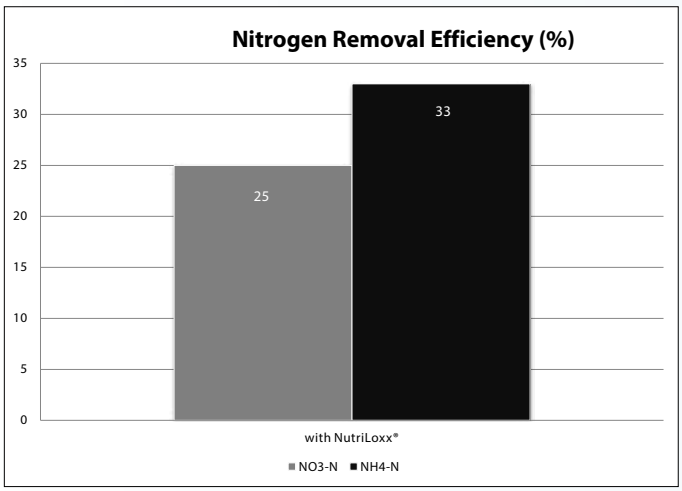
Coliform bacteria that BactoLoxx targets in runoff includes but is not limited to bacteria in the genera Escherichia, Klebsiella, Enterobacter, and Citrobacter, including E. coli and fecal coliforms.

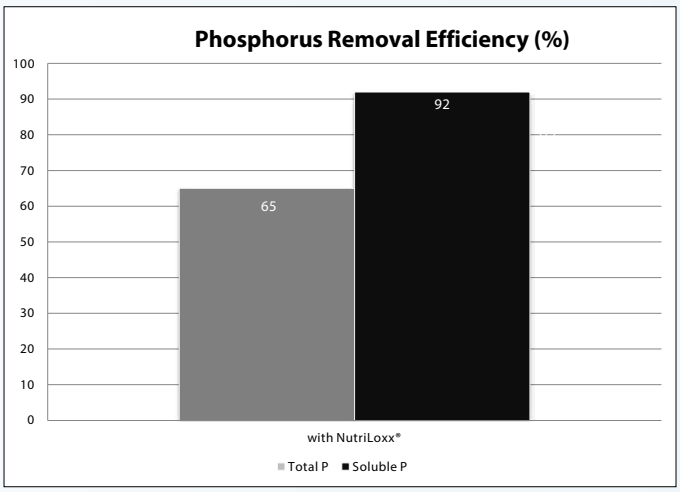
Mesh Identification

Uses Include:

- Sewers & septics
- CAFO's
- Agriculture
- Pet parks
- Landfills
- Industrial sites

NutriLoxx® Additive





NutriLoxx is used to reduce nitrogen and phosphorus loads in stormwater runoff, particularly on fertilized soils such as agricultural lands or golf courses.

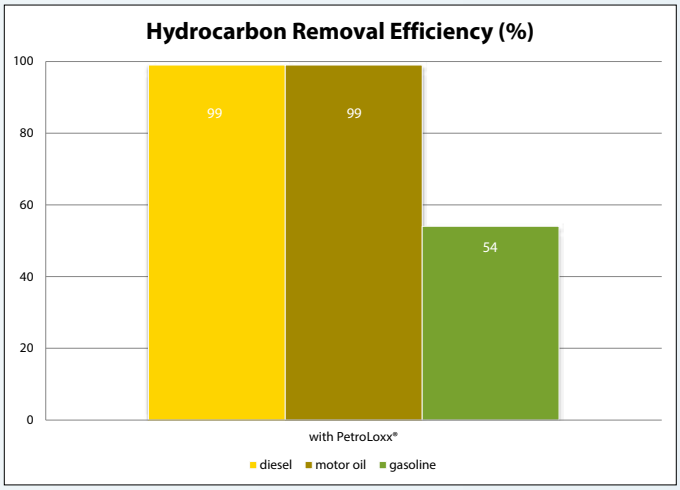
NutriLoxx additive is a natural material that chemically adsorbs soluble phosphorus and nitrogen (ammonium-N) in stormwater, thereby reducing transport to water bodies, reducing bioavailability to aquatic plants, and minimizing algae blooms, eutrophication, & low dissolved oxygen levels that can lead to fish kill & collapse of aquatic ecosystems.

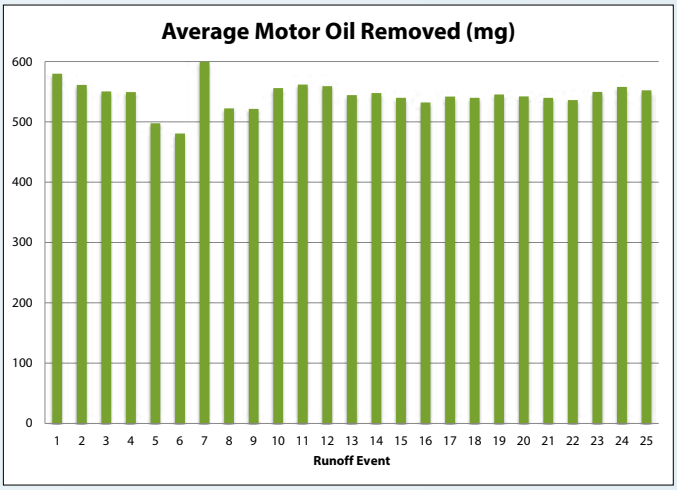
Mesh Identification

Uses Include:

- CAFO's
- Golf courses
- Agriculture
- Pet parks
- Nurseries
- Compost facilities
- Bulk storage
- Wetland overflows

PetroLoxx® Additive





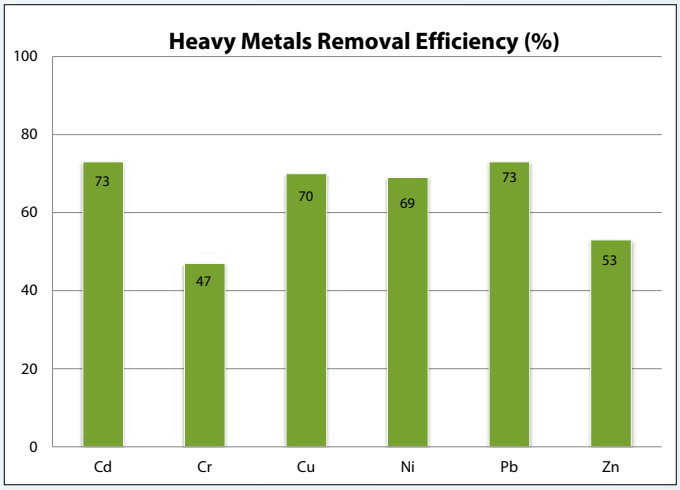
PetroLoxx is used to reduce petroleum hydrocarbon, or polycyclic aromatic hydrocarbon (oil/grease, diesel fuel, gasoline), loads in stormwater runoff, particularly in urban watersheds. PetroLoxx is not a coagulant and is made with100% all natural materials.

Mesh Identification

Uses Include:

- Industrial sites
- Recycling yards
- Parking lots/roadsides
- Fueling stations
- Vehicle wash stations
- Marinas & boat washes
- Drilling/fracking sites

MetalLoxx® Additive



	Removal Efficiency					
	Cd	Cr	Cu	Ni	Pb	Zn
Soluble	72%	29%	70%	69%	79%	57%
Particulates	77%	78%	45%	63%	61%	47%
Total	73%	47%	70%	69%	73%	53%

MetalLoxx additive is a natural ionic adsorbent that is used with Filtrexx® stormwater pollution prevention practices, such as Sediment Control, Check Dams, Inlet Protection, Filtration Systems, and Rain Garden/Bioretention Systems. It is ideal for reducing metals loads (Cd, Cr, Cu, Ni, Pb, Zn) in urban and post construction stormwater runoff.

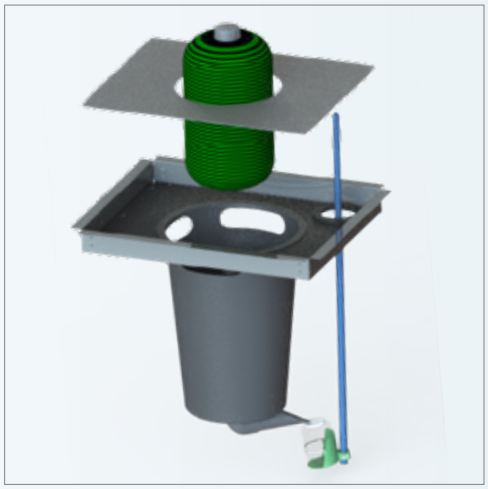
Mesh Identification

Uses Include:

- Recycling yards
- Landfills
- Rooftops
- Parking lots/roadsides
- Heavy industry
- Brownfields
- Marinas & boat washes

Above & Below Ground Stormwater Solutions

Use **EnviroSoxx®** for biofiltration systems, around inlets & outfalls, and wrapped around contaminated areas. EnviroSoxx can be used on pavement/asphalt without the need to stake or trench.



StormExx® CLEAN fits any existing storm drain, and features easy installation, maintenance, and replacement. Optional sample port available.

Overflow bypass: 500+ gpm*

StormExx® CLEAN uses similar EnviroSoxx filtering media & additives to treat stormwater in a replaceable cartridge for under the grate.

EnviroSoxx Technology

Compost FilterMedia™ (left) has the ability to filter fine sediments, nitrogen and phosphorus species, petroleum hydrocarbons, harmful bacteria, heavy metals, pesticides, herbicides, and other pollutants, reducing their transport in runoff, and absorption by plants.

EnviroSoxx contain one or more all natural sorbents used to increase pollutant removal capacity, specifically designed for urban watersheds, sensitive receiving waters, industrial and municipal (MS4) stormwater permit compliance, and TMDL (§303d) listed water bodies. EnviroSoxx are 100% formulated with all natural materials.

†Research References

Faucette, B., F. Cardoso, W. Mulbry, P. Millner. 2013. Performance of compost filtration practice for green infrastructure stormwater applications. Water Environment Research. 85:9: 806-814.

Faucette, B., F. Cardoso-Gendreau, E. Codling, A. Sadeghi, Y. Pachepsky, D. Shelton. 2009. Storm water pollutant removal performance of compost filter socks. Journal of Environmental Quality. 38:1233-1239.

Faucette, L. B., K. A. Sefton, A. M. Sadeghi, R. A. Rowland. 2008. Sediment and phosphorus removal from simulated storm runoff with compost filter socks and silt fence. Journal of Soil and Water Conservation. 63:4:257-264.

Filtrexx TechLinks #3325 and #3328

SiltSoxx™ are in compliance with most state & federal agencies including:

Made in USA

USDA CERTIFIED BIOBASED PRODUCT

US Army Corps of Engineers

USDA NRCS