

March 06, 2020

Mr. Jaime Favila  
California State Water Resources Control Board  
Division of Water Quality  
P.O. Box 100  
Sacramento, CA 95812-0100  
[Jaime.Favila@waterboards.ca.gov](mailto:Jaime.Favila@waterboards.ca.gov)

**Re: Application for Trash Treatment Control Device Certification - BrightWater™  
Curb Inlet Filter**

Dear Mr. Favila,

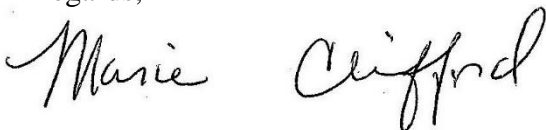
BrightWater™ is pleased to submit this application for Certification of the BrightWater™ Curb Inlet Filter as a Full Capture Trash Treatment Control Device. Documentation for this application is being submitted in accordance with the California State Water Resources Control Board *Trash Treatment Control Device Certification and Fact Sheet Update Requirements* document dated July 10, 2019 that includes the following minimum requisite sections:

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

A copy of this Application has been submitted to the Mosquito and Vector Control Association of California in accordance with Section 5.d.i. of the Certification Requirements.

Please contact me with any questions or should additional information be required. Thank you for your consideration of this application.

Regards,



Marie Clifford  
President

## **1.0 COVER LETTER**

### **1.A. A general description of the Device;**

The BrightWater™ Catch Basin Filter Insert for Curb Inlets is a post-construction, stormwater Best Management Practice (BMP) designed to capture coarse to medium grained sediment, oil and grease, and gross pollutants including trash and debris. The device, which consists of a filtration basket with filtration membrane(s) and mounting framework, installs beneath the curb opening of the catch basin and filters pollutants contained within the stormwater flow entering the catch basin. Capturing pollutants at this point closest to the source is an economical and efficient approach to stormwater management.

The Device frame, mounting structure, and hardware is fabricated from stainless steel allowing for a sturdy, non-corrosive installation that will provide the end user with a long service life treatment system. Installation and removal is made quick and effortless with a customized design allowing for minimal mounting hardware and quick release exchanges. The device is available with different filter basket configurations and media that allow the targeting of specific pollutants of concern. Maintenance time and costs are minimized with removable and reusable components.

### **1.B. The Device owner's and owner's representative's contact information;**

Corporate Contact:

Marie Clifford  
President  
BrightWater™  
P.O. Box 85430  
San Diego, California 92186  
(619) 821-1558  
[mclifford@wearebrightwater.com](mailto:mclifford@wearebrightwater.com)

### **1.C. The Devices' manufacturing location;**

BrightWater™ utilizes a combination of contract manufacturers and component suppliers to produce the Curb Inlet Filter stormwater treatment system. These partner facilities are located throughout the United States and BrightWater™ selects the facility used based on proximity to the project as well as other factors. The facilities utilized for any particular project are selected to provide the most cost effective and convenient solution.

BrightWater™ currently retains four partner manufacturing facilities strategically located throughout the country. The facility that serves the California market is located at 2285 Micro Place, Escondido, California 92029.

**1.D. A brief summary of any field/lab testing results that demonstrates the Device functions as described within the application;**

The BrightWater™ Curb Inlet Filter stormwater treatment system utilizes a screen that is made from perforated stainless steel mesh that has an aperture not greater than 4.7mm. All design flows must pass through the screen ensuring capture of all particles 5mm in size or larger and as such testing is not compulsory.

**1.E. A brief summary of the Device limitations, and operational, sizing, and maintenance considerations;**

The BrightWater™ Curb Inlet Filter is a pre-engineered filtration system designed to meet site-specific water quality treatment requirements. Conformance with the Engineer's Plans and Specifications and the Manufacturer's recommendations is essential to ensure proper operation and function of the Device.

The BrightWater™ Curb Inlet Filter frame, mounting structure, and hardware are manufactured using stainless steel components to provide for a long service life treatment system. The filtration membrane and media are made from substantial, proven fabrics and media. The materials selected are intended to serve a wide variety of applications and are the most durable materials available for stormwater treatment devices. Conformance to installation recommendations are required to ensure the design service life of the Device is maintained.

BrightWater™ Curb Inlet Filters should be sized to meet site and region specific water quality objectives and requirements. Systems that are not designed and installed in conformance within the maximum treatment flow rate and maximum bypass flow rate limits can cause adverse hydraulic conditions. Additionally, non-conformance with the Device design limits may cause non-compliance with the water quality objectives and requirements.

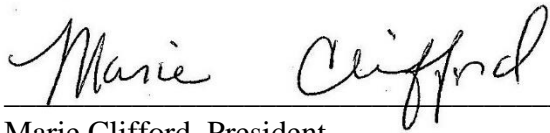
All structural, post-construction Best Management Practices require routine and scheduled inspection and maintenance. Inspection and maintenance is facilitated by the design of the Device. The design of the Device allows for quick and easy inspection and maintenance. Project design considerations for maintenance frequency should be a consideration.

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

Installations of the Trash Capture version of this device are pending SWRCB Certification.

**1.G. The certification below:**

*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.*



---

Marie Clifford, President

03/06/2020

Date



## 2.0 TABLE OF CONTENTS

### Contents

1.0	COVER LETTER.....	2
1.A.	A general description of the Device;.....	2
1.B.	The Device owner’s and owner’s representative’s contact information;.....	2
1.C.	The Devices’ manufacturing location; .....	2
1.D.	A brief summary of any field/lab testing results that demonstrates the Device functions as described within the application;.....	3
1.E.	A brief summary of the Device limitations, and operational, sizing, and maintenance considerations;.....	3
1.F.	A description or list of locations, if any, where the Device has been installed. Include the name and contact information of as many as three municipality(s) purchasing the Device, and .....	3
1.G.	The certification below: .....	4
2.0	TABLE OF CONTENTS.....	5
3.0	PHYSICAL DESCRIPTION .....	7
3.A.	Description on how the Device works to trap all particles that are 5 mm or greater in size and how it is sized for varying flow volumes;.....	7
3.B.	Design drawings for all standard Device sizes including dimensions, and alternative configurations;.....	11
3.C.	If the device is designed with an internal bypass, explain how the bypass only operates with flows greater than the design storm. ....	11
3.D.	Engineering plans/diagrams for a typical installation;.....	12
3.E.	Photographs, if any, of pre- and post-installation examples; and .....	12
3.F.	The Device maximum trash capture capacity;.....	12
3.G.	The Device hydraulic capacity (flow in cfs) at its maximum trash capture capacity for all standard Device sizes;.....	13
3.H.	Each material and material grade used to construct the Device (stainless steel, plastic, etc.);	13
3.I.	Conditions under which the Device re-introduces previously trapped trash;.....	13
3.J.	Estimated design life of the Device;.....	14
3.K.	If the Device is substantially similar to a device currently listed on the <i>Certified List of Trash Devices</i> , name the certified device(s) and identify the substantial similarities and any minor changes in materials, material thickness, structural assembly, etc. Explain how these minor changes in your Device will impact performance as compared to the similar certified Device. ....	14

<b>3.L.</b>	<b>If the Device includes ‘OPTIONAL COMPONENTS’ (e.g. deflector screen, etc.) provide installation diagrams of the Device with the optional component(s). Explain how the installation of the optional component impacts the overall performance of the Device.....</b>	<b>14</b>
<b>4.0</b>	<b>INSTALLATION GUIDANCE .....</b>	<b>17</b>
<b>4.A.</b>	<b>Installation considerations; .....</b>	<b>17</b>
<b>4.B.</b>	<b>Device installation procedures;.....</b>	<b>18</b>
<b>4.C.</b>	<b>Methods for diagnosing and correcting installation errors; and.....</b>	<b>18</b>
<b>4.D.</b>	<b>Provide and explanation of the condition or circumstances that would necessitate the implementation of an ‘OPTIONAL COMPONENT’ to render it no longer optional.....</b>	<b>19</b>
<b>5.0</b>	<b>OPERATION AND MAINTENANCE INFORMATION.....</b>	<b>20</b>
<b>5.A.</b>	<b>Device inspection frequency considerations, and inspection procedures; .....</b>	<b>20</b>
<b>5.B.</b>	<b>Maintenance frequency considerations, maintenance procedures, and a description of necessary equipment and materials; .....</b>	<b>21</b>
<b>5.C.</b>	<b>Effects of delayed maintenance on Device structural integrity, performance, odors; .....</b>	<b>24</b>
<b>5.D.</b>	<b>Vector Control Accessibility .....</b>	<b>24</b>
<b>5.E.</b>	<b>Repair procedures for the Device’s structural components.....</b>	<b>26</b>
<b>6.0</b>	<b>RELIABILITY INFORMATION .....</b>	<b>26</b>
<b>6.A.</b>	<b>Estimated design life of Device components before major overhaul; .....</b>	<b>26</b>
<b>6.B.</b>	<b>Device sensitivity to loadings other than trash (i.e., leaves, sediment);.....</b>	<b>26</b>
<b>6.C.</b>	<b>Warranty Information; and .....</b>	<b>27</b>
<b>6.D.</b>	<b>Customer support information.....</b>	<b>27</b>
<b>7.0</b>	<b>FIELD/LAB TESTING INFORMATION AND ANALYSIS.....</b>	<b>27</b>
<b>APPENDIX A</b>	<b>.....</b>	<b>28</b>
<b>APPENDIX B</b>	<b>.....</b>	<b>30</b>
<b>APPENDIX C</b>	<b>.....</b>	<b>39</b>
<b>APPENDIX D</b>	<b>.....</b>	<b>42</b>
<b>APPENDIX E</b>	<b>.....</b>	<b>54</b>

### **3.0 PHYSICAL DESCRIPTION**

#### **3.A. Description on how the Device works to trap all particles that are 5 mm or greater in size and how it is sized for varying flow volumes;**

The BrightWater™ Catch Basin Filter Insert for Curb Inlets is a post-construction, stormwater Best Management Practice (BMP) designed to capture coarse to medium grained sediment, oil and grease, and gross pollutants including trash and debris. The device, which consists of a filtration basket with filtration membrane(s) and mounting framework, installs beneath the curb opening of the catch basin and filters pollutants contained within the stormwater flow entering the catch basin. Unit processes for treatment of stormwater include screening, filtration, sedimentation, adsorption and absorption.

The basket is suspended beneath the curb inlet opening and retains the captured pollutants above the bottom of the catch basin allowing the captured trash, debris, and sediment to be stored away from other stormwater flows to minimize resuspension and further contamination through leaching. Design flows are first routed directly through the filtration/screening basket which is made from perforated stainless steel mesh that has an aperture not greater than 4.7mm. All design flows must pass through the screen ensuring capture of all particles 5mm in size or larger.

The BrightWater™ Curb Inlet Filter incorporates the following features to additionally ensure Full Capture of all particles larger than 5mm. These features also assist in preventing re-suspension of previously captured pollutants.

- The basket front wall, back wall, and bottom are manufactured from 20 gauge, perforated, Type 304 Stainless Steel mesh with an aperture not greater than 4.7mm and an open area not less than 50%.
- The basket sidewalls are manufactured from 20 gauge, solid, Type 304 Stainless Steel with a bypass opening above the treatment level of the screening basket.
- The filter basket is installed in such a manner that peak flows, above the Full Capture Design flow, are allowed to bypass the treatment area and directly enter the catch basin.

#### **Curb Inlet Filter Features**

The Curb Inlet Filter is comprised of several different components that all contribute to the installation, operation, and maintenance of the device. All structural components and all metal components are made from Grade 304 Stainless Steel. The device utilizes other materials that are designed to be consumable or replaceable and these materials are made from industrial grade

rubbers, plastics and media. Figure 1 and Figure 2 illustrate the different components of the Curb Inlet Filter.

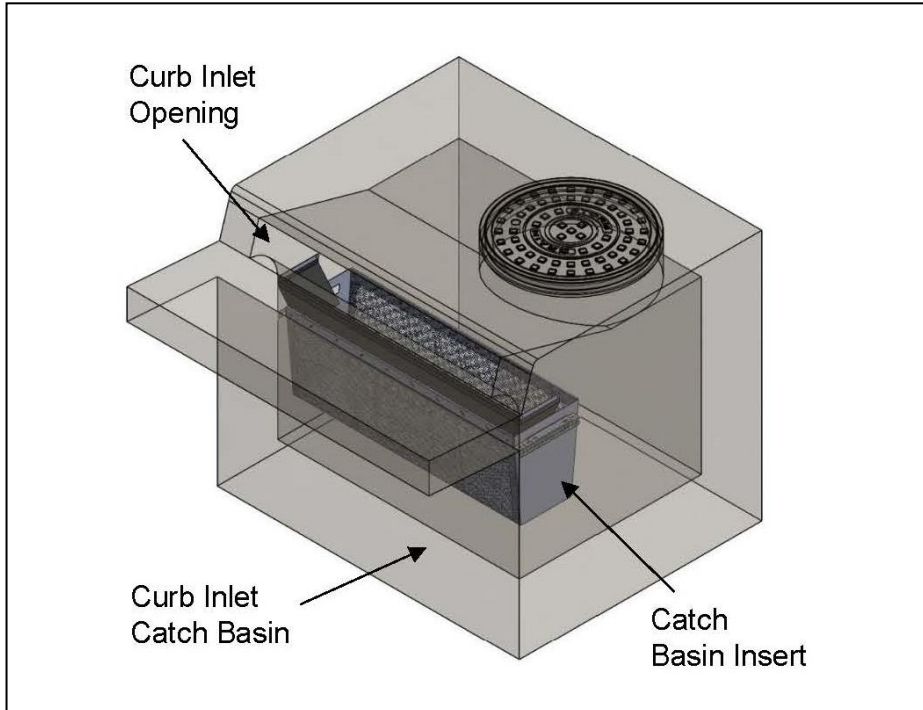


Figure 1 - Curb Inlet Filter Installed

The two main components of the Curb Inlet Filter are the Basket Frame and the Basket Screen. These two components are secured together to form the main structure of the Curb Inlet Filter. The screen is manufactured from Type 304 Stainless Steel mesh with an aperture not greater than

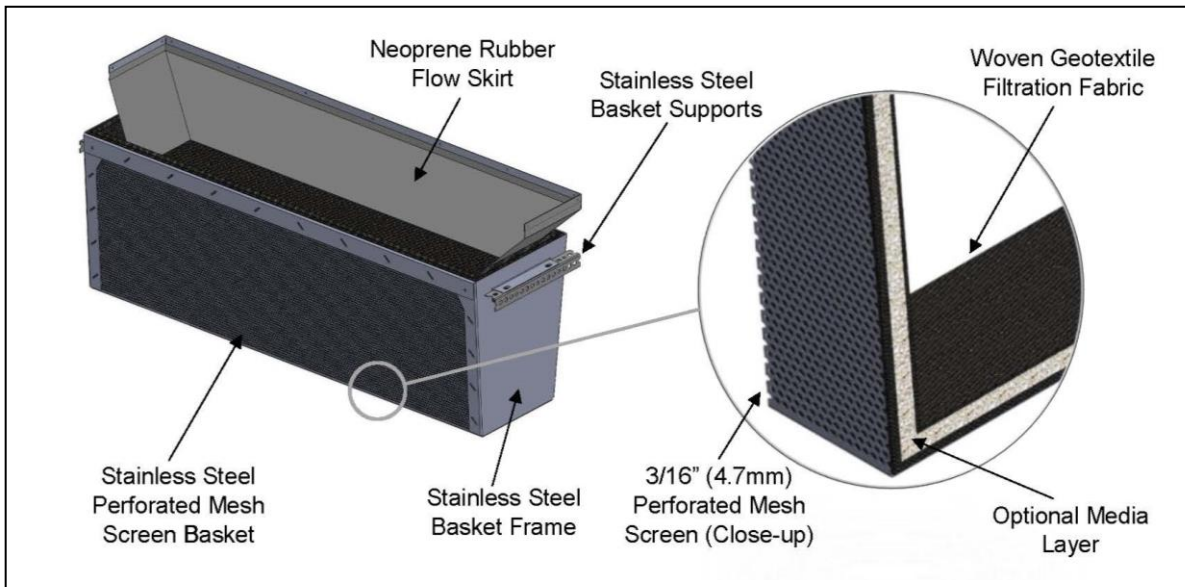


Figure 2 - Curb Inlet Filter Components

4.7mm and an open area not less than 50%. All Full Capture treatment flow is routed through the

basket and the mesh. The neoprene rubber skirt helps direct the flow towards the center of the basket ensuring no unwanted bypass or short circuiting of the screen. A Geotextile fabrics and select media may be optionally included with filter for targeting other pollutants for removal. These components are integrated with the frame and basket to function as a singular device components but do not detract from the gross pollutant removal process of the screen.

### **Curb Inlet Filter Operation - Diagram**

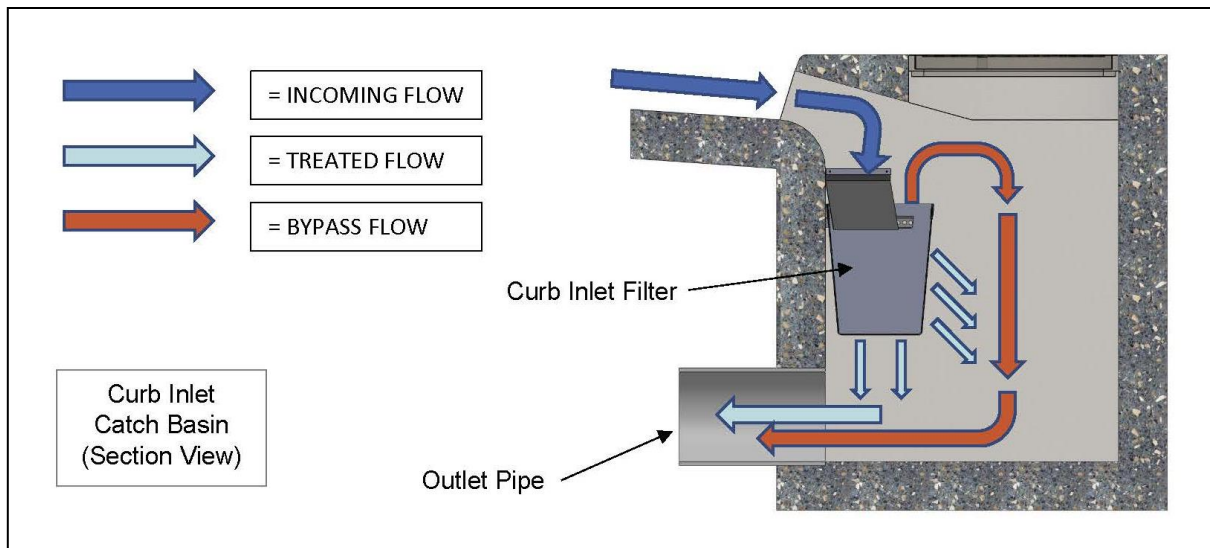


Figure 3 - Curb Inlet Filter Operation

### **Curb Inlet Filter Operation**

Stormwater flows from roads, parking lots and other pervious surfaces make their way to the curb inlet catch basin. Sheet flow from these surfaces are collected by the concrete gutter and the gutter directs the flows to the curb opening where it enters the catch basin. Curb opening catch basins are situated downslope of the gutter and receive flows from a single direction or often times curb opening catch basins are placed in a sump condition and flows are introduced to the catch basin from two directions. Although each catch basin operates under the same general principal, many municipalities have a region specific design that alters the standard design in some form our fashion. Curb inlet openings may be as short as two feet long or as long as 28 feet long. Catch basin widths and depths can also vary by municipality.

In a typical curb inlet, entering storm flow would be allowed to drop to the bottom of the catch basin and freely exit the basin through an outlet pipe that may be connected to one of the four catch basin walls. To treat for Trash Full Capture, the curb opening inlet is outfitted with a filter basket made from stainless steel. The basket is mounted directly beneath the curb opening and spans the entire length of the opening. The basket collects all low flows (from the one year, one hour storm event) entering the catch basin. The filter basket screens the water of trash and other gross pollutants prior to releasing the water to the bottom of the catch basin. Peak flows exceed the capacity of the basket and spillover the top of the basket. Bypass occurs hydraulically upstream

of the filter and thus peak flows are kept separate from the screening/treatment. Resuspension of pollutants does not occur. When in bypass, the Curb Inlet Filter does not alter the operation of the curb inlet. As such, the curb inlet operation is the unaffected and the bypass capacity of the Curb Inlet Filter is the same as the standard inlet capacity of the curb opening. (See Figure 3 – Curb Inlet Filter Operation.)

A sizing chart for the BrightWater™ Curb Inlet Filter is shown below in Table 1. The treatment basket length for each model varies based on the curb opening size. The treatment basket width and depth may vary based on catch basin configurations but are standardized for the majority of the applications. The characteristics and capacity Table lists the maximum treatment capacity for Full Capture trash removal. The Table additionally lists the maximum storage capacity (for trash and sediment). These capacities are considerate of both resuspension of removed pollutants and screen blocking. A safety factor has been applied to the storage capacity and treatment capacity. The Table includes the most commonly utilized standard sizes available. Other standard sizes are available as well as custom configurations. Characteristics and capacities will be determined on an as needed basis following the same guidelines and using the same empirically determined data for sizing of the custom configurations.

**BrightWater™ Curb Inlet Filter Capacities and Characteristics Table**  
(California Full Capture Certified Capacities)

**TABLE 1**

Model Number and Size		Maximum Sediment Treatment Flow Rate <sup>1</sup>	Maximum Trash Treatment Flow Rate <sup>2</sup>	Trash Storage Capacity <sup>3</sup>	Sediment Storage Capacity <sup>3</sup>	Oil Capture Capacity
(Model No.)	(ft.)	(cfs)	(cfs)	(ft <sup>3</sup> )	(ft <sup>3</sup> )	(gal)
BWCIF-2.0	2.0	0.76	1.52	0.77	0.38	3.52
BWCIF-2.5	2.5	1.00	2.01	1.01	0.51	4.67
BWCIF-3.0	3.0	1.25	2.50	1.26	0.63	5.81
BWCIF-3.5	3.5	1.49	2.99	1.51	0.76	6.95
BWCIF-4.0	4.0	1.74	3.48	1.76	0.88	8.09
BWCIF-5.0	5.0	2.23	4.46	2.26	1.13	10.38
BWCIF-6.0	6.0	2.72	5.45	2.75	1.38	12.67
BWCIF-7.0	7.0	3.21	6.43	3.25	1.62	14.95
BWCIF-10.0	10.0	4.69	9.38	4.74	2.37	21.81
BWCIF-14.0	14.0	6.65	13.31	6.72	3.36	30.95
BWCIF-21.0	21.0	10.09	20.19	10.20	5.10	46.95
BWCIF-28.0	28.0	13.53	27.07	13.68	6.84	62.95

This table lists commonly specified standard model sizes. Additional standard model sizes and custom sizes are available.

1. The Maximum Sediment Treatment Flow Rate is based on 80% instantaneous removal of suspended sediment with a mean particle (d50) size distribution of 250um. The Maximum Sediment Treatment Flow Rate considers a Safety Factor of 2X.
2. The Maximum Trash Treatment Capacity is the maximum flow rate of the device at which 100% removal of floatables 5mm or greater in size can be captured and retained. The Maximum Trash Treatment Capacity considers a Safety Factor of 2X.
3. Storage capacity reflects the maximum pollutant capacity prior to impeding maximum treatment flow rates.

### 3.B. Design drawings for all standard Device sizes including dimensions, and alternative configurations;

Design drawings for all standard devices and configurations are included in Appendix A.

### 3.C. If the device is designed with an internal bypass, explain how the bypass only operates with flows greater than the design storm.

The BrightWater™ Curb Inlet Filter is designed to capture trash, debris and sediment for “Full Capture” and “First Flush” sized storm events while also allowing larger flows from larger storm events to proceed uninterrupted by the presence of the Device. This is accomplished by way of features of the Curb Inlet Filter that allow for internal bypass.

The bypass features for the Curb Inlet Filter are positioned in the filter above the treatment and pollutant storage areas and become active only during larger storm events that produce large stormwater flows.

The filter basket for the Curb Inlet Filter is perforated to within approximately one inch to the top of the basket. The top lip of the basket is constructed from solid stainless steel and terminates the treatment area of the filter basket. Incoming flow to the curb inlet, represented by the dark blue arrows in Figure 4, drop into the filter basket. This flow is treated while passing through the screen and filtration media as represented by the light blue arrows in Figure 4. As the incoming flow increases, the basket fills with water until the ultimate flow capacity of the filter is achieved at which time the flow bypasses over the top of the basket as represented by the red arrows in Figure 4. Because bypass occurs upstream of the filter, peak flows are kept separate from the treatment area and resuspension of pollutants does not occur. Because the filter bypass operation is the same as the standard curb inlet operation, the bypass capacity of the filter is the same as the standard inlet capacity of the curb opening.

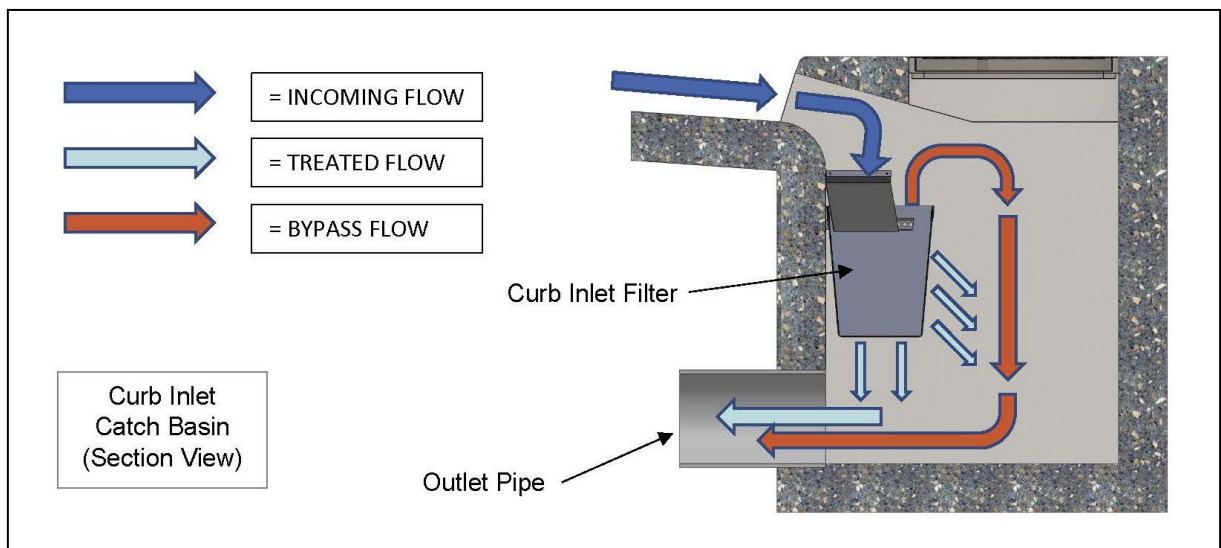


Figure 4 - Curb Inlet Filter Bypass Operation



**3.D. Engineering plans/diagrams for a typical installation;**

Engineering plans/diagrams for a typical installation are included in Appendix A.

**3.E. Photographs, if any, of pre- and post-installation examples; and**

Photographs of the Curb Inlet Filter are included below:



*Figure 5 - Curb Inlet Filter Prior to Installation.*



*Figure 7 - Curb Inlet Filter Prior to Installation.*



*Figure 6 - Curb Inlet Filter Prior to Installation.*



*Figure 8 - Curb Inlet Filter Being Installed.*

**3.F. The Device maximum trash capture capacity;**

Table 1 lists the maximum trash capture capacity for several standard Curb Inlet Filter Models. The column titled “Trash Storage Capacity” lists the trash capture volume (ft<sup>3</sup>) retained by each model Curb Inlet Filter model. The trash capture capacities listed are maximum volumes that can be removed without a reduction in treatment performance and considers full retention of trash with no re-entrainment under peak flow conditions.



### **3.G. The Device hydraulic capacity (flow in cfs) at its maximum trash capture capacity for all standard Device sizes;**

The maximum hydraulic capacity at the maximum trash capacity is listed as the “Maximum Trash Treatment Flow Rate in Table 1.

### **3.H. Each material and material grade used to construct the Device (stainless steel, plastic, etc.);**

The Curb Inlet Filter is constructed from high strength, non-corrosive materials to provide for a long service life treatment system. A full technical specification for the Curb Inlet Filter is included in Appendix B of this submittal and includes all materials utilized along with reference specifications. For convenience, materials for critical components are listed below:

- Basket – The filter basket is manufactured from perforated 304 stainless steel.
- Supports – The basket supports are made from 304 stainless steel slotted angle stock.
- Filtration Bag – The filtration membrane utilized to manufacture the filtration bag is made from a woven, polypropylene geotextile with an AOS not greater than a U.S. Standard Sieve #40.
- Flow Skirt – The flow skirt is made from neoprene rubber strips.
- Hardware – All mounting and assembly hardware is made from 304 stainless steel.

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

The BrightWater™ Curb Inlet Filter has been designed to remove and permanently retain all trash and debris that is 5mm in size or larger. Conditions under which the Device can re-introduce previously trapped trash are listed below:

- If the Curb Inlet Filter is not regularly inspected and maintained and trash and debris are allowed to accumulate beyond the maximum trash capture capacity, conditions could develop that could cause trash to be re-introduced into the stormwater.
- Devices with broken or damaged screens, frames, or other components can cause improper function and conditions that would allow re-introduction of trash and debris into the stormwater.
- Improperly installed Devices or Devices improperly applied can cause adverse conditions that could re-introduce trash and debris into the stormwater.
- Re-introduction of floatables and neutrally buoyant materials can occur after the curb inlet filter enters bypass. Because positive flow through the filter is still occurring, non-floatable material remains secured within the filter area.

### **3.J. Estimated design life of the Device;**

The estimated design (service) life for BrightWater™ Curb Inlet Filter is 25 to 50 years. The basket, supports and hardware material is made using high strength, non-corrosive stainless steel to allow for extended service life. The Curb Inlet Filter, in some applications, does utilize consumable materials such as a filtration membrane and media. These materials are intended to be replaced every five to ten years. The design (service) life of the Curb Inlet Filter is dependent on the materials utilized as well as the proper application and maintenance of those materials.

### **3.K. If the Device is substantially similar to a device currently listed on the *Certified List of Trash Devices*, name the certified device(s) and identify the substantial similarities and any minor changes in materials, material thickness, structural assembly, etc. Explain how these minor changes in your Device will impact performance as compared to the similar certified Device.**

The BrightWater™ Curb Inlet falls into the SWRCB category of “Catch Basin Inserts and Other Devices” for listed Devices. While the BrightWater™ is similar to other Devices on the certified list because it is the same type of Device and functions similarly it cannot be considered “substantially” because of the materials used for fabrication and configuration of the Device.

### **3.L. If the Device includes ‘OPTIONAL COMPONENTS’ (e.g. deflector screen, etc.) provide installation diagrams of the Device with the optional component(s). Explain how the installation of the optional component impacts the overall performance of the Device.**

The BrightWater™ Curb Inlet Filter can be supplied with optional components. These optional components are not necessary to the function of the Device as concerned with Trash capture. Optional components include filtration fabric, oil sorbent material and granular media. These components are implemented and utilized when the Device is intended to be used for removal of pollutants other than trash such as oil, metals, and nutrients. The addition of the components is strictly optional and there is no scenario where these components would be required for Trash Capture.

Figure 9 to 11 are illustrations of the BrightWater™ Curb Inlet Filter as a standard Device and with optional components installed. Each configuration is similarly configured with the standard configuration intended as the base design. Additional components are added to the base design to enhance performance of the Device with regard to additional pollutant removal. With the additional components installed such as filtration fabric and media the maximum treatment flow rate for the Curb Inlet Filter is typically reduced. Consideration must be given to the required Trash Capture flow rate for any application utilizing the optional media. The required flow rate for Trash Capture must be achievable by the Curb Inlet Filter with media installed. The reduced flow rates are listed in Table 1 as “Maximum Sediment Treatment Flow Rate”.

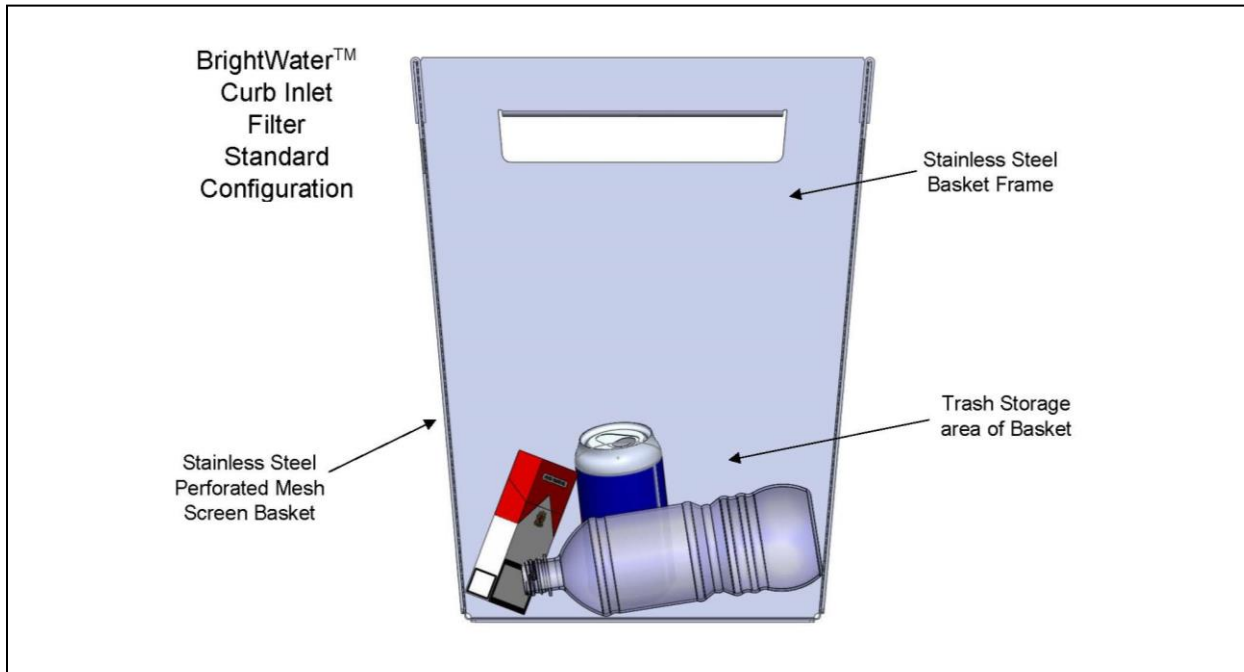


Figure 9 - BrightWater™ Curb Inlet Filter - Standard Configuration

Figure 9 is an illustration of the standard configuration of the BrightWater™ Curb Inlet Filter with no optional components. The mechanism for pollutant removal for this configuration of the Device is a stainless steel, perforated mesh screen basket. With the addition of optional components, the Device is capable of providing trash removal as well as removal of other pollutants. Figure 10 and Figure 11 are illustrations of these two optional configurations of the Device.

Figure 10 is an illustration of an optional configuration of the BrightWater™ Curb Inlet Filter. This option utilizes a woven geotextile filtration fabric to facilitate removal of sediment. Within

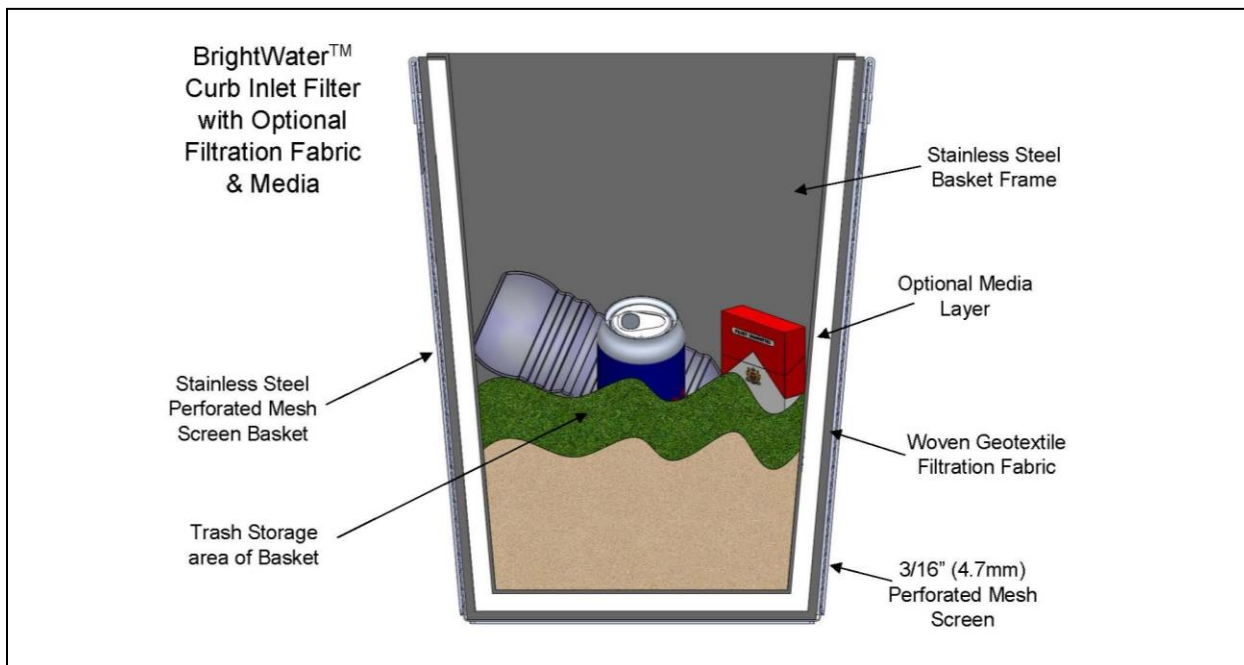


Figure 10 - BrightWater™ Curb Inlet Filter with Optional Filtration Fabric & Media

the core of the filtration fabric bag can be a variety of media. The filtration media selected is based

on the expected pollutants of concern and the necessary removal. These optional components are intended for removal of pollutants other than trash and are not necessary for the basic operation of the Device for trash removal. There is no scenario where these optional components would be considered necessary for the removal of trash.

Figure 11 is an illustration of a second optional configuration of the BrightWater™ Curb Inlet Filter. This option utilizes the same woven geotextile filtration fabric to facilitate removal of sediment and the same media within the core of the filtration fabric bag to facilitate removal of metals and nutrients. In addition, an oil-absorbent pillow (or pillows) are added to the interior of

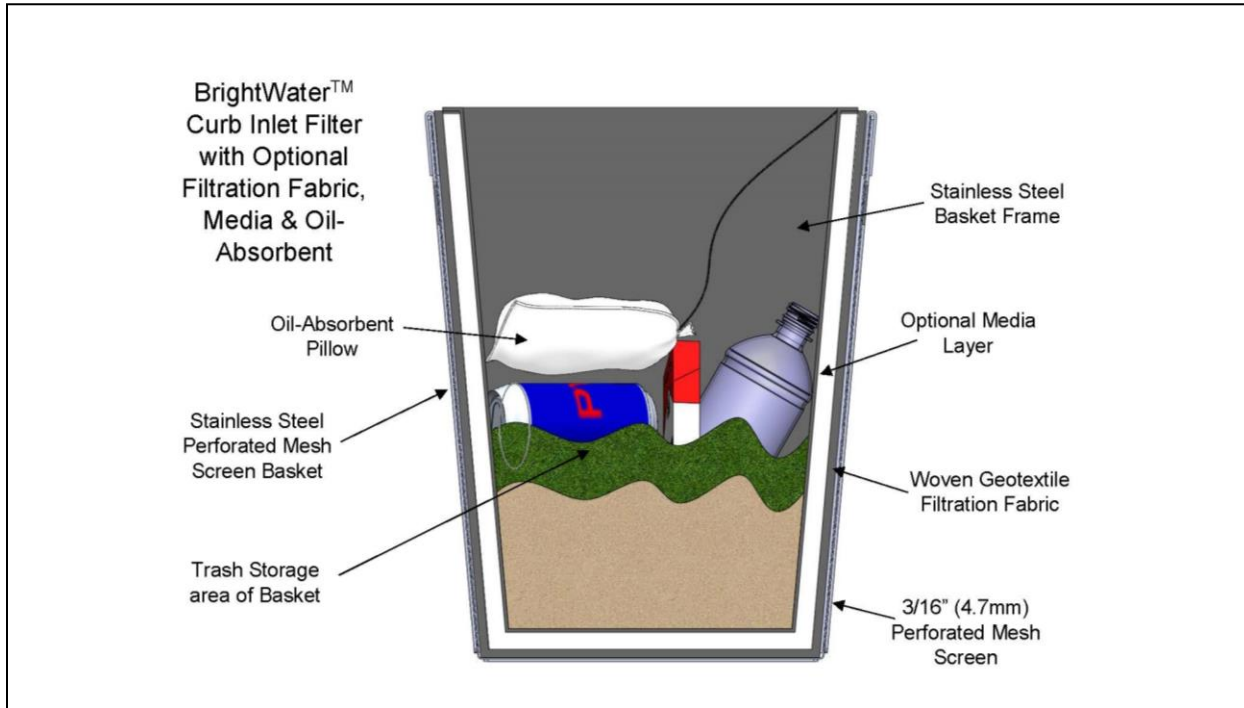


Figure 11 - BrightWater™ Curb Inlet Filter with Optional Filtration Fabric, Media & Oil-Absorbent Pillow

the basket to facilitate removal and retention of oil. These optional components are intended for removal of pollutants other than trash and are not necessary for the basic operation of the Device for trash removal. There is no scenario where these optional components would be considered necessary for the removal of trash.

## **4.0 INSTALLATION GUIDANCE**

### **4.A. Installation considerations;**

Installation requirements and procedures for the BrightWater™ Curb Inlet Filter are detailed in the *Curb Inlet Filter Installation Guidelines* which have been included in Appendix C of this submittal. The guidelines include requirements and procedures for:

- Delivery
- Inspection
- Catch Basin preparation
- Installation

#### **Curb Inlet Filter Installation**

The BrightWater™ Curb Inlet Filter system utilizes several components in addition to the filter basket and requires permanently installing some of the components to the inside walls of the catch basin. A critical part of the installation occurs well in advance of the installation of the Curb Inlet Filter system and that is the manufacture of the Curb Inlet Filter system. Ensuring proper manufacture of the Curb Inlet Filter system helps ensure proper installation of the system and this begins with measuring the catch basin. Proper measurement provides an opportunity for BrightWater™ Engineering and Manufacturing to review the application and determine the most suitable design and application of the Device. Measurement charts for the BrightWater™ Curb Inlet Filter are included as part of this submittal in Appendix C. In addition, BrightWater™ personnel are available for a site visit to provide assistance with measurement of the catch basins.

Installation of the Curb Inlet Filter for Trash Capture in association with Full Capture programs, Trash TMDLs, or the Statewide Trash Amendment are often retrofit type applications. A thorough review of the existing conditions should be conducted and documented so that a proper recommendation and installation can be facilitated. Consideration must be given to any unique configurations for flow, treatment, and installation.

Confined space entry of the catch basin is likely required for the primary installation of the Curb Inlet Filter system. It is imperative the installer adhere to all jurisdictional and/or OSHA safety recommendations and requirements.

Post installation inspection of the Curb Inlet Filters is strongly advised. A representative from BrightWater™ is available for on-site inspection and the Owner is encouraged to be present. Inspection should determine if the Curb Inlet Filter was installed and is functioning properly. The inspection should also document the condition of the Curb Inlet Filter and catch basin. Each item should be in a new (or like new condition for the catch basin) and no defects should be present as a result of the installation. Any potential for mosquito or vector control should be documented and the responsible, local district be notified accordingly.

#### **4.B. Device installation procedures;**

Installation requirements and procedures for the BrightWater™ Curb Inlet Filter are detailed in the *Curb Inlet Filter Installation Guidelines* which have been included in Appendix C of this submittal. The guidelines include requirements and procedures for:

- Delivery
- Inspection
- Catch Basin preparation
- Installation

#### **4.C. Methods for diagnosing and correcting installation errors; and**

BrightWater™ minimizes installations errors through design and manufacturing processes that ensure checks and balances with field conditions and Owner expectations. Should an installation error occur, BrightWater™ should be contacted immediately upon determination of the error so a thorough diagnosis can be conducted and a proper corrective action implemented.

One of the first steps to diagnosing an installation error is to conduct a review of the installation checklist. After completion of installation, BrightWater™ recommends completion of an installation checklist for the Curb Inlet Filter system. The checklist should include key criteria for determination of proper installation. This checklist should be reviewed in its entirety at the completion of the installation and kept as documentation of proper installation. If during the checklist review an error is determined, the documented error should be reported to BrightWater™ as well as the Owner and Engineer. The checklist should include key criteria such as:

- The catch basin is clean and free of trash and debris.
- The grate is properly seated in the frame and does not protrude above the frame.
- The grate is properly oriented to receive storm drain flow (ensure the veins of the grate are positioned in the direction of water flow).
- The filter basket is properly installed and seated.
- Inlet/Outlet pipes to/from the catch basin are not blocked or impeded as a result of the filter installation.
- Inlet Filter and Inlet Filter components are not bent, broken or damaged.
- All debris from installation has been cleaned and removed.
- All components are free of sharp corners and edges.
- Optional hydrocarbon absorbent booms and/or media is installed.

Additionally the Curb Inlet filters can be inspected after operation to determine proper function.

**4.D. Provide and explanation of the condition or circumstances that would necessitate the implementation of an ‘OPTIONAL COMPONENT’ to render it no longer optional.**

The BrightWater™ Curb Inlet Filter can utilize optional components. These components are however unrelated to the function of the Device as concerned with Trash capture. Optional components include oil sorbent material and media inserts. These components would be implemented when it is intended to use the Device for removal of pollutants other than trash such as oil, metals, and nutrients. The addition of the components is strictly optional and there is no scenario where these components would be required for Trash Capture. (Refer to Section 3.L. for additional information.)

## **5.0 OPERATION AND MAINTENANCE INFORMATION**

### **5.A. Device inspection frequency considerations, and inspection procedures;**

The BrightWater™ Curb Inlet Filter *Inspection and Maintenance Guide* is included with this submittal as Appendix D. This guide includes detailed requirements and recommendations for inspection, operation, and maintenance of the Curb Inlet Filters when used as a Full Capture Trash Treatment Control Device. A summary of the inspection requirements and recommendations are listed below:

#### **Inspection Summary**

- The inspection process is necessary to determine the required maintenance frequency and to determine proper operation of the Device.
- A thorough inspection program can minimize unnecessary maintenance.
- The first year inspection is more intensive than subsequent years and should consist of a minimum of three inspections.
- The second and subsequent years of inspection may be minimized based on data from the first year of inspection but should at a minimum occur twice annually.

#### **Inspection Procedures**

The BrightWater™ Catch Basin Insert Filter for Curb Inlets can be inspected without entry into the catch basin. The Inspection should begin by preparing and installing all safety measures followed by the inspection and documentation. Specific procedures for the inspection are detailed below:

- Adorn all PPE and prepare documentation equipment.
- Install all Work Zone safety equipment and conduct a brief safety meeting. Work Zone safety equipment should protect the inspector(s) from vehicular traffic and should also isolate and protect pedestrians and vehicles from the work zone.
- Remove the manhole cover utilizing the manhole puller/remover and safely set aside out of the way of the inspection operations and pedestrians or vehicles.
- Inspect the gutter, curb face, and curb opening. – The areas outside of the catch basin should be free from debris, obstructions and standing water. The presence of any of these conditions outside of the catch basin are potential indicators of maintenance that be necessary for the Catch Basin Filter Insert. If any of these maintenance indicators are encountered they should be documented and, depending on severity, should be rectified through recommended maintenance. Maintenance may occur simultaneously with inspection provided the maintenance indicators have already been documented.
- Utilizing a flashlight, inspect the inside of the catch basin – The interior of the catch basin should be free from debris, obstructions, and standing water. The pipe inlet(s) and outlet(s) should be free from debris, obstructions and standing water. The presence of any of these



conditions in the interior of the catch basin are potential indicators of maintenance that may be necessary for the Catch Basin Filter Insert. If any of these maintenance indicators are encountered, they should be documented and depending on the severity, should be rectified through recommended maintenance. Maintenance may occur simultaneously with inspection provided the maintenance indicators have already been documented.

- Inspect the Catch Basin Filter Insert for physical or structural anomalies. – The insert should be firmly mounted to the catch basin and there should be no loose or missing hardware. Bent, Broken, or otherwise damaged structural components should be documented and maintained.
- Inspect the Catch Basin Filter Insert for pollutants. – Pollutants such as trash and debris, oil and grease, and sediment are expected to be captured inside of the Catch Basin Filter Insert. The presence of such pollutants are indicators the Device is operating as intended. Conversely, the lack of such pollutants present in the Device may be an indicator that the Device of stormwater system is not functioning as intended. The quantities of pollutants should be documented and compared with the maximum capacities for the Device and maintenance recommended as necessary.
- Inspect the Media and Oil Absorbent – Devices equipped with media and oil absorbent pouches should be inspected for condition of these materials. Media and oil absorbent material darken in color as they collect pollutants. Full darkened media and oil absorbent are indicators that the material has reached its useful life and maintenance is necessary. The condition of the media and oil absorbent should be documented and maintenance recommended as necessary.
- Finalize the Documentation and Inspection Form – Photograph the conditions of interior and exterior of the catch basin and Catch Basin Insert. Document the inspection event utilizing the Treatment Device Inspection Form included with this manual or similar. The presence of standing water or vector such as mosquitos should be highlighted in the inspection form. The local vector control agency should be notified if mosquitos are present in the catch basin or treatment Device.
- Replace the manhole cover and remove all Work Zone Safety Equipment.
- *Confined Space Entry is typically not required for routine inspections of standard installations. Confined space entry protocol should be followed should circumstances require entry into the catch basin for inspection.*

## **5.B. Maintenance frequency considerations, maintenance procedures, and a description of necessary equipment and materials;**

The Curb Inlet Filter *Inspection and Maintenance Guide* is included with this submittal as Appendix D. This guide includes detailed requirements and recommendations for inspection, operation and maintenance of the Curb Inlet Filters when used as a Full Capture Trash Treatment Control Device. A summary of the maintenance requirements and recommendations are listed below:

### **Maintenance Frequency and Timing**

BrightWater™ Catch Basin Insert Filter for Curb Inlets should be maintained on a routine and recurring basis. The frequency and timing of the maintenance can be variable based on the configuration of the Device, location of the Device within the drainage system, and the geographic region of installation. During the first year of operation, after initial installation, the Catch Basin Filter Insert may need to be maintained more frequently to create a baseline of understanding for operation of the Device. Subsequent years of operation may have reduced maintenance provided no anomalous events occur during the year.

- First Year Maintenance – A minimum of three maintenance visits in the first year are recommended. The first maintenance visit should occur on or around the start of the rainy season with the last maintenance visit occurring on or around the end of the rainy season. If the region of installation has no definitive rainy season, maintenance visits should be spaced evenly throughout the year. Maintenance visits may coincide with inspection visits.
- Second Year and Subsequent Year Maintenance – A minimum of two maintenance visits per year are recommended. The first maintenance visit should occur on or around the start of the rainy season and the final maintenance visit should occur on or around the end of the rainy season. If the region of installation has no definitive rainy season, maintenance visits should be spaced evenly throughout the year. If during the first year inspection the Device and/or location is determined have high pollutant loadings or atypical loadings of sediment, trash and debris, additional maintenance visits may be necessary. Maintenance visits may coincide with inspection visits.

### **Maintenance Procedures**

The BrightWater™ Catch Basin Insert Filter for Curb Inlets can be routinely maintained without entry into the catch basin for most applications. Maintenance should begin by preparing and installing all safety measures followed by Inspection and documentation. Specific procedures for Maintenance are detailed below:

- Adorn all PPE and prepare documentation equipment.
- Install all Work Zone safety equipment and conduct a brief safety meeting. Work Zone safety equipment should protect the maintenance personnel from vehicular traffic and should also isolate and protect pedestrians and vehicles from the work zone.
- Remove the manhole cover utilizing the manhole puller/remover and safely set aside out of the way of the inspection operations and pedestrians or vehicles.
- If during inspection it is determined the accumulated trash, debris, and sediment requires removal, an industrial vacuum should be utilized to remove the material. Using a reduced diameter suction hose, vacuum the trash, debris, and sediment from the catch basin filter insert. The suction hose may be inserted into the filter through the curb opening as illustrated in Figure 2 or the hose may be inserted into the filter insert through the manhole opening as illustrated in Figure 3. A pressure washing wand may be utilized to assist this

process by freeing stubborn and clogged material from the filter insert fabric material. The suction hose should remain inside the filter while the insert is being washed down.

- If during inspection it is determined the media and/or oil absorbent require replacement, the replacement procedures should be followed. Replacement media bags and/or oil absorbent pouches should be pre-ordered in advance of the maintenance visit. Oil absorbent pouches should be unclipped from the media bag first. The media bag should be disconnected from the metal frame. Replacements should be reconnected and clipped in place.
- Removed trash, debris, and sediment should be disposed of following local, state, and federal guidelines. Typically this material is considered non-hazardous waste and can be disposed of in the standard waste stream. Media and oil absorbent should likewise be disposed of following local, state, and federal guidelines. Depending on oil content in the media and oil absorbent, this material may be classified as hazardous waste and should be disposed of according to local, state, and federal guidelines.
- Finalize the Documentation and Maintenance Form – Photograph the conditions of interior and exterior of the catch basin and Catch Basin Insert. Document the maintenance event utilizing the Treatment Device Inspection Form included with this manual or similar. The presence of standing water or vector such as mosquitos should be highlighted in the maintenance form. The local vector control agency should be notified if mosquitos are present in the catch basin or treatment Device.
- Replace the manhole cover and remove all Work Zone Safety Equipment.

### **Maintenance Equipment**

The following equipment and tools are recommended to facilitate maintenance of the BrightWater™ Catch Basin Filter Insert for Curb Inlets:

- Personal Protective Equipment (PPE) including but not limited to pants, long sleeve shirt, boots, gloves, eye protection, hearing protection, head protection, and high visibility safety vest.
- Work Zone safety equipment including but not limited to safety cones, street barricades, traffic control signage, and open manhole barricades.
- Manhole Hook/Removal Tool or similar.
- Flashlight.
- Tape Measure.
- Digital Camera.
- Small hand tools such as wrenches, screw drivers, and socket set.
- Industrial Vacuum (Truck mounted, trailer mounted, or portable)
- A treatment Device Inspection and Maintenance form for documenting the inspection visit. (A BrightWater™ Inspection and Maintenance form is included in the Inspection and Maintenance Guide in Appendix D.)

### **5.C. Effects of delayed maintenance on Device structural integrity, performance, odors;**

Standardized maintenance frequencies that are suitable for most sites are detailed in Section 5.A. and 5.B. Maintenance frequency however is very site specific depending on pollutant loading. Records from inspections and prior maintenances should be periodically reviewed to assess the appropriateness of the prescribed maintenance frequency.

Delayed or deferred maintenance can cause diminished pollutant removal, re-entrainment of pollutants, in catch basin and upstream hydraulic impacts, and impacts to water quality.

### **5.D. Vector Control Accessibility**

- i. Include the date the Device application was submitted to the Mosquito Vector Control Association of California’s Review for design verification via email (MVCAC <[trashreatment@mvcac.org](mailto:trashreatment@mvcac.org)>);**

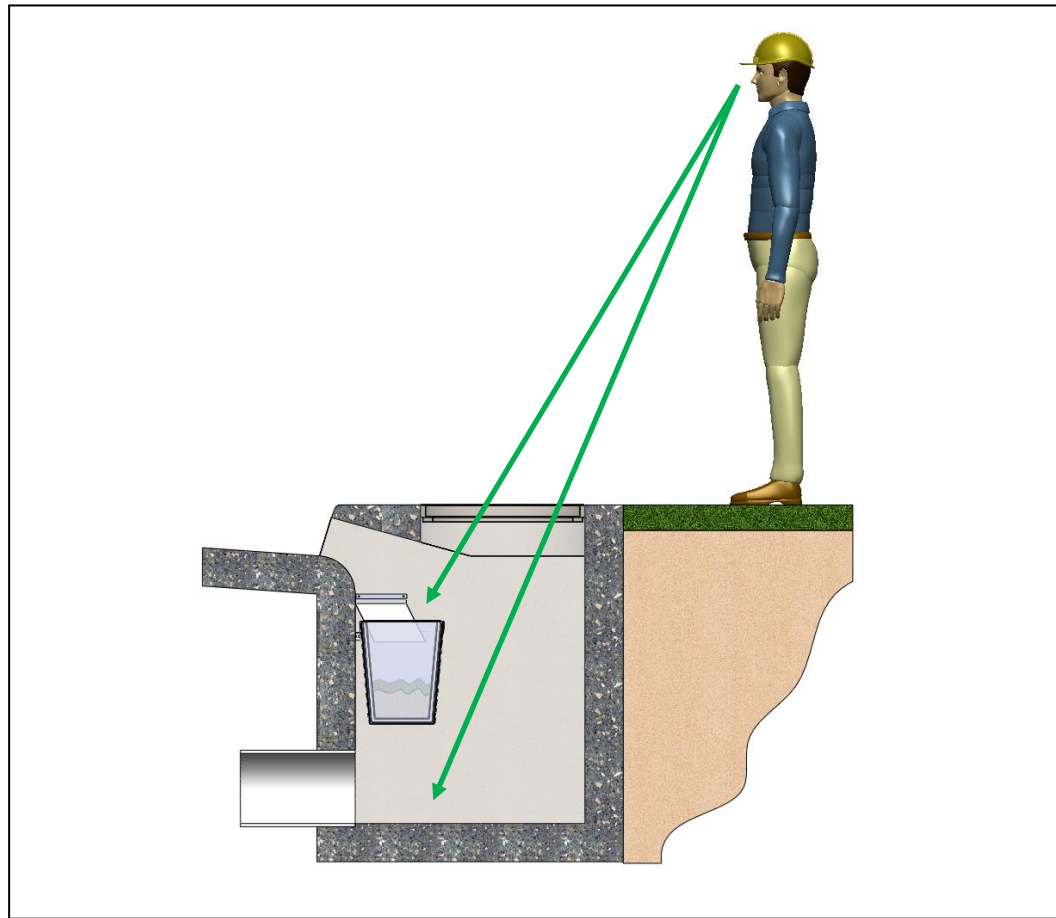
This application was submitted to the Mosquito and Vector Control Association of California directly after submittal to and receipt by the SWRCB.

- ii. Provide a video link or depict and describe how mosquito vector control personnel can readily access the bottom of the Device and/or storm water vault for visual observation and mosquito treatment; and**

The BrightWater™ Curb Inlet Filter is installed into existing and new curb inlet style catch basins. The installation requires little to no modifications of the catch basin and operation of the Curb Inlet Filter does not require or produce standing water. Curb Inlet Filter baskets are located directly beneath the catch basin curb opening. The installed location of the basket does not physically or visually obstruct access to the catch basin.

While in operation, the Curb Inlet Filters are designed to be free of standing or constant pools of water in both the filter baskets and the catch basins. In addition, filter baskets are suspended above the catch basin bottoms allowing the contents to dry between storm events. Because of the absence of any standing water and because prolonged wet conditions are not anticipated, vector are not anticipated as a result of the installation and operation of the Curb Inlet Filters.

It should be noted that some catch basins may be inadequately constructed and may be prone to retaining water even in small amounts, which can be problematic for mosquito breeding. The preferred course of action is to repair any deficiencies that



*Figure 12 - Depiction of Catch Basin and Device Inspection for Mosquito/Vector*

may cause standing water in a catch basin prior to installation of a Full Capture Device. In the event that repair of the catch basin has not occurred prior to installation of a Full Capture Device, it is critical that the deficient areas be visible and accessible by Vector/Mosquito Control personnel.

Figure 12 illustrates a typical installation of the BrightWater™ Curb Inlet Filter and the visual and physical access available to Mosquito and Vector Control personnel. The location of the filter basket does not impede Mosquito and Vector Control personnel visually or physically and is accessible for observation and treatment if necessary. The catch basin is equally physically and visually accessible with the filter basket only occupying the front wall of the catch basin in an elevated position leaving the entirety of the floor and adjacent walls open. Inspection and treatment (if necessary) are thus unimpeded.

- iii. **Provide the letter of verification from MVCAC the Mosquito Vector Control Association of California as soon as it becomes available. This letter shall verify that the design provisions have been included and allow full visual access to all areas for presence of standing water and/or treatment of mosquitoes when necessary.**

A letter of certification from the MVCAC will be provided to the SWRCB as soon as review by the MVCAC has concluded and the letter provided to BrightWater™.

### **5.E. Repair procedures for the Device's structural components.**

A requirement for repair or replacement of a structural component of the Curb Inlet Filter would be an anomalous condition. A BrightWater™ representative should be contacted and a site visit conducted to determine the most appropriate corrective action and necessary repair/replacement procedures.

## **6.0 RELIABILITY INFORMATION**

### **6.A. Estimated design life of Device components before major overhaul;**

The estimated design (service) life for BrightWater™ Curb Inlet Filter is 25 to 50 years. The basket, supports and hardware material is made using high strength, non-corrosive stainless steel to allow for the extended service life. The Curb Inlet Filter, in some applications, does utilize consumable materials such as a filtration membrane and media. These materials are intended to be replaced everyone to ten years. The design (service) life of the Curb Inlet Filter is dependent on the materials utilized as well as the proper application and maintenance of those materials.

### **6.B. Device sensitivity to loadings other than trash (i.e., leaves, sediment);**

The BrightWater™ Curb Inlet Filter is designed to treat pollutants other than trash such as sediment, oil and grease, and other gross pollutants. Loadings of these other pollutants is anticipated and expected. Because the design of the Curb Inlet Filter considers other pollutant loading, the presence of these other loading does not affect the removal of trash. Heavy pollutant loadings of sediment and other gross pollutants such as leaves and lawn clippings can sometimes be a heavier loading than trash and can therefore dictate maintenance frequency. The Device storage capacities considers all pollutant loadings.

## **6.C. Warranty Information; and**

BrightWater™ provides a one year limited warranty for the Curb Inlet Filter. The details of the warranty can be located in the warranty documented which has been included with this submittal in Appendix E.

## **6.D. Customer support information.**

BrightWater™ is a California based company with corporate offices located in Southern California. Customer service contact information is provided below:

BrightWater™  
P.O. Box 85430  
San Diego, California 92186  
Phone: (619) 821-1558  
[customerservice@wearebrightwater.com](mailto:customerservice@wearebrightwater.com)  
[www.wearebrightwater.com](http://www.wearebrightwater.com)

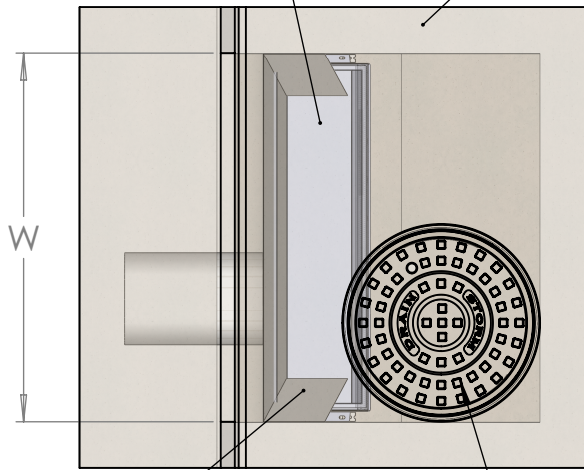
## **7.0 FIELD/LAB TESTING INFORMATION AND ANALYSIS**

The BrightWater™ Curb Inlet Filter stormwater treatment system is currently undergoing laboratory testing for removal performance of sediment and gross pollutants. Results of the testing will be provided to the SWRCB upon completion.

# **APPENDIX A**



BRIGHTWATER™ CURB INLET FILTER CATCH BASIN



RUBBER SKIRT

**SECTION B-B**  
Top View

MANHOLE COVER

Model Number and Size		Maximum Sediment Treatment Flow Rate <sup>1</sup>	Maximum Trash Treatment Flow Rate <sup>2</sup>	Trash Storage Capacity <sup>3</sup>	Sediment Storage Capacity <sup>3</sup>	Oil Capture Capacity
(Model No.)	(ft.)	(cfs)	(cfs)	(ft <sup>3</sup> )	(ft <sup>3</sup> )	(gal)
BWCIF-2.0	2	0.76	1.52	0.77	0.38	3.52
BWCIF-2.5	2.5	1	2.01	1.01	0.51	4.67
BWCIF-3.0	3	1.25	2.5	1.26	0.63	5.81
BWCIF-3.5	3.5	1.49	2.99	1.51	0.76	6.95
BWCIF-4.0	4	1.74	3.48	1.76	0.88	8.09
BWCIF-5.0	5	2.23	4.46	2.26	1.13	10.38
BWCIF-6.0	6	2.72	5.45	2.75	1.38	12.67
BWCIF-7.0	7	3.21	6.43	3.25	1.62	14.95
BWCIF-10.0	10	4.69	9.38	4.74	2.37	21.81
BWCIF-14.0	14	6.65	13.31	6.72	3.36	30.95
BWCIF-21.0	21	10.09	20.19	10.2	5.1	46.95
BWCIF-28.0	28	13.53	27.07	13.68	6.84	62.95

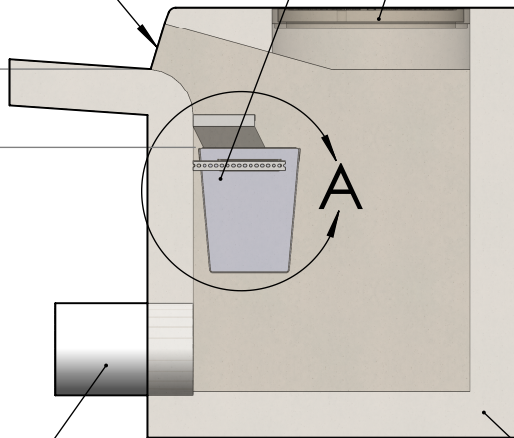
This table lists commonly specified standard model sizes. Additional standard model sizes and custom sizes are available.  
 1. The Maximum Sediment Treatment Flow Rate is based on 80% instantaneous removal of suspended sediment with a mean particle (d50) size distribution of 250um. The Maximum Sediment Treatment Flow Rate considers a Safety Factor of 2X.  
 2. The Maximum Trash Treatment Capacity is the maximum flow rate of the device at which 100% removal of floatables 5mm or greater in size can be captured and retained. The Maximum Trash Treatment Capacity considers a Safety Factor of 2X.  
 3. Storage capacity reflects the maximum pollutant capacity prior to impeding maximum treatment flow rates.

CURB OPENING



BRIGHTWATER™ CURB INLET FILTER

MANHOLE COVER



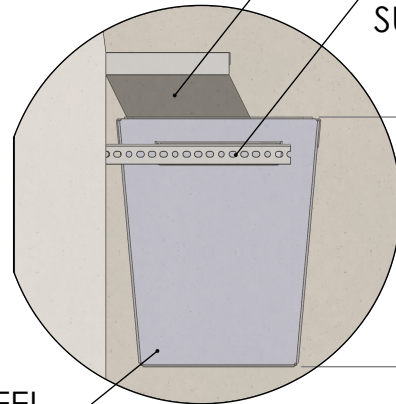
OUTLET PIPE

**SECTION A-A**  
Side View

CATCH BASIN

RUBBER SKIRT

BASKET SUPPORTS



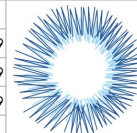
STAINLESS STEEL SCREEN BASKET

**DETAIL A**  
Filter Basket Mounting

NOTES:

1. All structural components made from 304 Stainless Steel.
2. Width (W) represents the curb opening width and can vary between a minimum of two feet and a maximum of 28ft.
3. Depth (D) represents the depth from the gutter flow line to the top of the curb inlet filter basket.

	NAME	DATE
DRAWN	DNL	01/24/2019
CHECKED	ALK	01/24/2019
ENG APPR.	NEL	01/31/2019
MFG APPR.		
Q.A.		



**BrightWater**

**PROPRIETARY AND CONFIDENTIAL**

THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF BRIGHTWATER, INC. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF BRIGHTWATER, INC. IS PROHIBITED.

COMMENTS:

**Brightwater,™ Inc.**

P.O. Box 85430 | San Diego, California 92184 | (619) 821-1558 | www.wearbrightwater.com

SIZE	DWG. NO.	REV.
<b>A</b>	<b>BWCIF-0001</b>	<b>A</b>
SCALE: NTS	SHEET 1 OF 1	

## **APPENDIX B**

## BrightWater™ Guide Specification

### Curb Inlet Filter

Released 07/26/2019

This product guide specification is written according to the Construction Specifications Institute (CSI) 3-Part Format, including MasterFormat, SectionFormat, and PageFormat, contained in the *CSI Manual of Practice*.

**Note to Architect/Engineer:**

This section must be carefully reviewed and edited by the Architect/Engineer to meet the requirements of the project and local building code. Coordinate this section with other specification sections and the Plans and Drawings. Delete all "Specifier Notes" when editing this section.

Section numbers are from MasterFormat 2016 Edition. Update section number as necessary to current versions if required.

**Specifier Notes:** This section covers the BrightWater™ Stormwater Catch Basin Insert Filter, Curb Inlet Configuration. The BrightWater™ Curb Inlet Filter is configured to meet the specific requirements of the project.

Consult BrightWater™ for assistance in editing this section for the specific project or application.

## **SECTION 33 44 26 – STORMWATER CATCH BASIN INSERT FILTERS**

### **PART 1 – GENERAL**

#### **1.01 SECTION INCLUDES**

- A. BrightWater™ Stormwater Catch Basin Insert Filter, Curb Inlet Configuration.

#### **1.02 RELATED SECTIONS**

- A. Section 01 33 00 – Submittal Procedures
- B. Section 33 42 33 – Stormwater Curbside Drains and Inlets

#### **1.03 REFERENCE STANDARDS**

- A. ASTM A193 – Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications
- B. ASTM A240 – Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
- C. ASTM A276 – Standard Specification for Stainless Steel Bars and Shapes
- D. ASTM D2000 – Standard Classification System for Rubber Products in Automotive Applications
- E. ASTM D3786 – Standard Test Method for Bursting Strength of Textile Fabrics – Diaphragm Bursting Strength Tester Method
- F. ASTM D4355 – Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc-Type Apparatus
- G. ASTM D4491 – Standard Test Methods for Water Permeability of Geotextiles by Permittivity
- H. ASTM D4533 – Standard Test Method for Trapezoid Tearing Strength of Geotextiles
- I. ASTM D4632 – Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
- J. ASTM D4751 – Standard Test Methods for Determining Apparent Opening Size of a Geotextile
- K. ASTM D4833 – Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products
- L. ASTM D4991 – Standard Test Method for Leakage Testing of Empty Rigid Containers by Vacuum Method
- M. ASTM D5261 – Standard Test Method for Measuring Mass per Unit Area of Geotextiles
- N. ASTM F593 – Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs
- O. ASTM F594 – Standard Specification for Stainless Steel Nuts
- P. ASTM F716 – Standard Test Methods for Sorbent Performance of Absorbents for Use on Chemical and Light Hydrocarbon Spills
- Q. ASTM F726 – Standard Test Method for Sorbent Performance of Adsorbents for use on Crude Oil and Related Spills

#### 1.04 QUALITY ASSURANCE

- A. Maintain at the project site a copy of each referenced standard that prescribes execution requirements.
- B. The materials, process and finished stormwater treatment system shall be subject to inspection by the Engineer. Acceptance or rejection of the system shall be based on the Specifications contained in this section.
- C. The manufacturer of the Catch Basin Insert Filter shall have a minimum of three years of experience manufacturing Devices of the type specified.
- D. The installer of the Catch Basin Insert Filter shall have a minimum of three years of experience installing Devices of the type specified.

#### 1.05 SUBMITTALS

- A. Submittals must conform to Section 01 33 00 - Submittal Procedures.
- B. Product Data: Submit manufacturer's product data, installation instructions, Operations and Maintenance Manual, Material Certifications, and Performance Certifications.
- C. Record Documents:
  - 1. Shop Drawings.
  - 2. Operations and Maintenance Manual.
  - 3. Installation Verification.
  - 4. Material Certifications.
  - 5. Performance Certifications.

#### 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Storage:
  - 1. Store in accordance with manufacturer's instructions.
  - 2. Store in clean, dry area, out of direct sunlight.
- C. Handling: Protect materials during handling and installation to prevent damage.

#### 1.07 WARRANTY

- A. Warranty must conform to Section 01 78 00 – Closeout Submittals. At a minimum, the Manufacturer shall provide a two (2) year limited warranty.



FILTRATION BAG The filtration membrane utilized to manufacture the filtration bag shall be made from a woven, polypropylene geotextile with an Apparent Opening Size (AOS) not greater than a U.S. Standard Sieve #40 in conformance with ASTM D4751. The membrane shall be capable of passing 145gpm/sf of water flow in conformance with ASTM D4491.

MEDIA Filter media shall consist of one or more of the following as specified by the Engineer:

Perlite: Perlite media shall be made of a natural siliceous volcanic rock and shall be free of any debris or deleterious substances. The perlite shall have a bulk density ranging from 6.0lb/ft<sup>3</sup> to 8.75lb/ft<sup>3</sup>. Media granules shall not be smaller than a U.S. Standard Sieve #8 and no larger than ¼-inch.

Granular Activated Carbon: Granular activated carbon shall be made from willow peat, lignite or coal that has been steam oxidized. The granular activated carbon shall have a bulk density ranging from 27 to 30 lb. /ft<sup>3</sup>. Media granules shall not be smaller than a U.S. Standard Sieve size #4 and no larger than a U.S. Standard Sieve size #8.

Sorbent: Sorbent shall be a hydrophobic, granulated material able to attract and retain petroleum hydrocarbons and other non-soluble pollutants in conformance with ASTM F716 and F726. The sorbent shall be non-leaching and contain no hazardous materials as defined by the U.S. Environmental Protection Agency.

FLOW SKIRT The flow skirt shall be made from neoprene rubber in conformance with ASTM D2000 with a durometer of 60A and a tensile strength no less than 1,600psi.

HARDWARE All mounting and assembly hardware shall be made from 304SS and shall conform to ASTM A193, F593 or F594.

## 2.05 PERFORMANCE

- A. The Catch Basin Insert Filter for Curb Inlets shall remove sediment, oil & grease, trash & debris, and gross pollutants from dry weather and wet weather runoff entering the project curb inlet catch basins.
- B. Treatment flow rates and storage capacities shall meet or exceed the Specifications in Table 1 for given models Specified on the Plans.
- C. Performance of the Catch Basin Insert Filter for Curb Inlets shall be based on treating the Water Quality Flow Rate and Trash Capture Flow Rate without internally bypassing and without re-suspension and washout of captured pollutants. The Maximum Treatment Flow

Rate for each targeted pollutant shall be greater than or equal to the WQF and Trash Capture Flow Rate as detailed in the project WQMP.

- D. The Catch Basin Insert Filter for Curb Inlets shall be capable capturing no less than 80% of the stormwater sediment load (with the sediment having a mean particle size distribution of 250um) without internally bypassing flows up to the maximum Sediment Treatment Flow Rate.
- E. The Catch Basin Insert Filter for Curb Inlets shall be capable of capturing and retaining 100% of all particles 5mm or greater up to the Maximum Trash Treatment Flow Rate.
- F. The Catch Basin Insert Filter for Curb Inlets shall be capable of capturing no less than 80% of the stormwater hydrocarbon load (non-emulsified) up to the Device maximum rated oil capture capacity. Captured hydrocarbons shall not be re-suspended into exiting flows.

*Table 1*

Model Number and Size		Maximum Sediment Treatment Flow Rate <sup>1</sup>	Maximum Trash Treatment Flow Rate <sup>2</sup>	Trash Storage Capacity <sup>3</sup>	Sediment Storage Capacity <sup>3</sup>	Oil Capture Capacity
(Model No.)	(ft.)	(cfs)	(yd <sup>3</sup> )	(yd <sup>3</sup> )	(yd <sup>3</sup> )	(yd <sup>3</sup> )
BWCIF-2.0	2.0	0.76	1.52	0.77	0.38	3.52
BWCIF-2.5	2.5	1.00	2.01	1.01	0.51	4.67
BWCIF-3.0	3.0	1.25	2.50	1.26	0.63	5.81
BWCIF-3.5	3.5	1.49	2.99	1.51	0.76	6.95
BWCIF-4.0	4.0	1.74	3.48	1.76	0.88	8.09
BWCIF-5.0	5.0	2.23	4.46	2.26	1.13	10.38
BWCIF-6.0	6.0	2.72	5.45	2.75	1.38	12.67
BWCIF-7.0	7.0	3.21	6.43	3.25	1.62	14.95
BWCIF-10.0	10.0	4.69	9.38	4.74	2.37	21.81
BWCIF-14.0	14.0	6.65	13.31	6.72	3.36	30.95
BWCIF-21.0	21.0	10.09	20.19	10.20	5.10	46.95
BWCIF-28.0	28.0	13.53	27.07	13.68	6.84	62.95

This table lists commonly specified standard model sizes. Additional standard model sizes and custom sizes are available.

1. The Maximum Sediment Treatment Flow Rate is based on 80% instantaneous removal of suspended sediment with a mean particle (d50) size distribution of 250um. The Maximum Sediment Treatment Flow Rate considers a Safety Factor of 2X.
2. The Maximum Trash Treatment Capacity is the maximum flow rate of the device at which 100% removal of floatables 5mm or greater in size can be captured and retained. The Maximum Trash Treatment Capacity considers a Safety Factor of 2X.
3. Storage capacity reflects the maximum pollutant capacity prior to impeding maximum treatment flow rates.

### **PART 3 – EXECUTION**

#### **3.01 General**

- A. The installation of the Catch Basin Insert Filter for Curb Inlets shall be performed by a Manufacturer approved installation Contractor. The Contractor and installation shall conform to all applicable national, state, and local laws and ordinances.



3.02 Identification

- A. All Catch Basin Insert Filters for Curb Inlets shall be identified with permanent markings that indicate the following minimum information:
  - 1. Name of Manufacturer
  - 2. Model of Device
  - 3. Date of Manufacture
  - 4. Date of Installation
  - 5. Manufacturer Contact Information

3.03 Installation

- A. The Contractor shall furnish all labor, equipment and materials required to install the Catch Basin Insert Filters for Curb Inlets in accordance with the Plans and Specifications.
- B. Plans indicate a general location and arrangement Catch Basin Insert Filters for Curb Inlets. Where specific installation procedures are not indicated in the Plans, follow the product manufacturer's written instructions.
- C. All Devices shall be inspected for defects in materials and workmanship prior to installation. Any defective, damaged or otherwise compromised Device shall be marked as such and not utilized.
- D. Any damage to the catch basin as a result of the installation is the responsibility of the Contractor.
- E. The Catch Basin Insert Filters for Curb Inlets shall be installed across the entire width of the curb opening. Trays, troughs or similar mechanisms to secondarily route flows to the Device will be considered non-compliant. Devices shall be installed in a manner such that no components of the Device blocks or impedes visual or physical access through the manhole opening.
- F. The Contractor shall supply the Engineer with a record of installation that includes the following minimum information:
  - 1. Project Name
  - 2. Project Location
  - 3. Name of Manufacturer
  - 4. Manufacturer Contact
  - 5. Date of Installation
  - 6. Drainage Inlet Location
  - 7. Model of Device

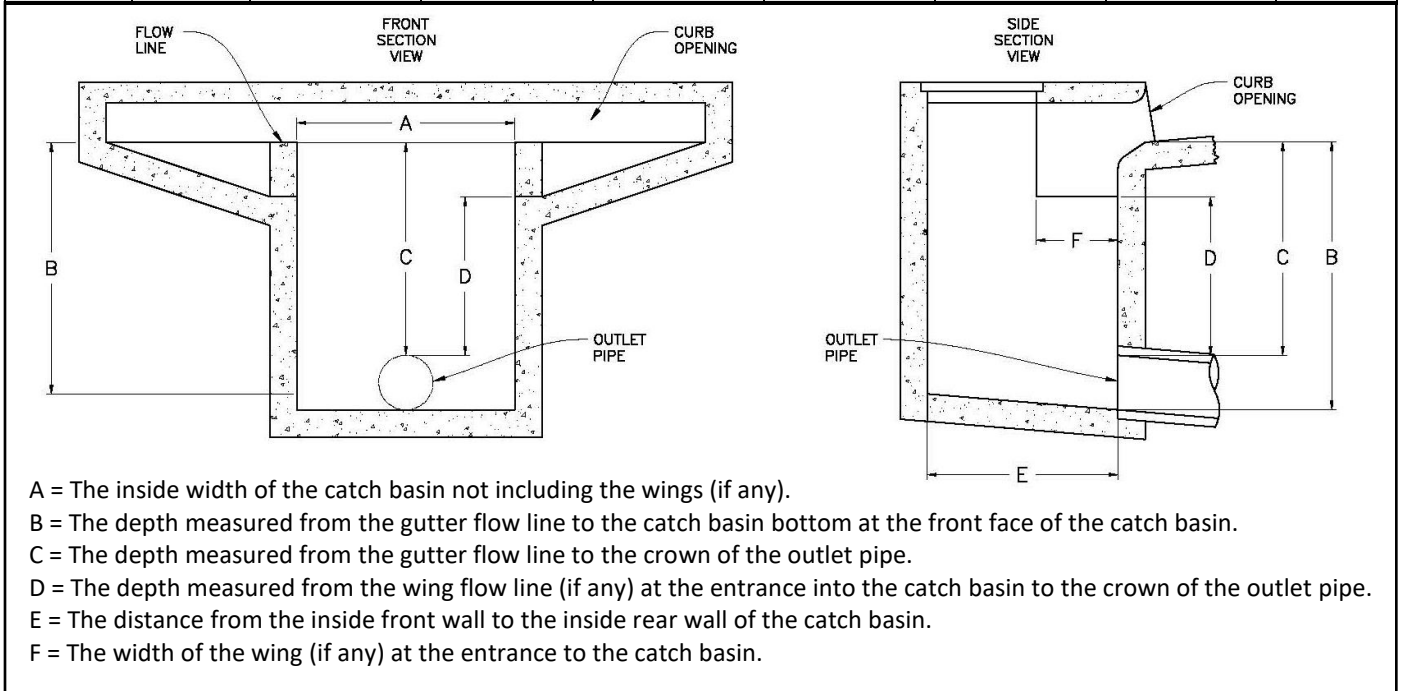
## REVISION TABLE

Version	Release Date	Summary of Changes
<b>BW1.00</b>	<b>07/26/2019</b>	<b>Initial Release</b>

## **APPENDIX C**

CONTACT AND PROJECT INFORMATION				
<b>CONTACT DETAILS</b>	Company Name:			
	Contact Name:			
	Mailing Address			
	Street:	City:	State:	Zip:
	Phone:			
	Email:			
<b>PROJECT DETAILS</b>	Project Name:			
	Project Address			
	Street:	City:	State:	Zip:
	Regulatory Agency:			
	Special Instructions:			

MEASUREMENTS								
DRAIN NO.	QTY	FIELD MEASURED DIMENSIONS						NO. OF WINGS
		A	B	C	D	E	F	



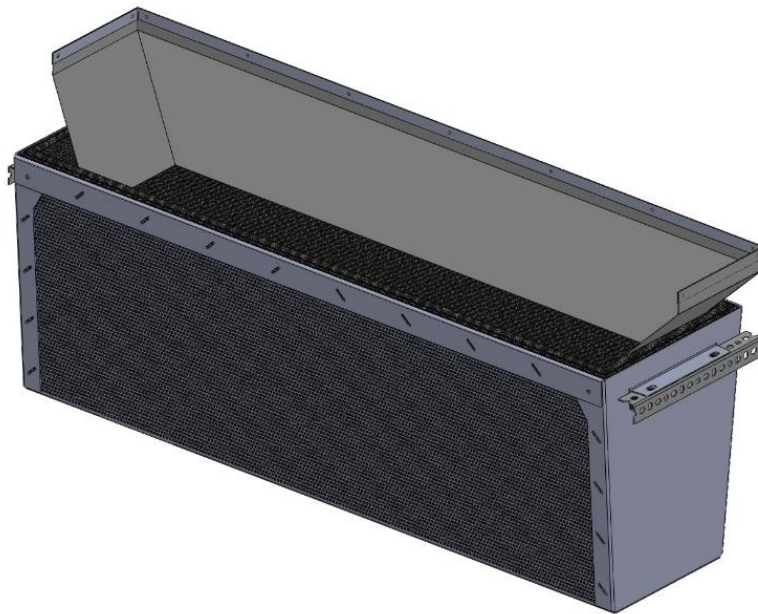
Please email the completed form to [customerservice@wearebrightwater.com](mailto:customerservice@wearebrightwater.com)  
 P.O. Box 85430 | San Diego, California 92186 | (619) 821-1558 | [www.wearebrightwater.com](http://www.wearebrightwater.com)

# **APPENDIX D**

---

# Inspection and Maintenance Guide

---



## OVERVIEW:

The BrightWater™ Catch Basin Filter Insert for Curb Inlets is a post-construction, stormwater Best Management Practice (BMP) designed to capture coarse to medium grained sediment, oil and grease, and gross pollutants including trash and debris. The Device is typically implemented to comply with Federal, State, and Local Clean Water Act regulations and to assist with protection of the Nation's water resources. To ensure proper function of the Device and continued protection of the receiving water bodies, the Device must be regularly inspected and maintained. These requirements to inspect and maintain apply to all stormwater BMPs regardless of type, function or even brand. This guideline contains recommendations and requirements for the inspection and maintenance specific to the BrightWater™ Catch Basin Filter Insert for Curb Inlets.

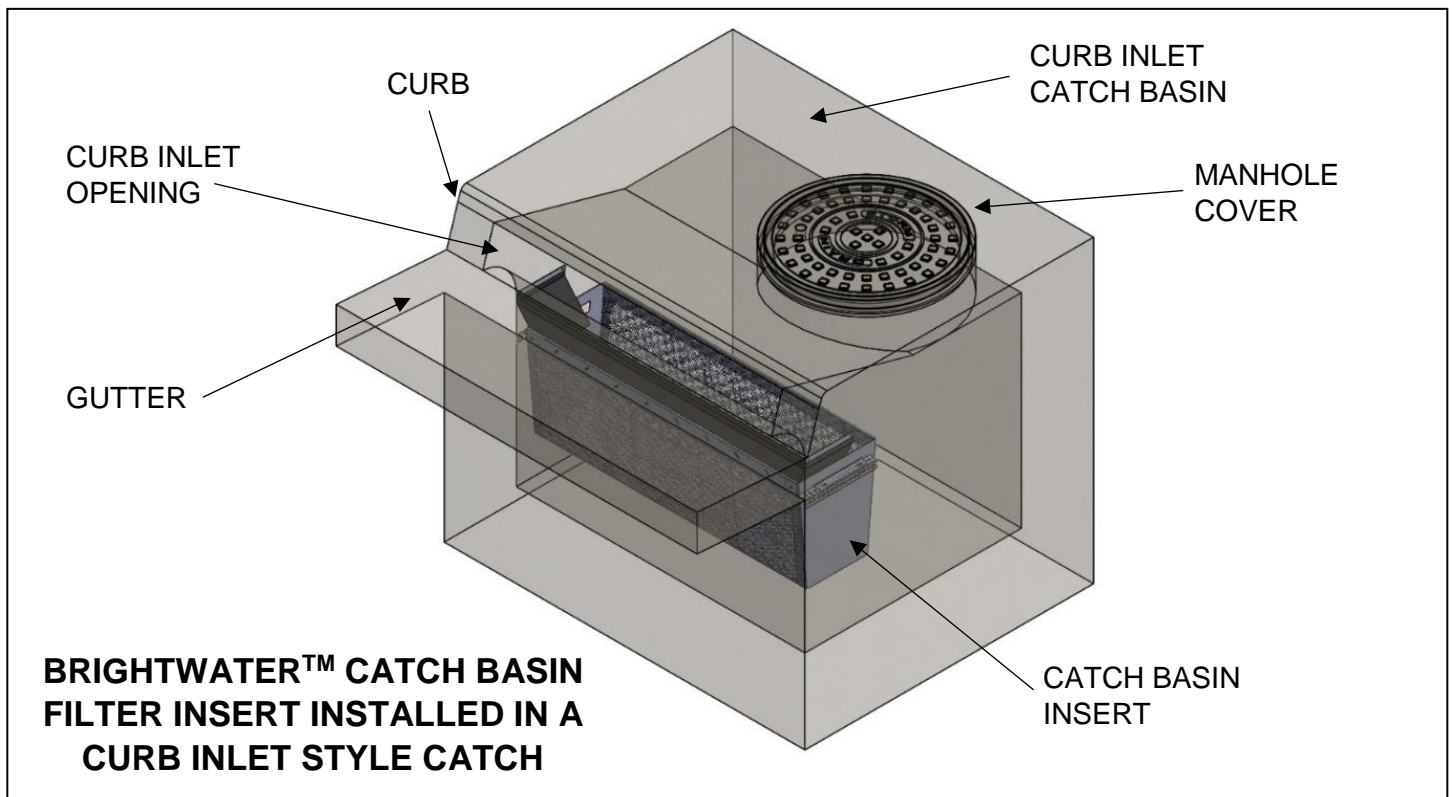


Figure 1- Brightwater™ Catch Basin Filter insert Diagram

## INSPECTION OVERVIEW:

A thorough inspection program is necessary to ensure the treatment Device is operating as intended and providing the necessary pollutant removal. An actively practiced inspection program can also minimize unnecessary maintenance and provide insight to the status of the receiving water bodies. An inspection program should be structured based on the type of treatment Device as well as the location and function of the treatment Device. It is critical to

closely monitor and document the first year of operation after initial installation in order to develop a long term maintenance plan for the Device that is consistent with the environmental requirements of the installation.

## **INSPECTION FREQUENCY AND TIMING:**

BrightWater™ Catch Basin Insert Filter for Curb Inlets should be inspected on a routine and recurring basis. The frequency and timing of the inspections can be variable based on the configuration of the Device, location of the Device within the drainage system, and the geographic region of installation. During the first year of operation, after initial installation, the Catch Basin Filter Insert should be inspected more frequently to create a baseline of understanding for operation of the Device. Subsequent years of operation can have reduced inspection provided no anomalous events occur during the year.

- **First Year Inspection** – A minimum of three inspections in the first year are recommended. The first inspection should occur on or around the start of the rainy season with the last inspection occurring on or around the end of the rainy season. If the region of installation has no definitive rainy season, inspections should be spaced evenly throughout the year. Maintenance visits may coincide with inspection visits.
- **Second Year and Subsequent Year Inspections** – A minimum of two inspections per year are recommended. The first inspection should occur on or around the start of the rainy season and the final inspection should occur on or around the end of the rainy season. If the region of installation has no definitive rainy season, inspections should be spaced evenly throughout the year. If during the first year inspection the Device and/or location is determined have high pollutant loadings or atypical loadings of sediment, trash and debris, additional inspections may be necessary. Maintenance visits may coincide with inspection visits.

## **INSPECTION EQUIPMENT:**

The following equipment and tools are recommended to facilitate inspection of the BrightWater™ Catch Basin Filter Insert for Curb Inlets:

- Personal Protective Equipment (PPE) including but not limited to pants, long sleeve shirt, boots, gloves, eye protection, hearing protection, head protection, and high visibility safety vest.
- Work Zone safety equipment including but not limited to safety cones, street barricades, traffic control signage, and open manhole barricades.
- Manhole Hook/Removal Tool or similar.
- Flashlight.



- Tape Measure.
- Digital Camera.
- A treatment Device Inspection and Maintenance form for documenting the inspection visit. (A BrightWater™ Inspection and Maintenance form is included with this document.)



## INSPECTION PROCEDURES:

The BrightWater™ Catch Basin Insert Filter for Curb Inlets can be inspected without entry into the catch basin. The Inspection should begin by preparing and installing all safety measures followed by the inspection and documentation. Specific procedures for the inspection are detailed below:

- Adorn all PPE and prepare documentation equipment.
- Install all Work Zone safety equipment and conduct a brief safety meeting. Work Zone safety equipment should protect the inspector(s) from vehicular traffic and should also isolate and protect pedestrians and vehicles from the work zone.
- Remove the manhole cover utilizing the manhole puller/remover and safely set aside out of the way of the inspection operations and pedestrians or vehicles.
- Inspect the gutter, curb face, and curb opening. – The areas outside of the catch basin should be free from debris, obstructions and standing water. The presence of any of these conditions outside of the catch basin are potential indicators of maintenance that be necessary for the Catch Basin Filter Insert. If any of these maintenance indicators are encountered they should be documented and, depending on severity, should be rectified through recommended maintenance. Maintenance may occur simultaneously with inspection provided the maintenance indicators have already been documented.
- Utilizing a flashlight, inspect the inside of the catch basin – The interior of the catch basin should be free from debris, obstructions, and standing water. The pipe inlet(s) and outlet(s) should be free from debris, obstructions and standing water. The presence of any of these conditions in the interior of the catch basin are potential indicators of maintenance that may be necessary for the Catch Basin Filter Insert. If any of these

maintenance indicators are encountered, they should be documented and depending on the severity, should be rectified through recommended maintenance. Maintenance may occur simultaneously with inspection provided the maintenance indicators have already been documented.

- Inspect the Catch Basin Filter Insert for physical or structural anomalies. – The insert should be firmly mounted to the catch basin and there should be no loose or missing hardware. Bent, Broken, or otherwise damaged structural components should be documented and maintained.
- Inspect the Catch Basin Filter Insert for pollutants. – Pollutants such as trash and debris, oil and grease, and sediment are expected to be captured inside of the Catch Basin Filter Insert. The presence of such pollutants are indicators the Device is operating as intended. Conversely, the lack of such pollutants present in the Device may be an indicator that the Device of stormwater system is not functioning as intended. The quantities of pollutants should be documented and compared with the maximum capacities for the Device and maintenance recommended as necessary.
- Inspect the Media and Oil Absorbent – Devices equipped with media and oil absorbent pouches should be inspected for condition of these materials. Media and oil absorbent material darken in color as they collect pollutants. Full darkened media and oil absorbent are indicators that the material has reached its useful life and maintenance is necessary. The condition of the media and oil absorbent should be documented and maintenance recommended as necessary.
- Finalize the Documentation and Inspection Form – Photograph the conditions of interior and exterior of the catch basin and Catch Basin Insert. Document the inspection event utilizing the Treatment Device Inspection Form included with this manual or similar. The presence of standing water or vector such as mosquitos should be highlighted in the inspection form. The local vector control agency should be notified if mosquitos are present in the catch basin or treatment Device.
- Replace the manhole cover and remove all Work Zone Safety Equipment.

\* *Confined Space Entry is typically not required for routine inspections of standard installations. Confined space entry protocol should be followed should circumstances require entry into the catch basin for inspection.*

## MAINTENANCE OVERVIEW:

To ensure proper function of the BrightWater™ Catch Basin Filter Insert and to ensure continued protection of the receiving water bodies, the Device must be regularly maintained. A maintenance program should be structured based on the type of treatment Device as well as the location and function of the treatment Device. It is also important to incorporate data received from the inspection program into the maintenance recommendations to ensure proper function but also to minimize unnecessary maintenance. It is important to recognize that

maintenance operations include a wide variety of operations and not all operations have to occur during each maintenance cycle. Maintenance may consist solely of trash and debris removal or may consist of removal and replacement of media depending on what the circumstances require. A customized maintenance program provides the most benefit to operation while minimizing maintenance costs.

## **MAINTENANCE FREQUENCY AND TIMING:**

BrightWater™ Catch Basin Insert Filter for Curb Inlets should be maintained on a routine and recurring basis. The frequency and timing of the maintenance can be variable based on the configuration of the Device, location of the Device within the drainage system, and the geographic region of installation. During the first year of operation, after initial installation, the Catch Basin Filter Insert may need to be maintained more frequently to create a baseline of understanding for operation of the Device. Subsequent years of operation may have reduced maintenance provided no anomalous events occur during the year.

- **First Year Maintenance** – A minimum of three maintenance visits in the first year are recommended. The first maintenance visit should occur on or around the start of the rainy season with the last maintenance visit occurring on or around the end of the rainy season. If the region of installation has no definitive rainy season, maintenance visits should be spaced evenly throughout the year. Maintenance visits may coincide with inspection visits.
- **Second Year and Subsequent Year Maintenance** – A minimum of two maintenance visits per year are recommended. The first maintenance visit should occur on or around the start of the rainy season and the final maintenance visit should occur on or around the end of the rainy season. If the region of installation has no definitive rainy season, maintenance visits should be spaced evenly throughout the year. If during the first year inspection the Device and/or location is determined have high pollutant loadings or atypical loadings of sediment, trash and debris, additional maintenance visits may be necessary. Maintenance visits may coincide with inspection visits.

## **MAINTENANCE EQUIPMENT:**

The following equipment and tools are recommended to facilitate maintenance of the BrightWater™ Catch Basin Filter Insert for Curb Inlets:

- Personal Protective Equipment (PPE) including but not limited to pants, long sleeve shirt, boots, gloves, eye protection, hearing protection, head protection, and high visibility safety vest.
- Work Zone safety equipment including but not limited to safety cones, street barricades, traffic control signage, and open manhole barricades.

For more information, please contact [customerservice@wearebrightwater.com](mailto:customerservice@wearebrightwater.com)  
P.O. Box 85430 | San Diego, California 92186 | (619) 821-1558 | [www.wearebrightwater.com](http://www.wearebrightwater.com)

- Manhole Hook/Removal Tool or similar.
- Flashlight.
- Tape Measure.
- Digital Camera.
- Small hand tools such as wrenches, screw drivers, and socket set.
- Industrial Vacuum (Truck mounted, trailer mounted, or portable)
- A treatment Device Inspection and Maintenance form for documenting the inspection visit. (A BrightWater™ Inspection and Maintenance form is included with this document.)



## MAINTENANCE PROCEDURES:

The BrightWater™ Catch Basin Insert Filter for Curb Inlets can be routinely maintained without entry into the catch basin for most applications. Maintenance should begin by preparing and installing all safety measures followed by Inspection and documentation. Specific procedures for Maintenance are detailed below:

- Adorn all PPE and prepare documentation equipment.
- Install all Work Zone safety equipment and conduct a brief safety meeting. Work Zone safety equipment should protect the maintenance personnel from vehicular traffic and should also isolate and protect pedestrians and vehicles from the work zone.
- Remove the manhole cover utilizing the manhole puller/remover and safely set aside out of the way of the inspection operations and pedestrians or vehicles.
- If during inspection it is determined the accumulated trash, debris, and sediment requires removal, an industrial vacuum should be utilized to remove the material. Using a reduced diameter suction hose, vacuum the trash, debris, and sediment from the catch basin filter insert. The suction hose may be inserted into the filter through the curb opening as illustrated in Figure 2 or the hose may be inserted into the filter insert through the manhole opening as illustrated in Figure 3. A pressure washing wand may be utilized to assist this process by freeing stubborn and clogged material from the filter insert fabric material. The suction hose should remain inside the filter while the insert is being washed down.

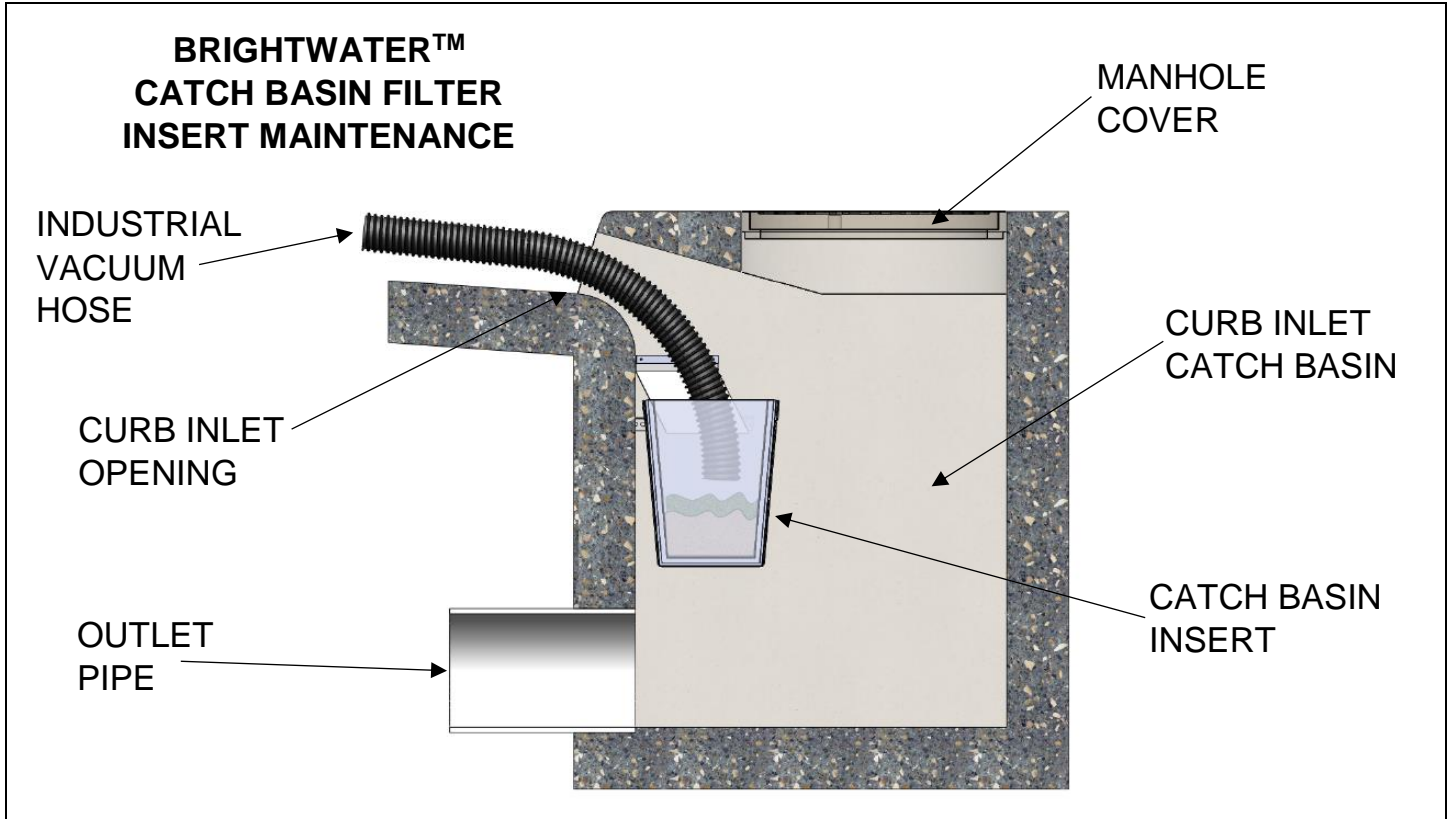


Figure 3 - Brightwater™ Catch Basin Filter Insert Maintenance Through Curb Opening

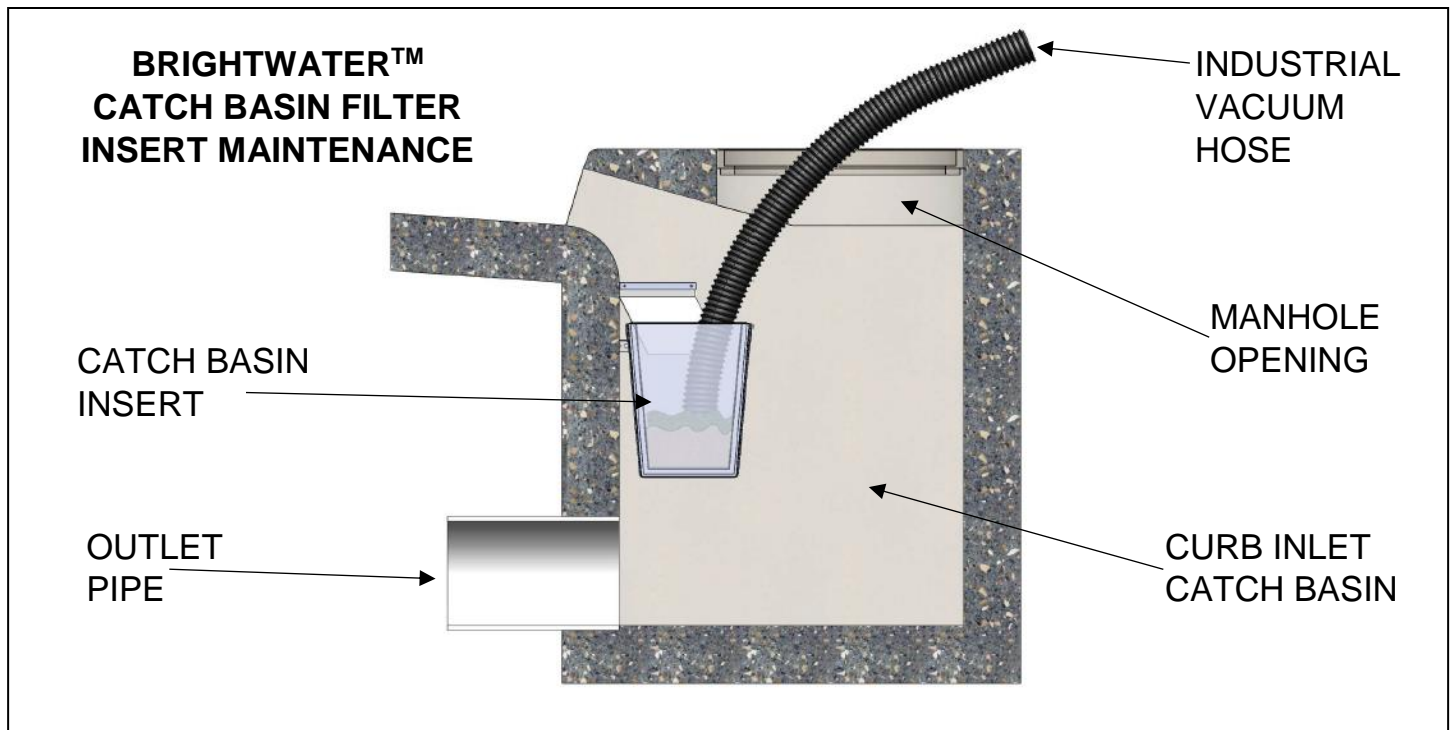


Figure 2 - Brightwater™ Catch Basin Filter Insert Maintenance Through Manhole Opening



- If during inspection it is determined the media and/or oil absorbent require replacement, the replacement procedures should be followed. Replacement media bags and/or oil absorbent pouches should be pre-ordered in advance of the maintenance visit. Oil absorbent pouches should be unclipped from the media bag first. The media bag should be disconnected from the metal frame. Replacements should be reconnected and clipped in place.
- Removed trash, debris, and sediment should be disposed of following local, state, and federal guidelines. Typically this material is considered non-hazardous waste and can be disposed of in the standard waste stream. Media and oil absorbent should likewise be disposed of following local, state, and federal guidelines. Depending on oil content in the media and oil absorbent, this material may be classified as hazardous waste and should be disposed of according to local, state, and federal guidelines.
- Finalize the Documentation and Maintenance Form – Photograph the conditions of interior and exterior of the catch basin and Catch Basin Insert. Document the maintenance event utilizing the Treatment Device Inspection Form included with this manual or similar. The presence of standing water or vector such as mosquitos should be highlighted in the maintenance form. The local vector control agency should be notified if mosquitos are present in the catch basin or treatment Device.
- Replace the manhole cover and remove all Work Zone Safety Equipment.

## INSPECTION & MAINTENANCE FORM

Site Name: \_\_\_\_\_

Site Address: \_\_\_\_\_

(City) \_\_\_\_\_ (State) \_\_\_\_\_ (Zip Code) \_\_\_\_\_

NPDES Tracking No. \_\_\_\_\_

Owner/Operator Name: \_\_\_\_\_

Site Contact: \_\_\_\_\_

Phone: (     )     -     Email: \_\_\_\_\_

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

Phone: (     )     -     Email: \_\_\_\_\_

Date of Visit: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ Time of Visit: \_\_\_\_\_ AM / PM

Type of Visit:  Scheduled  Pre-Storm  During Storm  Post-Storm  Emergency

Visit Purpose:  Inspection  Maintenance  Both

BMP ID	BMP Location (Site Map or GPS Coordinates)	Trash Load (yd <sup>3</sup> )	Debris Load (yd <sup>3</sup> )	Sediment Load (yd <sup>3</sup> )	Media Condition	Absorbent Condition	General Condition of BMP Corrective Action Required or Performed

(Continued on next page.)

## INSPECTION & MAINTENANCE FORM (Continued)

BMP ID	BMP Location (Site Map or GPS Coordinates)	Trash Load (yd <sup>3</sup> )	Debris Load (yd <sup>3</sup> )	Sediment Load (yd <sup>3</sup> )	Media Condition	Absorbent Condition	General Condition of BMP Corrective Action Required or Performed

### 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 gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, 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.”

**Print name and title:** \_\_\_\_\_

**Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_



# **APPENDIX E**

# **LIMITED WARRANTY BRIGHTWATER™**

TO THE EXTENT PERMITTED BY THE LAWS OF YOUR JURISDICTION, THIS LIMITED WARRANTY LIMITS OR EXCLUDES CERTAIN WARRANTIES OR RIGHTS OTHERWISE PROVIDED BY LAW.

BrightWater™ warrants that the product you ("Purchaser") have purchased from BrightWater™ or a BrightWater™ authorized reseller is free from defects in materials and workmanship under normal use for a period of one (1) year from the original date of product purchase. The warranty period begins on the day of shipment from BrightWater™. In the event the product is ready for shipment but Purchaser elects to postpone or delay shipment, the warranty period begins on the day of postponement or delay. The warranty extends only to the original purchaser and is not transferrable. The warranty excludes all expendable parts.

During the warranty period, BrightWater™ will repair or replace defective products or parts with new products or parts or, at the option of BrightWater™, serviceable used products or parts that are equivalent or superior to new parts in performance. This Limited Warranty extends only to products purchased from BrightWater™ or a BrightWater™ authorized reseller. This Limited Warranty does not extend to any product that has been damaged or rendered defective (a) as a result of accident, misuse or abuse; (b) as a result of utilizing improper installation methods (c) as a result of an act of God; (d) by operation outside the usage parameters; (e) by the use of parts not manufactured or sold by BrightWater™; (f) by modification of the product; (g) as a result of war or terrorist attack; or (h) as a result of service by anyone other than BrightWater™ or a BrightWater™ authorized reseller or authorized agent.

IT IS EXPRESSLY AGREED THAT THIS WARRANTY IS THE EXCLUSIVE AND ONLY WARRANTY TO PASS WITH BRIGHTWATER'S™ PRODUCTS. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, INCLUDING, WITHOUT LIMITATION, THOSE OF FITNESS FOR A PARTICULAR PURPOSE AND MERCHANTABILITY.

There are no other warranties or representations with respect to the nature or quality of BrightWater's™ products. Under no circumstances shall BrightWater™ be liable for incidental, consequential, or other additional damages of any kind or nature whatsoever, including, without limitation, shipping and freight charges, installation and/or removal expenses, labor charges, lost profits, interest, attorney fees, or other costs. This limitation applies whether damages are sought, or a claim made, under this warranty or as a tort claim (including negligence and strict product liability), a contract claim, or any other claim. This limitation of liability will be effective even if BrightWater™ or an authorized BrightWater™ representative has been advised by you of the possibility of any such damages.

In the event such disclaimer of implied warranties is held to be unenforceable or otherwise invalid, or if Purchaser or any third party, including, without limitation, employees, assignees, invitees, agents, contractors, subcontractors, and/or representatives of Purchaser, claim BrightWater™ is liable for negligence arising from the manufacture of its products, or if for any other reason a claim is made that BrightWater™ has not fully satisfied its obligations with respect to its products, BrightWater's™ liability is limited to an amount equal to two (2) times the original purchase price of BrightWater's™ products proven to be defective, exclusive of any applicable taxes. Purchaser hereby agrees to indemnify, defend and hold BrightWater™ harmless in the event any third party brings a claim against BrightWater™ relating to its products.

Any claim for breach of this warranty must be submitted within one year from the date of original purchase and must be in writing, addressed to President, BrightWater™, P.O. Box 85430, San Diego, CA 92186. Only a corporate officer (President, Vice President, or Corporate Secretary) of BrightWater™ shall have the authority to modify this warranty, and any such modification must be in writing and signed by the corporate officer, including reference to said officer's title, to be effective.

If a dispute arises out of or relates to this Limited Warranty, or performance or breach thereof, BrightWater™ and Purchaser agree first to try in good faith to resolve the dispute by mediation under the Commercial Mediation Rules published by the American Arbitration Association before resorting to arbitration. Thereafter, any remaining unresolved controversy or claim arising out of or relating to this Limited Warranty, or performance or breach thereof, shall be resolved by binding arbitration in accordance with the Commercial Arbitration Rules published by the American Arbitration Association, and shall be conducted in San Diego County, California. The sole Arbitrator shall be a retired or former Judge familiar with commercial and construction matters. Judgement upon the award rendered by the Arbitrator may be entered in the San Diego County court having jurisdiction thereof.