Bio Clean

A Forterra Company

Catch Basin Inlet Filters

Full Capture Type

Section [_____]
Stormwater Catch Basin Filtration Device

PART 1 – GENERAL

01.01.00 Purpose
The purpose of this specification is to establish generally acceptable criteria for devices used for filtration of stormwater runoff captured by catch basins with curb openings. It is intended to serve as a guide to producers, distributors, architects, engineers, contractors, plumbers, installers, inspectors, agencies and users; to promote understanding regarding materials, manufacture and installation; and to provide for identification of devices complying with this specification.

01.02.00 Description
Stormwater Catch Basin Filtration Devices (SCBFD) are used to filter stormwater runoff captured by catch basins. The SCBFD is a filter system composed of a filter basket, media filtration boom and a trough system. SCBFDs are used to remove various pollutants from stormwater by means of screening, separation and media filtration.

01.03.00 Manufacturer
The manufacturer of the SCBFD shall be one that is regularly engaged in the engineering, design and production of systems developed for the treatment of stormwater runoff for at least (10) years, and which have a history of successful production, acceptable to the engineer of work. In accordance with the drawings, the SCBFD(s) shall be a filter device manufactured/distributed by Bio Clean Environmental Services, Inc. or assigned distributors or licensees. Bio Clean Environmental Services, Inc. can be reached at:

Corporate Headquarters:
398 Via El Centro
Oceanside, CA 92058
Phone: (855) 566-3938
Fax: (760) 433-3176
www.BioCleanEnvironmental.com

01.04.00 Submittals

01.04.01 Shop drawings are to be submitted with each order to the contractor and engineer of work.

01.04.02 Shop drawings are to detail the SCBFD, its components and the sequence for installation, including:
- SCBFD configuration with primary dimensions
- Various SCBFD components
- Any accessory equipment

01.04.03 Inspection and maintenance documentation submitted upon request.

01.05.00 Work Included

01.05.01 Specification requirements for installation of SCBFD.

01.05.02 Manufacturer to supply SCBFD(s):
- Filter Basket
- Trough System (weir and trough)
- Media Filtration Boom

01.05.03 Media Filtration Boom shall be provided with each Filter Basket housed in nylon netting and securely fastened entrance to the Filtration basket. Each media boom shall contain polymer beads to permanently absorb hydrocarbons.

01.06.00 Reference Standards

ASTM A 240	Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
ASTM F 716	Testing Sorbent Performance of Absorbents
ASTM F 726	Sorbent Performance of Absorbents
ASTM D3787 - 07	Standard Test Method for Bursting Strength of Textiles-Constant-Rate-of-Traverse (CRT) Ball Burst Test
ASTM D2690-98	Standard Test Method for Isophthalic Acid in Alkyd and Polyester Resins
ASTM C 582-02	Standard Specification for Contact-Molded Reinforced Thermosetting Plastic (RTP) Laminates for Corrosion-Resistant Equipment
ASTM D 638	Standard Test Method for Tensile Properties of Plastics
ASTM D 790	Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
ASTM D 648	Standard Test Method for Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position
ASTM D 2583	Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor
ASTM D 4097	Standard Specification for Contact-Molded Glass-Fiber-Reinforced Thermoset Resin Corrosion-Resistant Tanks
ASTM D3409	Standard Test Method for Adhesion of Asphalt-Roof Cement to Damp, Wet, or Underwater Surfaces
IFI 114	Break Mandrel Blind Rivets

PART 2 – COMPONENTS

02.01.00 Trough System Components

02.01.01 Trough shall be manufactured from 100% marine grade polyester resin and fiberglass strands and stainless steel.

- The entire fiberglass structure must be coated with a polyester gel coating with ultra violet inhibitors incorporated into the coating for maximum ultra violet protection.
- Fiberglass must have a minimum thickness of 3/16”.

02.01.02 Weir portion of the Trough System shall be manufactured from 100% stainless steel.

- The Weir shall fully surround the Filter Basket on all sides. On the end of the weir the sides shall be made of screen with perforated round openings less than 5 mm in size.
- Water flows in access of the capacity of the Filter Basket shall pass through the additional weir screen for added treatment and retention of trash and debris during higher bypass flows.
- The Weir shall be hinged in the middle along the centerline of the Filter Basket and hinge upward to allow for access into the catch basin.

02.01.03 Mounting Hardware shall be 100% non-corrosive metals.

- Nuts and bolts
- Rivets
- Support brackets
- Concrete anchors

02.01.04 Concrete Filler and Sealant shall be made of Acrylic Emulsion and have a minimum service temperature range of -30°F to 150°F.

02.02.00 Filter Basket Components

02.02.01 Filter Basket Housing shall be manufactured of 100% stainless steel.

02.02.02 Side Screens shall be manufactured of 100% stainless steel louver expanded metal with openings equal to or less than 4.7 mm in size.

- Screens shall be oriented with openings opposite to the flow of water into the filter and be non-clogging based on perpetual deflective shielding.

02.02.03 Bottom Screens shall be manufactured of 100% stainless steel perforated round openings less than 5 mm in size.

02.02.03 Handle shall be manufactured entirely of 100% stainless steel and be mounted to the Filter Basket Housing using mounting hardware per section 02.01.03

02.02.04 Media Filtration Boom shall be made up of granulated oil absorbing polymers that have been tested in accordance with section 11.2 of ASTM F 716.07 and held within a netting.

- Oil absorbing polymers must be proven to absorb 180% of its weight within a 300 second contact time, and at this absorption percentage the physical increase in the size of the granules is not more that 50%.
- Netting shall be 100% polyester with a number 16 sieve size, and strength tested per ASTM D 3787.

PART 3 – PERFORMANCE

03.01.00 General

03.01.01 Function - The SCBFD has no moving internal components and functions based on gravity flow, unless otherwise specified. The SCBFD is composed of a Trough System, Media Filtration Boom and a Filter Basket. Runoff enters the SCBFD from a curb opening and flows into the Trough System which is mounted under the face of the curb opening. It then flows horizontally inside the System's Trough to the Weir which holds the Filter Basket. This Trough System positions the Filter Basket directly under the catch basin access point (manhole cover, grate or hatch). The Filter Basket can be removed through the access point without disassembly. The Filter Basket can also be cleaned without entering the access point by using a vacuum truck. Within the Filter Basket is a Media Filtration Boom. Water flows through the Weir and into the Filter Basket. Stormwater enters the inside of the Filter Basket and flows downward toward the bottom portion of the Basket. The non-clogging screen has openings that are facing upward. As water flows downward the screening continuously removes debris from the screen's surface. Flowing water also makes contact with the Media Filtration Boom which absorbs free floating oils. Stormwater flow up to the peak treatment flow rate is processed through the

filtration screens. During the heaviest flows the Filter Basket fills with water and spills over the top to bypass directly into the bottom of the catch basin, while previously captured debris and solids are contained by the weir screens which prevents re-suspension.

03.01.02 Pollutants - The SCBFD will remove and retain debris, sediments, metals, nutrients, oxygen demanding substances, bacteria and hydrocarbons entering the filter during frequent storm events and specified flow rates. For pollutant removal performance see section 03.02.00.

03.01.03 Treatment Flow Rate - The SCBFD operates using gravity flow. The SCBFD treatment flow rate varies by size and is provided on the drawings for each model. Flow rates must be supported by independent lab results.

03.01.04 Bypass Flow Rate – The SCBFD is designed to fit within the catch basin in a way not to affect the hydraulics. The area over the top of the Trough System is always greater than the curb opening area and/or the area of the outflow pipe. Therefore, the SCBFD does not create a critical point of restriction.

03.01.05 Pollutant Load – The SCBFD must be designed to have minimum storage capacity as documented on the drawing for each particular size and model.

03.01.06 Performance Protocol and Results – All lab testing on filtration media must be performed by an independent third party consultant and testing lab.

03.02.00 Test Performance

At a minimum, the SCBFD shall be tested, according to section 03.01.03 & 03.01.06, and meet these performance specifications:

03.02.01 Filter Pollutant Removal Table

POLLUTANT	REMOVAL EFFICIENCY
Trash and Debris - (down to 5 mm)	100%

03.02.02 Maintenance Performance – The Filter Basket must be able to be maintained and cleaned from finish surface using a vacuum hose inserted through the manhole or hatch opening and not the curb face. All cleaning shall be done without entering the catch basin. The Filter Basket shall be removable from finish surface and reinstalled from finish surface without entrance into the catch basin.

PART 4 - EXECUTION

04.01.00 General

The installation and use of the SCBFD shall conform to all applicable national, state, municipal and local specifications.

04.02.00 Installation

The contractor shall furnish all labor, equipment, materials and incidentals required to install the (SCBFD) device(s) and appurtenances in accordance with the drawings, installation manual, and these specifications, and be inspected and approved by the local governing agency. Installation contractor should possess a Confined Space Entry Certification Permit, pursuant to OSHA standards. Any damage to catch basin and surrounding infrastructure caused by the installation of the SCBFD is the responsibility of the installation contractor.

04.02.01 Trough System will be installed in accordance with manufactures' recommendations. The Trough component will be installed the complete width of the curb opening, or underneath any wings as to provide 100% coverage of incoming stormwater. The Weir component of the Trough System must be located directly under the manhole opening or other access point (not including the curb opening) regardless of its position relative of the curb opening. The Trough System must be properly mounted and assembled inside the catch basin with drive pins and pop rivets per manufacture's recommendations. Once the Trough System is secured to the walls of the catch basin all seams must be filled with sealant per section 02.01.03.

04.02.02 Filter Basket will be inserted through the manhole opening or access point of the catch basin directly without entry into the basin. The Filter Basket shall be fully visible from finish surface while looking into the access point for ease of inspection and maintenance. The curb opening itself is not a point of access as maintenance personnel cannot enter.

04.03.00 Shipping, Storage and Handling

04.03.01 Shipping – SCBFD shall be shipped to the contractor's address and is the responsibility of the contractor to transport the unit(s) to the exact site of installation.

04.03.02 Storage and Handling– The contractor shall exercise care in the storage and handling of the SCBFD(s) and its components prior to and during installation. Any repair or replacement costs associated with events occurring after delivery is accepted, and unloading has commenced shall be born by the contractor. The SCBFD(s) and its components shall always be stored indoors and transported inside the original shipping container(s) until the SCBFD(s) are ready to be installed. The SCBFD shall always be handled with care and lifted according to OSHA and NIOSA lifting recommendations and/or contractor's workplace safety professional recommendations.

04.04.00 Maintenance and Inspection

04.04.01 Inspection – After installation, the contractor shall demonstrate that the SCBFD has been properly installed at the correct location(s), elevations, and with appropriate supports and fasteners. All components associated with the SCBFD and its installation shall be subject to inspection by the engineer of work, governing agency, and the manufacture at the place of installation. In addition, the contractor shall demonstrate that the SCBFD has been installed per the manufacturer's specifications and recommendations. SCBFD(s) shall be physically inspected regularly in accordance to owner's Stormwater Pollution Prevention Plans (SWPPP) and manufacture's recommendations. An inspection record shall be kept by the inspection operator. The record shall include the condition of the SCBFD and its appurtenances. The most current copy of the inspection record shall always be copied and placed in the owner's SWPPP.

04.04.02 Maintenance – SCBFD(s) must be completely maintained from outside the catch basin. The SCBFD(s) shall be inspected, maintained and cleaned 1 to 4 times a year and/or in accordance to owner's Stormwater Pollution Prevention Plans (SWPPP). The maintenance shall be preformed by someone qualified. A Maintenance Manual is available upon request from the manufacturer. The manual has detailed information regarding the maintenance of the SCBFD. A Maintenance Record shall be kept by the

maintenance operator. The Maintenance Record shall include any maintenance activities preformed, amount and description of debris collected, and the condition of the filter. The most current copy of the Maintenance Record shall always be copied and placed in the owner's SWPPP.

04.04.03 Material Disposal - All debris, trash, organics, and sediments captured and removed from the SCBFD shall be transported and disposed of at an approved facility for disposal in accordance with local and state regulations. Please refer to state and local regulations for the proper disposal of toxic and non-toxic material.

PART 5 – QUALITY ASSURANCE

05.01.00 Warranty

The manufacturer shall guarantee the SCBFD against all manufacturing defects in materials and workmanship for a period of (1) year from the date of delivery to the contractor. The manufacturer shall be notified of repair or replacement issues in writing within the warranty period. The SCBFD is limited to recommended application for which it was designed.

[End of This Section]

Section [_____]
Stormwater Catch Basin Filtration Device

PART 1 – GENERAL

01.01.00 Purpose
The purpose of this specification is to establish generally acceptable criteria for devices used for filtration of stormwater runoff captured by catch basins with grates. It is intended to serve as a guide to producers, distributors, architects, engineers, contractors, plumbers, installers, inspectors, agencies and users; to promote understanding regarding materials, manufacture and installation; and to provide for identification of devices complying with this specification.

01.02.00 Description
Stormwater Catch Basin Filtration Devices (SCBFD) are used to filter stormwater runoff captured by catch basins. The SCBFD is a filter system composed of a SCBFD with a media filtration storm boom. SCBFDs are used to remove various pollutants from stormwater by means of screening, separation and media filtration.

01.03.00 Manufacturer
The manufacturer of the SCBFD shall be one that is regularly engaged in the engineering, design and production of systems developed for the treatment of stormwater runoff for at least (10) years, and which have a history of successful production, acceptable to the engineer of work. In accordance with the drawings, the SCBFD(s) shall be a filter device manufactured/distributed by Bio Clean Environmental Services, Inc., or assigned distributors or licensees. Bio Clean Environmental Services, Inc. can be reached at:

Corporate Headquarters:
398 Via El Centro
Oceanside, CA 92058
Phone: (760) 433-7640
Fax: (760) 433-3176
www.biocleanenvironmental.net

01.04.00 Submittals

01.04.01 Submittal drawings will be provided with each order to the contractor and engineer of work.

01.04.02 Submittal drawings are to detail the SCBFD, its components and the sequence for installation, including:
- SCBFD configuration with primary dimensions
- Various SCBFD components
- Any accessory equipment

01.04.03 Inspection and maintenance documentation submitted upon request.

01.05.00 Work Included

01.05.01 Specification requirements for installation of SCBFD.

01.05.02 Manufacturer to supply SCBFD(s):
- Filter Basket
- Media Filtration Storm Boom

01.05.03 Media Filtration Boom shall be provided with each Filter Basket housed in nylon netting and securely fastened entrance to the Filtration basket. Each media boom shall contain polymer beads to permanently absorb hydrocarbons.

01.06.00 Reference Standards

ASTM A 240	Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
ASTM F 716	Testing Sorbent Performance of Absorbents
ASTM F 726	Sorbent Performance of Absorbents
ASTM D3787 - 07	Standard Test Method for Bursting Strength of Textiles-Constant-Rate-of-Traverse (CRT) Ball Burst Test
ASTM D2690-98	Standard Test Method for Isophthalic Acid in Alkyd and Polyester Resins
ASTM C 582-02	Standard Specification for Contact-Molded Reinforced Thermosetting Plastic (RTP) Laminates for Corrosion-Resistant Equipment
ASTM D 638	Standard Test Method for Tensile Properties of Plastics
ASTM D 790	Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
ASTM D 648	Standard Test Method for Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position
ASTM D 2583	Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor
ASTM D 4097	Standard Specification for Contact-Molded Glass-Fiber-Reinforced Thermoset Resin Corrosion-Resistant Tanks
ASTM D3409	Standard Test Method for Adhesion of Asphalt-Roof Cement to Damp, Wet, or Underwater Surfaces
IFI 114	Break Mandrel Blind Rivets

PART 2 – COMPONENTS

02.01.00 Filter Basket Components

All SCBFD components must be made of stainless steel, per these specifications. SCBFD's containing any fabrics or plastics will not be accepted.

02.01.01 Filter Housing shall be manufactured of 100% stainless steel.

02.02.02 Side Screens shall be manufactured of 100% stainless steel louver expanded metal with openings equal to or less than 4.7 mm in size.

- Screens shall be oriented with openings opposite to the flow of water into the filter and be non-clogging based on perpetual deflective shielding.

02.02.03 Bottom Screens shall be manufactured of 100% stainless steel perforated round openings less than 5 mm in size.

02.02.04 Media Filtration Boom shall be made up of granulated oil absorbing polymers that have been tested in accordance with section 11.2 of ASTM F 716.07 and held within a netting.

- Oil absorbing polymers must be proven to absorb 180% of its weight within a 300 second contact time, and at this absorption percentage the physical increase in the size of the granules is not more that 50%.

- Netting shall be 100% polyester with a number 16 sieve size, and strength tested per ASTM D 3787.
- Filter netting shall be 100% polyester with a number 16 sieve size, and strength tested per ASTM D 3787.

PART 3 – PERFORMANCE

03.01.00 General

03.01.01 Function - The SCBFD has no moving internal components and functions based on gravity flow, unless otherwise specified. Runoff enters the SCBFD from a catch basin with a grate opening and flows downward into the SCBFD. This SCBFD shall be positioned directly under the catch basin grate. After removal of the grate the SCBFD must be able to be removed through the catch basin opening without any further disassembly Stormwater enters the inside of the Filter Basket and flows downward toward the bottom portion of the Basket. The non-clogging screen has openings that are facing upward. As water flows downward the screening continuously removes debris from the screen's surface. Flowing water also makes contact with the Media Filtration Boom which absorbs free floating oils. Stormwater flow up to the peak treatment flow rate is processed through the filtration screens. During the heaviest flows the Basket fills with water and spills out the internal bypass and into the bottom of the catch basin.

03.01.02 Pollutants - The SCBFD will remove and retain debris, sediments, metals, nutrients, oxygen demanding substances and hydrocarbons entering the catch basin during frequent storm events and specified flow rates. For pollutant removal performance see section 03.02.00.

03.01.03 Treatment Flow Rate - The SCBFD operates using gravity flow. The SCBFD treatment flow rate varies by size and is provided on the drawings for each model. Flow rates must be supported by independent lab results.

03.01.04 Bypass Flow Rate – The SCBFD is designed to fit within the catch basin in a way not to affect the existing hydraulics and treat or bypass all flows. The bypass must be sized with a surface area greater then the outlet pipe size, thus the SCBFD shall not be a critical point of flow restriction. Bypass flow rate must be based on the SCBFD's inlet throat or bypass orifice capacity, which ever is less.

03.01.05 Pollutant Load – The SCBFD must be designed to have minimum storage
03.01.06 capacity as documented on the drawing for each particular size and model.

03.01.07 Performance Protocol and Results – All lab testing on filtration media must be performed by an independent third party consultant and testing lab.

03.02.00 Test Performance

At a minimum, the SCBFD shall be tested, according to section 03.01.06, and meet these performance specifications:

03.02.01 Filter Pollutant Removal Table

POLLUTANT	REMOVAL EFFICIENCY
Trash and Debris - (down to 5 mm)	100%

PART 4 - EXECUTION

04.01.00 General

The installation and use of the SCBFD shall conform to all applicable national, state, municipal and local specifications.

04.02.00 Installation

The contractor shall furnish all labor, equipment, materials and incidentals required to install the (SCBFD) device(s) and appurtenances in accordance with the drawings, installation manual, and these specifications, and be inspected and approved by the local governing agency. Installation contractor should possess a Confined Space Entry Certification Permit, pursuant to OSHA standards. Any damage to catch basin and surrounding infrastructure caused by the installation of the SCBFD is the responsibility of the installation contractor.

04.02.01 Filter Basket and all components or accessories shall be inserted through the catch basin and properly secured per manufactures installation manual and these specifications.

04.03.00 Shipping, Storage and Handling

04.03.01 Shipping – SCBFD shall be shipped to the contractor's address and is the responsibility of the contractor to transport the unit(s) to the exact site of installation.

04.03.02 Storage and Handling– The contractor shall exercise care in the storage and handling of the SCBFD(s) and its components prior to and during installation. Any repair or replacement costs associated with events occurring after delivery is accepted, and unloading has commenced shall be born by the contractor. The SCBFD(s) and its components shall always be stored indoors and transported inside the original shipping container(s) until the SCBFD(s) are ready to be installed. The SCBFD shall always be handled with care and lifted according to OSHA and NIOSA lifting recommendations and/or contractor's workplace safety professional recommendations.

04.04.00 Maintenance and Inspection

04.04.01 Inspection – After installation, the contractor shall demonstrate that the SCBFD has been properly installed at the correct location(s), elevations, and with appropriate supports and fasteners. All components associated with the SCBFD and its installation shall be subject to inspection by the engineer of work, governing agency, and the manufacture at the place of installation. In addition, the contractor shall demonstrate that the SCBFD has been installed per the manufacturer's specifications and recommendations. SCBFD(s) shall be physically inspected regularly in accordance to owner's Stormwater Pollution Prevention Plans (SWPPP) and manufacture's recommendations. An inspection record shall be kept by the inspection operator. The record shall include the condition of the SCBFD and its appurtenances. The most current copy of the inspection record shall always be copied and placed in the owner's SWPPP.

04.04.02 Maintenance – The manufacturer recommends cleaning and debris removal and replacement of the Media Filtration Boom as needed. The maintenance shall be preformed by someone qualified. A Maintenance Manual is available upon request from the manufacturer. The manual has detailed information

regarding the maintenance of the SCBFD(s). A detailed Maintenance Record shall be kept by the maintenance operator. The Maintenance Record shall include any maintenance activities preformed, amount and description of debris collected, and the condition of the filter. The most current copy of the Maintenance Record shall always be copied and placed in the owner's Stormwater Pollution Prevention Plan (SWPPP) per governing agency.

04.04.03 Material Disposal - All debris, trash, organics, and sediments captured and removed from the SCBFD shall be transported and disposed of at an approved facility for disposal in accordance with local and state regulations. Please refer to state and local regulations for the proper disposal of toxic and non-toxic material.

PART 5 – QUALITY ASSURANCE

05.01.00 Warranty

The manufacturer shall guarantee the SCBFD against all manufacturing defects in materials and workmanship for a period of (1) year from the date of delivery to the contractor. The manufacturer shall be notified of repair or replacement issues in writing within the warranty period. The SCBFD is limited to recommended application for which it was designed.

[End of This Section]

Bio Clean

A Forterra Company

Catch Basin Inlet Filters

Multi-Level Screen Type

Section [_____]
Stormwater Catch Basin Filtration Device

PART 1 – GENERAL

01.01.00 Purpose
The purpose of this specification is to establish generally acceptable criteria for devices used for filtration of stormwater runoff captured by catch basins with curb openings. It is intended to serve as a guide to producers, distributors, architects, engineers, contractors, plumbers, installers, inspectors, agencies and users; to promote understanding regarding materials, manufacture and installation; and to provide for identification of devices complying with this specification.

01.02.00 Description
Stormwater Catch Basin Filtration Devices (SCBFD) are used to filter stormwater runoff captured by catch basins. The SCBFD is a filter system composed of a filter basket, media filtration boom and a trough system. SCBFDs are used to remove various pollutants from stormwater by means of screening, separation and media filtration.

01.03.00 Manufacturer
The manufacturer of the SCBFD shall be one that is regularly engaged in the engineering, design and production of systems developed for the treatment of stormwater runoff for at least (10) years, and which have a history of successful production, acceptable to the engineer of work. In accordance with the drawings, the SCBFD(s) shall be a filter device manufactured/distributed by Bio Clean Environmental Services, Inc. or assigned distributors or licensees. Bio Clean Environmental Services, Inc. can be reached at:

Corporate Headquarters:
398 Via El Centro
Oceanside, CA 92058
Phone: (855) 566-3938
Fax: (760) 433-3176
www.BioCleanEnvironmental.com

01.04.00 Submittals

01.04.01 Shop drawings are to be submitted with each order to the contractor and engineer of work.

01.04.02 Shop drawings are to detail the SCBFD, its components and the sequence for installation, including:
- SCBFD configuration with primary dimensions
- Various SCBFD components
- Any accessory equipment

01.04.03 Inspection and maintenance documentation submitted upon request.

01.05.00 Work Included

01.05.01 Specification requirements for installation of SCBFD.

01.05.02 Manufacturer to supply SCBFD(s):
- Filter Basket
- Trough System (weir and trough)
- Media Filtration Boom

01.05.03 Media Filtration Boom shall be provided with each Filter Basket housed in nylon netting and securely fastened entrance to the Filtration basket. Each media boom shall contain polymer beads to permanently absorb hydrocarbons.

01.06.00 Reference Standards

ASTM A 240	Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
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ASTM F 726	Sorbent Performance of Absorbents
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ASTM D2690-98	Standard Test Method for Isophthalic Acid in Alkyd and Polyester Resins
ASTM C 582-02	Standard Specification for Contact-Molded Reinforced Thermosetting Plastic (RTP) Laminates for Corrosion-Resistant Equipment
ASTM D 638	Standard Test Method for Tensile Properties of Plastics
ASTM D 790	Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
ASTM D 648	Standard Test Method for Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position
ASTM D 2583	Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor
ASTM D 4097	Standard Specification for Contact-Molded Glass-Fiber-Reinforced Thermoset Resin Corrosion-Resistant Tanks
ASTM D3409	Standard Test Method for Adhesion of Asphalt-Roof Cement to Damp, Wet, or Underwater Surfaces
IFI 114	Break Mandrel Blind Rivets

PART 2 – COMPONENTS

02.01.00 Trough System Components

02.01.01 Trough shall be manufactured from 100% marine grade polyester resin and fiberglass strands and stainless steel.

- The entire fiberglass structure must be coated with a polyester gel coating with ultra violet inhibitors incorporated into the coating for maximum ultra violet protection.
- Fiberglass must have a minimum thickness of 3/16”.

02.01.02 Weir portion of the Trough System shall be manufactured from 100% stainless steel.

- The Weir shall fully surround the Filter Basket on all sides. On the end of the weir the sides shall be made of screen with perforated round openings less than 5 mm in size.
- Water flows in access of the capacity of the Filter Basket shall pass through the additional weir screen for added treatment and retention of trash and debris during higher bypass flows.
- The Weir shall be hinged in the middle along the centerline of the Filter Basket and hinge upward to allow for access into the catch basin.

02.01.03 Mounting Hardware shall be 100% non-corrosive metals.

- Nuts and bolts
- Rivets
- Support brackets
- Concrete anchors

02.01.04 Concrete Filler and Sealant shall be made of Acrylic Emulsion and have a minimum service temperature range of -30°F to 150°F.

02.02.00 Filter Basket Components

02.02.01 Filter Basket Housing shall be manufactured of 100% stainless steel sheet metal.

02.02.02 Side Screens shall be manufactured of 100% stainless mesh screens of various sizes decreasing in opening size moving toward the bottom.

02.02.03 Bottom Screens shall be manufactured of 100% stainless steel mesh screens being of the same size or smaller than the bottom most side screen.

02.02.03 Handle shall be manufactured entirely of 100% stainless steel and be mounted to the Filter Basket Housing using mounting hardware per section 02.01.03

02.02.04 Media Filtration Boom shall be made up of granulated oil absorbing polymers that have been tested in accordance with section 11.2 of ASTM F 716.07 and held within a netting.

- Oil absorbing polymers must be proven to absorb 180% of its weight within a 300 second contact time, and at this absorption percentage the physical increase in the size of the granules is not more that 50%.
- Netting shall be 100% polyester with a number 16 sieve size, and strength tested per ASTM D 3787.

PART 3 – PERFORMANCE

03.01.00 General

03.01.01 Function - The SCBFD has no moving internal components and functions based on gravity flow, unless otherwise specified. The SCBFD is composed of a Trough System, Media Filtration Boom and a Filter Basket. Runoff enters the SCBFD from a curb opening and flows into the Trough System which is mounted under the face of the curb opening. It then flows horizontally inside the System's Trough to the Weir which holds the Filter Basket. This Trough System positions the Filter Basket directly under the catch basin access point (manhole cover, grate or hatch). The Filter Basket can be removed through the access point without disassembly. The Filter Basket can also be cleaned without entering the access point by using a vacuum truck. Within the Filter Basket is a Media Filtration Boom. Water flows through the Weir and into the Filter Basket. Stormwater enters the inside of the Filter Basket and flows downward toward the bottom portion of the Basket. As water flows downward the different size screening continuously removes debris from the screen's surface. Flowing water also makes contact with the Media Filtration Boom which absorbs free floating oils. Stormwater flow up to the peak treatment flow rate is processed through the filtration screens. During the heaviest flows the Filter Basket fills with water and spills over the top to bypass directly into

the bottom of the catch basin, while previously captured debris and solids are contained by the weir screens which prevents re-suspension.

03.01.02 Pollutants - The SCBFD will remove and retain debris, sediments, metals, nutrients, oxygen demanding substances, bacteria and hydrocarbons entering the filter during frequent storm events and specified flow rates. For pollutant removal performance see section 03.02.00.

03.01.03 Treatment Flow Rate - The SCBFD operates using gravity flow. The SCBFD treatment flow rate varies by size and is provided on the drawings for each model. Flow rates must be supported by independent lab results.

03.01.04 Bypass Flow Rate – The SCBFD is designed to fit within the catch basin in a way not to affect the hydraulics. The area over the top of the Trough System is always greater than the curb opening area and/or the area of the outflow pipe. Therefore, the SCBFD does not create a critical point of restriction.

03.01.05 Pollutant Load – The SCBFD must be designed to have minimum storage capacity as documented on the drawing for each particular size and model.

03.01.06 Performance Protocol and Results – All lab testing on filtration media must be performed by an independent third party consultant and testing lab.

03.02.00 Test Performance

At a minimum, the SCBFD shall be tested, according to section 03.01.03 & 03.01.06, and meet these performance specifications:

03.02.01 Filter Pollutant Removal Table

POLLUTANT	REMOVAL EFFICIENCY
Trash and Debris	High Level
Sediments	Medium Level
Oils & Grease	Medium Level
Other Particulate Pollutants	Medium Level

03.02.02 Maintenance Performance – The Filter Basket must be able to be maintained and cleaned from finish surface using a vacuum hose inserted through the manhole or hatch opening and not the curb face. All cleaning shall be done without entering the catch basin. The Filter Basket shall be removable from finish surface and reinstalled from finish surface without entrance into the catch basin.

PART 4 - EXECUTION

04.01.00 General

The installation and use of the SCBFD shall conform to all applicable national, state, municipal and local specifications.

04.02.00 Installation

The contractor shall furnish all labor, equipment, materials and incidentals required to install the (SCBFD) device(s) and appurtenances in accordance with the drawings, installation manual, and these specifications, and be inspected and approved by the local governing agency. Installation contractor should possess a Confined Space Entry Certification Permit, pursuant to OSHA standards. Any damage to catch basin and surrounding infrastructure caused by the installation of the SCBFD is the responsibility of the installation contractor.

04.02.01 Trough System will be installed in accordance with manufactures' recommendations. The Trough component will be installed the complete width of the curb opening, or underneath any wings as to provide 100% coverage of incoming stormwater. The Weir component of the Trough System must be located directly under the manhole opening or other access point (not including the curb opening) regardless of its position relative of the curb opening. The Trough System must be properly mounted and assembled inside the catch basin with drive pins and pop rivets per manufacture's recommendations. Once the Trough System is secured to the walls of the catch basin all seams must be filled with sealant per section 02.01.03.

04.02.02 Filter Basket will be inserted through the manhole opening or access point of the catch basin directly without entry into the basin. The Filter Basket shall be fully visible from finish surface while looking into the access point for ease of inspection and maintenance. The curb opening itself is not a point of access as maintenance personnel cannot enter.

04.03.00 Shipping, Storage and Handling

04.03.01 Shipping – SCBFD shall be shipped to the contractor's address and is the responsibility of the contractor to transport the unit(s) to the exact site of installation.

04.03.02 Storage and Handling– The contractor shall exercise care in the storage and handling of the SCBFD(s) and its components prior to and during installation. Any repair or replacement costs associated with events occurring after delivery is accepted, and unloading has commenced shall be born by the contractor. The SCBFD(s) and its components shall always be stored indoors and transported inside the original shipping container(s) until the SCBFD(s) are ready to be installed. The SCBFD shall always be handled with care and lifted according to OSHA and NIOSA lifting recommendations and/or contractor's workplace safety professional recommendations.

04.04.00 Maintenance and Inspection

04.04.01 Inspection – After installation, the contractor shall demonstrate that the SCBFD has been properly installed at the correct location(s), elevations, and with appropriate supports and fasteners. All components associated with the SCBFD and its installation shall be subject to inspection by the engineer of work, governing agency, and the manufacture at the place of installation. In addition, the contractor shall demonstrate that the SCBFD has been installed per the manufacturer's specifications and recommendations. SCBFD(s) shall be physically inspected regularly in accordance to owner's Stormwater Pollution Prevention Plans (SWPPP) and manufacture's recommendations. An inspection record shall be kept by the inspection operator. The record shall include the condition of the SCBFD and its appurtenances. The most current copy of the inspection record shall always be copied and placed in the owner's SWPPP.

04.04.02 Maintenance – SCBFD(s) must be completely maintained from outside the catch basin. The SCBFD(s) shall be inspected, maintained and cleaned 1 to 4 times a year and/or in accordance to owner's Stormwater Pollution Prevention Plans (SWPPP). The maintenance shall be preformed by someone qualified. A Maintenance Manual is available upon request from the manufacturer. The manual has detailed information regarding the maintenance of the SCBFD. A Maintenance Record shall be kept by the

maintenance operator. The Maintenance Record shall include any maintenance activities preformed, amount and description of debris collected, and the condition of the filter. The most current copy of the Maintenance Record shall always be copied and placed in the owner's SWPPP.

04.04.03 Material Disposal - All debris, trash, organics, and sediments captured and removed from the SCBFD shall be transported and disposed of at an approved facility for disposal in accordance with local and state regulations. Please refer to state and local regulations for the proper disposal of toxic and non-toxic material.

PART 5 – QUALITY ASSURANCE

05.01.00 Warranty

The manufacturer shall guarantee the SCBFD against all manufacturing defects in materials and workmanship for a period of (1) year from the date of delivery to the contractor. The manufacturer shall be notified of repair or replacement issues in writing within the warranty period. The SCBFD is limited to recommended application for which it was designed.

[End of This Section]

Section [_____]
Stormwater Catch Basin Filtration Device

PART 1 – GENERAL

01.01.00 Purpose
The purpose of this specification is to establish generally acceptable criteria for devices used for filtration of stormwater runoff captured by catch basins with grates. It is intended to serve as a guide to producers, distributors, architects, engineers, contractors, plumbers, installers, inspectors, agencies and users; to promote understanding regarding materials, manufacture and installation; and to provide for identification of devices complying with this specification.

01.02.00 Description
Stormwater Catch Basin Filtration Devices (SCBFD) are used to filter stormwater runoff captured by catch basins. The SCBFD is a filter system composed of a SCBFD with a media filtration storm boom. SCBFDs are used to remove various pollutants from stormwater by means of screening, separation and media filtration.

01.03.00 Manufacturer
The manufacturer of the SCBFD shall be one that is regularly engaged in the engineering, design and production of systems developed for the treatment of stormwater runoff for at least (10) years, and which have a history of successful production, acceptable to the engineer of work. In accordance with the drawings, the SCBFD(s) shall be a filter device manufactured/distributed by Bio Clean Environmental Services, Inc., or assigned distributors or licensees. Bio Clean Environmental Services, Inc. can be reached at:

Corporate Headquarters:
398 Via El Centro
Oceanside, CA 92058
Phone: (760) 433-7640
Fax: (760) 433-3176
www.biocleanenvironmental.net

01.04.00 Submittals

01.04.01 Submittal drawings will be provided with each order to the contractor and engineer of work.

01.04.02 Submittal drawings are to detail the SCBFD, its components and the sequence for installation, including:
- SCBFD configuration with primary dimensions
- Various SCBFD components
- Any accessory equipment

01.04.03 Inspection and maintenance documentation submitted upon request.

01.05.00 Work Included

01.05.01 Specification requirements for installation of SCBFD.

01.05.02 Manufacturer to supply SCBFD(s):
- Filter Basket
- Media Filtration Storm Boom

01.05.03 Media Filtration Boom shall be provided with each Filter Basket housed in nylon netting and securely fastened entrance to the Filtration basket. Each media boom shall contain polymer beads to permanently absorb hydrocarbons.

01.06.00 Reference Standards

ASTM A 240	Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
ASTM F 716	Testing Sorbent Performance of Absorbents
ASTM F 726	Sorbent Performance of Absorbents
ASTM D3787 - 07	Standard Test Method for Bursting Strength of Textiles-Constant-Rate-of-Traverse (CRT) Ball Burst Test
ASTM D2690-98	Standard Test Method for Isophthalic Acid in Alkyd and Polyester Resins
ASTM C 582-02	Standard Specification for Contact-Molded Reinforced Thermosetting Plastic (RTP) Laminates for Corrosion-Resistant Equipment
ASTM D 638	Standard Test Method for Tensile Properties of Plastics
ASTM D 790	Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
ASTM D 648	Standard Test Method for Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position
ASTM D 2583	Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor
ASTM D 4097	Standard Specification for Contact-Molded Glass-Fiber-Reinforced Thermoset Resin Corrosion-Resistant Tanks
ASTM D3409	Standard Test Method for Adhesion of Asphalt-Roof Cement to Damp, Wet, or Underwater Surfaces
IFI 114	Break Mandrel Blind Rivets

PART 2 – COMPONENTS

02.01.00 Filter Basket Components

All SCBFD components must be made of stainless steel, per these specifications. SCBFD's containing any fabrics or plastics will not be accepted.

02.01.01 Filter Housing shall be manufactured of 100% stainless steel sheet metal.

02.02.02 Side Screens shall be manufactured of 100% stainless mesh screens of various sizes decreasing in opening size moving toward the bottom.

02.02.03 Bottom Screens shall be manufactured of 100% stainless steel mesh screens being of the same size or smaller than the bottom most side screen.

02.02.04 Media Filtration Boom shall be made up of granulated oil absorbing polymers that have been tested in accordance with section 11.2 of ASTM F 716.07 and held within a netting.

- Oil absorbing polymers must be proven to absorb 180% of its weight within a 300 second contact time, and at this absorption percentage the physical increase in the size of the granules is not more that 50%.
- Netting shall be 100% polyester with a number 16 sieve size, and strength tested per ASTM D 3787.

- Filter netting shall be 100% polyester with a number 16 sieve size, and strength tested per ASTM D 3787.

PART 3 – PERFORMANCE

03.01.00 General

03.01.01 Function - The SCBFD has no moving internal components and functions based on gravity flow, unless otherwise specified. Runoff enters the SCBFD from a catch basin with a grate opening and flows downward into the SCBFD. This SCBFD shall be positioned directly under the catch basin grate. After removal of the grate the SCBFD must be able to be removed through the catch basin opening without any further disassembly Stormwater enters the inside of the Filter Basket and flows downward toward the bottom portion of the Basket. As water flows downward the different size screening continuously removes debris from the screen's surface. Flowing water also makes contact with the Media Filtration Boom which absorbs free floating oils. Stormwater flow up to the peak treatment flow rate is processed through the filtration screens. During the heaviest flows the Basket fills with water and spills out the internal bypass and into the bottom of the catch basin.

03.01.02 Pollutants - The SCBFD will remove and retain debris, sediments, metals, nutrients, oxygen demanding substances and hydrocarbons entering the catch basin during frequent storm events and specified flow rates. For pollutant removal performance see section 03.02.00.

03.01.03 Treatment Flow Rate - The SCBFD operates using gravity flow. The SCBFD treatment flow rate varies by size and is provided on the drawings for each model. Flow rates must be supported by independent lab results.

03.01.04 Bypass Flow Rate – The SCBFD is designed to fit within the catch basin in a way not to affect the existing hydraulics and treat or bypass all flows. The bypass must be sized with a surface area greater then the outlet pipe size, thus the SCBFD shall not be a critical point of flow restriction. Bypass flow rate must be based on the SCBFD's inlet throat or bypass orifice capacity, which ever is less.

03.01.05 Pollutant Load – The SCBFD must be designed to have minimum storage
03.01.06 capacity as documented on the drawing for each particular size and model.

03.01.07 Performance Protocol and Results – All lab testing on filtration media must be performed by an independent third party consultant and testing lab.

03.02.00 Test Performance

At a minimum, the SCBFD shall be tested, according to section 03.01.06, and meet these performance specifications:

03.02.01 Filter Pollutant Removal Table

POLLUTANT	REMOVAL EFFICIENCY
Trash and Debris	High Level
Sediments	Medium Level
Oils & Grease	Medium Level
Other Particulate Pollutants	Medium Level

PART 4 - EXECUTION

04.01.00 General

The installation and use of the SCBFD shall conform to all applicable national, state, municipal and local specifications.

04.02.00 Installation

The contractor shall furnish all labor, equipment, materials and incidentals required to install the (SCBFD) device(s) and appurtenances in accordance with the drawings, installation manual, and these specifications, and be inspected and approved by the local governing agency. Installation contractor should possess a Confined Space Entry Certification Permit, pursuant to OSHA standards. Any damage to catch basin and surrounding infrastructure caused by the installation of the SCBFD is the responsibility of the installation contractor.

04.02.01 Filter Basket and all components or accessories shall be inserted through the catch basin and properly secured per manufactures installation manual and these specifications.

04.03.00 Shipping, Storage and Handling

04.03.01 Shipping – SCBFD shall be shipped to the contractor's address and is the responsibility of the contractor to transport the unit(s) to the exact site of installation.

04.03.02 Storage and Handling– The contractor shall exercise care in the storage and handling of the SCBFD(s) and its components prior to and during installation. Any repair or replacement costs associated with events occurring after delivery is accepted, and unloading has commenced shall be born by the contractor. The SCBFD(s) and its components shall always be stored indoors and transported inside the original shipping container(s) until the SCBFD(s) are ready to be installed. The SCBFD shall always be handled with care and lifted according to OSHA and NIOSA lifting recommendations and/or contractor's workplace safety professional recommendations.

04.04.00 Maintenance and Inspection

04.04.01 Inspection – After installation, the contractor shall demonstrate that the SCBFD has been properly installed at the correct location(s), elevations, and with appropriate supports and fasteners. All components associated with the SCBFD and its installation shall be subject to inspection by the engineer of work, governing agency, and the manufacture at the place of installation. In addition, the contractor shall demonstrate that the SCBFD has been installed per the manufacturer's specifications and recommendations. SCBFD(s) shall be physically inspected regularly in accordance to owner's Stormwater Pollution Prevention Plans (SWPPP) and manufacture's recommendations. An inspection record shall be kept by the inspection operator. The record shall include the condition of the SCBFD and its appurtenances. The most current copy of the inspection record shall always be copied and placed in the owner's SWPPP.

04.04.02 Maintenance – The manufacturer recommends cleaning and debris removal and replacement of the Media Filtration Boom as needed. The maintenance shall be preformed by someone qualified. A Maintenance Manual is available upon request from the manufacturer. The manual has detailed information

regarding the maintenance of the SCBFD(s). A detailed Maintenance Record shall be kept by the maintenance operator. The Maintenance Record shall include any maintenance activities preformed, amount and description of debris collected, and the condition of the filter. The most current copy of the Maintenance Record shall always be copied and placed in the owner's Stormwater Pollution Prevention Plan (SWPPP) per governing agency.

04.04.03 Material Disposal - All debris, trash, organics, and sediments captured and removed from the SCBFD shall be transported and disposed of at an approved facility for disposal in accordance with local and state regulations. Please refer to state and local regulations for the proper disposal of toxic and non-toxic material.

PART 5 – QUALITY ASSURANCE

05.01.00 Warranty

The manufacturer shall guarantee the SCBFD against all manufacturing defects in materials and workmanship for a period of (1) year from the date of delivery to the contractor. The manufacturer shall be notified of repair or replacement issues in writing within the warranty period. The SCBFD is limited to recommended application for which it was designed.

[End of This Section]

Bio Clean
A Forterra Company

Catch Basin Inlet Filters

Kraken® Filter Type

Stormwater Catch Basin Filtration Device

PART 1 – GENERAL

01.01.00 Purpose

The purpose of this specification is to establish generally acceptable criteria for devices used for filtration of stormwater runoff captured by catch basins with curb openings. It is intended to serve as a guide to producers, distributors, architects, engineers, contractors, plumbers, installers, inspectors, agencies and users; to promote understanding regarding materials, manufacture and installation; and to provide for identification of devices complying with this specification.

01.02.00 Description

Stormwater Catch Basin Filtration Devices (SCBFD) are used to filter stormwater runoff captured by catch basins. The SCBFD is a filter system composed of a filtration basket, vertically extending membrane filter cartridges, and a trough system. SCBFDs are used to remove various pollutants from stormwater by means of membrane filtration.

01.03.00 Manufacturer

The manufacturer of the SCBFD shall be one that is regularly engaged in the engineering, design and production of systems developed for the treatment of stormwater runoff for at least (10) years, and which has a history of successful production, acceptable to the engineer of work. In accordance with the drawings, the SCBFD(s) shall be a filter device manufactured/distributed by Bio Clean or assigned distributors or licensees. Bio Clean can be reached at:

Corporate Headquarters:
398 Via El Centro
Oceanside, CA 92058
Phone: (855) 566-3938
Fax: (760) 433-3176
www.BioCleanEnvironmental.com

01.04.00 Submittals

01.04.01 Shop drawings are to be submitted with each order to the contractor and engineer of work.

01.04.02 Shop drawings are to detail the SCBFD, its components and the sequence for installation, including:

- SCBFD configuration with primary dimensions
- Various SCBFD components
- Any accessory equipment

01.04.03 Inspection and maintenance documentation submitted upon request.

01.05.00 Work Included

01.05.01 Specification requirements for installation of SCBFD.

01.05.02 Manufacturer to supply SCBFD(s):

- Filtration Basket
- Trough System – Trough and Weir
- Vertically Extending Membrane Filter Cartridges

01.06.00 Reference Standards

ASTM E2016-99(2004)e1	Standard Specification for Industrial Woven Wire Cloth
ASTM A 240	Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
ASTM F 716	Testing Sorbent Performance of Absorbents
ASTM F 726	Sorbent Performance of Absorbents
ASTM D3787 - 07	Standard Test Method for Bursting Strength of Textiles-Constant-Rate-of-Traverse (CRT) Ball Burst Test
ASTM D2690-98	Standard Test Method for Isophthalic Acid in Alkyd and Polyester Resins
ASTM C 582-02	Standard Specification for Contact-Molded Reinforced Thermosetting Plastic (RTP) Laminates for Corrosion-Resistant Equipment
ASTM D 638	Standard Test Method for Tensile Properties of Plastics
ASTM D 790	Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
ASTM D 648	Standard Test Method for Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position
ASTM D 2583	Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor
ASTM D 4097	Standard Specification for Contact-Molded Glass-Fiber-Reinforced Thermoset Resin Corrosion-Resistant Tanks
ASTM D3409	Standard Test Method for Adhesion of Asphalt-Roof Cement to Damp, Wet, or Underwater Surfaces
IFI 114	Break Mandrel Blind Rivets
ASTM C 443	Specification for joints for concrete pipe and manholes, using rubber sealants and gaskets
ASTM D 4101	Specification for copolymer steps construction

PART 2 – COMPONENTS

02.01.00 Trough System Components

02.01.01 Trough shall be manufactured from 100% marine grade polyester resin and fiberglass strands and stainless steel.

- The entire fiberglass structure must be coated with a polyester gel coating with ultra violet inhibitors incorporated into the coating for maximum ultra violet protection.
- Fiberglass must have a minimum thickness of 3/16".

02.01.02 Weir portion of the Trough System shall be manufactured from 100% stainless steel.

- The Weir shall fully surround the Filter Basket on all sides. On the end of the weir the sides shall be made of screen with perforated round openings less than 5 mm in size.
- Water flows in access of the capacity of the Filter Basket shall pass through the additional weir screen for added treatment and retention of trash and debris during higher bypass flows.
- The Weir shall be hinged in the middle along the centerline of the Filter Basket and hinge upward to allow for access into the catch basin.

02.01.03 Mounting Hardware shall be 100% non-corrosive metals.

- Nuts and Bolts
- Rivets
- Support Brackets
- Concrete Anchors

02.01.04 Concrete Filler and Sealant shall be made of Acrylic Emulsion and have a minimum service temperature range of -30°F to 150°F.

02.03.00 Membrane Filter Cartridge

Filter cartridges shall be comprised of cylindrical membrane filter elements pressure fitted to a filter coupling. The diameter of each cartridge is approximately 8", consisting of a 3" core surrounded by 2.5" pleated membranes to maximize surface area. The length of each filter element shall be a minimum of 9.62", with a maximum length of 30.75". The maximum flux rate determined by the maximum treatment flow rate per unit of filtration membrane surface area shall be 0.05 gpm/ft^2. The filter cartridges shall be located below the access hatches to allow access for maintenance. The filter cartridges shall have removable handles to facilitate ease of maintenance. The filter cartridges shall be removable and installed by hand.

Cartridge Length (in)	***Pleated Media Area (ft^2)***	***Design Treatment Flow Rate (gpm) (1 filter)***
9.62	40	2
19.5	90	4.5
30.75	170	8.5

02.03.01 Riser Tube – A PVC riser will be installed inside each cartridge to control the flow rate and evenly distribute sediment loading along the full height of the cartridge. One in every eight cartridges will include a riser with a drain down orifice at the bottom of the riser.

PART 3 – PERFORMANCE

The membrane media filter shall only meet performance specification listed on the submittal drawings.

03.01.00 General

3.01.01 Function

The storm water quality filter treatment device functions to remove pollutants by the following unit treatment processes; sedimentation, floatation and membrane filtration.

3.01.02 Pollutants

The stormwater quality filter treatment device removes oil, debris, trash, sediment, sediment-bound pollutants, metals and nutrients from stormwater during frequent wet weather events.

3.01.04 Treatment Flux Rate

The stormwater quality filter treatment device shall treat 100% of the required water quality treatment flow based on a maximum treatment flux rate across the membrane filter cartridges of 0.05 gpm/ft2 (0.034 lps/m2).

03.02.00 Test Performance

03.02.01 Independent Third Party Testing:
The SCBFD must be tested under a nationally recognized lab protocol and verified independently by a third party public agency;

- Must capable of removing greater than 80% TSS
- Must use a particle size distribution with d_{50} of 52 microns

3.02.02 Suspended Solids Removal
The SCBFD shall have demonstrated a minimum median TSS removal efficiency of greater than 80%.

03.02.03 Sediment Loading
The SCBFD must be proven to have the ability to load 27 lbs/cartridge and/or 37 lbs/sf of effective treatment/sedimentation area, while still maintaining an overall 89% removal efficiency.

PART 4 - EXECUTION

04.01.00 General

The installation and use of the SCBFD shall conform to all applicable national, state, municipal and local specifications.

04.02.00 Installation

The contractor shall furnish all labor, equipment, materials and incidentals required to install the (SCBFD) device(s) and appurtenances in accordance with the drawings, installation manual, and these specifications, and be inspected and approved by the local governing agency. Installation contractor should possess a Confined Space Entry Certification Permit, pursuant to OSHA standards. Any damage to catch basin and surrounding infrastructure caused by the installation of the SCBFD is the responsibility of the installation contractor.

04.02.01 Trough System will be installed in accordance with manufactures' recommendations. The Trough component will be installed the complete width of the curb opening, or underneath any wings as to provide 100% coverage of incoming stormwater. The Weir component of the Trough System must be located directly under the manhole opening or other access point (not including the curb opening) regardless of its position relative of the curb opening. The Trough System must be properly mounted and assembled inside the catch basin with drive pins and pop rivets per manufacture's recommendations. Once the Trough System is secured to the walls of the catch basin all seams must be filled with sealant per section 02.01.03.

04.02.02 Filter Basket will be inserted through the manhole opening or access point of the Trough System directly without entry into the basin. The Filtration Basket shall be fully visible from finish surface while looking into the access point for ease of inspection and maintenance. The curb opening itself is not a point of access as maintenance personnel cannot enter.

04.03.00 Shipping, Storage and Handling

04.03.01 Shipping – SCBFD shall be shipped to the contractor's address and is the responsibility of the contractor to transport the unit(s) to the exact site of installation.

04.03.02 Storage and Handling– The contractor shall exercise care in the storage and handling of the SCBFD(s) and its components prior to and during installation. Any repair or replacement costs associated with events occurring after delivery is accepted, and unloading has commenced shall be born by the contractor. The SCBFD(s) and its components shall always be stored indoors and transported inside the original shipping container(s) until the SCBFD(s) are ready to be installed. The SCBFD shall always be handled with care and lifted according to OSHA and NIOSA lifting recommendations and/or contractor's workplace safety professional recommendations.

04.04.00 Maintenance and Inspection

04.04.01 Inspection – After installation, the contractor shall demonstrate that the SCBFD has been properly installed at the correct location(s), elevations, and with appropriate supports and fasteners. All components associated with the SCBFD and its installation shall be subject to inspection by the engineer of work, governing agency, and the manufacture at the place of installation. In addition, the contractor shall demonstrate that the SCBFD has been installed per the manufacturer's specifications and recommendations. SCBFD(s) shall be physically inspected regularly in accordance to owner's Stormwater Pollution Prevention Plans (SWPPP) and manufacture's recommendations. An inspection record shall be kept by the inspection operator. The record shall include the condition of the SCBFD and its appurtenances. The most current copy of the inspection record shall always be copied and placed in the owner's SWPPP.

04.04.02 Maintenance – Routine maintenance and cleaning time of the SCBFD shall take no more than 15 minutes. Routine maintenance and cleaning time shall be field test certified by a third party per section 03.01.05. SCBFD(s) must be completely maintained from outside the catch basin. The SCBFD(s) shall be inspected, maintained and cleaned 2 to 4 times a and/or in accordance to owner's Stormwater Pollution Prevention Plans (SWPPP). The maintenance shall be preformed by someone qualified. A Maintenance Manual is available upon request from the manufacturer. The manual has detailed information regarding the maintenance of the SCBFD. A Maintenance Record shall be kept by the maintenance operator. The Maintenance Record shall include any maintenance activities preformed, amount and description of debris collected, and the condition of the filter. The most current copy of the Maintenance Record shall always be copied and placed in the owner's SWPPP.

04.04.03 Material Disposal - All debris, trash, organics, and sediments captured and removed from the SCBFD shall be transported and disposed of at an approved facility for disposal in accordance with local and state regulations. Please refer to state and local regulations for the proper disposal of toxic and non-toxic material.

PART 5 – QUALITY ASSURANCE

05.01.00 Warranty

The manufacturer shall guarantee the SCBFD against all manufacturing defects in materials and workmanship for a period of (1) year from the date of delivery to the contractor. The manufacturer shall be notified of repair or replacement issues in writing within the warranty period. The SCBFD is limited to recommended application for which it was designed.

END OF SECTION

Stormwater Catch Basin Filtration Device

PART 1 – GENERAL

01.01.00 Purpose

The purpose of this specification is to establish generally acceptable criteria for devices used for filtration of stormwater runoff captured by catch basins with grates. It is intended to serve as a guide to producers, distributors, architects, engineers, contractors, plumbers, installers, inspectors, agencies and users; to promote understanding regarding materials, manufacture and installation; and to provide for identification of devices complying with this specification.

01.02.00 Description

Stormwater Catch Basin Filtration Devices (SCBFD) are used to filter stormwater runoff captured by catch basins. The SCBFD is a filter system composed of a SCBFD with vertically extending membrane filter cartridges. SCBFDs are used to remove various pollutants from stormwater by means of membrane filtration.

01.03.00 Manufacturer

The manufacturer of the SCBFD shall be one that is regularly engaged in the engineering, design and production of systems developed for the treatment of stormwater runoff for at least (10) years, and which have a history of successful production, acceptable to the engineer of work. In accordance with the drawings, the SCBFD(s) shall be a filter device manufactured/distributed by Bio Clean Environmental Services, Inc., or assigned distributors or licensees. Bio Clean Environmental Services, Inc. can be reached at:

Corporate Headquarters:
398 Via El Centro
Oceanside, CA 92058
Phone: (760) 433-7640
Fax: (760) 433-3176
www.biocleanenvironmental.net

01.04.00 Submittals

01.04.01 Submittal drawings will be provided with each order to the contractor and engineer of work.

01.04.02 Submittal drawings are to detail the SCBFD, its components and the sequence for installation, including:

- SCBFD configuration with primary dimensions
- Various SCBFD components
- Any accessory equipment

01.04.03 Inspection and maintenance documentation submitted upon request.

01.05.00 Work Included

01.05.01 Specification requirements for installation of SCBFD.

01.05.02 Manufacturer to supply SCBFD(s):

- Filter Basket
- Vertically Extending Membrane Filter Cartridges

01.06.00 Reference Standards

ASTM A 240	Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
ASTM F 716	Testing Sorbent Performance of Absorbents
ASTM F 726	Sorbent Performance of Absorbents
ASTM D3787 - 07	Standard Test Method for Bursting Strength of Textiles-Constant-Rate-of-Traverse (CRT) Ball Burst Test
ASTM D2690-98	Standard Test Method for Isophthalic Acid in Alkyd and Polyester Resins
ASTM C 582-02	Standard Specification for Contact-Molded Reinforced Thermosetting Plastic (RTP) Laminates for Corrosion-Resistant Equipment
ASTM D 638	Standard Test Method for Tensile Properties of Plastics
ASTM D 790	Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
ASTM D 648	Standard Test Method for Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position
ASTM D 2583	Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor
ASTM D 4097	Standard Specification for Contact-Molded Glass-Fiber-Reinforced Thermoset Resin Corrosion-Resistant Tanks
ASTM D3409	Standard Test Method for Adhesion of Asphalt-Roof Cement to Damp, Wet, or Underwater Surfaces
IFI 114	Break Mandrel Blind Rivets

PART 2 – COMPONENTS

The Storm Water Membrane Filtration Device (SWMFD) and all of its components shall be self-contained within a concrete structure constructed with a minimum 28 day compressive strength of 5,000 psi, with reinforcing per ASTM A 615, Grade 60, and supports a minimum H-20 loading as indicated by AASHTO. All seams and connection points shall be sealed water tight with non-shrink grout in accordance with manufactures recommendations and project specifications.

02.01.00 Filter Basket Components

All SCBFD components must be made of stainless steel, per these specifications. SCBFD's containing any fabrics or plastics will not be accepted.

02.01.01 Filter Housing shall be manufactured of 100% stainless steel sheet metal.

02.02.00 Membrane Filter Cartridge

Filter cartridges shall be comprised of cylindrical membrane filter elements pressure fitted to a filter coupling. The diameter of each cartridge is approximately 8”, consisting of a 3” core surrounded by 2.5” pleated membranes to maximize surface area. The length of each filter element shall be a minimum of 9.62”, with a maximum length of 30.75”. The maximum flux rate determined by the maximum treatment flow rate per unit of filtration membrane surface area shall be 0.05 gpm/ft^2. The filter cartridges shall be located below the access hatches to allow access for maintenance. The filter cartridges shall have removable handles to facilitate ease of maintenance. The filter cartridges shall be removable and installed by hand.

Cartridge Length (in)	***Pleated Media Area (ft^2)***	***Design Treatment Flow Rate (gpm) (1 filter)***
9.62	40	2
19.5	90	4.5
30.75	170	8.5

02.02.01 Riser Tube – A PVC riser will be installed inside each cartridge to control the flow rate and evenly distribute sediment loading along the full height of the cartridge. One in every eight cartridges will include a riser with a drain down orifice at the bottom of the riser.

PART 3 – PERFORMANCE

The membrane media filter shall only meet performance specification listed on the submittal drawings.

03.01.00 General

03.01.01 Function - The SCBFD has no moving internal components and functions based on gravity flow, unless otherwise specified. Runoff enters the SCBFD from a catch basin with a grate opening and flows downward into the SCBFD. This SCBFD shall be positioned directly under the catch basin grate. After removal of the grate the SCBFD must be able to be removed through the catch basin opening without any further disassembly Stormwater enters the inside of the Filter Basket and flows downward toward the bottom portion of the Basket. As water flows downward the different size screening continuously removes debris from the screen's surface. Flowing water also makes contact with the Media Filtration Boom which absorbs free floating oils. Stormwater flow up to the peak treatment flow rate is processed through the filtration screens. During the heaviest flows the Basket fills with water and spills out the internal bypass and into the bottom of the catch basin.

03.01.02 Pollutants - The SCBFD will remove and retain debris, sediments, metals, nutrients, oxygen demanding substances and hydrocarbons entering the catch basin during frequent storm events and specified flow rates. For pollutant removal performance see section 03.02.00.

03.01.03 Treatment Flow Rate - The SCBFD operates using gravity flow. The SCBFD treatment flow rate varies by size and is provided on the drawings for each model. Flow rates must be supported by independent lab results.

03.01.04 Bypass Flow Rate – The SCBFD is designed to fit within the catch basin in a way not to affect the existing hydraulics and treat or bypass all flows. The bypass must be sized with a surface area greater then the outlet pipe size, thus the SCBFD shall not be a critical point of flow restriction. Bypass flow rate must be based on the SCBFD's inlet throat or bypass orifice capacity, which ever is less.

03.01.05 Pollutant Load – The SCBFD must be designed to have minimum storage capacity as documented on the drawing for each particular size and model.

03.01.06 Performance Protocol and Results – All lab testing on filtration media must be performed by an independent third party consultant and testing lab.

03.02.00 Test Performance

03.02.01 Independent Third Party Testing:
The SCBFD must be tested under a nationally recognized lab protocol and verified independently by a third party public agency;

- Must capable of removing greater than 80% TSS
- Must use a particle size distribution with d_{50} of 52 microns
- Approval must be current and not expired.

3.02.02 Suspended Solids Removal
The SCBFD shall have demonstrated a minimum median TSS removal efficiency of greater than 80%.

03.02.03 Sediment Loading
The SCBFD must be proven to have the ability to load 27 lbs/cartridge and/or 37 lbs/sf of effective treatment/sedimentation area, while still maintaining an overall 89% removal efficiency.

PART 4 - EXECUTION

04.01.00 General

The installation and use of the SCBFD shall conform to all applicable national, state, municipal and local specifications.

04.02.00 Installation

The contractor shall furnish all labor, equipment, materials and incidentals required to install the (SCBFD) device(s) and appurtenances in accordance with the drawings, installation manual, and these specifications, and be inspected and approved by the local governing agency. Installation contractor should possess a Confined Space Entry Certification Permit, pursuant to OSHA standards. Any damage to catch basin and surrounding infrastructure caused by the installation of the SCBFD is the responsibility of the installation contractor.

04.02.01 Filter Basket and all components or accessories shall be inserted through the catch basin and properly secured per manufactures installation manual and these specifications.

04.03.00 Shipping, Storage and Handling

04.03.01 Shipping – SCBFD shall be shipped to the contractor's address and is the responsibility of the contractor to transport the unit(s) to the exact site of installation.

04.03.02 Storage and Handling– The contractor shall exercise care in the storage and handling of the SCBFD(s) and its components prior to and during installation. Any repair or replacement costs associated with events occurring after delivery is accepted, and unloading has commenced shall be born by the contractor. The SCBFD(s) and its components shall always be stored indoors and transported inside the original shipping container(s) until the SCBFD(s) are ready to be installed. The SCBFD shall always be handled with care and lifted according to OSHA and NIOSA lifting recommendations and/or contractor's workplace safety professional recommendations.

04.04.00 Maintenance and Inspection

04.04.01 Inspection – After installation, the contractor shall demonstrate that the SCBFD has been properly installed at the correct location(s), elevations, and with appropriate supports and fasteners. All components associated with the SCBFD and its installation shall be subject to inspection by the engineer of work, governing agency, and the manufacture at the place of installation. In addition, the contractor shall demonstrate that the SCBFD has been installed per the manufacturer's specifications and recommendations. SCBFD(s) shall be physically inspected regularly in accordance to owner's Stormwater Pollution Prevention Plans (SWPPP) and manufacture's recommendations. An inspection record shall be kept by the inspection operator. The record shall include the condition of the SCBFD and its appurtenances. The most current copy of the inspection record shall always be copied and placed in the owner's SWPPP.

04.04.02 Maintenance – The manufacturer recommends cleaning and debris removal Of membrane filter cartridges. The maintenance shall be performed by someone qualified. A Maintenance Manual is available upon request from the manufacturer. The manual has detailed information regarding the maintenance of the SCBFD(s). A detailed Maintenance Record shall be kept by the maintenance operator. The Maintenance Record shall include any maintenance activities preformed, amount and description of debris collected, and the condition of the filter. The most current copy of the Maintenance Record shall always be copied and placed in the owner's Stormwater Pollution Prevention Plan (SWPPP) per governing agency.

04.04.03 Material Disposal - All debris, trash, organics, and sediments captured and removed from the SCBFD shall be transported and disposed of at an approved facility for disposal in accordance with local and state regulations. Please refer to state and local regulations for the proper disposal of toxic and non-toxic material.

PART 5 – QUALITY ASSURANCE

05.01.00 Warranty

The manufacturer shall guarantee the SCBFD against all manufacturing defects in materials and workmanship for a period of (1) year from the date of delivery to the contractor. The manufacturer shall be notified of repair or replacement issues in writing within the warranty period. The SCBFD is limited to recommended application for which it was designed.

END OF SECTION

Bio Clean
A Forterra Company

Catch Basin Inlet Filters

Media Filter Type

Bio Clean
A Forterra Company

Section [_____]
Stormwater Catch Basin Filtration Device

PART 1 – GENERAL

01.01.00 Purpose
The purpose of this specification is to establish generally acceptable criteria for devices used for filtration of stormwater runoff captured by catch basins with curb openings. It is intended to serve as a guide to producers, distributors, architects, engineers, contractors, plumbers, installers, inspectors, agencies and users; to promote understanding regarding materials, manufacture and installation; and to provide for identification of devices complying with this specification.

01.02.00 Description
Stormwater Catch Basin Filtration Devices (SCBFD) are used to filter stormwater runoff captured by catch basins. The SCBFD is a filter system composed of a filtration basket, media filtration boom and a trough system. SCBFDs are used to remove various pollutants from stormwater by means of screening, separation and media filtration.

01.03.00 Manufacturer
The manufacturer of the SCBFD shall be one that is regularly engaged in the engineering, design and production of systems developed for the treatment of stormwater runoff for at least (10) years, and which has a history of successful production, acceptable to the engineer of work. In accordance with the drawings, the SCBFD(s) shall be a filter device manufactured/distributed by Bio Clean or assigned distributors or licensees. Bio Clean can be reached at:

Corporate Headquarters:
398 Via El Centro
Oceanside, CA 92058
Phone: (855) 566-3938
Fax: (760) 433-3176
www.BioCleanEnvironmental.com

01.04.00 Submittals

01.04.01 Shop drawings are to be submitted with each order to the contractor and engineer of work.

01.04.02 Shop drawings are to detail the SCBFD, its components and the sequence for installation, including:

- SCBFD configuration with primary dimensions
- Various SCBFD components
- Any accessory equipment

01.04.03 Inspection and maintenance documentation submitted upon request.

01.05.00 Work Included

01.05.01 Specification requirements for installation of SCBFD.

01.05.02 Manufacturer to supply SCBFD(s):

- Filtration Basket
- Trough System – Trough and Weir
- Optional Media Filtration Boom

01.05.03 Optional Media Filtration Boom may be provided with each Filtration Basket housed in nylon netting and securely fastened to the Filtration basket. Each media boom shall contain polymer beads to permanently absorb hydrocarbons.

01.06.00 Reference Standards

ASTM E2016-99(2004)e1	Standard Specification for Industrial Woven Wire Cloth
ASTM A 240	Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
ASTM F 716	Testing Sorbent Performance of Absorbents
ASTM F 726	Sorbent Performance of Absorbents
ASTM D3787 - 07	Standard Test Method for Bursting Strength of Textiles-Constant-Rate-of-Traverse (CRT) Ball Burst Test
ASTM D2690-98	Standard Test Method for Isophthalic Acid in Alkyd and Polyester Resins
ASTM C 582-02	Standard Specification for Contact-Molded Reinforced Thermosetting Plastic (RTP) Laminates for Corrosion-Resistant Equipment
ASTM D 638	Standard Test Method for Tensile Properties of Plastics
ASTM D 790	Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
ASTM D 648	Standard Test Method for Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position
ASTM D 2583	Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor
ASTM D 4097	Standard Specification for Contact-Molded Glass-Fiber-Reinforced Thermoset Resin Corrosion-Resistant Tanks
ASTM D3409	Standard Test Method for Adhesion of Asphalt-Roof Cement to Damp, Wet, or Underwater Surfaces
IFI 114	Break Mandrel Blind Rivets

PART 2 – COMPONENTS

02.01.00 Trough System Components

02.01.01 Trough shall be manufactured from 100% marine grade polyester resin and fiberglass strands and stainless steel.

- The entire fiberglass structure must be coated with a polyester gel coating with ultra violet inhibitors incorporated into the coating for maximum ultra violet protection.
- Fiberglass must have a minimum thickness of 3/16”.

02.01.02 Weir portion of the Trough System shall be manufactured from 100% stainless steel.

- The Weir shall fully surround the Filter Basket on all sides. On the end of the weir the sides shall be made of screen with perforated round openings less than 5 mm in size.
- Water flows in access of the capacity of the Filter Basket shall pass through the additional weir screen for added treatment and retention of trash and debris during higher bypass flows.
- The Weir shall be hinged in the middle along the centerline of the Filter Basket and hinge upward to allow for access into the catch basin.

02.01.03 Mounting Hardware shall be 100% non-corrosive metals.

- Nuts and Bolts
- Rivets
- Support Brackets
- Concrete Anchors

02.01.04 Concrete Filler and Sealant shall be made of Acrylic Emulsion and have a minimum service temperature range of -30°F to 150°F.

02.02.00 Filter Basket Components

02.02.01 Filter Housing shall be manufactured of 100% stainless sheet metal.

02.02.02 Screens shall be manufactured of 304 stainless steel mesh constructed per ASTM E2016-99(2004).

02.02.03 Handle shall be manufactured entirely of 100% stainless steel and be mounted to the Filter Basket Housing using mounting hardware per section 02.01.03

02.02.04 Media Filtration Boom shall be made up of granulated oil absorbing polymers that have been tested in accordance with section 11.2 of ASTM F 716.07 and held within a netting.

- Oil absorbing polymers must be proven to absorb 180% of its weight within a 300 second contact time, and at this absorption percentage the physical increase in the size of the granules is not more that 50%.
- Netting shall be 100% polyester with a number 16 sieve size, and strength tested per ASTM D 3787.

PART 3 – PERFORMANCE

03.01.00 General

03.01.01 Function - The SCBFD has no moving internal components and functions based on gravity flow, unless otherwise specified. The SCBFD is composed of a Trough System and a Filter Basket. Runoff enters the SCBFD from a curb opening and flows into the Trough System which is mounted under the face of the curb opening. It then flows horizontally inside the Trough Systems Trough to the Weir which holds the Filtration Basket. This Trough System positions the Filtration Basket directly under the catch basin access point (manhole cover, grate or hatch). The Filtration Basket can be removed through the access point without disassembly. The Filtration Basket can also be cleaned without entering the access point by using a vacuum truck. Along the top perimeter of the Filter Basket is a tray containing an optional Media Filtration Boom. Water flows through and over the filtration boom and downward into the filtration basket. Stormwater enters the inside of the filtration basket and flows downward toward the bottom portion of the basket. Stormwater flow up to the peak treatment flow rate is processed through the filtration screens. These screens provide capture of TSS, sediment, particulate metals, hydrocarbons, nutrients, organics trash and debris. During the heaviest flows the basket fills with water and spills over the top to bypass directly into the bottom of the catch basin, while previously captured debris and solids are contained by an upper screen guard which prevents re-suspension.

03.01.02 Pollutants - The SCBFD will remove and retain debris, sediments, metals, nutrients, oxygen demanding substances, bacteria and hydrocarbons entering

the filter during frequent storm events and specified flow rates. For pollutant removal performance see section 03.02.00.

03.01.03 Treatment Flow Rate - The SCBFD operates using gravity flow. The SCBFD treatment flow rate varies by size and is provided on the drawings for each model.

03.01.04 Bypass Flow Rate – The SCBFD is designed to fit within the catch basin in a way not to affect the hydraulics. The area over the top of the Trough System and Filter Basket is always greater than the curb opening area and/or the area of the outflow pipe. Therefore, the SCBFD does not create a critical point of restriction.

03.01.05 Pollutant Load – The SCBFD must be designed to have minimum storage capacity as documented on the drawing for each particular size and model.

03.01.06 Performance Protocol and Results – All lab testing on filtration media must be performed by an independent third party consultant and testing lab.

03.02.00 Test Performance

At a minimum, the SCBFD shall be tested, according to section 03.01.05, and meet these performance specifications:

03.02.01 Filter Pollutant Removal Table

POLLUTANT	REMOVAL EFFICIENCY
TSS-(down to 100 microns)	93%

03.02.02 Maintenance Performance Table

Maintenance Activity	Poor		Fair		Excellent
	1	2	3	4	5
Ease of Attachment/Reattachment to Drain				**X**	
Ease of Handling and Entry Through Manhole					**X**
Ease of Cleaning and Filter Media Replacement				**X**	
Prevention of Debris Loss During Removal From Drain				**X**	
Overall Maintenance Turn-Around Time – 5 Rating = 15 Minutes or Less					**X**
				Total Score	***22***

PART 4 - EXECUTION

04.01.00 General

The installation and use of the SCBFD shall conform to all applicable national, state, municipal and local specifications.

04.02.00 Installation

The contractor shall furnish all labor, equipment, materials and incidentals required to install the (SCBFD) device(s) and appurtenances in accordance with the drawings, installation manual, and these specifications, and be inspected and approved by the local governing agency. Installation contractor should possess a Confined Space Entry Certification Permit, pursuant to OSHA standards. Any damage to catch basin and surrounding infrastructure caused by the installation of the SCBFD is the responsibility of the installation contractor.

04.02.01 Trough System will be installed in accordance with manufactures' recommendations. The Trough component will be installed the complete width of the curb opening, or underneath any wings as to provide 100% coverage of incoming stormwater. The Weir component of the Trough System must be located directly under the manhole opening or other access point (not including the curb opening) regardless of its position relative of the curb opening. The Trough System must be properly mounted and assembled inside the catch basin with drive pins and pop rivets per manufacture's recommendations. Once the Trough System is secured to the walls of the catch basin all seams must be filled with sealant per section 02.01.03.

04.02.02 Filter Basket will be inserted through the manhole opening or access point of the Trough System directly without entry into the basin. The Filtration Basket shall be fully visible from finish surface while looking into the access point for ease of inspection and maintenance. The curb opening itself is not a point of access as maintenance personnel cannot enter.

04.03.00 Shipping, Storage and Handling

04.03.01 Shipping – SCBFD shall be shipped to the contractor's address and is the responsibility of the contractor to transport the unit(s) to the exact site of installation.

04.03.02 Storage and Handling– The contractor shall exercise care in the storage and handling of the SCBFD(s) and its components prior to and during installation. Any repair or replacement costs associated with events occurring after delivery is accepted, and unloading has commenced shall be born by the contractor. The SCBFD(s) and its components shall always be stored indoors and transported inside the original shipping container(s) until the SCBFD(s) are ready to be installed. The SCBFD shall always be handled with care and lifted according to OSHA and NIOSA lifting recommendations and/or contractor's workplace safety professional recommendations.

04.04.00 Maintenance and Inspection

04.04.01 Inspection – After installation, the contractor shall demonstrate that the SCBFD has been properly installed at the correct location(s), elevations, and with appropriate supports and fasteners. All components associated with the SCBFD and its installation shall be subject to inspection by the engineer of work, governing agency, and the manufacture at the place of installation. In addition, the contractor shall demonstrate that the SCBFD has been installed per the manufacturer's specifications and recommendations. SCBFD(s) shall be physically inspected regularly in accordance to owner's Stormwater Pollution Prevention Plans (SWPPP) and manufacture's recommendations. An inspection record shall be kept by the inspection operator. The record shall include the condition of the SCBFD and its appurtenances. The most current copy of the inspection record shall always be copied and placed in the owner's SWPPP.

04.04.02 Maintenance – Routine maintenance and cleaning time of the SCBFD shall take no more than 15 minutes. Routine maintenance and cleaning time shall be field test certified by a third party per section 03.01.05. SCBFD(s) must be completely maintained from outside the catch basin. The SCBFD(s) shall be inspected, maintained and cleaned 2 to 4 times a and/or in accordance to owner's Stormwater Pollution Prevention Plans (SWPPP). The maintenance shall be preformed by someone qualified. A Maintenance Manual is available

upon request from the manufacturer. The manual has detailed information regarding the maintenance of the SCBFD. A Maintenance Record shall be kept by the maintenance operator. The Maintenance Record shall include any maintenance activities preformed, amount and description of debris collected, and the condition of the filter. The most current copy of the Maintenance Record shall always be copied and placed in the owner's SWPPP.

04.04.03 Material Disposal - All debris, trash, organics, and sediments captured and removed from the SCBFD shall be transported and disposed of at an approved facility for disposal in accordance with local and state regulations. Please refer to state and local regulations for the proper disposal of toxic and non-toxic material.

PART 5 – QUALITY ASSURANCE

05.01.00 Warranty

The manufacturer shall guarantee the SCBFD against all manufacturing defects in materials and workmanship for a period of (1) year from the date of delivery to the contractor. The manufacturer shall be notified of repair or replacement issues in writing within the warranty period. The SCBFD is limited to recommended application for which it was designed.

[End of This Section]