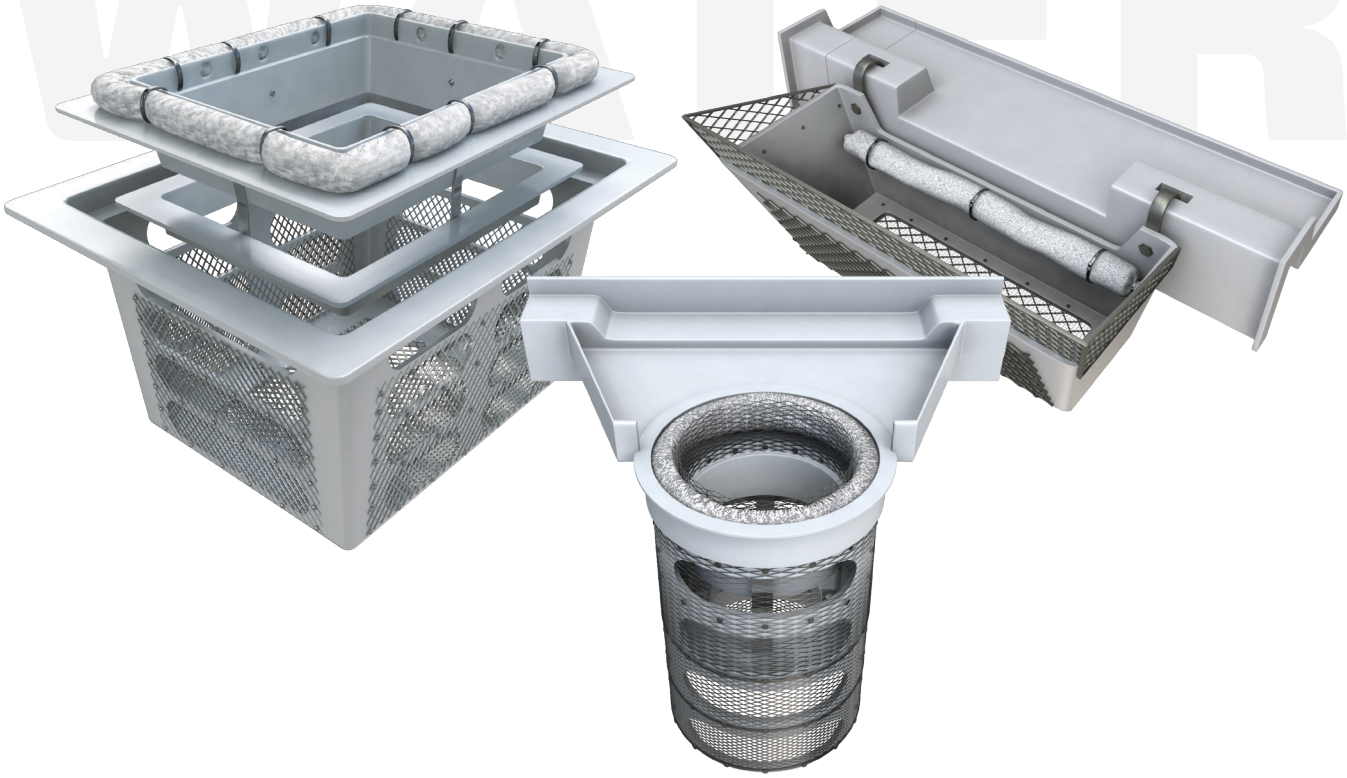
INLET FILTER SYSTEMS

Operation & Maintenance Manual Version 1



Oldcastle Infrastructure™
A CRH COMPANY

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TABLE OF CONTENTS

WARNING

Read the Following Information, Instructions and Warnings Before Inspecting or Installing this Stormwater Treatment Device.

This manual is intended to explain the specifics of the Oldcastle Infrastructure Grate Inlet Skimmer Box™ (GISB), High Capacity Curb Inlet Basket™ (HCCIB) and Standard Capacity Curb Inlet Basket™ (CIB) while reviewing the aspects of existing regulations and safety procedures. It is the responsibility of all personnel to familiarize themselves with, understand and comply with all applicable local, state and federal laws before attempting to inspect or service these devices.

All precautions and procedures in this manual are current at the time of printing but are subject to change based on the development of new processes and procedures. Oldcastle Infrastructure assumes no responsibility and is not accountable for any injuries, fines, penalties or losses that occur involving any procedure in this manual or other unaddressable actions taken.

The Grate Inlet Skimmer Box, High Capacity Curb Inlet Basket and Standard Capacity Curb Inlet Basket performance is based on the procedures being followed in this manual. Any Non-Compliance with the outlined measures will be the responsibility of the owner.

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CIB INFORMATION

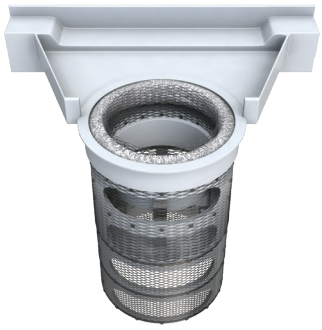
Curb Inlet Basket and High Capacity Curb Inlet Basket Information

The Standard Capacity Curb Inlet Basket (used in shallow catch basins) and High Capacity Curb Inlet Basket™ (used in deep catch basins) are specialized inlet filters used specifically for curb inlets where the only access element is a manhole. Both units are made of UV Coated marine grade fiberglass and stainless steel to ensure longevity and durability. Stormwater flow is directed into the filtration basket via a shelf system that is located directly under the manhole for easy access. Under high volume flows, the water can bypass the filtration system by simply flowing past the filter and into the catch basin.

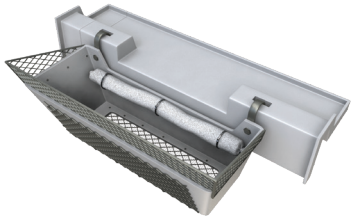
Benefits

- Will not impede design flow of the inlet.
- Removes more than 80% of total suspended solids.
- The HCCIB is able to retain hundreds of pounds of debris and sediment.
- Screens of different sieve sizes optimize filtration and flow.
- Bypass openings prevent clogging.
- Multi stage filtration captures hydrocarbons, sediment, litter and foliage.
- No need to enter the confined space of the catch basin.
- Easily serviced by vacuum truck.

Curb inlet where servicing can only occur via access from the manhole.



High Capacity Curb Inlet Basket with built in shelf system allows for ease of installation and service. For use in deep catch basins.



Standard Capacity Curb Inlet Basket with built in shelf system allows for ease of installation and service. Typically used in shallow catch basins.

CIB OPERATION

Operation Summary

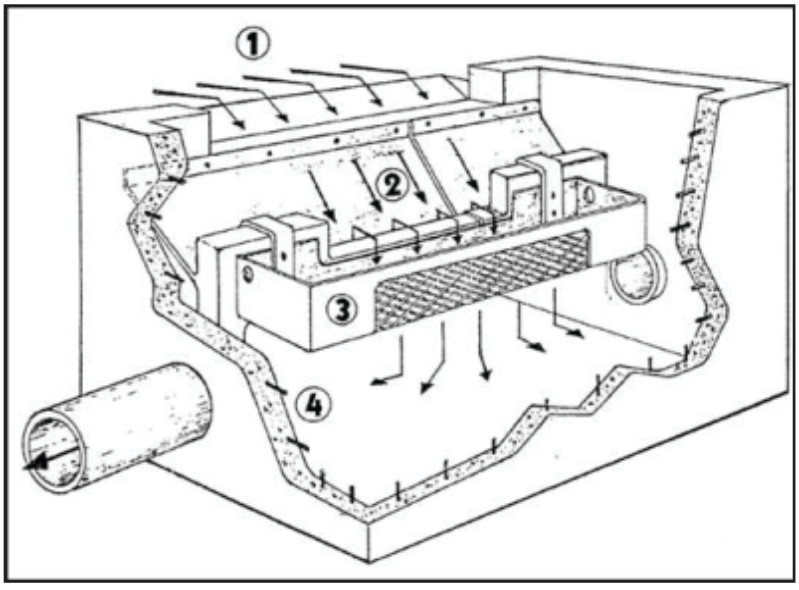
The Curb Inlet Basket (CIB) and High Capacity Curb Inlet Basket (HCCIB) are unique for their “Shelf System” which directs stormwater flow into the filter positioned directly under the access manhole. The Shelf System can be manufactured to any size and style of catch basin. The CIB and HCCIB are multi stage filtration systems that can capture a variety of pollutants during a storm event:

1 Stormwater carrying debris and pollutants enters the inlet through the curb.

2 An adjustable throat width funnels water to the weir. The immediate drop in the throat elevation prevents head loss through the inlet. This allows sediment to collect along the incoming side of the weir.

3 The water then flows over the weir and into the removable filtration basket, filtering out trash, foliage and sediment. Furthermore, If a StormBoom is installed, it will filter out any hydrocarbons from the stormwater as it flows into the filtration basket.

4 Filtered water leaves the basket and enters the catch basin where it flows down stream. The position of the curb inlet basket high in the catch basin allows for captured debris to dry between storm events as well as avoid restriction to any up stream pipes.



Curb Inlet Basket operation diagram depicting water flow.

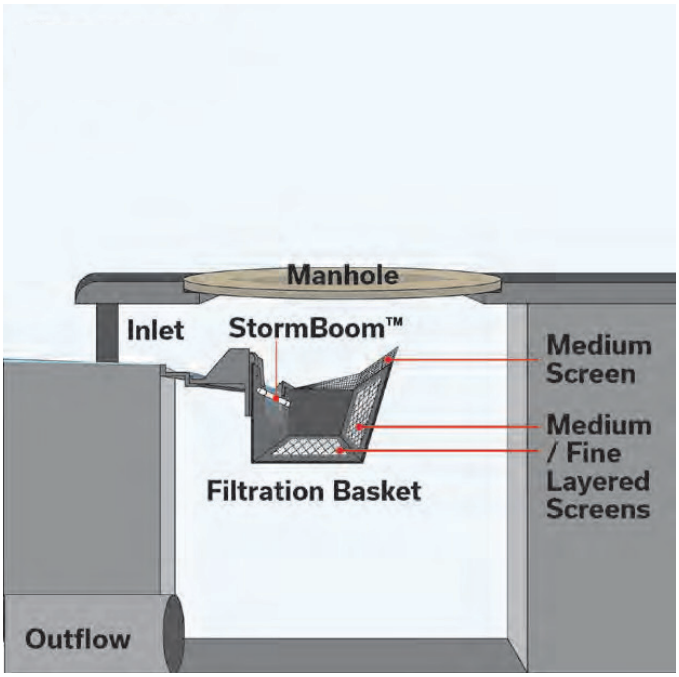
High Capacity Curb Inlet Basket after storm event containing dry foliage and debris ready for collection and disposal.

Standard Capacity Curb Inlet Basket removed from shelf inside inlet. The filtration basket holds dried debris ready for disposal.

CIB OPERATION

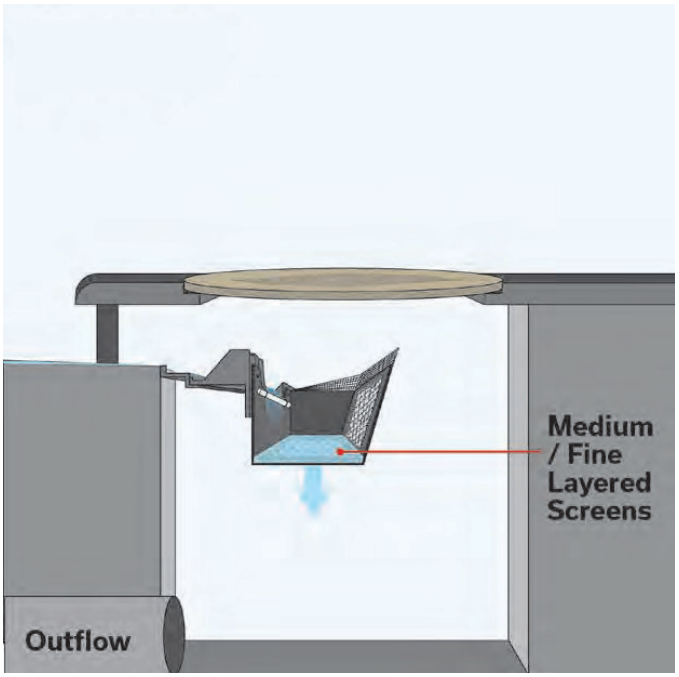
Standard CIB Operation Summary

1



Stormwater enters the inlet immediately coming in contact with a StormBoom which absorbs floating oils and hydrocarbons. The StormBoom can be outfitted with multiple types of filter media and is installed just under the weir opening.

2

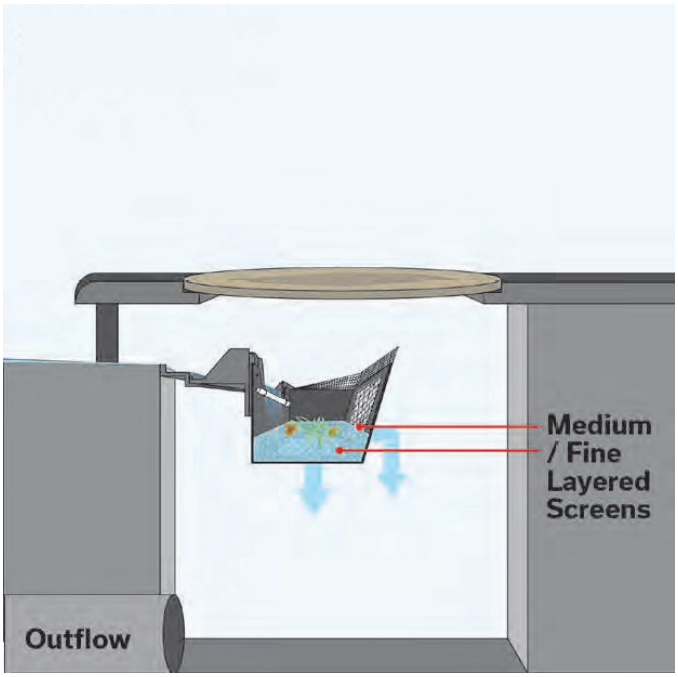


Throughout the storm event, water continues to come in contact with the StormBoom and then flows into the filtration basket where trash, sediment and debris collect. These pollutants are left behind in the basket as the filtered water passes through the bottom screen.

CIB OPERATION

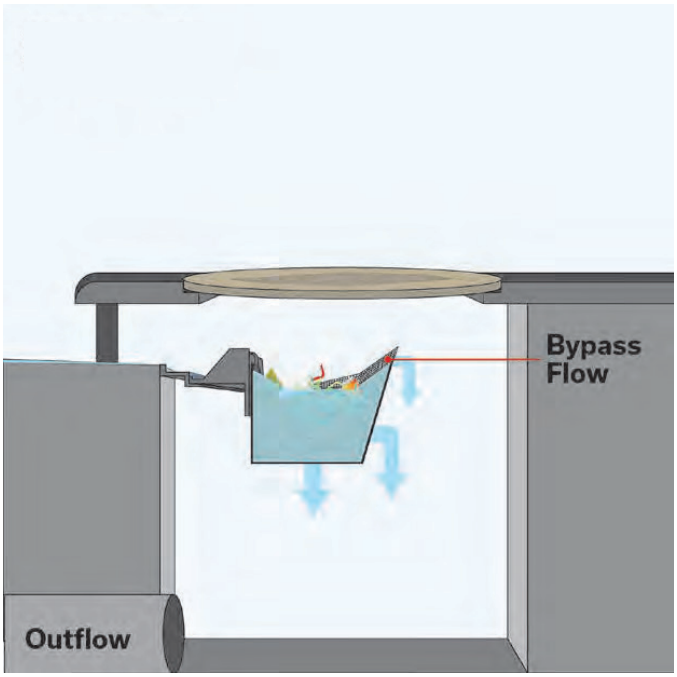
Standard CIB Operation Summary

3



As stormwater continues to flow into the filtration basket, sediment and debris continue to accumulate. As storm flow intensifies and / or the basket fills, water will begin to filter through the side screen in addition to the lower screens.

4

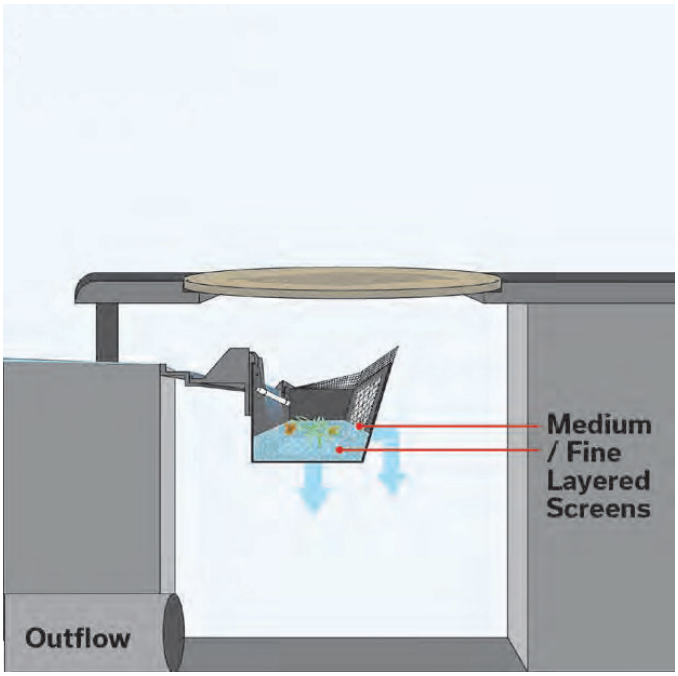


As stormwater continues to flow into the filtration basket, sediment and debris continue to accumulate. As storm flow intensifies and / or the basket fills, water will begin to filter through the side screen in addition to the lower screens.

CIB OPERATION

Standard CIB Operation Summary

5

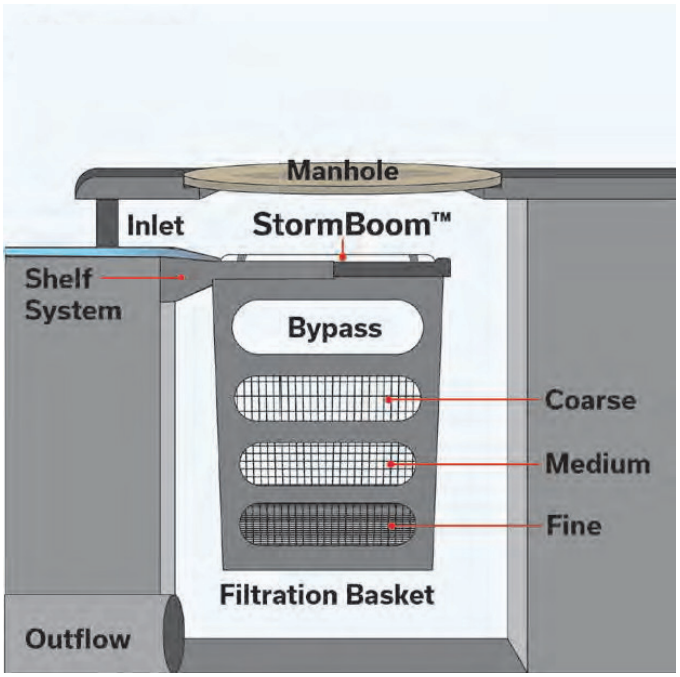


After the storm event has subsided, runoff will drain from the CIB leaving all collected debris suspended in the screen system to dry until removal during service. Captured pollutants include trash, debris, sediment as well as the nutrient pollutant load which prevents septic water, mosquito breeding and nutrient leaching.

CIB OPERATION

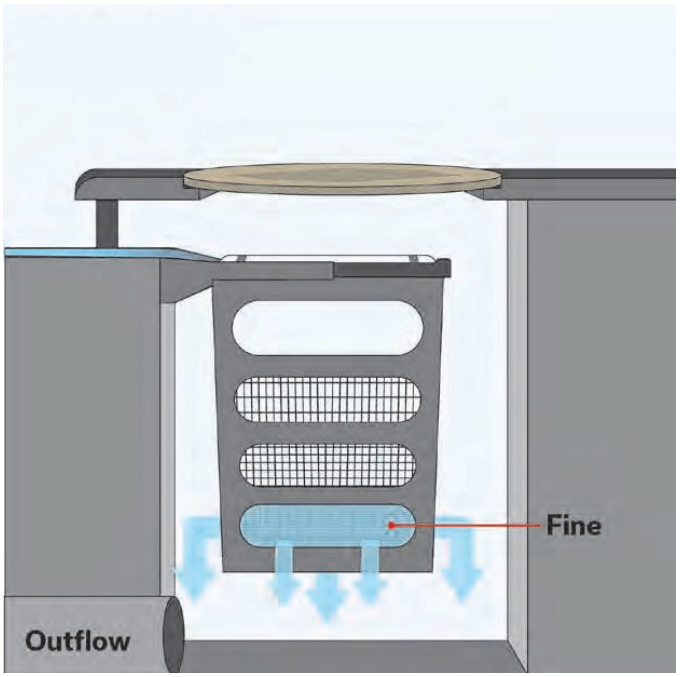
HCCIB Operation Summary

1



Stormwater enters the curb inlet immediately coming in contact with a StormBoom which absorbs floating oils and hydrocarbons. The StormBoom can be outfitted with four types of filtration media and is installed at the top of the screen basket.

2

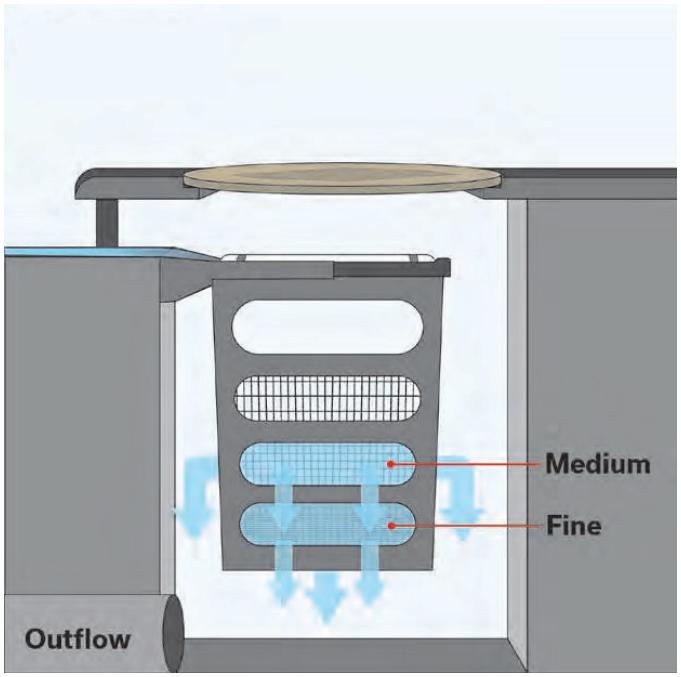


Throughout the storm event, water continues to come in contact with the StormBoom and then flows into the filtration basket where fine particulates and debris begin to settle. These pollutants are left behind in the basket as the filtered water passes through the bottom and lower fine sieve screens.

CIB OPERATION

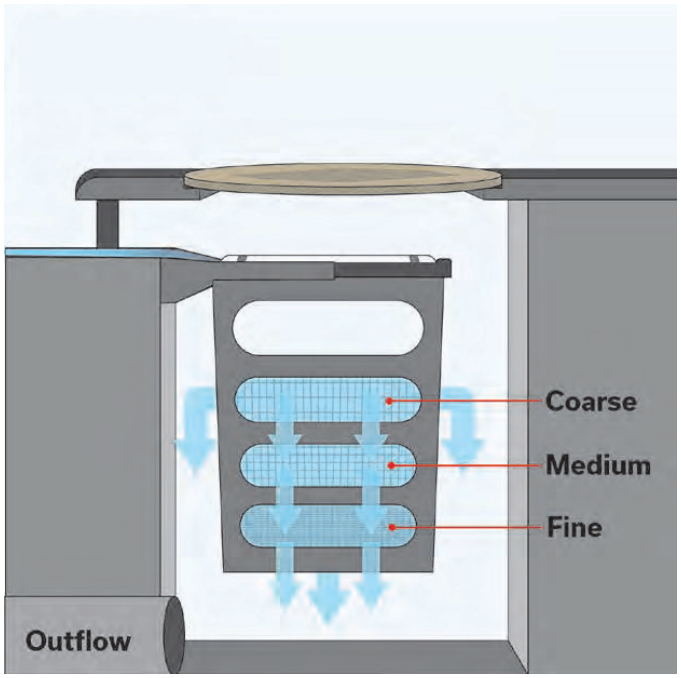
HCCIB Operation Summary

3



As the storm intensity increases, the water level in the HCCIB rises to a level adjacent with the medium sieve size screens. The medium sieve size screens provide additional flow with less chance of clogs or obstructions forming.

4

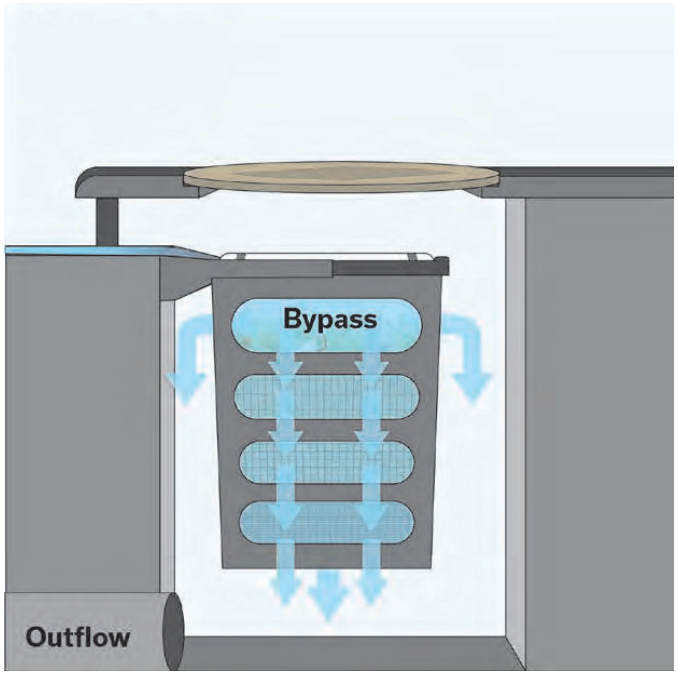


If the storm intensity becomes a high flow event, the water level in the HCCIB rises to a level adjacent to the coarse sieve size screens. These screens provide additional filtered flow with a far less chance of obstruction than the fine or medium sieve screens and is designed to capture floating debris like foliage and trash.

CIB OPERATION

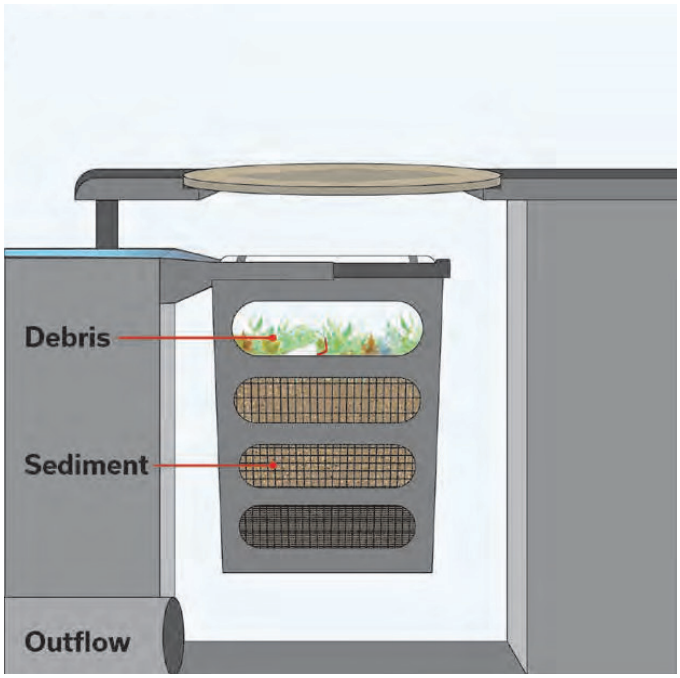
HCCIB Operation Summary

5



If the stormwater flow rate is extreme or the unit is full where the flow rate exceeds flow through all the screens, the water will bypass the screens through skimmer protected openings at the top of the HCCIB. During this time, water flow is still partially treated and continues to pass through all filtration screens.

6



After the storm event has subsided, the stormwater will drain from the HCCIB completely leaving all collected debris suspended in the screen system to dry until they are removed at time of service. The dry state storage contains solid debris as well as the nutrient pollutant load while also working to prevent septic water, nutrient leaching and mosquito breeding.

CIB MAINTENANCE

Maintenance Summary

Heavy equipment is not required and the use of a vacuum truck is optional when servicing the CIB. Whether servicing manually or with a vacuum truck, the 15 minute cleaning time facilitated by the Shelf System eliminates the need for confined space entry.

Manual Service

- Remove the manhole cover.
- Remove filtration basket either by hand or with manhole hook tool.
- Cut zip ties, remove StormBoom and dispose.
- Attach new StormBoom with zip ties.
- Brush filtration basket screens clean if necessary.
- Replace filtration basket and replace manhole cover.

Vacuum Service

- Remove the manhole cover.
- Cut zip ties, remove StormBoom and dispose.
- Place vacuum truck hose into filtration basket and suction out debris.
- Attach new StormBoom to skimmer tray with zip ties.
- Replace manhole cover

The shelf system allows for easy access to each Curb Inlet Basket for manual servicing.

High Capacity Curb Inlet Basket with built in shelf system allows for ease of installation and service. For use in deep catch basins.

High Capacity Curb Inlet Basket full of debris and needs to be cleaned. The StormBoom is discolored indicating the need for necessary replacement.

GISB INFORMATION

General Information

The Grate Inlet Skimmer Box (GISB) is a specialized inlet filter used specifically for grated catch basins. The unit is made of marine grade fiberglass and stainless steel to ensure longevity and durability. During a storm event, all incoming stormwater passes through the internal skimmer tray and into contact with a hydrocarbon absorption boom.

Stormwater and solid material then fall into the lower section of the skimmer box where small sieve sized filters capture and retain all solids. Turbulence deflectors within the filtration box act to calm the water and allow for a greater removal efficiency. Purified stormwater is thus able to pass into the catch basin system allowing the filters to dry after each storm event.

Grate removed and prepared for installation of the Grate Inlet Skimmer Box.

Benefits

- Will not impede design flow of the inlet.
- Captures hundreds of pounds of debris and sediment.
- Screens of different sieve sizes optimize filtration and flow screens of different sieve sizes optimize filtration and flow.
- Bypass openings prevent clogging.
- Interior components are easily removed to allow access to the lower chamber.
- Removes more than 80% of total suspended solids.
- No need to enter the confined space of the catch basin.
- Easily serviced by vacuum truck.

Grate Inlet Skimmer Box filtration basket installed into the grate inlet.

Grate Inlet Skimmer Box skimmer tray installed into the filtration basket and ready for use.

GISB SPECIFICATIONS

Common Size GISB Flow Rate Specifications

The maximum flow rate of the Grate Inlet Skimmer Box is determined by the amount of flow that can pass through the throat, the exception is found only in very large units. For instance, if the potential water flow through the throat is less than the potential flow through the bypass, then the throat determines the maximum flow. However, if the potential flow through the bypass is more than the throat, then the bypass determines the maximum flow. Filtered flow represents the potential flow rate through all screens and does not include the potential flow through the bypass. Water flow through the bypass happens only when the flow rate through the grate exceeds the flow rate through all the screens or the filtration basket is full.

Model Number	Flange Width (in)	Flange Length (in)	Flange Depth (in)	Throat Flow Rate (CFS)	Filtered Flow Rate (CFS)	Bypass Flow Rate (CFS)
GISB 12-12-12	12	12	12	0.25	1.26	0.88
GISB 12-12-24	12	12	24	0.31	2.37	1.11
GISB 17-33-24	17	33	24	5.61	14.91	0.73
GISB 18-18-18	18	18	18	0.64	2.65	1.40
GISB 24-24-24	24	24	24	3.48	11.09	5.64
GISB 24-36-24	24	36	24	7.66	16.31	7.50
GISB 27-27-24	27	27	24	4.21	12.12	5.73
GISB 36-36-24	36	36	24	13.93	15.62	7.66
GISB 48-27-18	48	27	18	15.39	12.17	9.68
GISB 48-27-24	48	27	24	20.61	25.01	12.08

GISB OPERATION

Operation Summary

1 Stormwater enters the inlet through the grate and passes through the StormBoom installed around the basket top.

2 Throughout the storm event, water continues to come in contact with the StormBoom and then flows into the lower filtration chamber.

3 As the storm intensity increases, the water level in the GISB rises to an adjacent level with the medium size sieve screens and turbulence deflector.

4 If the storm intensity becomes a high flow event, the water level in the GISB rises to a level adjacent to the coarse sieve size screens above the turbulence deflector.

5 If the stormwater flow rate is extreme or the GISB is full where it exceeds flow through all the screens, the water will bypass the screens by passing through skimmer protected openings at the top of the GISB.

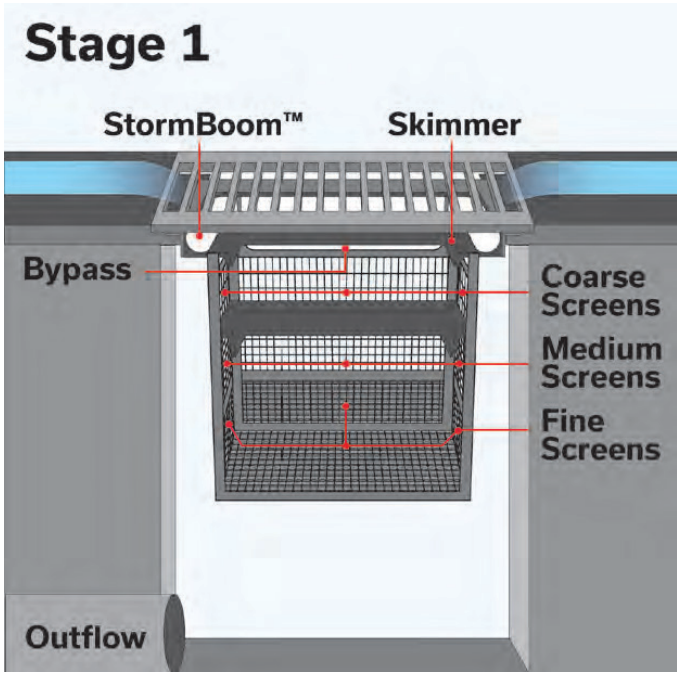
6 After the storm event has subsided, the stormwater will drain from the GISB, leaving all collected debris suspended in the basket to dry until removal during routine maintenance.

GISB after storm event, full of debris and discolored StormBoom indicating the need for service and replacement.

GISB OPERATION

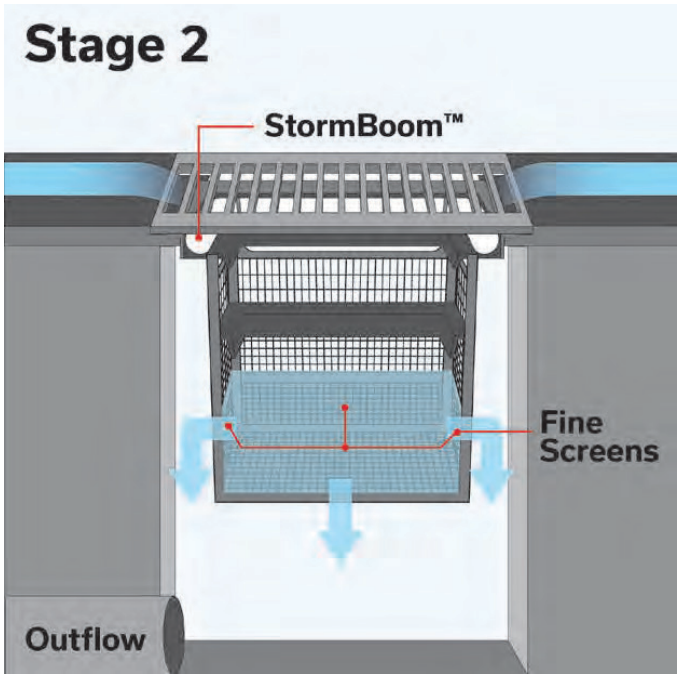
GISB Operation Summary

1



Stormwater enters the grate inlet immediately coming in contact with a StormBoom which absorbs floating oils and hydrocarbons. The StormBoom can be outfitted with four types of filtration media and is installed at the top of the device.

2

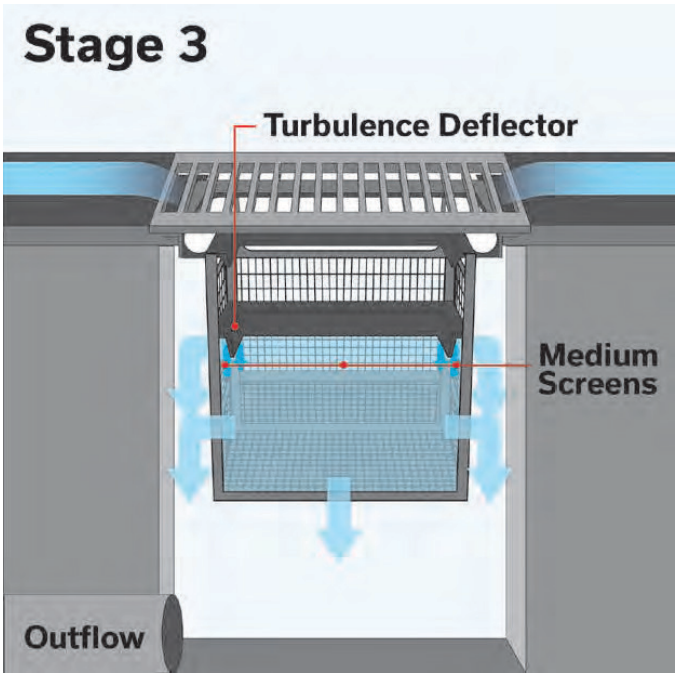


Throughout the storm event, water continues to come in contact with the StormBoom and then flows into the lower filtration chamber adjacent to the fine sieve size screens. The fine sieve size screens filter out fine particulates such as phosphates and sand.

GISB OPERATION

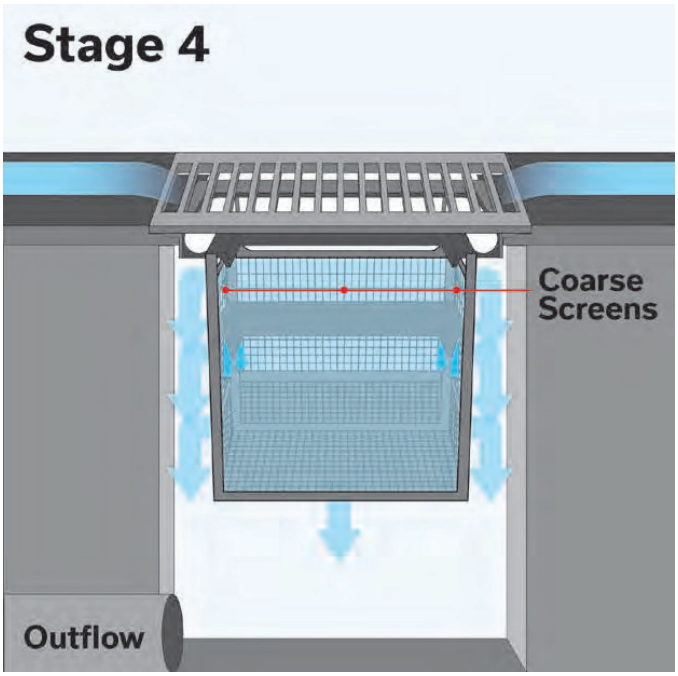
GISB Operation Summary

3



As the storm intensity increases, the water level in the GISB rises to a level adjacent with the medium size sieve screens and turbulence deflector. The medium size sieve screens provide additional flow with less chance of clogs or obstructions forming. The turbulence deflector reduces the turbidity in the lower chamber and prevents scouring.

4

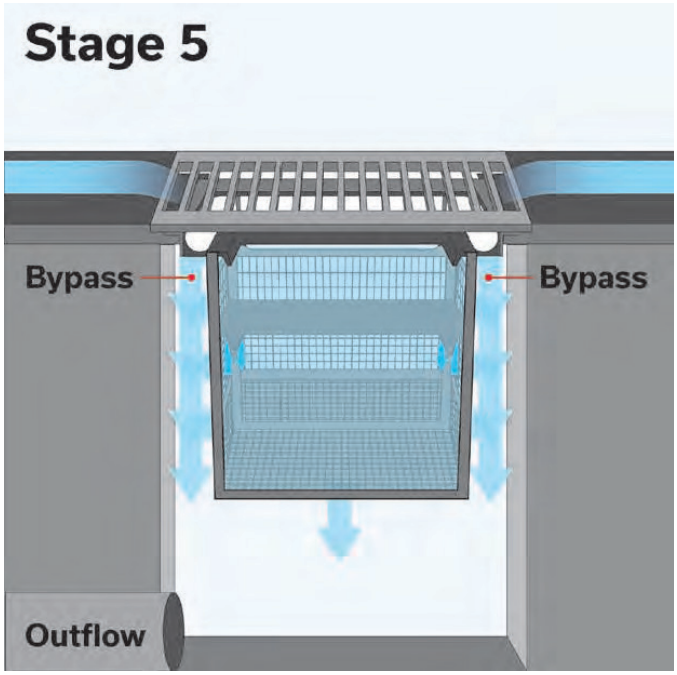


If the storm intensity becomes a high flow event, the water level in the GISB rises to a level adjacent to the coarse sieve screens above the first turbulence deflector. The coarse screen provides additional filtered flow with a far less chance of obstruction than the fine or medium sieve size screens and is designed to capture floating debris like foliage and trash.

GISB OPERATION

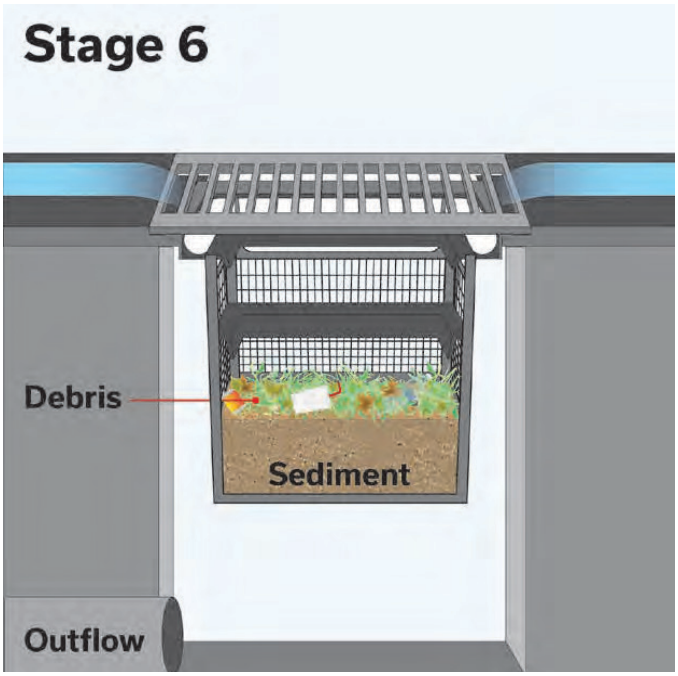
GISB Operation Summary

5



If the stormwater flow rate is extreme or the unit is full where the flow rate exceeds flow through all the screens, the water will bypass the screens through skimmer protected openings at the top of the GISB.

6



After the storm event has subsided, the stormwater will drain from the GISB completely leaving all collected debris suspended in the screen system to dry until removal during service. The screen also contains the nutrient pollutant load while also prevent septic water, mosquito breeding and nutrient leaching.

GISB MAINTENANCE

Maintenance Summary

The Grate Inlet Skimmer Box is recommended to be inspected and serviced quarterly. However, site conditions can affect the service interval to be either longer or shorter than the quarterly recommendation. The maximum flow capacity of the Grate Inlet Skimmer Box will be restored after each servicing. The flow rate through the unit will be the same as a new one no matter the times serviced due to the durable stainless steel construction of the GISB. The unit can easily be serviced manually or with the assistance of a vacuum truck.

Grate Inlet Skimmer Box filtration basket removed by hand for manual disposal of debris and basket cleaning.

Manual Service

- Remove the grate.
- Remove the skimmer tray.
- Cut zip ties, remove StormBoom and dispose.
- Remove and dispose of debris in skimmer tray.
- Attach new StormBoom to skimmer tray with zip ties.
- Remove filtration box, dispose of debris and brush screens.
- Replace filtration box into inlet, replace skimmer tray into filtration box and replace grate.

Grate Inlet Skimmer Box filtration basket being cleaned via vacuum truck hose and screens washed with spray wand.

Vacuum Service

- Remove the grate.
- Remove the skimmer tray.
- Cut zip ties, remove StormBoom and dispose.
- Remove and dispose of debris in skimmer tray.
- Attach new StormBoom to skimmer tray with zip ties.
- Reach into filtration box with vacuum and suction out debris and clean screens with spray wand or brush.
- Replace filtration box into inlet, replace skimmer tray into filtration box and replace grate.

STORMBOOM MEDIA

Hydrocarbon Absorption Booms

Oldcastle Infrastructure manufactures various media based StormBooms designed to filter a variety of pollutants. There are four types of media that StormBooms can be made of including:

Type 1

- **Hydrophobic Treated Cellulose** is a wide spectrum absorbent with a large sieve covering capable of absorbing chemicals other than oils and hydrocarbons. This media is a cellulose filler made from reclaimed paper mill by-products. Liquids are drawn into the cellulose fibers through capillaries and are encapsulated in the boom. It is recommended that this type of boom should be replaced every 3 to 4 months.

Type 2

- **Melt Blown Polypropylene** with a large size sieve covering which is limited to hydrocarbon absorption but will not biodegrade. This type of boom is recommended to be replaced every 3 to 4 months or when it becomes dark and discolored.

Type 3

- **50 – 50 blend of Hydrophobic Treated Cellulose and Melt Blown Polypropylene** with a large sieve sized covering. This boom offers wide spectrum absorption with an extra emphasis on hydrocarbons. This boom is vastly effective in high pollutant areas such as repair facilities and gas stations. It is recommended that this type of boom be replaced every 3 to 4 months.

Type 4

- **Polymer Crumb Filler** with a fine sieve size covering. This media will not absorb water and can float indefinitely as well as not biodegrade.This media is limited to hydrocarbon absorption which occurs on contact by chemically bonding with hydrocarbon molecules. This type of boom should be replaced every 3 to 4 months or as needed, when it starts to darken in color.

WARRANTY

Minimum Equipment Requirements

Oldcastle Infrastructure products are engineered and manufactured with the intent of being a permanent part of the infrastructure. Oldcastle Infrastructure warranties its products to be free from manufacturing defects for a period of five (5) years from the date of purchase.

In the event a warranty claim is made and determined to be valid, Oldcastle Infrastructure will replace or repair the product at their own discretion. Warranty claims must be submitted, evaluated and approved by Oldcastle Infrastructure for the claim to be determined valid. All warranty work must be authorized by Oldcastle Infrastructure prior to work beginning not covered by this warranty. There are no warranties expressed or implied other than what is specified herein.

Abusive treatment, neglect or improper use of the Curb Inlet Basket, High Capacity Curb Inlet Basket or Grate Inlet Skimmer Box will not be covered.

CONTACT INFORMATION

General Inquires

For additional information concerning installation, general usage, maintenance products, warranties or replacement parts please contact:

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Visit our website for in depth information on all of our products!