February 10, 2024

Mr. Leo Cosentini
California State Water Resources Control Board Division of Water Quality
P.O. Box 100
Sacramento, CA 95814-100

Re: REVISED: Application for Trash Treatment Control System – Enviropod® LittaTrap™ FC Full Capture System Grated Inlet, Enviropod® LittaTrap™ FC Full Capture System Curb Inlet, Enviropod® LittaTrap™ FC Full Capture System Combination Inlet, and Enviropod® LittaTrap™ FC Full Capture System Manhole Catch Basins Configuration (Application 27)

Dear Mr. Cosentini,

Enviropod is pleased to submit this revised application for the Enviropod® LittaTrap™ full capture device for four various catch basin installation types. Documentation for this revised application is being submitted in accordance with the California State Water Resources Control Board Trash Treatment Control Device Application Requirements document that includes the following minimum requisite sections:

- Cover Letter
- Table of Contents
- Physical Description
- Installation Information
- Operation and Maintenance Information
- Vector Control Accessibility
- Reliability Information
- Field/Lab Testing Information and Analysis

For the purposes of this revised application, each catch basin configuration is organized as follows:

- Configuration 1- Enviropod® LittaTrap™ FC Full Capture System Grated Inlet

- Configuration 2 - Enviropod® LittaTrapTM FC Full Capture System Manhole Catch Basin
- Configuration 3 - Enviropod® LittaTrapTM FC Full Capture System Combination Inlet
- Configuration 4A - Enviropod® LittaTrap™ FC, Curb Inlet High-Capacity
- Configuration 4B - Enviropod® LittaTrap^{TM} FC Curb Inlet Easy Manhole Maintenance Access (EMMA)

This revised application does not change the functionality of the previously certified system and therefore does not require a new application. This revised application includes the Easy Manhole Maintenance Access (EMMA) kit, stainless-steel basket, and stainless-steel flange options. The EMMA kit includes a conveyance trough that has undergone redesign and has been laboratory tested to address overtopping concerns recently recognized by the California Waterboard. The purpose of the stainless-steel products is to provide an option for clients who prefer that material. A minimum clearance requirement for compliance with trash full capture certification for curb/grate inlet configurations has also been added. The EMMA kit, stainless steel basket, stainless-steel flange option and minimum clearance requirements do not change the Enviropod$^{®}$ LittaTrap™ FC performance.

The revised section locations are summarized and attached as Appendix H.

Please contact Michael Hannah, Technical Director of Enviropod Inc. Limited, and the Stormwater360 Group if any additional information is required.

Regards,

Michael Hannah
Technical Director
Enviropod Inc.: A Stormwater360 Group Company

1.0 COVER LETTER

1.A: A general description of the Device

Enviropod International is a specialized stormwater catch basin technology company innovating since 1996. The Enviropod® LittaTrap™ FC was approved 10/14/2020. Since then, we have developed the Easy Manhole Maintenance Access (EMMA) kit to allow for the Enviropod® LittaTrap™ to be installed in an easily accessible location for maintenance, a stainless-steel basket, and a stainless-steel flange option for use with the LittaTrap™ FC on industrial or difficult sites.

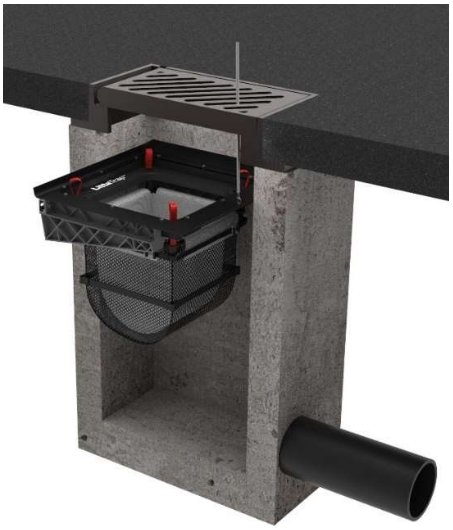
The Enviropod® LittaTrap™ is an innovative catch basin filter insert designed to be easily retrofitted into new and existing stormwater catch basins to capture trash. The Enviropod® LittaTrap™ can be installed in grated inlet, curb inlet, combination inlet, or manhole catch basins. Figure 1: Enviropod® LittaTrap™ example catch basin applications shows these types of installations. The Enviropod® LittaTrap™ maintains catch basin hydraulic capacity and allows for easy maintenance when completely full of trash and debris. The Enviropod® LittaTrap™ comes in a range of standard sizes, as well as custom, non-standard sizes that can be designed and manufactured upon request.

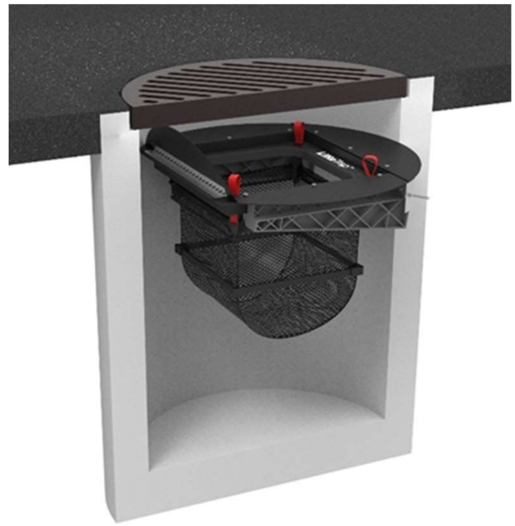
The Enviropod® LittaTrap™ FC is fitted with a mandatory 4.8 mm x 3.9mm liner screen that meets the requirements of the California Water Resources Control Boards Trash Provisions and is unchanged by this update.

The FC liner fits within the patented 4.9mm x 5.5mm screen Enviropod® LittaTrap™ batten basket. Battens provide structural integrity to each liner and prevent bulging allowing the basket and liner to be easily removed in times of maintenance. The basket design also allows use of a larger basket providing a higher surface area and storage volume than other non-battened “bag type” catch basin inserts. The batten basket also ensures a secondary flow path for bypass flows around the basket and liner. Confined space entry is not required to maintain the Enviropod® LittaTrap™ FC.

The Enviropod® LittaTrap™ FC stainless-steel option is made of 4.8mm 16 gage stainless steel with 51% open area, which meets the requirements of the California Water Resources Control Boards Trash Provisions. A stainless-steel flange option has also been added to the product line. The stainless-steel basket can be used and installed with any other LittaTrap™ component, such as the LittaTrap™ FC filter box and bracket, the stainless-steel flange and/or the EMMA kit. The location of updates pertaining to the Enviropod® LittaTrap™ FC stainless steel options can be found in Appendix H.

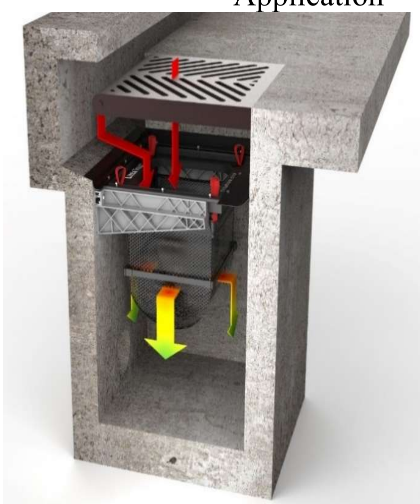
The Easy Manhole Maintenance Access (EMMA) kit does not change the Enviropod® LittaTrap™ liner or basket performance. The purpose of the EMMA kit is to convey





Configuration 1: Enviropod® LittaTrap™ Grate Inlet Catch Basin Application

Configuration 2: Enviropod® LittaTrap™ Manhole Catch Basin Application



Configuration 3: Enviropod® LittaTrap™ Combination Inlet Catch Basin Application

Configuration 4a: Enviropod® LittaTrap™ Curb Inlet Catch Basin High Cpacity Application

Configuration 4b: Enviropod® LittaTrap™ Curb Inlet Catch Basin EMMA Application

Figure 1: Enviropod® LittaTrap™ example catch basin applications.

water from a curb entry inlet to the Enviropod® LittaTrap™ FC when the product is installed directly under a manhole to enable maintenance from ground level without the need to enter the catch basin. The EMMA trough was redesigned to raise the height of the back wall from 6" to 8" to address concerns that trash may overtop the trough. Any existing EMMA installations will be retrofitted with the additional 2" 4.8mm steel screen. The width of the trough, from the catchbasin wall to the back wall of the trough remains as the original 10". The location of updates pertaining to the EMMA kit can be found in Appendix H.

The Enviropod® LittaTrap™ FC includes a hinged vector port seal (HVPS) when installed in a grated inlet or combination inlet catch basin. The HVPS allows visual inspection under the basket for access by Mosquito Vector Control Association of California (MVCAC) field personnel. The design of the HPVS has been approved by the MVCAC and is not altered by this update.

1.B: The devices owners and owners' representatives contact information

Device Owner
Enviropod International Ltd
7c Piermark Drive,
Rosedale,
Auckland 0632
New Zealand

Device Owners Authorized California representative:

William Harris
34428 Yucaipa Blvd., #E-344
Yucaipa, CA 92399
(909) 499-7298
willharrisjr@gmail.com

Device Owner Authorized Corporate Representative:

Mike Hannah
Technical Director
Enviropod International Ltd.
7c Piermark Drive,
Rosedale,
Auckland 0632
New Zealand
+64 21 422 398
Mike@enviropod.com

1.C: The devices' manufacturing location

The Enviropod® LittaTrap™ FC is manufactured by Enviropod International, a specialist stormwater management provider, which distributes its technology in New Zealand, Australia, Canada, and the USA. Enviropod International is part of the Stormwater360 group. https://www.stormwater360.com

The unique flat-pack, efficient, and flexible design allows the Enviropod® LittaTrap™ to be mass-produced, significantly reducing the delivery cost of the system while maintaining its hydraulic and structural properties. The Enviropod® LittaTrap™ is manufactured in Tijuana, Mexico, and warehoused in California for distribution throughout the United States.

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

The laboratory reports, as provided in APPENDIX D – Lab Testing Information, detail hydraulic testing of the Enviropod® LittaTrap™ FC liner and the Enviropod® LittaTrap™ FC 4.8mm 16-gauge stainless steel.

The hydraulic laboratory testing data has been used to develop empirical relationships between head loss and flow through the liners used in the Enviropod® LittaTrap™ FC.

Hydraulic analyses show that an empty Enviropod® LittaTrap™ FC for a 2ft x 2ft catch basin (LTFC6060) can convey 290.2 l/s (10.2 CFS) without bypass. Further analysis shows that the Enviropod® LittaTrap™ FC can convey 88.9l/sec (3.1 CFS) through the liner without bypass when the basket is 50% full. The stainless-steel basket option meets or exceeds these flow rates.

The bypass flow for an Enviropod® LittaTrap™ FC (2ft x 2ft) is at least 88.9 l/s (3.1 CFS) for all options when installed in accordance with the manufacturer's recommendation. An example of the hydraulic calculations is included in APPENDIX G – Example Hydraulic Calculations.

Enviropod® LittaTrap™ with standard basket (screen size 4.9mm – 5.5mm) and no liner has undergone full size laboratory trash capture testing. No formal "Full Capture" test protocol has been provided by the California State Water Board Trash Implementation Program. As such, a test protocol based on the Stormwater Equipment Manufacturers Association (SWEMA) and the California Department of Transportation (Caltrans) full capture testing was developed. The testing demonstrated 100% capture of particles 5 mm or larger in size and 99.6% total capture of solids at 15 l/sec for a unit of a 2ft x 2ft catch basin when 85% full. This information has been included to demonstrate the ability (as a whole) to intercept and capture trash 5mm and larger even without the required liner. It should be noted that this application is for the Enviropod® LittaTrap™ FC, which has a liner and therefore have a slightly reduced hydraulic conductivity than the Enviropod® LittaTrap™ with standard basket because of the smaller apertures in that liner.

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

The Enviropod® LittaTrap™ FC is a catch basin filter insert device with a full capture liner specifically designed to trap trash 5 mm or larger in size and meets the California State Water Resources Control Board Trash Provisions. Conformance with engineering plans, specifications, and manufacturer's recommendations is essential to the proper operation and function of this device.

The primary treatment mechanism employed by the Enviropod® LittaTrap™ FC to trap trash is the 4.7mm x 3.9mm FC liner in combination with the basket. Enviropod® LittaTrap™ FC is manufactured with a low head loss basket and comes with a bypass mechanism to meet peak flows entering the catch basin. Enviropod® LittaTrap™ FC has a range of sizes, and as a 4.8mm 16-gauge stainless steel basket. Each Enviropod® LittaTrap™ FC size has a design flow rate as well as a design bypass flow rate.

The Enviropod® LittaTrap™ basket is manufactured from durable plastics and has a life expectancy of a minimum of 20 years for all static parts. The basket system is specifically designed to be lightweight yet durable. The unique patented design of the basket allows hand maintenance when full, significantly lowering the operational cost of each model size. As the basket is frequently removed, it undergoes more stress and strain through this operation.

The design flow rate for trapping trash has been derived from the available head and head loss properties of the baskets and liners when the basket is 50% full. Treatment flow rate calculations assume that the maximum driving head is the top of the basket (bypass level). The maximum bypass flow rate has been calculated through orifice calculations assuming the maximum driving head is the surface level or the top of the grate.

Design treatment flow and peak flow are to be calculated by the consulting engineer in accordance with relevant local and regional stormwater guidance documents and should not exceed the Enviropod® LittaTrap™ FC model size design maximum capacity. Failure to do so can cause adverse hydraulic conditions. Additionally, non-conformance with the model size design limits may cause non-compliance with the water quality objectives and requirements.

Adherence to the manufacturer's installation guidance is essential for hydraulic and trash capture operation. The unique modular components allow the Enviropod® LittaTrap™ to be fitted into any catch basin curb entry, grate inlet, rectangular, and manhole catch basins. It is important that the Enviropod® LittaTrap™ FC is sized according to the catchment area and flows draining to the device using the local engineering guidance.

The Enviropod® LittaTrap™ FC is constructed from non-leaching and non-corroding materials and durable engineered plastics. All components are UV stable and designed to withstand temperatures between -20° C and 40° C.

Shallow catch basins less than 2ft from surface level may result in limited storage capacity and lower treatable flow rates. Shallow units may require custom baskets. Catch basins with less than 18 inches in depth to the invert of the outlet pipe may not be suitable for the installation of an Enviropod® LittaTrap™ FC.

All stormwater Best Management Practices require routine and scheduled inspection and maintenance. Inspection of the Enviropod® LittaTrap™ FC can be undertaken from the surface level. Maintenance can be performed with a vactor truck from the surface level for curb entry and grated inlet installations. Non confined space hand maintenance of grate inlet Enviropod® LittaTrap™ FC can be performed from the surface level.

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

There are hundreds of installations of an Enviropod® LittaTrap™ FC model currently in California in a variety of land uses including municipalities such as the City of Lincoln, the City of Colton and the City of Huntington Beach, and in a variety of private sites to help them achieve their trash full capture requirements.

City of Lincoln, Placer County, CA
Brian Smull, Lead Worker for Streets.
Email: brian.smull@lincolnca.gov phone: 916-581-9196

City of Colton, San Bernardino County, CA
Moises Peralta, Associate Engineer.
Email: mperalta@coltonca.gov phone: 909-370-5194

City of Huntington Beach, Orange County, CA
Jim Merid, Environmental Services Manager, Public Works
Email: jmerid@surfcity-hb.org phone: 714-374-1548

Please contact the project manager and EnviroPod California representative, Will Harris, for more information or to organize a site visit.

1.G: The certification below

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons that manage the system or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Mike Hannah
Technical Director
Enviropod International Ltd
Device Owner Authorized Corporate Representative: Date: 17/10/2024

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2.0 TABLE OF CONTENTS

3.0 PHYSICAL DESCRIPTION

3.A: Trash Capture

In a storm event, stormwater runoff flows enter a catch basin through a grate inlet, curb inlet, combination inlet or manhole type application. The catch basins must be existing or manufactured and installed by the purchaser. The downward flow is intercepted and captured by the Enviropod® LittaTrap™ FC for these catch basin applications. Once flow enters the Enviropod® LittaTrap™ FC the Enviropod® LittaTrap™ seals and basket collar direct the flow over the bypass slots and into the basket and liner. The seals are adjustable to ensure all particles 5 mm or larger are diverted into the basket and liner without "short-circuiting" or causing bypass.

- In an Enviropod® LittaTrap EMMA kit installation, rainfall runoff enters through the curb inlet into the fiberglass trough with stainless-steel screen extension, which then diverts trash and flows to the Enviropod® LittaTrap basket installed directly under the manhole.

The filter box sits on a support bracket that cantilevers off a single wall of the catch basin. The support bracket is located approximately 8 inches below the surface level creating a driving head to increase the maximum bypass flow rate without causing surface ponding. The support bracket has been structurally designed using Finite Element Analysis to take the load of the basket full of sediment, which is heavier than a combination of trash, vegetation and sediment, while the peak bypass flow is conveyed into the catch basin.

The unique patented Enviropod® LittaTrap™ FC has a mandatory 4.8mm x 3.9mm liner that meets the requirement of the California Trash Treatment Control Device Certification. The FC liner fits within a basket manufactured from a lightweight, durable marine-grade plastic netting with an opening size of 4.9 – 5.5 mm and a high percentage of open area to reduce head loss across the screen. The specifications and photos of the liner are provided in APPENDIX E – LittaTrap FC Liner Photos and Specifications. The LittaTrap™ FC basket incorporates a structural batten that has three functions:

1. Constrains the basket preventing the expansion or "bulging" so the basket can be easily removed when full of material;
2. Maintains a secondary flow path around the basket for bypass flows; and
3. Maximizes the screen area and material storage volume of the basket.

The stainless-steel basket option does not comprise a liner or structural battens given the inherent rigidity and an aperture size of 4.8mm.

3.B: Peak Flows / Trash Volumes

The Enviropod® LittaTrap™ FC comes in various model sizes. Figure 1: Enviropod® LittaTrap™ example catch basin applications details possible configurations of the Enviropod® LittaTrap™ FC. The treatable flow rates for each model size are calculated from the head loss across the liner and/or basket, the available surface area, and the available head in the basket. Treatment flow rate calculations assume that the maximum driving head is at the top of the basket (bypass level). The maximum bypass flow rate has been calculated through orifice calculations assuming the maximum driving head is the height of surface level or the top of the grate.

Laboratory testing information is provided in APPENDIX D – Lab Testing Information. An example set of calculations is provided in APPENDIX G – Example Hydraulic Calculations Figure 2, Figure 3 and Figure 4 show the Enviropod® LittaTrap™ FC components, operational flow paths, and the bypass mechanism flow path when the basket is full. Figure 5 though to Figure 9 provide further images of the possible configurations for clarity.

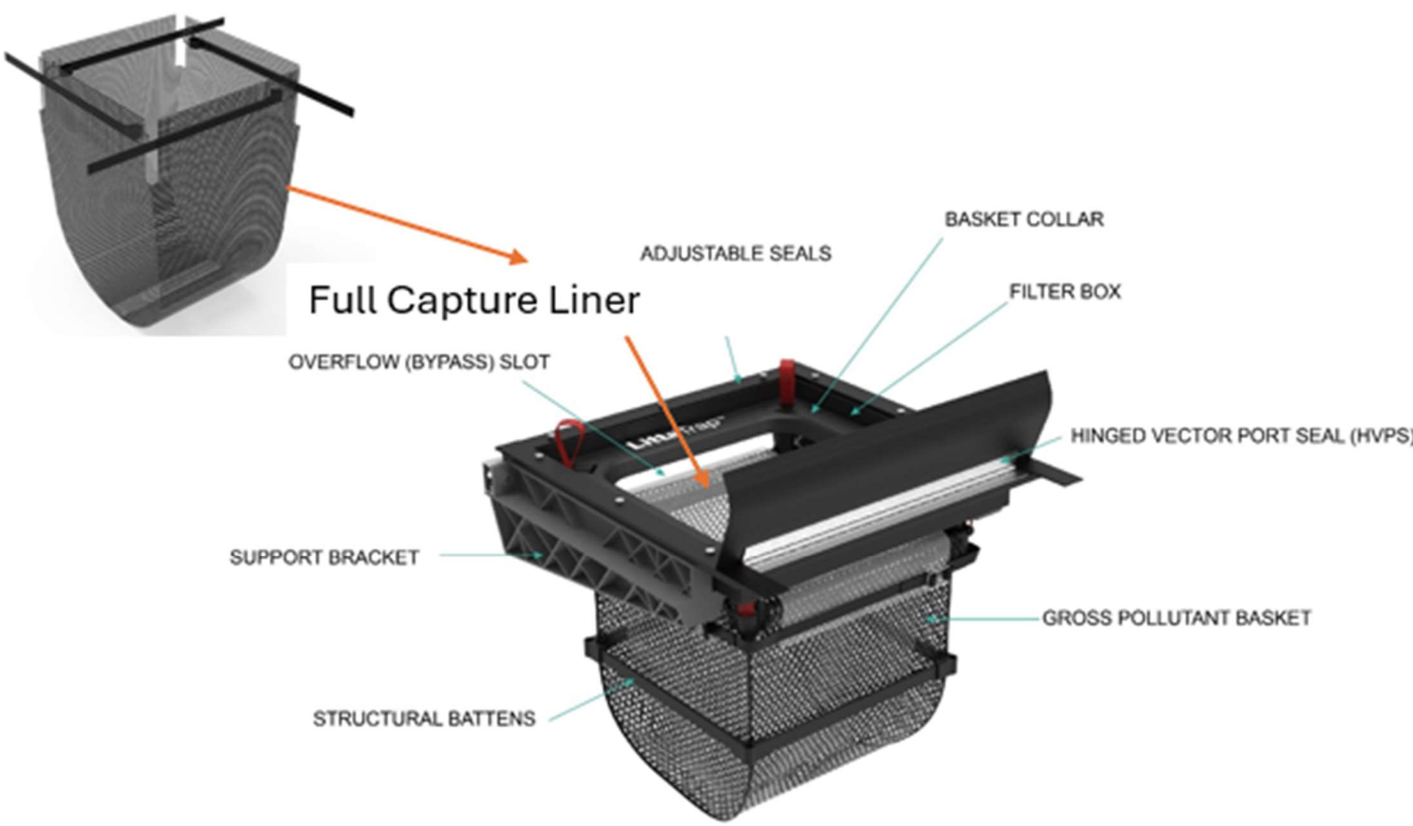


Figure 2: Enviropod® LittaTrap™ FC (all configurations) with HVPS Components. Note the mandatory 4.8 X 3.9mm full capture liner to be positioned within the gross pollutant basket

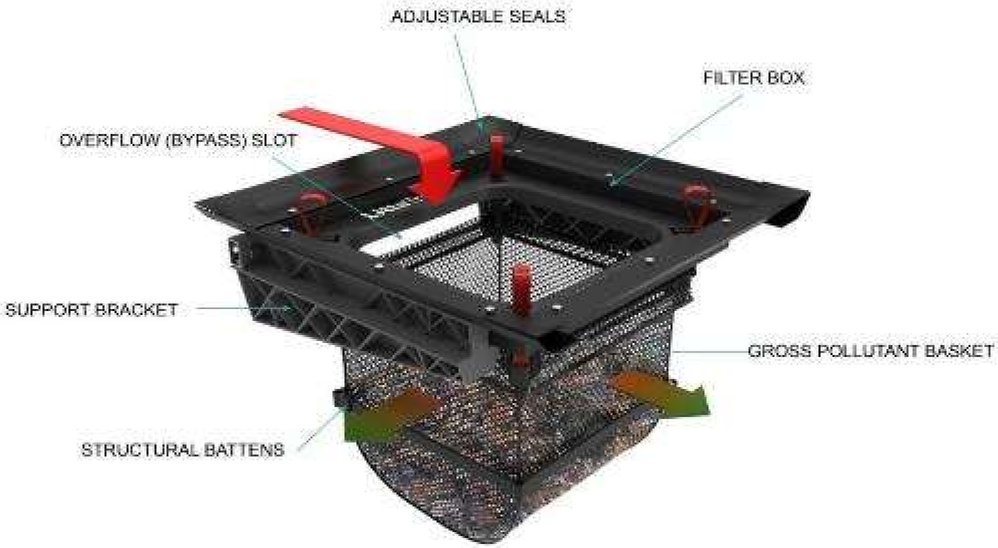


Figure 3: Enviropod® LittaTrap™ FC (all configurations) Operation (4.8 X 3.9mm liner within the gross pollutant basket not shown)

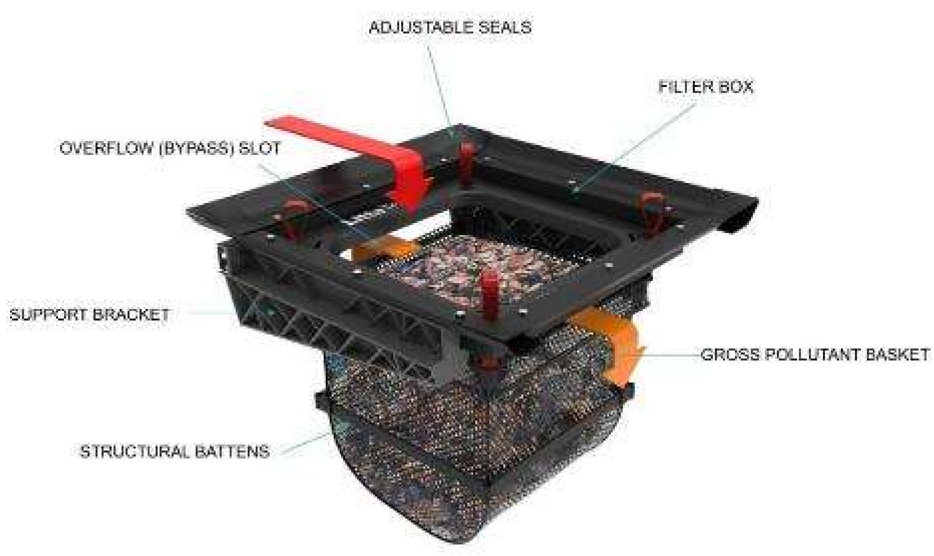
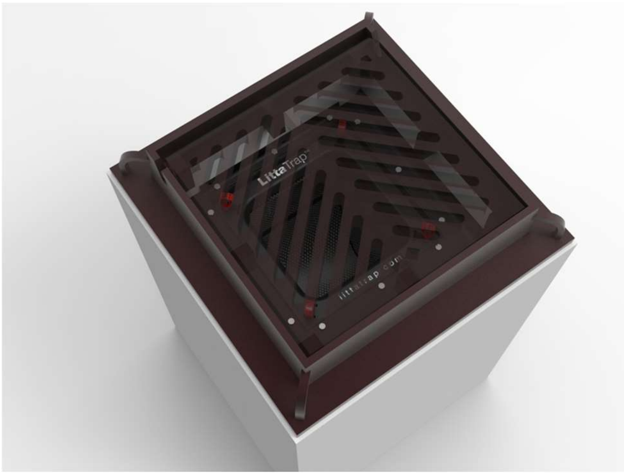


Figure 4: Enviropod® LittaTrap™ FC (all configurations) Bypass Operation (4.8 X 3.9mm liner within the gross pollutant basket not shown)

Configuration 1: Enviropod® LittaTrap™ FC, Grated Inlet Catchbasin Configuration



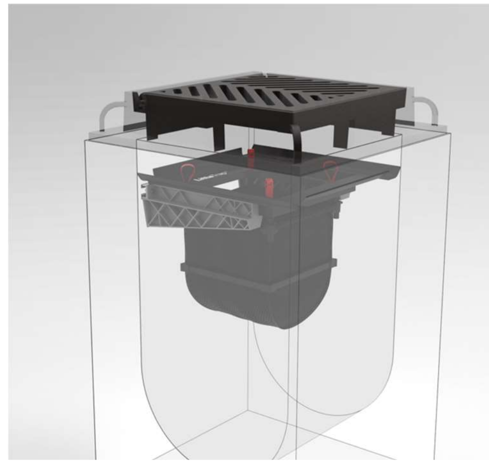


Figure 5 Enviropod® LittaTrap™ FC, grated inlet configuration top view (left) and isometric view in catchbasin (right)

Configuration 2: Enviropod® LittaTrap™ FC, Manhole Catchbasin Configuration

Figure 6 Illustration of the Enviropod® LittaTrap™ FC Manhole configuration.

Configuration 3: Enviropod® LittaTrap™ FC, Combination Inlet Catchbasin Configuration

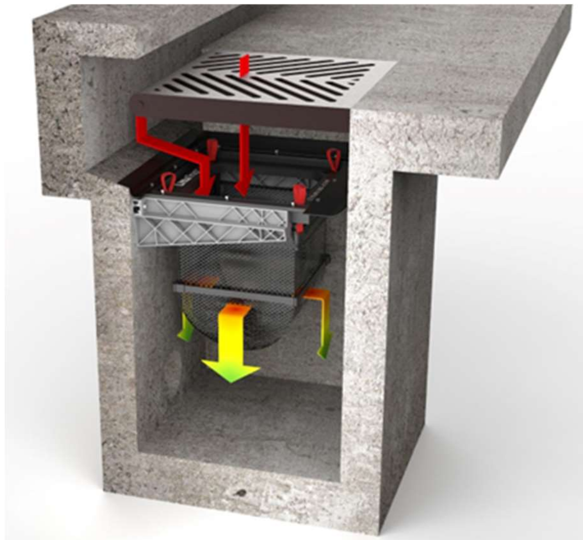


Figure 7 Illustration of the Enviropod® LittaTrap™ FC combination inlet configuration where both a curb entry and grated inlet are present.

Configuration 4a: Enviropod® LittaTrap™ FC, Curb Inlet: High-Capacity Configuration

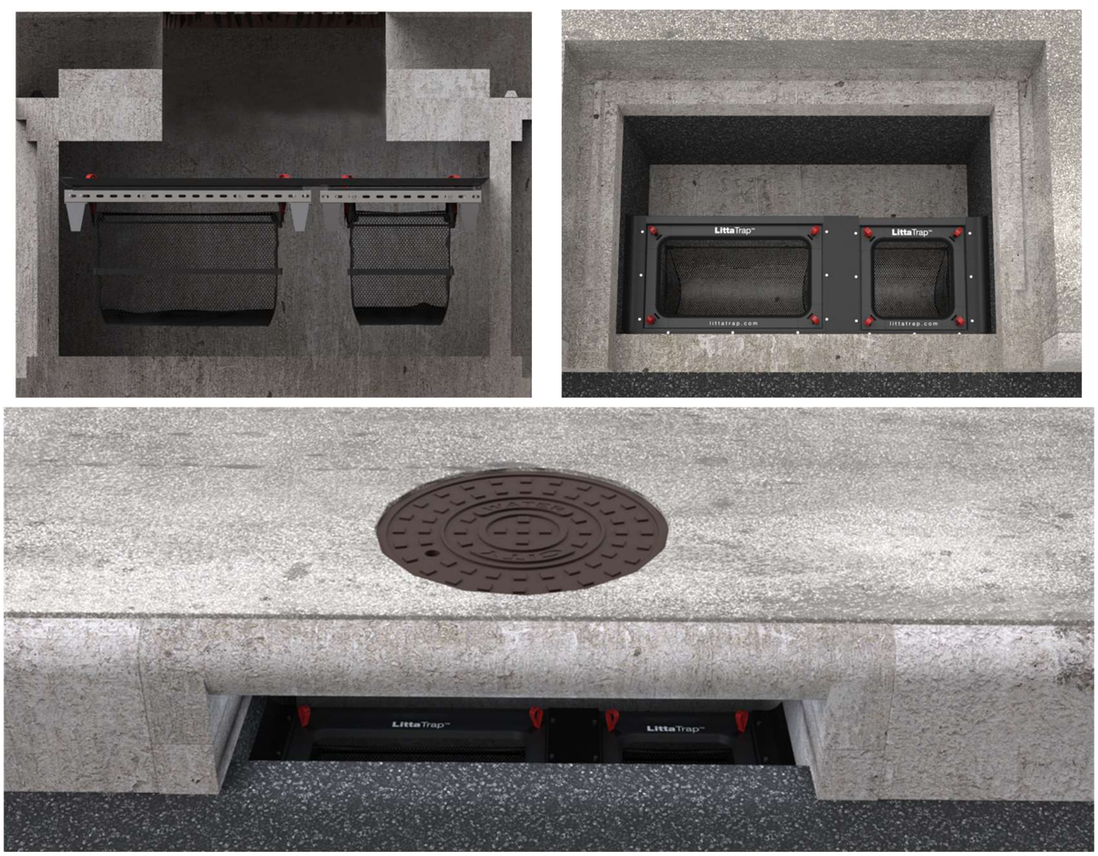


Figure 8 Enviropod® LittaTrap™ FC, Curb Inlet High-Capacity Configuration. Side view in catchbasin (top left) top view in catchbasin (top right) and street view looking into the curb inlet of a catchbasin (bottom). Note there are multiple LittaTrap™FC in this configuration, whereas the EMMA configuration only has one.

Configuration 4b: Enviropod® LittaTrap™ FC, Curb Inlet: EMMA Configuration

Figure 9 Enviropod® LittaTrap™ FC, Curb Inlet EMMA Configuration. Isometric view in catchbasin (top left) top view in catchbasin (top right) and street view looking into the curb inlet of a catchbasin (bottom). Noth this configuration has one LittaTrap™ FC which receives flow via a feeder trough whereas the high-capacity configuration has multiple LittaTrap™ FC for the length of the inlet.

Grate Inlet (Configuration 1), Manhole (Configuration 2), and Combination Inlet Catchbasin (Configuration 3): Selection, Configuration, and Operation

For grate inlet (Configuration 1) (Figure 5), manhole (Configuration 2) (Figure 6) and combination inlet (Configuration 3) (Figure 7) catchbasins the appropriate Enviropod® LittaTrap™ FC size is selected from the dimensions of the catch basin and catch basin grate. Table 1 details the maximum and minimum dimensions for the filter box and basket. The designer must ensure the filter box fit the sides of the catch basin, and the basket can fit through the clear opening of the grate. Seal extensions are available for irregular catch basins and manhole catch basins. Required flow rates are calculated by the design engineer in accordance with the trash control permit provisions.

Enviropod® LittaTrap™ FC Size	Nominal Catch Basin Size inch	Bracket Width Inch	Min Filter Box Size (without seals)		Max Filter Box Size (With Seals)		Basket Collar Size		Basket
			Length Inch	Width Inch	Length Inch	Width Inch	Length Inch	Width Inch	Depth Inch
LT4545	18 x 18	17.1	15.4	15.4	20.6	20.6	12.0	12.0	15.7
LT6060	24 x24	22.4	20.2	20.2	25.3	25.3	17.3	17.3	15.7
LT9060	36 x 24	34.3	32.0	17.6	37.1	22.7	29.1	17.3	15.7

Table 1: Standard Enviropod LittaTrap Model Dimensions.

Please note for a 36" x 18" catch basin 2 x LTFC4545 Enviropod® LittaTrap™ (18" x 18") are used. Likewise, for a 48" x 48" catch basin 2 x LTFC9060 are used. For a 36" x 36" catch basin a LTFC9060 is used with a seal extension kit. For 36" x 36" catch basins requiring additional storage or flow rates a double basket flange option is available. Additional nonstandard sizes are available on request.

High Capacity Curb Inlet (Configuration 4a) Filter Selection, Configuration, and Operation

An Enviropod® LittaTrap™ FC High Capacity configuration (Configuration 4a) (Figure 8) can be used for curb entry catchbasins. For curb entry catch basins with an Enviropod® LittaTrap™ FC High Capacity kit installed the operation is the same as a grated inlet (Configuration 1). Multiple Enviropod® LittaTrap™ FCs are selected to fit the entire length of the curb opening to ensure all flow is intercepted.

In the example below (Figure 10, Figure 11, Figure 12) a 72-inch curb inlet, catch basin is fitted with two Enviropod® LittaTrap™; 1 x LTFC9060 and 1 x LTFC6060. The cantilever support brackets are installed in series along the curb opening wall, positioning the filter box below the inlet. The positioning of the inlet allows unrestricted flow in bypass conditions. In curb inlets an additional bypass provision is provided by allowing flow to pass over the back of the filter box.

The seal extension kits are available from Enviropod for irregular-sized catch basins. The design flow rate is calculated by adding the design flow rate for each Enviropod® LittaTrap™ FC used in the curb entry design. The maximum storage capacity is calculated by adding the storage capacity for each unit used in the curb entry design. Hydraulic and storage capacities for standard sizes are listed in Section 3.C and in Section 3.D.

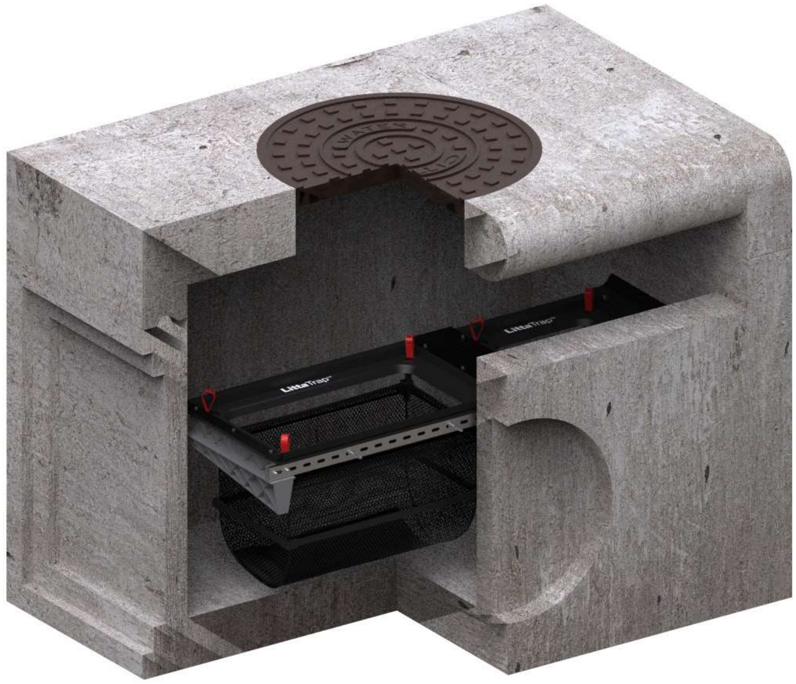


Figure 10: Curb Inlet Catch basin fitted with Enviropod® LittaTrap™ FC (Configuration 4a)

Figure 11: Installation of LTFC9060 Enviropod®LittaTrap FC and bracket for LTFC6060 in a Curb Entry Catch basin (Configuration 4a)

Figure 12: Plan view of an Enviropod® LittaTrap™ LTFC9060 and LTFC6060 installed on 72-inch curb entry catch basin Configuration 4a

Easy Manhole Maintenance Access (EMMA) (Configuration 4b) Curb Inlet Filter Selection, Configuration, and Operation

An Enviropod® LittaTrap™ EMMA (Configuration 4b) (Figure 9) can also be used in curb entry catch basins for easier maintenance of curb entry catch basins. When water and trash flow through the curb inlet it is intercepted by a trough, which conveys the flows to an Enviropod® LittaTrap™ installed directly below the manhole opening in the catch basin. Figure 13 shows the components required for a typical EMMA installation.

An example 84-inch curb inlet in Figure 14 shows the catch basin is fitted with a trough consisting of 2x trough endpieces and 2x fibreglass trough sections connected by a joiner. A video showing an example installation, rainfall runoff event, and maintenance is available here. The EMMA trough is now also fitted with a 2” stainless steel screen extension on the back wall to ensure trash full capture requirements are met See Appendix D for the laboratory testing report.

The seal extension kits are available from Enviropod for irregular-sized catch basins. The design flow rate is calculated by adding the design flow rate for each Enviropod® LittaTrap™ FC used in the curb entry design. The maximum storage capacity is calculated by adding the storage capacity for each unit used in the curb entry design. Hydraulic and storage capacities for standard sizes in each model are listed in the following sections.

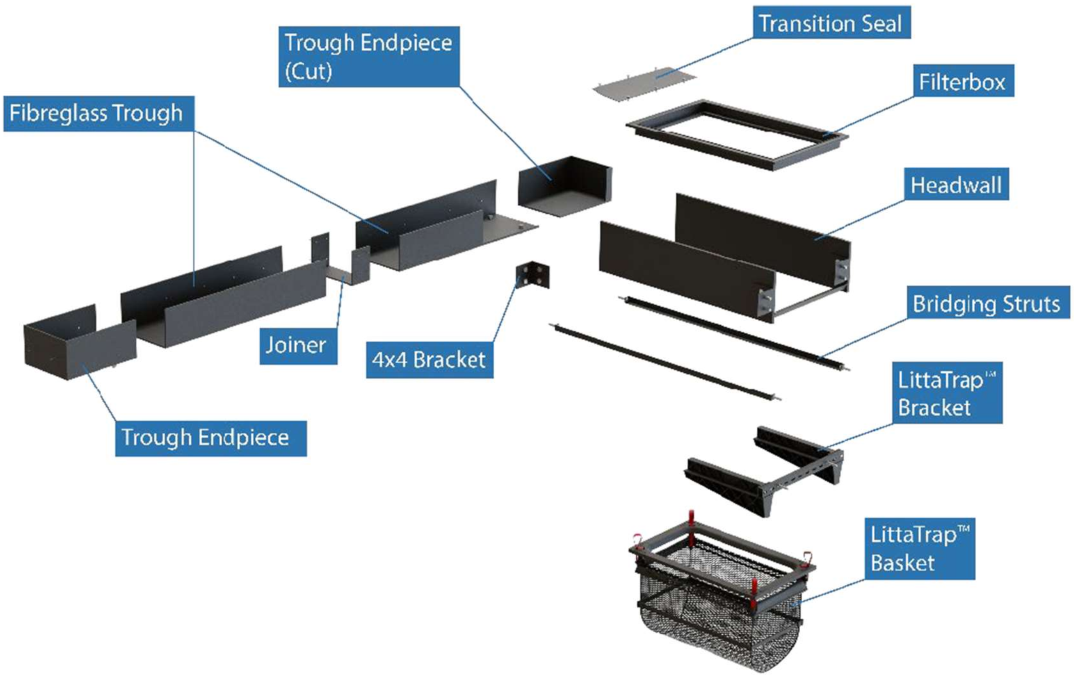


Figure 13 Diagram showing all components of the Enviropod® LittaTrap™ EMMA system (Configuration 4b)

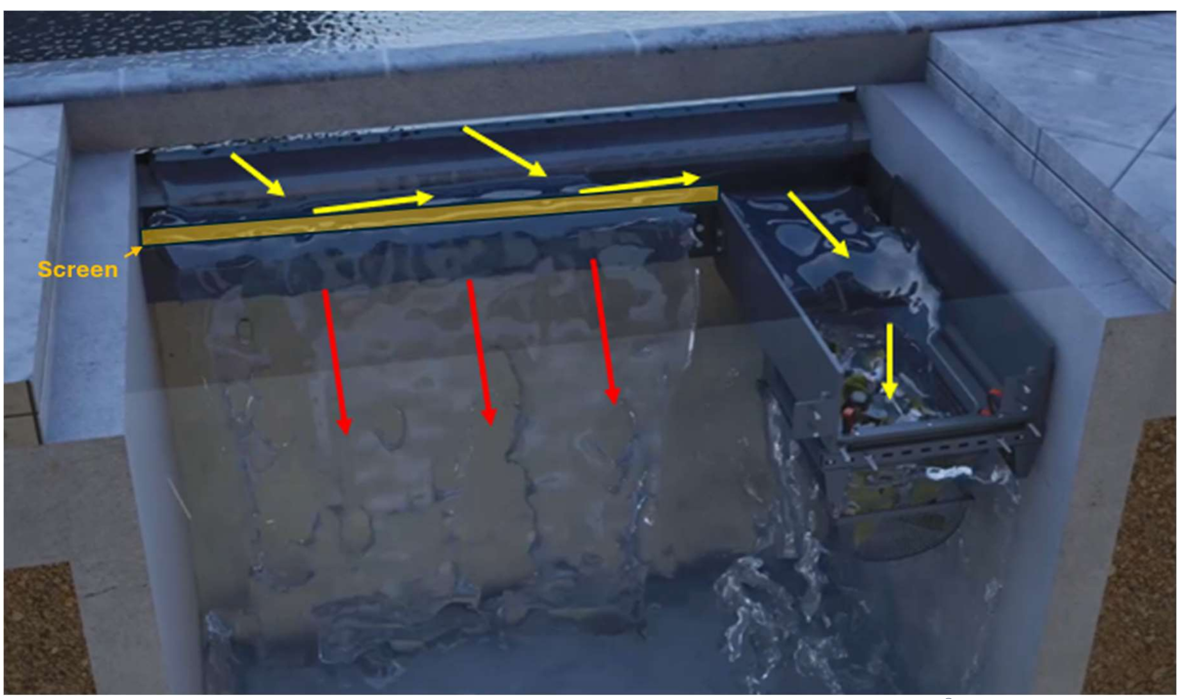


Figure 14 Illustration of the .Configuration 4b EMMA trough conveying flow to the Enviropod® LittaTrap™ basket. The curb inlet and EMMA trough flow regular flow is shown in yellow, the EMMA trough bypass flow is shown in red, the location of the screen extension is shown in orange

3.C: Hydraulic Capacity

Hydraulic and storage capacities for standard model sizes are listed in tables as follows:

- Table 2: Enviropod® LittaTrap™ Storage Capacity (all configurations)
- Table 3: Enviropod® LittaTrap™ FC Hydraulic Capacity (all configurations)
- Table 4: Enviropod® LittaTrap™ EMMA (Configuration 4b only) Kit Hydraulic Capacity. Basket flow rates and capture volumes are the same as for the baskets in Table 2 and Table 3.

The treatable flow rates for each size are calculated from the head loss across the basket materials and available screen area, and the available head in the basket. Treatment flow rate calculations assume that the maximum driving head is at the top of the basket (bypass level). Treatment flow calculations assume zero flow through the base of the basket. The maximum bypass flow rate has been calculated through orifice calculations assuming the maximum driving head is the surface level or the top of the grate. Laboratory testing information is provided in APPENDIX G – Example Hydraulic Calculations. The hydraulic capacity of the stainless-steel basket option meets or exceeds those listed in Section 3.D.

3.D: Comparison Tables

Basin Size Inches	Enviropod ® LittaTrap™ FC Size	Screen Area in^2	Maximum Trash Capture Volume (MTCV) ft^3
18 x 18	LTFC4545	601	0.7
24 x24	LTFC6060	969	1.6
36 x 18	2 x LTFC4545*	1203	1.4
36 x 24	LTFC9060	1473	3.0
36 x 36	LTFC9060 + Seal Extension Kit.	1473	3.0
48 x 48	2 x LTFC9060 + Seal kit	2946	6.0

Table 2: Enviropod® LittaTrap™ Storage Capacity (all configurations)

Basin Size	Enviropod® LittaTrap™ FC Size	Flow Rate 0% MTCV CFS	Flow Rate 25% MTCV CFS	Design Flow Rate 50% MTCV CFS	Flow Rate 75% MTCV CFS	Standard Bypass Flow* CFS
18 x 18	LTFC4545	8.2	5.2	2.1	0.4	2.1
24 x24	LTFC6060	13.0	7.7	3.2	0.7	3.3
36 x 18	2 x LTFC4545	16.5	10.4	4.2	0.9	4.2
36 x 24	LTFC9060	20.2	11.3	4.8	1.1	4.5
36 x 36	LTFC9060 + Seal Extension Kit	20.2	11.3	4.8	1.1	4.5
48 x 48	2 x LTFC9060	40.4	22.6	9.6	2.2	9.0

Table 3: Enviropod® LittaTrap™ FC Hydraulic Capacity (all configurations)

Enviropod® LittaTrap™ EMMA Kit Name	Enviropod LittaTrap Unit	Flow Rate 25% MTCV CFS	Design Flow Rate 50% MTCV CFS	Flow Rate 75% MTCV CFS	Standard Bypass Flow* CFS
Fiberglass EMMA Kit – LT6060	LT9060	7.7	2.1	0.4	2.1
Fiberglass EMMA Kit – LT9060	LT9060	11.3	4.8	1.1	4.5

Table 4: Enviropod® LittaTrap™ EMMA (Configuration 4b only) Kit Hydraulic Capacity. Basket flow rates and capture volumes are the same as for the baskets in Table 2 and Table 3

* Flow rates listed are for a factory set bypass. Please contact Enviropod for specific bypass requirements.

3.E: Design drawings

Generic design drawings for all standard Enviropod® LittaTrap™ FC sizes, including dimensions and the stainless-steel basket option, are included in APPENDIX A – Generic Drawings.

The Enviropod® LittaTrap™ FC has adjustable elements to fit most sizes, styles, and models of catch basins. Seal extension and manhole adaptor kits are available for nonstandard or manhole catch basins.

3.F: Alternative Components

The Enviropod® LittaTrap™ FC has the following components depending upon configuration type:

Seal extension kits: For irregular sized catch basins (all configurations).

Seal extension kits can be cut to size for any configuration to ensure no trash falls through. Example illustrations and images are provided in Figure 15 and Figure 16 and further information is provided in Section 4.B.

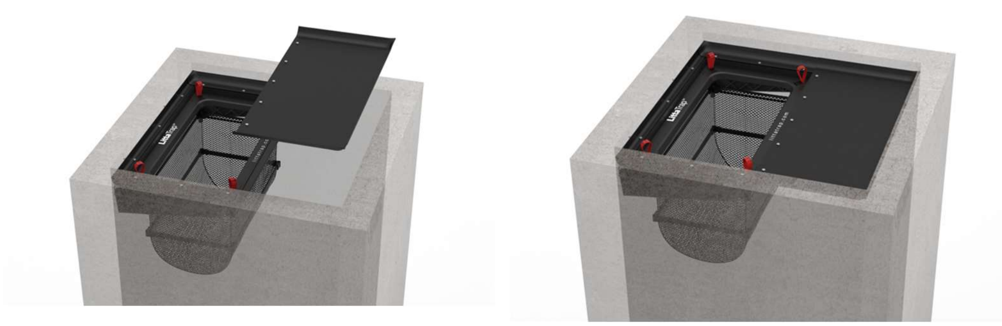


Figure 15 An illustration to demonstrate how a seal extension can be used with an Enviropod® LittaTrap™FC

Figure 16 Photos of seal kits surrounding Enviropod® LittaTrap™FC

<u>Manhole adaptor kit: Mandatory for manhole catch basins (Configuration 2)</u>

Manhole adaptor kits use a bracket and seal to mount the Enviropod® LittaTrap™FC in manhole catchbasins. An example is provided in Figure 17 and further information is provided in Section 4.B.

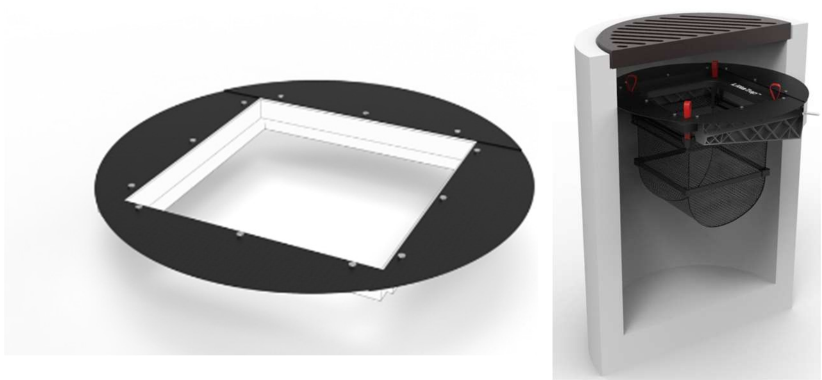


Figure 17 Enviropod® LittaTrap™FC mandatory manhole adaptor kit (left) and example install (right)

<u>Hinged Vector Port Seal (HVPS): Mandatory for grated inlets (Configuration 1, 2 and 3)</u>

HVPS are mandatory for any grate inlet configuration: grate inlet, combination inlet and manhole to provide access to potential standing water (Figure 18). Curb entry catchbasins can be inspected via the manhole. Further information is provided in Section 6.0: Vector Control Accessibility.

Figure 18 Hinged vector port seal example. For grated inlets (configurations 1, 2 and 3)

Stainless steel basket

EnviroPod® LittaTrap™ FC is available as a stainless-steel basket for clients that prefer that material. The stainless-steel basket can be used in conjunction with any other LittaTrap™ FC configuration. Figure 19 shows an example of a stainless-steel basket being used in conjunction with an EnviroPod® LittaTrap™ FC seal kit as in a grated inlet (Configuration 1). More information on the stainless-steel basket is included in Section 4.B.

Figure 19 EnviroPod® LittaTrap™ FC stainless steel basket installation (Configuration 1)

Stainless Steel Flanges

Stainless steel flanges are required for catch basins without a suitable wall to anchor the Enviropod® LittaTrap™ bracket. The stainless flange can be used with the stainless steel basket or original LittaTrap™ FC as shown in Figure 20.

Figure 20 Enviropod® LittaTrap™ FC grated inlet (Configuration 1) installed with a stainless-steel flange (left) and a stainless steel basket being installed on a stainless-steel flange (right).

These components have no impact on the overall performance of the system and meeting the California Water Resources Control Board Trash Provisions. If customized components are needed that alter the performance (i.e., hydraulic capacity) of the systems, a revised application will be submitted prior to any installations of the affected systems.

3.G: Internal Bypass

The internal bypass is shown in Figure 4: Enviropod® LittaTrap™ FC (all configurations) Bypass Operation . In a storm event, the flow enters the catch basin through a grate, curb inlet, or both. The downward flow is intercepted by the Enviropod® LittaTrap™ FC. Once flow enters the Enviropod® LittaTrap™ FC, the seals and basket collar direct the flow over the bypass slots into the liner and basket. Inflow cannot directly pass through the bypass slots as it is initially directed into the basket. As flow enters the FC basket, it builds up a driving head to push the flow through the clear (unobstructed) area of the Enviropod® LittaTrap™ basket. As material is trapped, it is stored in the base of the basket. As more material is captured, less unobstructed surface area of the basket is available to pass the flow.

The system is designed to allow the design flow to pass through the basket when it is half full. If flows greater than the design storm enters the system when the basket is half full, the driving head will rise to the bypass height, pushing additional flow through the bypass slots and into the catch basin as shown in Figure 3 and Figure 4.

For curb entry systems, the Enviropod® LittaTrap™ is located below the inlet to the catch basin allowing bypass over the back of the filter box as well as the bypass slots giving the system additional bypass capacity. The EMMA kit is designed so that the trough bypasses prior to the basket, further preventing the possibility of litter resuspension.

3.H: Previously Trapped Trash

The Enviropod® LittaTrap™ FC has been designed to trap and retain all trash and debris larger than 5mm that enters. Conditions under which the Enviropod® LittaTrap™ FC may re-introduce previously trapped trash are listed below:

- If the Enviropod® LittaTrap™ FC is not properly maintained and trash and debris can accumulate beyond the prescribed maximum allowed; and/or
- A damaged gross pollutant basket or liner may allow the loss of trapped material.

3.I: Calibration Feature

The Enviropod® LittaTrap™ does not have a calibration feature.

3.J: Photos Installation

All EnviroPod LittaTrap FC baskets are installed on a Unistrut and bracket as shown in Figure 24 unless a stainless steel flange is used, as shown in Figure 26, Figure 27, and Figure 28.

Photos of the installation process for grated, manhole and combination inlets (Configurations 1, 2, 3), high capacity curb inlet (Configuration 4a) and the basket component of the curb inlet EMMA (Configuration 4b) are provided in Figure 21and Figure 22. Installation photos of the trough component of the EMMA curb inlet (Configuration 4b) are provided in Figure 25. Post-installation photos are included in the case studies in the appendices.

Figure 21: Installation Process Part 1 (all configurations)

Figure 22: Installation Process Part 2 (all configurations)

Figure 23: Post Installation Operation

Figure 24: Example of Post Installation and Maintenance (all configurations)

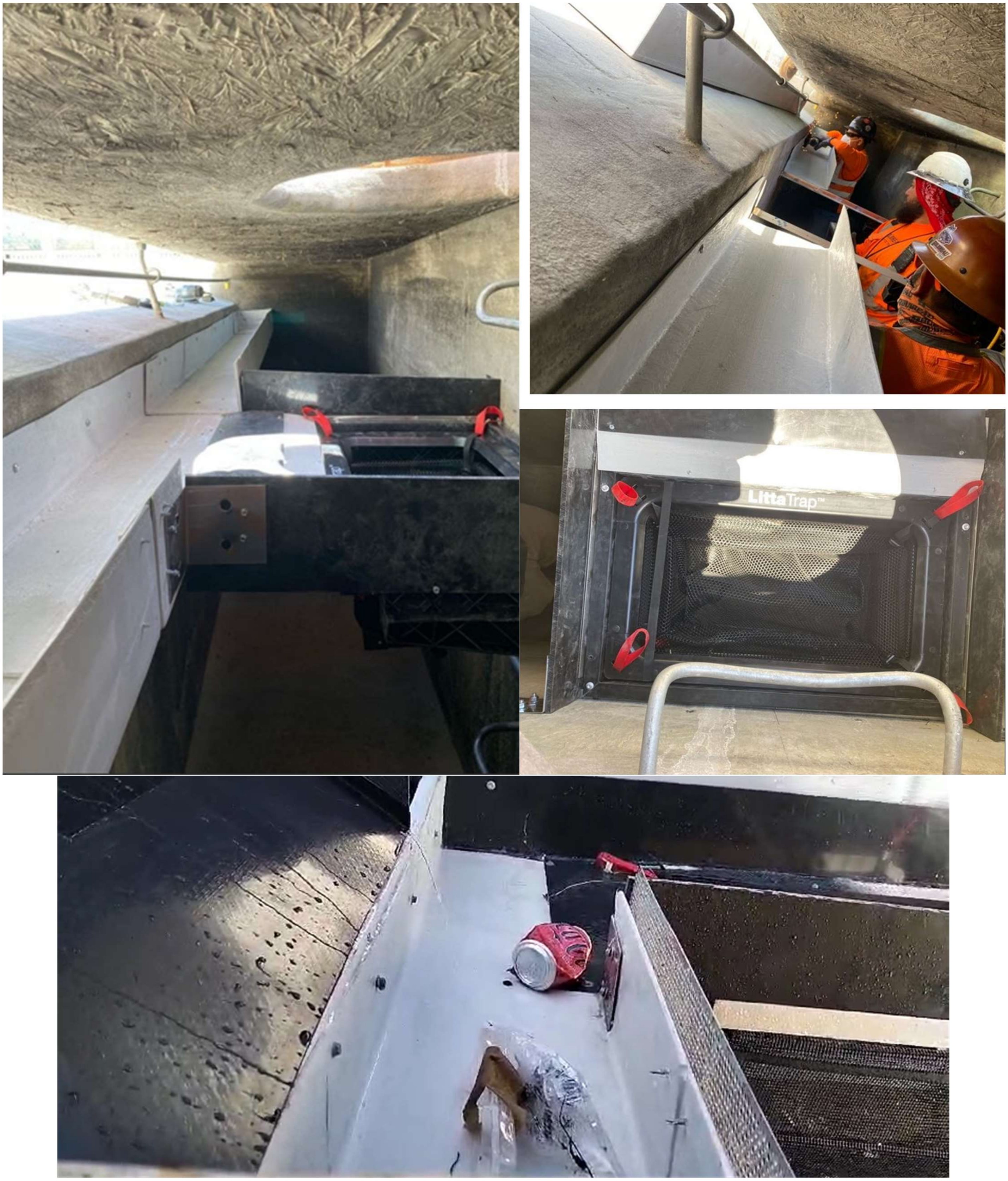


Figure 25: Top three: Examples of EMMA Kit Installations (Configuration 4b – trough component). Bottom: Example of stainless-steel screen for 2" backwall extension during laboratory testing.

3.K: Material Types

Table 5 below lists all materials used in the Enviropod® LittaTrap™ FC and Table 6 lists additional components and materials for the EMMA kit. All materials are UV stabilized and have been designed and tested to take the loads encountered in a catch basin.

Enviropod® LittaTrap™ Components	Material
Basket Mesh	Polyethylene
Basket Strapping	Polyethylene
Labels	Nylon
Strap	Polyester
Batten and Basket Corners	Nylon PA6 + Glass Fiber
Overflow Spacer	Polyethylene
Top Batten	Glass Fiber Pultrusion Rod
Basket Collar (frame)	PVC
Filter Box	PVC
Seals	HDPE + LDPE
Hinged Vector Port Seal	HDPE + Nitrile Rubber
Filter Box Screws	Galvanized Steel
Support Bracket Unistrut	Galvanized Steel
Support Bracket Unistrut Nut and bolt	Galvanized Steel
Support Bracket Mounting Arm	Nylon PA66 + Glass Fiber
Anchor Bolts	Galvanized Steel
Full Capture Liner (LittaTrap™ FC)	Polyester + PVC

Table 5: Enviropod® LittaTrap™ FC components and materials (all configurations)

Additional EMMA Components	Material
Trough	Fiberglass
End Piece	Fiberglass
Joiner	Fiberglass
4x4 Bracket	304 Stainless Steel
Bridging Struts	304 Stainless Steel
Headwall	HDPE
2" Backwall Screen extension	16 gauge 4.8mm Stainless Steel

Table 6: Enviropod® LittaTrap™ FC additional EMMA components and materials (configuration 4b only)

3.L: Design Life

The Enviropod® LittaTrap™ Filter box and support bracket components have a minimum 20-year life expectancy. The gross pollutant basket has a 5-year life expectancy. The system comes with an 8-year limited warranty on static parts. Replacement parts are available from Enviropod. The design life is dependent on the correct operation in accordance with the manufacturer's recommendations.

4.0 INSTALLATION GUIDANCE.

4.A: Standard device installation procedures including calibration instructions

A detailed installation manual for the Enviropod® LittaTrap™FC is attached in APPENDIX B – Installation Manuals. An installation video is at the following link.
https://www.enviropod.com/products/littatrap?gclid=CjwKCAjwmZbpBRAGEiwADrmVXt#Installation

Enviropod® LittaTrap™ FC liner is easy to install, as shown in APPENDIX B – Installation Manuals and the following videos:
Animation: https://www.youtube.com/watch?v=WcxcOomggyc
Live video: https://www.youtube.com/watch?v=uZZCHet761w&t=56s

The EMMA Kit is installed to allow the Enviropod® LittaTrap™ to be installed directly under a manhole and enable easy maintenance access. The following videos show the EMMA Kit installation process, which remains the same for the updated EMMA design:
Animation: https://www.youtube.com/watch?v=tjpXfThZrhg
Live video: https://www.youtube.com/watch?v=4m5nvMSGTlc

The Standard Operation Procedure (SOP) with installation details for the EMMA Kit is included in APPENDIX B – Installation Manuals.

4.B: Description of device installation limitations and/or non-standard device installation procedures

Installation
The Enviropod® LittaTrap™ FC has the following optional components. These optional components address specific installation challenges as detailed in the bullet points below:

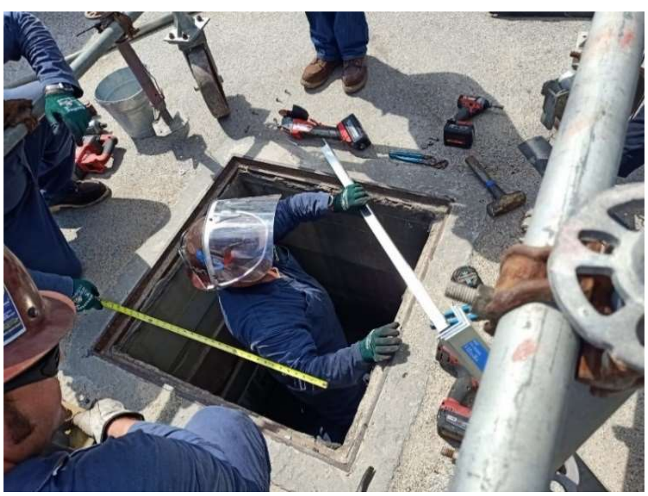
- Seal extension kits: For irregular sized catch basins.
    - Seals need to be cut to size during the installation, which is generally required for any installation.

- Please see step three of the installation guide: https://assets.website-files.com/5962ed9df8a926414007078c/5be4e914ba8c6df23e047248_LittaTrap%20Installation%20Manual%20LT%20MR.pdf

- Manhole adaptor kit: For manhole catch basins.
  - Please see the installation guide https://assets.website-files.com/5962ed9df8a926414007078c/602336a4d06a986c928d33cf_Manhole%20Installation%20Guide.PDF

- Hinge Vector Port control access port seal kit: For grated inlets.
  - Please see step five of the installation guide https://assets.website-files.com/5962ed9df8a926414007078c/5f6ac9c8a22b471c514be21f_EP%20LT%20Install%20Manual%20Full%20Capture%20v1%20LR.pdf

- Stainless Steel Flanges: Option for industrial sites and catch basins without a suitable wall to anchor the Enviropod® LittaTrap™ bracket to.
  - Stainless steel flanges are designed on a case-by-case basis and supplied with specific installation instructions based on that design. An example of a stainless-steel flange installation is provided in Figure 26.Stainless Steel Basket: Option for clients who prefer a stainless-steel basket. Install is the same as for a standard Enviropod® LittaTrap™ and can be installed with the stainless steel flange if preferred
  - An example of a stainless-steel basket installation is provided in Figure 27 and Figure 28, below Figure 26.



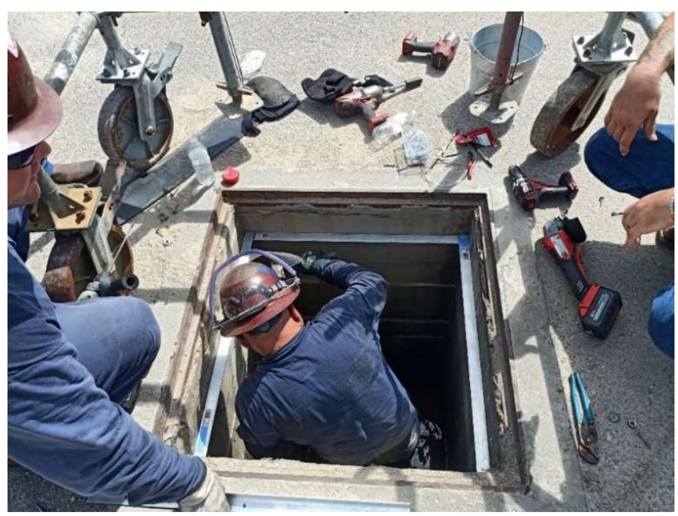


Figure 26 Example of a stainless-steel flange installation on a grate inlet (configuration 1)

Figure 27 Example of installing the stainless-steel basket within the stainless-steel basket option in a grated inlet (Configuration 1)

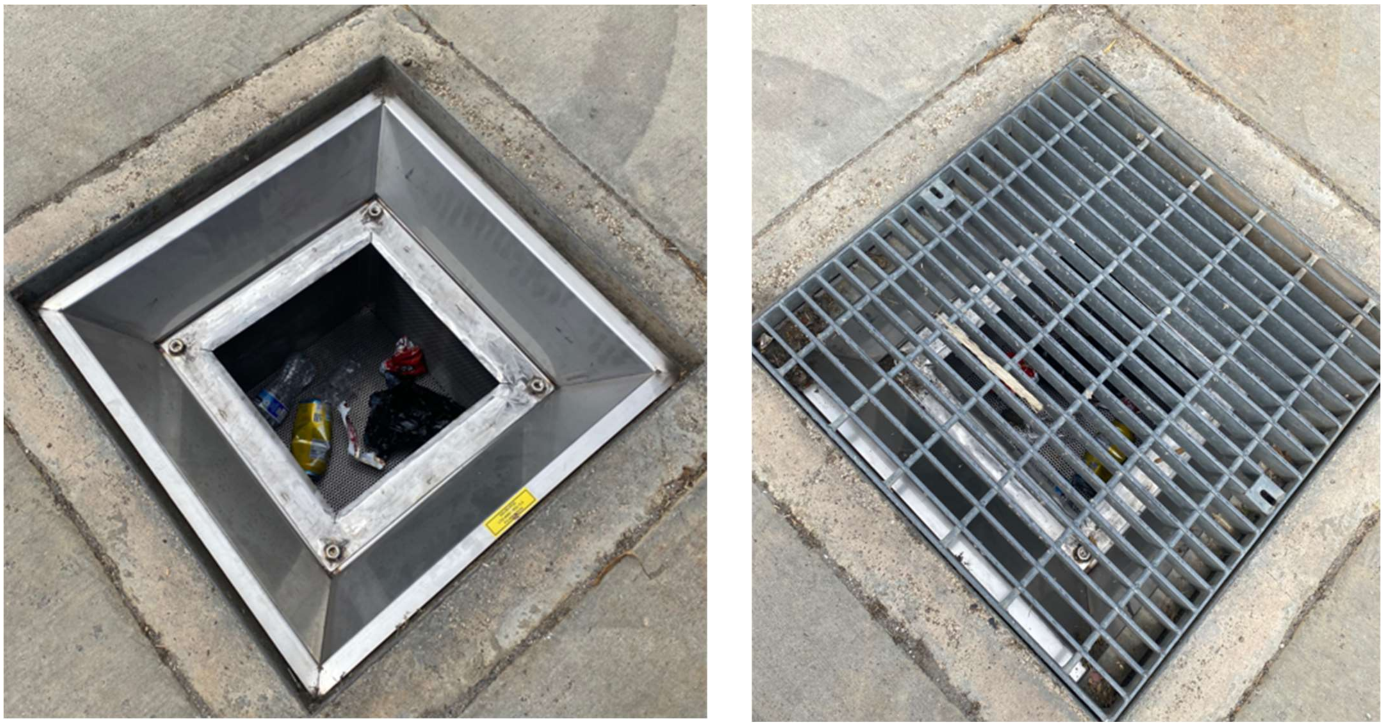


Figure 28 Example of the stainless-steel basket installed in a grate inlet catch basin (Configuration 1)

Limitations

Custom components and installations may alter flow rates when compared to those provided in Section 3.D: Comparison Tables.

For combination curb/grate inlet (Configuration 3) the Enviropod® LittaTrap™ FC must be installed to capture flows without blocking the curb opening, allowing minimum 2 ¾" clearance for cans and bottles to enter the basket from the curb entry as shown in Figure 29.

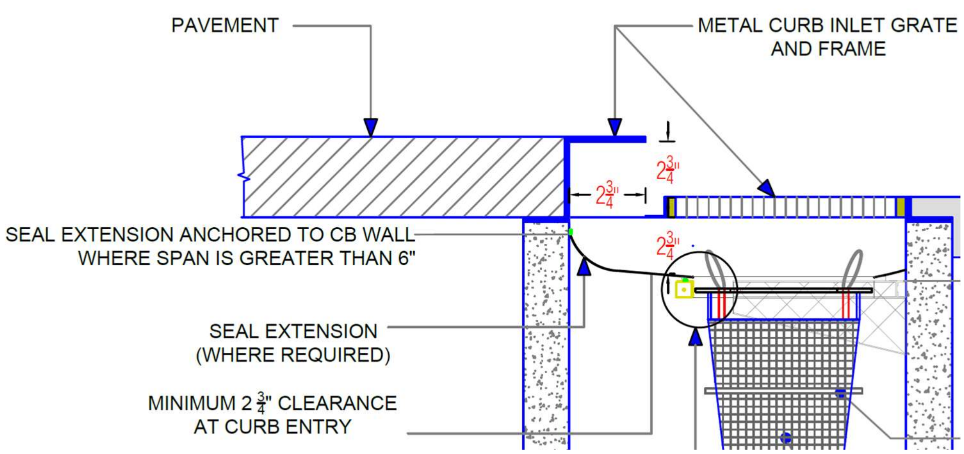


Figure 29 Illustration to show minimum clearance requirement on combination inlet (Configuration 3)

4.C: Methods for diagnosing and correcting installation errors

A pre-installation and installation checklist are provided in the installation manual in APPENDIX B – Installation Manuals. The installation checklist ensures correct installation is undertaken and includes the following items:

1. The catch basin is clean and free of trash and debris.
   1.a. for combination curb/grate inlets ensure minimum 2 ¾" clearance for cans and bottles through the curb entry.
2. The support bracket is installed 200 mm (7 7/8") below surface and level and below any curb entries.
3. Anchor bolts are tightened securely and firmly support the bracket.
4. Filter box positioned so the gross pollutant basket can easily be removed.
5. Basket is the correct size for the clear opening of the catch basin grate.
6. Seals are securely fastened to filter box and support bracket (if appropriate).
7. Seals extend to walls of catch basin have fall across the profile.
8. Basket and liner are placed in the filter box.
9. Liner is installed correctly and does not obstruct the bypass.
10. Check for gaps greater than 5 mm.
11. Take photos of the installed unit with GPS location services on.
12. All materials cleared from installation
13. Grate closed.

Enviropod has a process of quality assurance (QA) to ensure all designed and manufactured products are free from defects or errors. The process includes checks of all 3rd party parts as well as all manufactured parts at the manufacturer's facilities.

QA procedures include load and temperature testing of randomly selected units at the manufacturer's facilities. After each production run and after delivery to our warehouse facility, random QA checks are performed.

5.0 OPERATION AND MAINTENANCE INFORMATION.

5.A: Inspection procedures and frequency considerations

Health and safety

Enviropod recommends that owners check and utilize any applicable State and local regulatory requirements for applying a Site-Specific Safety Plan before undertaking any installation, inspection, or maintenance service. Personal Protection Equipment (PPE) is required when installing, inspecting, or maintaining an Enviropod® LittaTrap™. Field personnel shall utilize personal protection equipment (PPE) as required, including gloves, long sleeve shirts or outwear, long pants, Hi-Viz clothing as well as steel toe shoes. For additional advice on the relevant health and safety requirements, we recommend that you consult the local health and safety regulator.

Inspections

All trash capture treatment control devices require maintenance to remove trapped contaminants and to minimize bypass. Due to the variable nature of stormwater pollution and localized site pollutant loadings, maintenance frequencies vary for different sites and different rainfall characteristics.

It is recommended to inspect Enviropod® LittaTrap™ FC at least four times during the first year of operation to determine seasonal and annual maintenance requirements. Therefore, the initial inspection frequency is suggested every three months. However, if there is a presence of a high loading activity in the upstream catchment the inspection frequency should be revised. High loading activity in the upstream catchment includes the following:

- A large number of trees or vegetation;
- Construction activity;
- Unsealed roads.

Additional inspections are recommended after extreme rainfall events. The Enviropod® LittaTrap™ FC should be inspected at every maintenance to check for any unforeseen damage or evidence of illicit discharge.

5.B: Description of maintenance frequency considerations related to the device's hydraulic capacity at various levels of trash capture volumes

Table 7 shows the recommended maintenance frequency for the Enviropod® LittaTrap™ FC and the stainless steel basket option. Maintenance of the Enviropod® LittaTrap™ FC is recommended when more than 75% of the maximum trash capture volume (MTVC) of the model size installed is used.

Maintenance should be undertaken as per the municipal stormwater permit.

Enviropod® LittaTrap™ FC	Aperture Size	Maximum Trash Capture Volume (MTCV)	Inspections during first year	Maintenance Frequency (times per year)
Full Capture (FC) - Liner	4.8mm x 3.9mm	75%	4	1-2
Full Capture (FC) – Stainless Steel	4.8mm	75%	4	1-2

Table 7: Recommended maintenance frequency and at what percentage of MTCV for the Enviropod® LittaTrap™ FC.

5.C: Maintenance procedures, including procedures to clean the trash capture screen

The Enviropod® LittaTrap™ FC maintenance service should occur prior in accordance with the applicable regulatory permit but no less than the basket becoming 50% full of trash in order to maintain hydraulic integrity and to comply with the Trash Provisions. The Enviropod® LittaTrap™ FC maintenance service involves two activities. These activities are as follows:

1. Routine removal and emptying of the gross pollutant basket and liner; and
2. The periodic vacuum of oils and sediment residuals from the catch basin sump if required.

The suggested maintenance of grate or combination catch basin is by "hand" to reduce operational cost. The Enviropod® LittaTrap™ basket is fitted with lifting handles at the top and bottom of the basket, so no personal contact with retained pollutants is required.

Enviropod recommends the use of a vacuum induction truck for the maintenance of curb entry catch basin Enviropod® LittaTrap™ and the stainless-steel basket option, however, the stainless-steel basket has nuts that can have ⅜" Eye bolts installed for a two-person lift to remove the basket if the basket is not too heavy, as shown in Figure 27.

Enviropod® LittaTrap™ Hand Maintenance

It is recommended that the Enviropod® LittaTrap™ basket and liner be emptied when 75% Full. To empty the Enviropod® LittaTrap™, it is a simple one-minute exercise "Lift, Tip, Replace". The following steps detail hand maintenance:

1. Establish a safe working area per typical catch basin service activity.
2. Remove grate/access cover.
3. Remove the basket and liner with two lifting hooks or lift by hand through the loops on the top of the basket. Excess debris should be scooped out first if the basket is over half full.
4. Pour contents of the basket and liner into a disposal container.
5. Replace basket, liner and grate.

Enviropod also provides detailed maintenance instructional videos on its website, and YouTube page links to these are below:

- Hand Maintenance. https://www.youtube.com/watch?v=zyTtUS-tHEo&t=2s
- "J" Hook Maintenance https://www.youtube.com/watch?v=Su7Epduk6OA
- Vacuum Induction Maintenance https://www.youtube.com/watch?v=JztUeiJRGgk

The following video shows the hand maintenance of The Enviropod®

LittaTrap™ FC when the device is 100% full, and all material is removed from the basket without physically touching any debris.
https://www.youtube.com/watch?v=hmspyuV0HfI

Enviropod® LittaTrap™ FC Vactor Maintenance

The steps for induction maintenance are detailed below:

1. Establish a safe working area per typical catch pit service activity.
2. Remove grate/access cover.
3. Vacuum accumulated debris from the basket.
4. Vacuum contents from the base of the catch basin (if required).
5. Inspect basket, filter box, and seals for any damage.
6. Replace grate/access cover.

The following link below is a maintenance video of the Enviropod® LittaTrap™ FC and wet sump catch basin with an induction vactor truck. The video shows how all material is easily removed from the Enviropod® LittaTrap™ FC gross pollutant basket without the removal of the basket:

- FC Liner vactor maintenance: https://www.youtube.com/watch?v=hu280_muSZM&t=7s

The vactor method of maintenance is recommended for the stainless-steel basket option.

Curb entry catch basins that have the Enviropod® LittaTrap™ High Capacity kits installed can either be maintained through the curb opening if it is large enough for a vactor hose to enter (Figure 30), or maintenance is completed by entering the catch basin through the manway and using the vactor hose to remove debris (Figure 18). A curb inlet catch basin utilizing the Easy Manhole Maintenance Access (EMMA) kit can be maintained at ground level through the manhole as shown in Figure 32.

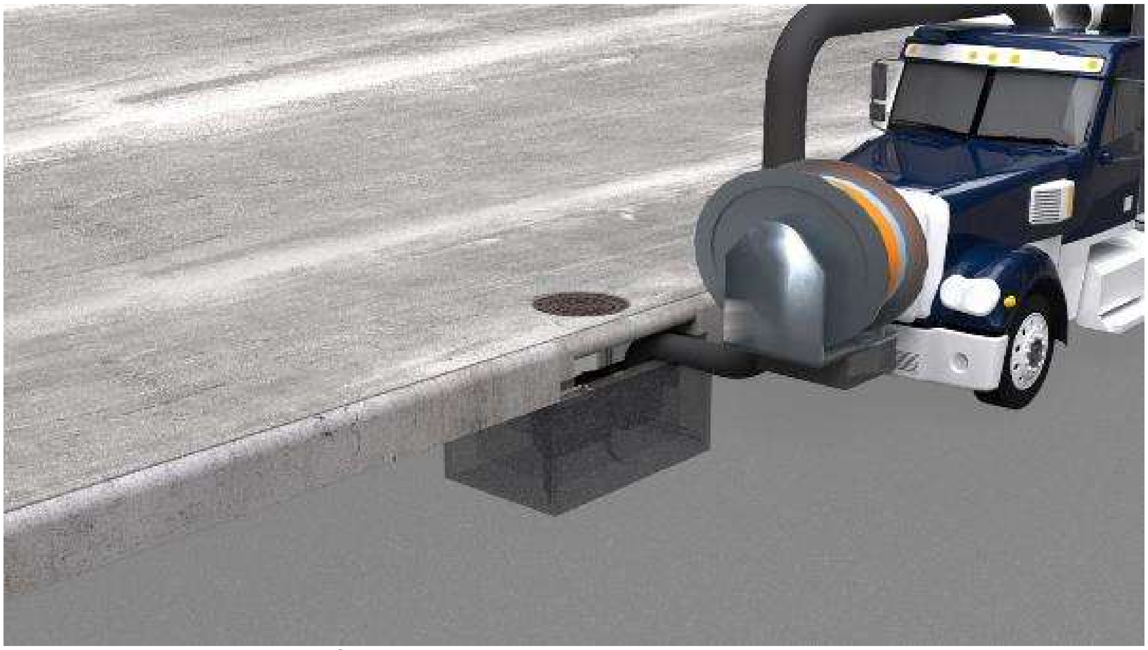


Figure 30 Illustration of an Enviropod® LittaTrap™ FC being maintained by a vactor hose through the curb opening.

Figure 31 Example of a contractor maintaining the Enviropod® LittaTrap™ High Capacity from within the catch basin having entered via the manway.

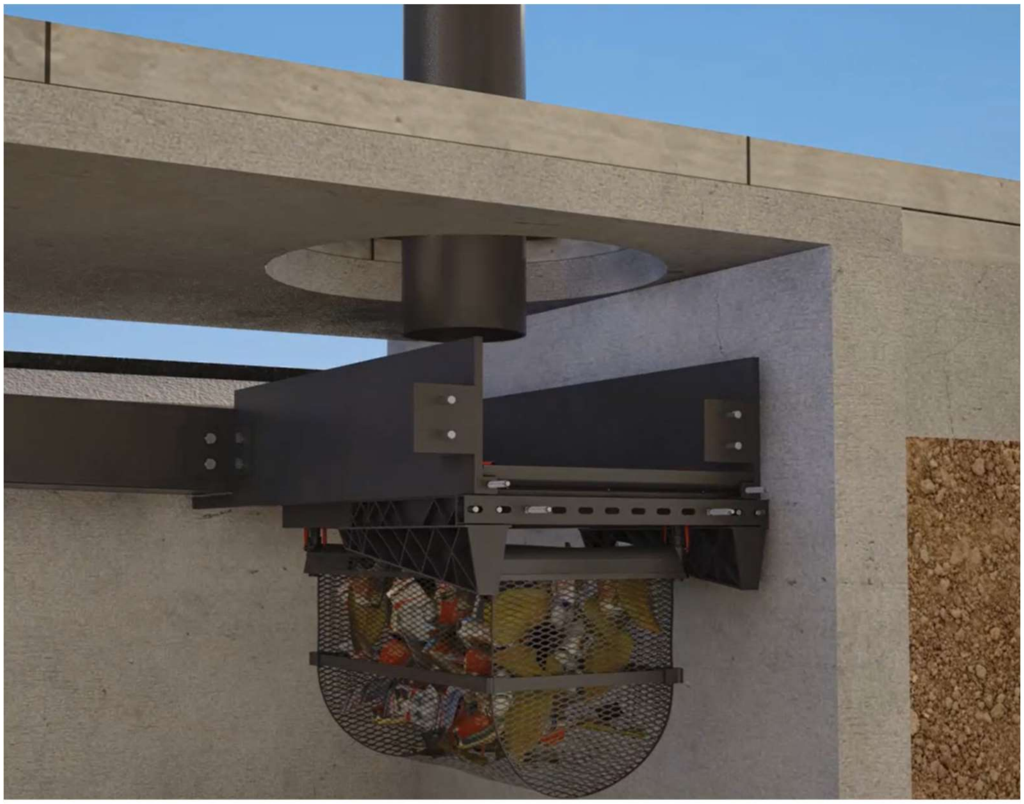


Figure 32 Illustration of a vactor truck hose accessing the Enviropod® LittaTrap™ FC via the manway directly above when fitted with the Easy Manhole Maintenance Access (EMMA) kit.

Enviropod LittaTrap basket and Liner cleaning

- Material trapped in the Enviropod® LittaTrap™ basket and liner is easily removed by shaking the basket or tapping the basket against a hard surface.

- The Enviropod® LittaTrap™ baskets and liners may require brushing or spraying with a pressure washer as shown in the video: https://www.youtube.com/watch?v=wQCegTctZSU

Record-Keeping Maintenance Procedures

- Following maintenance and/or inspection, the maintenance contractor shall prepare a maintenance/inspection record. The record shall include any maintenance activities performed, amount and description of debris collected, and condition of the system and its various filter mechanisms.
- The owner shall retain the maintenance/inspection records in accordance with local and/or state requirements.

5.D: Essential equipment and materials for proper maintenance activities

The following equipment is helpful when conducting Enviropod® LittaTrap™ Grate Inlet and Curb Inlet inspections and maintenance:

- Recording device (pen and paper form, voice recorder, iPad, etc.)
- Personal protection equipment (protective footwear, gloves, hardhat, safety glasses, high visibility clothing, etc.)
- Traffic control equipment (cones, barricades, signage, flagging, etc.)
- Manhole hook or pry bar
- Flashlight
- Tape measure
- Vacuum truck (optional but recommended for some configurations)
- Pressure washer (optional)
- Replacement oil absorbent pouches (Optional)

5.E: Description of the effects of deferred maintenance on device structural integrity, performance, odours, etc.

Delayed or deferred maintenance may reduce the trash capture capacity of the Enviropod® LittaTrap™ FC system and therefore impact water quality. Long term neglect of maintenance may affect the inlet capacity of the catch basin. To address this, the Enviropod® LittaTrap™ baskets and liners are designed to be easily removed when full or over capacity.

5.F: Repair procedures for the device's structural and screening components

In the unlikely event of an Enviropod® LittaTrap™ structural component requiring repair, the system can be easily uninstalled by reversing the installation procedure. Once uninstalled any faulty part or component can be replaced.

6.0 VECTOR CONTROL ACCESSIBILITY

6.A: The date the device application was submitted for vector control accessibility design verification via email to the Mosquito Vector Control Association of California.

This revised application has been submitted to the Mosquito Vector Control Association of California's (MVCAC) review for design verification on the 1st of July 2020. Attached in the APPENDIX F – MCVAC Approval Letter dated 20th of July 2020. Included in the submission are videos that demonstrate the operation of the vector inspection seal with the grate inlet on and off.

Vector Port Video 1:
https://www.youtube.com/watch?v=73hDSJ7Z5Nc&feature=youtu.be
Vector Port Video2:
https://www.youtube.com/watch?v=Dq0Pw2lp3So&feature=youtu.be

6.B: Description and/or video that demonstrates how mosquito vector control personnel can readily access the bottom of the storm water vault and/or Device for visual observation and mosquito treatment;

The Enviropod® LittaTrap™ device utilizes a basket and Full Capture (FC) liner with a screen size of 4.8mm X 3.8 mm and is suspended above the floor of the catch basin. This functionality greatly reduces the possibility of standing water in the system. Therefore, vector hazards are not anticipated as a result of the operation of the catch basin insert. The Enviropod® LittaTrap™ FC basket and liner design also allow easy hand removal giving clear access and visibility to the base or sump of the catch basin during maintenance activities.

The Enviropod® LittaTrap™ FC grated inlet installations in California will be installed with a "Hinged Vector Port Seal" (HVPS) that will allow full visual access to the catch basin floor or other internal areas below the Enviropod® LittaTrap™ FC. The HVPS will also allow personnel to take samples or apply treatment, if required.

Standard Hinged Vector Port Seal

The standard HVPS takes the form of a spring-loaded hinged HDPE and nitrile rubber seal. The inspection seal is easily lifted to 90 degrees with a J hook inserted into the lifting eye attached to the seal. This action provides a clear opening for inspection across the front face of the catch basin. Upon release, the hinged seal automatically closes ensuring no gaps of 5mm or larger exist between the seal and the catch basin wall. The hinged vector port seal can be opened with the catch basin grate closed with the use of a J Hook as shown in Figure 33.

Figure 33 shows the location of a vector portal for grated inlets (Configuration 1). The position for manhole catch basins (Configuration 2) and grated inlet catch basins (Configuration 3) is the same as for the grated inlet (shown in Figure 33 and Figure 34). There is no vector port required for curb inlet catch basins (Configuration 4a and Configuration 4b) because inspection can be completed via the manhole or inlet. Figure 35 and Figure 36 show photos of the HVPS in a closed and open position. The size of the seal is the same for each Enviropod® LittaTrap™ size. For larger units, it is installed over the standard seal and then the standard seal under the HVPS is cut away to create an opening approximately 2" x 18" Figure 37 shows a HVPS installed on an LT9060 at a private site in Poway.

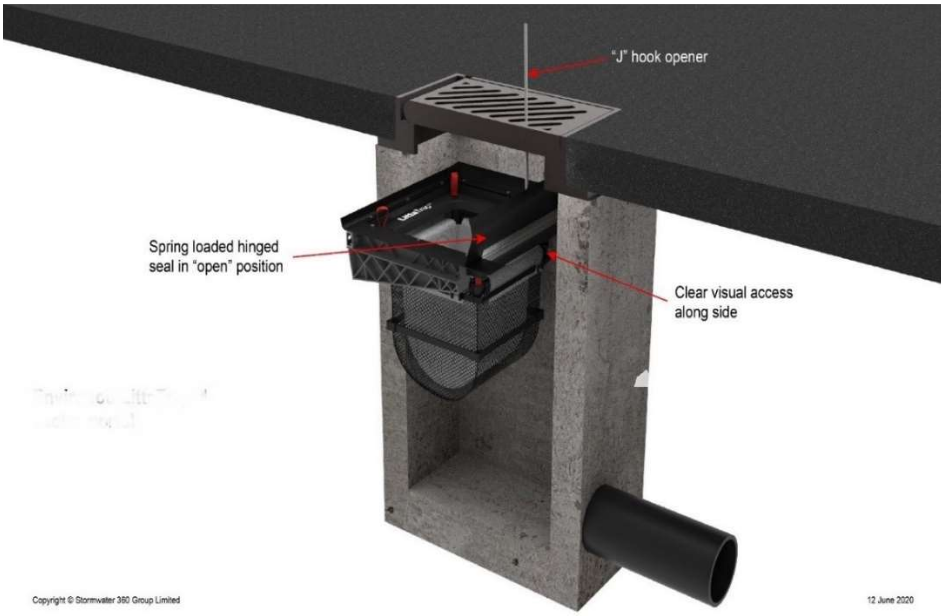


Figure 33: Vector Control Inspection Example (Grate inlet - Configuration 1)

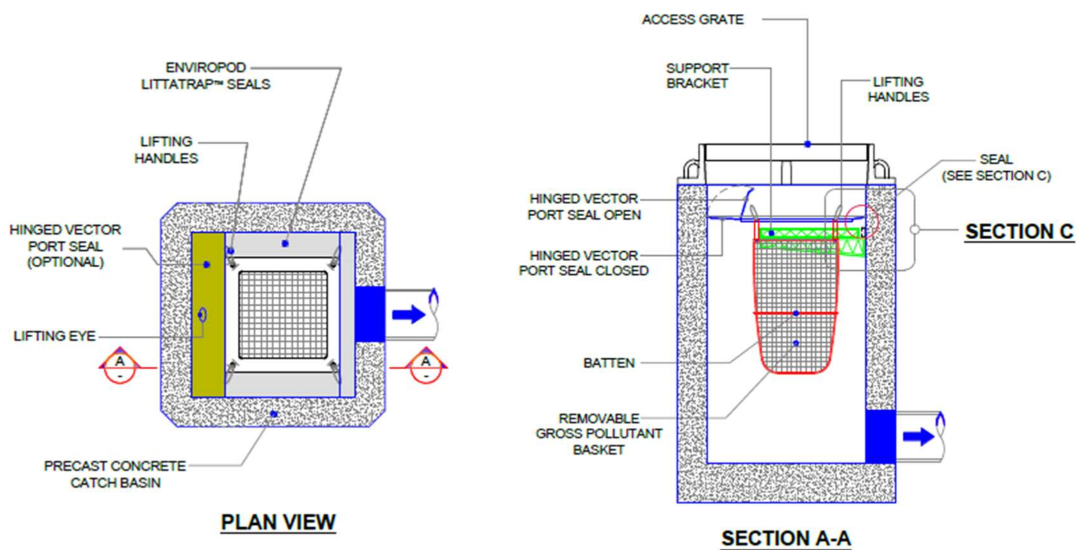


Figure 34: Vector Portal location for all grated inlets. This includes grated inlet catchbasins (Configuration 1), manhole catchbasins (Configuration 2) and combination inlet catchbasins (Configuration 3) .

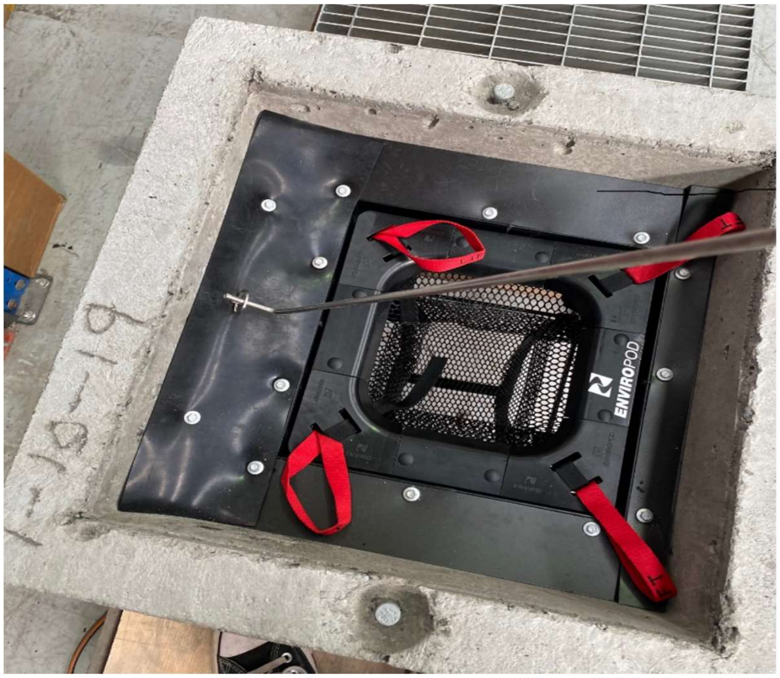


Figure 35: Enviropod® LittaTrap™ FC with Vector Inspection seal in closed position. The position and operation is the same for grated inlet catchbasins (Configuration 1), manhole catchbasins (Configuration 2) and combination inlet catchbasins (Configuration 3). Curb inlet configuration 4a and 4b do not require a vector port as they can be inspected via the manhole or inlet.

Figure 36: Enviropod® LittaTrap™ FC with Vector Inspection in open position. The position and operation is the same for grated inlet catchbasins (Configuration 1), manhole catchbasins (Configuration 2) and combination inlet catchbasins (Configuration 3) . Curb inlet configuration 4a and 4b do not require a vector port as they can be inspected via the manhole or inlet.

Figure 37 Enviropod® LittaTrap™ FC LT9060 with HVPS installed in a grated inlet (Configuration 1)

Stainless Steel Hinged Vector Port Seal

The stainless steel HVPS is specifically designed for the stainless-steel flange option. The preferred vector port takes the form of a hinged stainless steel cover with a latch at the top. The stainless-steel cover is not spring-loaded and therefore must be closed and latched post-inspection. To ensure inspections can be carried out with ease, the grate is required to be orientated perpendicular to the ports longest axis as shown in Figure 38. If the stainless steel flange angle is too shallow to allow the operation of the stainless steel HVPS, then the sliding option may be used. A detailed drawing is provided in APPENDIX A – Generic Drawings.

The stainless-steel sliding vector port seal is not the preferred option and will only be used when necessary. The ensure sliding vector port is easy to access the grate must be parallel to the longest axis of the port as shown in

Dimensions of the clear opening vary with the size of unit provided. The vector port size will vary with the size of the catch basin and Enviropod® LittaTrap ™ FC size used. Table 8 details the vector port size for each model of Enviropod® LittaTrap™ FC.

Catch Basin Size	Enviropod® LittaTrap™ FC Size	Vector Port Size.
18" x 18" – 48" x 48"	LTFC4545, LTFC6060, LTFC9060	3" x 18"

Table 8: Vector Port Opening Size for Different Enviropod® LittaTrap™ FC Size in grated inlet catchbasins (Configuration 1), manhole catchbasins (Configuration 2) and combination inlet catchbasins (Configuration 3) .

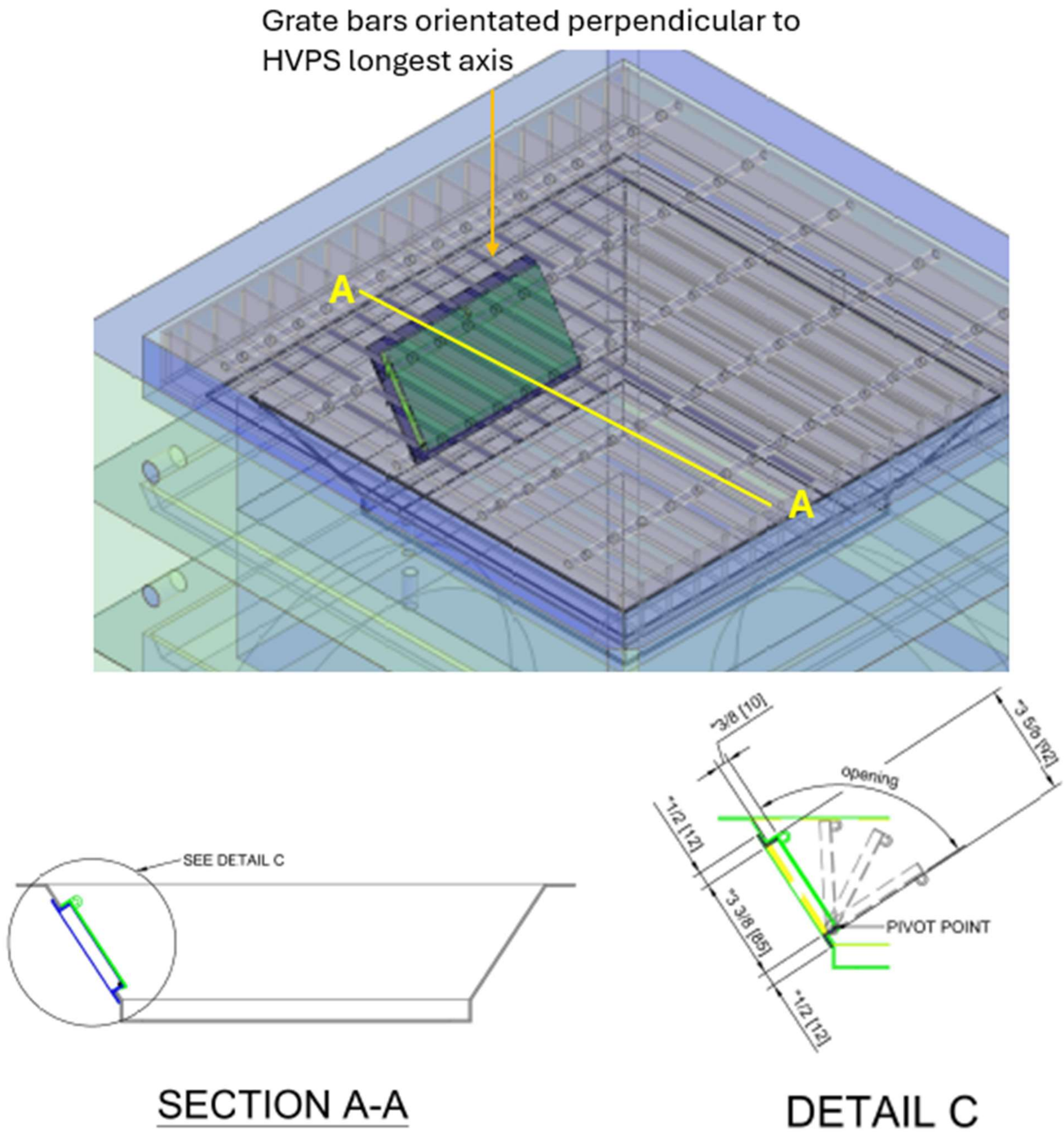


Figure 38 Stainless steel HVPS on a stainless-steel flange. Full drawing is available in Appendix A. This design is applicable to grated inlet catchbasins (Configuration 1), manhole catchbasins (Configuration 2) and combination inlet catchbasins (Configuration 3)

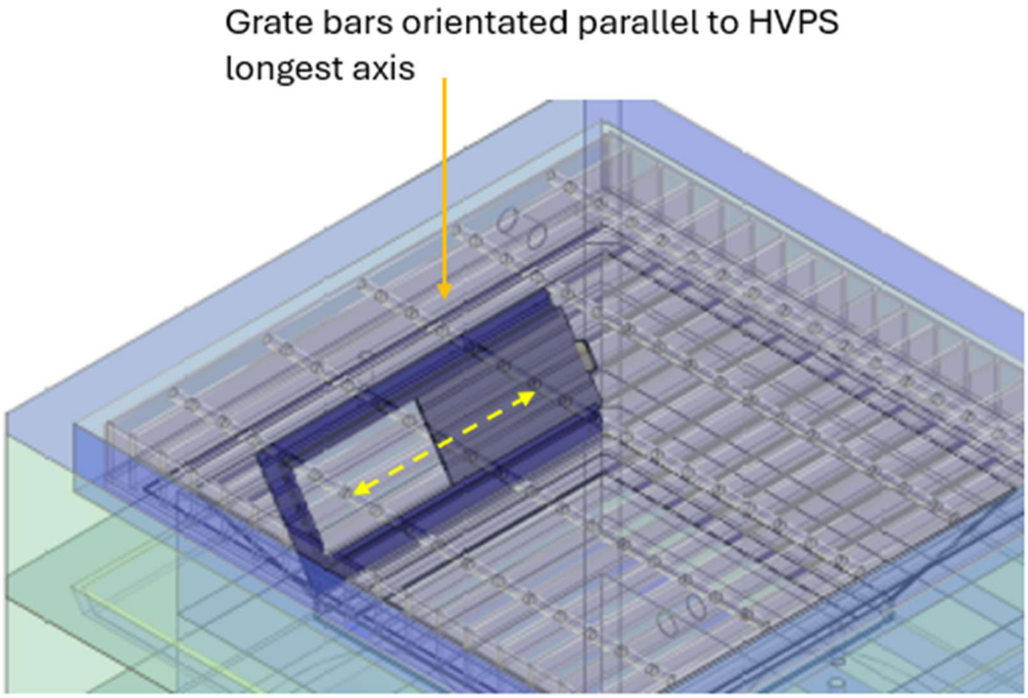


Figure 39 Stainless steel sliding vector port seal. Only to be used if the preferred design is not feasible and grate bars must be parallel the ports longest axis to enable sliding as indicated in yellow. Detailed drawing is provided in Appendix A

6.C: MVCAC Approval Letter

The original allocation received MVCAC approval on July, 20, 2020. Attached in Appendix F is the MVCAC approval letter for the revised application dated (November, 26, 2024). This letter verifies that the Enviropod® LittaTrap™ FC design allows full visual access for presence of standing water and treatment of mosquitoes when necessary. A new MVCAC approval will be attached when received.

7.0 RELIABILITY INFORMATION

7.A: Estimated design life of Device components before major overhaul

The Enviropod® LittaTrap™ Filter box and support bracket components have a minimum 20-year life expectancy. The basket and liners have a 5-year life expectancy. Replacement parts are available from Enviropod. The design life is dependent on correct operation in accordance with the manufacturer's recommendations.

7.B: Warranty Information

Enviropod provides an 8-year limited warranty on all static parts. The basket and liner have a one-year limited warranty for manufacturing defects.

7.C: Customer support information

Enviropod Canada Limited is a New Zealand based company with area representatives in California and Ontario Canada.

California Contact:
William Harris
34428 Yucaipa Blvd., #344
Yucaipa, CA 92399
willharrisjr@gmail.com
Ph (909) 499-7298

Corporate Office: Michael Hannah
Stormwater360 Group
7C Piermark Drive
Rosedale 0632
North Shore
Auckland New Zealand
Ph +64 9 4765 586

8.0 Field/Lab Testing Information and Analysis

Enviropod has commissioned 3rd party laboratory testing on the screening elements as well as the system, and has recently carried out testing in its own laboratory on alternative materials. Three laboratory testing reports are included in APPENDIX D – Lab Testing Information.

The hydraulic laboratory testing data has been used to develop empirical relationships between head loss and flow through the screens which are used in the design of each Enviropod® LittaTrap™ FC model and size.

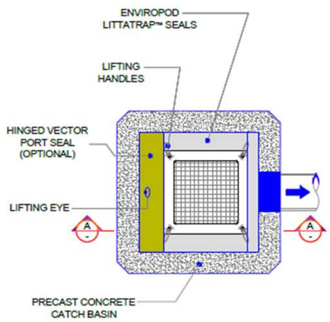
Hydraulic analyses show that an empty Enviropod® LittaTrap™ FC for a 2ft x 2ft catch basin (LTFC6060) can convey 290.2 l/s (10.2 CFS) without bypass. Further analysis shows the Enviropod® LittaTrap™ FC can convey of 88.9l/sec (3.1 CFS) through the liner or stainless steel when the basket is 50% full without bypass.

The maximum bypass flow for an Enviropod® LittaTrap™ FC (2ft x 2ft) is 88.9 l/sec (3.1 CFS) for all baskets and liners when installed in accordance with the manufacturer's recommendation.

An Example of the hydraulic calculations are included in APPENDIX G – Example Hydraulic Calculations

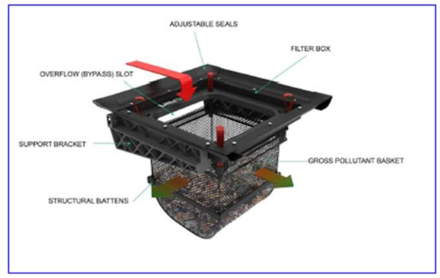
A version of the Enviropod® LittaTrap™ FC with basket (screen size 4.9mm – 5.5mm) and no mandatory liner has undergone full size laboratory trash capture testing. No formal "Full Capture" test protocol has been provided by the California State Water Board Trash Implementation Program. As such, a test protocol based on the Stormwater Equipment Manufacturers Association (SWEMA) and the California Department of Transportation (Caltrans) full capture testing was developed. The testing demonstrated 100% capture of particles 5 mm or larger in size and 99.6% total capture of solids at 15 l/sec for a unit of a 2ft x 2ft catch basin when 85% full. This information has been included to demonstrate the technologies' ability (as a whole) to intercept and capture trash 5mm and larger. It should be noted that this application is for the Enviropod® LittaTrap™ FC, which has a liner and therefore has a slightly reduced hydraulic conductivity than the Enviropod® LittaTrap™ with standard basket because of the smaller apertures in the liner.

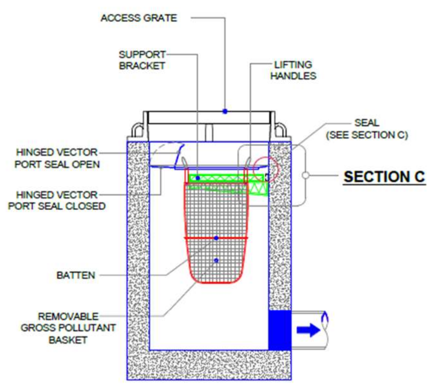
APPENDIX A – Generic Drawings



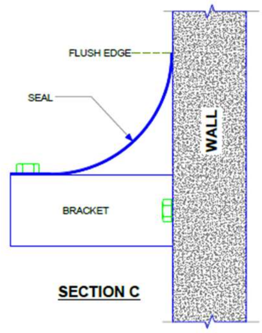
PLAN VIEW

ENVIROPOD LITTATRAP™ FC COMPONENTS





SECTION A-A



SECTION C

ENVIROPOD LittaTrap™ FC MODELS AND SIZES

Nominal Catch Basin Size (inch)	LittaTrap FC Model Size	Bracket Width (inch)	Min Filter Box Size (Without Seals)		Max Filter Box Size (With Seals)		Basket Collar Size		Basket Depth (inch)
			Length (inch)	Width (inch)	Length (inch)	Width (inch)	Length (inch)	Width (inch)	
18 x 18	LTFC4545	17.1	15.4	15.4	20.6	20.6	12.0	12.0	15.7
24 x 24	LTFC6060	22.4	20.2	20.2	25.3	25.3	17.3	17.3	15.7
36 x 24	LTFC9060	34.3	32.0	20.2	37.1	25.3	29.1	17.3	15.7

ENVIROPOD LittaTrap™ FC FLOW AND STORAGE SPECIFICATION

Basin Size (Inch)	LittaTrap FC Model SIZE	Screen Area in²	Maximum Trash Capture Volume (MCTV) - ft³	Design Flow Rate 50% MCTV CFS	Standard Bypass Flow CFS
18 x18	LTFC4545	601	0.7	2.1	2.1
24 x 24	LTFC6060	969	1.6	3.2	3.3
36 x18	2 x LTFC4545 *	1203	1.4	4.2	4.2
36 x 24	LTFC9060	1473	3.0	4.8	4.5
36 x 36	LTFC9060 + Seal Extension Kit *	1473	3.0	4.8	4.5
48 x 48	2 x LTFC9060 *	2946	6.0	9.6	9.0

The Enviropod LittaTrap™ has an adjustable bypass. Flow rates listed are for a standard set bypass. Please contact Enviropod for specific bypass requirements.

* Requires an additional seal extension kit for standard installation

THE Enviropod® may be protected by one of the following Canadian, USA or International patent numbers and has other patents pending : 2,810,974, 13/824,376, 15/459,964, 2011302712, 588049

PATENT No.

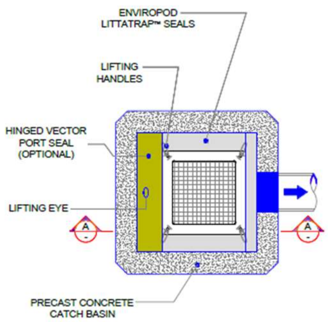
ENVIROPOD™
A STORMWATER360™ COMPANY

ENVIROPOD LittaTrap™ FC
WITH VECTOR INSPECTION PORT
SPECIFICATION DRAWING
(IMPERIAL UNITS)

DRG No : LT -GRATED INLET GENERIC | REV : A | DATE : 14.12.21

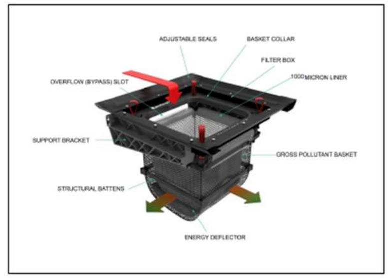
JOB NO :
PROJECT :
DRN : R.P. 14.12.21
CKD : BVL 14.12.21

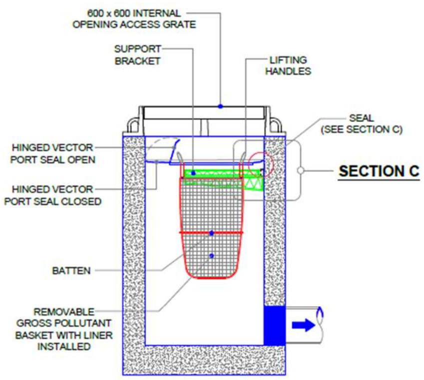
REV	REVISION DETAIL	DATE
G	REDRAWN	14.12.21
H	VP OPTIONAL	10.01.22



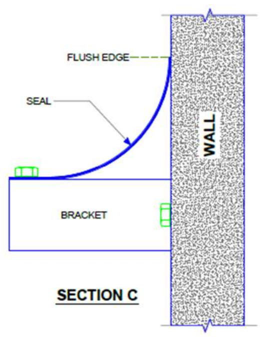
PLAN VIEW

ENVIROPOD LITTATRAP™ WITH 1000 MICRON LINER COMPONENTS





SECTION A-A



SECTION C

ENVIROPOD LittaTrap™ MODELS AND SIZES

Nominal Catch Basin Size (inch)	LittaTrap™ Model Size	Bracket Width (inch)	Min Filter Box Size (Without Seals)		Max Filter Box Size (With Seals)		Basket Collar Size		Basket Depth (inch)
			Length (inch)	Width (inch)	Length (inch)	Width (inch)	Length (inch)	Width (inch)	
18 x 18	LT4545	17.1	15.4	15.4	20.6	20.6	12.0	12.0	15.7
24 x 24	LT6060	22.4	20.2	20.2	25.3	25.3	17.3	17.3	15.7
36 x 24	LT9060	34.3	32.0	20.2	37.1	25.3	29.1	17.3	15.7

ENVIROPOD LittaTrap™ WITH NURDLE LINER FLOW AND STORAGE SPECIFICATION

Basin Size (Inch)	LittaTrap™ Model SIZE	Screen Area in²	Maximum Trash Capture Volume (MCTV) - ft³	Design Flow Rate 50% MCTV CFS	Standard Bypass Flow CFS
18 x18	LT4545	601	0.7	1.9	2.1
24 x 24	LT6060	969	1.6	3.0	3.3
36 x18	2 x LT4545 *	1203	1.4	3.8	4.2
36 x 24	LT9060	1473	3.0	4.5	4.5
36 x 36	LT9060 + Seal Extension Kit *	1473	3.0	4.5	4.5
48 x 48	2 x LT9060 *	2946	6.0	9.0	9.0

The Enviropod LittaTrap™ has an adjustable bypass. Flow rates listed are for a factor set bypass. Please contact Enviropod for specific bypass requirements.

* Requires an additional seal extension kit for standard installation

THE Enviropod® may be protected by one of the following Canadian, USA or International patent numbers and has other patents pending : 2,810,974, 13/824,376, 15/459,964, 2011302712, 588049

PATENT No.

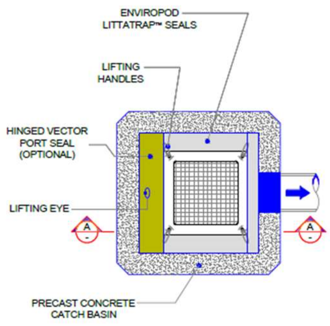
ENVIROPOD™
A STORMWATER360™ COMPANY

ENVIROPOD LittaTrap™
WITH VECTOR INSPECTION PORT
AND NURDLE LINER SPECIFICATION
DRAWING

DRG No : LT -GRATED INLET 1000 | REV : I | DATE : 31.05.22

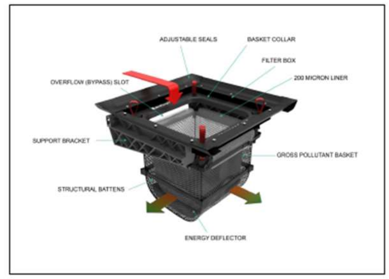
JOB NO :
PROJECT :
DRN : R.P. 14.12.21
CKD : BVL 14.12.21

REV	REVISION DETAIL	DATE
G	REDRAWN	14.12.21
H	VP OPTIONAL	10.01.22
I	1000 LINER	31.05.22

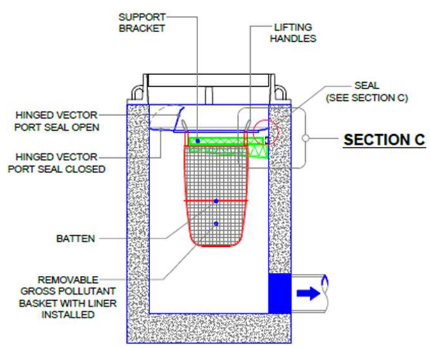


PLAN VIEW

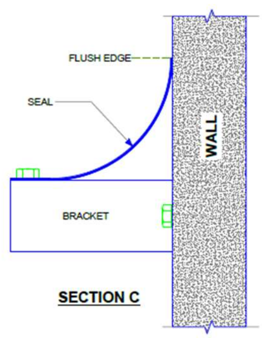
ENVIROPOD LITTATRAP™
WITH 200 MICRON LINER COMPONENTS



ENVIROPOD LittaTrap™ MODELS AND SIZES									
Nominal Catch Basin Size (inch)	LittaTrap™ Model Size	Bracket Width (inch)	Min Filter Box Size (Without Seals)		Max Filter Box Size (With Seals)		Basket Collar Size		Basket Depth (inch)
			Length (inch)	Width (inch)	Length (inch)	Width (inch)	Length (inch)	Width (inch)	
18 x 18	LT4545	17.1	15.4	15.4	20.6	20.6	12.0	12.0	15.7
24 x 24	LT6060	22.4	20.2	20.2	25.3	25.3	17.3	17.3	15.7
36 x 24	LT9060	34.3	32.0	20.2	37.1	25.3	29.1	17.3	15.7



SECTION A-A



SECTION C

ENVIROPOD LittaTrap™ WITH 200 MICRON LINER FLOW AND STORAGE SPECIFICATION					
Basin Size (Inch)	LittaTrap™ Model SIZE	Screen Area in²	Maximum Trash Capture Volume (MCTV) - ft³	Design Flow Rate 50% MCTV CFS	Standard Bypass Flow CFS
18 x18	LT4545	601	0.7	1.2	2.1
24 x 24	LT6060	969	1.6	1.9	3.3
36 x18	2 x LT4545 *	1203	1.4	2.4	4.2
36 x 24	LT9060	1473	3.0	2.9	4.5
36 x 36	LT9060 + Seal Extension Kit *	1473	3.0	2.9	4.5
48 x 48	2 x LT9060 *	2946	6.0	5.8	9.0

The Enviropod LittaTrap™ has an adjustable bypass. Flow rates listed are for a factor set bypass. Please contact Enviropod for specific bypass requirements.

* Requires an additional seal extension kit for standard installation

THE Enviropod® may be protected by one of the following Canadian, USA or International patent numbers and has other patents pending : 2,810,974, 13/824,376, 15/459,964, 2011302712, 588049

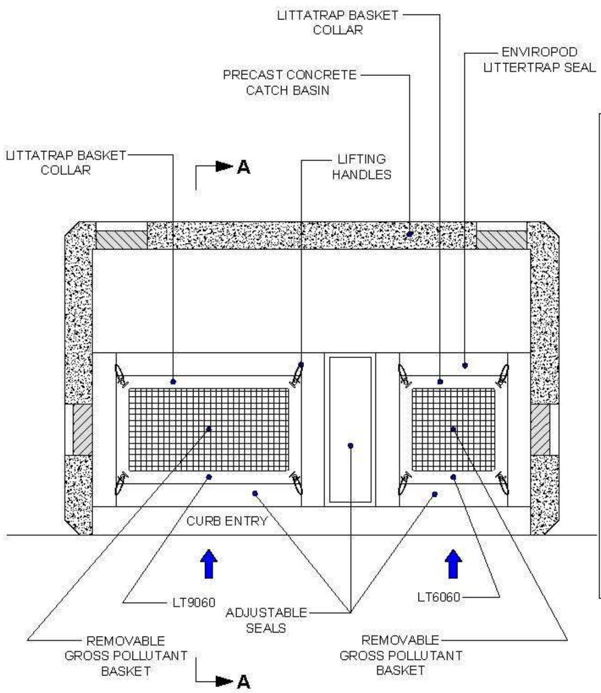
PATENT No.

ENVIROPOD™
A STORMWATER360™ COMPANY

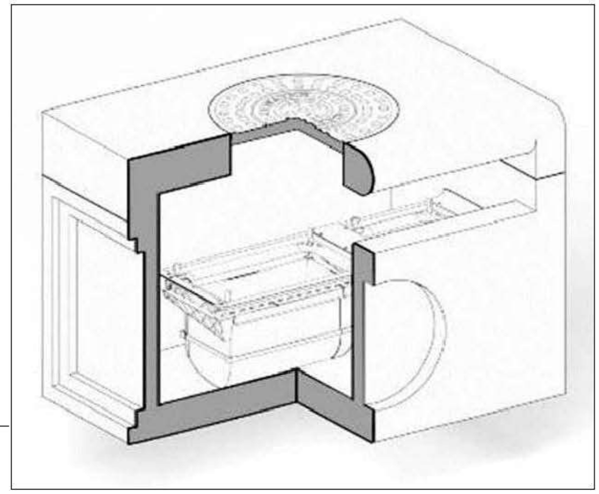
ENVIROPOD LittaTrap™
WITH VECTOR INSPECTION PORT
AND 200 MICRON LINER SPECIFICATION
DRAWING

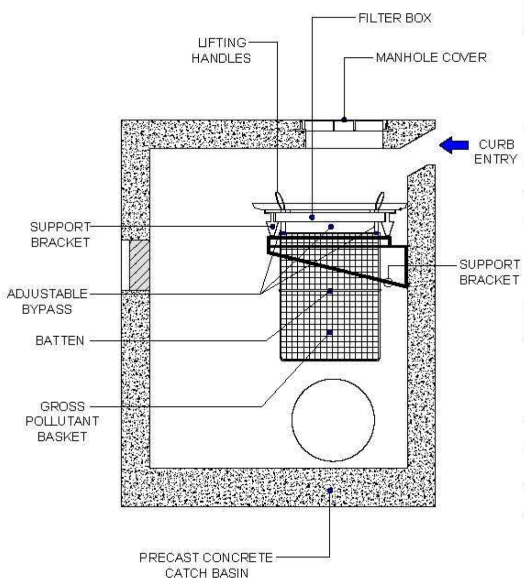
JOB NO :				REV	REVISION DETAIL	DATE
PROJECT :				G	REDRAWN	14.12.21
				H	VP OPTIONAL	10.01.22
				I	200 LINER	31.05.22
DRN :	R.P.	14.12.21				
CKD :	BVL	14.12.21				

DRG No : LT -GRATED INLET 200 | REV : I | DATE : 31.05.22



PLAN VIEW





SECTION A-A

ENVIROPOD LittaTrap™ FC MODELS AND SIZES

Nominal Catch Basin Size (inch)	LittaTrap FC Model Size	Bracket Width (inch)	Min Filter Box Size (Without Seals)		Max Filter Box Size (With Seals)		Basket Collar Size		Basket Depth (inch)
			Length (inch)	Width (inch)	Length (inch)	Width (inch)	Length (inch)	Width (inch)	
18 x 18	LTFC4545	17.1	15.4	15.4	20.6	20.6	12.0	12.0	15.7
24 x 24	LTFC6060	22.4	20.2	20.2	25.3	25.3	17.3	17.3	15.7
36 x 24	LTFC9060	34.3	32.0	17.6	37.1	22.7	29.1	17.3	15.7

ENVIROPOD LittaTrap™ FC FLOW AND STORAGE SPECIFICATION

Basin Size (Inch)	Screen Area in²	Maximum Trash Capture Volume (MCTV) ft³	Design Flow Rate 50% MCTV CFS	Standard Bypass Flow CFS
18 x18	601	0.7	2.1	2.1
24 x 24	969	1.6	3.2	3.3
36 x 24	1473	3.0	4.8	4.5

The Enviropod LittaTrap™ has an adjustable bypass. Flow rates listed are for a factor set bypass. Please contact Enviropod for specific bypass requirements.

For curb entry catch basins a series of standard LittaTrap™ models and seal extension kits are used to extend across the length of the curb entry.

The "EnviroPod LittaTrap™" may be protected by one of the following Canadian, USA or International patent numbers and has other patents pending : 2,810,974, 13/824,376, 15/459,964, 2011302712, 588049 | PATENT No.

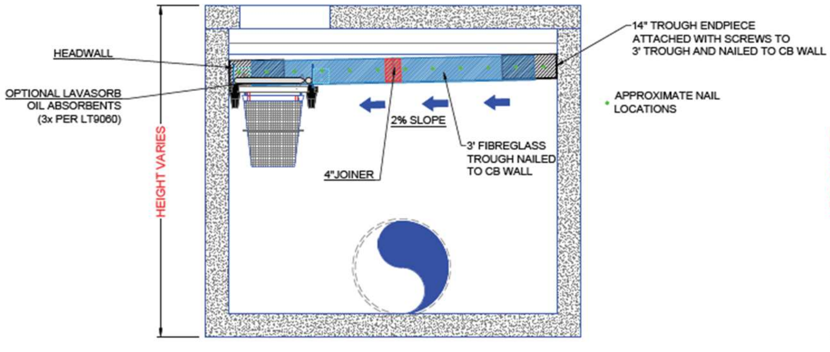
ENVIROPOD
www.enviropod.com

Enviropod LittaTrap™ FC
CURB ENTRY
GENERIC DRAWING
(IMPERIAL UNITS)

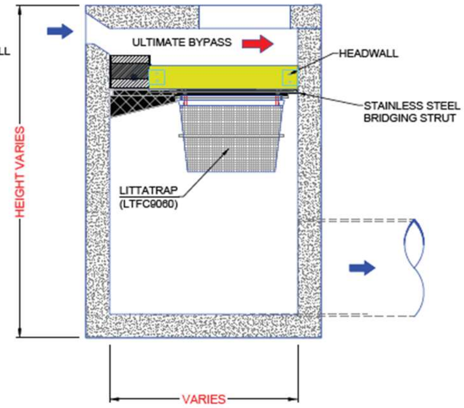
REV #	DATE	REVISION DESCRIPTION	BY
A	13.07.19	FIRST ISSUE	R.P.
B	10.04.20	TABLE REVISED	R.P.
C	21.04.20	VECTOR PORT UPDATE	R.P.
D	30.07.20	TABLES REVISED	R.P.
E	09.09.20	TABLES REVISED	R.P.

SHEET NUMBER: 1 OF 1

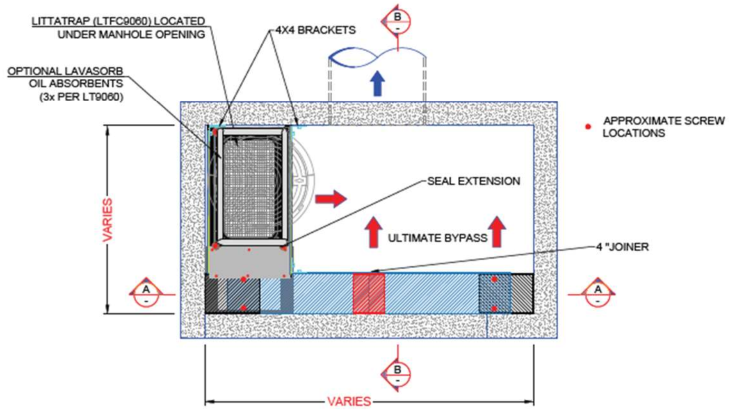
DATE : 13.07.19 | SCALE : NTS | DRAWN : R.P. | CHECKED : M.H. | PROJECT No : | REV : E



SECTION A-A



SECTION B-B



PLAN VIEW

ENVIROPOD EASY MAINTENANCE MANHOLE ACCESS (EMMA) CURB ENTRY LITTATRAP FLOW AND STORAGE SPECIFICATION

LITTATRAP EMMA KIT NAME	CURB ENTRY CATCH BASIN LENGTH (FEET)	LittaTrap FC MODEL	MAXIMUM TRASH CAPTURE VOLUME (MTCV)	LITTATRAP DESIGN FLOW RATE (50% MTCV) CFS	CHANNEL MAX FLOW RATE CFS	BASKET BYPASS FLOW RATE CFS	TROUGH BYPASS (200% SAFETY FACTOR) CFS
Fiberglass EMMA kit - LT9060	3'+	LTFC9060	3.0	4.8	2.1	4.5	3.4 + 0.55 per ft

The Enviropod LittaTrap™ flow rates listed are for a factory set bypass. Please contact Enviropod for specific bypass requirements.

Trough bypass is based on minimum 3' EMMA kit and has additional bypass capacity per each added foot of trough, and is based on 150mm height above the trough and assumes no restriction in structure inlets/outlets.

PATENT No.

THE **Enviropod®** may be protected by one of the following Canadian, USA or International patent numbers and has other patents pending : 2,810,974, 13/824,376, 15/459,964, 2011302712, 588049

ENVIROPOD™
A STORMWATER360™ COMPANY

ENVIROPOD LittaTrap™
CURB ENTRY APPLICATION
EASY MAINTENANCE MANHOLE (EMMA)
GENERAL ARRANGEMENT

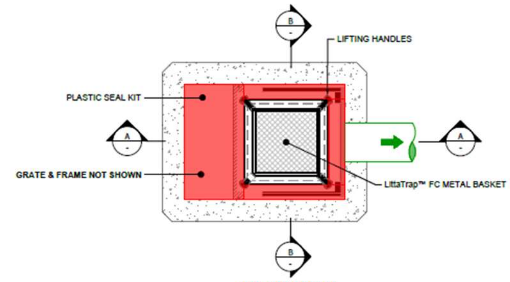
DRG No : USA-CURB-EMMA-V2 | REV : E | DATE : 11/17/23

JOB NO :			
PROJECT :			
DRN :	R.P.	08/23/21	
CKD :	M.H.	08/23/21	

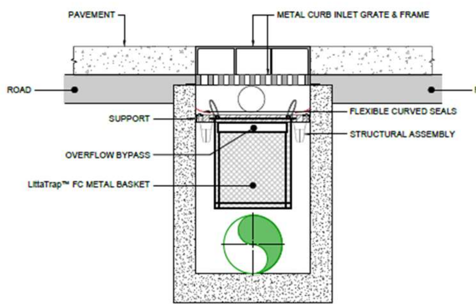
REV	REVISION DETAIL	DATE
A	FIRST ISSUE	08/23/21
B	ADDED DETAIL	12/14/21
C	FIBERGLASS	03/03/23
D	TABLE/LAVASORB	11/09/23
E	SIMPLE TABLE	11/17/23

ENVIROPOD LittaTrap™ FC METAL BASKET COMBINATION INLET FLOW & STORAGE SPECIFICATION					
Catch Basin Diameter (Inch)	LittaTrap™ FC Metal Basket Model	Screen Area (in²)	Maximum Trash Capture Volume (MCTV ft³)	Design Flow Rate 50% MCTV CFS	Standard Bypass Flow CFS
18 x 18	LTHD4545	558	0.75	2.2	2.1
24 x 24	LTHD6060	942	2.15	3.8	3.5
36 x 24	LTHD9060	1295	3.75	5.2	4.8

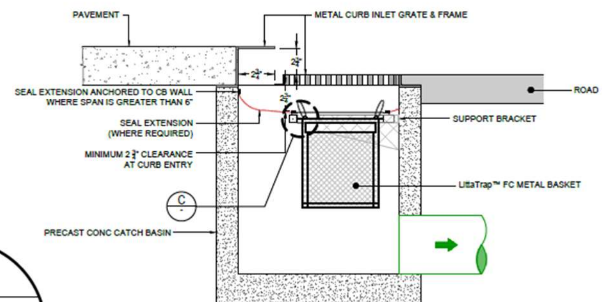
NOTE: Bypass flow rates based on a standard 2" bypass. Contact Enviropod for additional bypass requirements.
Additional seal kits or metal flanges may be required based on Catch Basin internal dimensions.



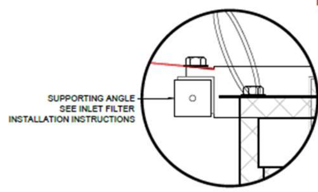
PLAN VIEW



SECTION B-B



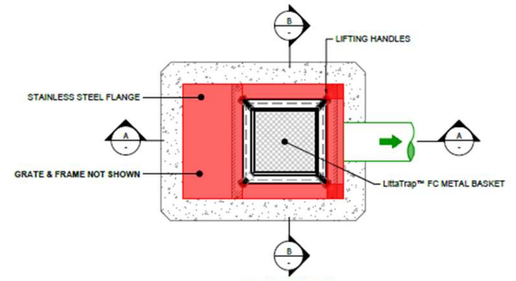
SECTION A-A



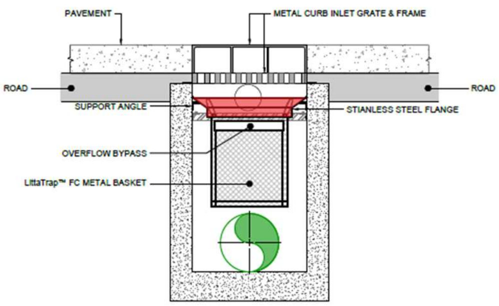
DETAIL C

ENVIROPOD A STORMWATER360™ COMPANY	(866) 651 0566	CONDITION OF USE	ENVIROPOD INC.	JOB NO :		REV	REVISION DETAIL	DATE
	info@enviropod.com	© ENVIROPOD 2021 Any unauthorised reproduction of this drawing in part or in full is prohibited	LittaTrap™ FC COMBINATION INLET METAL BASKET	PROJECT :		A	FOR INFORMATION	05/08/24
	www.enviropod.com		GENERAL SPECIFICATIONS DRAWING	DRN :	B.NEL 05/08/2024			
			SCALE : N.T.S. DRG No : US-LTHD-FCSC-INO-20 REV : A DATE : 05/08/24	CKD :	B.v.LEER 05/08/2024			

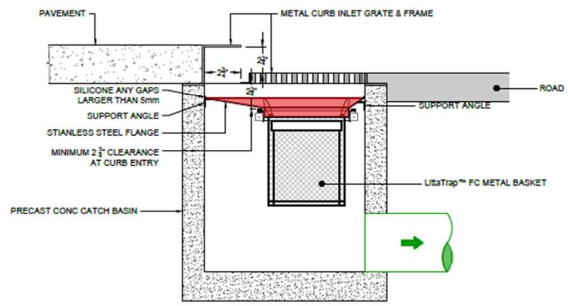
ENVIROPOD LittaTrap™ FC METAL BASKET COMBINATION INLET FLOW & STORAGE SPECIFICATION					
Model Name	SKU	Screen Area in^2	Maximum Trash Capture Volume (MTCV) ft^3	Design Flow Rate 50% MTCV (CFS)	Standard Bypass Flow (CFS)
LittaTrap™ HD (18 x 18)	LTHD4545	558	0.75	2.2	2.1
LittaTrap™ HD (24 x 24)	LTHD6060	942	2.15	3.8	3.5
LittaTrap™ HD (36 x 24)	LTHD9060	1295	3.75	5.2	4.8
NOTE: Bypass flow rates based on a standard 2" bypass. Contact Enviropod for additional bypass requirements					



PLAN VIEW



SECTION B-B



SECTION A-A

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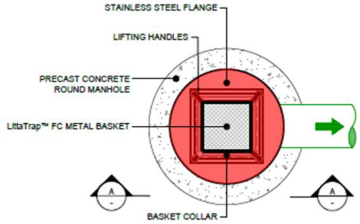
ENVIROPOD INC.
LittaTrap™ FC COMBINATION INLET METAL BASKET & FLANGE
GENERAL SPECIFICATIONS DRAWING

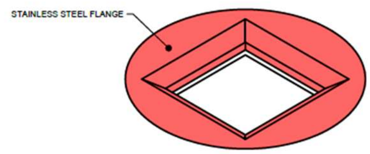
SCALE : N.T.S. | DRG No : US-LTHD-FCSC-INFL-20 | REV : A | DATE : 05/08/24

			REV	REVISION DETAIL	DATE
JOB NO :					
PROJECT :			A	FOR INFORMATION	05/08/24
DRN :	B.NEL	05/08/2024			
CKD :	B.v.LEER	05/08/2024			

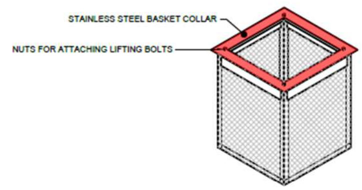


PLAN VIEW

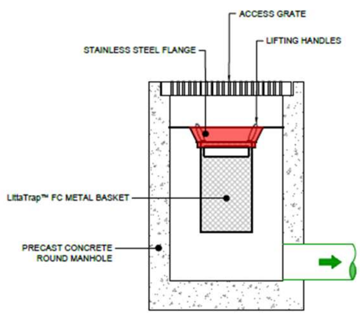
COVER AND FRAME OMITTED FOR CLARITY



LittaTrap™ FC METAL BASKET ROUND FLANGE



LittaTrap™ FC METAL BASKET



SECTION A-A

ENVIROPOD LittaTrap™ FC METAL BASKET MODELS & SIZES

LittaTrap™ FC Metal Basket Model Size (inch)	LittaTrap™ FC Metal Basket Model	Bracket Width (Inch)	Min Filter Box Size (Without Seals)		Min Filter Box Size (WithSeals)		Basket Collar Size		Basket Depth (Inch)
			Lenght (Inch)	Width (Inch)	Lenght (Inch)	Width (Inch)	Lenght (Inch)	Width (Inch)	
18 x 18	LTHD4545	17.1	15.4	15.4	20.6	20.6	12.0	12.0	15.5
24 x 24	LTHD6060	22.4	20.2	20.2	25.3	25.3	17.3	17.3	15.5

ENVIROPOD LittaTrap™ FC METAL BASKET ROUND MANHOLE FLOW & STORAGE SPECIFICATION

Catch Basin Diameter (Inch)	LittaTrap™ FC Metal Basket Model	Screen Area (in²)	Maximum Trash Capture Volume (MCTV ft³)	Design Flow Rate 50% MCTV CFS	Standard Bypass Flow CFS
24" - 27"	LTHD4545	558	0.75	2.2	2.1
36"	LTHD6060	942	2.15	3.8	3.5
48"	LTHD6060	942	2.15	3.8	3.5

NOTE: Bypass flow rates based on a standard 2" bypass. Contact Enviropod for additional bypass requirements

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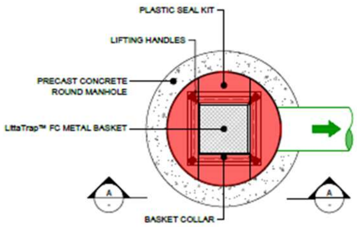
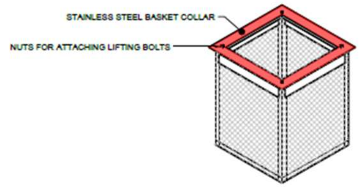
ENVIROPOD INC.
LittaTrap™ FC ROUND MANHOLE
METAL BASKET & FLANGE
GENERAL SPECIFICATIONS DRAWING

SCALE : N.T.S.	DRG No : ENV-LT-FC-RD-MH-20	REV : A	DATE : 05/08/24		
JOB NO :			REV	REVISION DETAIL	DATE
PROJECT :			A	FOR INFORMATION	05/08/24
DRN :	B.NEL	05/08/2024			
CKD :	B.v.LEER	05/08/2024			

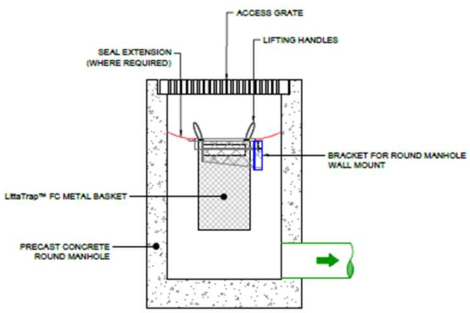


PLAN VIEW

COVER AND FRAME OMITTED FOR CLARITY



LittaTrap™ FC METAL BASKET



SECTION A-A

ENVIROPOD LittaTrap™ FC METAL BASKET MODELS & SIZES

LittaTrap™ FC Metal Basket Model Size (inch)	LittaTrap™ FC Metal Basket Model	Bracket Width (Inch)	Min Filter Box Size (Without Seals)		Min Filter Box Size (WithSeals)		Basket Collar Size		Basket Depth (Inch)
			Lenght (Inch)	Width (Inch)	Lenght (Inch)	Width (Inch)	Lenght (Inch)	Width (Inch)	
18 x 18	LTHD4545	17.1	15.4	15.4	20.6	20.6	12.0	12.0	15.5
24 x 24	LTHD6060	22.4	20.2	20.2	25.3	25.3	17.3	17.3	15.5

ENVIROPOD LittaTrap™ FC METAL BASKET ROUND MANHOLE FLOW & STORAGE SPECIFICATION

Catch Basin Diameter (Inch)	LittaTrap™ FC Metal Basket Model	Screen Area (in²)	Maximum Trash Capture Volume (MCTV ft³)	Design Flow Rate 50% MCTV CFS	Standard Bypass Flow CFS
24" - 27"	LTHD4545	558	0.75	2.2	2.1
36"	LTHD6060	942	2.15	3.8	3.5
48"	LTHD6060	942	2.15	3.8	3.5

NOTE: Bypass flow rates based on a standard 2" bypass. Contact Enviropod for additional bypass requirements

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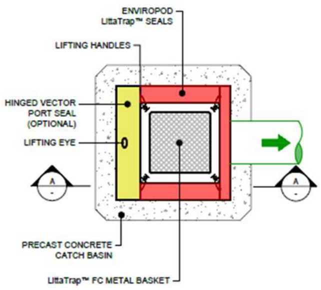
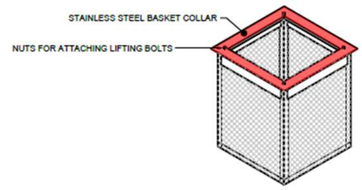
ENVIROPOD INC.
LittaTrap™ FC ROUND MANHOLE METAL BASKET
GENERAL SPECIFICATIONS DRAWING

SCALE : N.T.S.	DRG No :	ENV-LT-FC-RD-MHNF-20	REV : A	DATE : 05/08/24

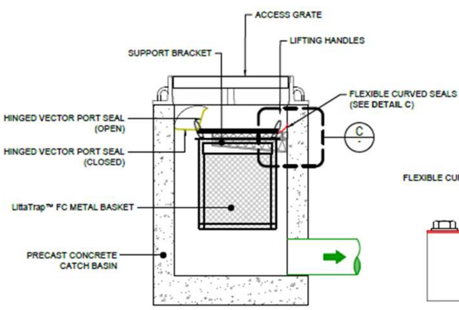
JOB NO :			REV	REVISION DETAIL	DATE
PROJECT :			A	FOR INFORMATION	05/08/24
DRN :	B.NEL	05/08/2024			
CKD :	B.v.LEER	05/08/2024			



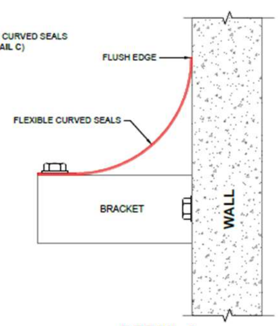
PLAN VIEW



LittaTrap™ FC METAL BASKET



SECTION A-A



DETAIL C

ENVIROPOD LittaTrap™ FC METAL BASKET MODELS & SIZES									
LittaTrap™ FC Metal Basket Model Size (inch)	LittaTrap™ FC Metal Basket Model	Bracket Width (Inch)	Min Filter Box Size (Without Seals)		Min Filter Box Size (WithSeals)		Basket Collar Size		Basket Depth (Inch)
			Lenght (Inch)	Width (Inch)	Lenght (Inch)	Width (Inch)	Lenght (Inch)	Width (Inch)	
18 x 18	LTHD4545	17.1	15.4	15.4	20.6	20.6	12.0	12.0	15.5
24 x 24	LTHD6060	22.4	20.2	20.2	25.3	25.3	17.3	17.3	15.5
36 x 24	LTHD9060	34.3	32.0	20.2	37.1	25.3	29.1	17.3	15.5

ENVIROPOD LittaTrap™ FC METAL BASKET GRATE INLET FLOW & STORAGE SPECIFICATION					
Catch Basin Diameter (Inch)	LittaTrap™ FC Metal Basket Model	Screen Area (in^2)	Maximum Trash Capture Volume (MCTV ft^3)	Design Flow Rate 50% MCTV CFS	Standard Bypass Flow CFS
18 x 18	LTHD4545	558	0.75	2.2	2.1
24 x 24	LTHD6060	942	2.15	3.8	3.5
36 x 18	2 x LTHD4545	1116	1.5	4.4	4.2
36 x 24	LTHD9060	1295	3.75	5.2	4.8
36 x 36	LTHD9060 + Seal Extension Kit	1295	3.75	5.2	4.8
48 x 48	2 x LTHD9060*	2590	7.5	10.4	9.6

The Envipod LittaTrap™ has an adjustable bypass. Flow rates listed are for a factor set bypass. Please contact Enviropod for specific bypass requirements.
* Requires an additional seal extension kit for standard installation

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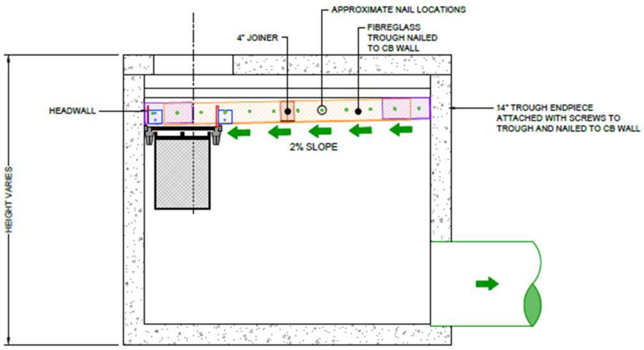
CONDITION OF USE

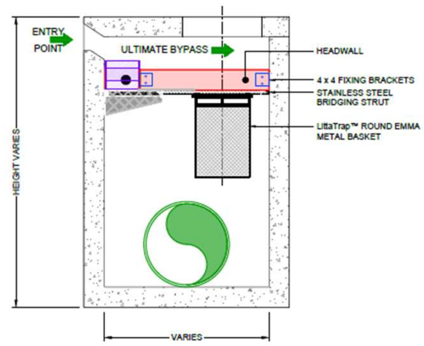
ENVIROPOD INC.
LittaTrap™ FC GRATE INLET
WITH METAL BASKET
GENERAL SPECIFICATIONS DRAWING

SCALE : N.T.S. | DRG No : LT-GRATED-INLET-FC-20 | REV : A | DATE : 05/08/24

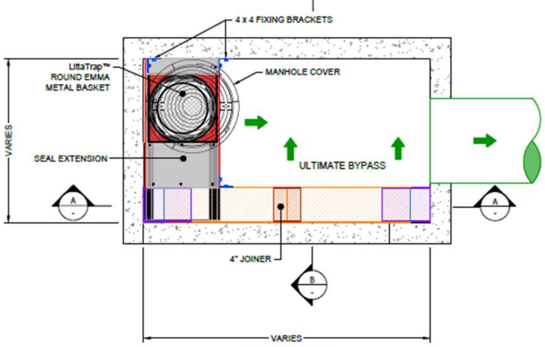
			REV	REVISION DETAIL	DATE
JOB NO :					
PROJECT :			A	FOR INFORMATION	05/08/24
DRN :	B.NEL	05/08/2024			
CKD :	B.v.LEER	05/08/2024			



SECTION A-A



SECTION B-B



PLAN VIEW

ENVIROPOD EASY MAINTENANCE MANHOLE ACCESS (EMMA) CURB ENTRY LittaTrap™ FLOW & STORAGE SPECIFICATIONS

LittaTrap™ EMMA Kit Name	Curb Entry Catch Basin Length (ft)	LittaTrap™ FC Metal Basket Model	Maximum Trash Capture Volume (MCTV ft³)	Design Flow Rate 50% MCTV (CFS)	Channel Max Flow Rate (CFS)	Basket Bypass Flow Rate (CFS)	Trough Bypass (200% Dafety Factor CFS)
Fibreglass EMMA Kit - LTHDEMMA-12	3'+	LTHDEMMA-12	1.35	1.84	2.1	2.6	3.4 + 0.55 per ft
Fibreglass EMMA Kit - LTHDEMMA-24	3'+	LTHDEMMA-24	2.70	8.07	2.1	2.6	3.4 + 0.55 per ft

The Enviropod LttaTrap™ flow rates listed are for a factory set bypass. Please contact Enviropod for specific bypass requirements.
Trough bypass is based on minimum 3' EMMA kit and has additional bypass capacity per each added foot of trough, and is based on 150mm height above the trough and assumes no restriction in structure inlets/outlets.
The Enviropod LittaTrap™ shall not block the view of the outlet pipe for easy mosquito vector access.

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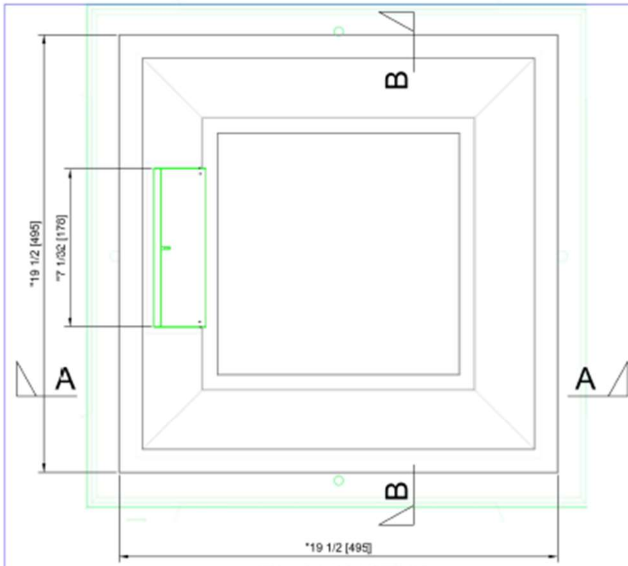
ENVIROPOD INC.
LittaTrap™ FC METAL BASKET
EASY MAINTENANCE MANHOLE (EMMA)
GENERAL SPECIFICATIONS DRAWING

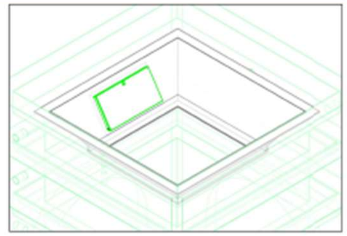
SCALE : N.T.S. | DRG No : USA-CURB-EMMA-V2-20 | REV : A | DATE : 05/08/24

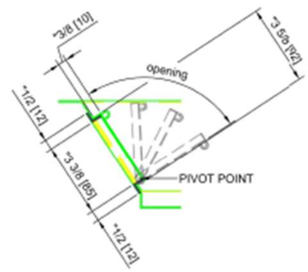
JOB NO :		REV	REVISION DETAIL	DATE
PROJECT :		A	FOR INFORMATION	05/08/24
DRN :	B.NEL 05/08/2024			
CKD :	B.v.LEER 05/08/2024			



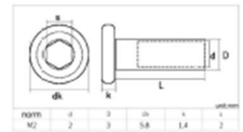
PLAN VIEW

SCALE 1:5





DETAIL C



Proposed PIVOT POINT :
Hexagon Socket Rivet Connector Insert Joint
Sleeve Cap
Nut M2 - 304 Stainless Steel Splint Nut

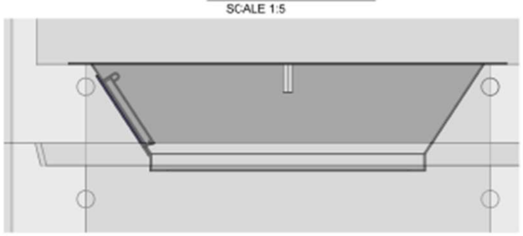
Design and Fabrication Notes for Hinged Cover Plate:

1. Lid:
   Material: 1/16" stainless steel (SS 304)
   Function: Designed to cover an inspection opening and allow easy access.

2. Pivot Point Specifications:
   Hexagon Socket or Rivet Connector.

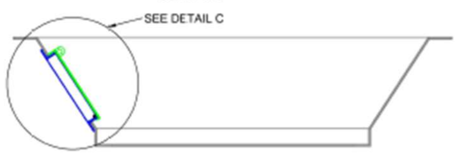
3. Frame:
   Stainless steel (SS 304)..
   Fixed to S/S flange fron the bottom, use 3/32" pop rivets or suitable self-tapping screws for assembly, all fasteners to be S/S

4. Safety and Finishing:
   Edge Deburring: Deburr all edges to ensure there are no sharp or rough edges that could lead to injuries or snagging.
   Alignment Check: Ensure that the cover plate aligns correctly with the frame when closed.
   Weatherproofing (Optional): If required, add a gasket or seal around the perimeter to prevent water ingress.
5. Testing:
   Operational Test: Test the hinge mechanism to ensure it operates smoothly and that the cover securely latches when closed.
   Durability Verification: Confirm that the hinge and fasteners hold up under repeated operation without loosening.

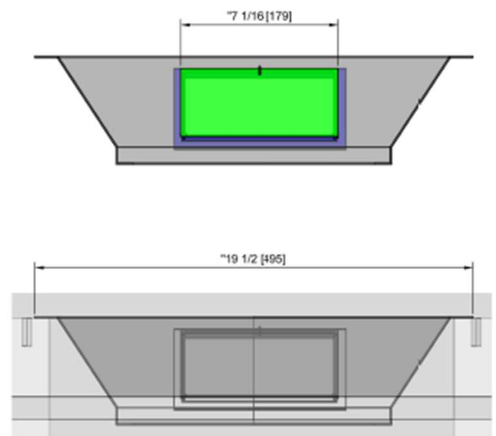


FRONT VIEW

SCALE 1: 5

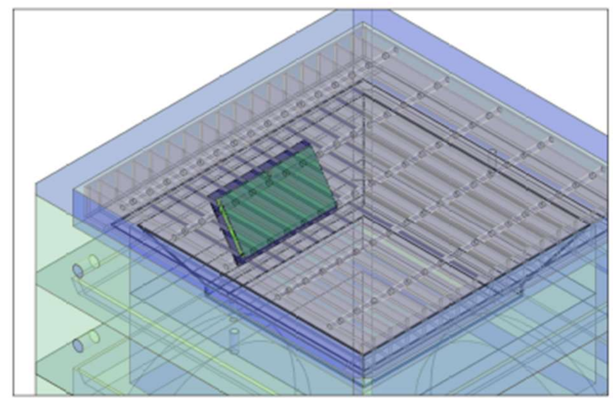


SECTION A-A



SIDE VIEW

SCALE 1:5



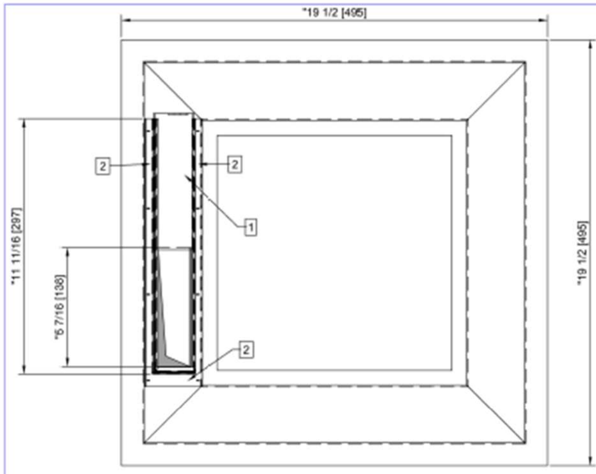
Vector Port Seal mounted in the S/S flange

Stormwater360
BETWEEN SKY AND SEA

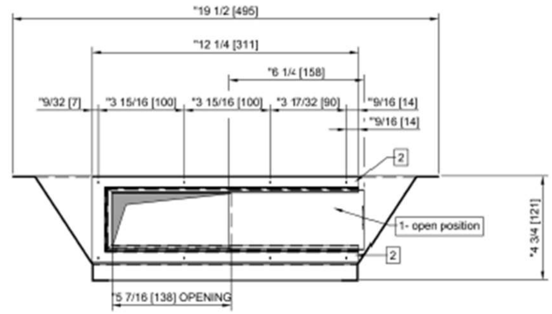
0800 STORMWATER
sales@stormwater360.co.nz
www.stormwater360.co.nz

Hinged Vector Port Seal
for
EnviroPod Stainless steel flange
Detail drawing

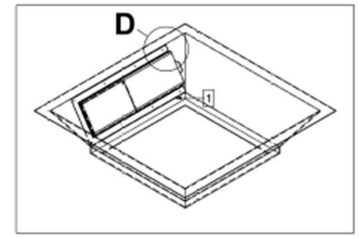
SCALE :	DRG No : HINGED VECTOR PORT	REV : B	DATE : 15.11.24		
JOB NO :	-		REV	REVISION DETAIL	DATE
PROJECT :	-		A	FOR INFORMATION	15.11.24
			B	GRATE ORIENTATION	19.11.24
DRN :	DDB	15.11.2024			
CKD :	GY	15.11.2024			



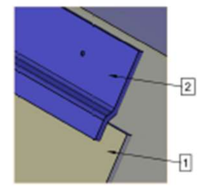
PLAN VIEW
SCALE 1:5



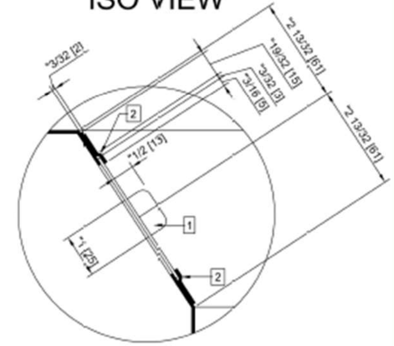
B-B (1:5)



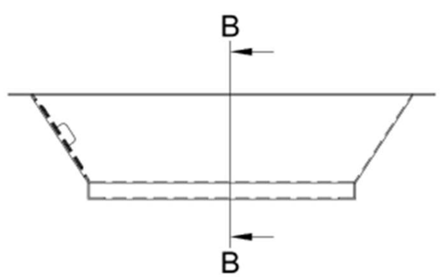
ISO VIEW



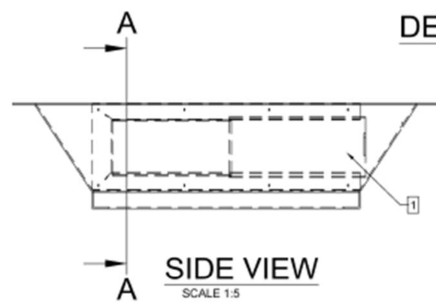
DETAIL D



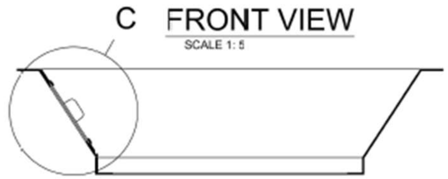
DETAIL C



FRONT VIEW
SCALE 1: 5



SIDE VIEW
SCALE 1:5



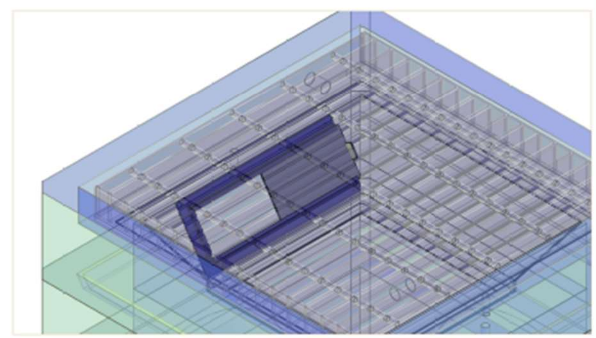
A-A (1:5)

Parts:

1. **Sliding Cover Plate**: Fabricate from 1/16" stainless steel (SS 304). Designed to cover an inspection opening.
2. **Guide Channels**: Install at the top and bottom of the opening to facilitate smooth sliding of the cover plate. Attach these guide channels to the Enviropod stainless steel flange using 3/32" pop rivets or suitable self-tapping screws.

Notes:

- Manufacture guide channels with precise clearances to allow for easy, unrestricted movement of the sliding cover plate.
- Attach a push plate, as per the drawing, centered on the cover plate to assist in sliding it open and closed.
- Ensure all edges are deburred and smooth to prevent snagging during operation.
- Test the sliding operation to verify ease of movement and alignment.
- Confirm that all fasteners used are corrosion-resistant, meeting industry standards for durability.



Vector Port Seal mounted in the S/S flange

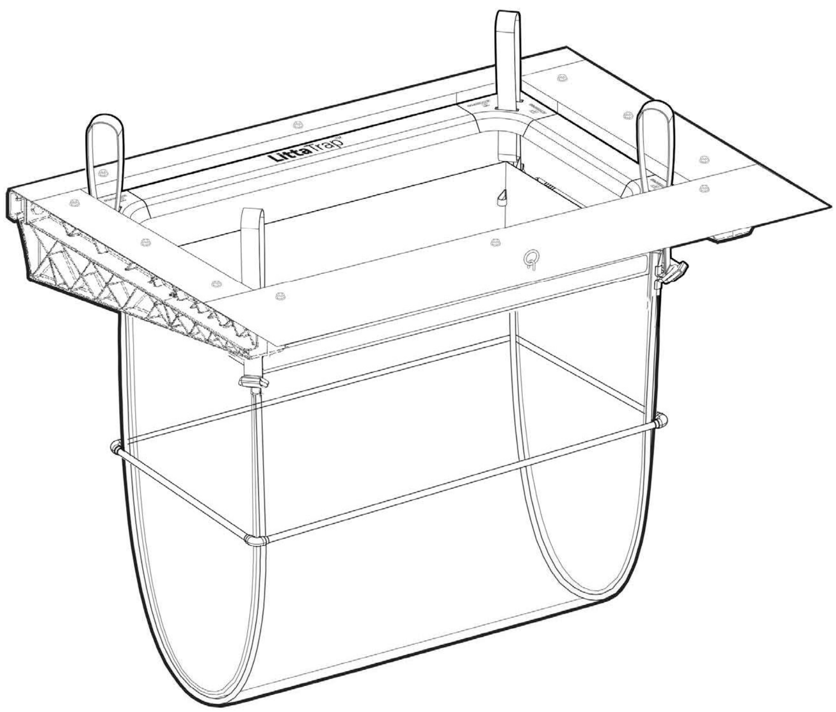
Stormwater360 BETWEEN SKY AND SEA	0800 STORMWATER	CONDITION OF USE	Sliding Vector Port Seal for EnviroPod Stainless steel flange Detail drawing	JOB NO : -		REV	REVISION DETAIL	DATE
	sales@stormwater360.co.nz	© STORMWATER360 2022		PROJECT : -		A	FOR INFORMATION	12.11.24
	www.stormwater360.co.nz	Any unauthorised reproduction of this drawing in part or in full is prohibited				B	COMMENTS ADDED	14.11.24
			SCALE :	DRN : DDB	12.11.2024			
			DRG No : SLIDING VECTOR PORT REV : A DATE : 12.11.24	CKD : GY	12.11.2024			

APPENDIX B – Installation Manuals

LittaTrap™

CATCH BASIN INSERT FOR FULL CAPTURE OF TRASH AND GROSS POLLUTANTS

Enviropod LittaTrap™ FC
For Grated Inlet Catch Basins



For installation you will need:

- Measuring Tape
- Box Knife
- Rotary Hammer Drill and 3/8" (10mm) Masonry Bit
- Socket Set with 1/2" (13mm) & 11/16" (17mm) Sockets
- Battery Drill/Driver & 5/16" (8mm) Socket Bit

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The "EnviroPod LittaTrap" may be protected by one of the following Canadian, USA or International patent numbers and has other patents pending : 2,810,974 , 13/824,376 , 15/459 ,964 , 2011302712, 588049

WARNING

It is essential to follow any local or national Occupational Health and Safety Laws when installing or maintaining LittaTrap™ filters. Ensure all required Personal Protection Equipment (PPE) is worn at all times and Traffic Management rules are adhered to.

When maintaining the LittaTrap™ follow all local or national guidelines for manual lifting whenever hand maintenance is actioned.

SITE SAFETY

We recommend checking your local website for a Site Specific Safety Plan before undertaking any installation.

HEALTH AND SAFETY

Personal Protection Equipment (PPE) is required when installing or maintaining a LittaTrap™. This will mean long sleeves, long pants, Hi-Viz, and closed shoes.

We also recommend the use of gloves when maintaining the LittaTrap™.

When maintaining the LittaTrap™ by hand it is essential to identify and assess the weight of the captured material before lifting, as weights can vary depending on the filter contents.

For additional advice on the relevant Health and Safety requirements we recommend that you consult your local website.

MAINTENANCE

All treatment devices require maintenance to remove trapped contaminants and prevent overflow bypass or flooding. Due to the variable nature of stormwater pollution and localised site pollutant loadings, maintenance frequencies vary for different sites and different rainfall characteristics. It is recommended to inspect your LittaTrap™ frequently over the first year of operation to determine seasonal and annual maintenance requirements.

The LittaTrap™ filter should be maintained when it is approximately 2/3 filled with pollutants or if the filter fabric becomes blocked from hydrocarbons, organics or sediment.

Maintenance is carried out by lifting the filter insert out of the frame assembly using 'J' hooks and emptying into a suitable vessel or trailer to be taken away from the site and disposed of appropriately for the contaminants. Please ensure that all care is taken when disposing of litter as the rubbish caught could contain sharp and dangerous objects.

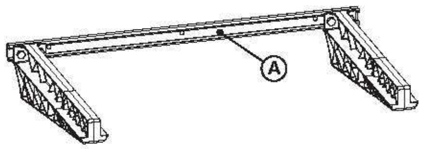
If there are no "J" hooks the bag can be lifted out by the pulling the Filterbag handles. If the filter fabric is clogged, it should be water blasted into a contained vessel prior being fitted back into the frame assembly.

When carrying out maintenance of the LittaTrap™, it is essential to inspect the overflow bypass slots at the top of the filter insert to ensure no pollutants have been caught and may restrict the flow.

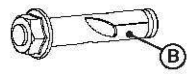
If the LittaTrap™ insert is too heavy to lift by hand, it will need to be maintained using a vacuum inductor truck. When cleaning using a vacuum inductor truck it is essential to take care to not damage the bag from the induction boom. Sediment and pollutants should be vacuum inducted until approx 3/4 empty, and then the remainder lifted and emptied by hand.

SUPPLIED COMPONENTS

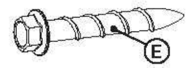
Part A – x1
Bracket



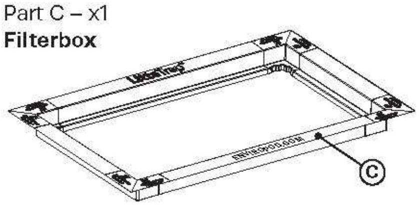
Part B
Masonry Anchor Bolts



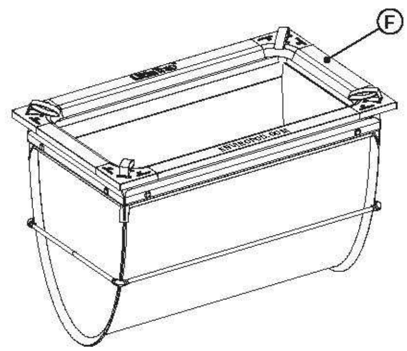
Part E
Self Drilling Hexhead Screws



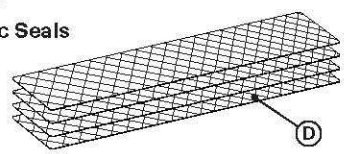
Part C – x1
Filterbox



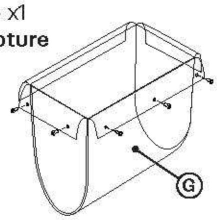
Part F – x1
Filterbag



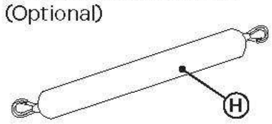
Part D
Plastic Seals



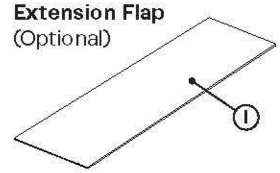
Part G - x1
Full Capture Liner



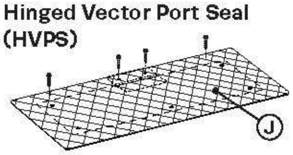
Part H - x1
Oil Absorbant Pouches
(Optional)



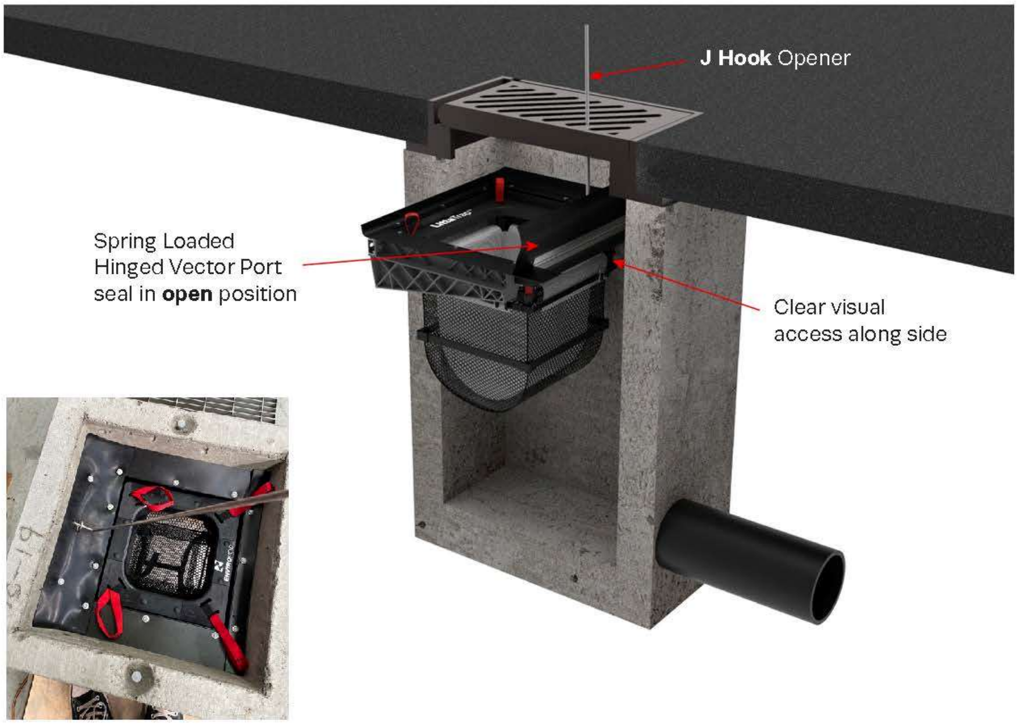
Part I - x1
Extension Flap
(Optional)



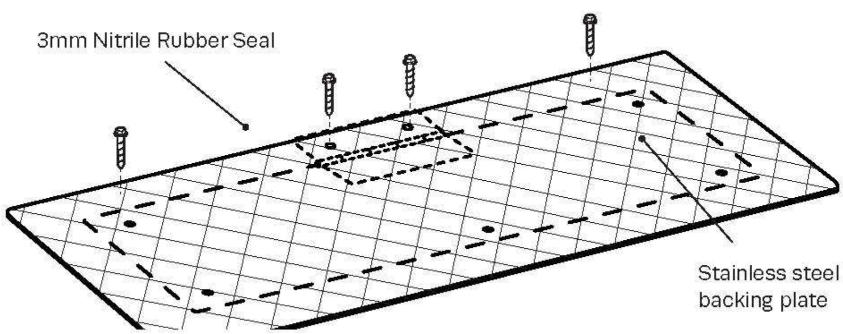
Part J - x1
Hinged Vector Port Seal (HVPS)



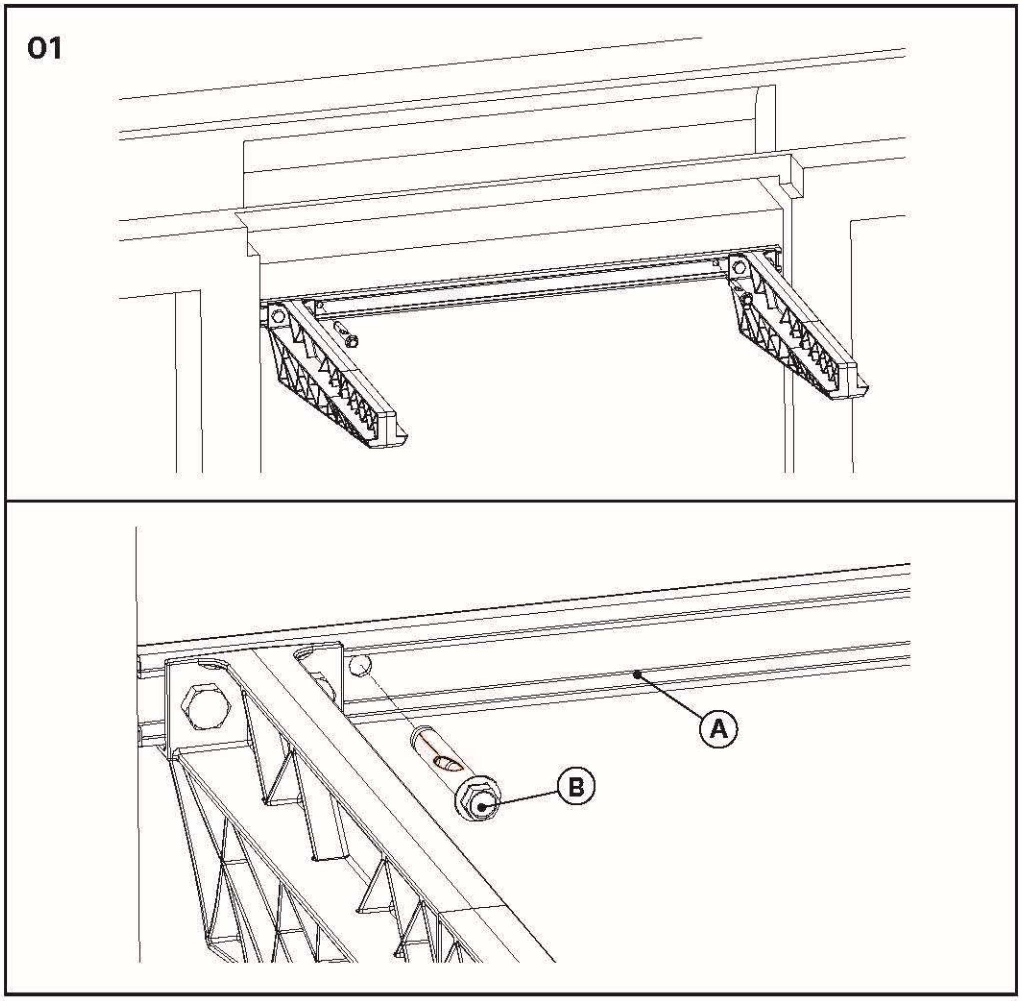
Hinged Vector Port Seal (HVPS)



Part J – x1
Hinged Vector Port Seal (HVPS)



BRACKET INSTALLATION

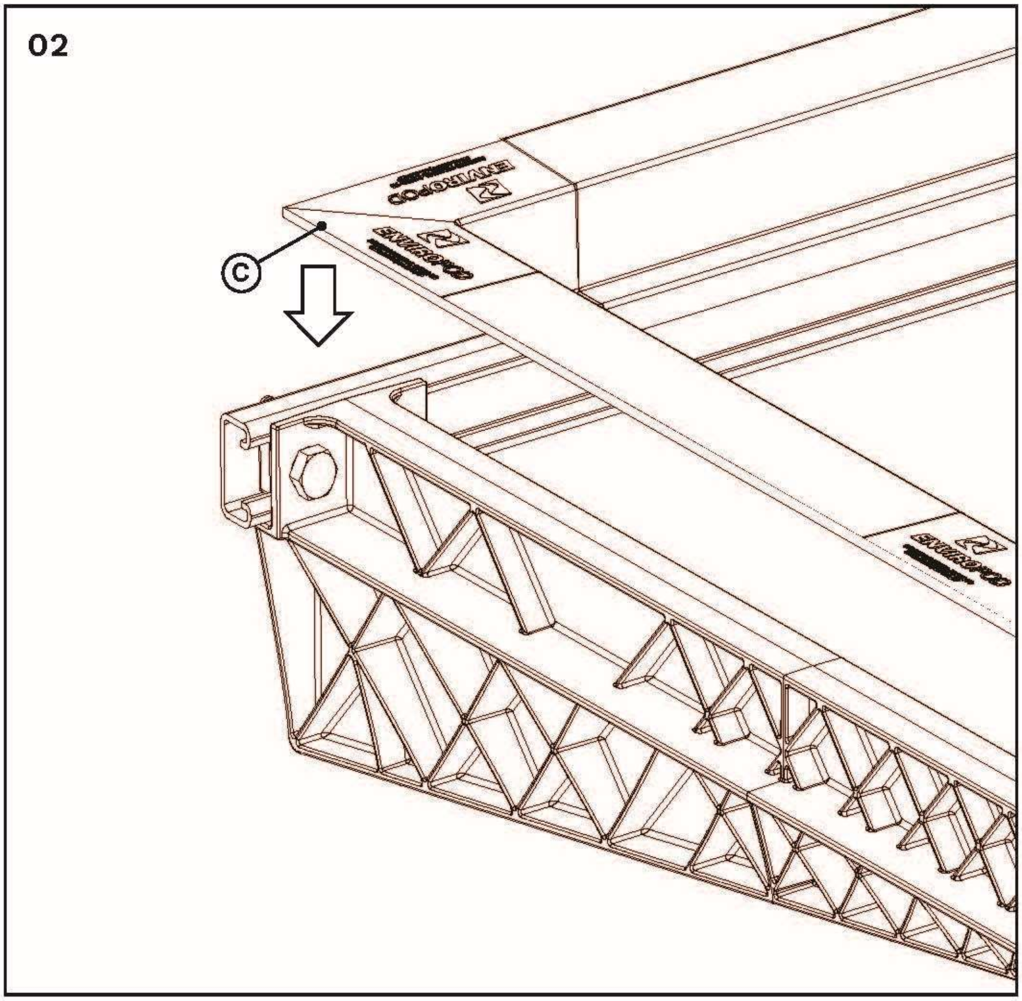


STEP 01

Place the **Bracket** support at approximately 8" below the grate or low enough to intercept any kerb entry inlet and ensure it is level. Using the **Masonry Drill**, drill holes into the pit wall using the **Bracket** holes as guidelines.

Insert the **Anchor Bolts** and using the **1/2" (13mm) socket**, secure through the bracket into the wall and tighten to secure.

02

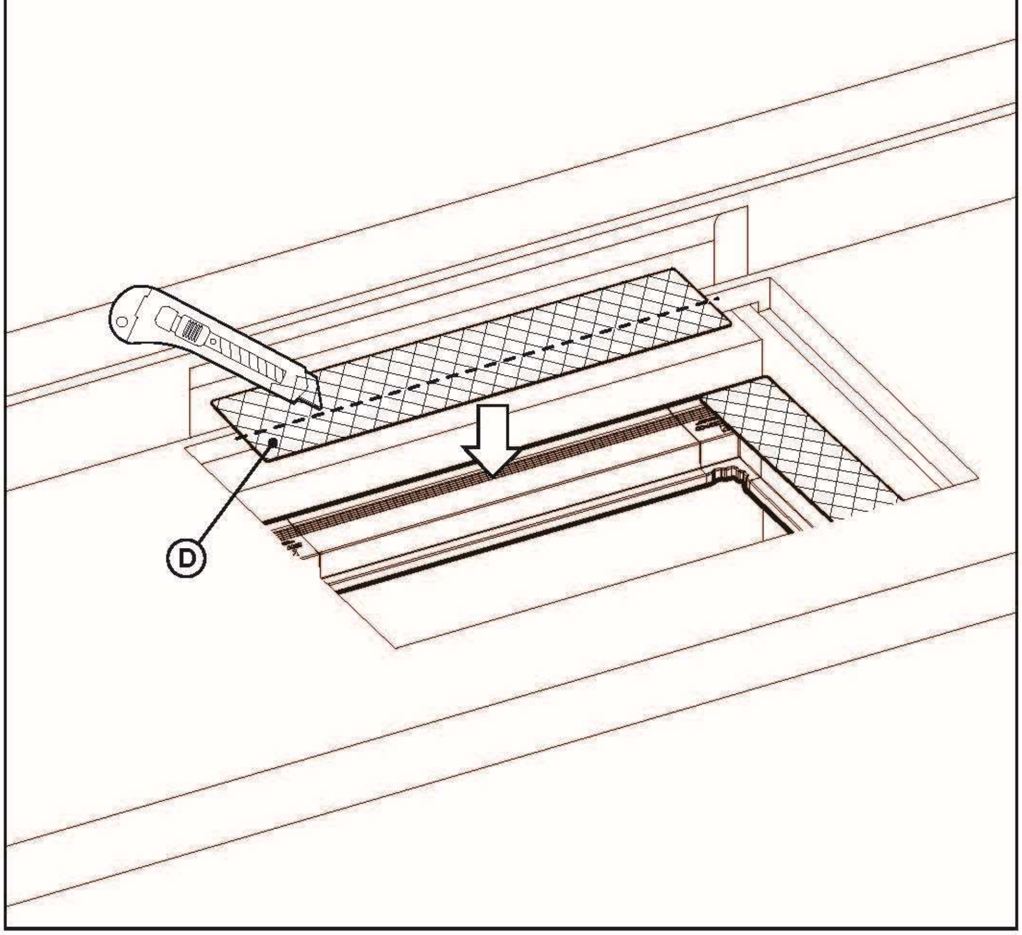


STEP 02

Place **Filterbox** onto the bracket & position hard against bracket assembly to allow maximum opening for the Hinged Vector Port Seal on the opposite side of the Filterbox.

FILTERBOX INSTALLATION

03



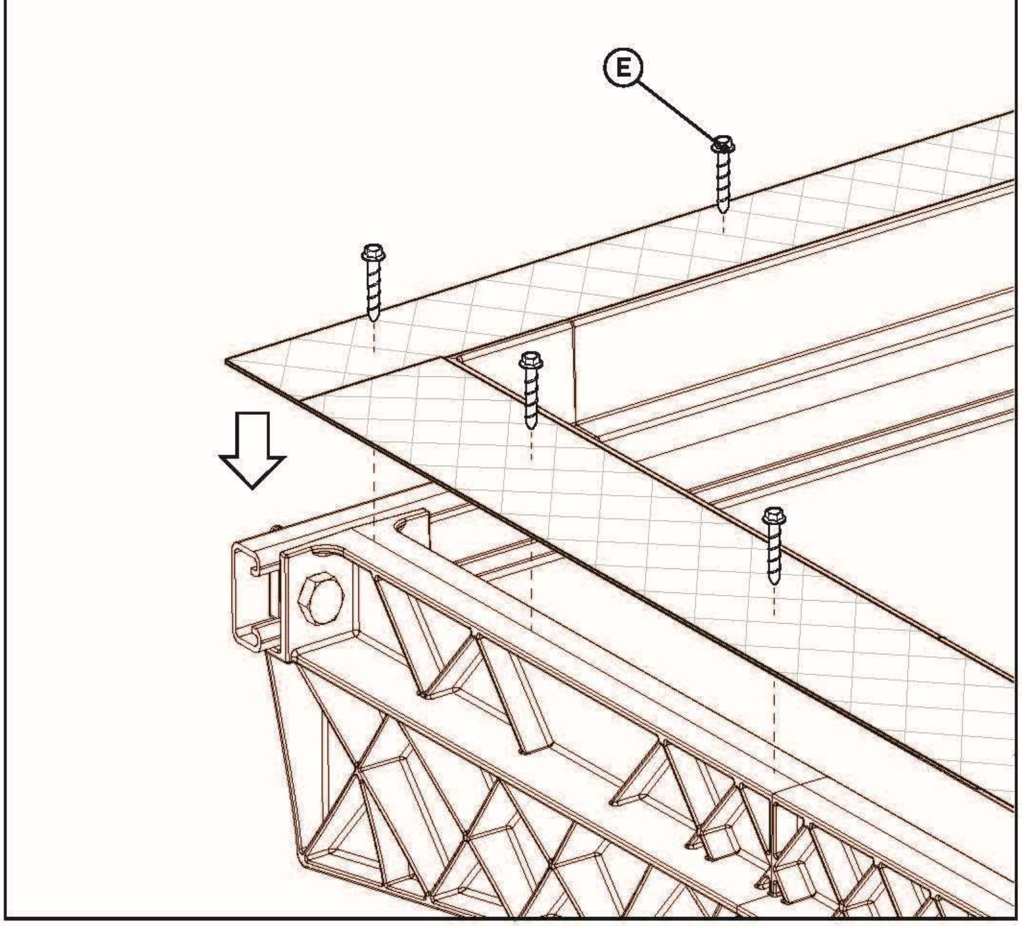
STEP 03

Measure & trim **Plastic Seals** to size with **Box Knife** to seal gaps between **Filterbox** & pit wall.

Make sure the **Plastic Seals** are flush with the **Filterbox** inside edge and do not overlap the inside face.

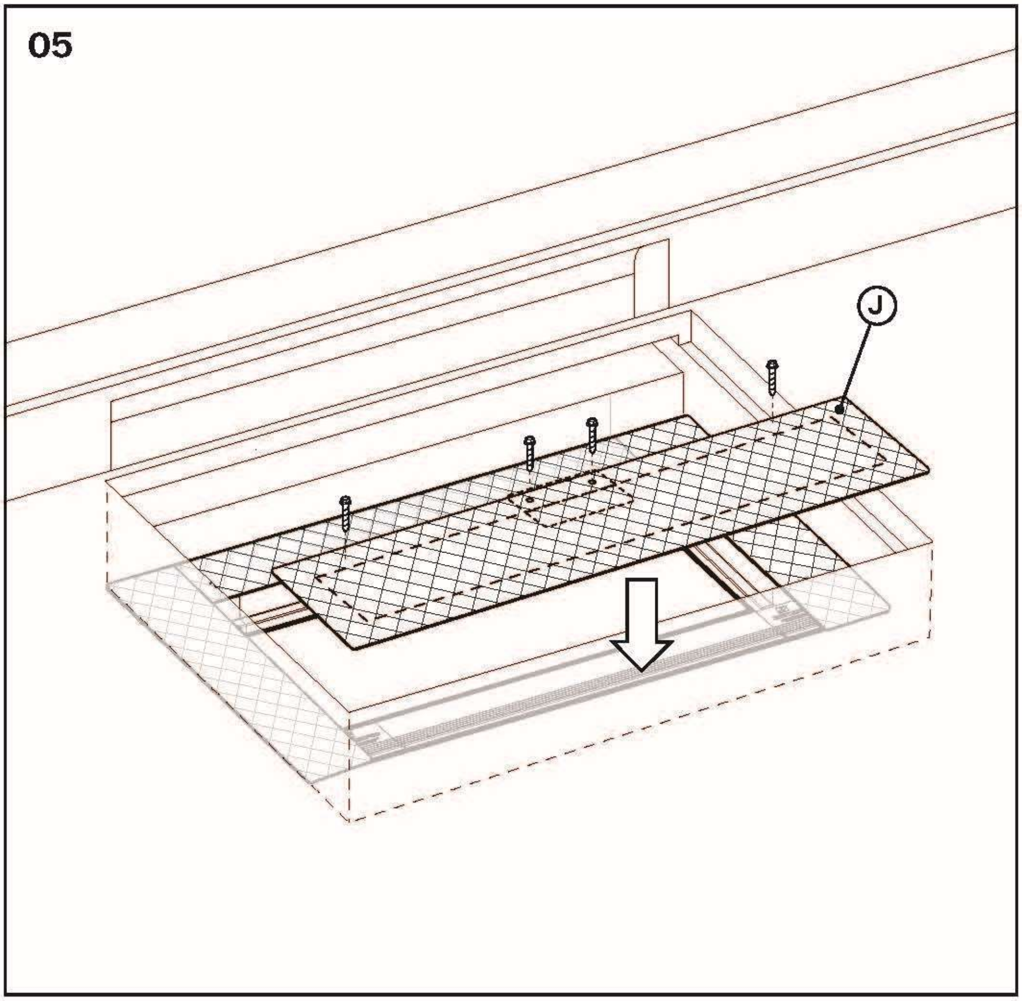
FILTERBOX INSTALLATION

04



STEP 04

Secure the unit using the **Battery Drill** to screw the **Self Drilling Screws** through the **Plastic Seals** into the **Filterbox** and into **Bracket**.
Complete on bracket assembly edge and adjust sides.



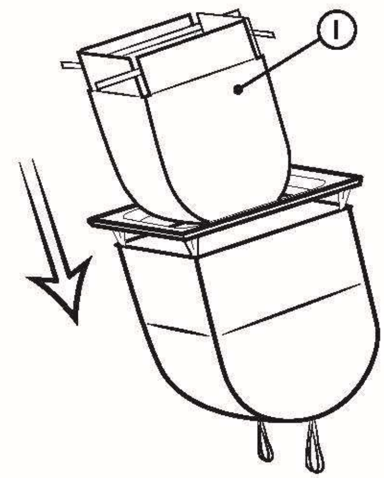
STEP 05

Screw the **Hinged Vector Portal Seal (HVPS)** to the front face of **Filterbox** and **Bracket** to seal gaps.

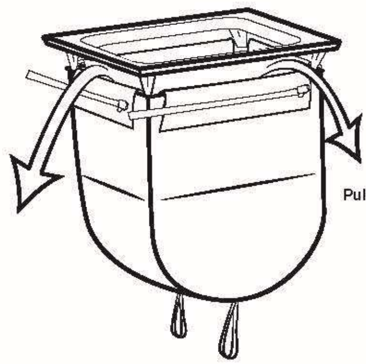
LINERBAG INSTALLATION GUIDE – ALL MODELS

06

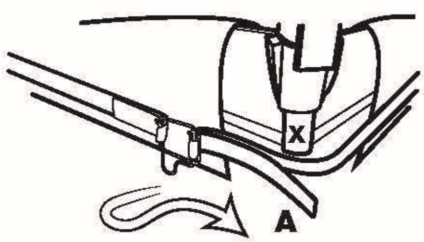
6.1 Insert Full Capture LinerBag
Check LittaTrap & LinerBag **size** match



6.2 Pull LinerBag flaps through gap
Check LinerBag is **not stressed** in corners and no gaps

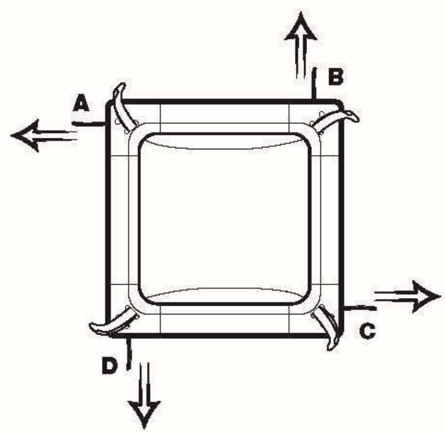


6.3 Thread strap 'A' through buckle (all corners)
Arrange straps **below** plastic corner **peg 'X'**



Thread strap through **middle** of buckle
around and **under**, then **pull** tight

6.4 Pull LinerBag straps tight all corners
Check straps are **below** plastic corner **pegs (fig 3)**



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The Enviropod® LittaTrap Installation Check List

The following installation checklist ensures correct installation of the Enviropod® LittaTrap™ FC. Please complete each step with each installation of the Enviropod® LittaTrap™ FC

Activity	Complete (Y/N)
1. The catch basin is clean and free of trash and debris.	
2. The support bracket is installed 200 mm (7 7/8") below surface and level and below any curb entries.	
3. Anchor bolts are tightened secure and firmly support the bracket.	
4. Filter box positioned so the gross pollutant basket can easily be removed.	
5. Basket is the correct size for the clear opening of the catch basin grate.	
6. Seals are securely fastened to filter box and support bracket (if appropriate).	
7. Seals extend to walls of catch basin have fall across the profile.	
8. Basket and liner is placed in the filter box.	
9. Check for gaps greater than 5 mm.	
10. Take photos of the installed unit with GPS location services on.	
11. All materials cleared from installation	
12. Grate closed.	

LittaTrap™ EMMA Kit SOP

ALL installations start with safety. Please follow all safety protocols for your area. If in the USA, please follow all OSHA guidelines for safe installation per your site. Use the proper PPE for your job. Recommended PPE: safety glasses, hearing protection, dust mask, gloves, Hi-vis clothing, safety toe shoes or boots, long pants, shirt with sleeves, and hard hat or head protection such as a bump cap.

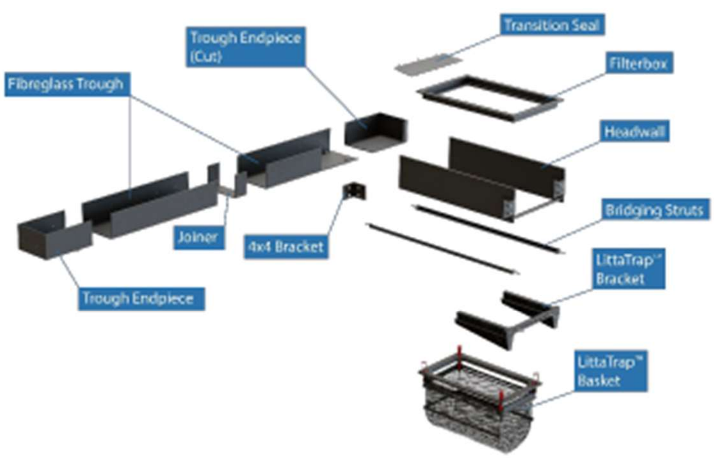
For installation you will need these tools:

- **Razor knife**
- **Tape Measure**
- **Marker**
- **Rotary hammer drill (for masonry)**
- **Impact drill**
- **Grinder with cutoff wheel**
- **Deep socket sizes 3/8", ½"**
- **Masonry drill size ¼"x6", 3/8"x6"**
- **Magnetic tip for Tek screws**
- **Hammer**
- **Level**
- **Masonry Chisel**
- **Caulking Gun**
- **Plumb bob**

The EMMA trough design is intended to position the filter bag insert directly beneath the center of the catch basin manhole or manway. The EMMA design uses a trough system to convey water from the entire catch basin to one or two access points for the catch basin. This design is specifically for ease of maintenance.

Keep in mind that the main principle is to have the water directed to one location using the gradual fall of the trough. The optimal fall for the EMMA trough can be represented as 1/4" per foot or a 2% slope . Variables do occur in the field occasionally. The slope or fall for the EMMA trough has an allowable difference 1/8"-3/8" per foot of fall or 1%-3.1% slope. Again, the optimal designed fall is ¼" per foot or 2% slope. If the CB is shallow, installation may vary, contact Enviropod for more info.

Listed below are the components provided with the EMMA kit:



Hardware and other components required for installation that are not included:

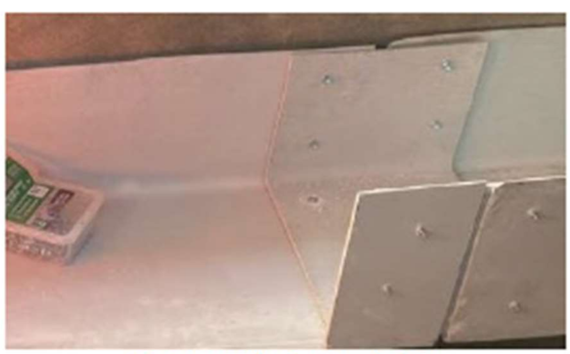
- #10x ¾" TEKS self-driving screws-
- ¼ x 1 ½" drive pins
- 3/8x 3" Red Head concrete anchors

Installation

1. Attaching End Cap to Trough End Sections.
   The end cap should be attached to the length of trough using ¼ by 1 ½ drive pins. If the any of the installed sections will be directly across from the manhole, start with steps 3, 4, and 5 before attaching the trough to the concrete wall. The trough system should be installed 3" below flowline at a 2% slope towards the manhole to account for flow.

Trough with end cap installed attached to the wall.

2. Joining Sections
   When attaching multiple trough sections, first attach a joiner to the section already affixed to the wall. Slide another trough section into place on the joiner and attach to the wall using pins. Continue attaching joiners and trough sections until the final section to be added is directly across from the manhole.

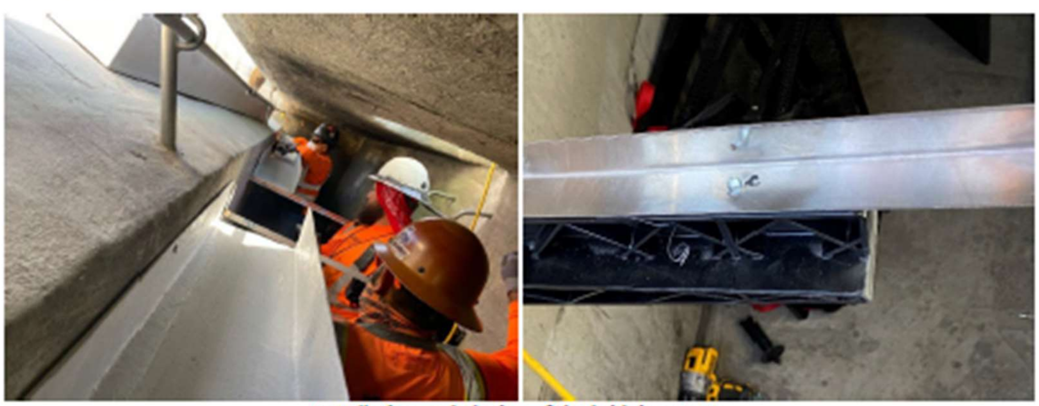


Joiner connecting two trough pieces

3. Installation of LittaTrap frame.
Use a plumb bob or similar tool to position the LittaTrap bracket directly in the middle of the manhole or manway. Obstruction may be present. If ladder rungs in the catch basin are present, you may be able to mount the LittaTrap bracket between the ladder rungs. Removal of obstructions may be necessary for optimal positioning during installation. Follow the instructions with your Enviropod LittaTrap FC kit for installation. Ensure bracket is placed a minimum of 10" below the inlet throat opening. Depending on the configuration, the bracket arms may need to be brought closer together so the LT9060 Filterbox rests on the bridging strut along the long end. Separate instructions are available for that, please contact Enviropod for more detail.

Installation of the LittaTrap Bracket

4. Bridging Strut Installation.
Install the bridging strut by placing it onto the bracket arm as shown in the photo below (right). Fix using Tek screws through the pilot holes into the bracket arm and onto the opposite wall using 3/8" concrete anchors. The bridging struts should be attached to the concrete wall so that the next trough will go over the top and rest directly on top at a slightly higher level than the LittaTrap Bracket.



Installation and placing of the bridging struts.

5. Cut opening for trough transition
   Measure the distance between the bridging struts and cut a rectangular section out of the final trough piece(s). The cut opening should line up with the bridging struts when placed on top as shown in the example below. Place the cut section of trough between joiner and wall and install into the concrete using the ¼" drive pins and using ¼" Tek screws on the opposite side.

Example installation where a 2' trough section has a section cutout that matches the bridging struts.

6. Attaching Headwalls and 4x4 brackets
   Screw the headwalls into the 4x4 brackets using the Tek screws. Then, attach the 4x4 brackets to the concrete wall of the catch basin and the trough as shown in the images below.

4x4 bracket installation attaching the headwall to the trough (left) and the concrete cb wall (right).

7. Filterbox installation
   Install Filterbox on the LittaTrap bracket arms using the Tek screws so that the Filterbox is directly under the manhole opening. If there are ladder rungs or other obstructions in the catch basin, make sure there is space for the basket to be removed when full.

Filterbox is attached to bridging struts and bracket arms with Tek screws. Basket is placed in Filterbox early to confirm easy removal even when full.

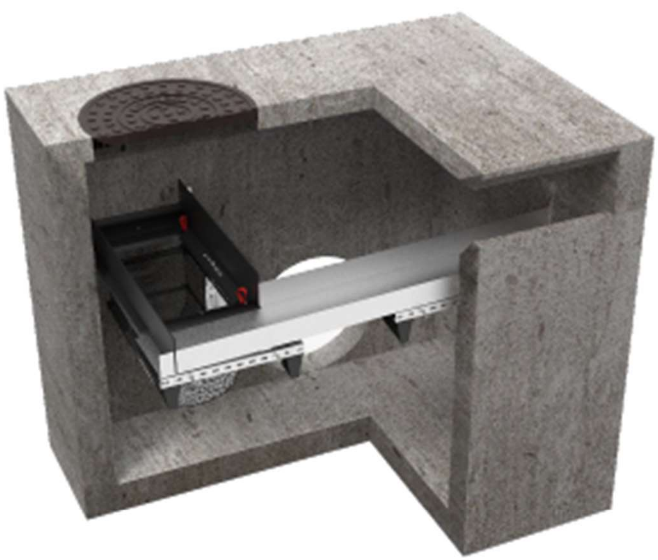
8. **Install transition seal**
   Using the Tek screws, cut and install the extension seal across the transition area between the trough and the LittaTrap Filterbox. You can use the cutout section of the fiberglass trough to help span the gap as shown below

Transition section between the trough and Filterbox spanned with LittaTrap seal and the cut out section of the trough.

9. **RTV silicone all joints and gaps greater than 5mm.**

10. Insert the LittaTrap Filter bag with FC liner and oil absorbent pouches as required per project.

Finished installation with the LittaTrap basket placed in the catch basin.



Cutaway model of a side manhole EMMA installation.

APPENDIX C – Case Studies

LittaTrap™

PROJECT UPDATE 25/03/15

Beresford Street Trial

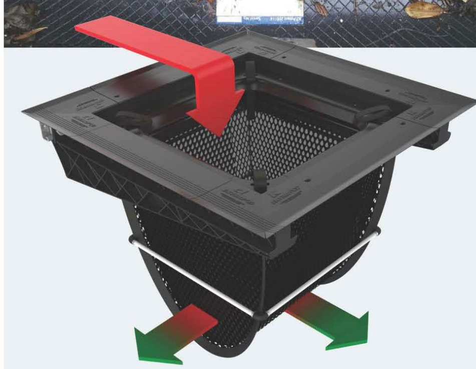
The Beresford Street Trial is a pilot study of the use of the Gross Pollutant LittaTrap under the supervision of Stormwater360. A single catchpit insert was installed on the corner of Beresford Street and Hopetoun Street, Auckland. The aim of the trial is to provide quantitative and qualitative data on the gross pollutants captured by the LittaTrap in a typical inner city Auckland catchment.

Figure 2. Beresford Street site. Approximate catchment area shaded.

CATCHMENT

The Beresford Street catchment is part of a steeply sloping street in Auckland's Karangahape Road district. The catchment area is nominally ca. 300 m2 (see Figure 2), however in periods of high flow it probably receives runoff from a substantially larger area, due to bypass of the uphill catchments on the steep slope.

The catchment has relatively low vehicle traffic loads, but receives substantial foot traffic. It is adjacent to several high density apartment developments and has both on-street and off-street car parking. The uphill end of Beresford Street has several bars and cafes. It attracts substantial night-life and the associated phenomenon of outdoor cigarette smoking.



The LittaTrap is a versatile catchpit insert system. It is readily installed in new or existing catchpits and may be configured to capture sediment or gross pollutants. For this trial the LittaTrap had a 1000 micron burnproof liner installed. By capturing the bulk of gross pollutants in its removable insert it allows fast hand maintenance and significantly reduces the frequency of costly suction maintenance of each catchpit. In addition it significantly improves the capture of positively and neutrally buoyant materials which are typically washed through the system, particularly in periods of high flow.

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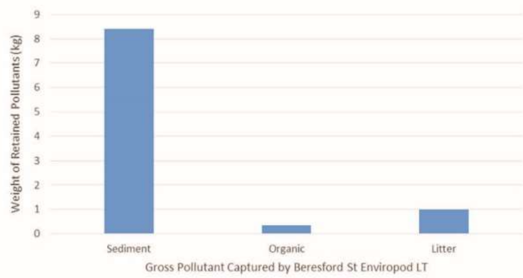
RESULTS

The LittaTrap was first installed June 2012 and the content was emptied 3 times for analysis purposes on March, April, and May 2013. In approximately 11 months of service, the LittaTrap captured 10.72 kg (wet, drained weight) of gross pollutants (see Figure 3).

GROSS POLLUTANT CAPTURED



ACCUMULATED WEIGHT

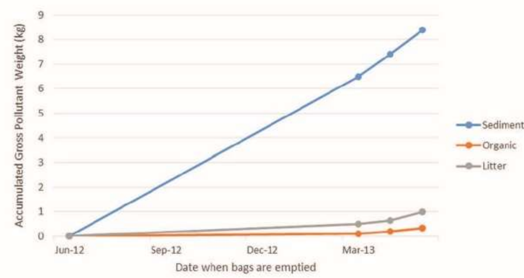
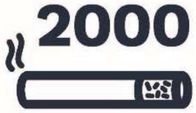


Figure 3: Accumulated Gross Pollutant Weight

Figure 4: Thousands of cigarette butts captured by the LittaTrap

Figure 5: Other gross pollutants captured by LittaTrap

2000



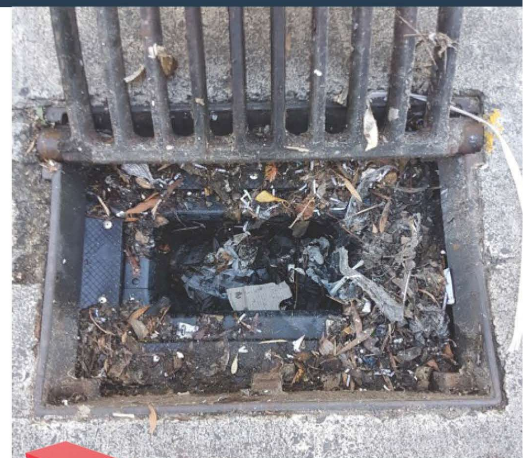
CIGARETTE BUTTS
in 10.72 kg of debris

Gross pollutants captured by the system were a mixture of predominantly negatively buoyant road sediments, neutrally buoyant organic material and positively buoyant trash and debris. Most notably the number of cigarette butts found in 10.72 kg of debris was estimated at 2000. In addition, a considerable amount of debris, such as cans and plastic and glass shards were found. These gain entry to the catchpit via the large kerb entry slot, rather than the grate. Also found in the captured material were wrappers, straws, wine corks and bottle caps.

LittaTrap™

Farro Fresh Supermarket, Mairangi Bay, Auckland

farro FRESH FOOD

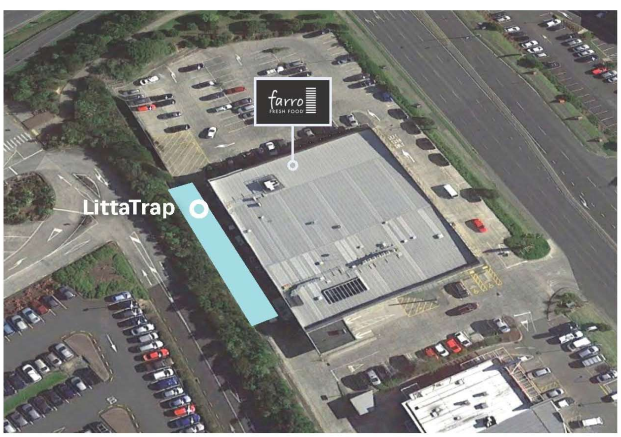


LITTER HOT SPOT – LOADING ZONE

Last year Stormwater360 approached Farro Fresh to install a trial LittaTrap in a loading zone storm drain to monitor how much plastic and litter could be stopped from entering the stormwater system.

The LittaTrap was installed at the Mairangi Bay store, and was maintained and monitored over six months.

The LittaTrap is a solution for companies that have a commitment to our environment.
Those companies that want to take a proactive approach to stopping plastic from their site entering the stormwater system and making its way to the ocean.



The LittaTrap is a storm drain insert system. It is readily installed in new or existing storm drains and may be configured to capture a variety of pollutants. The LittaTrap is hand maintainable, allowing for low cost and frequent maintenance.

By installing a LittaTrap there is a significant improvement of capturing plastic and other litter which are washed down a storm drain when it rains.

CATCHMENT

The LittaTrap was placed outside the service entrance to the supermarket where goods are received and dispatched. The catchment area was approx. 500 sq metres.

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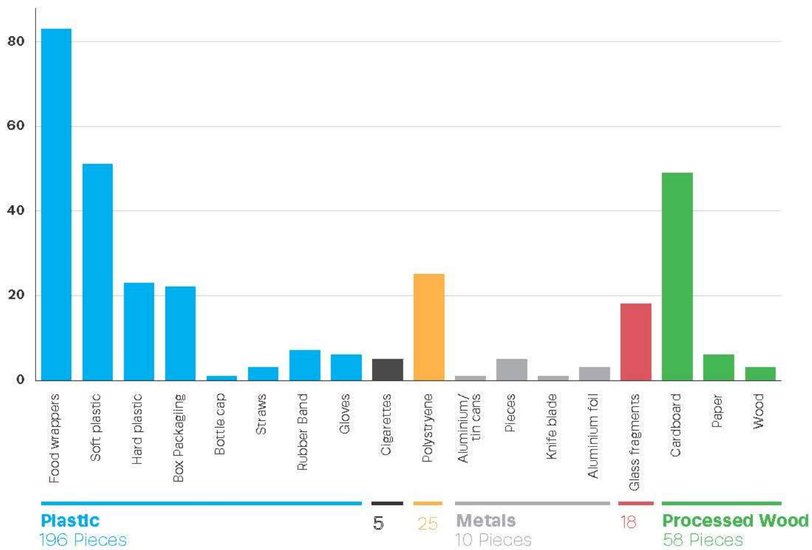
RESULTS

The final results yielded a total of 312 pieces of rubbish captured. The litter counted was typical of the environment in which the LittaTrap was installed, including soft and hard plastics, glass, cigarettes, metals and woods.

The largest type of pollutant counted was plastic food wrapping (83 pieces), followed by soft and hard plastic, and polystyrene. Without the LittaTrap installed, these pieces of litter would flow straight into the stormwater system and out to sea.

The LittaTrap also captured over 12kgs of organic matter, mainly consisting of leaves and food waste. Organic matter that makes it into our waterways leaches nitrogen and phosphorus – both harmful nutrients to our waterways.



CONCLUSION

The LittaTrap installed captured over 300 pieces of detrimental litter that would have otherwise ended up in our oceans. This was only one LittaTrap, in one location, for a short period of time.

There are over 3000 supermarkets in New Zealand, this means that we could be stopping over one and half million pieces of plastic every year if every loading zone had a LittaTrap installed.

OVER 300 pieces of litter trapped

1 SITE / 6 MONTHS

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LittaTrap™

EDUCATION

Kaitiaki Stormwater Action Project : Wilford School

In 2016 students from Wilford School took part in the Experiencing Marine Reserves programme, which takes groups of school children snorkelling to experience their marine environment. After snorkelling in Taputeranga Marine Reserve and comparing this to their local rocky shore snorkelling spot at Lowry Bay, students identified litter washing up on local beaches as the problem they wanted to tackle.

A small group of students decided targeting the source of the marine pollution problem through education and raising awareness about where it was coming from would be the best way to achieve positive change. They wanted to capture and monitor the litter travelling down roadside stormwater drains, which all lead to the ocean without being treated, and then share this with their local community.

THE MONITORING PROGRAMME

Stormwater360 donated two LittaTraps™ to the school to assist the children in their monitoring. LittaTraps™ are designed to capture litter and other solid pollutants heading into the stormwater drains and prevent them from reaching the ocean.

The students had one installed in the heart of Jackson Street's busy shopping area, and the other installed in amongst the housing area. This allowed them to compare pollutants found from the commercial and residential ends of Jackson Street.

The LittaTrap™ is a versatile catchpit insert system. It is easily installed in new or existing catchpits and may be configured to capture sediment or gross pollutants. The LittaTrap™ is hand maintainable, allowing for low cost and frequent maintenance. By installing a LittaTrap™ there is a significant improvement of capturing both positive and neutrally buoyant materials which are typically washed down a storm drain, particularly in periods of heavy rain.

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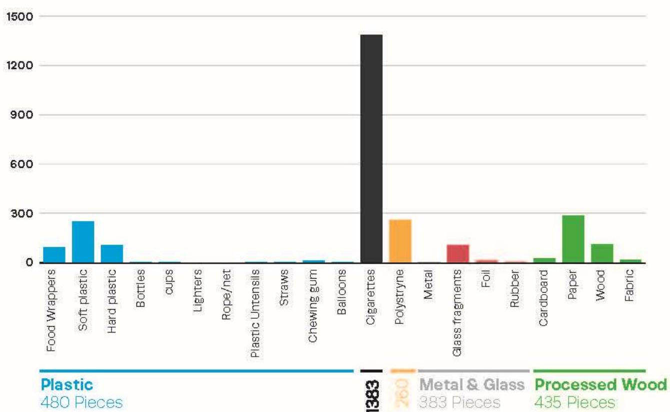
RESULTS

In the twelve weeks of monitoring, the students collected 2,680 pieces of litter from two drains. That meant 2,680 pieces of litter that didn't end up in the sea.

Half of these pieces (50 percent) were cigarette butts. The other litter included plastic, aluminium cans, polystyrene, wood, broken glass, straws, soft drink bottles, parking tickets, library receipts, food wrappers, cardboard, and fabric. The stormwater drain outside the cafes and restaurants collected much more litter than the drain outside the houses.



The two drains that the students investigated collected 2,680 pieces of litter over 12 weeks.

This meant that one drain would have sent about 1,340 pieces of litter to the sea in 12 weeks. And each week, one drain would have sent about 110 pieces of litter to the sea.

To work out how much litter this is over one year (52 weeks), the students multiplied 110 by 52.

There are 93 stormwater drains in and around Jackson Street, all leading to the sea. If one drain sends about 5,720 pieces of litter, then 93 drains could send 531,960 pieces of litter into Lowry Bay every year.

That's over half a million pieces of litter.

SUMMARY

The students presented their findings to community members. They had kept all the rubbish collected so this could be revealed to those attending. Parents, community members and local councillors were shocked to see just what the students had found and supported their message of needing change to happen.

In many ways the realisation that there is a lot of litter going down our drains and that we need to do something about it is easier for children. Children's views and actions are not restricted. Children do not think of reasons not to do things.

This study has shown how children experiencing plastic and litter in their local marine environment can drive change. It also demonstrates how learning about the sources of these pollutants and how they make their way to the ocean, can influence a community.

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Brampton Maintenance Yard, Ontario, Canada





Enviropod Canada in conjunction with their partners **Imbrium Systems** approached the Brampton Public Works team to trial the Enviropod technologies: the **Enviropod™ Filter** – a high performing catch basin insert and the **LittaTrap™** – a low cost, hand maintainable catch basin insert. Both technologies are highly engineered for high performance and high flows.

Two trial units were installed and monitored for 18 months to understand suitability across all weather conditions. The trial involved retrofitting the technology into existing catch basins at Sandalwood Works Yard and required no construction or disturbance to the existing infrastructure.

After 18 months of testing these new technologies, the City has retrofitted the remaining thirteen (13) of the fifteen (15) catch basins in the Yard with six (6) additional Enviropod Filters and seven (7) LittaTraps.

Different technologies were installed in different parts of the yard. The LittaTrap is a simple tool for managing plastics, gross solids and sediment in stormwater runoff. These were installed in lower contaminant generating areas.

The Enviropod is a high performing catch basin insert capable of capturing fine sediments and associated pollutants such as heavy metals. The Enviropod Filters were installed in areas that were subject to higher loadings of finer sediment from the snow melting operation. (Independent testing has shown the system removes over 90% of particles greater than 100 microns in size.)

OUTCOME

William Guy, Manager, Contracts with the City of Brampton Public Works Department says of the solutions, "The Enviropod technologies are a cost effective, easily maintained approach to managing pollutants and debris washing off our Yard from our snow melting and general road maintenance operations. By installing both LittaTraps and Enviropods we have found a simple, practical and effective solution to filter runoff and reduce the debris making its way into the stormwater system.

Another key reason for choosing and installing the Enviropod units is there are no expensive filters to be replaced every couple of months. Maintenance can be easily performed by staff at the Yard by simply pulling the LittaTrap or Enviropod baskets up by hand, emptying them and putting them back in. Cold weather and frozen filters are no longer an issue, and that, for our purposes, is a winning design."

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LittaTrap™

FoodStuffs Trial

FINAL REPORT & ANALYSIS

Plastic pollution is a major global problem with an estimated 80% of marine debris coming from land. Enviropod developed the LittaTrap in response to this.

The LittaTrap is an innovative catch basin insert that is fitted into new and existing stormwater drains to capture plastic and other pollutants before they would be washed into the drain and out to the waterways.

In the development of the product, we have identified industries which can be litter "hot spots." Industries such as supermarkets which have a high pedestrian foot count and busy loading zones can have increased litter loading.

Wishing to collect data on supermarket litter loading Enviropod approached Foodstuffs in 2016 to conduct a trial of the LittaTrap to measure the type and quantity of pollutants that would enter the stormwater system via the stormwater drains on their busy sites.

TRIAL SITES

Two trial sites were identified, and an audit was conducted to determine the most appropriate catch basins on each site. The catch basins on each site were chosen to be representative of all the basins on sites; some were picked for high loading (loading zones), and the others chosen for low loading rates. The loading rate is anticipated to vary from basin to basin, and clean to clean. These rates can be influenced by climate, environmental and physical influences, such as rain, wind and traffic volumes.

Pit 1 – Special Parking Zone

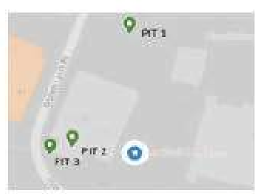
Pit 2 – Parking Area

Pit 3 – Front of Store

Trial site one: New World Browns Bay

Browns Bay New World is situated 400m from the ocean. The existing infrastructure is old and does not have any stormwater treatment and any plastic and pollutants that reach the stormwater system are discharged untreated to Taiaotea Creek.

Three catch basins were identified as appropriate for the trial. The catch basins were chosen to give a represented litter loading and have good access for installation and maintenance.



Pit 1 – Carpark

Pit 2- Tradewaste(not monitored)

Pit 3 – Loading Zone

Trial site two: New World New Lynn

Stormwater from the New Lynn site flows untreated into the stormwater system to the headwaters of the Whau River where it is finally discharged.

Two catch basins on this site were identified as appropriate for the trial – the first situated in the carpark and the other downstream of the loading zone. A third trap was installed to capture trade waste as requested by the owner of the store as the Oil and Grease Trap installed downstream was consistently getting blocked. This catch basin was outside the butcher and continually received a lot of organic material adding to the blockages downstream. This LittaTrap was NOT monitored for this trial.

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RESULTS

A total of 1203 pieces of plastic and other gross pollutants were captured and retained in the trial LittaTraps. These pollutants were stopped from entering the stormwater system and making their way to the Waitamata Harbour. The total caught averages to 523 pieces of litter per catch basin per year.

Figure 1 shows the breakdown of the litter caught. 73% was plastic including hard & soft plastic, polystyrene, and cigarette butts. Cigarette butts are the most common form of plastic litter in the world. Globally more than 4.5 trillion cigarette butts make their way into the environment every year. Almost all of them contain a filter made of fibres of cellulose acetate.

Figure 2 shows the composition of the plastic caught. Soft plastic and cigarette butts the top pollutants. We defined soft plastic in this study as soft or flexible plastic. It included fragments of plastic bags and packaging material. Soft plastic is particularly hazardous in the marine environment as UV easily breaks down this plastic into smaller and smaller pieces. Small pieces of plastic are easily ingested by marine animals mistaking the plastic as food. The fragmentation of soft plastic makes them almost impossible to remove once they are in the ocean

These small pieces were predominately found in the catch basins close to the loading zones. In busy loading zones where inward and outward goods are managed accidental littering of packaging can happen. Interesting to note – there were no complete plastic bags caught in any of the LittaTraps.

The data shows there is plastic reaching all the drains regardless of the location and on these two sites, all drains are discharged into a waterway.

75% of the litter collected was plastic. (Soft Plastic, Hard Plastic, Food Wrappers, Butts or Polystyrene).

The biggest single source of pollutant was cigarette filters. Cigarettes made up 20% of the total litter caught (243 butts.)

FIGURE 1 – Litter Composition

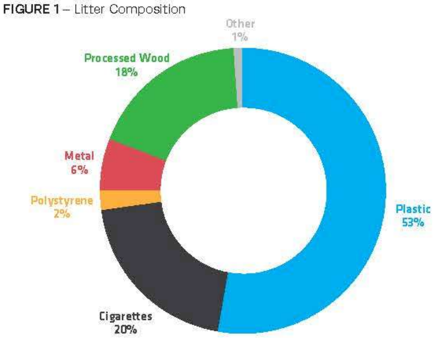
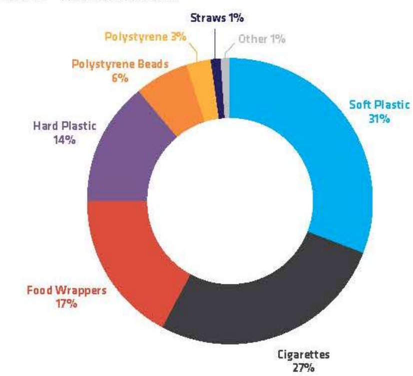


FIGURE 2 – Plastic Composition



NEW WORLD BROWNS BAY RESULTS

Browns Bay had a 33% higher litter loading than the New Lynn site. We assume this could be from the weekend market and higher pedestrian use.

The special carpark had the highest loading with a total of 355 pieces counted. Mainly cigarette butts were found here; possibly this is a smoking area for staff.

NEW WORLD NEW LYNN RESULTS

The loading between the two catch basins was quite similar. The loading zone did have a much higher incidence of plastic wrapping, which is expected in this location.

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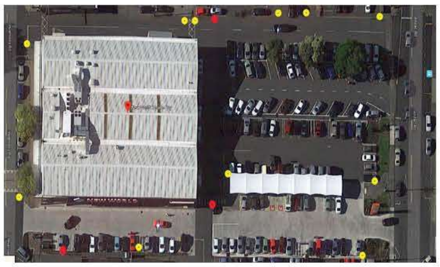
OBSERVATIONS

The catch basins monitored were only a small percentage of catch basins on each site.



NEW WORLD BROWNS BAY

Browns Bay has a total of 14 catch basins with three being monitored

- Yellow — Stormwater drains on site
- Red — LittaTrap installed

If all stormwater drains at Browns Bay had a LittaTrap installed, a total of **7322 pieces of plastic and other litter could be retained over a 12-month period**

NEW WORLD NEW LYNN

New Lynn has a total of 13 catch basins with two being monitored.

- Yellow — Stormwater drains on site
- Red — LittaTrap installed

If all stormwater drains at New Lynn had a LittaTrap installed a total of **6799 pieces of plastic and other litter could be retained over a 12-month period**

900,000
pieces of plastic & litter

Foodstuffs has 421 retail outlets across the North Island. These include New Worlds, PaknSaves, Liquorlands and Four Squares. If 4 x LittaTaps were installed at each store, **Foodstuffs could stop approximately 900,000 pieces of plastic & litter a year from entering the marine environment via the storm drains.**

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APPENDIX D – Lab Testing Information

Good Harbour Laboratories

2596 Dunwin Drive
Mississauga ON L5L 1J5
Phone: 905.696.7276
Fax: 647.496.1565

Test Report

Customer: Stormwater360 7C Piermark Drive Rosedale 0632 North Shore	**Project Number:** PN 20-001
Report Date: April 09, 2020	
Date(s) Analysis Performed: Feb. 13 - 14; Mar. 12 - 13; Mar. 17, 2020	
Data Reference: Notebook A005, pp. 104 - 118.	

Good Harbour Laboratories was asked to determine the head loss that occurred as water passed through a number of fabrics that were supplied by Stormwater360. The fabrics, either singly or in pairs, could potentially be used as part of their catch basin inserts.

The test fabric(s) were mounted in a wooden frame (Figure 1) that exposed a screen face 557 mm wide and 222 mm high. The frame was mounted in a trough and water was passed through the partially-submerged screen. The difference in water height before and after the screen was used to determine head loss. The test set-up is illustrated in Figure 2 and the frame installation is shown in Figure 3.

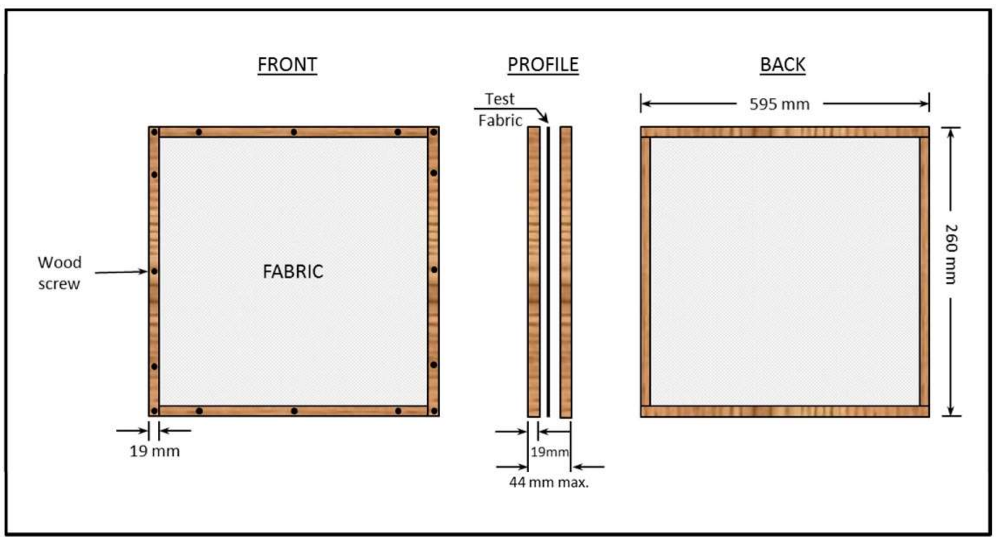

Figure 1: Fabric Test Frame

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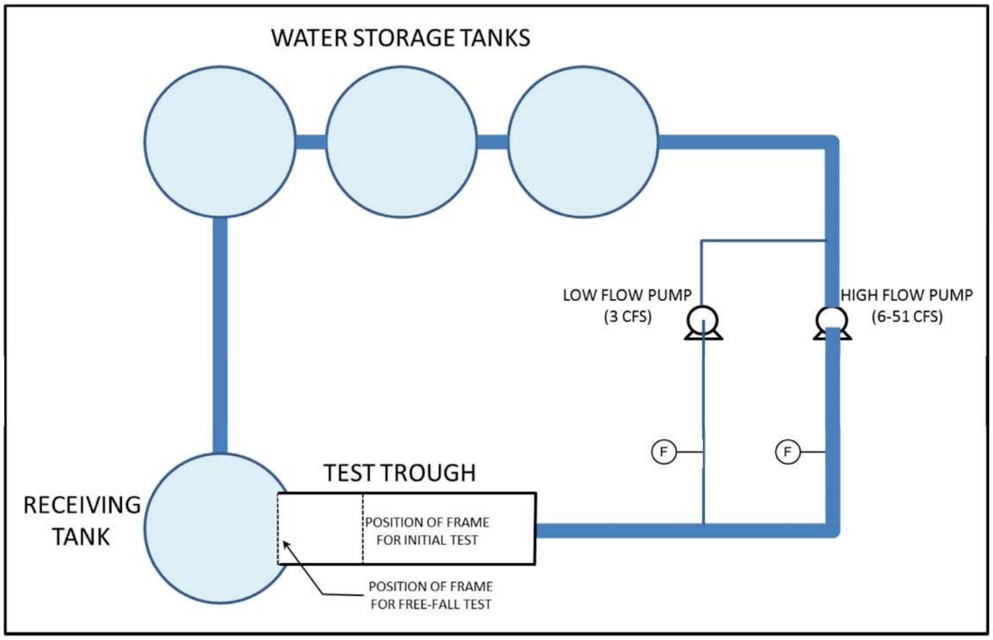

Figure 2: Test Set-up

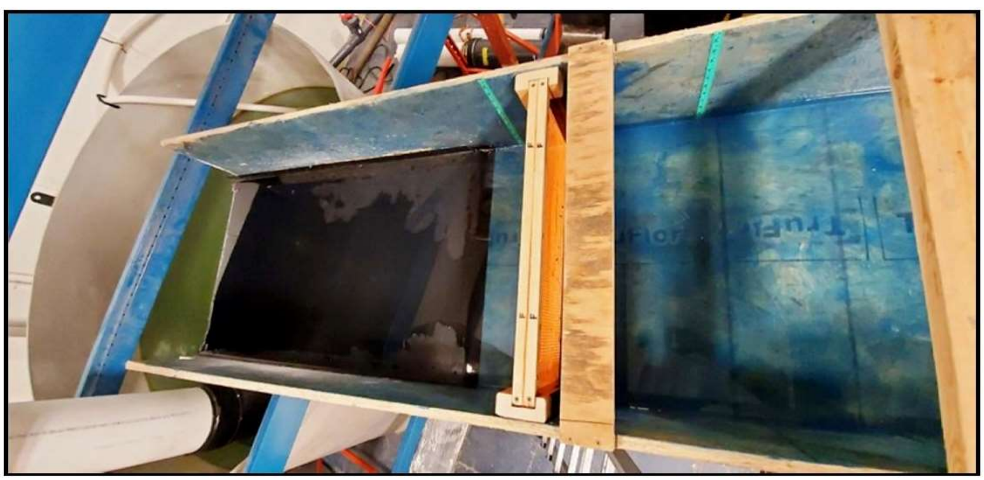

Figure 3: Test Frame Installation for Partially-Submerged Screen

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The following fabrics were submitted for testing:

Table 1: Test Fabrics

Code	Mesh	Opening	Description
Fabric F	4x4	4.75 x 4.75mm	Orange 4x4 fibreglass mesh
Fabric G	8x4	2.36 x 4.75mm	White Arlyn 4x4 fibreglass mesh
Fabric H	8x8	2.36 x 2.36mm	White Arlyn 4x4 fibreglass mesh
Fabric I	5mm	approx. 4.7mm	Black Polyester 5x5mm mesh
Fabric J	5mm	approx. 5.0mm	Black PVC coated Polyester 5x5mm mesh
Fabric K	3.175mm	3.175 x 3.173mm	Black Polyethylene mesh
LTF	-	-	Current LittaTrap fabric

Following the testing described above, a second set of tests were conducted with a modified configuration, the effluent side of the screen was allowed to free-fall into the receiving tank and the water height on the inlet side of the grating was recorded. This test setup is shown in Figure 4.

Figure 4: Free-fall Test Frame Installation

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TEST RESULTS:

Water flow to the test lop was initiated and allowed to stabilize. The following measurements were made:

Table 2: Submerged-Screen Head Loss

Fabric	Flow Rate		Upstream Height	Downstream Height
	(GPM)	(LPS)	(MM)	(MM)
Control (No Fabric)	50.1	3.2	33	10
	99	6.2	38	15
	200	12.6	43	22
	299	18.9	60	38
	399	25.2	85	50
LTF	50.1	3.2	36	8
	99	6.2	40	25
	201	12.7	53	39
	300	18.9	83	45
	399	25.2	105	55
F	49.5	3.1	44	5
	102	6.4	50	13
	201	12.7	65	30
	300	18.9	90	38
	400	25.2	105	50
I	50.6	3.2	49	8
	101	6.4	48	26
	201	12.7	65	38
	299	18.9	98	40
	400	25.2	110	55
J	50.1	3.2	45	7
	101	6.4	53	12
	201	12.7	54	33
	301	19.0	85	40
	400	25.2	105	50
K	50.0	3.2	38	3
	101	6.4	33	13
	199	12.6	50	25
	300	18.9	77	34
	400	25.2	95	45

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Table 2 (Cont'd)

Fabric	Flow Rate (GPM)	Flow Rate (LPS)	Upstream Height (MM)	Downstream Height (MM)
F + LTF	50.0	3.2	45	3
	102	6.4	38	20
	201	12.7	60	35
	301	19.0	105	35
	400	25.2	130	48
G + LTF	49.9	3.1	45	10
	101	6.4	52	23
	200	12.6	63	37
	299	18.9	100	45
	400	25.2	115	55
H + LTF	50.5	3.2	52	10
	102	6.4	57	24
	202	12.7	76	35
	301	19.0	113	40
	399	25.2	130	49
I + LTF	50.3	3.2	32	5
	102	6.4	37	18
	202	12.7	58	35
	300	18.9	105	33
	400	25.2	130	48
J + LTF	50.1	3.2	30	5
	99	6.2	38	20
	202	12.7	55	35
	301	19.0	110	35
	402	25.4	130	47
K + LTF	50.2	3.2	38	3
	101	6.4	34	15
	199	12.6	53	32
	302	19.1	108	33
	401	25.3	125	45

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Table 3: Free-Fall Head Loss

Fabric	Flow Rate		Upstream Height
	(GPM)	(LPS)	(MM)
Control	50.0	3.2	61
	100	6.3	73
	200	12.6	93
	299	18.9	105
	400	25.2	115
	500	31.5	135
	600	37.9	147
	701	44.2	157
	802	50.6	165
LTF	50.5	3.2	69
	99	6.2	82
	198	12.5	105
	299	18.9	124
	399	25.2	138
	500	31.5	154
	602	38.0	171
	700	44.2	184
	800	50.5	192
F	50.0	3.2	67
	99	6.2	79
	200	12.6	102
	300	18.9	116
	399	25.2	128
	502	31.7	148
	600	37.9	165
	700	44.2	175
	800	50.5	187
J	50.3	3.2	69
	99	6.2	81
	201	12.7	106
	300	18.9	123
	399	25.2	138
	500	31.5	158
	602	38.0	175
	700	44.2	188
	802	50.6	193

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Table 3 (Cont'd)

Fabric	Flow Rate (GPM)	Flow Rate (LPS)	Upstream Height (MM)
K	50.0	3.2	70
	99	6.2	83
	199	12.6	100
	299	18.9	122
	398	25.1	137
	500	31.5	152
	600	37.9	169
	700	44.2	182
	800	50.5	190
F + LTF	49.9	3.1	73
	101	6.4	89
	199	12.6	111
	300	18.9	135
	400	25.2	156
	500	31.5	170
	600	37.9	180
	700	44.2	202
	802	50.6	222
G + LTF	49.9	3.1	72
	100	6.3	85
	199	12.6	108
	300	18.9	126
	399	25.2	145
	500	31.5	157
	600	37.9	175
	700	44.2	187
	800	50.5	195
J + LTF	50.1	3.2	74
	99	6.2	90
	201	12.7	116
	300	18.9	138
	399	25.2	156
	500	31.5	164
	600	37.9	180
	701	44.2	200
	800	50.5	217

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Table 3 (Cont'd)

Fabric	Flow Rate		Upstream Height
	(GPM)	(LPS)	(MM)
K + LTF	50.1	3.2	74
	101	6.4	90
	200	12.6	116
	299	18.9	134
	401	25.3	153
	500	31.5	165
	600	37.9	184
	700	44.2	204
	802	50.6	220

Released By: Joe Costa (Name) — [signature] (Signature) — April 15, 2020 (Date)

Senior Scientist & Quality Manager (Title)

PERFORMANCE TESTING OF A

LITTATRAP CATCH BASIN FILTER

Prepared by:

Joe Costa, B.Sc.
Senior Scientist & Quality Manager

Good Harbour Labs
2596 Dunwin Drive
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October 30, 2019

Prepared for:

Mike Hannah
Managing Director

Stormwater360
7C Piermark Drive
Rosedale 0632, New Zealand

Report ID: TR-JC20180305-02

Revision Table

Revision Number	Reason for Revision
01	Initial document revision
02	Revised wording around gross pollutant capture for more clarity.

Approvals

Author(s) Review: I confirm that the information in this technical report is accurate, appropriately referenced, and scientifically sound

Oct. 30, 2019

Joe Costa
Senior Scientist & Quality Manager

Date

Technical Review: I confirm that sufficient information and detail have been reported in this technical report, that it is scientifically sound, and that appropriate conclusions have been included.

Oct 30, 2019

De Wu Zhang
Research Scientist

Date

Stormwater360:

Oct 31, 2019

Mike Hannah
Managing Director

Date

Please note that for the purposes of California Water Board Trash Full Capture Certification the content of this laboratory report that do NOT pertain to trash capture have been omitted. The full report is available from EnviroPod.

This laboratory report refers to trash as 'gross pollutants', that is: trash and other pollutants the are great than 5mm in size.

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2.4 Gross Pollutant Test

This performance test assessed the LittaTrap's™ ability to remove gross pollutants from stormwater runoff and was based on work reported in the Caltrans document "*Laboratory Testing of Gross Solids Removal Devices*" - CTSW-RT-05-73-18.1. The composition of the Gross Pollutant used is summarized in

Table 5. The Gross Pollutant test was conducted at 3 flow rates, 5, 10 and 15 L/s. To better assesses the performance of the LittaTrap™, a control run was performed on the catch basin alone at 5 and 15 L/s.

For this test, 10 L (approximately 193 g) of gross solids were added at the target flow rate over a 5 minute period. This was completed manually by dropping a handful of solids onto the "Streetscape" and allowing the solids to be washed into the catch basin. To ensure that the Gross Pollutants were washed into the catch basin, the grate was removed from the opening (Figure 7). Following the Gross Pollutant addition, the grate was replaced and water was allowed to flow into the catch basin at the target flow rate for at least an additional 10 minutes. In the case of the 15 L/s run, the water flow rate was sustained for an additional 55 minutes following the solids addition.

For the control test, 256 g of solids was added to the catch basin over a 5 minute period. The grate was replaced on top of the catch basin and the water flow continued for an additional 10 minutes. The flow was then increased to 15 L/s and held for an additional 15 minutes (no further trash addition at the higher flow). Since it was observed that most of the solids had escaped from the catch basin, there was no need to maintain the flow any longer than 15 minutes.

Table 5: Gross Pollutant Composition

Component	Description	Dimensions	% by Mass
Cigarette Filter	OCB regular cigarette filters 9.15 g/100 filters Bulk density = 900 filters/1L	7 mm diameter x 15 mm	14
Newspaper	Standard news print sheet cut in strips	28 cm x 5 cm	17
Wood	Popsicle sticks	11 cm x 0.95 cm x 0.2 cm	11
Plastic-Moldable	10 oz. PETE plastic cup cut in strips	9 cm x 2.5 cm	23
Plastic-Film	Plastic shopping bag split in half and cut in strips	40 cm x 8 cm	8
Cardboard/Chipboard	Cardboard box cut in strips	23 cm x 2.5 cm	10
Cloth	Cotton linen fabric cut in strips	35 cm x 5 cm	6
Metal – Foil, Molded	Aluminum drink can cut in strips	10 cm x 2.5 cm	7
Styrofoam	Standard "S"-shaped peanut packing material	3 mm x 3.5 mm x 1.5 mm	4

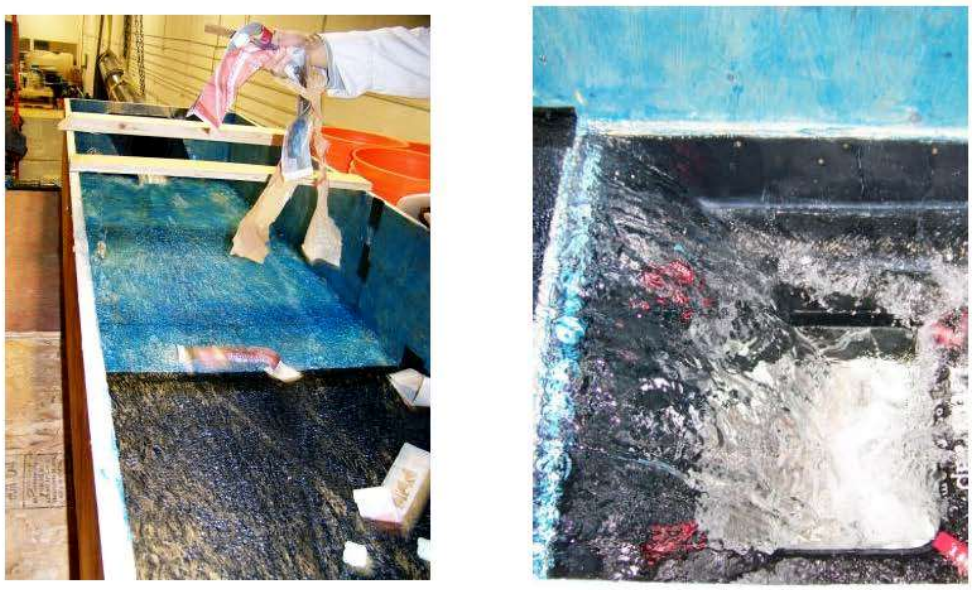


Figure 7: Gross Pollutant Addition to Streetscape

3.3 Gross Pollutant Removal

The solids for the Gross Pollutant test were divided into four batches, one for each run (Figure 9). During the tests, any solids that escaped the catch basin were captured in a net, air-dried and weighed. The test results have been tabulated in Table 10 and Table 11.

Figure 9: Gross Pollutant Test Solids

Table 10: LittaTrap Gross Pollutant Test Results

Test Item	Flow Rate (LPS)	Mass of Escaped Solids (g)	Description of Escaped Solids	Estimated Gross Solids Capture Efficiency (%)
LittaTrap™	5	0.0275	Newspaper (fragments), fabric (fragments)	100 [1]
LittaTrap™	10	0.1546	Newspaper (fragments), fabric (fragments)	99.9 [1]
LittaTrap™	15 [2]	1.47	Styrofoam pieces, Newspaper (fragments)	99.2 [1]

[1] Based on an added mass of 193 g

[2] Flow held for 55 min. following the addition of solids

Table 11: Catch Basin (control) Gross Pollutant Test Results

Test Item	Flow Rate (LPS)	Mass of Escaped Solids (g)	Description of Escaped Solids	Estimated Gross Solids Capture Efficiency (%)
Catch Basin (Control)	5	221.99	All components	13.4 [1]
Catch Basin (Control)	15	234.97 [2]	Popsicle sticks, metal strips, plastic strips	8.3 [1]

[1] Based on an added mass of 256 g

[2] Includes the mas of escaped solids at 5 LPS (above)

A small volume of fragmented newspaper and fabric where observed to bypass through the LittaTrap™ basket during the 5 and 10 L/s test runs. These articles were less than 5mm in diameter, the nominal screen size of the trap and were a result of the paper and fabric strips breaking down during the test.

At 15 L/s the water level inside the LittaTrap™ basket was at the crest of the internal bypass, causing some bypass. During the 55 minute sustained flow some Styrofoam pieces were lost through the bypass channel. At the end of the test the LittaTrap™ contained the captured wet gross solids (Figure 11). In total, only 0.8% (mass basis) of the solids escaped the LittaTrap™ during the test at 15 L/s.

Figure 10: Escaped Solids – LittaTrap™ at 15 L/s

Figure 11: Retained Solids – LittaTrap™ at 15 L/s

For the Catch Basin, 87% of the solids escaped at 5 L/s and 92% escaped once the flow was increased to 15 L/s (Figure 12and Figure 13).

Figure 12: Escaped Solids – Control at 15 L/s

5 L/s **15 L/s**

Figure 13: Retained Solids – Control at 5 and 15 L/S

3.4 Experimental Design Errors

For this study, the catch basin, grating and streetscape were fabricated from plywood as it was impractical to use concrete in a laboratory setting. To prevent leaks and stop the wood from absorbing water, surfaces were painted with a rubberized coating. It was discovered that from the continual lifting and dropping of the grate on the catch basin, some of the coating was removed and showed up in the effluent in the form of small fibers. A micrograph of some of the larger fibers is shown in Figure 14.

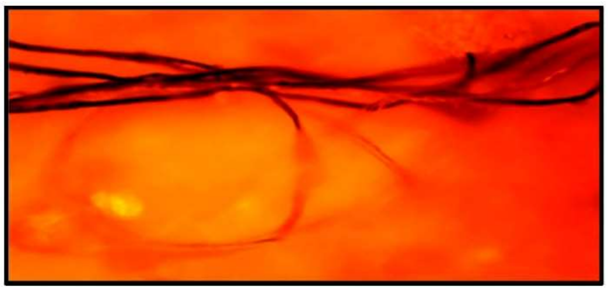


Figure 14: Rubber Coating Fibers

To estimate the impact these fibers had on the data, the fibers were removed from one of the recovered sediment sample dishes and the sample was reweighed. The mass of the fibers was found to be only 0.2 mg. Therefore, it is unlikely that the presence of the fibers had a significant impact on the results. In any future testing, the grating, and any surface it sits on at the top of the catch basin, should be replaced or lined with PVC, polyethylene or other similar material.

Testing of alternative material for Enviropod® LittaTrap™ FC

Introduction

An alternative material was tested for use in the Enviropod® LittaTrap™ FC. The material tested is 4.8mm perforated 16-gauge stainless steel. The alternative material was required to meet client demand.

Method

The material was tested at multiple flow rates in the Enviropod Hydraulic Laboratory. The material was tested in free discharge conditions and the water surface elevation behind the screen was measured for each flow rate. A schematic of the test apparatus and images of the testing are provided in Figure 1. The results were compared to the existing Enviropod® LittaTrap™ FC material to ensure the hydraulic capacity of the Enviropod® LittaTrap™ FC is not adversely affected when using the alternative material.

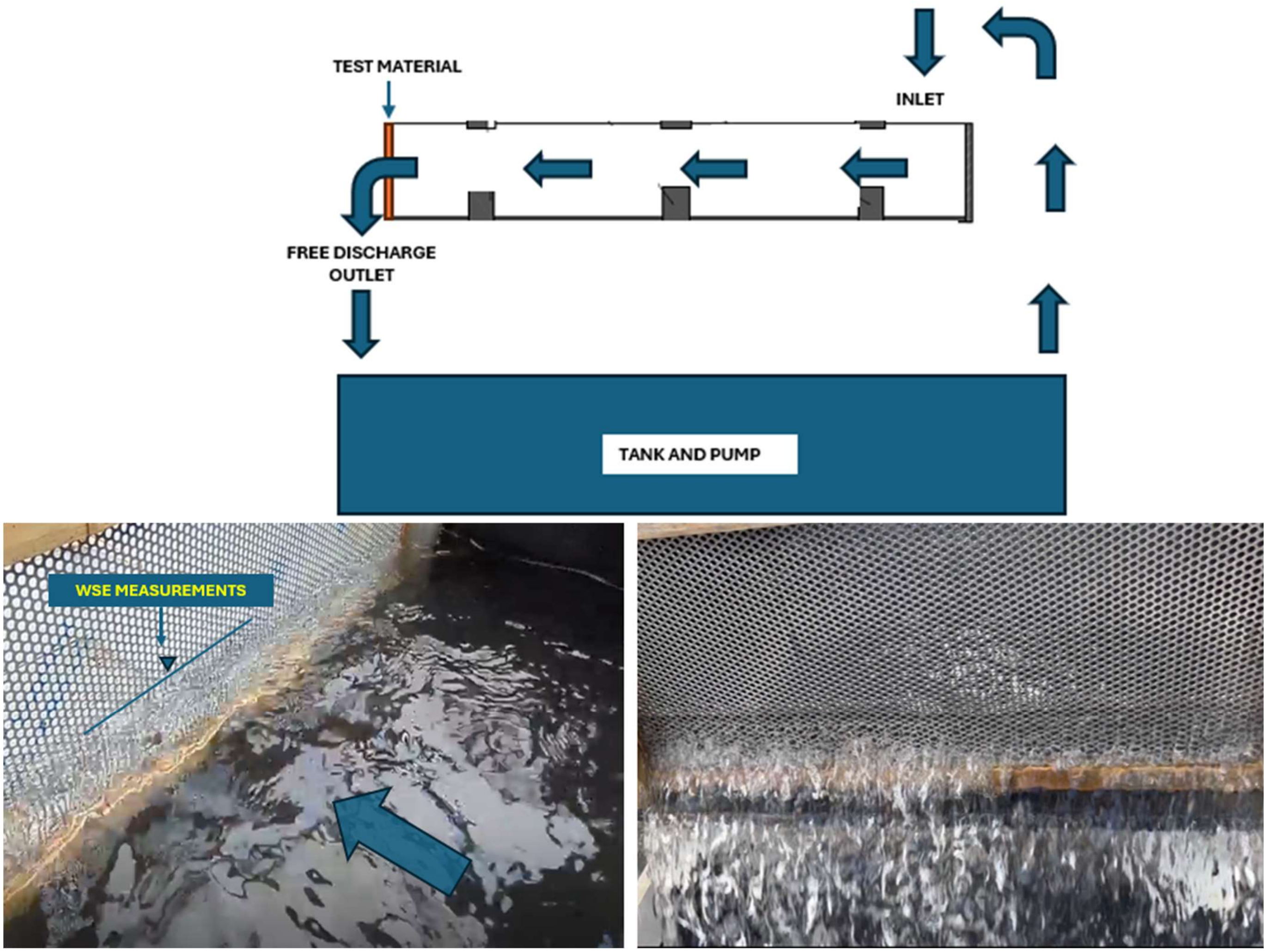


***Figure1 Top**: Schematic diagram of the laboratory apparatus. **Bottom left**: Image of the test showing where the water surface elevation is measured on the material tested. **Bottom right**: Image to illustrate free discharge conditions.*

Results

Figure 2 provides laboratory testing results for the 4.8mm 16-gauge stainless steel and the original Enviropod® LittaTrap™ FC materials. The specific flow rate is a measure of the hydraulic capacity of material that is used to account for differences in the testing apparatus and make the results comparable.

The results show that the hydraulic capacity of the 4.8mm stainless-steel material (blue) is higher than the original LittaTrap FC material.

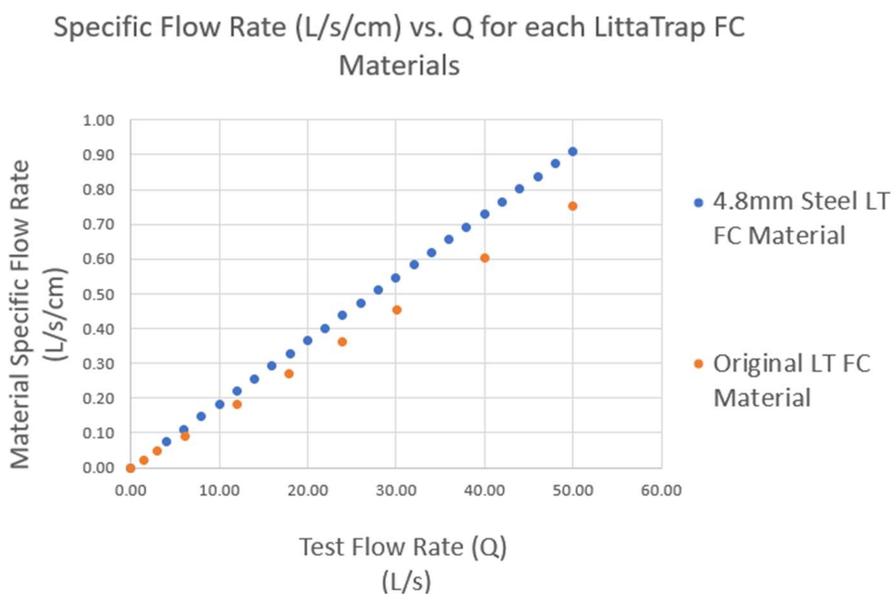


Figure 2 Graph of laboratory testing results.

Conclusion

The 4.8mm 16 gage stainless steel has a higher hydraulic capacity than the original Enviropod® LittaTrap™ FC, therefore, the stainless steel can be used as an alternative material in the Enviropod® LittaTrap™ FC without adversely affecting the treatment capacity.

Test Report: EMMA Trough Conveyance System

Prepared by: EnviroPod Inc

Date of testing 05 September 2024

Executive Summary

The California Board Recently identified a risk of trash overtopping conveyance troughs. Therefore, the EMMA trough design has been updated and tested in a hydraulic laboratory to confirm the performance of the trough meets the trash full capture requirements. EnviroPod carried out an internal demonstration of the EMMA trough during a simulated 1-year 1-hour storm and a 10-year 1-hour storm for Sonoma, California. Rainfall intensity data on the NOAA website, which is included in this report, suggested Sonoma receives the most intense rainfall hence this location was selected.

*The calculated flow rate used for the testing was ***GPM and fed into the 4-foot-wide mock catch basin via a 2-foot wide by 4-foot-long flume on a 2% slope. The 2%, or 1.15-degree, slope is considered typical of a standard roading cross slope. The 2-foot-wide flume was designed to demonstrate the performance in the case of a direct and concentrated flow into the catch basin, which is considered unlikely and the highest stress or worst-case scenario for the trough.*

The trough and flume were populated with plastic bottles, cans, polystyrene balls, cigarette butts, leaves and other miscellaneous trash at concentrations higher than should be expected on any typical California Street.

The cross-sectional area of the trough was increased by raising the back wall height of the trough from 6" to 8". The increased height is created with a 2" screen made of 16 gauge 4.8mm stainless steel, which can be retrofitted to any existing installations. The trough's horizontal depth or width remains 10".

EnviroPod designed and constructed a high-flow hydraulic test to confirm this modification's effectiveness. Testing comprised pumping up to 317GPM into the 2ft flume using a pump fitted with a variable speed drive to maintain flows during testing.

This report demonstrates and confirms that the EnviroPod EMMA trough can convey 100% of trash to the LittaTrap in the highest stress conditions, which includes excessive trash, 10-year 1-hour flows, which are well beyond the regulation requirement if 1-year 1 hour storms, and with concentrated flow entering perpendicular to the catchbasin inlet and directly hitting the trough. The report includes photographic evidence of testing, flow calculations, a test schematic and details of the trough's new cross-sectional configuration.

Introduction

The EnviroPod Easy Manhole Maintenance Access (EMMA) trough is designed to convey high flows and large amounts of trash from the catch basin inlet to the Enviropod® LittaTrap™. The EMMA trough allows the Enviropod® LittaTrap™ to be installed directly beneath a manhole which allows for easier maintenance of curb entry catch basins from road level where the manhole cover can simply be removed.

The testing in this report shows that even when trash and debris accumulate during dry weather, either wind blown into the trough or sitting at inlet, road or gutter, they will be captured by the Enviropod® LittaTrap™ and EMMA trough system.

Objectives

The test objectives were to:

Evaluate the performance of recent design modifications in simulated:

- 1-year 1 hour storm
  - The regulation requirement
- 10-year 1 hour storm
  - A worst-case scenario as safety measure

Ensure there is no overtopping of trash in either condition and provide confidence to the California Waterboard that the product meets Trash Full Capture Requirements

<u>Methods</u>

Water Quality Flow Calculation

Determining the maximum water quality flow rate for catch basin full trash capture device based on the highest rainfall intensity in California which is based in Santa Rosa where the 1 year 1 hour intensity is 0.507 in/hr.

NOAA Atlas 14, Volume 6, Version 2
Location name: Santa Rosa, California, USA*
Latitude: 38.4343°, Longitude: -122.7184°
Elevation: 155 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	1.80 (1.61-2.05)	2.16 (1.92-2.46)	2.64 (2.34-3.01)	3.05 (2.66-3.50)	3.61 (3.05-4.33)	4.07 (3.35-4.99)	4.55 (3.64-5.74)	5.05 (3.90-6.59)	5.76 (4.25-7.88)	6.94 (4.91-9.89)
10-min	1.30 (1.15-1.47)	1.55 (1.37-1.76)	1.89 (1.67-2.16)	2.18 (1.91-2.51)	2.59 (2.18-3.10)	2.92 (2.40-3.58)	3.26 (2.60-4.12)	3.62 (2.80-4.72)	4.12 (3.04-5.65)	4.97 (3.52-7.09)
15-min	1.04 (0.928-1.18)	1.25 (1.11-1.42)	1.52 (1.35-1.74)	1.76 (1.54-2.02)	2.09 (1.76-2.50)	2.35 (1.93-2.88)	2.62 (2.10-3.32)	2.92 (2.26-3.81)	3.32 (2.45-4.56)	4.01 (2.84-5.71)
30-min	0.728 (0.648-0.828)	0.872 (0.774-0.992)	1.07 (0.944-1.22)	1.23 (1.08-1.42)	1.46 (1.23-1.75)	1.64 (1.35-2.02)	1.83 (1.47-2.32)	2.04 (1.58-2.66)	2.32 (1.71-3.18)	2.80 (1.98-3.99)
60-min	0.507 (0.451-0.576)	0.606 (0.539-0.690)	0.741 (0.656-0.846)	0.855 (0.749-0.984)	1.01 (0.855-1.22)	1.14 (0.939-1.40)	1.28 (1.02-1.61)	1.42 (1.10-1.85)	1.62 (1.19-2.21)	1.95 (1.38-2.78)
2-hr	0.379 (0.337-0.430)	0.453 (0.402-0.515)	0.549 (0.486-0.626)	0.626 (0.549-0.721)	0.728 (0.614-0.873)	0.806 (0.663-0.990)	0.884 (0.706-1.12)	0.963 (0.745-1.26)	1.07 (0.787-1.46)	1.15 (0.813-1.64)

Figure1 NOAA Point Precipitation Estimates for Santa Rosa, California. From Website: https://hdsc.nws.noaa.gov/pfds/pfds_map_cont.html?bkmrk=ca

The assumed catchment area is 1 acre feeding 1 storm drain with c factor of: 0.90

The rational method says Q = CiA, therefore for 1 year 1 hour storm:

Q = 0.90 x 0.507 x 1 = 0.456 CFS

For a 10-year 1 hour storm:

Q = 0.9 x 0.855 x 1 = 0.8 CFS

The maximum flow rate the EnviroPod pump can achieve is 0.7 CFS (20 LPS), however because the flow is concentrated into a 2ft wide channel as opposed to being spread over the full 4ft curb entry, the flows are hitting the EMMA at a higher velocity.

As demonstrated in Figure 2, flows per foot would be 0.2 CFS/ft in a 4ft wide flume where the flows are 0.35 CFS/ft in the 2 ft flume.

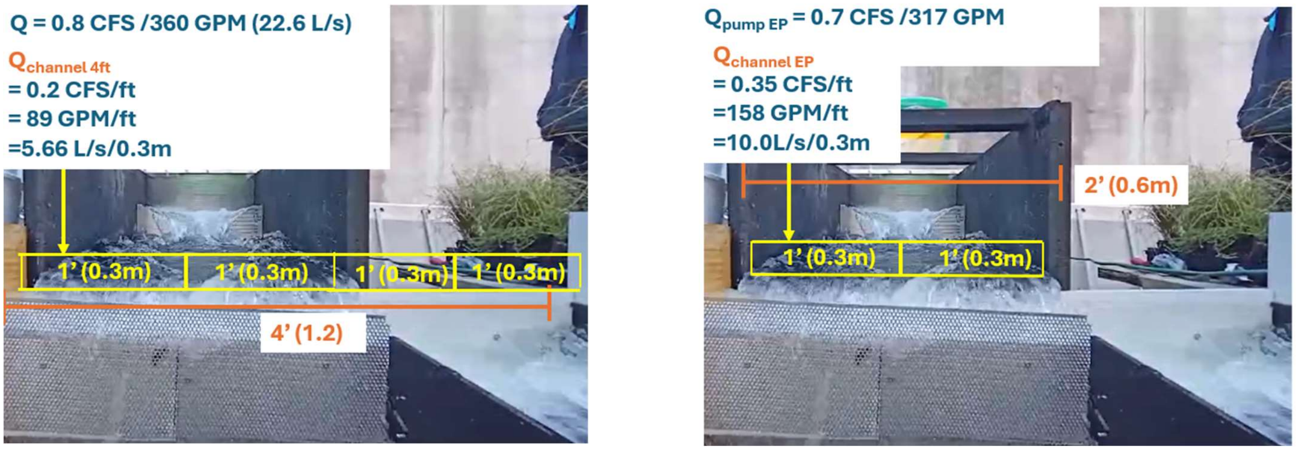


Figure 2 Illustration to demonstrate the effect of concentrated flows within the 2ft wide flume entrance to the EMMA,

Testing

A schematic diagram to show the overall set-up is provided in Figure 3 and photographs are provided in Figure 4 for further context.

The 2-foot-wide flume was equipped with a mock catch basin inlet to emulate the steepness and increased flows at curb inlet catchbasin that have wide steep inlets (Figure 3).

The flume was fitted with a V-notch weir to manually calculate the flows and check for any losses in the system from the pump to the flume. The pump is fitted with a variable speed drive to maintain a consistent flow for the duration of each test.

Trash comprising soda cans, plastic water bottles, plastic wrappers and cups, polystyrene balls, cigarette butts and detritus such as leaves was loaded into the flume and trough prior to each test.

The concentrated flows were pumped via the 2-foot-wide flume into the 4-foot-wide EMMA trough with the recent design modifications.

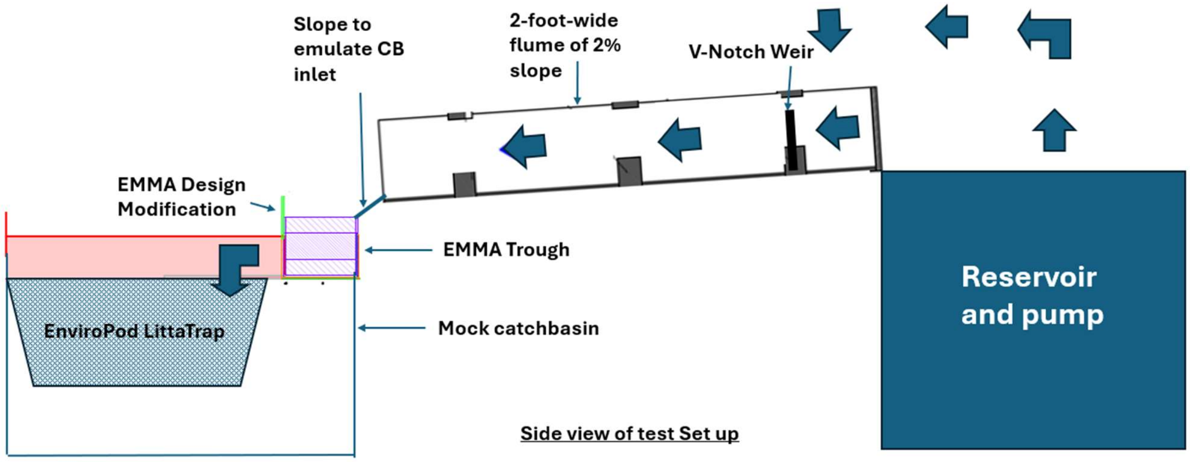
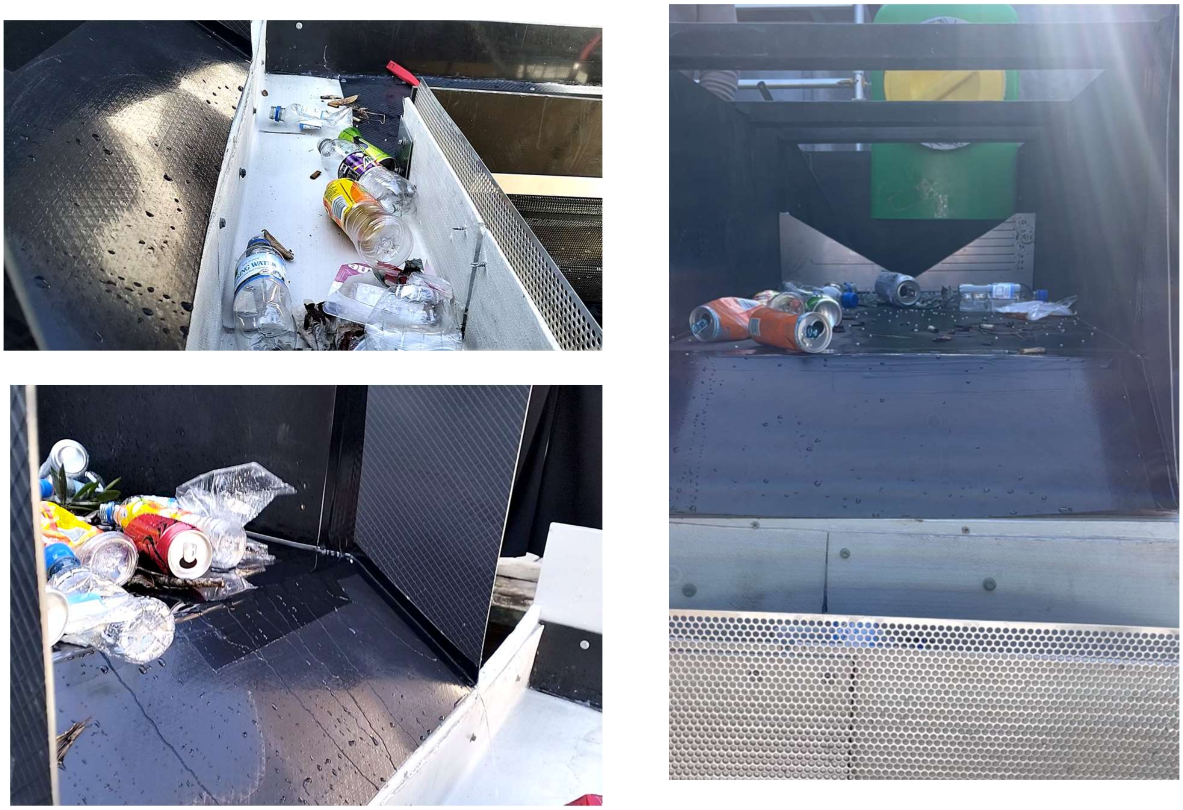


Figure 3 Schematic diagram to demonstrate the test setup

Figure 4 Plan view photograph of LittaTrap, EMMA trough and steep flume inlet as test set up.



igure 40 Photographs of testing ready to be carried out. Top: EMMA trough loaded with trash ready for testing. Note the 2 inch steel esh screen extension to the back wall of the trough, which is the design modification. Bottom: Trash in the flume behind the steep catch asin inlet emulation. Right: looking up the flume to the v-notch weir and the green water inlet.

<u>Results</u>

Results showed no overtopping of trash in any scenario. This confirmed the design modifications not only satisfy the regulatory requirements but perform in a 'worst case scenario' which satisfies concerns that trash could overtop in a larger event.

Videos of the testing can be viewed via the following links:

- EMMA Design Modification Test_1-year 1-hour Storm - https://youtu.be/7Qlm8bJLF5A
- EMMA Design Modification Test _10-year 1-hour Storm - https://youtu.be/MqVvpPwY_Z4

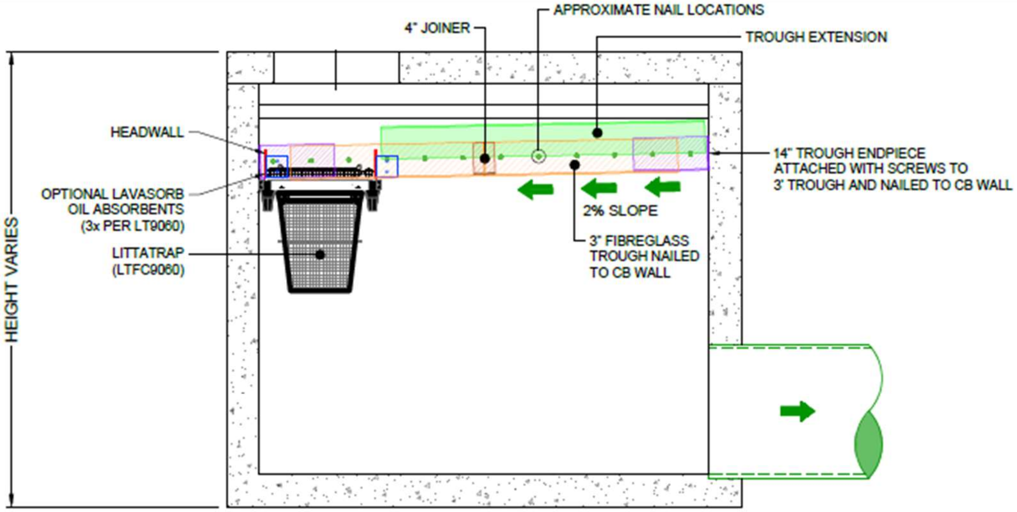
<u>Conclusion</u>

This report demonstrates and confirms that the EnviroPod EMMA trough can convey 100% of trash to the LittaTrap in the highest stress conditions, which includes excessive trash, 10-year 1-hour flows, which are well beyond the regulation requirement if 1-year 1-hour storms, and with concentrated flow entering perpendicular to the catchbasin inlet and directly hitting the trough.

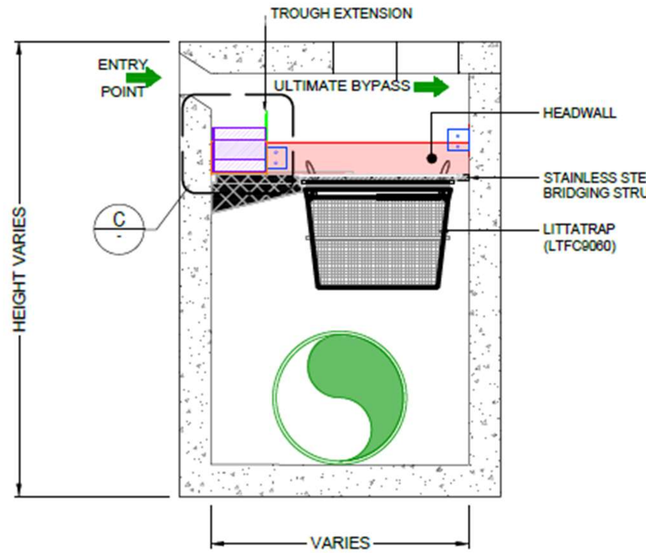
The EMMA design modifications are adequate and fit for purpose.

Appendix A
EMMA Trough Design Update

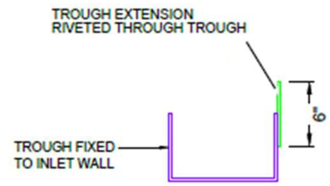
Enviropod Inc. 473 E. Carnegie Dr. Suite 200, San Bernardino, California 92408 USA
www.enviropod.com



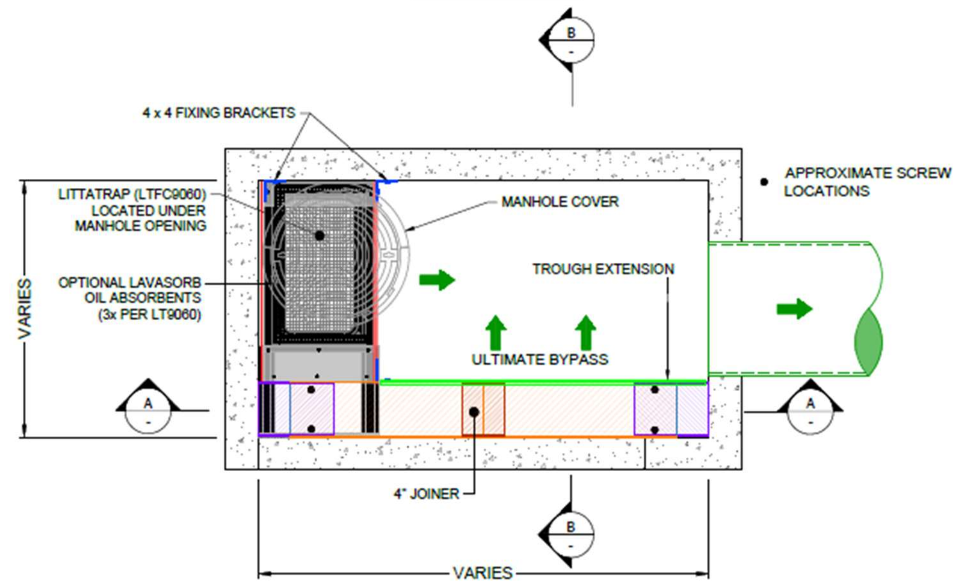
SECTION A-A



SECTION B-B



DETAIL C



PLAN VIEW

ENVIROPOD EASY MAINTENANCE MANHOLE ACCESS (EMMA) CURB ENTRY LITTATRAP FLOW AND STORAGE SPECIFICATION							
LITTATRAP EMMA KIT NAME	CURB ENTRY CATCH BASIN LENGTH (FEET)	LittaTrap FC MODEL	MAXIMUM TRASH CAPTURE VOLUME (MTCV)	LITTATRAP DESIGN FLOW RATE (50% MTCV) CFS	CHANNEL MAX FLOW RATE CFS	BASKET BYPASS FLOW RATE CFS	TROUGH BYPASS (200% SAFETY FACTOR) CFS
Fiberglass EMMA kit - LT9060	3'+	LTFC9060	3.0	4.8	2.1	4.5	3.4 + 0.55 per ft

The Enviropod LittaTrap™ flow rates listed are for a factory set bypass. Please contact Enviropod for specific bypass requirements.

Trough bypass is based on minimum 3' EMMA kit and has additional bypass capacity per each added foot of trough, and is based on 150mm height above the trough and assumes no restriction in structure inlets/outlets.

The Enviropod LittaTrap™ shall not block the view of the outlet pipe for easy mosquito vector access.

PATENT No.

THE Enviropod® may be protected by one of the following Canadian, USA or International patent numbers and has other patents pending : 2,810,974, 13/824,376, 15/459,964, 2011302712, 588049

ENVIROPOD™
A STORMWATER360™ COMPANY

ENVIROPOD LittaTrap™
CURB ENTRY APPLICATION
EASY MAINTENANCE MANHOLE (EMMA)
GENERAL ARRANGEMENT

DRG No : USA-CURB-EMMA-V2 | REV : F | DATE : 15/08/24

JOB NO :
PROJECT :

DRN :	R.P.	08/23/21
CKD :	M.H.	08/23/21

REV	REVISION DETAIL	DATE
B	ADDED DETAIL	12/14/21
C	FIBERGLASS	03/03/23
D	TABLE/LAVASORB	11/09/23
E	SIMPLE TABLE	11/17/23
F	RETURN ADDED	15/08/24

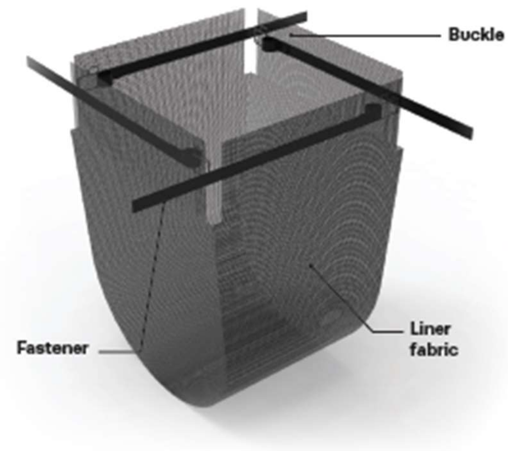
APPENDIX E – Enviropod® LittaTrap™ FC Liner Photos and Specifications

LittaTrap™

Full Capture Liner

ENVIROPOD.COM

Full Capture Performance Liner designed to meet or exceed compliance with California State Waterboard Full Capture Trash Device design standard protocols. Full Capture Liner is used in conjunction with a LittaTrap™ inlet filter basket.



SPECIFICATIONS

Nominal Aperture Dimensions: 4.8mm x 3.9mm

Material: PVC with PE

Use: Capture of trash and other gross pollutants

Enviropod LittaTrap™ With Full Capture Liner Flow & Storage Specification

LittaTrap™ and Liner Model Size inch	Screen Area In²	Maximum Trash Capture Volume (MCTV) – ft³	Design Flow Rate at 50% MCTV CFS	Standard Bypass Flow CFS
18 x 18	601	0.7	2.1	2.1
24 x 24	969	1.6	3.2	3.3
36 x 24	1473	3.0	4.8	4.5

Image of correct liner installation, with fastener attached to the appropriate buckle with no obstruction of LittaTrap™ bypass

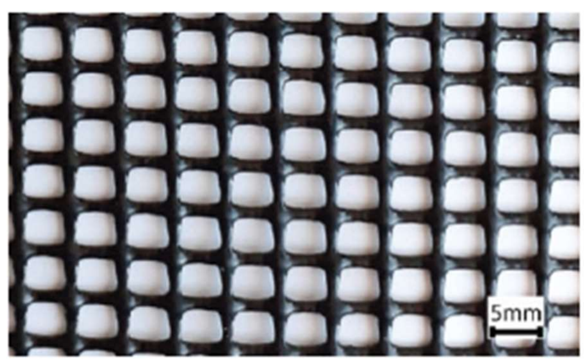


Image of Full capture liner for scale

ENVIROPOD™
A STORMWATER360™ COMPANY

(877) 651-0566
INFO@ENVIROPOD.COM
ENVIROPOD.COM

APPENDIX F – MCVAC Approval Letter

MVCAC
Mosquito and Vector Control Association of California
One Capitol Mall, Suite 320 • Sacramento, CA 95814 • p: (916) 440-0826 • f: (916) 444-7462 • e: mvcac@mvcac.org

Enviropod International Ltd
7c Piermark Drive,
Rosedale, Auckland 0632
New Zealand

November 26, 2024

Dear Mr. Hannah,

Thank you for the submission of the Enviropd LittaTrap Trash Treatment Control System, Grated Inlet, Curb Inlet, Combination Inlet, and Manhole Catch Basin Configuration for review by the Mosquito and Vector Control Association of California pursuant to the SWRCB Trash Treatment Control Device Application Requirements. The Association has reviewed the conceptual drawings for the above LittaTrap configurations and verifies that provisions have been included in the designs that allow for full visual access to all areas for presence of standing water, and when necessary, allows for treatments of mosquitoes.

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

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

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

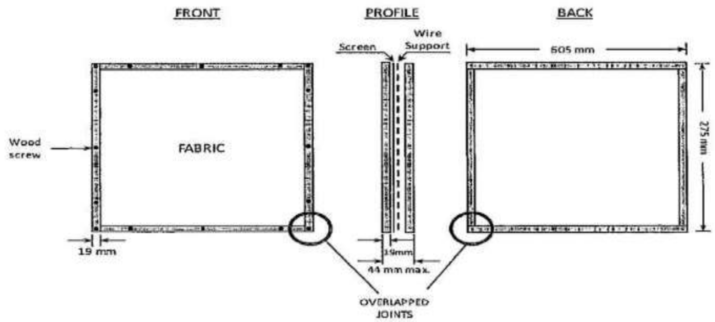
Sincerely,

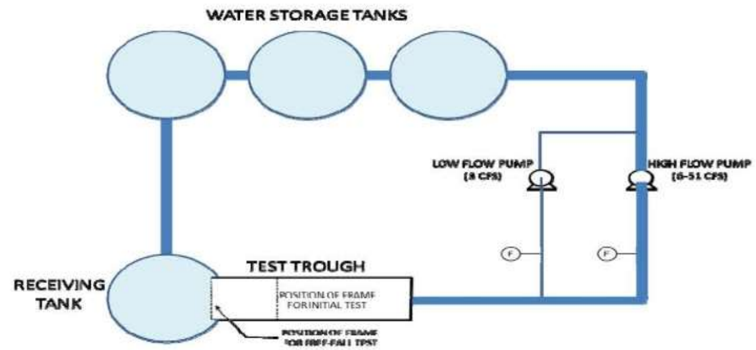
Megan MacNee
MVCAC Executive Director

APPENDIX G – Example Hydraulic Calculations

Empirical Test Data

These calculations are based on the test data from the Enviropod Fabric hydraulic report April 9 2020
These calculations used the results for the fabric combination of J + LTF
The follow table details the water surface elevation required to pass flow at a given flow rate through the screen in a free discharge situation.
The water surface elevation is the height of water,
The specific flow rate is calculated by dividing the flow rate by the length of the test fabric at that height of water
The test fabric is a rectangle of the following dimensions

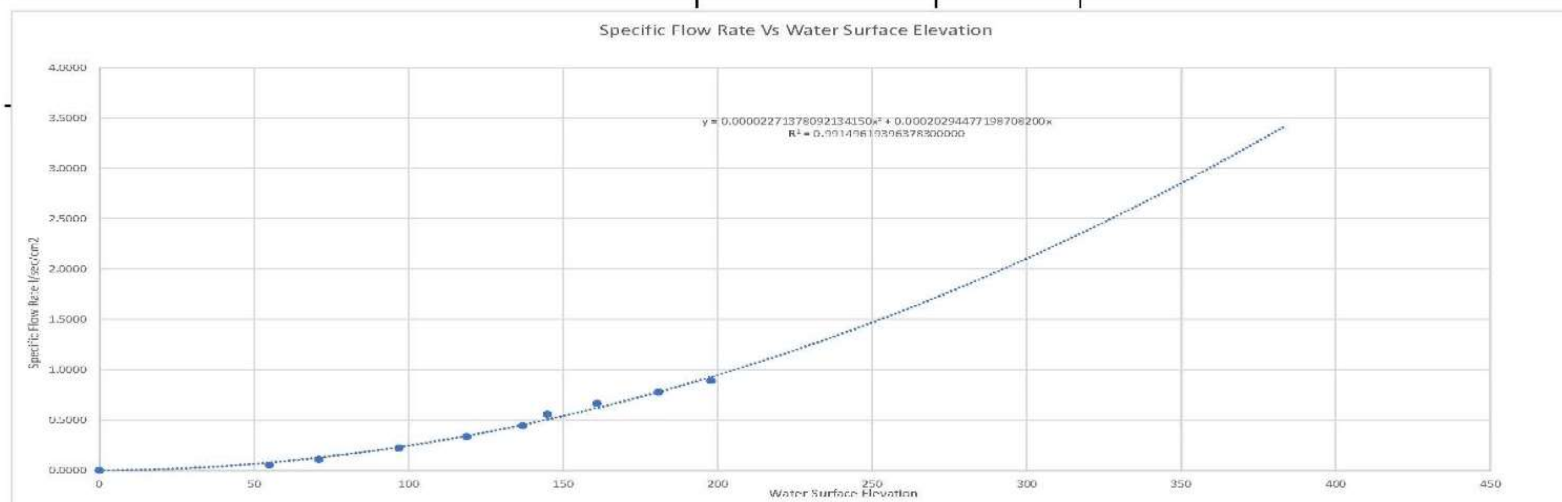




Test Fabric Width 567 mm

y = 0.000002271378092134150x2 + 0.00020294477198708200x

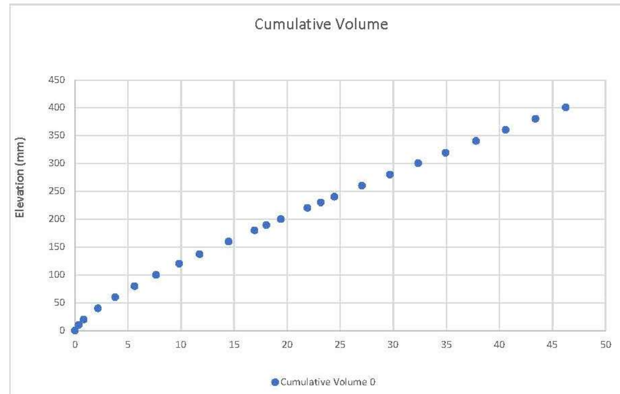
Fabric	Flow Rate (GPM)	Flow Rate (LPS)	Water Surface Elevation	Submerged Screen Area (cm2)	Specific Flow Rate l/sec/cm	Model Output Check (Specfic Q)
	0	0	0	0	0	0
J + LTF	50	3.2	55	312	0.056	0.058
	99	6.2	71	403	0.110	0.100
	201	12.7	97	550	0.224	0.194
	300	18.9	119	675	0.334	0.297
	399	25.2	137	777	0.444	0.399
	500	31.5	145	822	0.556	0.448
	600	37.9	161	913	0.668	0.556
	701	44.2	181	1026	0.780	0.707
	800	50.5	198	1123	0.890	0.850

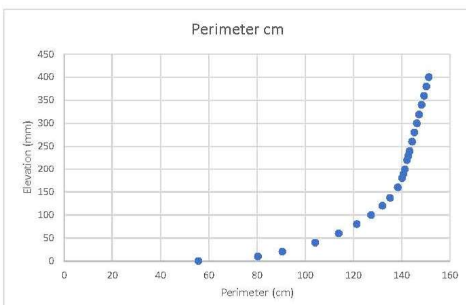


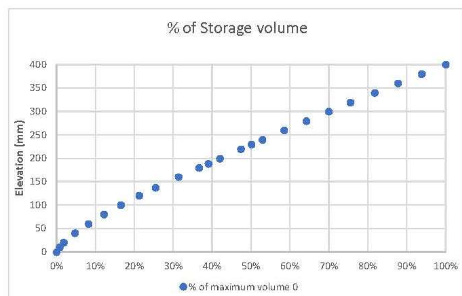
Enviropod Littatrap FC Stage Storage.

Elevation from base mm	Perimeter cm	Cross Sectional Area cm2	Volume per elevation section	Cumulative Volume	% of maximum volume
400	151	1429	2.9	46	100%
380	150	1410	2.8	43	94%
360	149	1391	2.8	41	88%
340	148	1372	2.9	38	82%
319	147	1352	2.6	35	75%
300	146	1334	2.7	32	70%
280	145	1315	2.6	30	64%
260	144	1297	2.6	27	58%
240	143	1278	1.3	24	53%
230	143	1268	1.3	23	50%
220	142	1259	2.5	22	47%
200	141	1240	1.4	19	42%
189	141	1229	1.1	18	39%
180	140	1220	2.4	17	37%
160	138	1188	2.7	14	31%
137	135	1135	1.9	12	25%
120	132	1084	2.2	10	21%
100	127	1010	2.0	8	17%
80	121	920	1.8	6	12%
60	114	809	1.6	4	8%
40	104	670	1.3	2	5%
20	90	479	0.5	1	2%
10	80	340	0.3	0	1%
0	56	0	0.0	0	0%

Max Basket Volume 46.24 Litters







Stage Discharge Of a Partially Full Basket

The flow rate at each level of fullness is determined by the following process and is based on empirical test data for the fabric

Level Full from the base is the level of trash accumulation from the base of the basket.

The % full is the percentage of the maximum storage volume

Available free board is the screen hight above the level of the trash accumulation

Determine the Specific flow rate perimeter (l/sec/cm) at this flow rate with the following equation

y = 0.00002271378092134150x2 + 0.00020294477198708200x

where y = Specific flow rate l/sec/cm2 and X is the available free board or height

Determine the average perimeter of the free board area

Calculate the flow rate by multiplying Specific flow rate by the average perimeter length.

Level Full from basket mm	Perimeter cm	Cumulative Volume litters	% Full	Available Free board mm	Average Perimeter cm	Specific flow rate at Available free board	Flow Rate l/sec
400	151.20	46.24	100%	0	151.20	0.00	0
360	149.20	40.57	88%	40	150.20	0.03	4
340	148.20	37.78	82%	60	149.70	0.07	10
319	147.15	34.90	75%	81	149.18	0.13	20
300	146.20	32.33	70%	100	148.70	0.21	31
280	145.20	29.66	64%	120	148.20	0.30	45
260	144.20	27.03	58%	140	147.70	0.42	62
240	143.20	24.44	53%	160	147.20	0.55	81
230	142.70	23.16	50%	170	146.95	0.62	91
220	142.20	21.89	47%	180	146.70	0.70	103
200	141.20	19.38	42%	200	146.20	0.87	127
189	140.65	18.01	39%	211	145.93	0.97	141
180	140.11	16.91	37%	220	145.66	1.05	154
160	138.30	14.47	31%	240	144.75	1.26	182
137	135.13	11.74	25%	263	143.17	1.52	217
120	131.98	9.81	21%	280	141.59	1.72	244
100	127.29	7.64	17%	300	139.25	1.98	276
80	121.36	5.62	12%	320	136.28	2.26	308
60	113.85	3.78	8%	340	132.53	2.56	339
40	104.11	2.16	5%	360	127.66	2.87	366
0	55.60	0.00	0%	400	103.40	3.55	367

Bypass flow Rate

The bypass flow is determined by modelling the bypass as 4 orifice controls
The flow though each orifice is calculated as a rectangular orifice
The LittaTrap is installed with the bypass centre 200mm below surface level.
The driving head is therefore 200mm
With width of the bypass is 50mm and the length is the length of the basket side.

LT6060

Long Side Orifices			Long Side Orifices		
h=	0.2	m	h=	0.2	m
L=	0.38	m	L=	0.38	m
W=	0.05	m	W=	0.05	m
Area=	0.019	m2	Area=	0.019	m2
n=	1		n=	1	
2*9.81*h=	3.924		2*9.81*h=	3.92	
% unblocked	100%		% unblocked	100%	
Q=m3	0.02	m3	Q=m3	0.02	m3
Q=l/sec	23	l/sec	Q=l/sec	23	l/sec
No Openings	2		No Openings	2	
Total Q_{out}	47	l/sec	Total Q_{out}	47	l/sec

Overall Q_{out}	93	l/sec
	3.3	CFS

EMMA Channel Calculations - Metric and Imperial, all sizes

		Channel Slope:	2%	Channel height (in):	6	Channel Width (in):	10
Channel opening (mm):	512	Channel Slope (mm/m):	20mm/m	Channel height (mm)	152.4	Channel Width (mm	254
Channel opening (m):	0.512	Channel Slope (m/m):	0.02m/m	Channel height (m):	0.1524	Channel Width (m):	0.254
Channel Length (Channel + headwall (ft'in"))	8.34	Cross sectional area of the channel (in^2)	60.00				
Channel length (Channel + headwall (mm))	2541.36	Cross sectional area of the channel (mm^2)	38709.6				
Channel length (Channel + headwall (m))	2.54	Cross sectional area of the channel (m^2)	0.0387096				

$Q = (A \times R^{(2/3)} \times S^{(1/2)})/n$

(for fiberglass) n	0.008	
(for stainless steel) n	0.012	
A	0.03871	m2
S	0.02	
P	0.5588	m
g	9.8067	m/s/s

The weir flow rate is the function of the coefficient of the discharge (C), upstream head (H), and length of the weir (L). The equation also depends on the cross-sectional profile. The broad crested weir equation to calculate discharge (Q) is:

$Q=C \times L \times H^{3/2}$

The broad crested weir coefficient (C), in this case, depends on acceleration due to gravity, such that:

$C=[2/3]^{3/2} g^{0.5}$

https://www.omnicalculator.com/physics/broad-crested-weir

To calculate the maximum flow rate of a channel, you can use Manning's equation, which is commonly used for open-channel flow calculations. Manning's equation relates the flow rate (Q) to the hydraulic radius (R), the channel slope (S), and the Manning's roughness coefficient (n):

$Q = (1.0/n) \times A \times R^{(2/3)} \times S^{(1/2)}$ **(for metric 1/n ...for imperial 1.486/n)

So, for metric can be rearranged to:

Q = (A × R^(2/3) × S^(1/2))/n

Where: Q = Flow rate (cubic meters per second, or other appropriate units)
n = Manning's roughness coefficient (dimensionless) that represents the resistance to flow in the channel
A = Cross-sectional area of flow (square meters, or other appropriate units)
R = Hydraulic radius, defined as the ratio of the cross-sectional area (A) to the wetted perimeter (P) of the channel (meters or other appropriate units)
S = Channel slope, expressed as the change in elevation per unit distance (meters per meter, or other appropriate units)

To calculate the maximum flow rate, you will need to determine the maximum values for A, R, and S based on the channel geometry and the specific conditions you are considering. The Manning's roughness coefficient (n) represents the resistance to flow and depends on the channel material,

Curb inlet length (ft)	Curb inlet length + Headwall (L) (m)	H (m)	R (m)	C ($^{0.5}s^{-1}$)	Channel Max Flow Rate (fibreglass) (m^3/s)	Channel Max Flow Rate (stainlees steel) (m3/s)	Chanel Max Flow Rate (CFS)	Channel Max flow with 200% FOS (CFS)	Ultimate Bypass (m3/s)	Ultimate Bypass (CFS)	Ultimate bypass with 200% FOS (CFS)	
3	1.89	0.15	0.07	1.705	0.115	0.077	4.076	2.038	0.191645402	6.767893409	3.38395	
3.5	2.04	0.15	0.07	1.705	0.115	0.077	4.076	2.038	0.207100287	7.313677518	3.65684	0.27289
4	2.19	0.15	0.07	1.705	0.115	0.077	4.076	2.038	0.222555172	7.859461627	3.92973	0.27289
5	2.50	0.15	0.07	1.705	0.115	0.077	4.076	2.038	0.253464943	8.951029845	4.47551	0.54578
6	2.80	0.15	0.07	1.705	0.115	0.077	4.076	2.038	0.284374713	10.04259806	5.02130	0.54578
7	3.11	0.15	0.07	1.705	0.115	0.077	4.076	2.038	0.315284483	11.13416628	5.56708	0.54578
8	3.41	0.15	0.07	1.705	0.115	0.077	4.076	2.038	0.346194253	12.2257345	6.11287	0.54578
9	3.72	0.15	0.07	1.705	0.115	0.077	4.076	2.038	0.377104023	13.31730272	6.65865	0.54578
10	4.02	0.15	0.07	1.705	0.115	0.077	4.076	2.038	0.408013794	14.40887093	7.20444	0.54578
11	4.33	0.15	0.07	1.705	0.115	0.077	4.076	2.038	0.438923564	15.50043915	7.75022	0.54578
12	4.63	0.15	0.07	1.705	0.115	0.077	4.076	2.038	0.469833334	16.59200737	8.29600	0.54578
13	4.94	0.15	0.07	1.705	0.115	0.077	4.076	2.038	0.500743104	17.68357559	8.84179	0.54578
14	5.24	0.15	0.07	1.705	0.115	0.077	4.076	2.038	0.531652875	18.7751438	9.38757	0.54578
15	5.55	0.15	0.07	1.705	0.115	0.077	4.076	2.038	0.562562645	19.86671202	9.93336	0.54578
16	5.85	0.15	0.07	1.705	0.115	0.077	4.076	2.038	0.593472415	20.95828024	10.47914	0.54578
19	6.77	0.15	0.07	1.705	0.115	0.077	4.076	2.038	0.686201726	24.23298489	12.11649	1.63735
21	7.38	0.15	0.07	1.705	0.115	0.077	4.076	2.038	0.748021266	26.41612133	13.20806	1.09157

All Flow rates include 200% safety factor

APPENDIX H – Summary of locations of updates

EMMA Updates

Updates pertaining to the EMMA kit can be found in the following locations:

- 3.A: Trash Capture, Page 1.
- 3.B: Peak Flows / Trash Volumes:
  - Easy Manhole Maintenance Access (EMMA) (Configuration 4b) Curb Inlet Filter Selection, Configuration, and Operation, Page 9.
- Figure 13 Diagram showing all components of the Enviropod® LittaTrap™ EMMA system; Page 10.
- Figure 14 Illustration of the .Configuration 4b EMMA trough conveying flow to the Enviropod® LittaTrap™ basket.; Page 10.
- Table 4: Enviropod® LittaTrap™ EMMA (Configuration 4b only) Kit Hydraulic Capacity. Basket flow rates and capture volumes are the same as for the baskets in Table 2 and Table 3 Page 12.
- 3.G: Internal Bypass. Page 15.
- 3.J: Photos
  - Figure 25: Top three: Examples of EMMA Kit Installation. Page 20.
- 3.K: Material Types
  - Table 6: Enviropod® LittaTrap™ FC additional EMMA components and materials. Page 21.
- 4.A: Standard device installation procedures including calibration instructions. Page 22.
- 4.B: Description of device installation limitations and/or non-standard device installation procedures. Page 22.
- 5.C: Maintenance procedures, including procedures to clean the trash capture screen ; Page 28.
- Figure 32 Illustration of a vactor truck hose accessing the Enviropod® LittaTrap™ FC via the manway directly above when fitted with the Easy Manhole Maintenance Access (EMMA) kit.; Page 31.
- APPENDIX B – Installation Manuals; Page 1
  - EMMA SOP; Page 59.
- APPENDIX D – Lab Testing Information – EMMA Trough Lab Testing
  - Pages 99-104

Stainless Steel Flange and Basket Updates

The LittaTrap™ now has a metal (stainless-steel) basket option. The basket is made of 4.8mm 16 gauge stainless steel with 51% open area, which meets the requirements of the California Water Resources Control Boards Trash Provisions and can be used and installed with any other LittaTrap™ component, such as the LittaTrap™ FC filter box, the stainless-steel flange and/or the EMMA kit. Updates pertaining to the Enviropod® LittaTrap™ FC stainless steel option can be found in the following sections:

- 1.D: A brief summary of any field/lab testing results that demonstrates the device functions as described within the application, Page iv and Page v.
- 1.E: A brief summary of the device limitations, and operational, sizing, and maintenance considerations; Page v
- 3.A: Trash Capture, Page 1.
- 3.C: Hydraulic Capacity, Page 11
- 3.E: Design drawings, Page 12
    - APPENDIX A – Generic Drawings, Page 41
- 3.F: Alternative , Page 12
- 4.B: Description of device installation limitations and/or non-standard device installation procedures, Page 22
    - Figure 27 Example of installing the stainless-steel basket within the stainless-steel basket option, Page 24
    - Figure 28 Example of the stainless-steel basket installed in a grate inlet catch basin, Page 25
- 5.B: Description of maintenance frequency considerations related to the device's hydraulic capacity at various levels of trash capture volumes, Page 27
    - Table 7: Recommended maintenance frequency and at what percentage of MTCV for the Enviropod® LittaTrap™ FC. Page, 27.
- 5.C: Maintenance procedures, including procedures to clean the trash capture screen, Page 28.
- 8.0: Field/Lab Testing Information and Analysis, Page 39
    - APPENDIX D – Lab Testing Information, Page 97-98

The purpose of the stainless-steel flange option is to provide a more robust flange for industrial sites. Updates pertaining to the stainless-steel flange and vector ports for the stainless steel flange option can be found in the in the following sections:

- 3.F: Alternative ; Page 12.
- 4.B: Description of device installation limitations and/or non-standard device installation procedures Page 22.
- Figure 26 Example of a stainless-steel flange installation; Page 24.
- 6.0 VECTOR CONTROL ACCESSIBILITY Page 32
    - Figure 38 Stainless steel HVPS on a stainless-steel

flange. Full drawing is available in Appendix A. This design is applicable to grated inlet catchbasins (Configuration 1), manhole catchbasins (Configuration 2) and combination inlet catchbasins (Configuration 3)

- Figure 39 Stainless steel sliding vector port seal. Only to be used if the preferred design is not feasible and grate bars must be parallel the ports longest axis to enable sliding as indicated in yellow. Detailed drawing is provided in Appendix A

Minimum Clearance Requirement Updates

Updates pertaining to curb/grate inlet minimum clearance requirements can be found in the following locations:

- 4.B: Description of device installation limitations and/or non-standard device installation procedures, Page 22
- Figure 29 Illustration to show minimum clearance requirement Page 25.
- 4.C: Methods for diagnosing and correcting installation errors, Page 26.