TEXAS REGIONAL STORMWATER CONFERENCE

Critical Factors with Retrofitting Catch Basins to Trap Trash at the Source

William Harris
Vice President
Enviropod, Inc.

Eric Gonzales
Project Engineer
GeoSolutions, Inc.

www.enviropod.com

Overview

- Introduction to Enviropod International
- What is Trash & Impacts on our waterways
- Sources of Trash & Trash Leakage
- Trash Regulations
- Example Devices of Capturing Trash in CBs
- Critical design factors for Catch Basin Trash Traps
- Device Maintenance and Costs
- Example Trash Capture Project: City of San Marcos

Protecting the future of our waterways for over 25 years

Enviropod, Inc. is based in California with offices and distribution centers throughout the USA and Canada

Enviropod is part of Stormwater360 Group. A specialist stormwater management and green infrastructure technology company.

We believe in science and research and, as part of our ongoing efforts to improve water quality outcomes, we've invested heavily in innovation.

We have invested in Enviropod to provide an accessible solution to stop plastic being transported from the land to worlds ocean's lakes and rivers

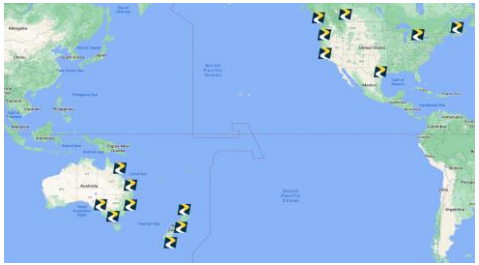
ENVIROPOD™

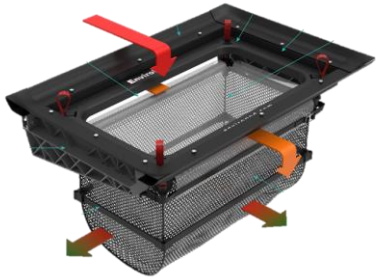
25 YEARS

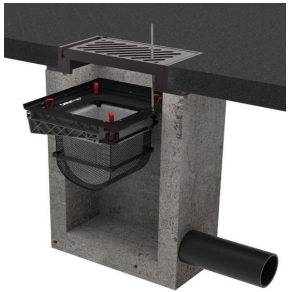
Stormwater360
BETWEEN SKY AND SEA

LittaTrap: Modular Inlet Filter System

- Durable and modular inlet trap system with 8-year warranty
- Mass produced and flat packed for low-cost manufacture, freight and warehousing
- Fits inside any type of catch basin inlet structure. Easy to install & maintain
- Additional range of consumables and add-ons
- 28 years of testing and validation of performance
- USA and Canada Distribution Centers with full stock of LittaTrap parts & components



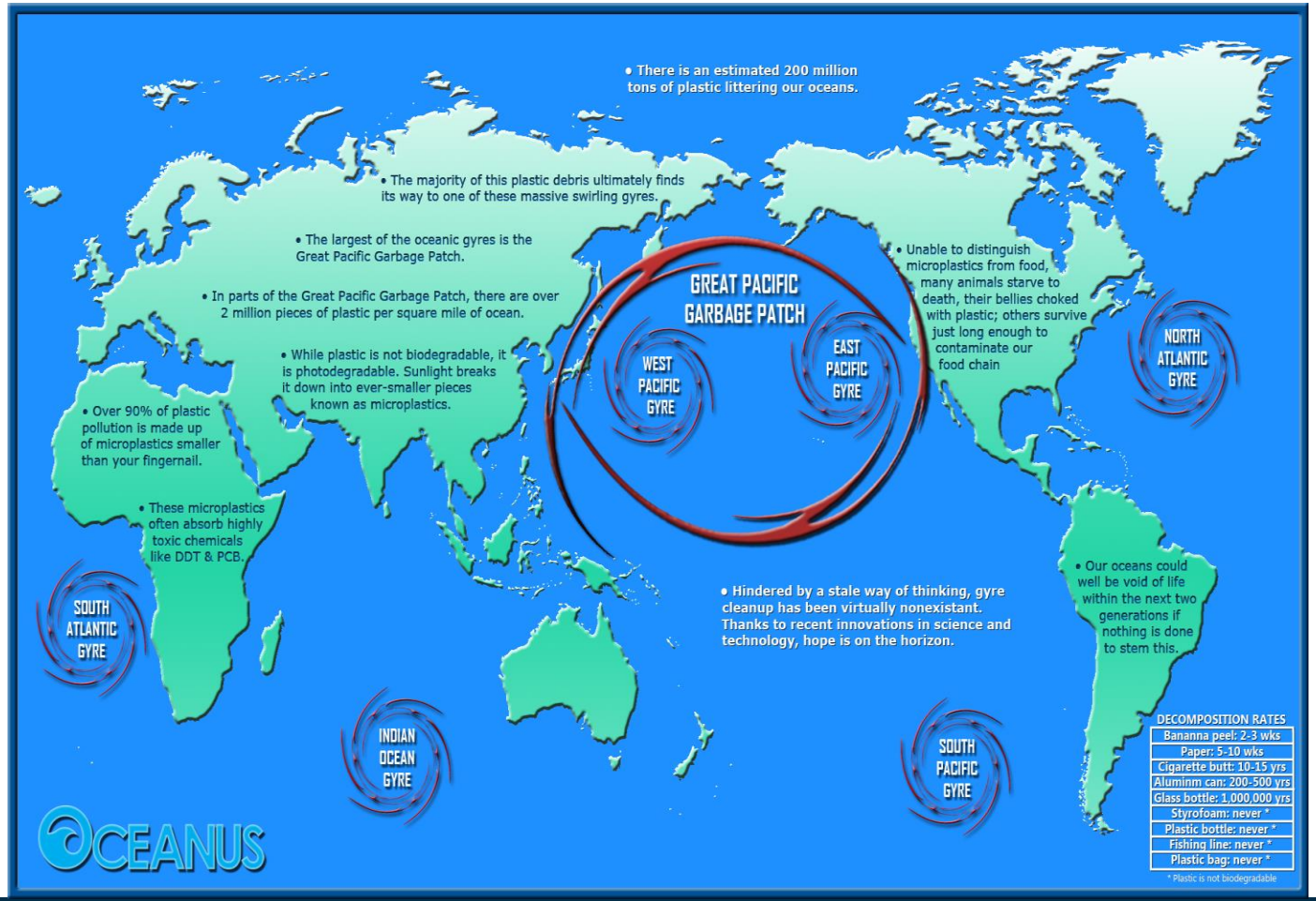




What is Trash?

Trash Talk

Trash Talk



200 Million Tons of Plastic in Our Oceans


Rich Horner

Trash Talk

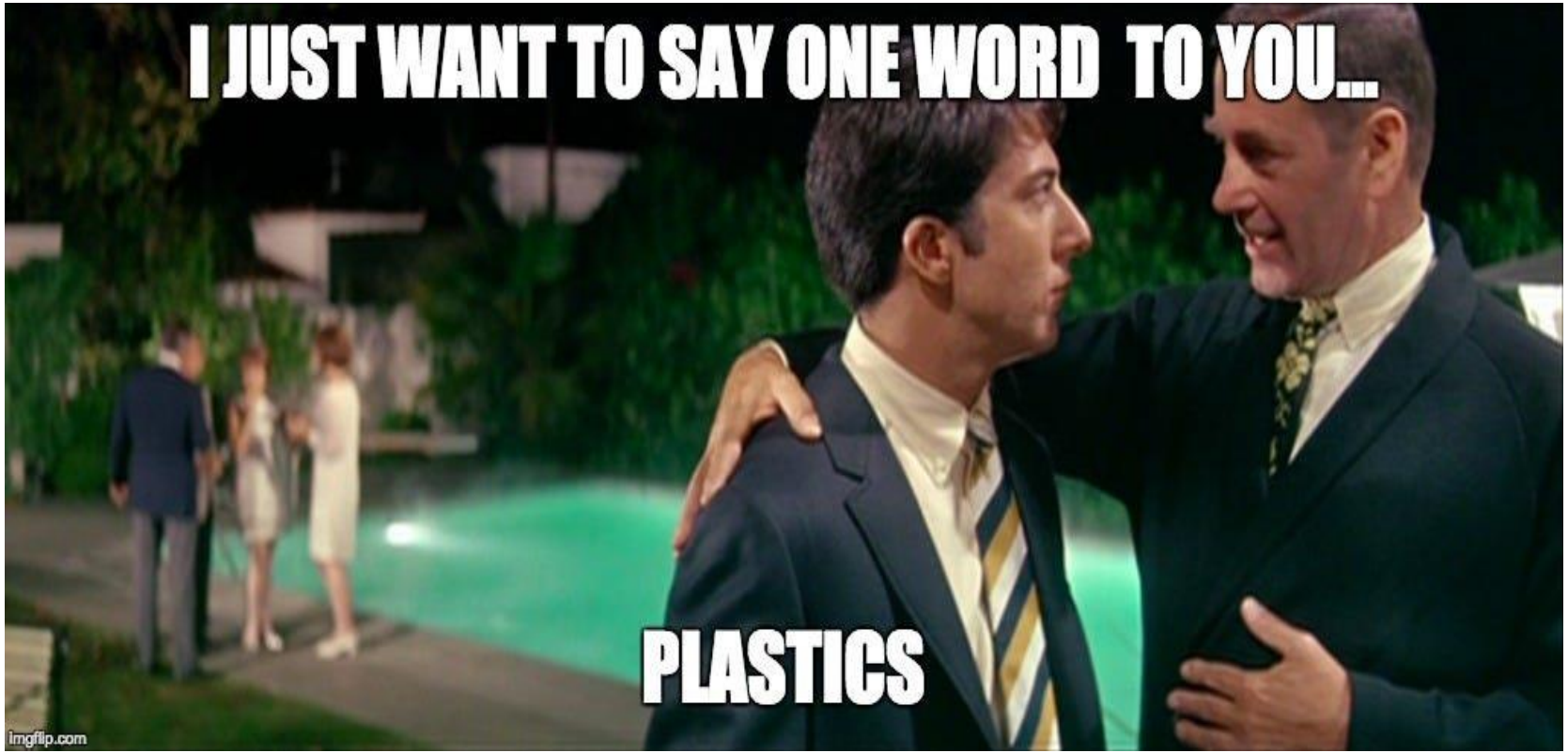
Trash, Plastic & Gross Pollution

- Gross pollutants (GP) are defined as debris items larger than 5 mm
- GP generally consist and coarse sediments
- 50 – 90 % of GP is organic of litter, debris
- 70 -80% of inorganic material is plastic
- 20% is floating
- 80 – 320 lb/ac Mass load from urban areas
- 6 - 30 ft3/ac Volumetric load from urban areas

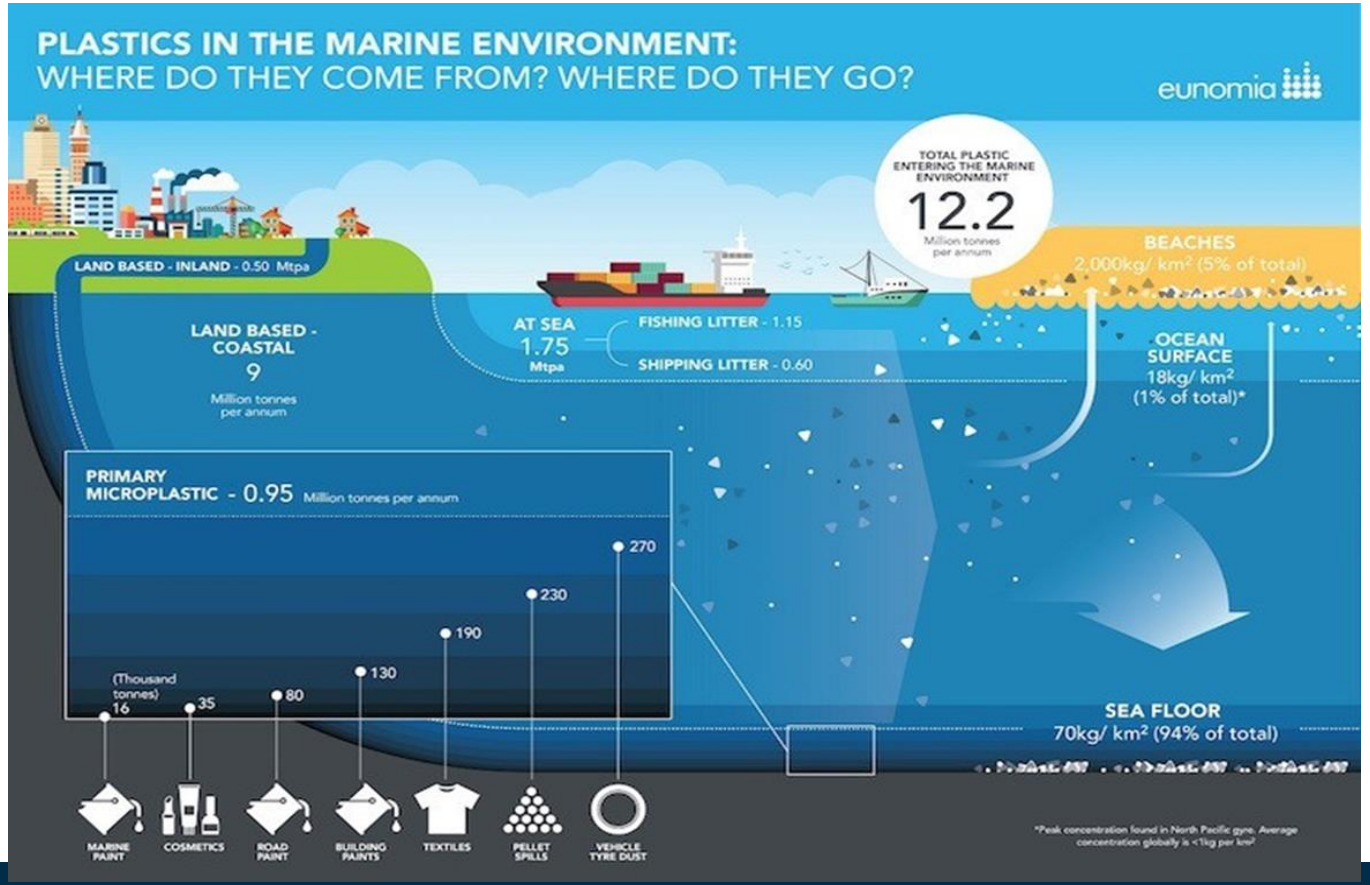
Allison, R.A, Walker, T.A., Chiew, F.H.S., O'Neill, I.C., McMahon, T.A. (1998) *From Roads to Rivers: Gross Pollutant Removal from Urban Waterways*, Cooperative Research Centre for Catchment Hydrology

Hannah, M.M. (2005) *Stormwater Bed load and Gross Pollutant Export rates and their implication for treatment devices*, North American stormwater conference (Stormcon) Orlando, Florida.

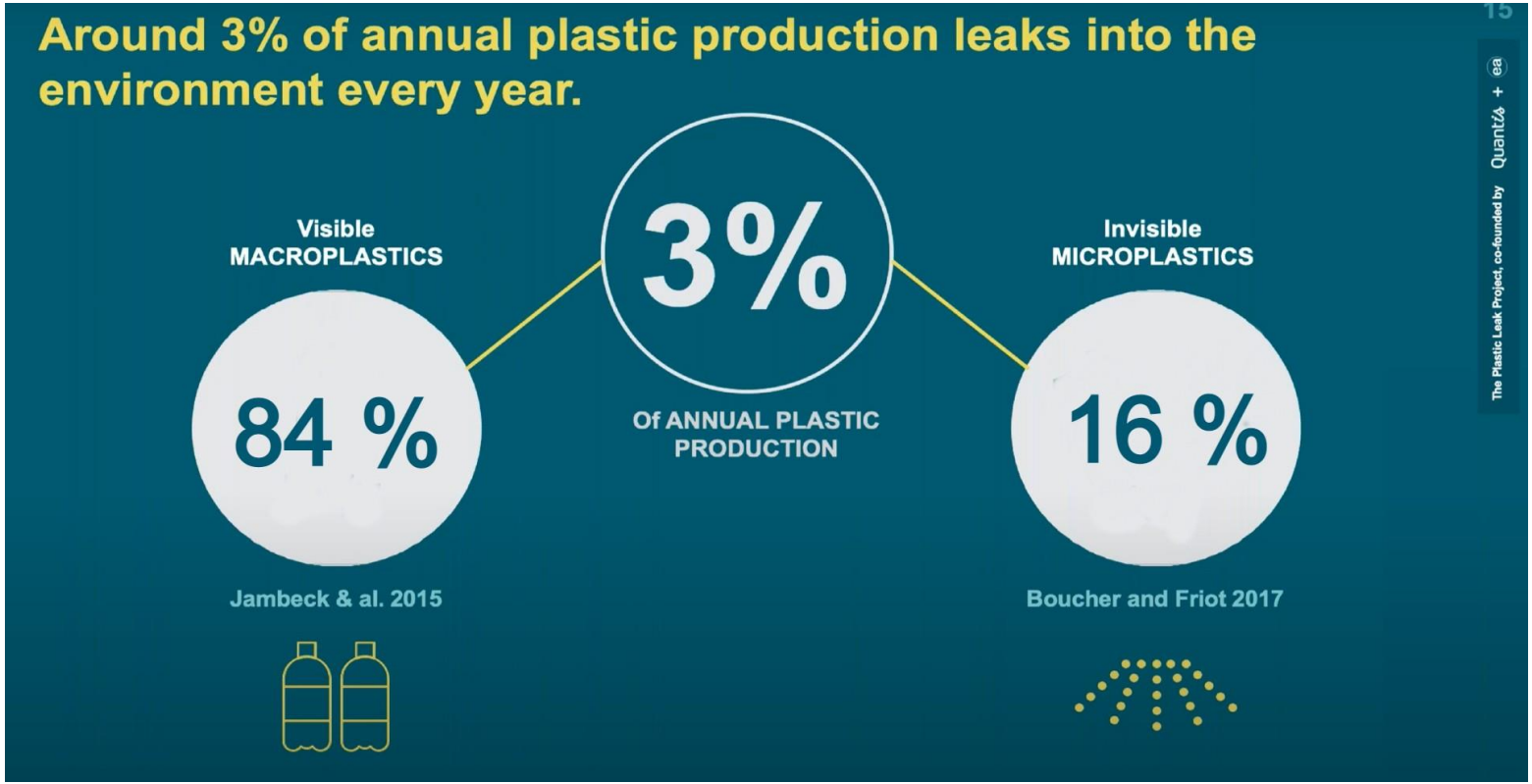
Plastic Universe



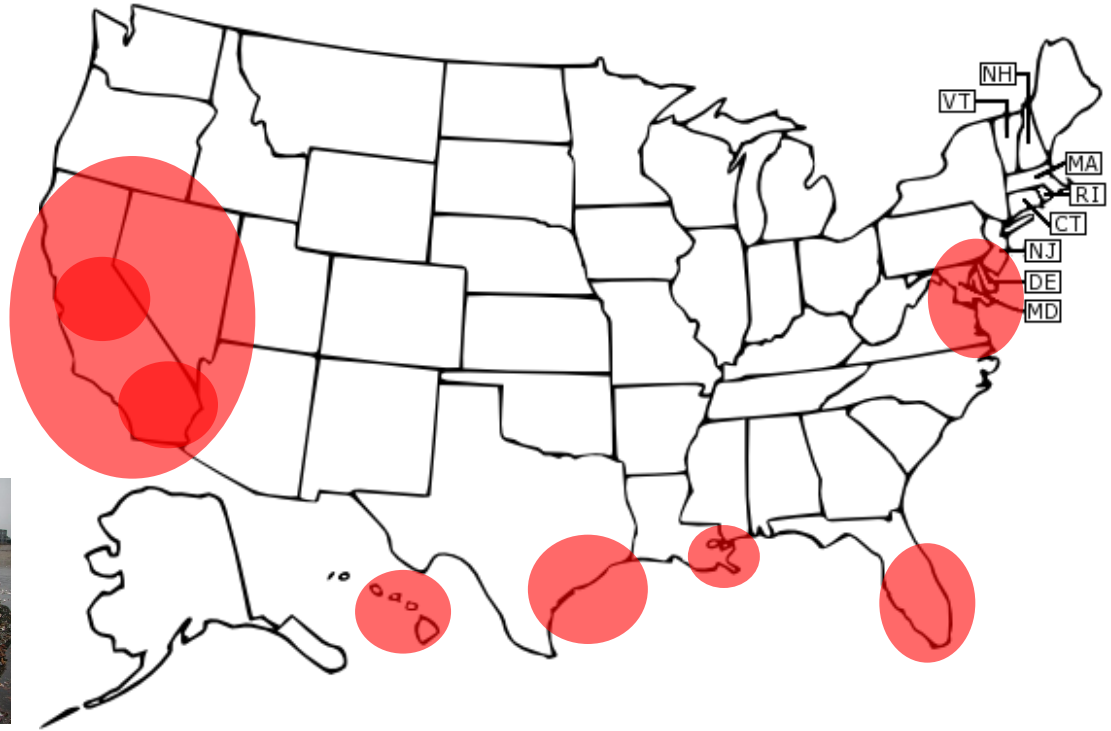
Where does marine plastic come from?



Marco Plastic vs Micro Plastic Leakage



Trash Regulations, TMDL's & Statewide Strategies



Trash Regulation Results

Los Angeles Region

Los Angeles River Watershed

Actual capture of over six million pounds of trash per year through 17,000 installed full capture systems

Ballona Creek Watershed

- Actual capture of over one million pounds of trash per year via 2,500 full capture systems

San Francisco Bay Region

- 90 percent permittee compliance with the 2020 goal of 80 percent trash reduction

California State-Wide Trash Provisions

California has adopted statewide trash provisions that:

- Are applicable to all regulated stormwater discharges to surface waters, including the ocean
- Replace the need for Regional Boards to adopt future trash Total Maximum Daily Loads
- Provide state-wide regulatory consistency
- Implement a statewide trash prohibition with a 0% discharge goal by 2030
- Require capture of 100% of 5-mm or greater from a peak flow generated from 1-year, 1–hour storm event from priority land uses or equivalent removal of trash by nonstructural means
- Only certified full capture trash systems may be used

California State Water Board FTC Device Application & Certification

California Water Boards

Gavin Newsom
Governor

Jared Blumenfeld
Secretary for Environmental Protection

State Water Resources Control Board

EXECUTIVE DIRECTOR DESIGNEE CERTIFICATION OF TRASH FULL CAPTURE SYSTEMS (Updated October 2020)

The Executive Director Designee of the State Water Resources Control Board certified and added the following devices to the Certified Full Capture System List of Trash Treatment Control Devices on specified date.

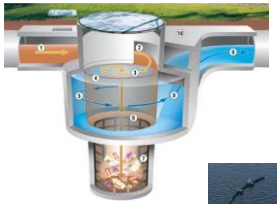
No.	Description of Trash Devices	Date of Certification
26	Enviropod® LittaTrap™ Full Capture Device	10/15/2020

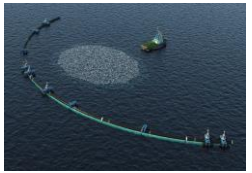
In accordance with the Trash Amendments[1], I do hereby certify that the Trash Treatment Control Devices/Systems in the Certified Full Capture Systems lists of Trash Treatment Control Devices meet the Full Capture System definition provided the device or system meets the conditions stated within these lists.

Karen Mogus, Deputy Director of Water Quality
Executive Director Designee

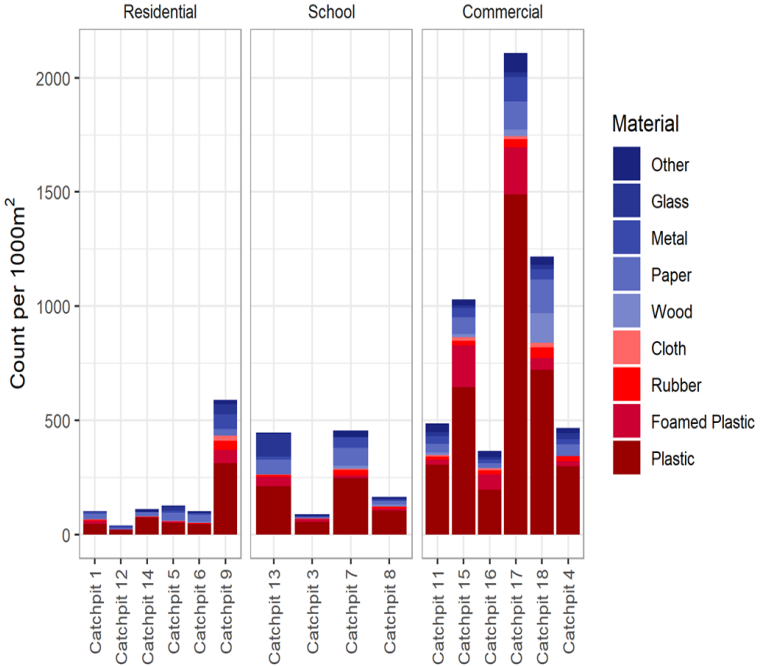
Managing Trash

- Source control
- At-source control - Catch basin
- Inline – Low-capacity screening
- End of line – High-capacity screening
- Beach clean-up / ocean clean-up

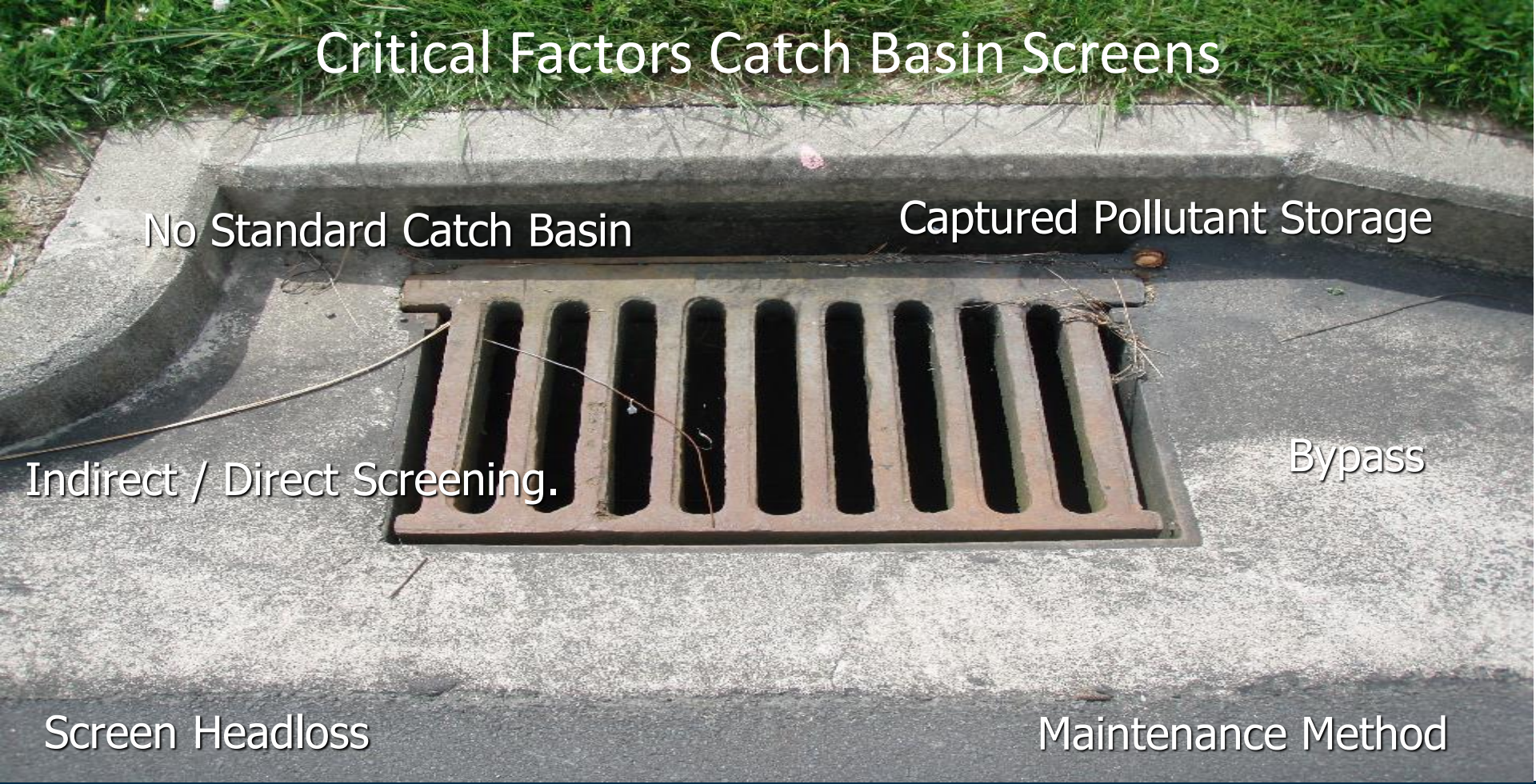




Identify Trash Hotspots



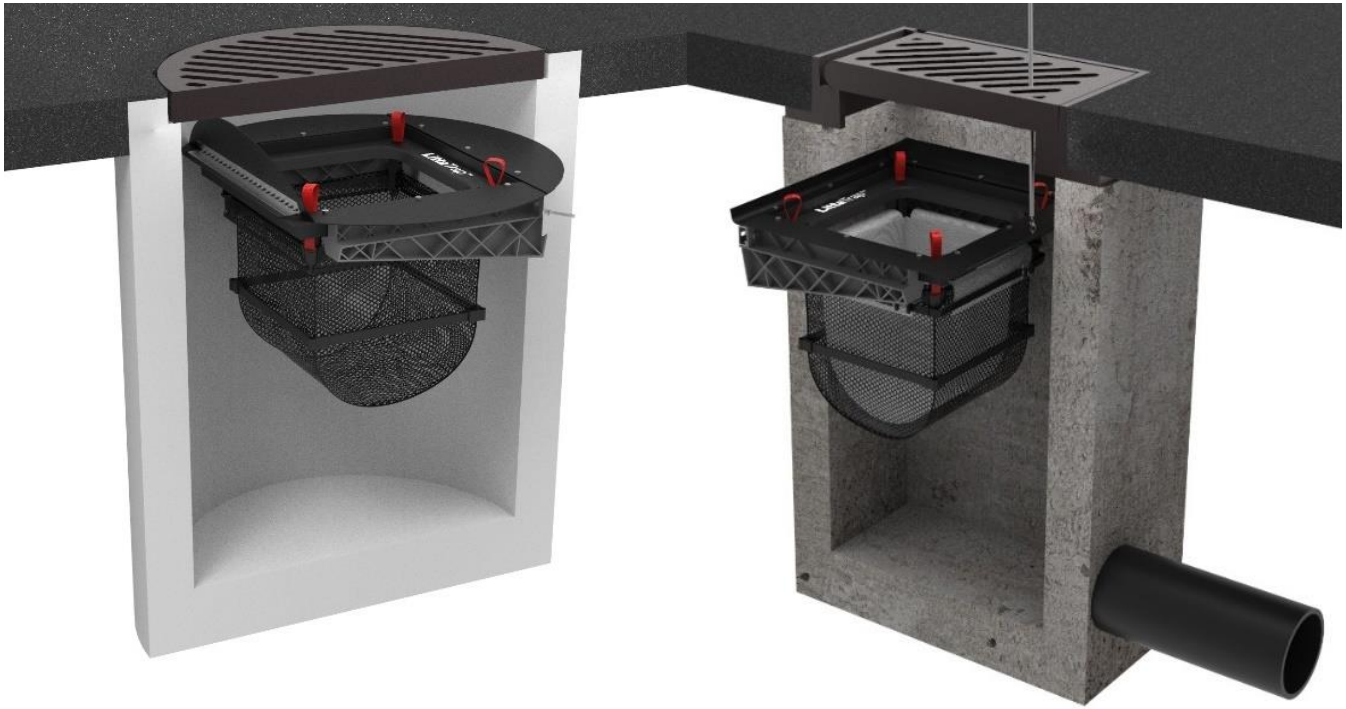
Critical Factors Catch Basin Screens



Catch Basin Characteristics

- Drain Inlet, Catch basin, Gullypit, Stormwater Inlet
- Huge variance in dimensions. “No two the same”.
- Designed to a flow / catchment area
- Dry or Sumped
- Short time of concentration
- Historical designs provide little water quality benefit.
- Fundamental Stormwater Asset

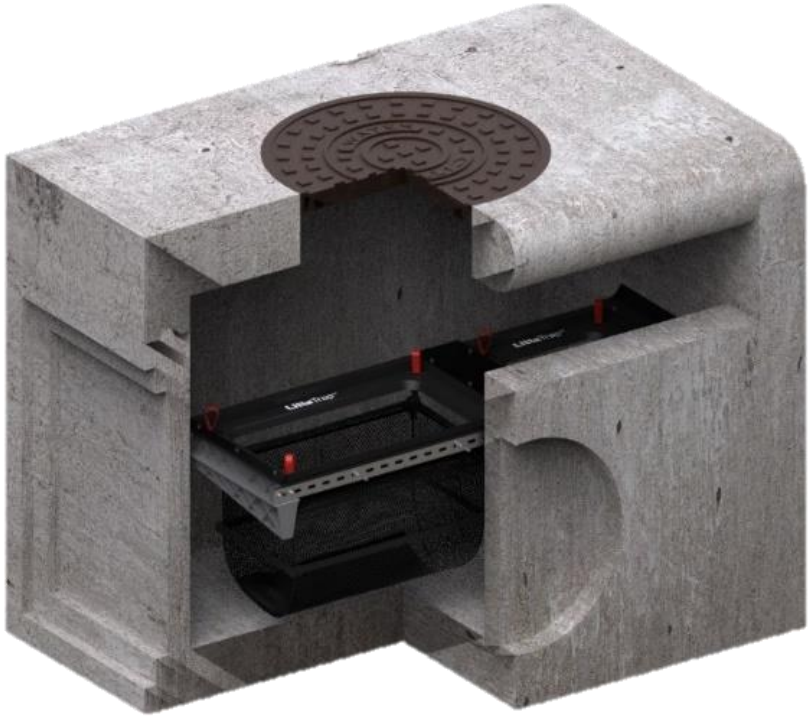
Grate Inlet Configurations



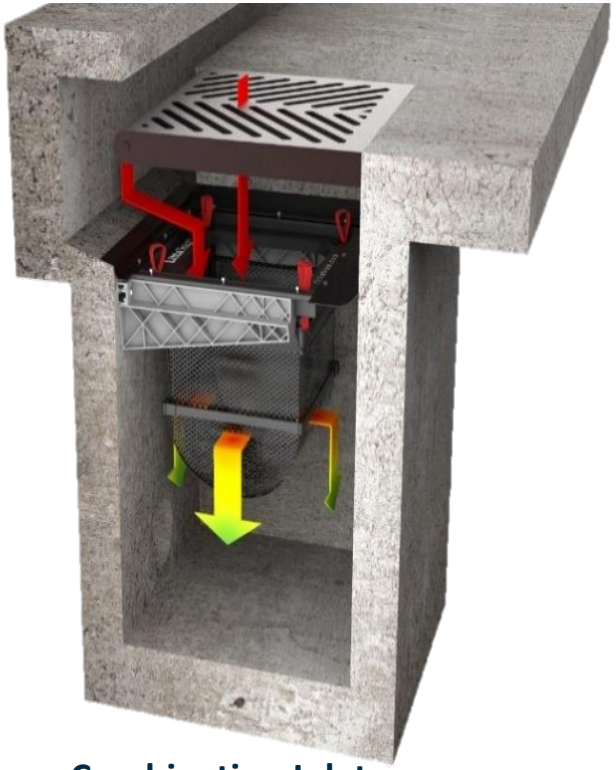
Manhole Grate Inlet with HVPS

Grate Inlet with HVPs

Curb Inlet Configuration



Curb Inlet



Combination Inlet

Catch Basin Challenges

Offset Grates

Rotated CB's

Catch Basin Challenges

Channel drains

Inlet pipes

Catch Basin Challenges

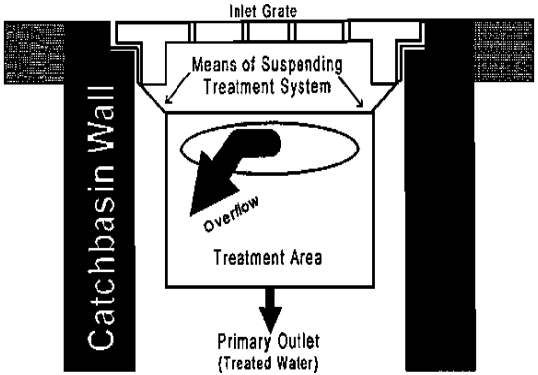
Inlet pipes

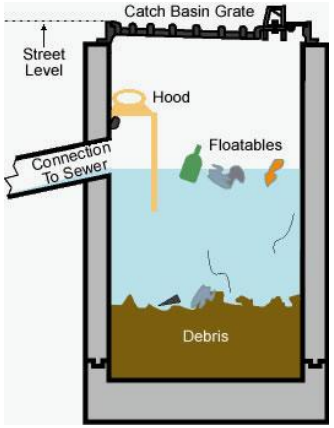

C.B. Access?

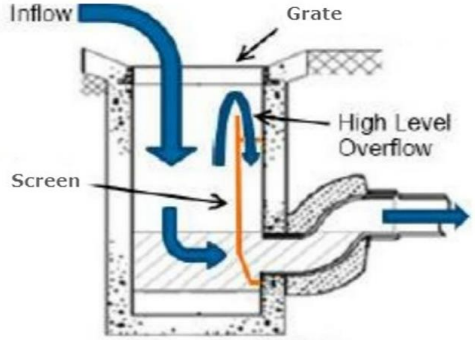
At Source (Catch Basin) BMPs

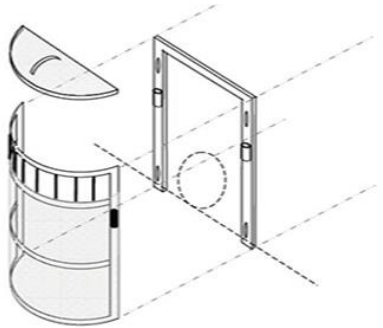
What is a Catch Basin Insert?

- Designed to be retrofitted into new and existing catch basins
- Enhances the water quality benefit of any standard catch basin design
- No construction and no land take.
- Low capital cost
- Requires on going maintenance.





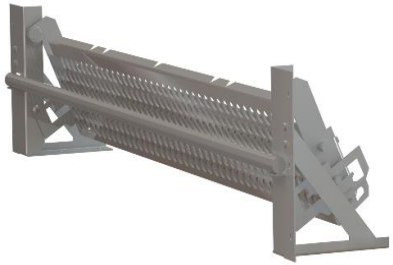


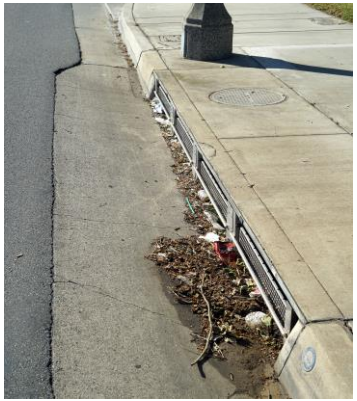


Trash Screens

Fixed Screen

ARS Screen





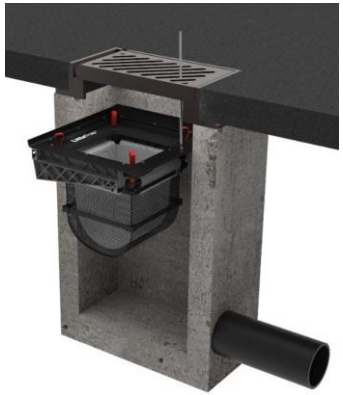
MODULAR CPS

Screen Maintenance – Routine Street Sweeping

Catch Basin Inlet Filter Devices

AbTech

Enviropod LittaTrap



BioClean Inlet Filters (Contech)

FLEXSTORM INLET FILTERS
A division of ADS

Fabco Screen Box Inlet Filters

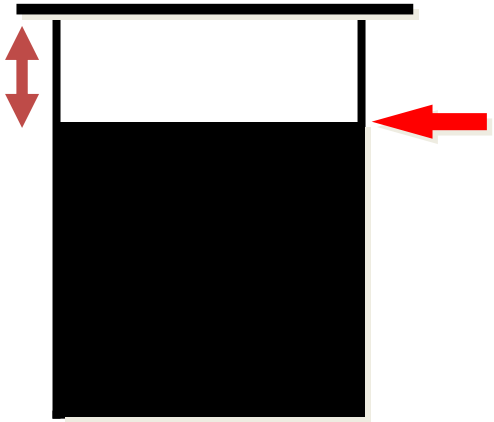
REM Triton Drop Inlet Filters

Questions you need to ask Manufacturers

- What is the life span of the device (life cycle)?
- What are the device materials (Steel? HDPE? Fiberglass? Any Textiles? Chemical Resistance?)
- Has the device been tested by 3rd Parties? Is the Device approved by an Agency? Where?
- How many std sizes and configurations? Design Options? Can the device be customized?
- What is the Storage Capacity of the collection basket or container? Maintenance Frequency?
- How is the device installed? Ask for Installation procedures for all models and sizes.
- Will the device allow access to the floor of the catch basin?
- What are the maintenance procedures? Confined Space Requirements?
- Are parts and components readily available if needed? What do they cost?
- Does the device come with a warranty? How long is the warranty?
- How much does each device model cost per type of catch basin size / configuration?

Pollutant Storage / Treatable Flow Rate

Available Screen Area & driving head



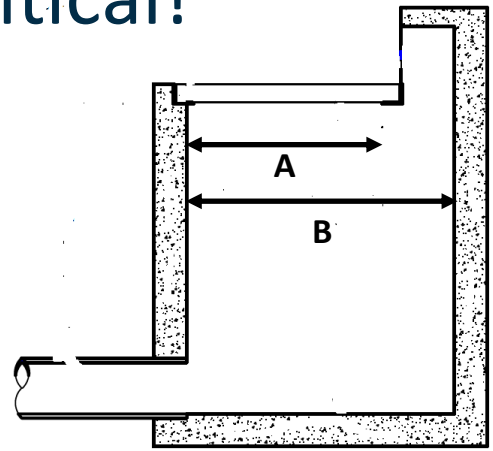
Storage Volume

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 24	LTFC9060	1473	3

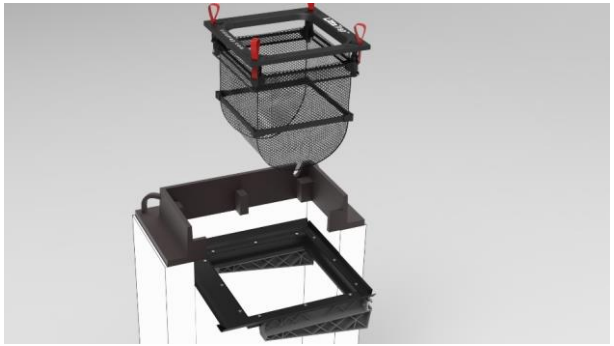
Basin Size	Enviropod® LittaTrap™ FC Size	Flow Rate 0% MTCV CFS	Flow Rate 25% MTCV CFS	Design Flow Rate 50% MTCV CFS	Flow Rate 75% MTCV CFS	Standard Bypass Flow* CFS
18 x 18	LTFC4545	8.2	5.2	2.1	0.4	2.1
24 x24	LTFC6060	13	7.7	3.2	0.7	3.3
36 x 24	LTFC9060	20.2	11.3	4.8	1.1	4.5

CB Dimensions are Critical!

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



A = Grate clear opening dimensions
B = Catch basin Dimensions



Submit CB Measurements

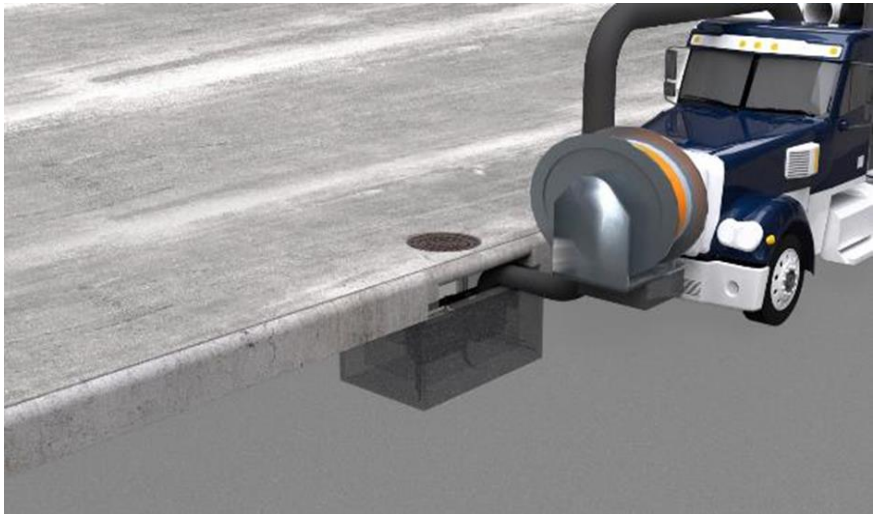
Provide Photo of CB with the Grate removed and the camera pointed down inside the CB

City of Colton, CA
2021

Curb Inlet Filter Installation

ENVIROPOD.COM

Catch Basin Filter Maintenance

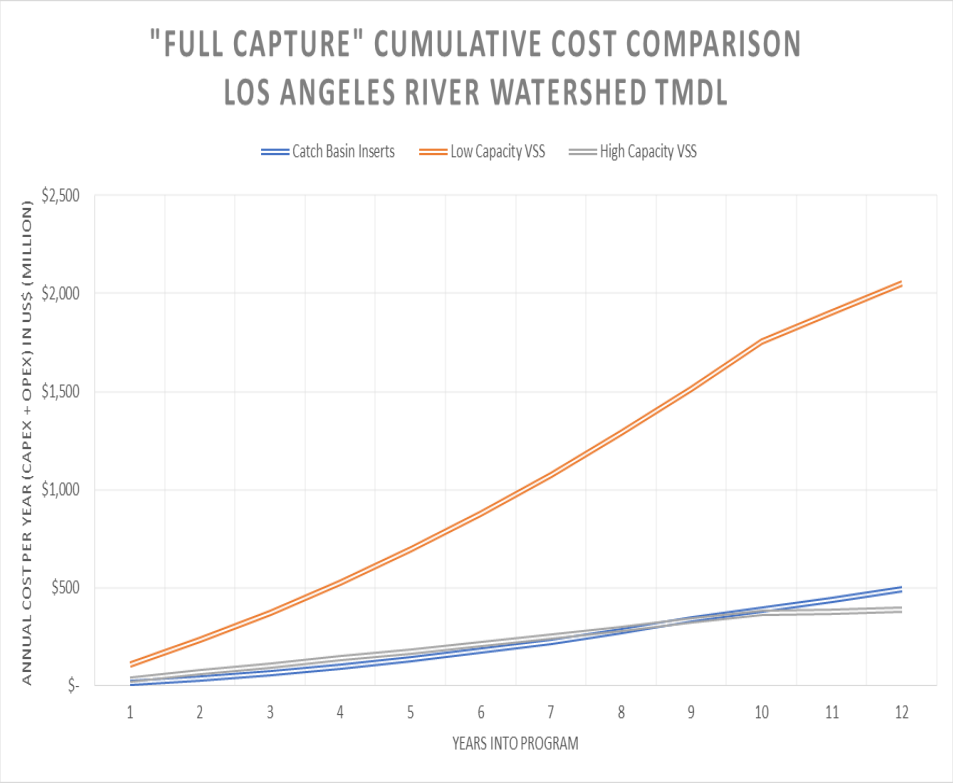


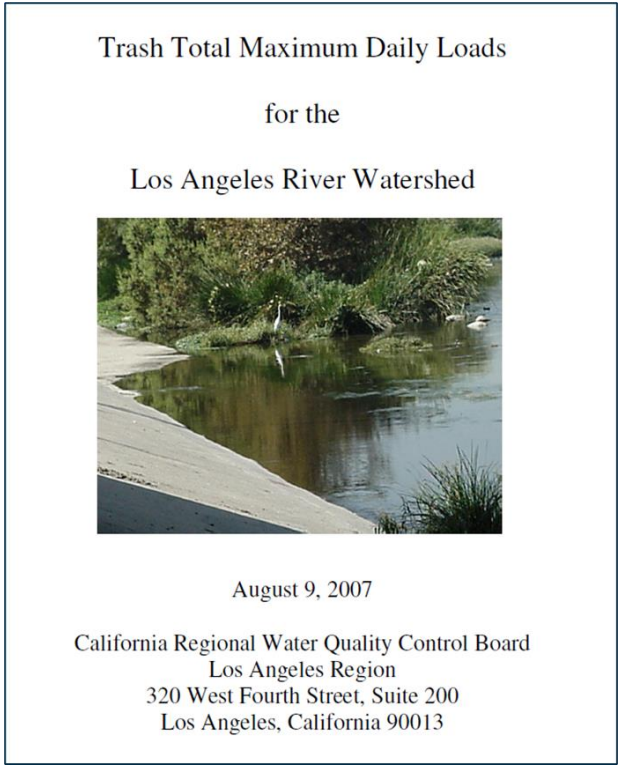
Maintenance Regimen & Frequency

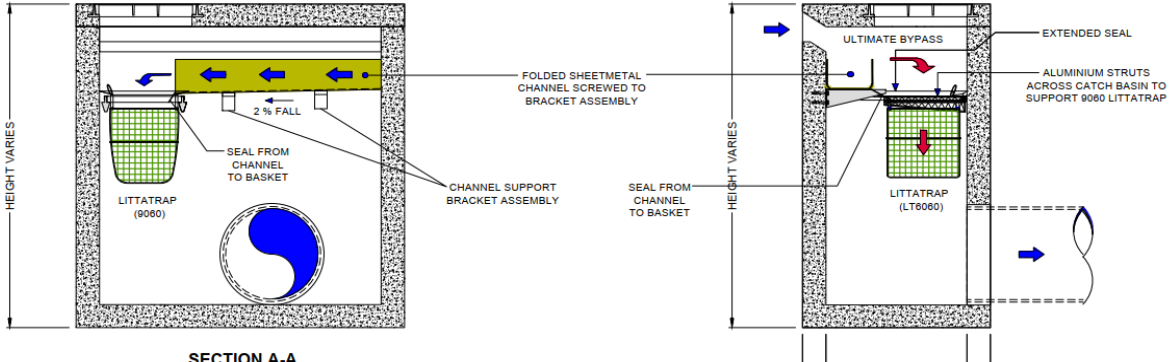
- Method – Hand / Vactor Truck
- Frequency / Storage Volume /Efficiency
- Removal/Reinstall
- Cleaning / Replacements of Screens
- Easy Access
- Replacement and repair cost

Safety

At Source vs Inline vs End Of Line

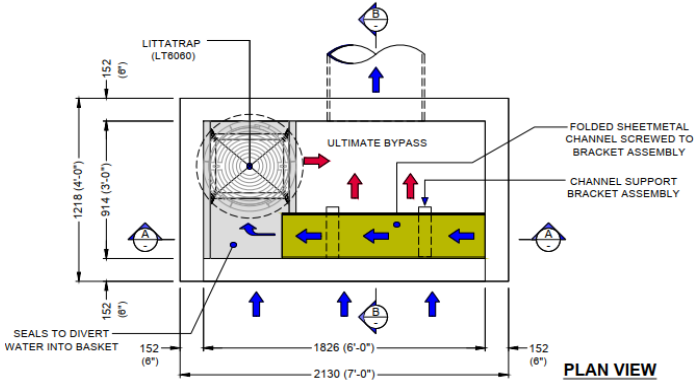






SECTION A-A

SECTION B-B



PLAN VIEW

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

Curb Entry Catch Basin Length (Feet)	LittaTrap FC Model Size	Maximum Trash Capture Volume (MTCV)	Design Flow Rate (50% MTCV) CFS	Channel Maximum Flow rate CFS	Ultimate Bypass (200%) Safety Factor CFS
7"	LTFC6060	3.0	4.8	2.1	12.08

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

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

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

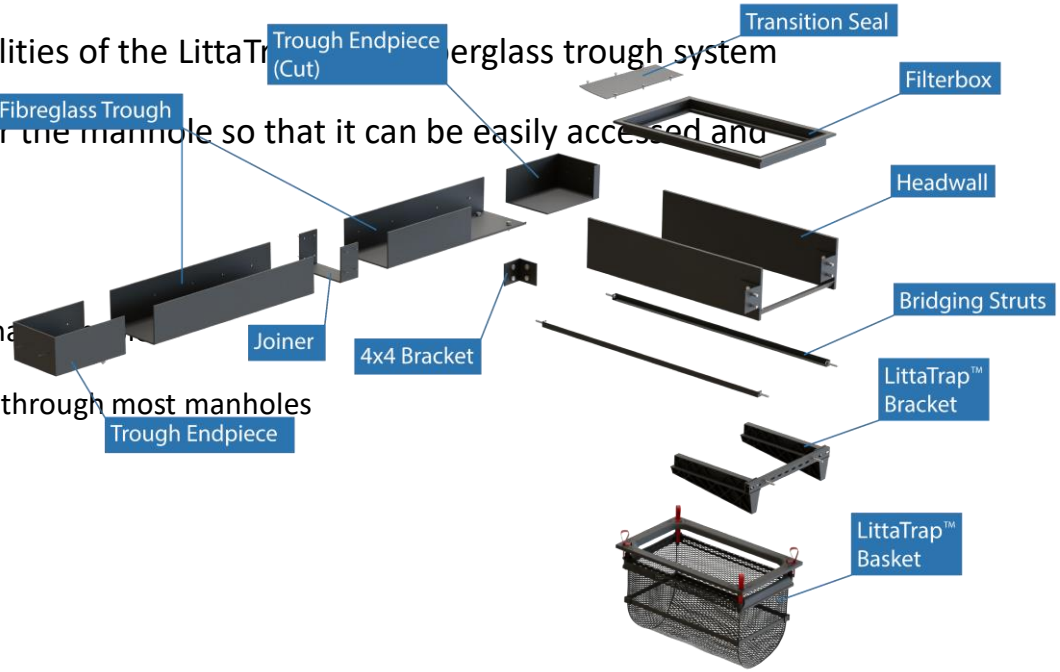
DRG No : USA-CURB-EMMA | REV : A | DATE : 27.04.22

JOB NO :
PROJECT :
DRN : R.P. 27.04.22
CKD : M.H. 27.04.22

REV	REVISION DETAIL	DATE
A	FIRST ISSUE	27.04.22

EMMA – Easy Manhole Maintenance Access

- The EMMA design combines the modular abilities of the LittaTr… erglass trough system
- This places the LIttaTrap basket directly under the manhole so that it can be easily accessed and maintained.
- Two basket options available:
  - LT(36x24) – large capacity but typically not hand ma…
  - LT(24x24) – Smaller basket but can be maintained through most manholes
- Video detailing standard installation



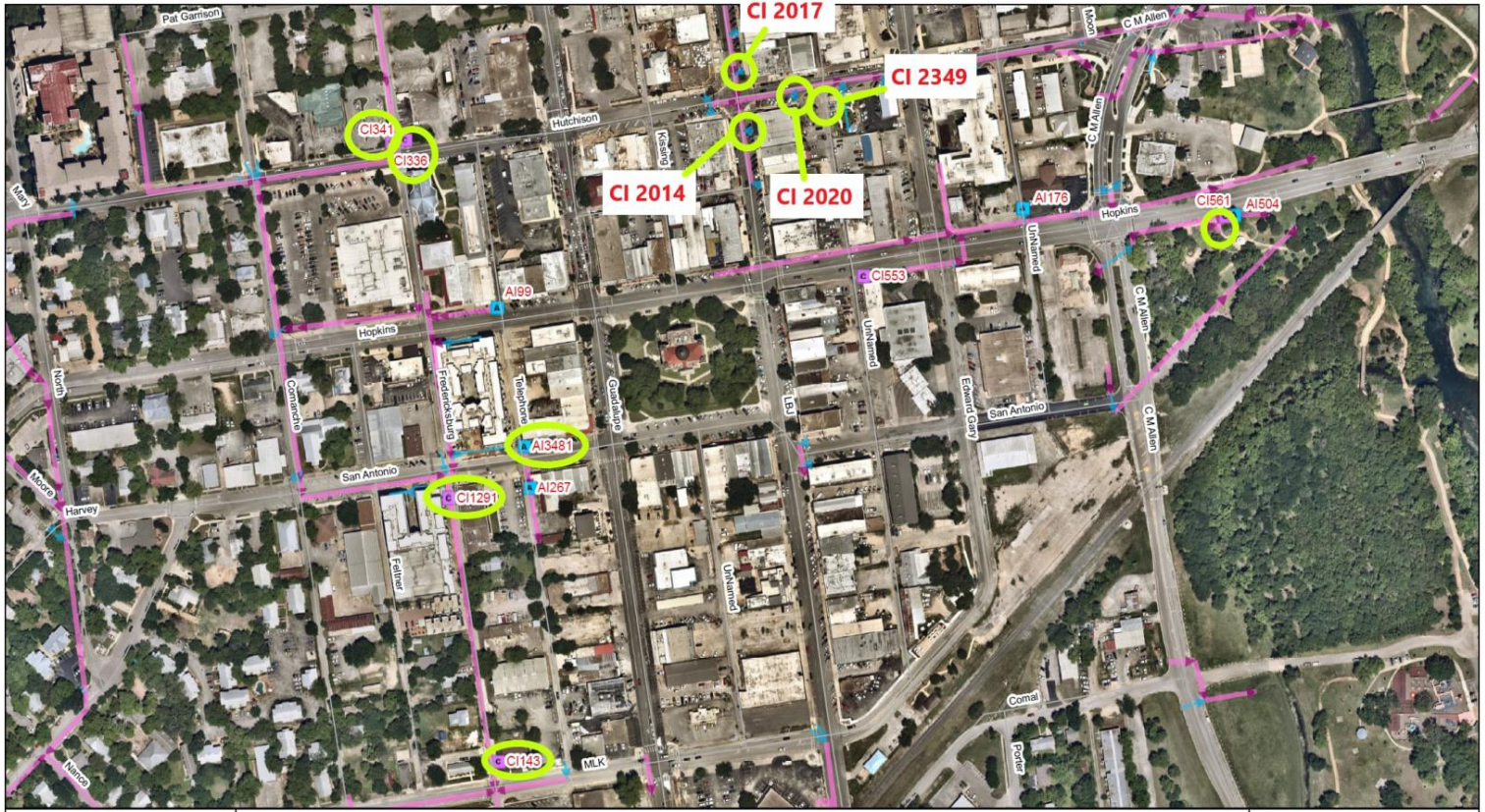
LittaTrap™ EMMA Kit

Easy Manhole Maintenance Access
Installation, Operation, & Maintenance

ENVIROPOD™

City of San Marcos Map Overview

Locations of
Trash Trap
Inlet Filter
Catch Basins



N

0 110 220 Feet

1 inch = 221 feet

CI336: 6' and 11' wide
CI341: 7' deep and 11' wide
AI276: 4' 8" and 6' wide

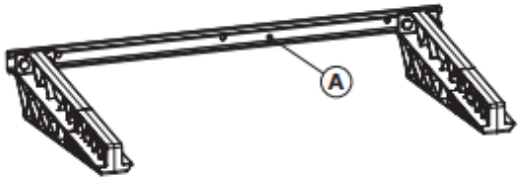
CI143: 42" deep and 6' 4" wide
CI1291: New AI 4' 8" deep and 10' wide
AI3481: 24" deep and 24x24' wide
AI99: unknown depth and 14' wide

CI553: Unknown
AI176: Unknown Plugged
AI504: 24" diameter circle grate
CI561: 6' deep and 10' wide

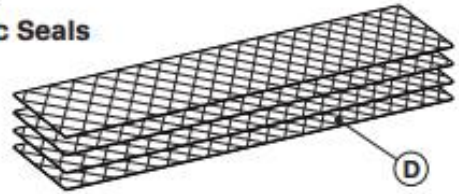
City of San Marcos
Public Services
Drainage Department
630 E. Hopkins St.
San Marcos, TX 78666
This product is for informational purposes only and may not have been prepared for or be suitable for legal, engineering, or surveying purposes it does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries

LittaTrap Installation

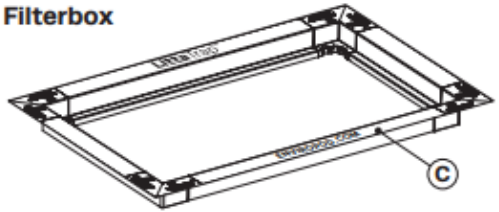
Part A – x1
Bracket



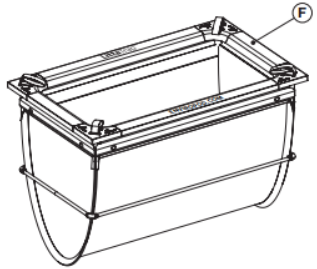
Part D
Plastic Seals



Part C – x1
Filterbox



Part F – x1
Filterbag



Part B
Masonry Anchor Bolts

Part E
Self Drilling Hexhead Screws

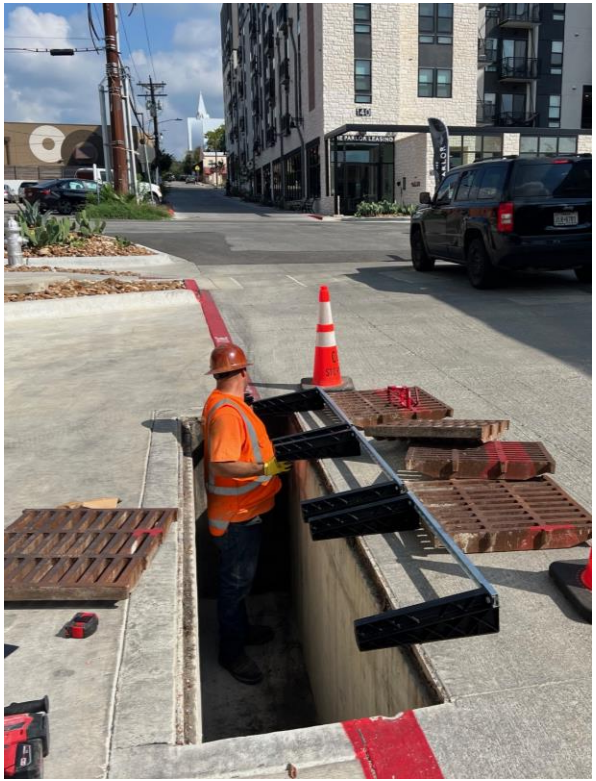
LittaTrap Installation

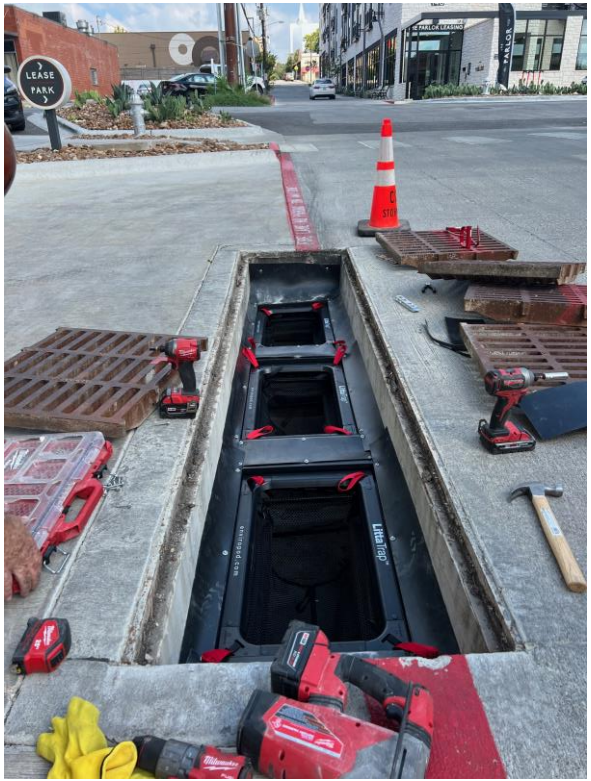
LittaTrap Installation

LittaTrap Installation

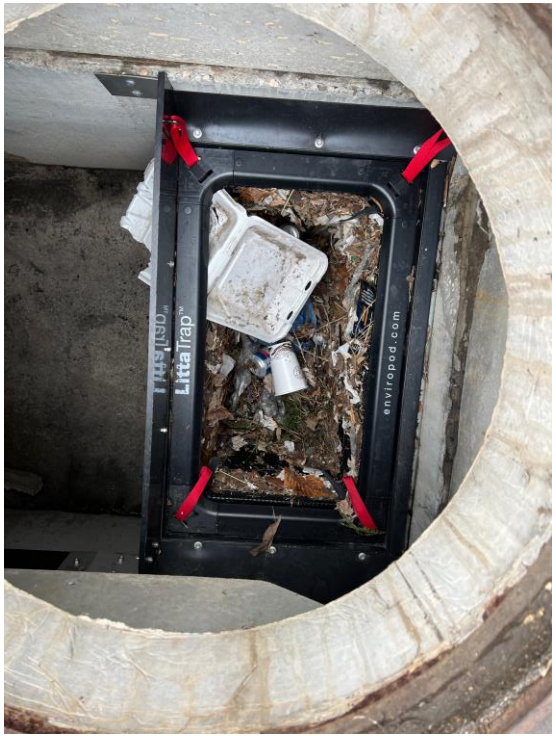
LittaTrap Installation

LittaTrap Installation





LittaTrap Maintenance



LittaTrap Maintenance

LittaTrap Maintenance

LittaTrap Maintenance

Summary

- Trash has different characteristics to other stormwater pollutants
- Trash traps catch large volumes trash and organics
- At source treatment is a cost-effective way to manage trash in urban areas by hotspot targeting.

Criticall Factors of a Catch Basin Inserts for Trash :

- Direct or Indirect screening - Clogging
- Screen hydraulic loading rate - Clogging
- Head loss – Treatable flow rate
- Bypass – Flow rate
- Captured Pollutant Storage – Maintenance
- Maintenance Method - $$
- Safety - $$

Thank You & Questions

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