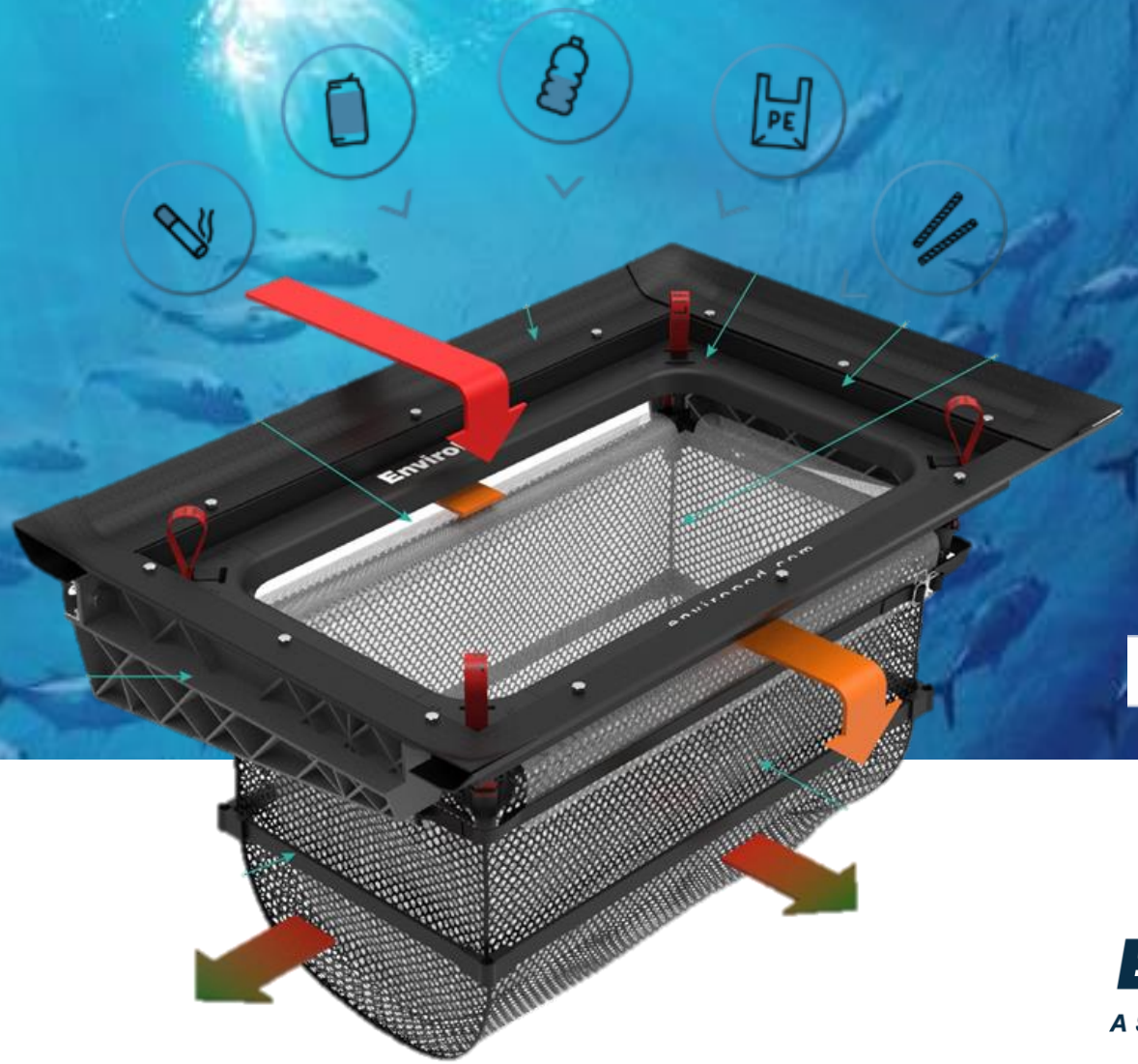
Our Marine Plastic Solution



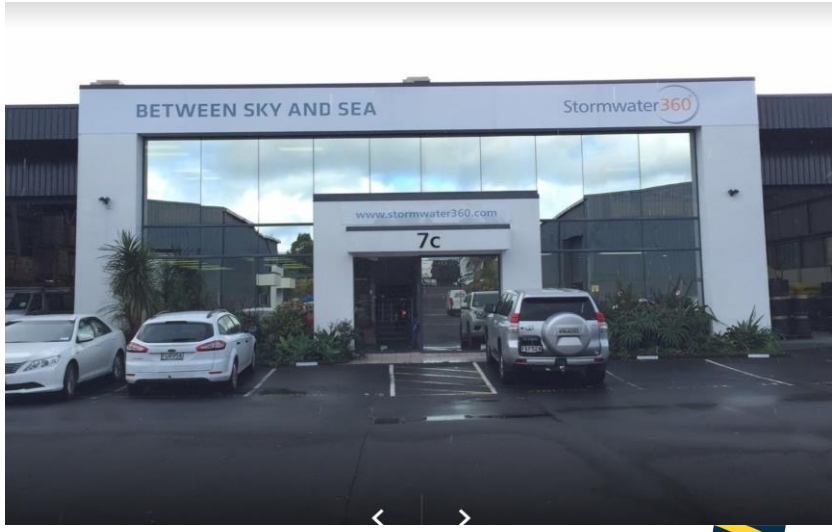
LittaTrap™

YachtingNZ
Introduction to the LittaTrap

ENVIROPOD™
A STORMWATER360™ COMPANY

About Enviropod

- Incorporated in 1996.
- Part of Stormwater360 Group, New Zealand.
- Australasia's leading catchbasin insert company.
- Distribution partners in Australia, Canada and USA.
- Over 30,000 installations world wide.
- A leader in Stormwater and Green Infrastructure Solutions.
- Videos:
  - The Enviropod Story
  - Our mission: Protecting the Future of our Waterways



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Case Studies

School programs

Public Outreach

Using community science to fight against marine plastic

Environmental education is key to increasing public awareness of the sources of marine plastic pollution. President **Michael Hannah** of EnviroPod® Canada Limited explains how a simple, affordable catch basin insert can help businesses control their plastic footprint and help educate the public about non-point source pollutants.

New Zealand's war against marine plastic starts at stormwater drains. Education professionals are teaching the next generation of Kiwis by showing them what goes down the stormwater drains and where it ends up.

Environmental education is a process that allows individuals to explore environmental issues, engage in problem-solving, and act to improve the environment. As a result, individuals develop a deeper understanding of environmental issues and have skills to make informed and responsible decisions.

New Zealand's environmental educators are engaging with students and communities to monitor an at-source treatment device in several community-based programs. In doing so, these groups are learning about the problem and helping to find solutions. By collecting data on what's going down the stormwater drains, they are helping identify the sources of marine plastic and the character of this non-point source pollutant.

One of the biggest challenges with stormwater pollution is that the public still does not know that most stormwater drains flow to the ocean, creeks, rivers, and lakes untreated. A recent study by Christchurch City Council in New Zealand showed that 55 percent of people did not know that stormwater drains discharge directly into waterways. Because marine plastic is the most visual form of stormwater pollution, it is an effective tool for public understanding of wider stormwater issues.

Environmental educators are working with one of New Zealand's companies, EnviroPod to achieve greater public awareness of sources of stormwater pollution This for-profit social enterprise company was founded by two stormwater engineers – Michael Hannah and Greg Yeoman – who have looked at the pollution caught in stormwater devices for 25 years as part of their work. Realizing that people need to see and understand the problem, they developed a simple solution to eliminate plastic in stormwater runoff that also has educational value. The LittaTrap™ is a lightweight catch basin insert that can easily be emptied and replaced by hand, catching plastic pollutants while also creating the opportunity for community education into the street-level sources of marine plastic.

***Kaitiakitanga* for the local water environment**

The first organization to use the technology was Mountains to Sea, Wellington (MTSW). MTSW delivers freshwater and marine education programs for schools and communities across the greater Wellington region. One of their programs, Healthy Harbours, explores the link between land and sea through the waterways in the Porirua or Wellington catchments. The program engages students by initially connecting them with the ocean through a snorkeling experience and then leads exploration through discovery walks back up into the catchment to consider the issues associated with urban runoff.

As an extension to the program, groups of students actively monitor an at-source LittaTrap, a device that captures litter in stormwater catch basins. By monitoring the device in different locations and considering the findings, the students gain greater awareness of marine pollution and a better understanding of both issues and solutions – thereby fostering *kaitiakitanga* (the Maori word for guardianship and stewardship of natural resources) and action for the environment.

Another educating group, Tread Lightly of Auckland, uses LittaTraps in the mobile environmental class room called the Drain Game. The Tread Lightly Drain Game visits elementary and middle schools – exploring the difference between stormwater and wastewater systems; where the different drains lead; and the effects of pollutants, contaminants, and rubbish that enters both systems has on freshwater and marine environments. As part of the program, using aerial images of their school and local area, students are challenged to identify and map the locations of any stormwater drains. Students also observe what is in each drain, making the connection with litter and other materials that can get washed into the stormwater system.

In the South Island of New Zealand, Environment Canterbury educators adopted the LittaTrap monitoring program with 10 schools and community groups. The participating groups are undertaking a 10-month monitoring and evaluation program to measure content and volume of waste captured in stormwater drains as well as behavior change. The data collected will be of use for several purposes. One of these is to support groups to present to the local council and Zone Committees. In turn, it is hoped that this will influence policy and action to improve plastic management in the community.

BY COLLECTING DATA ON WHAT'S GOING DOWN THE STORMWATER DRAINS, THEY ARE HELPING IDENTIFY THE SOURCES OF MARINE PLASTIC AND THE CHARACTER OF THIS NON-POINT SOURCE POLLUTANT.

From neighborhood to nation

The data collected in these community science projects is extremely valuable to engineers and scientists. One Crown Research Institute, part of the National Institute of Water and Atmospheric Research in New Zealand (NIWA), has engaged with the community and an education group to undertake a LittaTrap monitoring project across an entire watershed. The NIWA study is not only looking at what is washing down the drains, but its character as it travels to the ocean in order to also understand the volume of marine plastic that is land-based and pollution hotspots. Exploring a hypothesis that plastics are being broken into tiny pieces in rivers creating microplastics, which is potentially more harmful to aquatic life. The long-term study is incorporating other upstream educational activities to see if change can influence the amount of plastic being discharged through the stormwater system. This work includes an analysis of how recycled plastics that are being lost down stormwater drains can support science in the circular economy approach of plastic use and management.

As an island nation, New Zealand is greatly concerned with the build-up of plastic in the ocean. For this reason, the country's Ministry of Education includes information on the program in its science-learning hub. The hub provides teacher support, materials, and connections to the New Zealand school curriculum. To support this, EnviroPod produced an education fieldguide, and provides safety support through an outreach program as well as offering discounted LittaTraps to educators.

The ultimate hope from these programs is that through the use of simple technology such as the LittaTrap coupled with community science and engagement, long-lasting policy and behavior change will create action and turn the tide on plastic pollution.

Author's Note

EnviroPod Canada Limited President Mike Hannah is committed to preserving oceans and waterways for future generations. Through the Toronto-based company in Canada, Hannah uses technology (such as the LittaTrap) and public engagement to raise awareness of the sources of plastic pollution in marine water. Hannah is also the co-founder and managing/ technical director of the specialist stormwater management company, Stormwater360 New Zealand. With 27 years of experience as a stormwater management and green infrastructure practitioner, Hannah has designed, developed, and implemented numerous stormwater solutions across the Asia Pacific region. He works regularly with local and central government in New Zealand to consult on planning and legislation of stormwater policy and practices.

Web Resources

1. Mountains to Sea Wellington website: http://mountainstosea.wellington.nz/
2. Tread Lightly Website: https://tread-lightly.org/
3. Ministry of Education of New Zealand, Science Learning HUB Website: https://www.sciencelearn.org.nz/resources/2747-down-the-drain

Top: Students sort through waste captured in LittaTraps.
Above middle: Students lift a LittaTrap from a stormwater drain
Above: Cigarette butts found as part of a community science project.
Photos by Mountains to Sea, Wellington

Logistics Facility

LittaTrap™

Mainfreight

INDUSTRIAL

As a global supply chain business with over 250 branches around the world, Mainfreight is one of the world's largest freight companies offering logistics solutions across the globe. The company has a strong sustainability agenda and is committed to the protection of the environment.

EnviroPod has worked with Mainfreight over the years on the logistics of transporting LittaTraps around the world and approached the new Mainfreight Warehouse in Burlington, Ontario to install two LittaTraps in the truck-loading zone.

The truck-loading zone manages all the in and out loading and is a bustling site. In a situation like this, packaging materials from the goods can sometimes be accidentally lost & subsequently reach the storm drains.

By installing LittaTraps, Mainfreight has committed to protecting Lake Ontario from accidental plastic loss by preventing plastics and packaging from their loading bay reaching the lake.

MAINTENANCE

EnviroPod installed and then monitored the two units over three months and maintained the units on day 89 of installation. Maintenance is simply performed by lifting the patented basket out, emptying the basket into a recycling bucket and then placing the basket back into the LittaTrap frame.

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Retail Shop

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.

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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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.

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Case Studies

Manufacturing

LittaTrap™

PROJECT UPDATE 25/03/15

EXPOL Manufacturing Plant Trial

EXPOL is the largest manufacturer and distributor of polystyrene products in New Zealand.

EXPOL are committed to protecting the natural environment and were concerned that waste material from manufacturing their polystyrene products was entering waterways via the stormdrains. Stormwater360 installed a LittaTrap™ as a trial unit in May 2016. The aim of the trial was to provide data on the effectiveness of the LittaTrap™ in capturing these small polystyrene particles and other gross pollutants.

Polystyrene, is a petrochemical-based plastic that is harmful to the marine environment. Studies have shown that polystyrene begins to decompose within one year, releasing components that are detectable in the parts-per-million range. Those chemicals also decompose in the open water and inside marine life.

CATCHMENT

The catchment was estimated to be 8m X 27m to give a total of 216 m2 of industrial hardstand.

Figure 1. Aerial view of EXPOL Onehunga site

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 nurdle liner installed to capture the smaller particles. The LittaTrap™ is hand maintainable, allowing for low cost and frequent maintenance. By installing a LittaTrap™ there is a significant improvement of capturing both postive and neutrally buoyant materials which are typically washed down a storm drain, particularly in periods of high flow.

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Education Programmes

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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Plastic Manufacturer

LittaTrap™

Medical Plastics

Medical Plastics, Auckland, New Zealand

LITTER HOT SPOT – MANUFACTURING

A LittaTrap™ was installed at a plastic manufacturer in Auckland, New Zealand and was monitored over a 12 month period.

Plastics New Zealand has been running the global Operation Clean Sweep programme for 2 years in New Zealand. They recommend changes to manufacturing sites to assist in protecting our waterways from accidental plastic pollution.

A range of solutions are recommended to manage accidental plastic pellet loss. One of these solutions is to retrofit filters inside stormwater catchpits in high risk areas such as loading/unloading zones, waste skips, and regrind operations where there is often spills of pellets and other plastic fragments.

Installing a filter into a catch basin prevents any accidentally spilled material from heading down the drain into the local waterway.

Auckland member, Medical Plastics Ltd, has been monitoring the effectiveness of one LittaTrap™ in their stormwater drain for the past 12 months.

Medical Plastics is a very clean site, however with all plastic manufacturing sites it is inevitable that there are accidental spills. At this site, the waste and recycling bins are located in the same area as the loading and unloading zone all of which flow to one stormwater drain.

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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. For this trial the LittaTrap™ was installed with a 1mm fibreglass liner for full capture of the smallest particles. The LittaTrap™ is hand maintainable, allowing for low cost and frequent maintenance. Installing a LittaTrap™ will capture both positive and neutrally buoyant materials, including plastic pellets which are typically washed down a storm drain when it rains.

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Vehicle Dealership

LittaTrap™

farro FRESH FOOD

Farro Fresh Supermarket, Mairangi Bay, Auckland

LITTER HOT SPOT – LOADING ZONE

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Case Studies: Marinas / Yachting Clubs, Canada

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The Great Lakes Region

- Binational region spanning across 8 states and 2 provinces.
- Great Lakes account for 21% of the world's and 84% of North America's freshwater surface – the largest freshwater system in the world.
- More information about Council of the Great Lakes Region initiatives with marina's available here: https://councilgreatlakesregion.org/coalition-launches-great-lakes-plastic-cleanup/
- Media articles: https://www.cbc.ca/news/canada/toronto/ontario-great-lakes-plastic-project-1.5744875

Statistics sourced from Mark Fisher (2020), Council of the Great Lakes Region

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LittaTrap Benefits

Key Benefits

The LittaTrap is an innovative catch basin insert designed to be easily fitted into new and existing stormwater catch basins.

The LittaTrap simply sits inside the catch basin and when it rains, catches plastic and rubbish caught up in the runoff before it can reach the rivers, lakes and oceans.

Stop plastic leaving your site
The LittaTrap is designed to capture all particles larger than 5mm or smaller with optional liner.

Reduce your costs
Installing a LittaTrap can reduce the risk of stormwater infrastructure blocking further downstream or act as pretreatment for other treatment devices.

Minimal maintenance costs
The LittaTrap is able to maintained by hand, reducing expensive maintenance costs.

Easy to retrofit
Easily retrofitted into existing catch basin/gullypits.

Energy Dissipation
Enhanced sedimentation with reduced resuspension & loss of captured of total suspended solids

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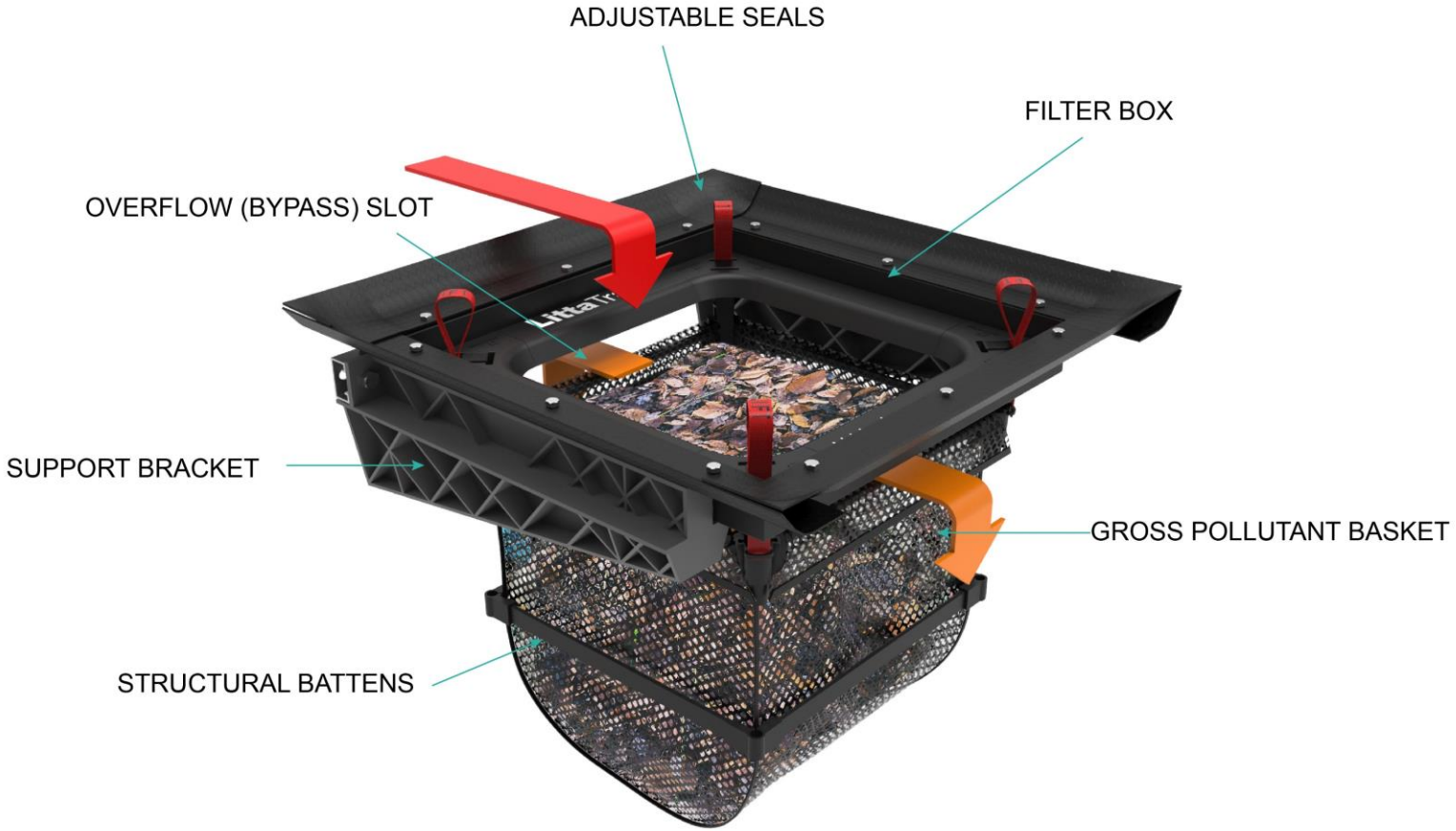
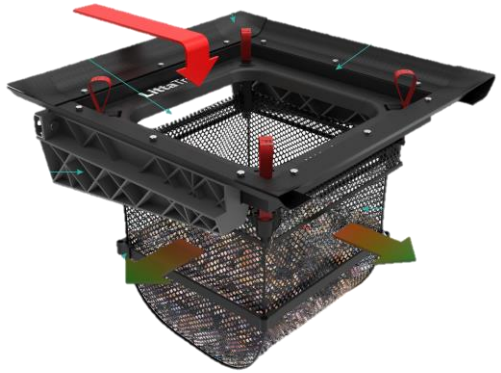
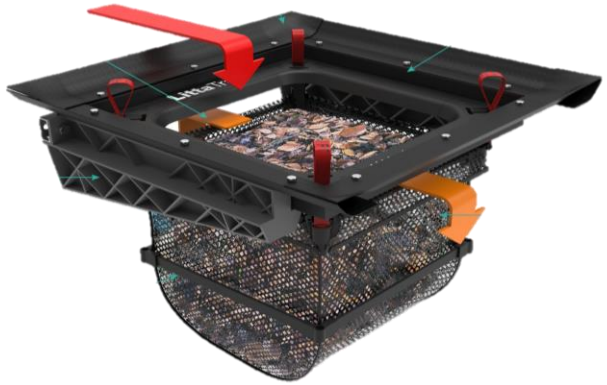
Components





Normal Operation



Bypass Operation

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Installation

Video Link: https://youtu.be/AEkoW6pEOfc

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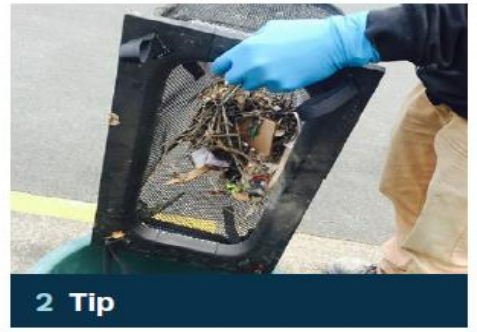
Maintenance



Video Link: https://youtu.be/zyTtUS-tHEo

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Other Applications


Pretreatment


Manufacturing

Retail


Industrial


Smoking Areas

Food Processing


Pedestrian Areas


City Streets


Car Parks

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