


CONTECH®
ENGINEERED SOLUTIONS

Stormwater Trash Control

Solutions Guide

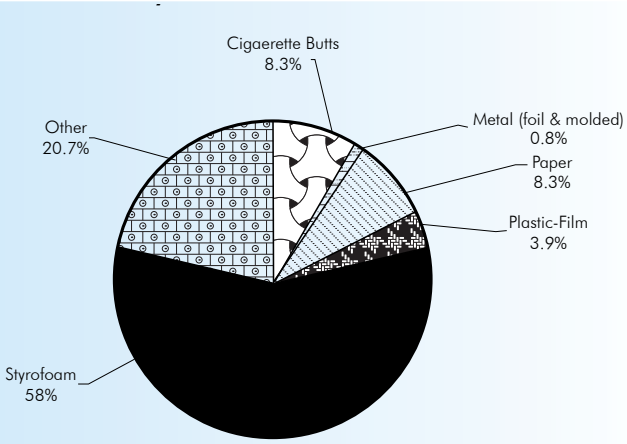
Trash Control Solutions

The Need for Controlling Trash in Waterways

Our nation has some of the world's most beautiful beaches and waterways. Unfortunately, trash such as cigarette butts, food packaging, cans and bottles, and plastic waste discarded on land frequently makes its way into streams, creeks, rivers, and eventually the ocean, as rain storms wash it into gutters and storm drains.

This trash not only detracts from the aesthetics of waterways, it poses a threat to marine life and public health. It can also clog conveyance systems and outlet control structures leading to upstream flooding.

Characterization of the Volume of Litter Collected at the Ocras Avenue CDS® Unit



Developing a Trash Control Strategy

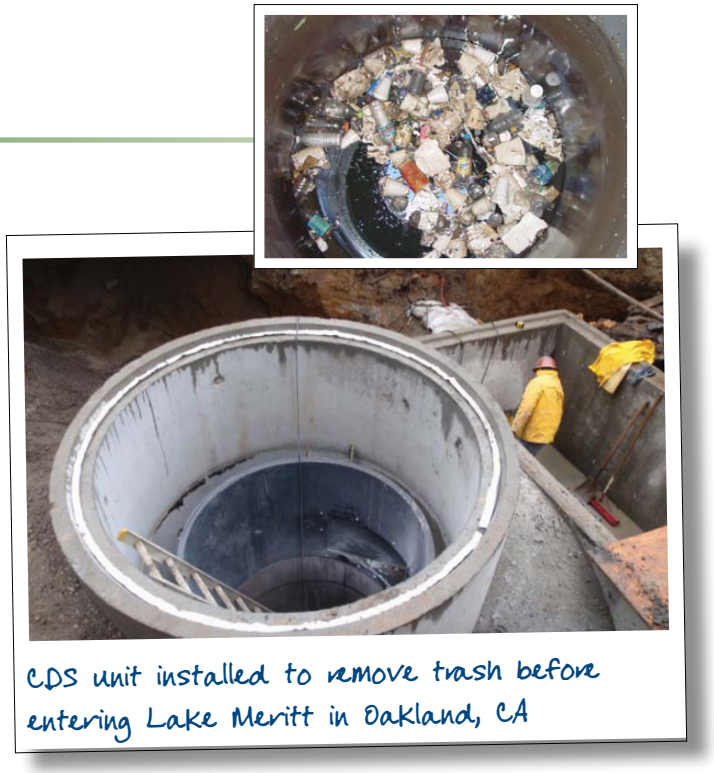
Better trash management increases the aesthetics of the landscape and reduces health and safety threats to both wildlife and humans. When developing a trash control strategy, municipalities should consider the following five points:

1. **Identify all outfalls and drainages** - Identify sources and estimate trash loads
2. **Identify high trash zones** - Identify priority areas for treatment (high trash areas, problem areas, illegal dumping)
3. **Choose Sites and Devices** - Choose the drainage areas that will be treated and the method for treatment
4. **Develop Inspection & Maintenance Plan** - To ensure proper functioning of BMP's
5. **Monitor** - To document load reductions

Developing a Trash Control Strategy

Many municipalities have enacted specific trash control strategies in response to TMDLs or municipal stormwater permit requirements. At the heart of these efforts are requirements to reduce environmental issues associated with trash in waters by installing, monitoring, and maintaining stormwater BMP's that collect and retain trash and total suspended solids (TSS) from drains serving high priority trash areas.

To address these issues, stormwater managers, municipal officials, and other stakeholders are in need of a BMP that can remove trash and TSS, is easy to maintain, can work well as stand alone or end-of-pipe treatment system, and can easily be implemented in a retrofit scenario.



CDS unit installed to remove trash before entering Lake Meritt in Oakland, CA

Removing Trash and TSS with CDS®

The most-effective way to eliminate trash and TSS is to use structural control measures that capture trash and TSS before it enters a waterway. The Contech Engineered Solutions CDS system is a below-ground, flow-through treatment device that uses multiple treatment processes including swirl concentration and continuous deflective separation to screen, separate and trap trash, debris, sediment, hydrocarbons and other pollutants of concern from stormwater runoff. CDS can be installed at the inlet, outlet or intermediate point of drainage system to prevent pollutants from being discharged into lakes, streams, or the ocean.

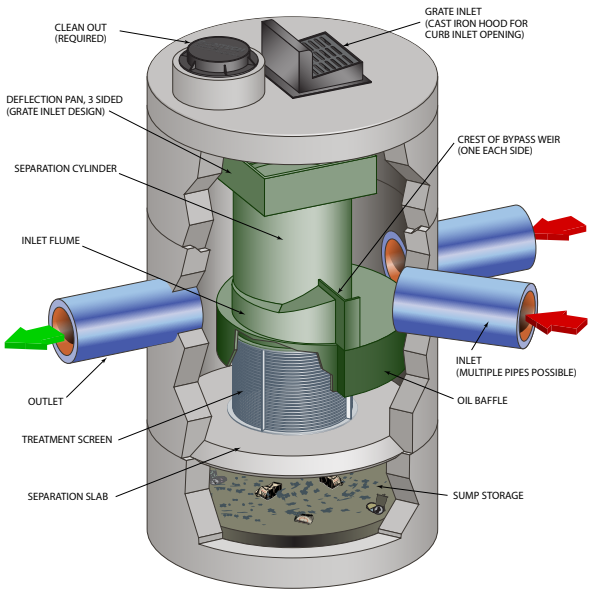
CDS Features & Benefits

Superior Trash Capture

- Captures and retains 100% of floatables and neutrally buoyant debris 4.7mm or larger (2.4mm option also available)
- Effectively removes Total Suspended Solids (TSS) and floating oil and grease

Excellent Pollutant Retention

- Isolated storage sump eliminates scour potential
- Oil baffle improves hydrocarbon removal
- Retention of all captured pollutants, even at high flows



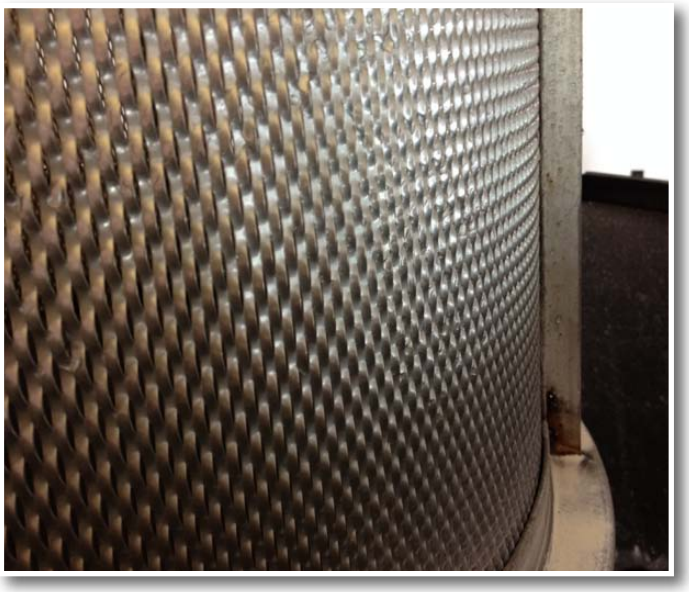
Multiple Options to Meet Site-Specific Needs

- Inline, offline, grate inlet and drop inlet configuration
- Accepts multiple pipe inlets and 90-180° angles – eliminating the need for junction manholes
- Internal and external peak bypass options available

The CDS® Screen – The Only Non-Blocking Screening Technology Available

Traditional approaches to trash control typically involve "direct screening" that can easily become clogged, as trash is pinned to the screen as water passes through. Clogged screens can lead to flooding as water backs up.

The design of the CDS screen is fundamentally different. Flow is introduced to the screen face which is louvered so that it is smooth in the downstream direction. The effect created is called "Continuous Deflective Separation." The power of the incoming flow is harnessed to continually shear debris off the screen and to direct trash and sediment toward the center of the separation cylinder. This unique design makes CDS the only hydrodynamic separation system to utilize non-blocking screening technology.

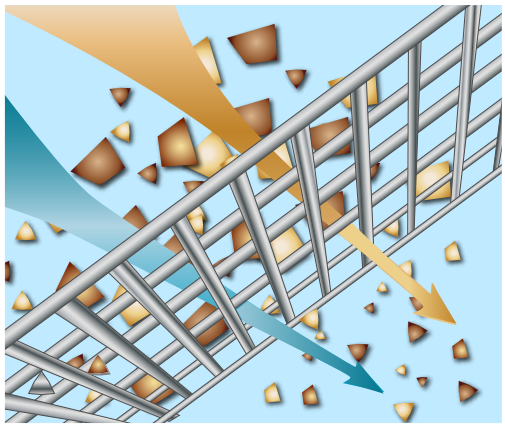


Key Features:

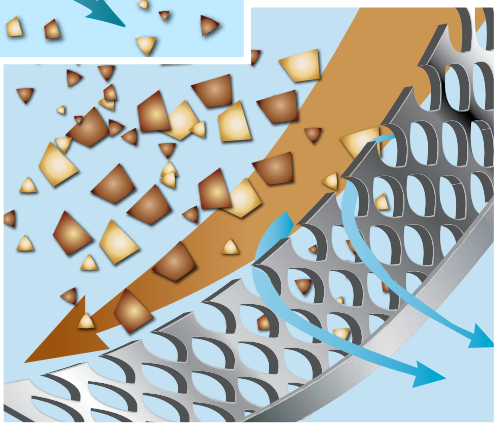
One-of-a-Kind Screening Technology

- CDS Screen captures neutrally buoyant materials missed by other separator systems.
- Screen is hydraulically designed to be self-cleaning.
- Runoff entering the separation cylinder must pass through the screen prior to discharge, eliminating potential for scouring previously captured trash at high flow rates.

One-of-a-Kind Screening Technology ❖ ❖ ❖



Direct Screening – particles that are larger than the aperture size of the screen can cause clogging, resulting in flooding if not maintained frequently.



Continuous Deflective Separation Indirect Screening – water velocities within the swirl chamber continually shear debris off the screen to keep it clean.

Learn more at www.ContechES.com/cds

Proven Performance - CDS® Trash and Pollutant Removal Studies

STUDY	RESULTS
Baseline Trash Generation Report[1] – Los Angeles Department of Public Works	CDS units captured 100% of trash and debris 5 mm and larger and provided significant sediment and oil removal.
Gross Pollutant Removal From Waterways[2] – CSIRO, Australia	During 12 months of monitoring, practically all gross pollutants transported by the stormwater were trapped by the CDS device (i.e. 100% removal rate).
BMP Retrofit Pilot Program[3] – CalTrans	The CDS units were highly successful at removing gross pollutants, capturing an average of 88 percent, with bypass of this material occurring mainly when the flow capacity of the units was exceeded.
Laguna Beach Storm Drain Pollution Control Project[4] – City of Laguna Beach	6 CDS systems were installed, and over 18 months of monitoring the systems removed 12,000 lbs. of trash, sludge and debris.
Manasquan Savings Bank Site[5] – TARP Tier II Protocol Study	Significant reductions for suspended solids loads were observed between influent and effluent sampling locations: SSC (<2000μm) 98%, TSS-SM (<2000μm) 95%, TSS-EPA (<2000μm) 95%, SSC (<500μm) 97%, and SSC (<50μm) 65%. During the 11-month monitoring period the mass of materials captured and retained by the High Efficiency CDS unit was approximately 1300 kg (2860 lbs.).

A bank of a stormwater retention pond in Pinellas County, Florida was fouled with cigarettes and other debris.

Two and a half months after a CDS was installed, the bank was clean.

References:

1.) County of Los Angeles Department of Public Works Watershed Management Division. Trash Baseline Monitoring Results, Los Angeles River and Ballona Creek Watersheds. 2004.

2.) Allison, R.A. et al. From Roads to Rivers, Gross Pollutant Removal from Urban Waterways. Victoria, Australia: Cooperative Research Center for Catchment Hydrology, 1998.

3.) BMP Retrofit Pilot Program Final Report. Sacramento: Caltrans Division of Environmental Analysis, 2004.

4.) Holoman, Will. Laguna Beach Water Quality Department. Laguna Beach Storm Drain Pollution Control Project CBI Grant #86, 2008.

5.) NJCAT Technology Verification, High Efficiency Continuous Deflective Separator (CDS), Contech Construction Products Inc, January 2010.

Retrofitting with CDS®

Many older storm sewer systems were designed primarily for efficient conveyance and lack adequate pollution controls. CDS is available in many configurations that make it an ideal choice for retrofitting existing storm drains. CDS can be installed at an existing outfall, inserted within a pipe or channel network, used as a junction manhole for multiple inlet pipes, and is even available with a grate inlet. The vertical orientation of the CDS minimizes the construction footprint. Head loss is also minimized through the use of broad diversion weirs that divert the required treatment flows into the CDS separation cylinder and safely convey peak flows downstream through existing pipes.

A CDS was used in a Green Street Retrofit in Whitehall, Michigan to remove trash, debris, and sediment from stormwater prior to treatment from land based BMP's

Maintenance

All stormwater treatment systems vary in their maintenance requirements. The selection of a cost-effective and easy-to-access treatment system can make a huge difference in maintenance expenses for years to come. Because the CDS screen is non-blocking, maintenance is recommended when solids within the CDS unit's sump reach 75% of the sump capacity.

Access to the CDS unit is typically achieved through two manhole access covers – one allows inspection and cleanout of the separation chamber and sump, and the other allows inspection and cleanout of sediment captured and retained behind the screen. A vacuum truck is recommended for cleanout of a CDS. Smaller units can be cleaned in less than 30 minutes. No confined space entry is needed to maintain the CDS.

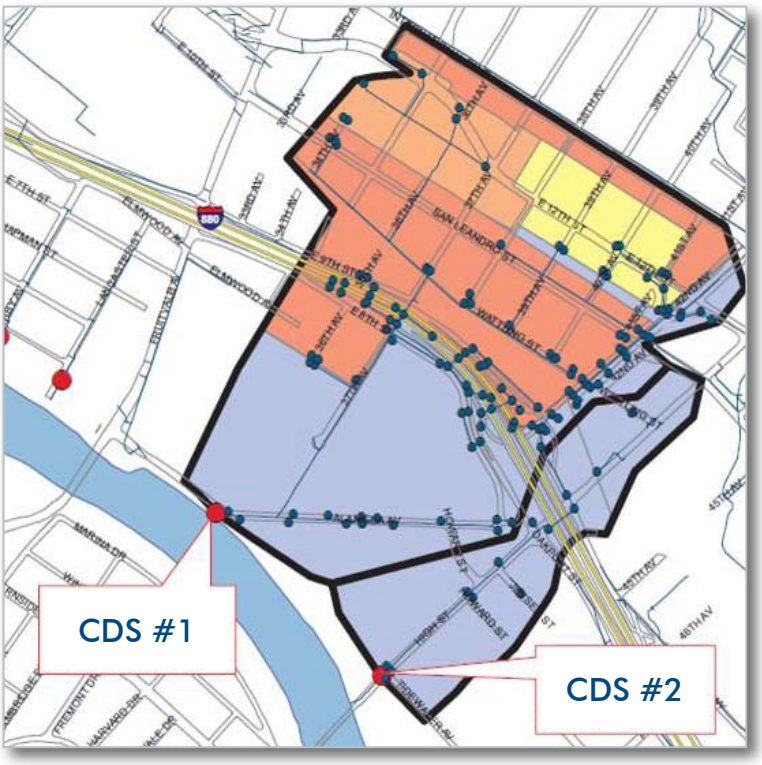
The CDS system is maintained from ground level, eliminating the need for confined space entry

The Economics of Trash Capture

Catch basins inserts, trash racks, and trash nets are often used to capture trash in stormwater from within existing catch basins. While these systems are relatively inexpensive, they have two major drawbacks – they can only treat small drainage areas and they require frequent maintenance. End of pipe solutions such as the CDS can significantly lower lifecycle costs. Replacing several catch basin inserts with a single CDS system allows for easy maintenance and substantial savings in annual maintenance costs.

CASE STUDY City of Oakland Trash Capture Project Several Small Systems vs. Two Large Systems		
Treat 42.5 cfs with two CDS units • $200K (total installed cost) • $2,400/yr. (maintenance cost) • **15 year cost = $236K**	OR	Treat 42.5 cfs with 117 Catch Basin Inserts • $100K (total installed cost) • $41,067/yr. (maintenance cost) • **15 year cost =$ 716K**

Reduced maintenance costs results in CDS being the most economical choice ❖ ❖ ❖



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Find all the information you need at www.ContechES.com, including field and laboratory test results, approvals, brochures, design guides, standard details, and specifications within the product section of our site.

Connect with Us

We're here to make your job easier – and that includes being able to get in touch with us when you need to. Go to www.ContechES.com/ConnectwithContech.

While you're there, be sure to check out our upcoming seminar schedule or request an in-house technical presentation.

Start a Project

If you are ready to begin a project, contact your local representative to get started. Or you can check out our design toolbox for all our online resources at www.ContechES.com/designtoolbox.

Links to Stormwater Tools:

To use the Land Value Calculator, visit:
www.ContechES.com/lvc
(Look under the Stormwater Management section to download the Land Value Calculator)

To use the Design Your Own Detention System tool, visit:
www.ContechES.com/dyods

To use the Design Your Own Hydrodynamic Separator tool, visit:
www.ContechES.com/dyohds

To use the Rainwater Harvesting Runoff Reduction Calculator tool, visit: www.ContechES.com/rwh-calculator

To use the LID Site Planner , visit:
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