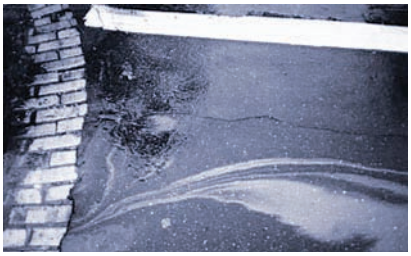
THE DRAINage

WHY DO WE TREAT URBAN RUNOFF?

For centuries the solitary goal of urban drainage was to transport excess water to prevent flooding with an "out of sight, out of mind" mentality. With increased environmental awareness during the past forty years, stormwater is now regarded as more than displaced rainwater. Urban runoff from impermeable areas such as roads, storage areas, and parking lots contains recognized pollutants that can be toxic to the natural environment. These pollutants must be removed before the stormwater enters natural environment.



There are many types of stormwater pollutants including suspended solids, dissolved solids, and hydrocarbons. The source of these materials varies with each site; automobiles, for example, are an

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Rinker Materials Expands Stormceptor Engineering Team

Rinker Materials recently added 6 new engineers to its Stormceptor marketing group bringing the total to 18 field representatives to provide better customer support in the US market. Rinker Materials is the largest manufacturer of concrete pipe and precast in the United States and seeks to continue expanding its presence in the stormwater BMP market with this addition. Rinker Materials holds the license to market, manufacture and sell the Stormceptor System in 43 of the 50 US states. This team is managed by Rick Traylor out of the corporate office in Houston, Texas.

Stormceptor®

www. stormceptor. com

The Stormceptor System is a vertically-oriented stormwater separator that removes oil, sediment and other pollutants from urban runoff. Its built-in bypass feature prevents trapped contents from flushing out during intense rain storms.

STORMCEPTOR SYSTEMS IN USE TO DATE

8021

SIZING SOFTWARE NOW ON THE WEB

Need to size a Stormceptor® unit fast? Save time by using the lookup table version of the Expert System on our website. This tool provides the same analysis as the CD, but is faster and easier to use.

Instructions

1. Select location (state or province). The sizing model uses local historical rainfall data.

2. Select rainfall data set. Highlight/select the location that is closest to the site of your project.

3. Specify total drainage area. The size of the unit is dependent on the size of the catchment area, NOT the peak flow. The US EPA SWM Vers. 4.3 hydrologic software embedded in the model automatically calculates flows. Therefore, there is no need for the designer to input flow data.

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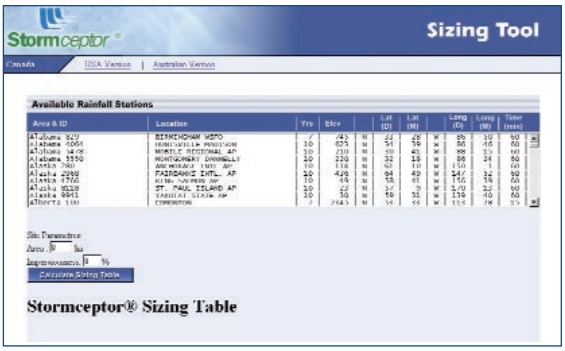

Go to www.stormceptor.com, and look for the SIZING TOOL

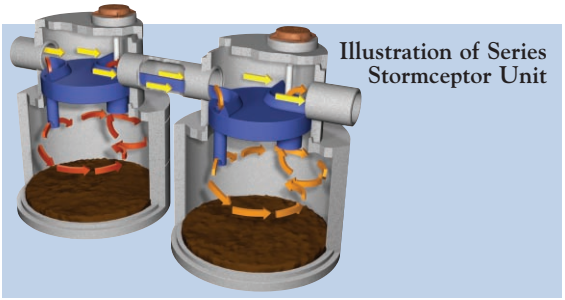

Illustration of Series Stormceptor Unit

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WHY DO WE TREAT URBAN RUNOFF?

obvious common source from both road and parking lot drainage areas. Mechanical wear, tire wear, and corrosion are primary sources of particulates and metals including: lead, zinc, copper, cadmium, and chromium[1]. The amount of metals discharged into the environment in stormwater varies. Studies conducted at a variety of locations indicate high levels of metals in stormwater runoff. Drapper[1] tested road runoff at 21 sites in Southeast Queensland, Australia. A study by Pitt[2] involved 56 tests conducted on a number of different land uses in Birmingham, Alabama. These included parking areas, road runoff, and landscaped areas.

Table1 - Comparison between water quality guidelines and Storm water runoff *

Parameter	Ont. DWO[4] (mg)	EPA DWS[3] (mg)	B.C. Guidelines for Interpreting Water Quality Data[6] (mg)			South Queensland[1] (mg)			Birmingham, Alabama[2] (mg)		
			Aquatic Life	*Livestock*	*Recreational*	Mean	Max.	Min.	Mean	Max.	Min.
Cadmium	5	5	0.05	80	10	-	-	-	*9.1*	*220*	0.1
Chromium	50	100	-	-	-	-	-	-	*57*	*710*	2.2
Copper	1000	1300	50000	300	1000	99	*305*	30	148	*1830*	1.5
Lead	10	15	8000	100	10	*224*	*575*	50	*54*	*330*	1
Zinc	5000	5000	241	2000	5000	*553*	*1850*	175	*363*	*1580*	4

Table 1 compares the concentrations of five metals in stormwater data collected by researchers, to various North American water quality regulations and guidelines. The comparison shows that levels of lead and cadmium in runoff are above both the USA and Ontario drinking water standards.

Although stormwater is not a direct source of drinking water for humans in North America, it often drains into drinking water supplies and natural environments, causing harm to aquatic organisms. Bioaccumulation of toxins in nature eventually affect humans and creatures higher up in the food chain.

Guidelines from British Columbia provide additional standards for interpreting results by identifying various use categories including Aquatic Life, Livestock, and Recreational. These guidelines give an indication of the sensitivity of different water uses to metal concentrations. Research data show that theconcentrations of cadmium, chromium and zinc in stormwater runoff are well above the recommended guidelines.

"A large percentage of metals can be prevented from entering the natural environment, thereby minimizing the impact to plants, animals and humans"

The effects of excessive metals in drinking water can be as benign as an unpleasant odor or taste and as severe as kidney damage and physical or mental development problems in children.

Undissolved metals found in stormwater adhere to fine particulate matter.[5] By removing these fine particles, a large percentage of metals can be prevented from entering the natural environment, thereby minimizing the impact to plants, animals and humans. Urban runoff must be treated toprevent further degradation of the natural environment, minimize health risks and reduce bioaccumulation.

Table 2 - Potential Health effects of ingesting metals in drinking water[3]

Parameter	Potential Health Effects from Ingestion of Water[3]
Cadmium	Kidney Damage
Chromium	Allergic Dermatitis
Copper	Gastrointestinal Illness Liver or Kidney Damage
Lead	Delays in Physical or Mental Development; Kidney Problems, High Blood Pressure
Zinc	Effects Odor and Taste of Water

Fabio Tonto, P. Eng.
Stormceptor® Canada

See footnotes on page 4

** Italicized values indicate concentrations that exceed at least one of the water quality guidelines shown.*

LAFARGE SUPPLIES THE BC CONTAINER TERMINAL

Opened in June of 1997, the Deltaport British Columbia container terminal is located next to the Tsawwassen Ferry terminal which is 35 minutes from downtown Vancouver.

The facility is a partnership between the Vancouver Port Authority, TSI Terminal systems, CN Rail and CP Rail. Capable of more than a million throughputs a year using state of the art container tracking and moving systems. It is situated in the middle of the Boundary Bay and Lower Fraser Estuary ecosystems and encountered considerable opposition when initially proposed because of concerns for the surrounding environment.

"PBK Engineering chose Stormceptor® to protect the surrounding waters from the impact of a large container terminal"

When the 100 acre facility was constructed in 1997, PBK Engineering chose Stormceptor to protect the surrounding waters from the impacts of a large container terminal. Lafarge Canada Inc. supplied 24 Stormceptor units, consisting primarily of STC 4000 and 5000s with a few STC 1000 and 1500s. During this period Bel Construction did the installation work. In 2000, construction began to expand the facility to 160 acres. At this stage 4 STC 5000s were required. However, a competitor's product was approved as an alternate because of its perceived "lower cost and ease of installation" at the high water level location. This product was the traditional 3-chamber oil/water separator with an external bypass built around the unit. The contractor installed the "approved equal" but the 16 week delivery time for the structure delayed the entire project. This delay (combined with the additional cost to build the external bypasses required for the 3-chamber structure) more than exceeded any savings on purchase price.

In 2001 the next phase called for 7 STC 5000s and the specifications were now written by Omni Engineering, so that there was no chance an alternate could be considered. Lafarge delivered the units within 3 weeks of receiving the order. The units were in the yard and ready for installation. The contractor for 2001 was the JJM Group. The JJM Group had the $20 million contract and completed the work in 5 months, on schedule and on budget.

JJM took delivery of the first unit in October 2001. The accompanying photo shows a group of three that were connected by a large distribution box.

Pete Law, B.A.Sc., Civil Eng.
Lafarge Canada

STORMCEPTOR SYSTEMS
- **INLET**
- **INLINE**
- **SUBMERGED**
- **SERIES**

Boundary Bay

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SIZING SOFTWARE NOW ON THE WEB

4. Specify impervious percentage. The portion of the total drainage area covered by impervious surfaces will affect the total flow and sediment draining from the site.

Result

After the user provides these four inputs, the model instantaneously displays a table of all available Stormceptor® units and their treatment efficiency that can be provided for the project site. The percentage of runoff capture is also shown for jurisdictions requiring this information. As always, it is left up to the designer and permitting agency to specify the level of treatment required (typically 80% TSS removal) and then select the appropriate Stormceptor unit to achieve this requirement based on this output table.

Notes

1. Output assumes no upstream flow control exists.

2. Output is based on the US EPA and Ontario MOE fine particle size distribution that includes 20% of particles by mass of the following sizes (20 mm, 60 mm, 150 mm, 400 mm, and 2000 mm).

3. If flows are controlled upstream, or a different particle size distribution is used for sizing, then please contact a local Stormceptor affiliate to conduct your analysis with the appropriate user-specified design parameters, or use the version of the software on the CD-ROM.

Brian Lee, P. Eng.
Hanson Pipe & Products Canada, Inc.

IDEAL APPLICATIONS INCLUDE

- Industrial Properties
- Commercial Parking Lots
- Gas Stations
- Transportation Terminals
- Highways / Streets
- Pond / Wetland / Infiltration Pre-Treatment

Performance Claim Verified by the ETV Program

CONTINUED FROM PAGE 2
WHY DO WE TREAT URBAN RUNOFF?

Footnotes

1. Drapper, D., R. Tomilinson, P. Williams. An Investigation of the Quality of Stormwater Runoff from Road Pavements; A South-east Queensland Case Study. School of Environmental Engineering, Griffith University, Nathan Campus, Queensland

2. Pitt, R., R. Field, M. Lalor, and M. Brown Urban, 1995. Urban stormwater toxic pollutants: assessment, sources, and treatability. Water Environment Research Vol. 67, 260-274

3. US EPA, Office of Water, Current Drinking Water Standards, www.epa.gov/safewater/mcl.html

4. MOE, Ontario Drinking Water Objectives, January 2001. Government of Ontario, Queen's Printer for Ontario

5. Ball, J.E., R. Jenks and D. Aubourg, 1998. An assessment of the availability of pollutant constituents on road surfaces. Sci of the Tot Env 209 (1998):243-254.

6. Ministry of Environment, Lands and Parks Land Data BC, Geographic Data BC for the Land Use Task Force Resources Inventory Committee, Guidelines for Interpreting Water Quality Data, 1998. Province of British Columbia, Resources Inventory Committee

Stormceptor is manufactured under license by:

IN CANADA

IN THE USA

THE STORMCEPTOR GROUP OF COMPANIES
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Fax: 416-960-5637

THE STORMCEPTOR SYSTEM IS PROTECTED BY ONE OR MORE OF THE FOLLOWING PATENTS
Canadian Patent No. 2,009,208
Canadian Patent No. 2,137,942
Canadian Patent No. 2,175,277
Canadian Patent No. 2,180,305
Canadian Patent No. 2,206,338

RINKER MATERIALS HYDRO CONDUIT DIVISION
712 Broadway, Suite 600
Kansas City, MO 64105
Tel: 800-909-7763
Fax: 816-802-3871

THE STORMCEPTOR SYSTEM IS PROTECTED BY ONE OR MORE OF THE FOLLOWING PATENTS
U.S. Patent No. 4,985,148
U.S. Patent No. 5,498,331
U.S. Patent No. 5,725,760
U.S. Patent No. 5,753,115
U.S. Patent No. 5,849,181
U.S. Patent No. 6,068,765
U.S. Patent No. 6,371,690