

PROBLEM:

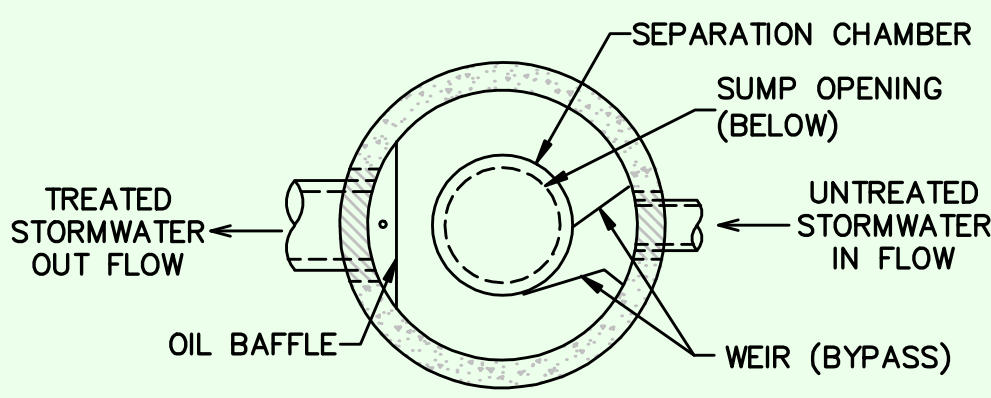
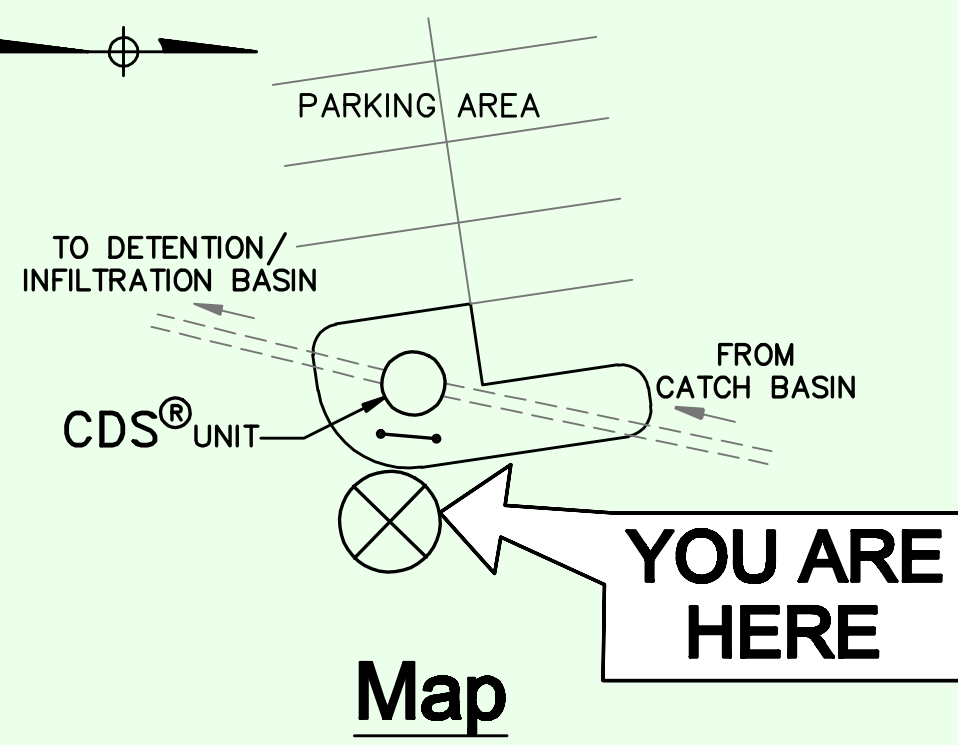
STORMWATER RUNOFF CONTAINS TRASH, OIL AND SOLID CONTAMINANTS. IF UNTREATED, THESE CONTAMINANTS GO DIRECTLY INTO RIVERS, LAKES, STREAMS AND THE OCEAN.

HOLE-IN-THE-WALL PARKING LOT
LONG ISLAND SOUND STORMWATER QUALITY IMPROVEMENTS
HYDRODYNAMIC SEPARATOR
(CONTECH - CDS® UNIT)

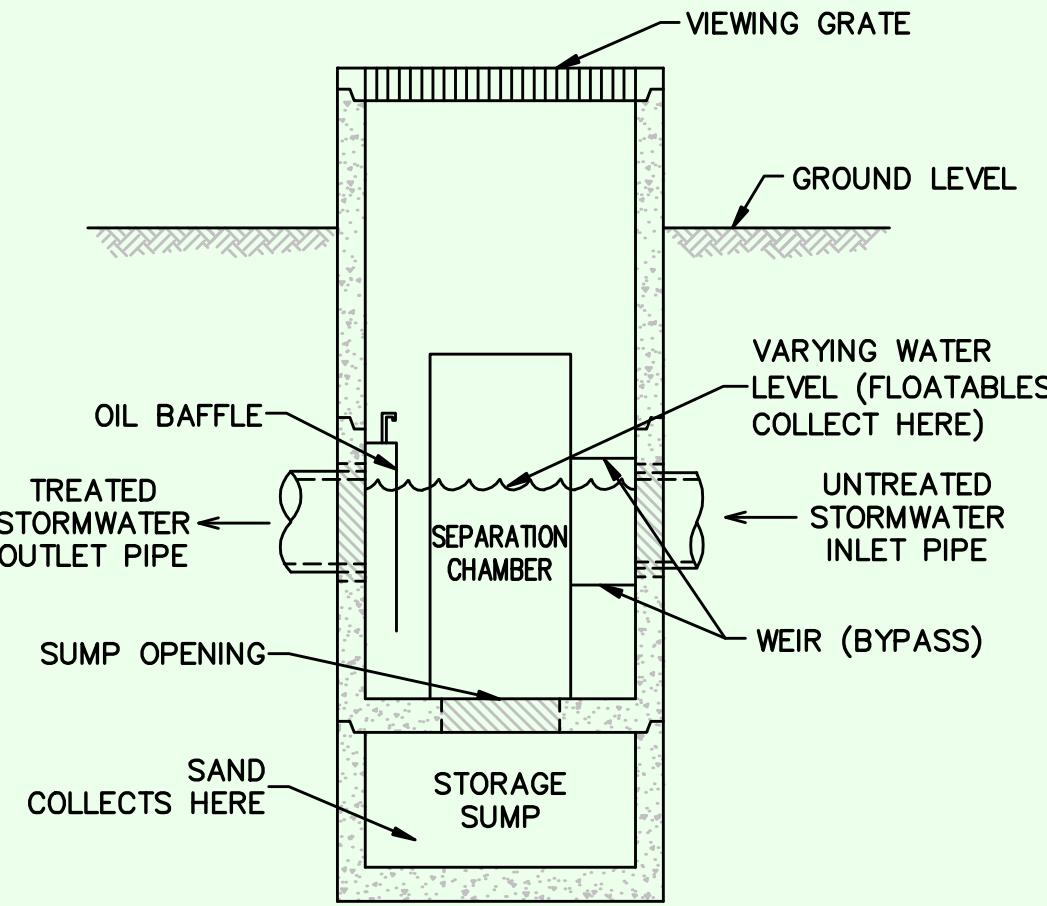


SOLUTION:

HYDRODYNAMIC SEPARATORS USE SWIRL TECHNOLOGY TO SEPARATE OIL, TRASH AND SOLID CONTAMINANTS OUT OF STORMWATER. (SWIRL TECHNOLOGY USES THE SAME PRINCIPLE AS RUNNING IN A CIRCLE IN A ROUND SWIMMING POOL AND DIRT AND BUGS GO TO THE CENTER)



Top View
(Plan)



Side View

Hydrodynamic Separator
(CDS® Unit)

Continuous Deflective Separation (CDS®)

The CDS unit functions like other hydrodynamic separators, but provides enhanced pollutant removal because it includes an indirect screening technology called continuous deflective separation. Unlike other hydrodynamic separators, this technology only allows water out of the treatment chamber through very small holes. This screen does not allow any material larger than 4.7-mm to be released and thus guarantees its permanent capture before maintenance.

The CDS technology also utilizes the whirl-pool action of the swirl concentrator to continually clear the screen of debris so that it will not inhibit flow or get clogged. This is in contrast to a direct screen that will begin to collect debris and block flow immediately upon assuming operation.

CDS units can accept flows from 3 to 300 cubic feet per second (cfs), depending on the application. Every unit requires a detailed hydraulic analysis before it is installed to ensure it achieves optimum solids separation.

On this site, the CDS unit treats stormwater from 23 acres of downtown Niantic. Prior to its installation, polluted runoff would flow under this parking area directly into Long Island Sound. Now, the CDS screens, separates and traps sediment, debris, and oil and grease from stormwater runoff, which improves water quality.

The site's existing storm drainage system was retrofitted so that the CDS system could be installed and provide primary treatment of the stormwater. The amount of contaminants removed is dependent on the rate (cfs) of water moving through the system and the volume of pollutants on-site. On average, this unit will trap approximately 84% of the suspended particles over the course of a year.

Because stormwater leaving this CDS unit may still contain dissolved contaminants and very fine particles, it is diverted into a large infiltration basin for secondary treatment. The successive treatment systems are collectively referred to as a treatment train. A properly designed treatment train will use Best Management Practices (BMP's) that are appropriate for the site-specific conditions.

Important Fact

Hydrodynamic separators are normally installed underground with a manhole cover for a top. This unit is specially designed with a grate for educational viewing.

Interesting Conversion

1 cubic feet of water = 7.48 gallons of water

Acknowledgements

CDS® unit donated by:
CONTECH Construction Products, Inc.
9025 Centre Pointe Drive, Suite 400
West Chester, OH 45069
(800) 338-1122
www.contech-cpi.com



Concrete portions of the CDS® unit donated by:
ARROW Concrete Products
560 Salmon Brook St.
Granby, CT 06035
(860) 653-5063
www.arrow-concrete.com



Additional assistance by Grid Technologies, Inc., www.gridtech.com

Educational Corner

- Terms to study:
- Hydrodynamic Separator
 - Total Suspended Solids (TSS)
 - Cubic Feet per second (cfs)
 - Floatables
 - Weir
 - Primary Stormwater Treatment
 - Stormwater Treatment Train
 - Best Management Practices (BMP's)
 - Headloss

How does a Hydrodynamic Separator work?

Hydrodynamic separator systems help meet stormwater quality regulatory requirements by removing solid pollutants, such as TSS, oil, trash and debris from stormwater runoff. Also called swirl concentrators, these systems are enhanced gravity separation devices. Polluted stormwater enters the device through an inlet, and flows into a swirl chamber, which is designed to create a swirling (whirl-pooling) action. This forces the incoming water into an organized circular flow pattern that slows down the flow and reduces turbulence, allowing solids to more quickly settle out of the water to into a storage sump at the bottom of the unit. Floatable pollutants, such as paper, trash and oil float to the top of the unit and are trapped inside. Some hydrodynamic separators, like the one on this site, offer enhanced pollutant removal with a screen, which essentially traps all material larger than the screen openings in the system. The clean water leaves the unit through the outlet pipe. Pollutants are removed manually using a vacuum truck.

Advantages of Hydrodynamic Separators:

- Removes sediment, floatables, free oil and grease
- Is widely accepted for effective solids removal
- Occupies a small footprint for treated flow rate
- Delivers treatment with minimal headloss
- Can be used to retrofit existing drainage systems

Maintenance:

All stormwater treatment devices need to be maintained periodically in order to remove the captured pollutants. As most hydrodynamic separators have a manhole cover, determining when the unit is full of debris requires removing the manhole cover for routine inspection.



Project concept, design and construction management by the East Lyme Engineering Department.



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Managed by the State of Connecticut, Department of Economic and Community Development (DECD) and the Department of Environmental Protection (DEP).

