The Growing Need for Stormwater Retrofits

The need to address stormwater runoff problems in developed areas is growing. While new developments are required to meet modern stormwater regulations, older developments may have been constructed before stormwater management was required or modern criteria were established. Stormwater retrofit drivers may include the correction of prior design or performance deficiencies, addressing water quality concerns, flood or combined sewer event prevention, improving stormwater capture or groundwater recharge rates, or other reasons.

Retrofitting an already developed site often comes with a variety of challenges related to space limitations due to the location of existing structures and utilities. Complete redevelopment of a site can be expensive, which is why municipalities and commercial entities work with Contech to develop economical retrofit solutions that meet the overall project goals and are compatible with existing infrastructure.

Types of Stormwater Retrofits:

- Trash, debris, and sediment removal
- Water quality improvement/MS-4
- Low Impact Development (LID) retrofits in urban environments
- Green streets

Municipalities & commercial entities work with Contech to develop economical retrofit solutions that meet the overall project goals and are compatible with existing infrastructure.
Expert Assistance at Every Stage of Your Retrofit Project

Retrofit applications bring their own set of challenges. Our highly trained team of Stormwater Design Engineers, Regulatory Managers and local Stormwater Consultants work alongside civil engineers, municipalities and owners in retrofit solution development.

- Extensive Research & Technology Development
  Performance Verification, Regulatory Approval & Permitting Guidance

- Design Your Own (DYO) Tools for Stormwater
  Detention/Infiltration, HDS, Rainwater Harvesting & LID Solutions

- Solution Development
  Engineering Calculations, CAD Drawings & Specifications

- Product Manufacture & Supply
  Reliable Quality & On-Time Delivery

- Product Installation
  Installation & Maintenance Support
Trash, Debris, and Sediment Removal

Many older stormwater systems were designed primarily for efficient conveyance and lack adequate pollution controls. Contech’s hydrodynamic separation (HDS) products have been providing reliable sediment, oil, trash, and debris removal for more than 20 years. With numerous 3rd party lab and field performance tests across the country, these systems are widely accepted. Contech has three HDS solutions that can be incorporated into existing stormwater conveyance systems to meet individual site constraints.

The indirect screening capability of the CDS allows for 100% removal of floatables and neutrally buoyant material, and is the only non-blocking screening technology available.

CDS®

In addition to having a small manhole-based footprint, the CDS has a variety of configuration benefits that makes it ideal for retrofit applications. The indirect screening capability of the CDS allows for 100% removal of floatables and neutrally buoyant material, and is the only non-blocking screening technology available. The internal bypass weir allows the unit to be placed inline, eliminating the need for a separate bypass structure. The system can accommodate multiple inlets, allowing it to be utilized as a junction manhole. A grate inlet can also be incorporated, allowing the CDS to be used as an inlet.

Vortechs®

The Vortechs system has a shallow profile which provides easy and cost effective installation, especially on sites with utility constraints, high groundwater, or bedrock.

VortSentry® HS

The VortSentry HS is ideal for many retrofit applications due to the small manhole footprint, internal bypass weir, which eliminates the need for a bypass structure, and grate inlet option, which allows the unit to be utilized as an inlet structure.

Design Your Own Hydrodynamic Separator with the DYOHDS™ Tool.

Go to www.conteches.com/dyohds to receive a detailed report of performance calculations, specifications and system details.
Lake Street in Whitehall

Michigan’s First “Green Road”
Trash Removal/Green Street Retrofit
Whitehall, Michigan

White Lake is a major tributary to Lake Michigan and an EPA Area of Concern (AOC). Government officials are now working to reduce the volume of polluted stormwater that drains off the land and into White Lake. To accomplish this, the city of Whitehall recently completed Michigan’s first “Green Road.”

The city transformed 2,800 linear feet of Lake Street from a traditional paved roadway into a state-of-the-art stormwater collection system. The system uses pervious pavers, a Contech CDS hydrodynamic separator, rain gardens and bio-swales to capture and filter stormwater runoff from 60 acres of streets and industrial land near White Lake. Prior to the retrofit, runoff collected at industrial facilities east of Lake Street drained to the street without treatment. A CDS system was installed to remove trash, debris and sediment from the industrial area flows prior to treatment by BMPs within the green street. This greatly improves the longevity of those systems and retains pollutants where they will not come into contact with groundwater, soil or wildlife.

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Water Quality Improvement/MS-4

Many retrofit projects are undertaken to improve water quality and to meet MS4 requirements. In addition to trash, debris, and sediment removal, Contech’s filtration products are specifically designed to remove significant amounts of nutrients, metals, and other common pollutants found in stormwater runoff. Contech offers two stormwater filtration products that can be incorporated into existing stormwater conveyance systems to meet water quality goals.

The Stormwater Management StormFilter® removes the most challenging target pollutants – including fine solids, soluble heavy metals, hydrocarbons, and nutrients. With performance verified by the WA Ecology and NJ DEP, the system is approved for use by numerous local agencies. During operation, stormwater is siphoned through the StormFilter cartridge’s radial flow filter bed. As runoff rates subside and the siphon breaks, a momentary reversal of flow prevents solids from accumulating on the filter surface, resulting in fewer maintenance events.

The Jellyfish® Filter is a stormwater quality treatment technology featuring pretreatment and membrane filtration in a compact stand-alone system. The compact design and high surface area cartridges provide effective removal of fine sand and silt sized particles and removes a high percentage of particulate-bound pollutants including nutrients, metals, and hydrocarbons. The Jellyfish Filter is available in multiple configurations and has numerous agency approvals, including NJDEP certification based on successful full-scale field testing.

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Decatur Street Retrofit
Water Quality Improvement / Low Impact Development Retrofit
Olympia, Washington

With nine streams, four lakes, four large wetlands, and six miles of shoreline, it’s no surprise that protecting water quality in Olympia, WA is of the utmost importance. The goal of this project was to meet the water quality treatment requirements of the Washington State Department of Ecology’s 2005 Stormwater Manual for Western Washington.

Historically, runoff from Decatur Street and much of the surrounding neighborhood was piped into Puget Sound, without treatment. With no land available to build large stormwater ponds, the city used a variety of LID techniques to retrofit the street, one of which was regular asphalt pavement overlying a geogrid and an under-pavement infiltration system pretreated by a catch basin StormFilter from Contech. The graded road surface directs runoff to the catch-basin StormFilter. The filtered water is then piped to a perforated pipe running the length of the road, where it percolates into the native soils beneath the street.

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Low Impact Development (LID) Retrofits in Urban Environments

The central goal of an LID design approach is to mimic predevelopment hydrology through the use of systems that optimize natural processes including infiltration, evapotranspiration, filtration, and detention of stormwater. Contech offers a number of solutions often used in LID retrofits to minimize the hydrologic impacts of land development and to minimize pollutant discharge.

Underground Detention/Infiltration Systems

Contech underground detention/infiltration systems are ideal for retrofitting dense developments or sites with lower infiltration rates where aboveground practices are not viable. Belowground practices provide a significant storage volume and infiltration footprint without using land that could otherwise be preserved.

Contech’s corrugated metal pipe (CMP), DuroMaxx® steel reinforced polyethylene (SRPE) pipe, ChamberMaxx® plastic chambers, and CON/SPAN® & Terre Arch™ precast concrete stormwater storage systems offer you flexibility for customized detention or infiltration retrofit applications.

Rainwater Harvesting

If project goals include the use of rainwater as a resource, Contech’s turn-key rainwater harvesting systems can be an ideal solution for retrofit applications. Our DuroMaxx® steel reinforced polyethylene (SRPE) cisterns are highly customizable. Diameters range from 24” to 120”, and the configuration possibilities are endless since the joints can be welded in the field to provide a watertight seal. This allows the cistern to be designed around existing structures and utilities, which provides significant cost savings.

Rainwater harvesting systems are increasing being used in urban redevelopment projects where infiltration systems are not a viable option. Not only are runoff reduction goals met, but the harvested rainwater can also be used to offset potable water demand for irrigation, indoor non-potable use, cooling water makeup, or other uses.

CDS®

CDS systems are often used as pretreatment upstream of landscape based systems or water features. They are also used to pretreat detention, infiltration, and rainwater harvesting systems to extend the lifecycle of the infiltration system and eliminate the need for frequent maintenance.
Alta Vista Park Diversion & Reuse Project

Water Quality Improvement/Low Impact Development Retrofit
Redondo Beach, California

The Alta Vista Park Diversion and Reuse Project was designed to help the City of Redondo Beach comply with Regional Water Quality Control Board requirements to reduce stormwater pollution entering Santa Monica Bay. This system collects urban runoff including dry weather flow that formerly discharged to the beach and cleans and stores it for use in irrigating Alta Vista Park.

Stormwater is pretreated with a Contech CDS hydrodynamic separator to remove trash, debris, and sediment, refined with a StormFilter to remove nutrients, metals, and other pollutants, and held in one of two DuroMaxx rainwater harvesting cisterns. Water stored in the cisterns is used to irrigate the park. Excess water not needed for irrigation is infiltrated into the ground, recharging groundwater and reducing discharge into the ocean.
“Green Streets” are streets that have been transformed to have the least impact on their surroundings. Green Streets are pedestrian and bicycle oriented, attractive, and often use LID principles to reduce urban run-off discharges. With Green Streets, stormwater management features are often located within the street’s right of way, and many contain visible components designed to improve the aesthetic appeal of the community. Contech offers a number of products often used in Green Street retrofits.

**UrbanGreen® BioFilter** is an aesthetic landscape solution for green street retrofits. With the UrbanGreen BioFilter, pollutants are removed by filtration during a storm event and then transformed, assimilated, and/or absorbed within the soil ecosystem. Biofiltration can provide a highly effective treatment and partial runoff reduction capability in green street applications where infiltration of the entire design storm is not practical. An optional infiltrating design increases runoff reduction and more closely mimics the hydraulic performance of traditional bioretention systems.

**ChamberMaxx® Chambers** are a corrugated, open-bottom plastic arch system designed to detain and infiltrate stormwater runoff. The chambers are ideal for Green Street applications where maximum storage capacity is needed within a shallow profile. By utilizing ChamberMaxx, the infiltration capacity of a Green Street can be dramatically increased without limiting vehicular or pedestrian access.

**Green Street solutions are... attractive and often use LID principles to reduce urban run-off discharges.**
Ocean Park Boulevard

Green Streets Retrofit
Santa Monica, California

In 2012, Ocean Park Boulevard was turned into a “Complete Green Street” that is pedestrian and bicycle oriented, attractive, and reduced urban runoff discharge into the Santa Monica Bay. Key elements of the project included wider sidewalks, over 100 trees, improved landscaping, a drip irrigation system, crosswalks, traffic signal improvements, parkway/stormwater biofilter swales and infiltration areas, storm improvements, and more.

The solution includes four basins of ChamberMaxx® open-bottom plastic chambers, which allow stormwater to infiltrate into surrounding soil, effectively achieving runoff reduction requirements. Two basins of perforated CMP of various sizes were also used to meet the depth requirements and to address utility conflicts and grade issues. By utilizing subsurface infiltration, space was preserved for green spaces above, runoff was reduced, and groundwater recharge was maximized.
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**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/lve
(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: www.ContechES.com/LIDsiteplanner