Hydrodynamic Separation

Oldcastle Infrastructure™
A CRH COMPANY

Reliable, Proven Technologies Engineered for Success

Hydrodynamic Separation: **Solving water infrastructure challenges through innovation**

As America's leading water infrastructure solutions provider, only we have the scale, product breadth and technical expertise to deliver a multi-purpose suite of hydrodynamic separators to meet any site or regulatory requirement. Our systems are engineered for long-term performance in the most demanding of environments, giving you reliable, proven technologies that enable you to manage stormwater effectively now and in the future.

Our comprehensive line of hydrodynamic separators ensures planners and engineers can specify solutions that align with site conditions, compliance goals, and long-term maintenance strategies.

Hydro-Shield® Advance certified by NJDEP following 2021 protocol allows for variable pipe angles and lamella separation technology.

Prevent nutrient leaching by capturing large debris and storing it in a dry state in a Nutrient Separating Baffle Box®, certified by NJDEP following 2021 protocol.

When to Use Hydrodynamic Separation

Hydrodynamic separators are particularly useful in locations where space is constrained or where installing complex treatment trains would be impractical. They provide a front-line defense against pollutant washout in pretreatment applications and are ideal as standalone systems or as part of a multi-stage approach.

Their modularity and shallow-depth configurations support integration with a wide range of land uses; from commercial parking areas and mixed-use developments to public roads and residential subdivisions. In redevelopment applications, hydrodynamic separators allow for quick upgrades to meet updated permit requirements or site redevelopment needs.

These systems manage both dry and wet weather flows and are an effective year-round solution.

Our Modular System Approach

One solution doesn't fit all. That's why we offer multiple hydrodynamic separator options, each designed to handle different flow rates, configurations, and site constraints, while sharing core benefits. See the comparison chart at the end of this brochure for general specifications across all products.

- **Hydro-Shield® Advance**
- **Nutrient Separating Baffle Box® (NSBB®)**
- **Downstream Defender®**
- **First Defense®**

The Downstream Defender® enables engineers to deliver effective pollutant removal at a single point in the drainage system.

The low-energy vortex separation of the First Defense® eliminates excessive agitation ensuring pollutants are not washed out during rainfall events.

Installation & Maintenance Advantages

Our hydrodynamic separators are designed for speed and simplicity—both during installation and ongoing maintenance. Units are precast and can be pre-assembled, reducing the need for field labor and avoiding construction delays. Installation of these systems often requires minimal excavation and is well suited for areas with high groundwater or shallow cover.

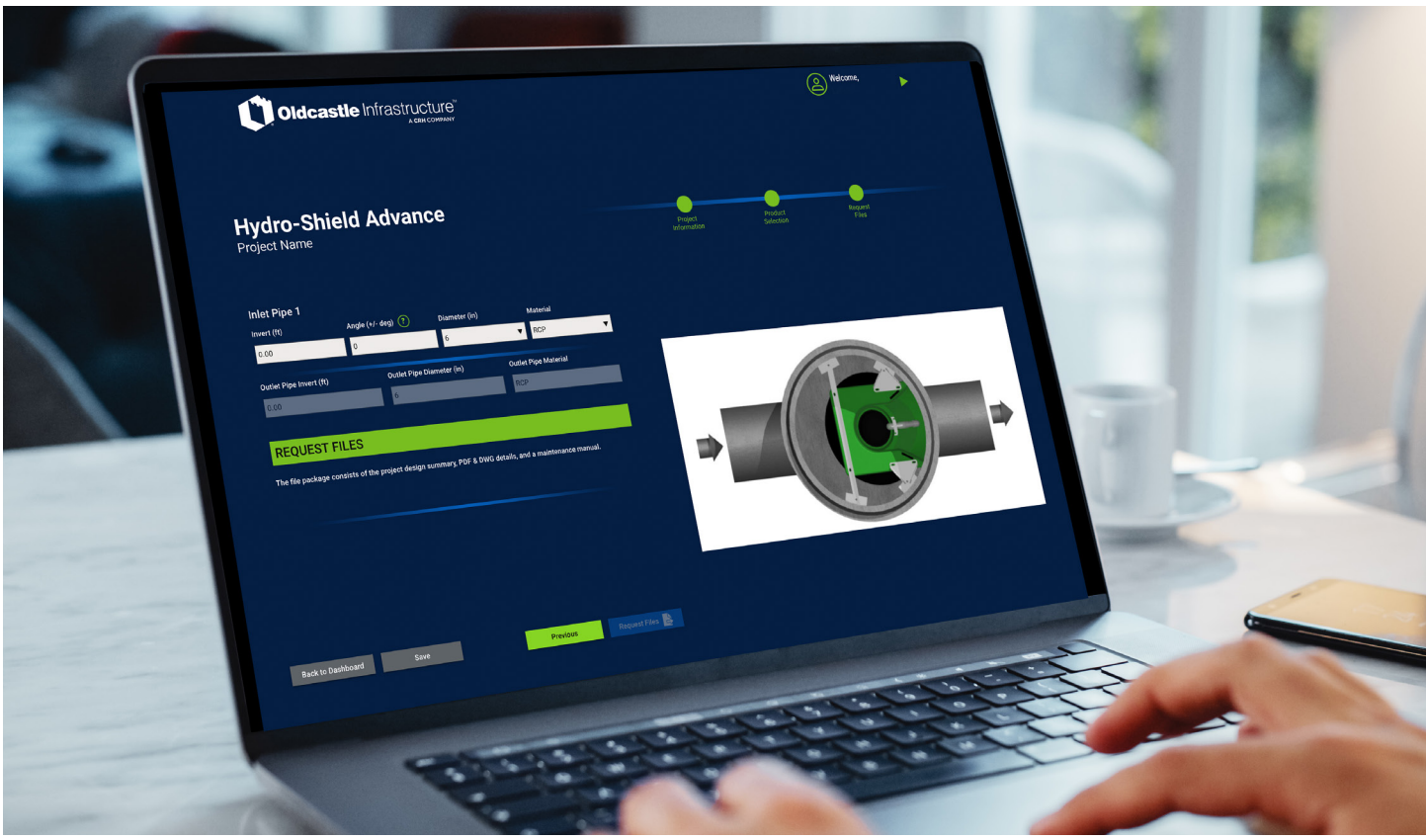
Our network of precast manufacturing facilities across North America allows us to provide you with reliable, local manufacturing; consistent product quality, shorter lead times, and responsive technical support.

During operation, these systems allow for predictable service intervals with easy access for vacuum trucks or manual removal of captured materials. Maintenance staff appreciate the lack of filters to clean or replace and the visual confirmation of sediment and floatables through access hatches or manhole covers. Over the product lifecycle, this translates to lower total ownership costs.

Trusted Approvals

Our hydrodynamic separation systems have been tested, verified, and adopted across the United States. With certifications from leading regulatory agencies like NJCAT/NJDEP, Virginia DEQ, California SWRCB, Washington TAPE, and Maryland MDE, these solutions help projects gain faster approvals and meet stringent performance benchmarks.

Design Support



To support engineering consultants and designers, we offer robust technical documentation, CAD and CAD assets, and a free online design tool for sizing and configuration recommendations – designed for engineers, by engineers.

Our team of stormwater experts is available for one-on-one consultations to ensure optimal system selection and layout. Whether you're pursuing regulatory compliance or value engineering, our tools and personnel help streamline your path to project success.

oldcastleinfrastructure.com/infrastructure-design-solutions

Easy to Use

Design Tools

Produce plans faster with flexible design options

- **Storage**
- **Bioretention**
- **Biofiltration**
- **Hydrodynamic Separation**
- **Deep Infiltration**
- **Cartridge Filtration**

Hydro-Shield® Advance

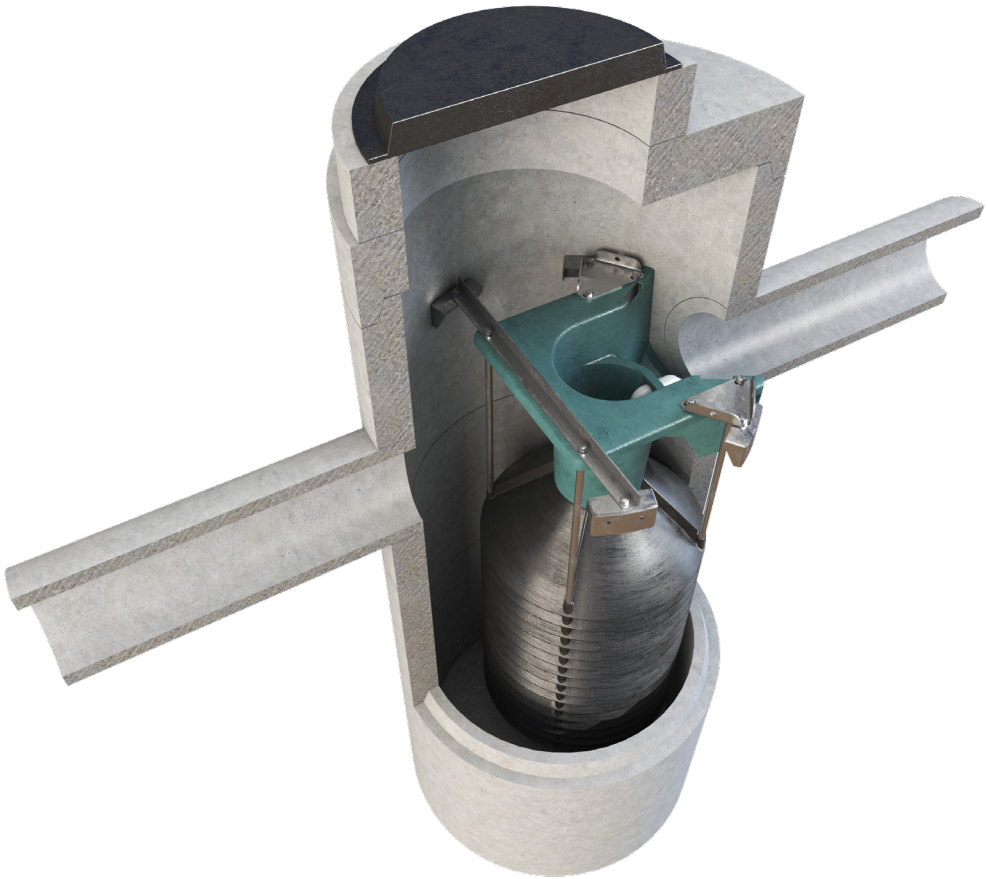
Hydro-Shield® Advance is a next-generation hydrodynamic separator that uses lamella plate technology to increase TSS capture while minimizing system footprint. It offers flexible sizing and is NJCAT 2021 verified and NJDEP certified, making it an ideal choice for both new and retrofit sites with variable constraints.

Features and Benefits

- Variable pipe angles provide added design flexibility
- Peak flow bypass only limited by pipe size, ideal for retrofit design
- Configurable cone stacks allow for flexible depth and footprint configurations
- Lamella plate design enables high removal efficiency

Specifications

- Available Sizes / Configurations: 4 ft, 6 ft and 8 ft unit sizes with shallow, standard, and plus configurations for depth
- Flow Rates: 0.44 cfs – 5.96 cfs
- Max Pipe Size: 30 in
- Certifications: NJCAT 2021 Verified, NJDEP Certified



OUR PRODUCTS

Nutrient Separating Baffle Box® (NSBB®)

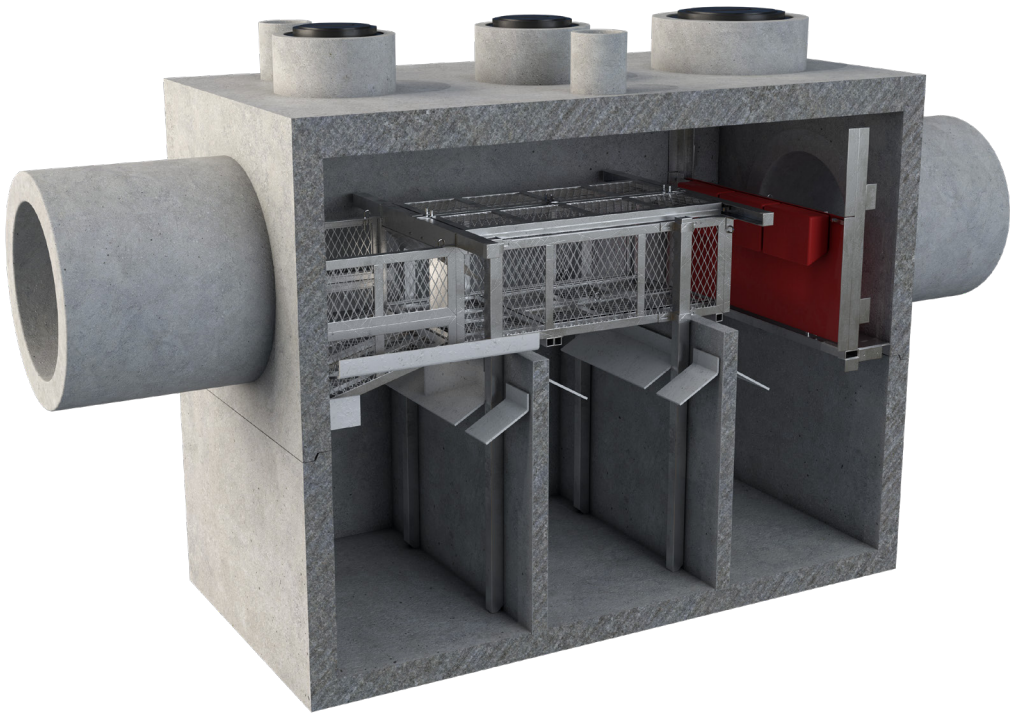
The NSBB® is a triple-chambered treatment system that prevents nutrient leaching by storing captured debris in a dry state. It features SkimBoss® MAX skimmer, patented screens, and deflector baffles to eliminate sediment scouring during high flows. NJDEP certified under 2021 protocol.

Features and Benefits

- Patented screen system holds captured debris in a dry state, minimizing nutrient leaching
- Meets requirements for full trash capture TMDL programs
- Maintenance-friendly access points
- Patented deflector system ensures no sediment scouring during high flows

Specifications

- Standard Sizes / Configurations*: 4 ft x 8 ft to 12 ft x 24 ft vaults
- Flow Rates: 28.8 cfs – 71.7 cfs
- Max Pipe Size: 72 in
- Certifications: Maryland DOE, Virginia DEQ, California SWRCB, NJDEP certified and NJCAT verified under 2021 protocol



*Larger, custom sizes (up to 100+ cfs) are available – contact us for custom configuration options.

First Defense®

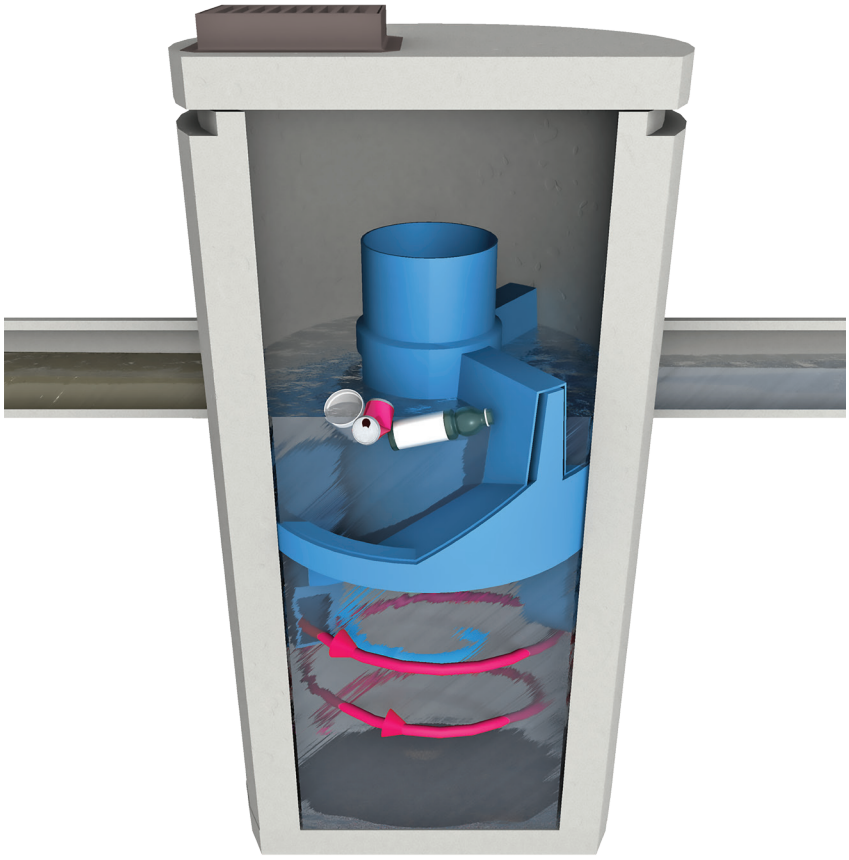
First Defense® is a versatile, NJCAT/NJDEP-certified per 2013 protocol hydrodynamic separator engineered for tight urban footprints and high-flow conditions. With its internal bypass and scalable design, it balances performance and ease of installation.

Features and Benefits

- Fits constrained footprints with flexible depth configurations to easily adapt to site limitations
- Save installation time – every unit is delivered to site pre-assembled and ready for installation
- Works with single and multiple inlet pipes and inlet grates – easily maintained by standard vacuum tanker

Specifications

- Available Sizes / Configurations: 3 ft to 10 ft diameter range
- Flow Rates: 0.84 cfs – 11.75 cfs
- Max Pipe Size: 48 in
- Certifications: NJCAT and NJDEP per 2013 protocol, OK110



OUR PRODUCTS

Downstream Defender®

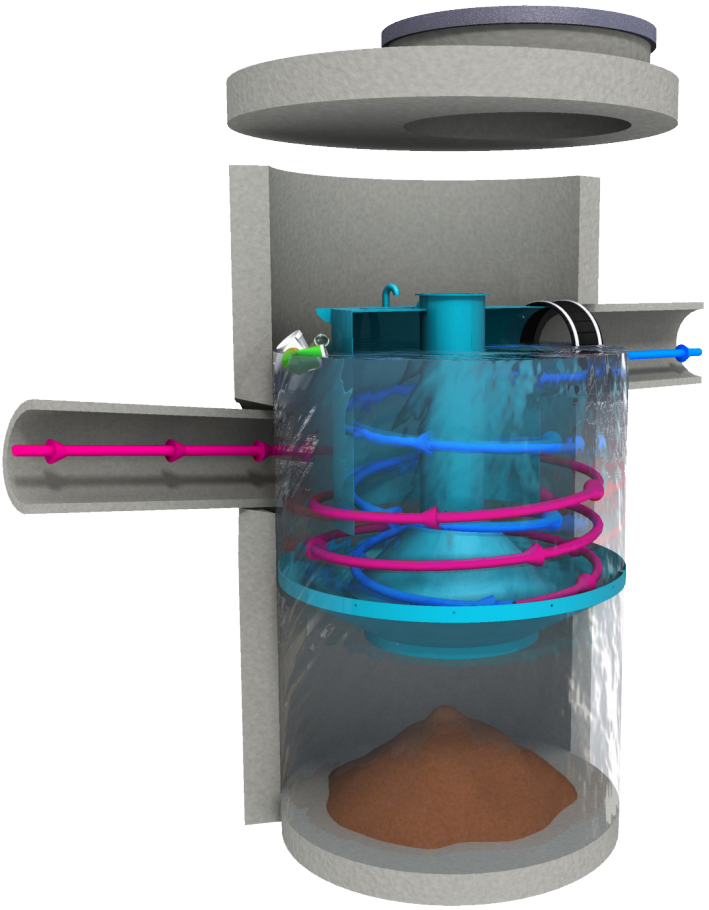
Downstream Defender® utilizes a submerged tangential inlet and spiral flow regime to trap sediment and floatables within a compact, cylindrical vessel. With online and offline configuration options, it offers consistent pollutant removal with low headloss.

Features and Benefits

- Submerged inlet prevents washout
- Reduced headloss provides engineers with design options for shallower sites
- Designed to function as either a pretreatment or as a stand-alone device

Specifications

- Available Sizes / Configurations:
  4.1 ft – 11.2 ft distance from outlet to sump floor
- Flow Rate: 1.3 cfs – 17.7 cfs
- Max Pipe Size: 36 in
- Certifications: NJCAT, ETV (Canada), WA TAPE approved pretreatment device



Systems that meet a range of site requirements

We offer multiple hydrodynamic separator options, each designed to handle different flow rates, configurations, and site constraints, while sharing core benefits.

Feature	Hydro-Shield® Advance	Nutrient Separating Baffle Box® (NSBB®)	Downstream Defender®	First Defense®
Max Pipe Size (in)	30	72	36	48
Max Flow Rate (cfs)	5.96	71.7	38	11.75
Configurations	Shallow, Standard, and Plus	Vault-based	Cylindrical	Cylindrical
Bypass Type	Internal	Optional Internal	Optional Internal	Internal
Key Tech	Lamella Plates	Dry Screen, Deflectors	Spiral Flow Path	Spiral Flow Path
Certifications	NJCAT 2021, NJDEP	MDE, VA DEQ, CA SWRCB, NJCAT 2021, NJDEP	NJCAT, WA TAPE, ETV(Canada)	NJCAT, NJDEP 2013 OK110

Beyond the Test

The US stormwater sector is highly regulated, with stormwater testing protocols such as NJCAT and TAPE setting a high standard for pollutant removal performance. However, engineers will benefit their clients and their communities by looking beyond the test and partner with providers that go beyond the test to deliver the real-world performance and practical considerations that improve design, installation and long-term stormwater maintenance. *Continue the article online*

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