The Barracuda S4 is a market-changing stormwater quality technology. This high performance vortex hydrodynamic separator is designed to remove total suspended solids in order to protect our precious receiving waters. The Barracuda is also an outstanding value that offers multiple pipe configurations, and quick installation.

**FEATURES:**
- Single manhole design
- No elevation loss between the inlet and outlet
- Flexible inlet/outlet positions (not just 180 degree orientation)
- Internal bypass for inline installation (where applicable)
- Revolutionary, patent pending “teeth” mitigate turbulence in the sump area to prevent resuspension of captured contaminants.

**BENEFITS:**
- Internal components are in stock for quick delivery.
- The S4 can be provided within a 48” ADS HP Manhole, to be factory fabricated and delivered complete to the jobsite.
- The S4 can also be installed in a standard 48” precast manhole. The Barracuda “teeth” apparatus is fabricated and designed for quick and easy field assembly.
- Designed for easy maintenance using a vacuum truck or similar equipment.
- Inspection and maintenance are performed from the surface with no confined space entry.

**ADS Service:** ADS representatives are committed to providing you with the answers to all your questions, including specifications, installation and more.
BARRACUDA S4 SPECIFICATION

MATERIALS AND DESIGN

• Concrete Structures: Designed for H-20 traffic loading and applicable soil loads or as otherwise determined by a Licensed Professional Engineer. The materials and structural design of the devices shall be per ASTM C857 and ASTM C858.

• 48" HP Manhole Structures: Made from an impact modified copolymer polypropylene meeting the material requirements of ASTM F2764. The eccentric cone reducer shall be manufactured from polyethylene material meeting ASTM D3350 cell class 213320C. Gaskets shall be made of material meeting the requirements of ASTM F477.

• Separator internals shall be substantially constructed of stainless steel, polyethylene or other thermoplastic material approved by the manufacturer.

PERFORMANCE

• The stormwater treatment unit shall be an inline unit capable of conveying 100% of the design peak flow. If peak flow rates exceed maximum hydraulic rate, the unit shall be installed offline.

• The Barracuda unit shall be designed to remove at least 80% of the suspended solids on an annual aggregate removal basis. Said removal shall be based on full-scale third party testing using OK-110 media gradation or equivalent and 300 mg/L influent concentration. Said full scale testing shall have included sediment capture based on actual total mass collected by the stormwater treatment unit.

  - OR -

  The Barracuda unit shall be designed to remove at least 50% of TSS using a media mix with d_{50}=75 micron and 200 mg/L influent concentration.

  - OR -

  The Barracuda unit shall be designed to remove at least 50% of TSS per current NJDEP/NJCAT HDS protocol.

• The stormwater treatment unit internals shall consist of (1) separator cone assembly, and (1) sump assembly which includes (4) legs with "teeth".

<table>
<thead>
<tr>
<th>Barracuda S4</th>
<th>Manhole Diameter</th>
<th>80% Removal OK-110</th>
<th>50% TSS per NJCAT</th>
<th>Max Hydraulic Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>48&quot;</td>
<td>1.08 CFS</td>
<td>1.25 CFS</td>
<td>6.25 CFS</td>
</tr>
</tbody>
</table>

INSTALLATION

Installation of the stormwater treatment unit(s) shall be performed per manufacturer’s installation instructions. Such instructions can be obtained by calling Advanced Drainage Systems at (800) 821-6710 or by logging on to www.ads-pipe.com or www.baysaver.com.
ATTENTION: Daniel Figola, General Manager
REFERENCE: Third Party Review of NJCAT Testing Procedures for Barracuda™ Separator at the Mid Atlantic Storm Water Research Center, 1207 Park Ridge Drive, Mount Airy, MD 21771

**SUMMARY**

Boggs Environmental Consultants, Inc. (BEC) was hired by Advanced Drainage Systems (ADS) in May of 2017, to serve as independent third-party oversight of NJCAT testing of the BaySaver Barracuda S4 Separator test unit for removal of sediment. The device is an insert that can be installed in either Polypropylene plastic pipe or concrete vault, and consists of a cone (vortex separator) and baffles (“teeth”). For the particle size distribution and weighted calculation method required by the NJDEP HDS Protocol, the Barracuda Separator demonstrated greater than 50% TSS removal at an MTFR of 1.25 cfs (559 gpm) under the NJCAT protocol and gained approval by NJDEP.

**SCALED RESULTS**

All testing and data collection procedures, including sediment blending, were supervised by BEC, and in accordance with the New Jersey Department of Environmental Protection Laboratory Protocol to Assess Total Suspended Solids Removal by a Hydrodynamic Sedimentation Manufactured Treatment Device (January 2013) (NJDEP HDS Protocol). Testing flow rates ranged from 0.32 to 1.60 cfs (142 gpm – 720 gpm), with a target influent sediment concentration of 200 mg/L. Based upon New Jersey scaling methodology, the table below represents treatment and device information for the S4, S6, and S8 units.

<table>
<thead>
<tr>
<th>Model</th>
<th>Manhole Diameter (ft)</th>
<th>NJDEP 50% TSS MTFR (cfs)</th>
<th>Treatment Area (ft²)</th>
<th>Hydraulic Loading rate (gpm/ft²)</th>
<th>Chamber Depth (ft)</th>
<th>Wet Volume (ft³)</th>
<th>50% Maximum Sediment Storage² (ft³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barracuda S4</td>
<td>4</td>
<td>1.25</td>
<td>12.57</td>
<td>44.6</td>
<td>6.83</td>
<td>75.4</td>
<td>10.47</td>
</tr>
<tr>
<td>Barracuda S6</td>
<td>6</td>
<td>2.80</td>
<td>28.27</td>
<td>44.6</td>
<td>6.83</td>
<td>169.7</td>
<td>23.56</td>
</tr>
<tr>
<td>Barracuda S8</td>
<td>8</td>
<td>5.00</td>
<td>50.27</td>
<td>44.6</td>
<td>11.03</td>
<td>512.7</td>
<td>41.89</td>
</tr>
</tbody>
</table>

Notes:
1. In some areas Barracuda units are available in additional diameters. Units not listed here are sized not to exceed 44.6 gpm/ft² of effective treatment during the peak water quality flow.
2. 50% Sediment Storage Capacity is equal to manhole diameter x 10 inches of sediment depth. Each Barracuda unit has a 20 inches deep sediment sump.

Should you have any questions, contact our office at your earliest convenience.

Sincerely,
Boggs Environmental Consultants, Inc.
William R. Warfel  
Principal Environmental Scientist
Robin J. Maliszewskyj  
Chemical Engineer

---

**ENVIROMENTAL SCIENCE, ENGINEERING & INDUSTRIAL HYGIENE SERVICES**
THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

48" HP MANHOLE

30" FRAME & COVER

INTEGRATED INTERNAL WEIR

FIN ARRAY (TYP 4 PLACES)

VARIABLE INLET LOCATIONS

18" (MIN)

* FABRICATED PP OUTLET STUB

FIN ARRAY (TYP 4 PLACES) INTEGRATED INTERNAL WEIR

VARIABLE OUTLET LOCATIONS

18" (MIN)

30" FRAME & COVER

INTEGRATED INTERNAL WEIR

TURF INSTALLATION

6" MIN. OVERLAY

6" MIN. (30" MIN)

INTEGRATED INTERNAL WEIR

* FABRICATED PP INLET STUB

FIN ARRAY (TYP 4 PLACES)

BOWL

6" MIN. DESIGN BY SITE ENGINEER PER LOADING AND SOIL CONDITIONS

CLASS I BACKFILL & BEDDING PER ASTM D2321, MATERIAL SHALL BE WELL PLACED UNFORMLY AROUND STRUCTURE AND INLET CONNECTIONS AND COMPACTED IN 8" MAX. LIFTS AT LEAST 18" FROM OUTSIDE OF STRUCTURE.

BOWL

FIN ARRAY (TYP 4 PLACES)

6.92’SUB.

63.0°

98.0°

8.37°

9.42°

[113.0°]

[113.0°]

SECTION VIEW A-A

SECTION VIEW B-B

VARIABLE INLET LOCATIONS

18" (MIN)

* FABRICATED PP INLET STUB

FIN ARRAY (TYP 4 PLACES) INTEGRATED INTERNAL WEIR

VARIABLE OUTLET LOCATIONS

18" (MIN)

30" FRAME & COVER

INTEGRATED INTERNAL WEIR
BARRACUDA S4

UNIT ID: BMP1

PEAK FLOW RATE (CFS)

TREATMENT FLOW RATE (CFS)

1.25 CFS

8.92' [107.0"

9.42' [113.0"

83"

12" (MIN)

30.0" (30" MIN)

FIN ARRAY
(TYP 4 PLACES)

INTEGRATED INTERNAL WEIR

INTEGRATED INTERNAL WEIR

BOWL

FIN ARRAY
(TYP 4 PLACES)

BOWL

INTEGRATED INTERNAL WEIR

INTEGRATED INTERNAL WEIR

BOWL

FIN ARRAY
(TYP 4 PLACES)

FIN ARRAY
(TYP 4 PLACES)
One of the advantages of the BaySaver Barracuda is the ease of maintenance. Like any system that collects pollutants, the BaySaver Barracuda must be maintained for continued effectiveness. Maintenance is a simple procedure performed using a vacuum truck or similar equipment. The systems were designed to minimize the volume of water removed during routine maintenance, reducing disposal costs.

Contractors can access the pollutants stored in the manhole through the manhole cover. This allows them to gain vacuum hose access to the bottom of the manhole to remove sediment and trash. There is no confined space entry necessary for inspection or maintenance.

The entire maintenance procedure typically takes from 2 to 4 hours, depending on the size of the system, the captured material, and the capacity of the vacuum truck.

Local regulations may apply to the maintenance procedure. Safe and legal disposal of pollutants is the responsibility of the maintenance contractor. Maintenance should be performed only by a qualified contractor.

**Inspection and Cleaning Cycle**

Periodic inspection is needed to determine the need for and frequency of maintenance. You should begin inspecting as soon as construction is complete and thereafter on an annual basis. Typically, the system needs to be cleaned every 1-3 years.

Excessive oils, fuels or sediments may reduce the maintenance cycle. Periodic inspection is important.

**Determining When to Clean**

To determine the sediment depth, the maintenance contractor should lower a stadia rod into the manhole until it contacts the top of the captured sediment and mark that spot on the rod. Then push the probe through to the bottom of the sump and mark that spot to determine sediment depth.

Maintenance should occur when the sediment has reached the levels indicated in the Storage Capacity Chart.

### BaySaver Barracuda Storage Capacities

<table>
<thead>
<tr>
<th>Model</th>
<th>Manhole Diameter</th>
<th>Treatment Chamber Capacity</th>
<th>Standard Sediment Capacity (20” depth)</th>
<th>NJDEP Sediment Capacity (50% of standard depth)</th>
</tr>
</thead>
<tbody>
<tr>
<td>S3</td>
<td>36”</td>
<td>212 gallons</td>
<td>0.44 cubic yards</td>
<td>0.22 cubic yards</td>
</tr>
<tr>
<td>S4</td>
<td>48”</td>
<td>564 gallons</td>
<td>0.78 cubic yards</td>
<td>0.39 cubic yards</td>
</tr>
<tr>
<td>S5</td>
<td>60”</td>
<td>881 gallons</td>
<td>1.21 cubic yards</td>
<td>0.61 cubic yards</td>
</tr>
<tr>
<td>S6</td>
<td>72”</td>
<td>1269 gallons</td>
<td>1.75 cubic yards</td>
<td>0.88 cubic yards</td>
</tr>
<tr>
<td>S8</td>
<td>96”</td>
<td>3835 gallons</td>
<td>3.10 cubic yards</td>
<td>1.55 cubic yards</td>
</tr>
<tr>
<td>S10</td>
<td>120”</td>
<td>7496 gallons</td>
<td>4.85 cubic yards</td>
<td>2.43 cubic yards</td>
</tr>
</tbody>
</table>

**Maintenance Instructions**

1. Remove the manhole cover to provide access to the pollutant storage. Pollutants are stored in the sump, below the bowl assembly visible from the surface. You’ll access this area through the 10” diameter access cylinder.
2. Use a vacuum truck or other similar equipment to remove all water, debris, oils and sediment. See figure 1.
3. Use a high pressure hose to clean the manhole of all the remaining sediment and debris. Then, use the vacuum truck to remove the water.
4. Fill the cleaned manhole with water until the level reaches the invert of the outlet pipe.
5. Replace the manhole cover.
6. Dispose of the polluted water, oils, sediment and trash at an approved facility.
   • Local regulations prohibit the discharge of solid material into the sanitary system. Check with the local sewer authority for authority to discharge the liquid.
   • Some localities treat the pollutants as leachate. Check with local regulators about disposal requirements.
   • Additional local regulations may apply to the maintenance procedure.

Figure 1