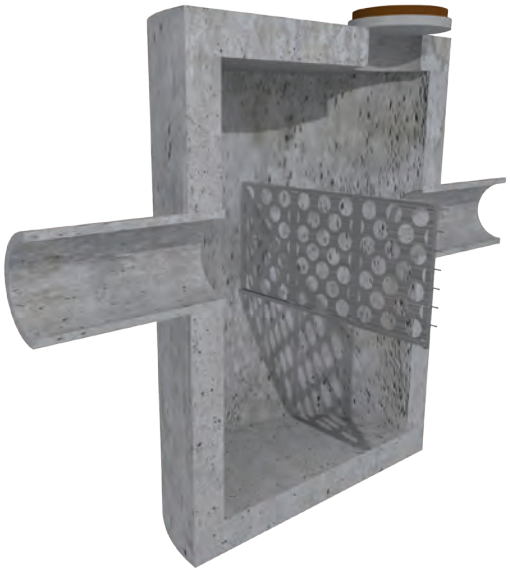
SAFL BAFFLE

PATENT PROTECTED

Upstream Technologies
600 County Road D West, Suite 14
New Brighton, MN 55112
651.237.5123

45 MINUTE STORMWATER SEDIMENT SOLUTION

The SAFL Baffle* is the best way to keep sediment pollution out of lakes, rivers, and oceans. It fits into both new and existing sump manholes, where it upgrades them to capture more sediment found in stormwater. Installation takes about 45 minutes and captured sediment can be conveniently removed with a vacuum truck. Without the SAFL Baffle, sediment collects in ponds, wetlands, and infiltration basins, which must be periodically maintained. Collecting sediment upstream with a SAFL Baffle will extend the lives of downstream BMPs, significantly reducing long term maintenance costs.



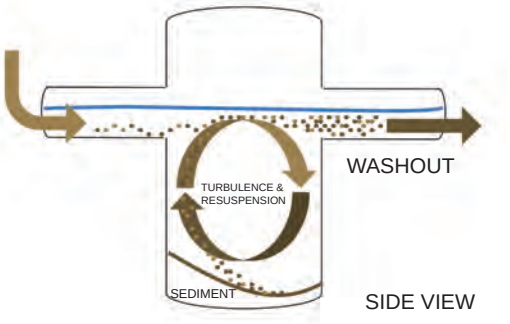
90%
REDUCTION OF MAINTENANCE COSTS OVER DREDGING

45
MINUTE INSTALL

RETROFITS
AND NEW CONSTRUCTION

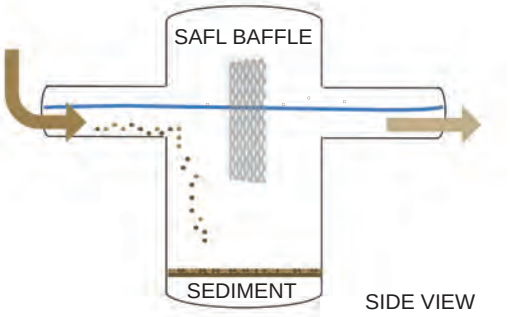
STARTING AT
$3600

HIGH FLOW CONDITIONS



SIDE VIEW

HIGH FLOW CONDITIONS



SIDE VIEW

Washout Protection

Four years of testing at the University of Minnesota's St. Anthony Falls Laboratory showed the SAFL Baffle to dramatically reduce washout of previously collected sediment. The SAFL Baffle does this by preventing a circular, plunging flow pattern from occurring within the sump manhole at high flow rates.

Stainless Steel

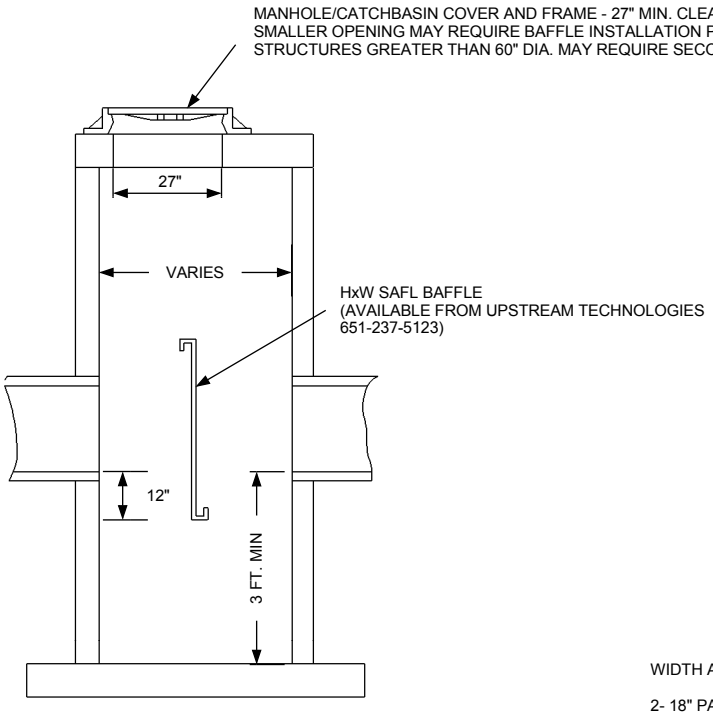
Every piece of the baffle fits through a casting

Easy Install

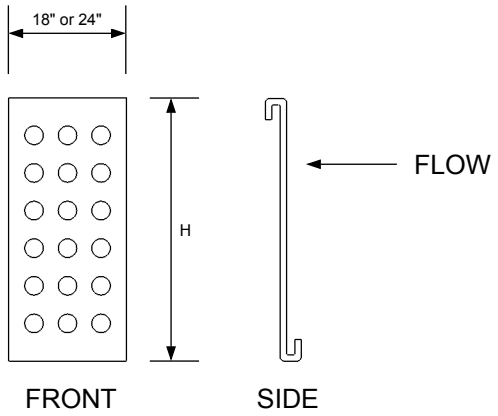
Installs with a hammer drill, bubble level and wrenches

www.upstreamtechnologies.us

Patents: US 8,715,507 B2, US 8,663,466 B2 and US 9,506,237 B2
CA 2742207



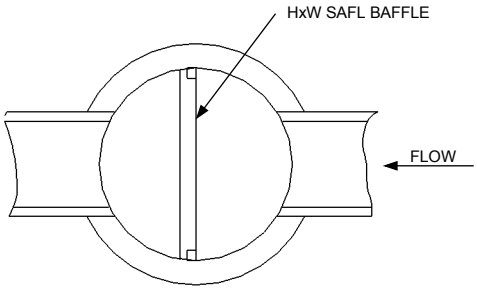
SAFL BAFFLE INSTALLATION DETAIL



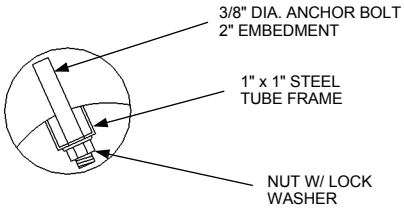
WIDTH ADJUSTMENT FOR PANEL SIZES

2- 18" PANELS	32" MIN	36" MAX	4" TOTAL
2- 24" PANELS	44" MIN	48" MAX	4" TOTAL
3- 18" PANELS	46" MIN	54" MAX	8" TOTAL
3- 24" PANELS	64" MIN	72" MAX	8" TOTAL

SAFL BAFFLE PANEL DETAIL



SAFL BAFFLE INSTALLATION PLAN



SAFL BAFFLE ATTACHMENT BOLT DETAIL

NOTES:

1) UPSTREAM TECHNOLOGIES INC. IS THE EXCLUSIVE LICENSEE OF THE SAFL BAFFLE

2) CONTRACTOR MUST VERIFY LOCATION OF CASTING AND STEPS PRIOR TO INSTALLATION OF THE STRUCTURE

3) CONTRACTOR STRUCTURES GREATER THAN 72" REQUIRE SECOND CASTING FOR MAINTENANCE ACCESS

4) THIS GENERIC DETAIL DOES NOT ENCOMPASS THE SIZING, FIT AND APPLICABILITY OF THE SAFL BAFFLE FOR THIS SPECIFIC PROJECT. IT IS THE ULTIMATE RESPONSIBILITY OF THE DESIGN ENGINEER TO ASSURE THAT THE DESIGN IS IN COMPLIANCE WITH ALL APPLICABLE LAWS AND REGULATIONS. THE SAFL BAFFLE IS A PATENTED TECHNOLOGY OF UPSTREAM TECHNOLOGES, INC. AND THE UNIVERSITY OF MINNESOTA AND NEITHER UPSTREAM TECHNOLOGIES NOR THE UNIVERSITY OF MINNESOTA APPROVES PLANS, SIZING, OR SYSTEM DESIGNS.

THROUGH PIPE CONFIGURATION

SAFL BAFFLE STANDARD DETAIL
UPSTREAM TECHNOLOGIES
NEW BRIGHTON, MN
651.237.5123
www.upstreamtechnologies.us

SAFL BAFFLE

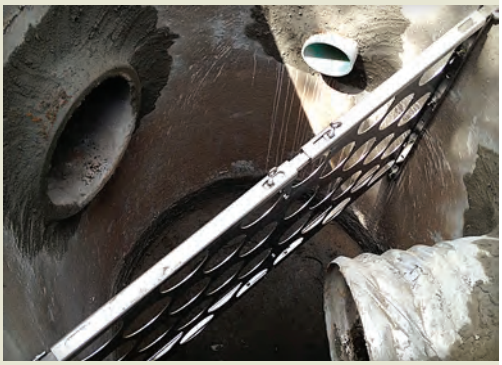
EVOLUTION

In 2007, the Minnesota Department of Transportation approached John Gulliver, PhD a professor in the Department of Civil, Environmental and Geo-Engineering at the University of Minnesota College of Science and Engineering's St. Anthony Falls Laboratory (SAFL), to analyze ways to reduce / eliminate sump manhole "washout" due to heavy rainfall events negatively impacting storm water systems. Four years, dozens of designs and thousands of testing hours later, the SAFL Baffle solution emerged.

Years of design / test experimentation cycles determined both the optimal sump manhole positioning and defined the Flow Funnel™ design (40-50 percent) for maximizing sediment capture. Flow Funnel™ design and baffle positioning are the two critical factors in managing sediment washout. These design characteristics are covered in the University of Minnesota's patent US 8,715,507B2.

FAST INSTALLATION

EASY MAINTENANCE



WORKS WITH MULTIPLE INLET PIPES

SAFL BAFFLE TODAY

Performance efficiency

Performance can be modeled through an independently developed simulation program (SHSAM, owned by Barr Engineering) for determining sediment removal efficiency.

Double the capture

Municipal retrofit installations confirm that the SAFL Baffle doubles sediment capture compared to the sump without the SAFL Baffle.

Avoid the "nozzle effect"

SAFL researchers determined that installation at the center of the manhole results in the greatest removal efficiency. Other baffle products are placed closer to the inlet pipe, where removal efficiency is less than optimal.

Fast, easy installation

Installs in less than an hour. Contractors have reported 15-minute installations in existing storm water sumps.

Works with popular "skimmers"

Works with popular "skimmers," like the Snout, manufactured by BMP Products, Inc.

In use at more than 500 sites across North America

Installed at more than 500 storm water sites in 22 states and Canada.

Agency approved

Approved for use by US Federal Highway Department, the US Army Corp of Engineers, and over a dozen state agencies from Washington to Maryland.

Patented design

US 8,715,507 B2
US 8,663,466 B2
US 9,506,237 B2

CA 2742207

Durable

Made in the USA, out of 100 percent stainless steel.

www.upstreamtechnologies.us
600 County Road D West, Suite 14
New Brighton, MN 55112
651.237.5123

Upstream Technologies™

SAFL Baffle Case Study: Sediment Retention
Golden Valley, Minnesota

The City of Golden Valley conducted a case study to determine the effectiveness of the SAFL Baffle.

Year 1: Seven existing sump structures were selected and monitored for 12 months.

Structure	Sump Dimensions (ft – D x H)	Watershed Area (acres)	Sediment Captured Per Year (lbs)
Hidden Lake	4.5 x 3.14	7.63	1124
Bridgewater	4.5 x 2.87	4.36	1027
Waterford	4.5 x 3.10	3.00	1109
Skyline	4.5 x 3.00	2.00	1074
Meander	6.0 x 3.00	27.00	1909
Western	4.0 x 2.29	32.00	647
Edgewood	6.0 x 3.00	6.40	1909

8,799 pounds of sediment was removed in a 12-month period without SAFL Baffles installed.

Year 2: SAFL Baffles were installed in each of the seven sump structures.

Structure	Sump Dimensions (ft – D x H)	Watershed Area (acres)	Sediment Captured Per Year (lbs)
Hidden Lake	4.5 x 3.14	7.63	2023
Bridgewater	4.5 x 2.87	4.36	1972
Waterford	4.5 x 3.10	3.00	2219
Skyline	4.5 x 3.00	2.00	1889
Meander	6.0 x 3.00	27.00	4199
Western	4.0 x 2.29	32.00	1295
Edgewood	6.0 x 3.00	6.40	3970

17,567 pounds of sediment was removed in a 12-month period with the SAFL Baffles installed.

Year 1: Without SAFL Baffles: 8,799 pounds removed
Year 2: With SAFL Baffles: 17,567 pounds removed

A 99% increase in sediment retention

Rain events for both years were similar

Upstream Technologies™

600 County Road D West, Suite 14
New Brighton, MN 55112
651-237-5123
www.upstreamtechnologies.us