Aqua-Guardian™ Catch Basin Insert

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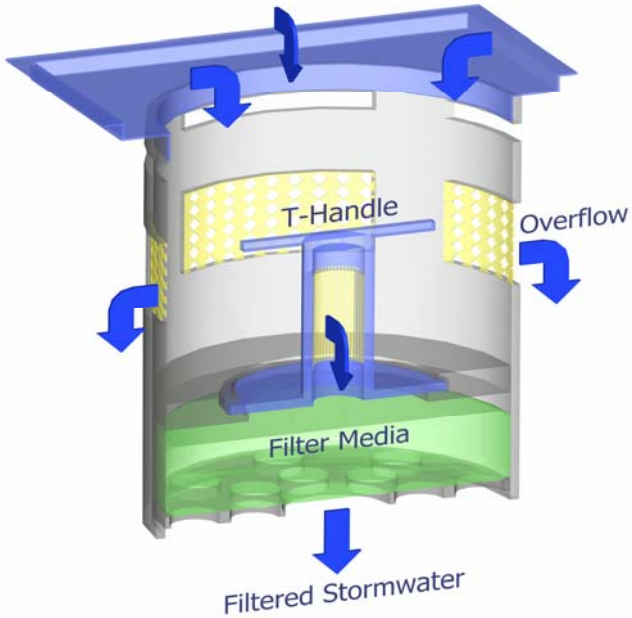
2733 Kanasita Drive, Suite B • Chattanooga, Tennessee 37343
Phone (888) 344-9044 • Fax (423) 826-2112
www.aquashieldinc.com

Aqua-Guardian™ Catch Basin Insert

AquaShield™, Inc. has improved the patented Aqua-Guardian™ Catch Basin Insert by increasing the treatment flow rates, while maintaining Total Suspended Solids (TSS) and debris removal efficiency. Filtration of fine sediment and associated pollutants transported during the first flush of the storm continues to be the initial level of treatment.

Each Aqua-Guardian™ insert includes a sediment collection/storage area within the High Density Polyethylene (HDPE) structure. Traditionally, the filter media utilized in the Aqua-Guardian™ Insert is medium-grained perlite. Zeolite, granular activated carbon, leaf compost and various media blends are also available in easy to remove filter containers. *See the "Performance and Testing" Section for details*.

System Operation



The Aqua-Guardian™ is suspended inside the catch basin by a stainless steel support collar, which acts as a funnel to direct runoff water into the sediment collection and storage area. The support collar forms a baffle around the inside of the insert, which acts to trap floatable debris, even during overflow conditions.

Stormwater enters the Aqua-Guardian™ from the surface and accumulates in the sediment chamber to begin the treatment process of capturing pollutants. As the storm continues, water flows through the locked filter screen standpipe and is dispersed over the filter media where fine sediment, petroleum hydrocarbons, nutrients (nitrogen and phosphorus), and heavy metals (copper, lead, zinc) are removed before exiting the insert through the base plate.

As the runoff increases, water rises in the sediment chamber to the level of the "filter screen outlets" built into the perimeter of HDPE structure. Removal, or treatment, of sediment and debris continues at increased flow rates as shown in the Aqua-Guardian™ Sizing Chart. The internal high-flow bypass openings at the top of the structure reduce the possibility of water backing onto the surface. The baffle formed by the stainless steel support collar prevents captured floatable debris from exiting through the overflow holes.

Retrofit Applications

The Aqua-Guardian™ can be used in most standard catch basins or storm drains, regardless of age or location. AquaShield™ can custom-fabricate the stainless steel support collar to fit nearly any size or shape of an existing catch basin. The dimensions or diameter of the surface drain opening need to be accurately described on the Aqua-Guardian™ Aqua-Site worksheet.

An Aqua-Guardian™ Catch Basin Insert with a retrofit steel support collar

Installation

Simple installation of an Aqua-Guardian™ Catch Basin Insert

Installation is as simple process of removing the surface grate cover and lowering the Aqua-Guardian™ into the catch basin. Due to the lightweight nature of HDPE, the Aqua-Guardian™ units can be installed without the need for special lifting equipment. However, removal and handling of the storm grate cover may require lifting equipment due to its weight and size.

The stainless steel support collar on the Aqua-Guardian™ is custom fitted to the inside frame of the surface grate. The flange on the stainless steel support collar will rest on the same rim that receives the surface grate cover. Once the insert is properly seated on the metal rim, replace the grate cover.

Inspection and Maintenance

A shop vacuum is used to clean an Aqua-Guardian™ Catch Basin Insert

A routine inspection and maintenance program is established for each unit based on the volume or load of the contaminants of concern, the frequency of releases of contaminants at the facility or location, and the nature of the area being drained. Typically, the Aqua-Guardian™ should be inspected quarterly or after significant storm events.

The Aqua-Guardian™ Catch Basin Insert can be visually inspected from the surface without the need to remove the catch basin grate. Use a tape measure to gauge the amount of sediment in the collection

area. When sediment level reaches the bottom of the perimeter “filter screen outlets”, the unit should be serviced.

The first step in maintaining the Aqua-Guardian™ requires the removal of the surface grate cover. A wet/dry shop-vac is often used to remove debris and sediment collected inside the chamber. The locking centerpiece assembly is removed by rotating the assembly with the “T” handle on top of filter screen standpipe. Once the centerpiece assembly is removed, the filter bag will be visible so that it can be pulled from the Aqua-Guardian™. Cleanout any residual sediment in the filter area and place a new filter container in the unit. Press down on all sides of the newly installed filter to ensure good contact with the outside walls.

The inside of an Aqua-Guardian™ Catch Basin Insert

The centerpiece assembly is then replaced and rotated (or locked) under the fitted guides. The final maintenance step is to replace the surface grate cover to its normal position.

Aqua-Guardian™ Worksheet

Aqua-Site worksheets are provided as an example of the information that AquaShield™ will need to customize an Aqua-Guardian™ to a specific work site.

- *1 completed example*
- *2 blank worksheets*

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Aqua-Guardian™ Worksheet

Project Information

Project Name: *County Recreation Center*

Location (City, State): *Anytown, USA*

Site Use (circle one): Residential Commerical Industrial Other

Site Plan Attached: ☐ YES ☐ NO

Pollutants (TSS, Floatable Debris, oils/grease, TP, etc.): *TSS, Oils, Heavy Metals,TP*

AutoCAD Version: *4.0*

Date Submitted: *3/12/2004*

Specifier Information

Designer's Name: *Sheri Phillips*

Design Firm: *Phillips Engineering*

Address: *123 Main Street*

City, State, Zip: *AnyTown, USA*

Phone: *423-870-8888*

Fax: *423-826-2112*

E-mail: *sheri@phillipsengr.com*

Specifications

Unit Label or Number	Aqua-Guardian™ Model	Design Flow Rate		Inlet Frame & Grate Cover				Catch Basin Size			Drainage Area Info	
		Water Quality Treatment Flow[1] (cfs - L/s)	Peak Design Flow[2] (cfs - L/s)	Frame (L x W or Dia.) (in - mm)	Rim of Frame (under grate cover) (in - m)	Grate Cover (L x W or Dia.) (in - mm)	Grate Thickness (edge & middle) (in - m)	Total Depth (top of grate to bottom) (in - mm)	Depth to Top of Pipe (in - mm)	Pipe Diameter (in - mm)	Area (acres - ha)	Percent Impervious (%)
CB-1	*AG-24*	*1.1*	*1.5*	*24 x 24*	*1.5*	*22.5 x22.5*	*1.75*	*48*	*36*	*6*	*1.2*	*100*

Special Site Conditions or Requirements:

Please provide copy of Site Plans showing orientation

How did you learn about Aqua-Shield™ ? *Website*

(1) Water Quality Treatment Flow is presribed by local regulatory agencies to achieve full treatment of specific amount of stormwater.

(2) Peak Design Flow refers to maximum calculated flow for an outfall or recurrence interval (10-yr, 25-yr event)

Specifier's Signature: Sheri Phillips **Date:** 12-Mar-04

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Aqua-Guardian™ Worksheet

Project Information

Project Name:

Location (City, State):

Site Use (circle one): Residential Commerical Industrial Other

Site Plan Attached: ☐ YES ☐ NO

Pollutants (TSS, Floatable Debris, oils/grease, TP, etc.):

AutoCAD Version:

Date Submitted:

Specifier Information

Designer's Name:

Design Firm:

Address:

City, State, Zip:

Phone:

Fax:

E-mail:

Specifications

Unit Label or Number	Aqua-Guardian™ Model	Design Flow Rate		Inlet Frame & Grate Cover				Catch Basin Size			Drainage Area Info	
		Water Quality Treatment Flow[1] (cfs - L/s)	Peak Design Flow[2] (cfs - L/s)	Frame (L x W or Dia.) (in - mm)	Rim of Frame (under grate cover) (in - m)	Grate Cover (L x W or Dia.) (in - mm)	Grate Thickness (edge & middle) (in - m)	Total Depth (top of grate to bottom) (in - mm)	Depth to Top of Pipe (in - mm)	Pipe Diameter (in - mm)	Area (acres - ha)	Percent Impervious (%)

Special Site Conditions or Requirements:

How did you learn about Aqua-Shield™ ?

Please provide copy of Site Plans showing orientation

(1) Water Quality Treatment Flow is presribed by local regulatory agencies to achieve full treatment of specific amount of stormwater.

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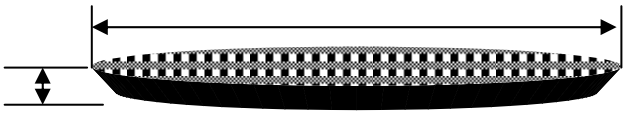
Specifier's Signature: **Date:**

Aqua-Guardian™
Installation Worksheet

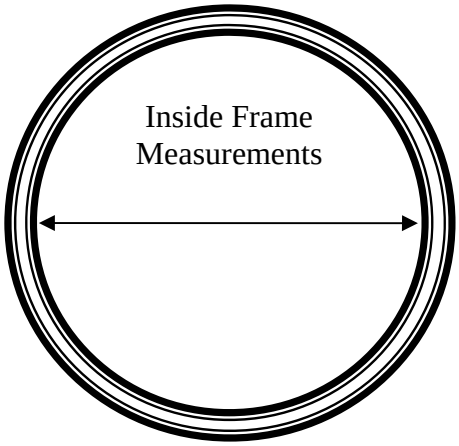
Project Name: _____Location: _____

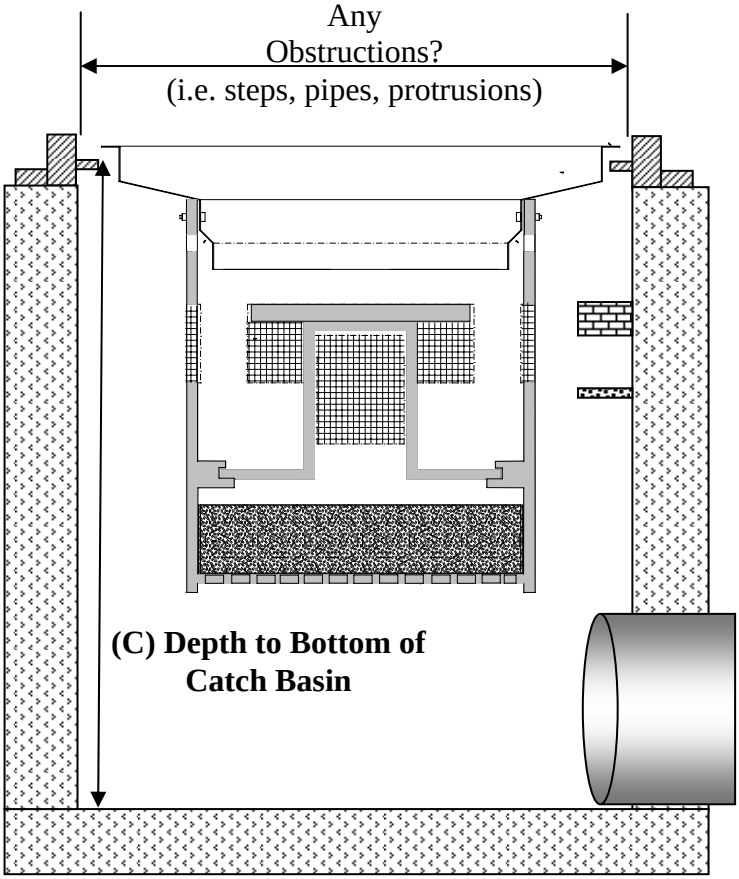
(ATTACH TO SITE SHEET)

(A) Surface Drain Grate Cover

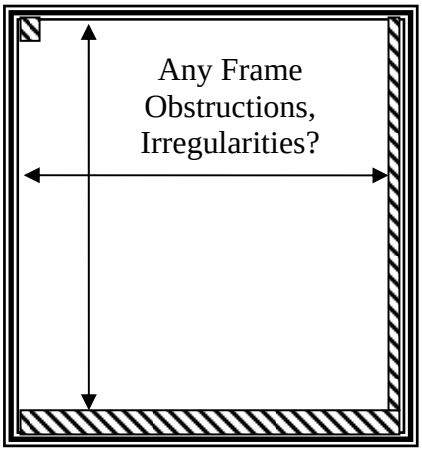


(B) Surface Drain Grate Frames





(C) Depth to Bottom of Catch Basin



(A) Surface Grate Cover: **Length _____(in/cm) Width _____ (in/cm)** - OR -
Diameter _____(in/cm) - AND-
Thickness @ ends _____ (in/cm) @ center _____(in/cm)

(B) Grate Frame: **Length _____(in/cm) Width _____ (in/cm)** - OR -
Diameter _____(in/cm) Thickness _____ (in/cm)

(C) Depth of Catch Basin: _____**(in/cm)**

NOTES:_____

_____

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Aqua-Guardian™ Worksheet

Project Information

Project Name:

Location (City, State):

Site Use (circle one): Residential Commerical Industrial Other

Site Plan Attached: ☐ YES ☐ NO

Pollutants (TSS, Floatable Debris, oils/grease, TP, etc.):

AutoCAD Version:

Date Submitted:

Specifier Information

Designer's Name:

Design Firm:

Address:

City, State, Zip:

Phone:

Fax:

E-mail:

Specifications

Unit Label or Number	Aqua-Guardian™ Model	Design Flow Rate		Inlet Frame & Grate Cover				Catch Basin Size			Drainage Area Info	
		Water Quality Treatment Flow[1] (cfs - L/s)	Peak Design Flow[2] (cfs - L/s)	Frame (L x W or Dia.) (in - mm)	Rim of Frame (under grate cover) (in - m)	Grate Cover (L x W or Dia.) (in - mm)	Grate Thickness (edge & middle) (in - m)	Total Depth (top of grate to bottom) (in - mm)	Depth to Top of Pipe (in - mm)	Pipe Diameter (in - mm)	Area (acres - ha)	Percent Impervious (%)

Special Site Conditions or Requirements:

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(1) Water Quality Treatment Flow is presribed by local regulatory agencies to achieve full treatment of specific amount of stormwater.

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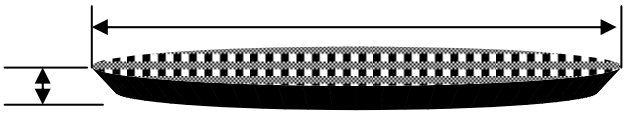
Specifier's Signature: **Date:**

Aqua-Guardian™
Installation Worksheet

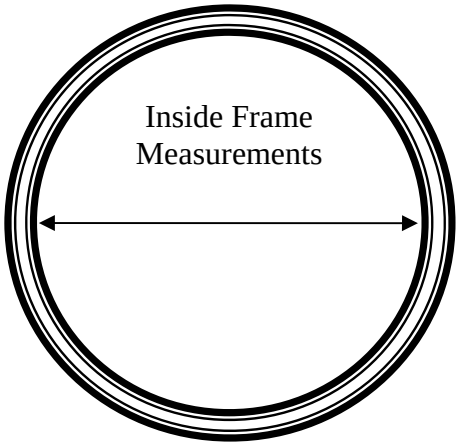
Project Name: _____Location: _____

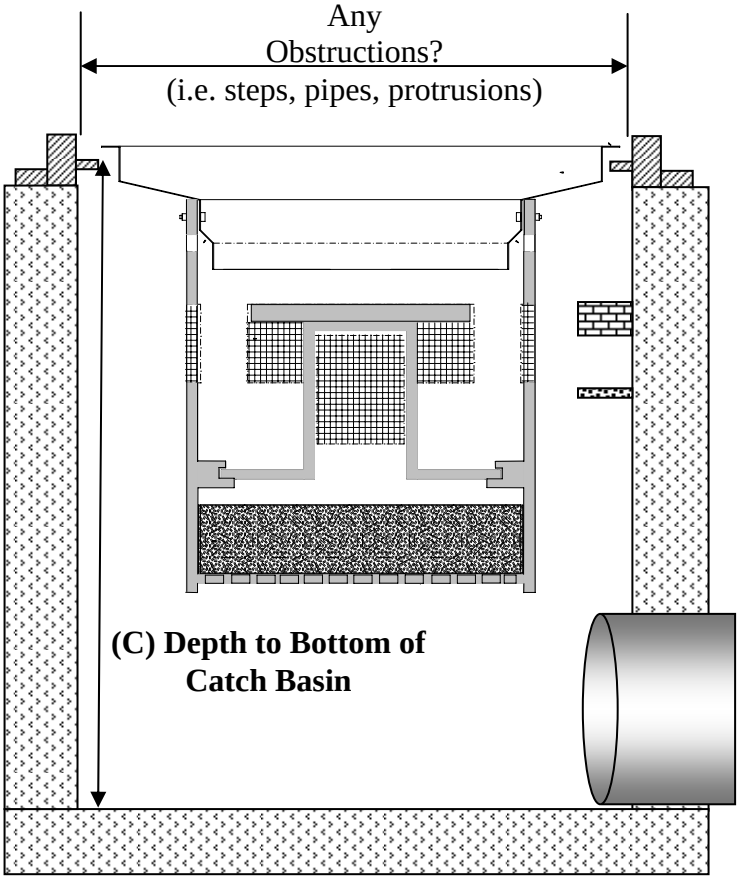
(ATTACH TO SITE SHEET)

(A) Surface Drain Grate Cover

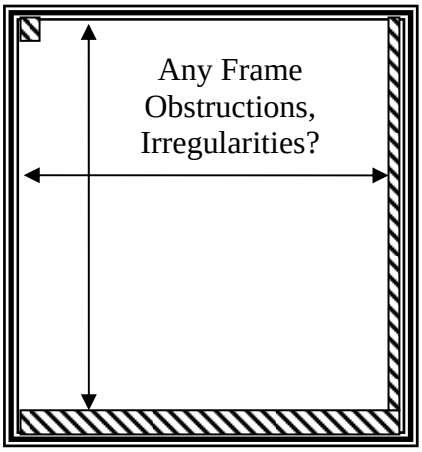


(B) Surface Drain Grate Frames





(C) Depth to Bottom of Catch Basin



(A) Surface Grate Cover: **Length _____(in/cm) Width _____ (in/cm)** - OR -
Diameter _____(in/cm) - AND-
Thickness @ ends _____ (in/cm) @ center _____(in/cm)

(B) Grate Frame: **Length _____(in/cm) Width _____ (in/cm)** - OR -
Diameter _____(in/cm) Thickness _____ (in/cm)

(C) Depth of Catch Basin: _____**(in/cm)**

NOTES:_____

_____

Aqua-Guardian™ Sizing Chart *(English)*

Aqua-Guardian™ Model	Surface Drain Opening Size,[A] or Diameter (inches)	Max. Flow Rate (Filtered + By-pass) (cfs)	Total Filtered Flow Rate (cfs)	Filter Body Diameter[B] (inches)	Filter Body Height[C] (inches)	Sediment/ Debris Storage Capacity (ft^3)	Oil Removal/ Storage (gallons)
AG-18	**18 - 24**	**1.2**	**0.9**	**14**	**25.5**	**0.7**	**1.5**
AG-24	**24 - 36**	**1.7**	**1.2**	**20**	**25.5**	**1.3**	**3.0**
AG-36	**36 - 48**	**2.8**	**2.1**	**30**	**25.5**	**2.7**	**7.5**

(A) *Surface Drain Opening Size is determined by the engineer/designer of the drainage system for the site based on standard engineering practices. The Aqua-Guardian™ will correspond to the dimensions of the drain opening and information provided by the engineer/designer. Refer to "Site Worksheet" to complete field measurements of surface drain(s).*

(B) *A minimum of 2" clearance is required on all sides of the HDPE structure from surface drain opening dimension. A minimum 1" wide support rim is needed on the frame of the surface grate.*

(C) *Dimension provided is for standard units and is the minimum depth needed between surfaces drain opening and top of discharge pipe.*

(D) *Care should be taken to note any obstruction(s) or irregularities within the frame of the surface drain opening or grate cover, which could affect the proper fit of the Aqua-Guard™ support collar. Drawings or photographs of the surface drain frame and grate may be needed to supplement the Site Worksheet information.*

The design and orientation of the Aqua-Guardian™ generally entails some degree of customization. For assistance in design and specific sizing using historical rainfall data, please refer to an AquaShield™ representative or go to our web site for more information to locate your representative at www.AquaShieldInc.com. CAD details and specifications are available upon request.

Aqua-Guardian™ Sizing Chart *(Metric)*

Aqua-Guardian™ Model	Surface Drain Opening Size,[A] or Diameter (mm.)	Max. Flow Rate (Filtered + By-pass) (L/s)	Total Filtered Flow Rate (L/s)	Filter Body Diameter[B] (mm.)	Filter Body Height[C] (mm.)	Sediment/ Debris Storage Capacity (m^3)	Oil Removal/ Storage (L)
AG-18	**457 - 610**	**34**	**25**	**356**	**648**	**0.02**	**6**
AG-24	**610 - 914**	**48**	**34**	**508**	**648**	**0.04**	**11**
AG-36	**914-1219**	**79**	**59**	**762**	**648**	**0.08**	**28**

(A) *Surface Drain Opening Size is determined by the engineer/designer of the drainage system for the site based on standard engineering practices. The Aqua-Guardian™ will correspond to the dimensions of the drain opening and information provided by the engineer/designer. Refer to "Site Worksheet" to complete field measurements of surface drain(s).*

(B) *A minimum of 50mm clearance is required on all sides of the HDPE structure from surface drain opening dimension. A minimum 25mm wide support rim is needed on the frame of the surface grate.*

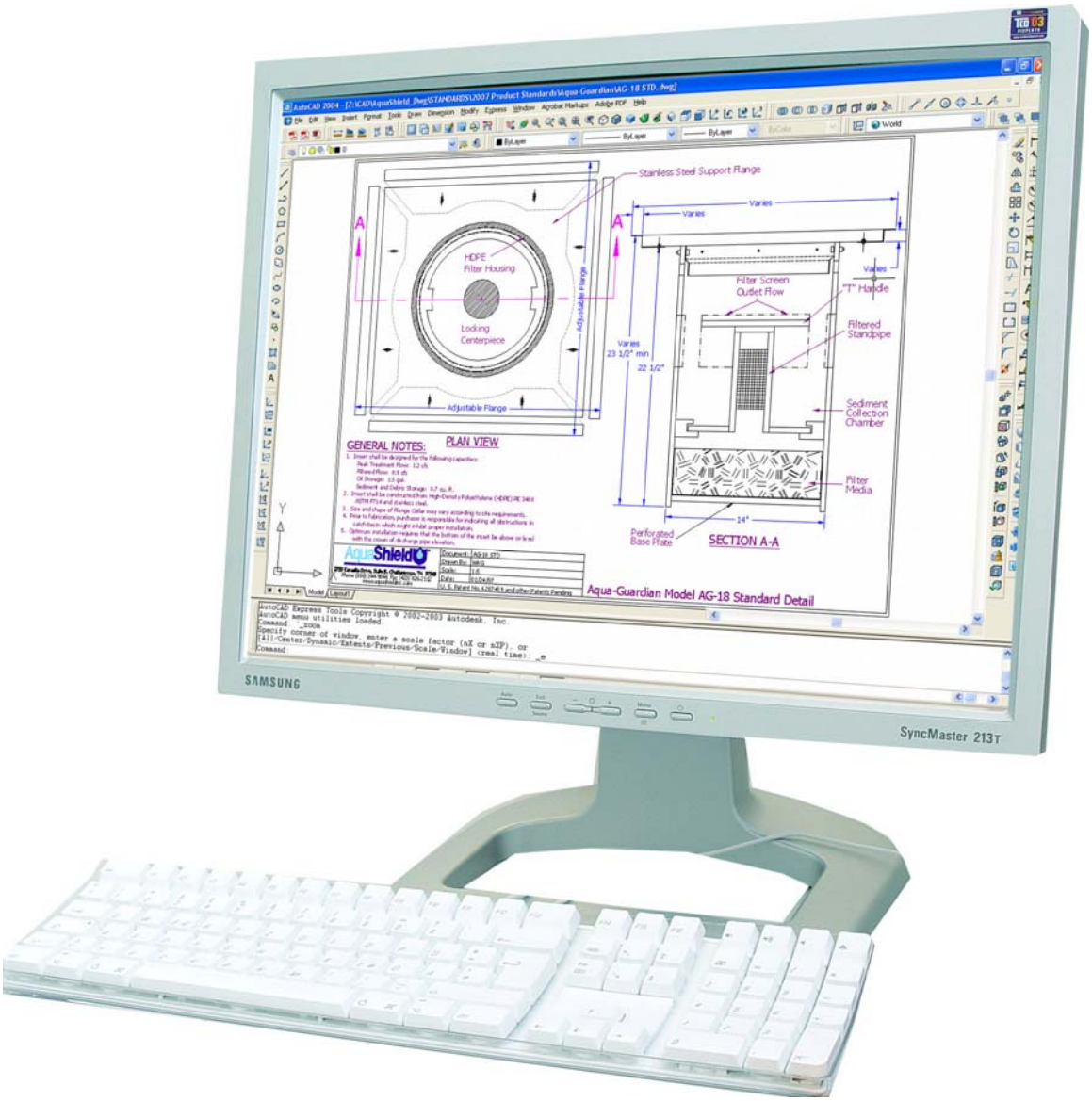
(C) *Dimension provided is for standard units and is the minimum depth needed between surfaces drain opening and top of discharge pipe.*

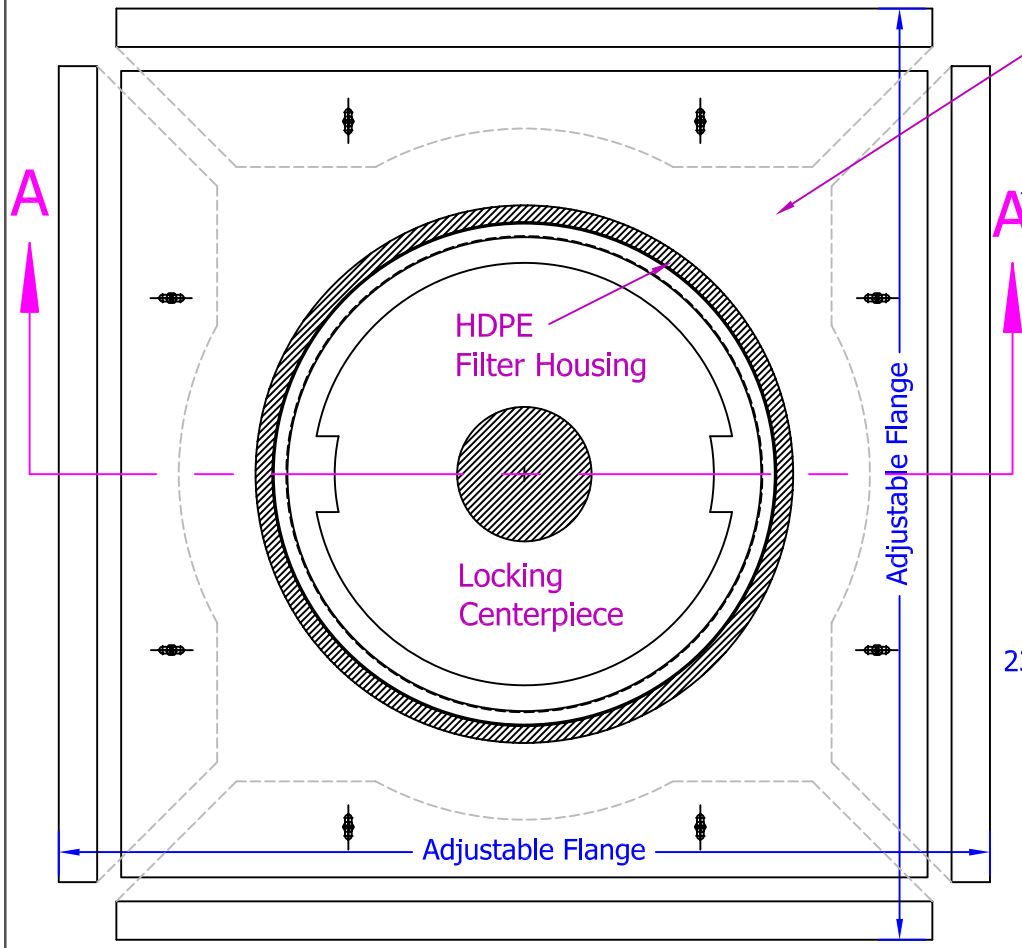
(D) *Care should be taken to note any obstruction(s) or irregularities within the frame of the surface drain opening or grate cover, which could affect the proper fit of the Aqua-Guardian™ support collar. Drawings or photographs of the surface drain frame and grate may be needed to supplement the Site Worksheet information.*

The design and orientation of the Aqua-Guardian™ generally entails some degree of customization. For assistance in design and specific sizing using historical rainfall data, please refer to an AquaShield™ representative or go to our web site for more information to locate your representative at www.AquaShieldInc.com. CAD details and specifications are available upon request.

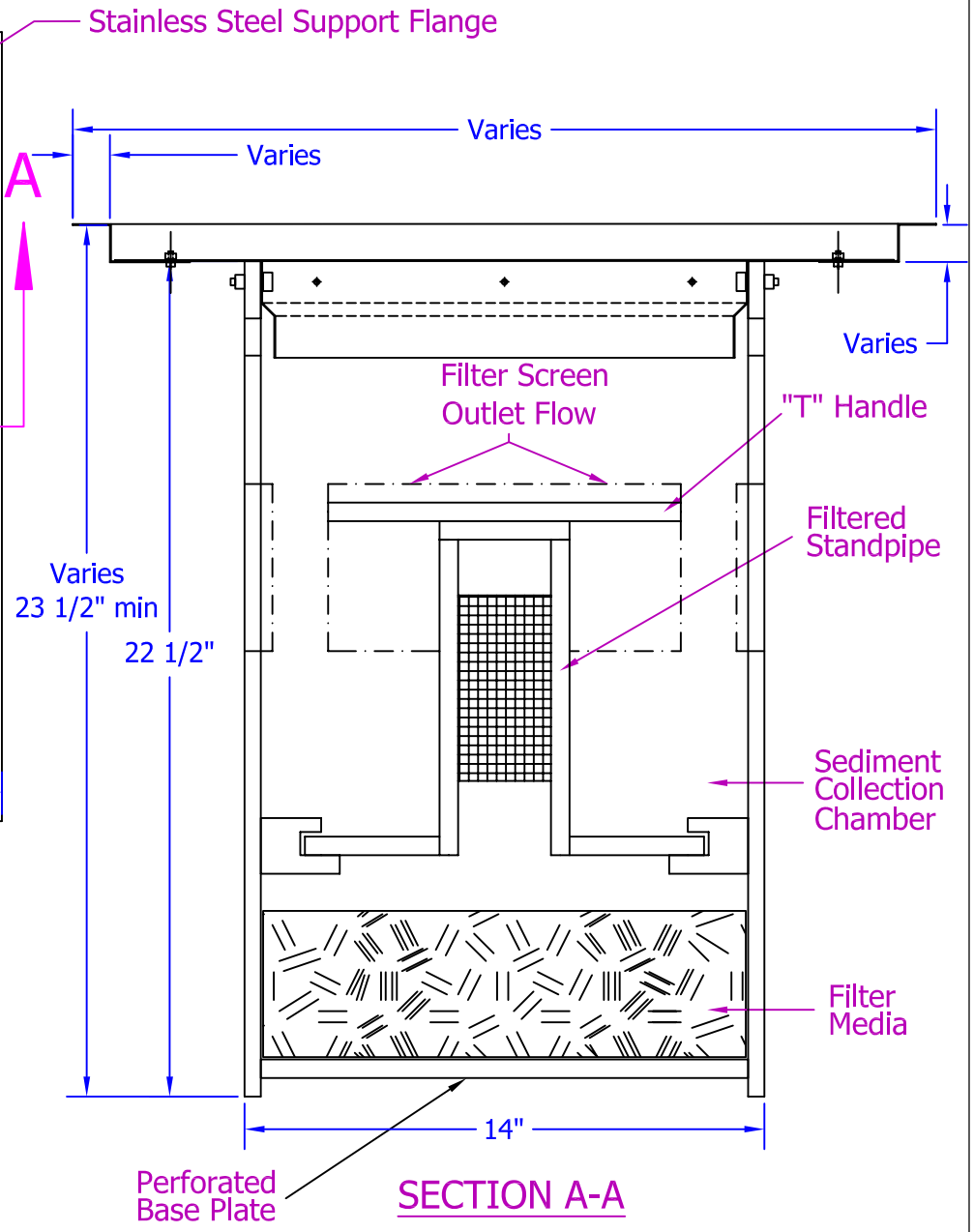
Aqua-Guardian™ Sample Detail Drawings

Sample Aqua-Guardian™ detail drawings are provided as examples of the type of systems that AquaShield™ can offer for a specific work site.





PLAN VIEW



SECTION A-A

GENERAL NOTES:

1. Insert shall be designed for the following capacities:
   Peak Treatment Flow: 1.2 cfs
   Filtered Flow: 0.9 cfs
   Oil Storage: 1.5 gal.
   Sediment and Debris Storage: 0.7 cu. ft.
2. Insert shall be constructed from High-Density Polyethylene (HDPE) PE 3408 ASTM F714 and stainless steel.
3. Size and shape of Flange Collar may vary according to site requirements.
4. Prior to fabrication, purchaser is responsible for indicating all obstructions in catch basin which might inhibit proper installation.
5. Optimum installation requires that the bottom of the insert be above or level with the crown of discharge pipe elevation.

AquaShield
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www.aquashieldinc.com

Document:	AG-18 STD
Drawn By:	WKG
Scale:	1:5
Date:	01/24/07
U. S. Patent No. 6287459 and other Patents Pending	

Aqua-Guardian Model AG-18 Standard Detail