the pondless® waterfall

tales from the FIELD

Have you ever heard us say Keep it Simple Stupid? Well it doesn't get any more simple than a Pondless® Waterfall. What could be easier than a stream and waterfall that disappears into a bed of stone and gravel?

Who Wouldn't Want a Pond?

This is the answer to all the customers you've encountered that only want the sound of water or the look of a stream and waterfall, without the maintenance of a pond. Yes, there are people out there that don't want fish – I know it's hard to believe, but they're around and they want water features.

I personally couldn't imagine mine without the fish but we all have our reasons for having a water feature and they're probably all different.

The fact is, it's pretty common to run into people who aren't totally sold on the idea of a pond. That's where the Pondless® Waterfall comes into play.

The Pondless® Waterfall is perfect not only for people who want less maintenance, but also for people who only have a small space to work with, or people with children. It's pretty hard to find a person who wouldn't want at least the sound of water in their backyard.

Ed Beaulieu

Vice President of Field Research

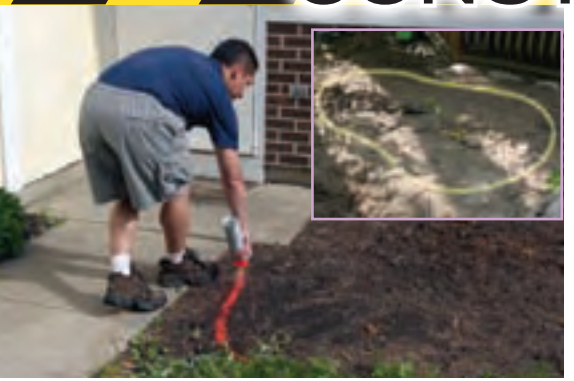
How Is It Done?

So how do you create a so-called Pondless® Waterfall? Aquascape offers two sizes of Pondless® Waterfalls filters. The Large Snorkel™ Vault and Centipede™ Module is used mainly for the Mid to Large size projects and the MicroSnorkel™ Vault and MicroCentipede™ Module are used for the small to midsize projects, basically your typical residential sized project.

The Snorkel™ Vault and Centipede™ Module basically serve as the pump housing. The water held within the

open spaces of the gravel flows down toward the Centipede™ Module, which is connected to the Snorkel™ Vault. From there, it gets pumped up to the waterfall where it flows by gravity back down through the gravel bed and Centipede™ Module where the cycle repeats itself.

The greatest benefits are little to no maintenance because there is no skimmer or fish to take care of, no liabilities. The water level can fluctuate greatly between fillings and it can even be turned off when not being enjoyed. This is the answer for those who don't want to get into the hobby of watergardening, but still want the meditative qualities of listening to the soothing sounds created by falling water. We will now go explain how a small project using the MicroSnorkel™ Vault and MicroCentipede™ Module is done and also how a large or custom project is done using the Large Snorkel and Centipede.



esp *Instalación de tamaño Pequeño a Mediano*

Small to Midsize Installation

1 Lay out the location of the basin and waterfall

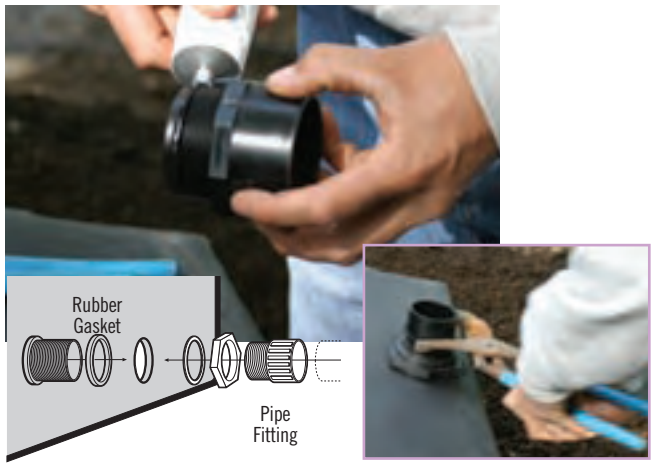
- The basin size is determined by the height, length, width, and depth of the water in the stream and waterfall. Our Pondless® Waterfall Kits have taken this into account and will ensure that you have enough water beneath the gravel to operate the stream and waterfall. Follow the sizes given with the kit you purchased. For example: the 4′ x 6′ Pondless® Waterfall basin will provide enough water to supply a waterfall and stream up to 16′ long. Waterfalls and streams longer than this will require the basin to be increase in size

esp Localice el riachuelo y la cascada.

- *El tamaño del riachuelo es determinado por la altura, longitud, lo ancho, y lo profundo de agua en el riachuelo y la cascada. En nuestros Pondless Waterfall kits ya esta incluido las dimensiones y aseguraran que usted tendrá suficiente agua debajo de la grava para operar el riachuelo y la cascada. Siga las medidas que vienen con el kit que usted compro. Por ejemplo, el riachuelo de Pondless Waterfall 4′ x 6′ proveerá suficiente agua para una cascada y riachuelo que llegue hasta 16′ de largo. Cascadas y riachuelos más largos que eso requieren que el riachuelo este más grande.*

2 Installing the bulkhead fitting

- The first step is to install the bulkhead fitting in the hole provided in the back of the BIOFALLS® filter. The rubber washer should be located on the inside of the BIOFALLS® filter. Tighten the nut (one or two turns past hand-tight) on the outside until the rubber washer begins to bulge.



- Install the PVC fitting included with the filter into the bulkhead fitting. Use some of the silicone sealant to coat the threads of the fitting, in order to help provide a watertight seal.

esp Instalación del bulkead

- *El primer paso es instalar el bulkhead en el orificio posterior localizado en la parte trasera del BIOFALLS®. La rueda de hule debe colocarse en la parte interior del BIOFALLS®. Apriete la tuerca (una o dos vueltas después de apretarla a mano) en el exterior, hasta que la rueda de hule empiece a expanderse.*
- *Instale el mpt de PVC que se incluye con el filtro, en el bulkhead. Use un poco de sello de silicón para cubrir la rosca del bulkhead para proporcionar un sello a prueba de agua.*

CONSTRUCTION GUIDELINES

3 Setting and leveling the BIOFALLS® filter

- Place the BIOFALLS® filter into the desired position
- The BIOFALLS® filter should be set at, or slightly below, the grade of the yard. Simply remove a section of sod or a few inches of soil in order to create a firm foundation for the BIOFALLS® filter to sit.
- Be sure to compact the area beneath the BIOFALLS® filter with a hand tamper. This will prevent any future settling.
- Use a 2' bubble level in order to make sure the BIOFALLS® filter is properly set into position. The BIOFALLS® filter should be level from side to side, and tilted forward ¼ of a bubble on a 2' level.

esp Ajustando y nivelando el BIOFALLS®.

- *Coloque el BIOFALLS® en la posición deseada*
- *El BIOFALLS® debe colocarse al nivel o un poco abajo del patio o jardín. Simplemente extraiga una sección del césped o unas pocas pulgadas de tierra para crear una base firme para asentar el BIOFALLS®.*
- *Cerciórese de compactar el área bajo el BIOFALLS® con un compactador manual. Esto evitará un asentamiento posterior.*
- *Use un nivel de burbuja de 2' para asegurarse que el BIOFALLS® este colocado correctamente. El BIOFALLS® debe estar nivelado de lado a lado e inclinado hacia adelante ¼ de burbuja, usando un nivel de 2'.*

4 Attaching the flexible PVC pipe

- The BIOFALLS® filter is now ready for the PVC flex pipe to be glued into place.
- Apply the primer to the inside of the PVC fitting, and the outside of the pipe that will go into the fitting.

esp Colocación de la manguera flexible de PVC

- *El BIOFALLS® ahora está listo para que se pegue la manguera de PVC en su lugar.*
- *Aplique la capa base (primer) dentro del mpt fitting de PVC y en la parte exterior del tubo que entrará en el aditamento.*
- After priming, apply the cement to the PVC fitting and pipe and insert the pipe into the PVC fitting.
- Hold the pipe in place for 60 seconds in order for the glue to set.
- Wait several minutes to let the glue completely set before you begin to bury the BIOFALLS® filter.
- Install the BIOFALLS® filter support rack before you start to backfill soil around the BIOFALLS® filter.
- The excavated soil from the basin can be backfilled around the sides and back of the BIOFALLS® filter, creating a berm and a foundation for the waterfalls. Hand-tamp the soil while backfilling in order to reduce settling.
- The PVC flex pipe can also be buried beneath the soil as well. Make sure the PVC pipe decreases in elevation from the BIOFALLS® filter to the basin. Try to avoid any dips or low spots in the flex pipe to alleviate any drainage problems during cleaning and winterizing.

- *Después de la capa base (primer), aplique cemento al mpt fitting de PVC y al tubo e inserte el tubo en el aditamento.*
- *Sostenga el tubo en su lugar durante 60 segundos para que seque el pegamento.*
- *Espere 10-15 minutos dejando que el pegamento endurezca completamente antes de que empiece a enterrar el BIOFALLS®*
- *Instale el bastidor de soporte del filtro BIOFALLS® antes de empezar a rellenar con tierra alrededor del BIOFALLS®.*
- *La tierra excavada del riachuelo puede usarse para rellenar a los lados y atrás del filtro BIOFALLS® creando una base para las cascadas. Compacte manualmente la tierra mientras rellena, para reducir el asentamiento posterior.*

- *La manguera flexible de PVC también puede enterrarse. Cerciórese de que la elevación del tubo de PVC disminuya del BIOFALLS® al estanque. Trate de evitar depresiones y puntos bajos en el tubo flexible para aliviar los problemas de drenaje durante la limpieza y la preparación para el invierno.*

5 Excavation

- We suggest excavating the basin no more then 24″ in depth. This depth will provide the proper water volume in the basin to operate the waterfall.

esp Excavación

- *Sugerimos que excave el estanque no más de 24″ de profundo. Esta profundidad proveerá el volumen de agua apropiado en el estanque para operar la cascada.*

6 Positioning the MicroSnorkel™ and MicroCentipede™ Module

- Connect the MicroCentipede™ Vault to the MicroSnorkel™ Module Vault by sliding it onto the port located on the bottom of the vault. Mark the outline of them with paint. The outline should be 2 - 4″ wider than the MicroSnorkel™ Vault and MicroCentipede™ Module.

esp Posicionamiento de el módulo Micro Snorkel™ y el Micro Centipede™

- *Conecte el Micro Centipede™ a el Micro Snorkel™, colocándolo dentro de la abertura. Marque el dibujo de el Micro Centipede y Micro Snorkel con pintura. El dibujo debe ser de 2-4″ más ancho que el Micro Snorkel™ y el Micro Centipede™.*

CONSTRUCTION GUIDELINES

7 Excavating the MicroSnorkel™ and MicroCentipede™ Module

- Excavate the painted area out 6" for the MicroSnorkel™ Vault and MicroCentipede™ Module. This excavated area will be the deepest point in the basin, and should have an ultimate depth of 24".
- Place the MicroSnorkel™ Vault and MicroCentipede™ Module back into the excavation to check for a proper fit.

esp Excavación de el Micro Snorkel™ y el Micro Centipede™

- *Excave el área pintada 6" para el Micro Centipede™ y para el Micro Snorkel™. El área excavada para el Micro Snorkel™ será el punto más profundo de el estanque y debe tener una profundidad de 24".*
- *Coloque el Micro Snorkel™ y el MicroCentipede™ nuevamente en la excavación para comprobar que ajusten bien.*

8 Install the underlayment and liner

- Remove the MicroSnorkel™ and MicroCentipede™ from the excavated hole. Lay the underlayment and then liner into the excavated basin. The MicroSnorkel™ and MicroCentipede™ can then be placed back into their proper location on top of the liner.

esp Instalación del underlayment y el liner

- *Extraiga el Micro Snorkel™ y el Micro Centipede™ del agujero excavado. Coloque el underlayment y luego el liner en el estanque excavado. El Micro Snorkel™ y el Micro Centipede™ pueden entonces colocarse nuevamente en su ubicación apropiada, encima del liner.*

9 Place AquaBlox in basin

- Place the AquaBlox™ in the basin. Example: For a 4' x 6' Pondless® Waterfall, you will need 6 AquaBlox™, position the AquBlox™ accordingly.

esp Coloque AquaBlox en el riachuelo

- *Coloque AquaBlox en el estanque. Por ejemplo, para un Pondless Waterfall de 4'x6', usted necesitara 6 AquaBlox y debe posicionarlos apropiadamente.*

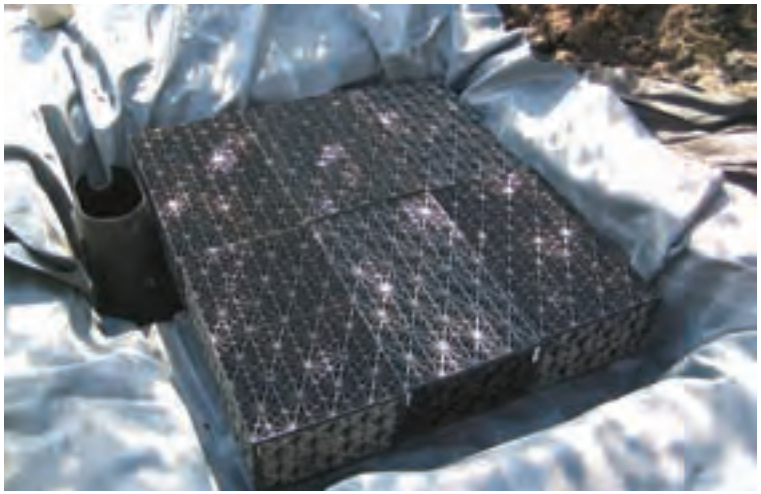
10 Place 1½ – 2" gravel in basin

- Fill in the gaps around the AquaBlox™ in the basin.

esp Coloque grava de 1.5" a 2" en el estanque

- *Cubra las áreas descubiertas alrededor del AquaBlox™ en el estanque.*

CONSTRUCTION GUIDELINES



11 Place boulder edges

• Set the boulders that are going to act as the edges of your basin on top of the AquaBlox™ inside the perimeter.

esp Coloque las piedras grandes en las orillas

• *Coloque las piedras que va a utilizar para las orillas de su estanque arriba de los AquaBlox por dentro del perímetro del estanque.*

12 Fold liner and cover edges

• By setting your boulder edges inside the perimeter of the AquaBlox™, you can now fold the liner over the AquaBlox™ and cover with rocks and dirt.

esp Doble el liner y cubra sus orillas

• *Al instalar sus piedras dentro de el perímetro del estanque, entonces puede doblar el liner por encima de las piedras que utilizo para la orilla y cubra el liner con piedras y tierra.*

13 Place final layer of gravel in basin

• Fill in the area inside your boulder edges with 1½" - 2" gravel making sure to cover any exposed AquaBlox™. A thin layer of decorative rock may be added.

esp Coloque la última capa de grava en el estanque

• *Rellene las áreas descubiertas en medio de las orillas de las piedras con 1.5" – 2" de grava asegurándose que cubra las AquaBlox. Una capa de piedras decorativas se pueden añadir.*

14 Wash rocks in basin

• Wash down the rocks in the basin. You can use the pump provided in the kit or use an Aquascape clean out pump (sold separately) to pump out any dirty water. Place the pump in the MicroSnorkel™ and MicroCentipede™ and discharged the water into a drainage area.

esp Lave las piedras en el estanque

• *Lave bien las piedras en el estanque. Puede utilizar la pompa que viene incluido en el kit o puede utilizar un clean out pump de Aquascape (se vende separado), para sacar el agua sucia. Coloque la pompa dentro del Micro Snorkel y saque el agua hacia un área de drenaje.*

CONSTRUCTION GUIDELINES

15 Fill the basin with water.

esp Llene el estanque con agua.

16 Build the stream and waterfall

- Excavate and shape the location of the waterfall spillways. Once satisfied, place the liner into position.
- Starting at the bottom of the stream, overlap the basin liner with the stream liner by a minimum of 6". Conform the liner to the stream and waterfall working up towards the BIOFALLS® filter.
- Connect the liner to the front of the BIOFALLS® filter using the following steps (see sidebar to right).

esp Construya el riachuelo y la cascada

- *Excave y forme la localización de la salida del agua de la cascada. Una vez que esté satisfecho, coloque el liner en su posición.*
- *Empezando en el fondo del riachuelo, asegúrese de poner el liner del riachuelo sobre la liner del estanque por un mínimo de 6". Asegúrese de acomodar el liner del riachuelo y la cascada empezando de la orilla del estanque hiendo hacia el BIOFALLS®.*
- *Conecte el liner con el frente del BIOFALLS® usando los pasos siguientes.*

Connecting the Liner to the Front of BIOFALLS® FIlter

Step 1: Make sure the face of the BIOFALLS® filter and liner is clean and free of dust and debris.
Cerciórese de que el liner y el BIOFALLS® esté limpio y libre del polvo.

Step 2: Using an awl, poke a hole through the liner at the screw holes. Remove the awl while holding the lip and liner in place, and begin threading one of the screws into the filter.
Con una lesna, haga un agujero a través del liner en los agujeros donde van a ir los tornillos.

Step 3: Tighten the screws just enough to thread them into the inserts.
Apriete los tornillos lo suficiente para roscarlos en los rellenos.

Step 4: Remove the lip with the screws still penetrating through the liner.
Quite el labio con los tornillos aun penetrados en el liner.

Step 5: Apply a thick bead of fish safe silicone sealant around the BIOFALLS® filter opening.
Haga una línea gruesa de silicón alrededor por encima de los hoyos en el BIOFALLS®.

Step 6: Reattach the BIOFALLS® filter lip using the pre-installed screws as your guide.
Vuelva a conectar el labio del BIOFALLS® usando los tornillos instalados previamente como su guía.

Step 7: Punch the remaining screw holes with the awl and thread in the remaining screws. Be sure to tighten all screws.
Con la lesna haga los últimos hoyos y atornille los tornillos restantes. Asegúrese que estén bien atornillados.

Step 8: Using the snout as a guide, cut the remaining liner out of the BIOFALLS® filter snout opening.
Usando el labio como guía, corte el restante del liner fuera de la abertura del labio del BIOFALLS®.

For more information on the techniques of waterfall and stream construction, see Aquascape's Waterfall and Stream Construction video (sold separately).

17 Hook up the pump and check valve assembly

- A check valve is provided in the kit and will need to be assembled. The check valve can be threaded on to the pump and lowered into the MicroSnorkel™ Vault. You can glue the check valve to the plumbing that is connected to the BIOFALLS® filter.

esp Conectar la pompa y la check valve

- *Una válvula (check valve) esta incluida en el kit y tendrá que ser armada. La válvula se conecta a la pompa y después se instala a el Micro Snorkel™. Usted puede pegar la válvula a la plomería que está conectada con el BIOFALLS®.*

18 Edge treatment

- Once everything is running and you know how high the water level is, you can trim the excess liner and finish the edges with additional rocks and gravel.
- The pipe from the BIOFALLS® filter is simply laid over the edge of the basin liner and buried out of sight, under the top layer of gravel. The pipe at the edge of the basin will be hidden with stone and gravel, and the rest of the pipe going to the BIOFALLS® filter should be buried beneath the ground.

esp Tratamiento de orilla

- *En cuanto todo este funcionando y usted sepa que tan alto este el nivel del agua, puede cortar el liner restante y cubrir las orillas con grava y piedras adicionales.*
- *La manguera del Biofalls se pone encima del liner del estanque y se sepulta para no ser vista debajo de la grava. La manguera en la orilla del estanque será escondida con piedras y grava y el resto de la manguera que va al Biofalls debe de ser sepultada.*

19 Tweak the waterfall

- As soon as the basin is filled to the proper level and all of the foam is dry in the waterfall and stream, you can turn on the pump.
- Placing smaller stones and gravel on the waterfall cascades will change the appearance and sound of the water. Tweak the waterfall using this method until you achieve the desired effect. **DONE!**

esp Ajuste la cascada

- *En cuanto el estanque este lleno a su nivel apropiado y todo el foam este seco en la cascada y el riachuelo, puede prender la pompa.*
- *Colocando piedras pequeñas y grava en la cascada creerá un estilo y sonido diferente. Ajuste la cascada usando este método hasta que alcance el efecto deseado. Termino!*

CONSTRUCTION GUIDELINES

esp *Instalaciones grandes usando el snorkel y el centipede o proyectos especiales medianos o grandes*

Midsize to Large or Custom Installations

1 Lay out the location of the basin and waterfall

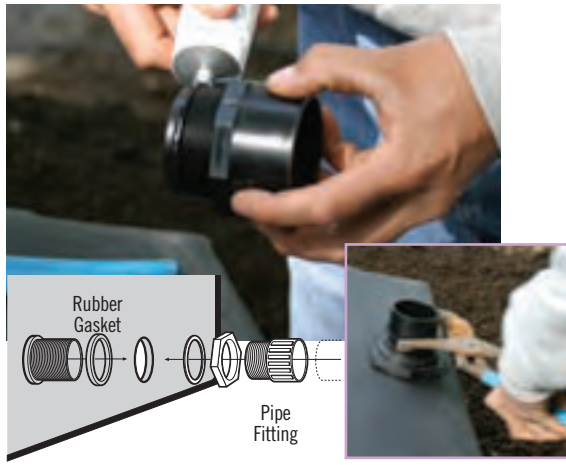
- As you may have read earlier, the basin size is determined by the height, length, width, and depth of the water in the stream and waterfall. The calculations shown on pg. 289 will help you determine that size and depth. These calculations will also help you figure out the size liner and underlayment, rocks and gravel, AquaBlox™ needed. If you are still having troubles figuring out the calculations please contact the Aquascape Tech Dept.

esp Coloque la localización del estanque y la cascada

- *Como leo anteriormente, el tamaño del estanque es determinado por lo alto, lo largo, ancho, y lo profundo del agua en el riachuelo y la cascada. Las calculaciones demostradas en la página 289 le ayudara a determinar ese tamaño y profundidad. Estas calculaciones también le ayudaran a calcular el tamaño del liner y underlayment, piedras y grava, AquaBlox que se necesiten. Si toda vía tiene problemas con las calculaciones por favor contacte el departamento de técnicos en Aquascape.*

2 Installing the bulkhead fitting

- The first step is to install the bulkhead fitting in the hole provided in the back of the BIOFALLS® filter. The rubber washer should be located on the inside of the BIOFALLS® filter. Tighten the nut (one or two turns past hand-tight) on the outside until the rubber washer begins to bulge.



- Install the PVC fitting included with the filter into the bulkhead fitting. Use some of the silicone sealant to coat the threads of the fitting, in order to help provide a watertight seal.

esp Installando el bulkhead fitting

- *El primer paso es instalar el bulkhead fitting en el orificio que esta localizado el la parte posterior del Biofall. La rueda de hule debe ser colocada en la parte de adentro del Biofalls. Apriete la tuerca (apriete una o dos vueltas mas después de haberlo apretado con la mano) por la parte de afuera hasta que la rueda de hule empiece a expender.*

3 Setting and leveling the BIOFALLS® filter

- Place the BIOFALLS® filter into the desired position
- The BIOFALLS® filter should be set at, or slightly below, the grade of the yard. Simply remove a section of sod or a few inches of soil in order to create a firm foundation for the BIOFALLS® filter to sit.
- Be sure to compact the area beneath the BIOFALLS® filter with a hand tamper. This will prevent any future settling.
- Use a 2' bubble level in order to make sure the BIOFALLS® filter is properly set into position. The BIOFALLS® filter should be level from side to side, and tilted forward ¼ of a bubble on a 2' level.

esp Ajustando y nivelando el BIOFALLS®.

- *Coloque el BIOFALLS® en la posición deseada*
- *El BIOFALLS® debe colocarse al nivel o un poco abajo del patio o jardín. Simplemente extraiga una sección del césped o unas pocas pulgadas de tierra para crear una base firme para asentar el BIOFALLS®.*
- *Cerciórese de compactar el área bajo el BIOFALLS® con un compactador manual. Esto evitará un asentamiento posterior.*
- *Use un nivel de burbuja de 2' para asegurarse que el BIOFALLS® este colocado correctamente. El BIOFALLS® debe estar nivelado de lado a lado e inclinado hacia adelante ¼ de burbuja, usando un nivel de 2'.*

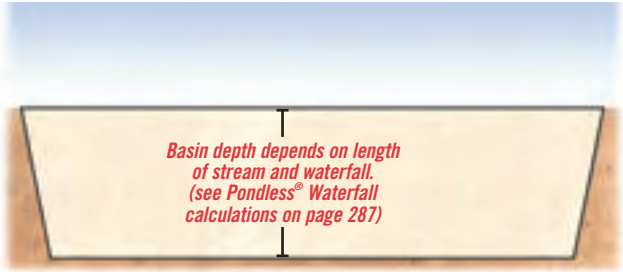
4 Attaching the flexible PVC pipe

- The BIOFALLS® filter is now ready for the PVC flex pipe to be glued into place.
- Apply the primer to the inside of the PVC fitting, and the outside of the pipe that will go into the fitting.
- After priming, apply the cement to the PVC fitting and pipe and insert the pipe into the PVC fitting.
- Hold the pipe in place for 60 seconds in order for the glue to set.
- Wait several minutes to let the glue completely set before you begin to bury the BIOFALLS® filter.
- Install the BIOFALLS® filter support rack before you start to backfill soil around the BIOFALLS® filter.
- The excavated soil from the basin can be backfilled around the sides and back of the BIOFALLS® filter, creating a berm and a foundation for the waterfalls. Hand tamp the soil while backfilling in order to reduce settling.
- The PVC flex pipe can also be buried beneath the soil as well. Make sure the PVC pipe decreases in elevation from the BIOFALLS® filter to the basin. Try to avoid any dips or low spots in the flex pipe to alleviate any drainage problems during cleaning and winterizing.

esp Colocación del tubo flexible de PVC

- *El BIOFALLS® ahora está listo para que se pegue la manguera de PVC en su lugar.*
- *Aplique la capa base (primer) dentro del mpt fitting de PVC y en la*

CONSTRUCTION GUIDELINES



parte exterior del tubo que entrará en el aditamento.

- *Después de la capa base (primer), aplique cemento al mpt fitting de PVC y al tubo e inserte el tubo en el aditamento.*
- *Sostenga el tubo en su lugar durante 60 segundos para que seque el pegamento.*
- *Espere 10-15 minutos dejando que el pegamento endurezca completamente antes de que empiece a enterrar el BIOFALLS®*
- *Instale el bastidor de soporte del filtro BIOFALLS® antes de empezar a rellenar con tierra alrededor del BIOFALLS®.*
- *La tierra excavada del riachuelo puede usarse para rellenar a los lados y atrás del filtro BIOFALLS® creando una base para las cascadas. Compacte manualmente la tierra mientras rellena, para reducir el asentamiento posterior.*
- *La manguera flexible de PVC también puede enterrarse. Cerciórese de que la elevación del tubo de PVC disminuya del BIOFALLS® al estanque. Trate de evitar depresiones y puntos bajos en el tubo flexible para aliviar los problemas de drenaje durante la limpieza y la preparación para el invierno.*

5 Excavation

- The basin depth depends on how long the stream and waterfall are. A deeper or larger basin will store more water, which will support longer streams and multiple waterfalls.

esp Excavación

- *La profundidad del estanque depende de que tan largos sean el riachuelo y la cascada. Un estanque hondo o más grande acumulara mas agua y mantendrá a un riachuelo mas largo y mas de una cascada.*

6 Positioning the Snorkel™ Vault and Centipede™ Module

- Connect the Centipede™ Module to the Snorkel™ Vault by sliding it onto the port located on the bottom of the vault. Mark the outline of them with paint. The outline should be 4 - 6" wider than the Snorkel™ Vault and Centipede™ Module.

esp Posicionamiento del Snorkel y el Centipede

- *Conecte el Centipede™ a el Snorkel™, colocándolo dentro de la abertura. Marque el dibujo del Centipede y el Snorkel con pintura. El dibujo debe ser de 4 - 6" más ancho que el Snorkel™ y el Centipede™.*

7 Excavating the Snorkel™ Vault and Centipede™ Module

- Excavate the painted area out 14" for the Centipede™ Module, and 18" for the Snorkel™ Vault. The excavated area for the Snorkel™ Vault will be the deepest point in the basin, and should have an ultimate depth of 36".
- Place the Snorkel™ Vault and Centipede™ Module back into the excavation to check for a proper fit.

esp Excavación del Snorkel y el Centipede™

- *Excave el área pintada 14" para el Centipede™ y para el Snorkel™. El área excavada para el Snorkel™ será el*

punto más profundo de el estanque y debe tener una profundidad de 36″.

- *Coloque el Snorkel™ y el Centipede™ nuevamente en la excavación para comprobar que ajusten bien.*

8 Install the underlayment and liner

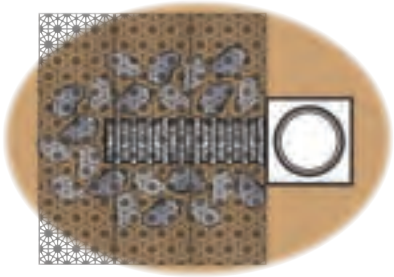
- Remove the Snorkel™ Vault and Centipede™ Module from the excavated hole. Lay the underlayment and then liner into the excavated basin. The Snorkel™ Vault and Centipede™ Module can then be placed back into their proper location on top of the liner. Place the cap onto the end of the Centipede™ Module.

esp Instalación del underlayment y el liner

- *Extraiga el Snorkel™ y el Centipede™ del agujero excavado. Coloque el underlayment y luego el liner en el estanque excavado. El Snorkel™ y el Centipede™ pueden entonces colocarse nuevamente en su ubicación apropiada, encima del liner. Ponga la tapa al final del Centipede.*

9 Place 4 - 8" diameter stones on the sides of the Centipede™ Module.

- Put the 4 - 8″ stones around the sides of the Centipede™ Module in the bottom of the basin. If using the AquaBlox™ be sure to not place any boulders on top of the Centipede™ Module. This will cause the AquaBlox™ to not lay flat.



esp Coloque piedras de 4 - 8" de diámetro en los lados del Centipede

- *Ponga las piedras de 4 - 8″ a los lados del Centipede en lo hondo del estanque. Si esta usando las AquaBlox, asegúrese de no poner piedras grandes encima del Centipede. Esto causara que las AquaBlox™ no queden bien acomodadas.*

10 Place AquaBlox™ in basin

esp Coloque AquaBlox™ en el estanque

11 Place 2 - 3" gravel in basin

- Fill in the gaps around the AquaBlox™. In the basin.

esp Coloque 2 - 3" de grava en el estanque

- *Cubra las áreas descubiertas alrededor del AquaBlox™ en el estanque.*

CONSTRUCTION GUIDELINES

12 Place boulder edges

• Set character boulders in and/or around the edges of the basin.

esp Coloque las piedras grandes en las orillas

• *Coloque las piedras decorativas en o alrededor de las orillas del estanque.*

13 Fold liner and cover edges

• By setting your boulder edges inside the perimeter of the AquaBlox™, you can now fold the liner over the AquaBlox™ and cover with rocks and dirt.

esp Doble el liner y cubra sus orillas

• *Al instalar sus piedras dentro de el perímetro del estanque, entonces puede doblar el liner por encima de las piedras que utilizo para la orilla y cubra el liner con piedras y tierra.*

14 Place a layer of 1½ - 2" gravel on top of the stone layer

• The gravel should not be able to filter through any of the gaps in the first layer of stone

esp Ponga una capa de 1½ - 2" de grava encima de la capa de piedra

• *La grava no debería salirse por los huecos en la primera capa de piedra*

15 Place a layer of decorative gravel

• A finishing layer of decorative gravel can be added next. This is optional and up to the contractor.

esp Coloque una capa de grava decorativa

• *Una capa de grava decorativa se le puede agregar. Este es opcional y depende del contratista.*

16 Trim down the Snorkel™ Vault

• The Snorkel™ Vault is designed to fit a wide range of applications. As a designer, you have the flexibility to modify the Snorkel™ Vault height to fit your specific project. There are two options, a total Pondless® Waterfall that disappears into a bed of stone; or leave several inches of water above the gravel and fill it with aquatic plants. You can then diversify your garden with plants that love water. Using a saw, remove the appropriate segments off the Snorkel™ Vault, leaving approximately 2-3" of the Snorkel™ Vault above the finished layer of gravel. When using the AquaBlox™, we recommend that you cut off the top portion of the Snorkel to make it easier to disguise the cap.

esp Recorte el Snorkel

• *El Snorkel es diseñado para quedar en diferentes aplicaciones. Como el diseñador usted tiene la flexibilidad de ajustar lo alto del Snorkel para quedarle a su proyecto especifico. Hay dos opciones, un Pondless® Waterfall que desaparece en una cama de piedras o dejar varias pulgadas de agua por encima de la grava y llenarla con plantas aquaticas. Después puede poner diferentes clases de plantas que les gusta el*

agua. Usando un serrucho, corte los segmentos apropiados del Snorkel dejando aproximadamente 2-3" del Snorkel por encima de la última capa de grava. Cuando use las AquaBlox, le recomendamos que corte la parte de arriba del Snorkel para sea mas fácil de esconder la tapa.

17 Wash rocks in the basin

- Wash down the rocks in the basin. You can use the pump provided in the Kit or use an Aquascape clean out pump *(sold separately)* to pump out any dirty water. Place the pump in the Snorkel™ Vault and Centipede™ Module and the water discharged into a drainage area.

esp Lave las piedras en el estanque

- *Lave bien las piedras en el estanque. Puede utilizar la pompa que viene incluido en el kit o puede utilizar un clean out pump de Aquascape (se vende separado), para sacar el agua sucia. Coloque la pompa dentro del Snorkel y el Centipede y saque el agua hacia un área de drenaje.*

18 Trim off the end of the hose tail on the Snorkel™ Vault

- The pump will be housed at the bottom of the Snorkel™ Vault. Hose tails have been designed on the back side of the Snorkel™ Vault for the pumps plumbing. Simply use a saw to cut off the end of the uppermost hose tail.
- The plumbing from the BIOFALLS® filter can be trimmed to proper length and inserted through the hose tail opening.

esp Haga un hoyo para la manguera del Snorkel

- *La pompa estará colocada en la parte interior del Snorkel. Detrás de el Snorkel se han diseñado codos llamados 'hose tails' para la plomería de las pompas. Use un serrucho para cortar la salida del codo más alto.*
- *La plomería del Biofalls se puede cortar a la medida apropiada e introducir por la abertura del codo.*

19 Build the stream and waterfall

- Excavate and shape the location of the waterfall spillways. Once satisfied, place the liner into position.
- Starting at the bottom of the stream, overlap the basin liner with the stream liner by a minimum of 6". Conform the liner to the stream and waterfall working up towards the BIOFALLS® filter.
- Connect the liner to the front of the BIOFALLS® filter following the steps on the next page.

esp Construya el Riachuelo y la Cascada

- *Excave y forme la localización de la salida del agua de la cascada. Una vez que esté satisfecho, coloque el liner en su posición.*
- *Empezando en el fondo del riachuelo, asegúrese de poner el liner del riachuelo sobre la liner del estanque por un mínimo de 6". Asegúrese de acomodar el liner del riachuelo y la cascada empezando de la orilla del estanque hiendo hacia el BIOFALLS®.*
- *Conecte el liner con el frente del BIOFALLS® usando los pasos siguientes.*

CONSTRUCTION GUIDELINES

Connecting the Liner to the Front of BIOFALLS® FIlter

Step 1: Make sure the face of the BIOFALLS® filter and liner is clean and free of dust and debris.
Cerciórese de que el liner y el BIOFALLS® esté limpio y libre del polvo.

Step 2: Using an awl, poke a hole through the liner at the screw holes. Remove the awl while holding the lip and liner in place, and begin threading one of the screws into the filter.
Con una lesna, haga un agujero a través del liner en los agujeros donde van a ir los tornillos.

Step 3: Tighten the screws just enough to thread them into the inserts.
Apriete los tornillos lo suficiente para roscarlos en los rellenos.

Step 4: Remove the lip with the screws still penetrating through the liner.
Quite el labio con los tornillos aun penetrados en el liner.

Step 5: Apply a thick bead of fish safe silicone sealant around the BIOFALLS® filter opening.
Haga una línea gruesa de silicón alrededor por encima de los hoyos en el BIOFALLS®.

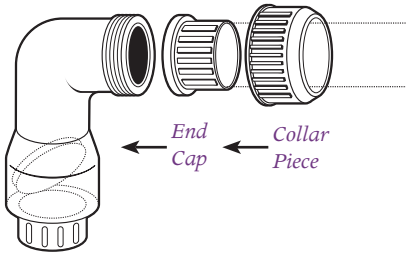
Step 6: Reattach the BIOFALLS® filter lip using the pre-installed screws as your guide.
Vuelva a conectar el labio del BIOFALLS® usando los tornillos instalados previamente como su guía.

Step 7: Punch the remaining screw holes with the awl and thread in the remaining screws. Be sure to tighten all screws.
Con la lesna haga los últimos hoyos y atornille los tornillos restantes. Asegúrese que estén bien atornillados.

Step 8: Using the snout as a guide, cut the remaining liner out of the BIOFALLS® filter snout opening.
Usando el labio como guía, corte el restante del liner fuera de la abertura del labio del BIOFALLS®.

20 Hook up the Pump and Check Valve Assembly

- A check valve with a long extension pipe is provided in the kit and will need to be assembled. Trim the extension pipe according to the cut line used on the Snorkel™ Vault. The check valve can be threaded onto the pump and lowered into the Snorkel™ Vault. You can glue the check valve to the plumbing that is connected to the BIOFALLS® filter.
- Finally, cut a notch in the Snorkel™ Vault to allow the pump cord to exit the unit.



Slide collar piece over PVC, then glue pipe end cap to PVC tubing. Slide collar up to check valve and hand tighten. It's as simple as that!

Deslice la pieza del cuello sobre PVC, luego pegue la tapa del extremo al tubo de PVC. Deslice el cuello hasta la válvula de retención y apriete a mano.¡Es así de simple!

esp Conectar la Pompa y la Check Valve

- *Una válvula (check valve) con un pedazo de manguera mas largo esta incluida en el kit y tendrá que ser armada. Corte la manguera a la medida de acuerdo con la línea usada en el Snorkel. La válvula se conecta a la pompa y después se instala a el Snorkel™. Usted puede pegar la válvula a la plomería que está conectada con el BIOFALLS®.*
- *Finalmente, corte un orificio en el Snorkel para que el cable tenga salida.*

21 Attach and disguise the lid for the Snorkel™ Vault

- Use rocks, gravel, aquatic plants, driftwood, or other similar material to further disguise the lid.

esp Sujete y esconda la tapa del Snorkel

- *Use piedras, grava, plantas acuáticas, u otras materias similares para esconder bien la tapa.*

22 Edge Treatment

- Once everything is running and you know how high the water level is, you can trim the excess liner and finish the edges with additional rocks and gravel.
- The pipe from the BIOFALLS® filter is simply laid over the edge of the basin liner and buried out of sight, under the top layer of gravel. The pipe at the edge of the basin will be hidden with stone and gravel, and the rest of the pipe going to the BIOFALLS® filter should be buried beneath the ground.

esp Tratamiento de Orilla

- *En cuanto todo este funcionando y usted sepa que tan alto este el nivel del agua, puede cortar el liner restante y cubrir las orillas con grava y piedras adicionales.*
- *La manguera del Biofalls se pone encima del liner del estanque y se sepulta para no ser vista debajo de la grava. La manguera en la orilla del estanque será escondida con piedras y grava y el resto de la manguera que va al Biofalls debe de ser sepultada.*

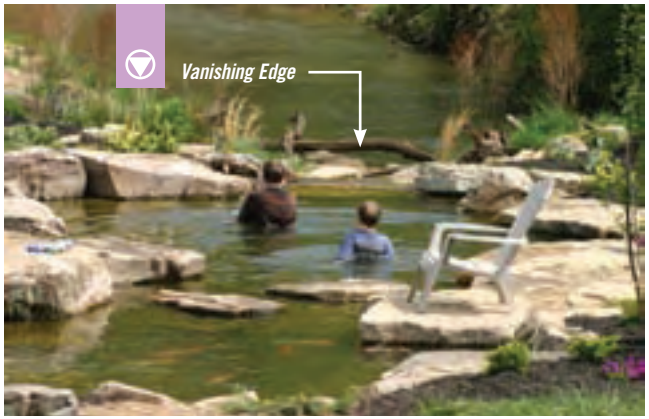
23 Tweak the Waterfall

- As soon as the basin is filled to the proper level and all of the foam is dry in the waterfall and stream, you can turn on the pump.
- Placing smaller stones and gravel on the waterfall cascades will change the appearance and sound of the water. Tweak the waterfall using this method until you achieve the desired effect.

esp Ajuste la Cascada

- *En cuanto el estanque este lleno a su nivel apropiado y todo el foam este seco en la cascada y el riachuelo, puede prender la pompa.*
- *Colocando piedras pequeñas y grava en la cascada creerá un estilo y sonido diferente. Ajuste la cascada usando este método hasta que alcance el efecto deseado.*

While the waterfall is sure to attract kids of all ages, the parents need not worry about children playing near a deep pond.



Vanishing Edges and the Skimmer

The concept originated from our Pondless® Waterfall systems and has since been modified to fit a variety of different projects. The idea behind it is simple, to have a unique feature with less maintenance than a pond with a skimmer. Here's how it works; all ponds need some sort of skimming or method to remove surface debris off of the water, and the traditional method has been a mechanical skimmer filter. This filter requires some basic maintenance by cleaning the skimmer debris basket or net when full. This is by no means considered laborious, but it needs to be done. The skimmer also houses the pump, concealing it from view while the debris basket keeps the larger debris from getting sucked into the pump. This is important because it keeps the pump and, more importantly, the biological filter from getting clogged. This will increase the overall efficiency of the filter and reduce the total amount of decaying debris in the system, which will have a direct influence on water quality and algae. One last overlooked fact with skimmers is they draw water from the surface of the pond, which typically has a higher amount of dissolved oxygen; this is important for the biological filter as the more fish waste and debris in the system, the more oxygen that's needed for the subsequent oxidation of those compounds. Bottom line… the higher the dissolved oxygen sent to the biological filter the better.


A wide waterfall with a thin sheet of water flowing over it keeps the fish from escaping.

Positioning the Pond

Now that we've had a recap on the importance of skimmers, we can get to vanishing edge technology. First we start with the proper positioning of the pond, as the name implies the goal is to create the illusion that the pond edging is blending into the background thus disappearing or vanishing. This is better suited for large ponds but can be done with any size if desired. The water will then flow over a waterfall into a basin below the pond; this change in elevation is key to the functioning of this system because the waterfall acts like a skimmer in this situation, sweeping any debris on the surface of the pond over the waterfall. The basin is just like our Pondless® Waterfall basins in which we use a Snorkel™ Vault, Centipede™ Module, AquaBlox™, and a lot of rock and gravel. The gravel on the surface acts as the screen, and the larger debris gets caught on the surface and can be removed as needed. The beauty of this is you'll end up with a huge skimmer debris basket that can be customized according to the design of the pond and landscape. The typical debris basket is only 1½ square feet vs. a large vanishing edge basin that can be 10 – 100 square feet or more if desired. This will greatly extend the amount of time needed between cleanings.

A Quick Tip

A great idea is to create a small basin of water at the entry point of the stream or waterfalls. This will not only look more appealing, but it will help with the overall efficiency and maintenance of the system. This is accomplished by removing 6-12" of gravel from the desired area, leaving a depression. Place a large piece of scrap liner in this depression and cover it with rock and gravel as you would any section of pond or stream. Leave the rock and gravel lower than the surrounding rock and gravel and that section will fill up with water, capturing finer debris and sediments before they have a chance to spill out over the rest of the basin where the large debris gets captured. The water will then fall between the gravel into the underground storage area or basin. If you have a heavy fish load and can use a little extra filtration, adjust the thickness of the gravel on top of the AquaBlox™ up to several feet in thickness. Make sure to use a snorkel extension with this method to allow for pump access. The operating water level should be kept below this layer of gravel so the water can trickle through the gravel bed, acting like a trickle filter which happens to be an extremely efficient biological filter. Highly oxygenated water and filter efficiency is the pinnacle of that design. Water and air become entwined as the water bounces around the individual pieces of gravel that are coated in a biological film and teeming with bacterial colonies that are waiting for the incoming flow of nutrients.

esp Un Consejo Rápido

Una buena idea es de crear un estanque pequeño de agua al entrar el riachuelo y la cascada. Esto se vera mas atractivo y también ayudara con la eficiencia total y el mantenimiento del sistema. Esto se puede lograr con quitando 6-12" de grava de la área deseada dejando un hoyo. Coloque una pieza grande de liner en este hoyo y cúbralo con piedras y grava como lo haría con cualquier sección de estanque o riachuelo. Deje las piedras y grava más bajas que las piedras y grava que están alrededor y esa sección se llenara de agua, capturando la mezcla de piedra y tierra antes de que se pase al estanque más grande donde la mezcla de piedra y tierra se acumulara. El agua después se meterá entre la grava a la área debajo del agua. Si usted tiene muchos pescadas y necesita más filtración, ajuste lo grueso de la grava de encima de los AquaBlox otros cuantos pies de grueso. Asegúrese de usar una extensión para el snorkel con este método para permitir el acceso a la pompa. El nivel del agua debe de estar mas baja que el nivel de la grava para que así mismo se este filtrando el agua come si fuera un filtro biológico. Lo bueno del diseño es que el agua esta bien concentrada de

oxigeno y el filtro es muy eficiente. El agua y el aire se juntan al tiempo que el agua se pega contra las piezas individuales de grava que están cubiertos de un estrato biológico y lleno de bacteria que espera la llegada de nutrientes.

On to the Math

Now that you know the theories behind the design, how do you calculate the proper size for the basin? We've tried several different calculations and ideas, all of which have worked in varying degrees. The most reliable method is to calculate the entire surface area of the system as you would in a Pondless® Waterfall system. Multiply the surface area in feet by .25. This will give you the volume of water in transit x 2 for most systems. In other words, there is typically about 1–1½" of water flowing over the waterfall for most pumps and waterfall types (we usually create a wide waterfall with a thin sheet of water flowing over it). The basin should hold at least double this amount to allow the system to run for extended periods of time without adding water to the basin. If a water fill valve is installed, this can be adjusted. Once you know the cubic footage of water, you can simply divide that number by 4.3, which is the amount of space available within one large AquaBlox™ or by 2 for the smaller AquaBlox™. This will give you the number of AquaBlox™ needed for the system. When calculating the square footage, use the standard length x width x 85% for most pond shapes (this can be changed to 75% for highly irregular ponds or up to 95% for ponds that utilize most of the given area). The best thing to do is play around with several different options until you're comfortable with the numbers.

The Advantages

The large size of these basins has several other advantages besides skimming. First, larger volumes of water are much more stable than their counterparts, and stability is king when it comes to controlling water quality. In addition, these basins can be used to store excess water generated during heavy rains and used as needed, further decreasing the need for refilling the pond (desirable in areas with limited precipitation). The large skimmer area means for little maintenance, allowing the pond to run for extended periods with little interaction. The look of these features is also more appealing than skimmers and allows for greater interaction in the landscape. It's pretty awesome to see a well designed and executed vanishing edge pond that blends seamlessly into its surroundings, creating a much grander experience through a clever illusion.

esp *Cálculos de la cascada Pondless®*

Pondless® Waterfall Calculations

Water in stream – L x W x .25 x 7.48

Gallons needed in basin – L x W x .25 x 7.48 x 2

Gallons in basin – L x W x D x 2.2

Rock in large basin – 90 lbs per cubic foot.
40% 4 - 6" and 60% 1½ - 2" gravel.

Rock in Micro basin – 90lbs per cubic foot.
All 1½ - 2" gravel.

Large Aquablox™ – Volume needed in basin / 32

Small Aquablox™ – Volume needed in basin / 17

*for larger and more advanced projects consult Aquascape's Tech department.

Calculations for a Pondless® basin are like everything in the pond business, not an exact science. So Aquasape's construction crew has made, and learned from all the mistakes in the field so you don't have to. What we've learned from our field research should keep you from ever having to run into a problem with sizing your basin.

To figure the size of the basin needed in a Pondless® first you need to determine how much water is in the stream. Taking the length and width of the stream multiplied by 0.25 then 7.48 will give you the approximate volume of water in the stream. Your basin will need to be able to hold double that number. So you will take the volume of water in the stream times 2 and that gives you how much water is needed in the basin. The reason for that is, while the pump is running and the stream is full, your basin still needs to have water to fully submerge the pump and keep it from running dry. Also when the pump is shut down the empty half of that basin will fill up with the water from the stream preventing water loss.

Now that you know how much water you need its time to size the basin. First take the volume needed divided by 2.2. Then divide that number by the average depth of the basin. That will give you your square footage of the basin. Once you know the square footage you can pick your dimensions that give you the proper square footage.

Once you know the size of your basin you will need to know how much stone you will need to fill it. When using the MicroPondless® Filter you will fill the entire basin with 100% 1½ - 2" gravel. The Large Pondless® Filter requires 40% of 4 - 6" stone, and 60% 1½ - 2"gravel. In both cases you can choose to put a top layer of decorative gravel. To calculate the tonnage, take the cubic footage of the basin times 100.

Example: You have an 8' long stream that is 2' wide. 8' x 2' x 0.25 x 7.48 x 2 = 60 gallons. So the basin needs to hold 60 gallons. We will use a MicroPondless® Filter for the basin so we will have a 1½' average depth. 60 / 2.2 / 1½' = 18 square feet. 4' x 6' = 24 square feet. 4' x 6' x 1.5' x 2.2 = 80 gallons. So if you had a 4' x 6' x 1.5' MicroPondless® Basin, you multiply 4 x 6 x 1½ x 100 = 3600 lbs. That basin will require 3600 lbs of 1½ - 2" gravel.

The calculations provided are going to get you close to what you will need. It is never a bad thing to over size your basin a little bit. The last thing you want to do however is under size your basin. When you try to cut corners and save a few bucks to get the cost of a job down, that could very easily be the job you end up losing money on.

Aquablox™

Aquascape has come up with a new product that can save you time and money on a Pondless® feature. The Aquablox™ are plastic containers that displace stone from the basin and allows you to use a smaller basin. A rock basin holds 2.2 gallons per cubic foot. The Aquablox™ hold approximately 7 gallons per cubic foot. It saves in labor involved with digging the basin, moving and placing the rock into the basin. You will also use a fraction of the amount stone, less liner, and less underlayment.

When calculating how many are needed, you take the amount of water needed for the basin divided by the amount of gallons held in one of the Aquablox™. There is a large and a small size. The Large unit will hold 32 gallons and the small will hold 17 gallons. The Micropondless® Filter will require the use of the small unit, and the Large Pondless® filter requires the use of the Large unit. If you had a stream that required a 200 gallon basin you would divide that by 17 gallons for the small Aquablox™. That tells you to use 12 Aquablox™. Now that you know 12 are required you can set up the configuration which determines the basin size. Take the length of the unit times 3 and the width of the unit by 4. 26½" x 3 = 80" and 16" x 4 = 64". So your basin size would be 80" x 64" x 18". To figure gallons just multiply number of Aquablox™ x 17 gallons = 204 gallons.