

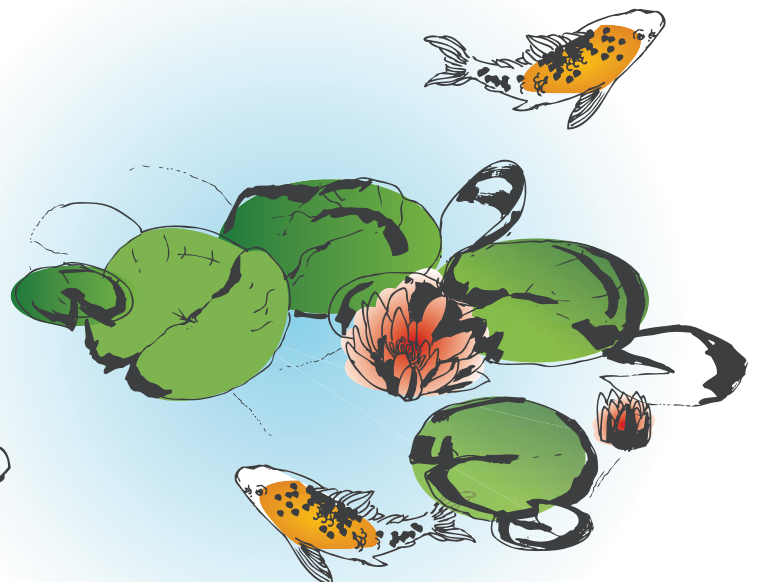
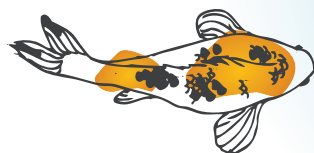


Build your own garden pond

In our guide we have compiled essential information and handy tips on all aspects of water gardens to make the perfect pond possible. It is as easy as following the five steps below, read on and enjoy water gardening success.

Discover why water gardening is becoming so popular world wide. There is something about water movement that fascinates us all, irrespective of our age. Water gently trickling or a turbulent cascade holds most of us spellbound. With the technology now available, achieving water movement is simple. Creating a water garden paradise isn't just a dream.

- Step 1** Choosing your pond location and pond type
- Step 2** Choosing your waterfall, fountain or feature
- Step 3** Selecting your pond filtration system
- Step 4** Selecting the right pump
- Step 5** Year round maintenance



STEP 1

Choosing pond location & pond type

Pond location is important and some careful consideration will prevent unnecessary headaches. The most important pond location points:

- » Visibility
- » Sunlight
- » Pollutants
- » Power Supply
- » Noise Factor

THE RIGHT LOCATION

- » Place your pond in a location where its beauty can be enjoyed. Water features are best when visible from entertaining areas or the house.
- » Ponds should be in a location where they will receive between 4-6 hours of sunlight per day. Be sure the sunlight's reflection doesn't affect viewing.
- » Avoid placing your pond under trees, as leaves and debris will pollute the water and tree roots may damage or move the pond.
- » Consider the location of power (electricity) and water supply.
- » Consider the noise factor; water running continuously can be irritating at night.

CHOOSING THE TYPE OF POND

Now that you have decided on the location of your water garden you will need to determine which type of pond is most suitable.

- » Rigid Preformed poly pond,
- » Fibreglass pond, or
- » Flexible pond liner.

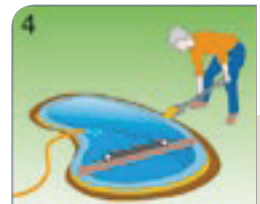
RIGID PREFORMED PONDS

Rigid preformed ponds are available in many different shapes and sizes. They also vary in depth and some will have shelves for water plants. Rigid ponds, in either sanded fibreglass or poly are easy to install and are very durable. Our rock-look ponds have a 5 Year Guarantee. Poly ponds come with a 20 year/ lifetime guarantee.



Poly Pond Installation

1. Place the pond in the position you have chosen and mark the outline with a garden hose or rope. Remove the pond and excavate the hole 5cm wider and deeper than the pond dimensions.
2. Evenly line the excavation with approximately 5cm of damp sand.
3. Using a spirit level check that the layer of sand covering the bottom of the excavation is level.
4. Place the pond into the prepare area.
5. Gradually fill the pond with water and at the same time fill in the gaps between the pond and edge of excavation with sand and topsoil. Ensure the pond remains level during this stage.



IMPORTANT

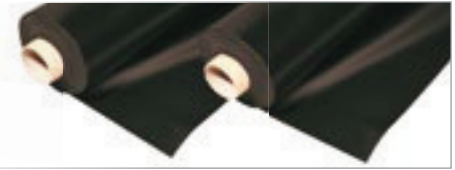
It is essential that the pond should be filled and allowed to settle for minimum of 7 days before any rocks or slabs are placed around the edge. This will allow for any movement beneath the pond due to the weight of water.

STEP 1

Choosing pond location & pond type (continued)

FLEXIBLE LINER PONDS

Flexible pond liners allow you to create the shape and size pond that suits you and your garden. Being flexible they can conform to most designs. Pond liner is available in sizes of rolls, with widths of 2/4/6/8 and 10m. Our pond liners offer peace of mind with 10 year guarantee.



Calculating Liner Size

Use the easy formula below to calculate liner size.

Liner Length

Length (a) + Depth (b) x 2 + 80cm
(40cm overlap each side under rocks)

Liner Width

Width (c) + Depth (b) x 2 + 80cm
(40cm overlap each side under rocks)

Calculating Pond Volume

Use the easy formula below to calculate pond volume.

Length [m] (a) x Width [m] (c) x Depth [m] (b) x 1000

Calculate...	
Pond Volume	

Pond Liner Installation



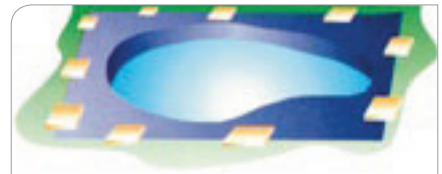
Step 1

Once you have decided where to locate your pond, lay out its shape on the ground with a piece of rope or garden hose. Next, excavate the depth of the shelves, which should be approx 20cm wide and 25cm below the water level – sloping inwards. Then dig out the rest of the pond.



Step 2

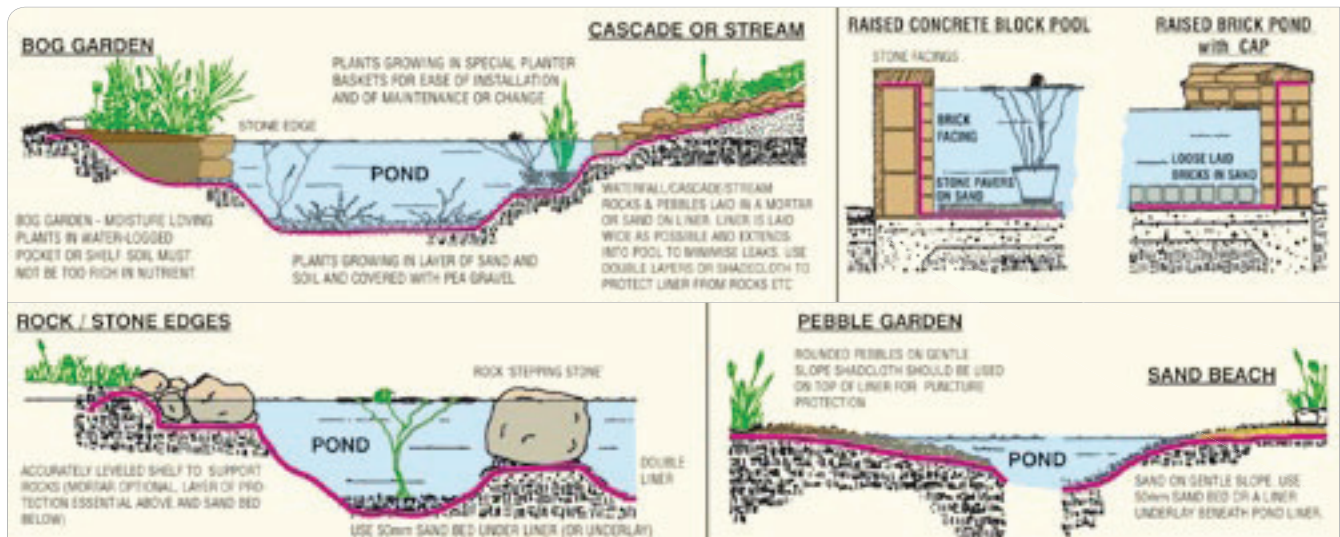
Remove all shape stone and ensure the top of the pool is even. Prepare pond area with clean sand or underlay. Drape the liner loosely over the top and lightly anchor in position with bricks or rocks evenly distributed around the liners edge.



Step 3

Run water into the pond gradually, tucking the liner into shape to ensure a neat finish. Any wrinkles present will disappear as the pond fills. Once full allow to settle overnight. Trim excess liner and complete by edging with stones or paving. See below for edge treatment methods.

Pond Liner Edge Treatment Methods



STEP 2

Choosing your waterfall, fountain or feature

All ponds need water movement. Aside from creating the desired aesthetic effect, water movement is essential for providing oxygen.



WATERFALL SELECTION

Waterfalls give a pleasant visual effect and provide the soothing water noise. For each 10mm of stream/waterfall width you need 100 litres per hour of water.



FOUNTAIN SELECTION

Fountain nozzles are a pleasant feature within a pond. Many pond owners prefer this to a waterfall as a means of creating interest and oxygen to the water. Remember fountain sprays can be easily effected by wind, also pumps for fountain nozzles need to have a foam prefilter. The flow for the typical nozzle in the average pond is 1,000 litres per hour.



WATER FEATURE SELECTION

Water features come in numerous sizes and types. The possibilities are immense; spheres, columns, tiered fountains and water panels. The required flow will vary for every different water feature. Spitters need approx 600 litres per hour and larger feature pieces approx 1,000-2,000 litres per hour.

Flow/Height	
Flow Required (L/H)	
Head Height*	

*Height from water level

Flow/Height	
Flow Required (L/H)	
Head Height of Spray*	

Flow/Height	
Flow Required (L/H)	
Head Height*	

CALCULATE REQUIRED FLOW/HEAD

Where two or three different features are to be operating in the one pond, the required flow of all features is added together.

Calculate...	
Height of Tallest Feature (m)	
Combined Flow Required (L/H)	
Head Height of Spray*	

STEP 3

Selecting your pond filtration system

Whether you are a beginner or experienced water gardener, you will probably have one objective and that is a clear, clean healthy pond. Ponds will be effected by various factors- unconsumed fish food, decomposing vegetation, and fish excrement. If these pollutants are allowed to accumulate in time they will become harmful to your fish and produce green unsightly water.

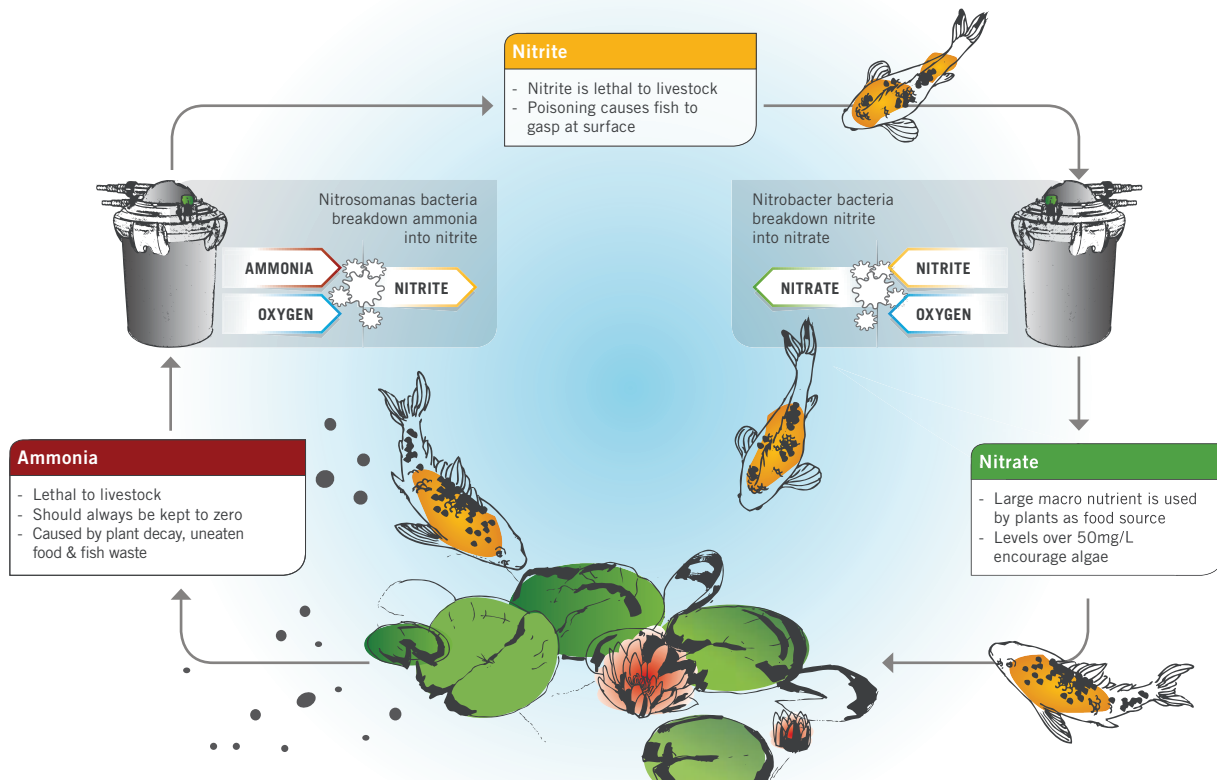
The use of biological filtration will remove these toxins (nitrate ammonia) and provide good quality water. Filters for ponds usually combine both biological and mechanical filtration. Mechanical filtration removes the solid particles in the water by brushes or filter matting. Biological filtration is the converting of toxic pollutants in the water by the bacteria living in the bio media.

THE MOST IMPORTANT POINTS FOR FILTRATION

- » **Equipment & materials of a capable size:** Filter sizing is based on the pond volume calculations, and fish stocking densities. Always go bigger to get better performance.
- » **Correct equipment:** Remember when making your selection that if your pond volume is close to the maximum capacity of the filter in mind then we suggest you choose the next model up. If unsure always upsize. Look for filtration with product and clear water guarantees
- » **Completely circulating water:** All the pond water needs to pass through the biofilter. The pump needs to be at one end and the biofilter at the other.
- » **Continuous filtration;** Pond filtration needs to run 24 hours a day. Bacteria in the biological filter will die if it is without water and oxygen. Bacteria takes 4-6 weeks to fully establish.
- » **Don't overstock pond:** Over stocking of fish will strain the pond filtration system. Ideal stocking levels = 50cm of fish per 1,000 litres. Remember to allow for the fish to grow.
- » **Use water plants:** Water plants are vital in maintaining the balance in the ponds eco system. Plants remove nitrates, provide shade and oxygen. If not in your pond try to use water plants in a stream or spill.
- » **Don't over feed fish:** Pond fish cannot eat a great quantity of food at one time therefore little and often must be the rule. Overfeeding increases the danger of polluting the pond. Remember fish will consume less food in colder months.
- » **Remove/restrict pollutants & debris:** Leaves, debris and fertiliser allowed to enter the pond will all breakdown into ammonia, which is toxic to live stock. Remember to remove pollutants or/and use a pond net to cover the pond.

THE NITROGEN CYCLE

The Nitrogen Cycle occurs in all mature ponds. In a well stocked pond you need a filter, which accelerates the nitrogen cycle and acts like a mini "sewage treatment works".



STEP 3

Selecting your pond filtration system (continued)

TYPES OF FILTRATION



Example of Pressurised Biological Filter



Example of External Biological Filter



Example UV Clarifiers

Pressurised Biological Filters

Pressurised biofilters use the same mechanical then biological technology but have the advantage of being fully sealed. This means the filter can be placed above or below the water level and can be put inline between the pump and water feature.

See examples on page 40

External Biological Filters

External biological filters come in all shapes, sizes and configurations but all function in similar ways. All incorporate mechanical filtration to remove solid particles from the water and then biologically filter through bacteria in biomed. External biofilters are gravity fed. This means the water is pumped into the box and trickles through the filter and flows out under gravity. Consequently the filters must be set at the highest point in the circuit i.e. above the waterfall, which results in the outlet from the filter being elevated above the water surface of the pond/waterfall.

See examples on page 42

UV Clarifiers/Sterilisers

UV (ultraviolet) clarifiers can clear a green pea soup pond in a very short space of time. UV clarifiers use ultra violet radiation from the lamp to kill the suspended algae making the algae cells clump together so that these dead algae can be mechanically filtered. When UV clarification is used in combination with a biofilter UV lamps inside the unit have to be replaced after about 8000 to 12000 hours of running (approx 12-18 months). Most pond keepers try to control algae by using chemicals, this is can be an expensive and labourious solution that may have side effects on fish and plant life.

See examples on page 41

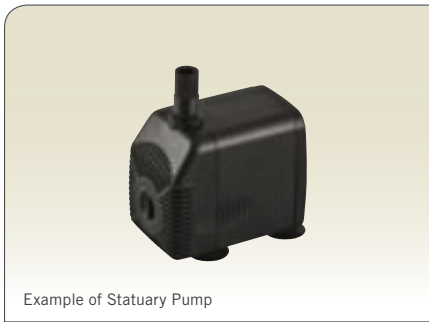
STEP 4

Choosing the right pump

The pond pump is the heart of the water garden. With this in mind, selecting your pond pump is probably the most important decision you will make setting up your water garden. Remember the golden pond keeping rule-if you are unsure go to the next size up. The important pump selection criteria:

- » Reliability
- » Use Of Pump
- » Power Consumption
- » Correct Flow Rate & Head
- » Tubing/Plumbing Size

TYPES OF PUMP

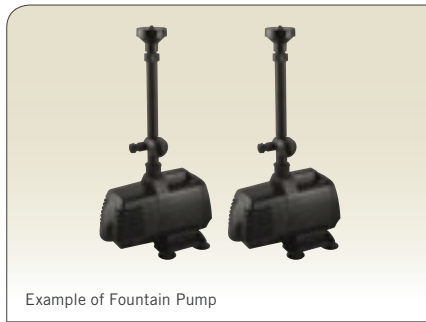


Example of Statuary Pump

Statuary Pumps

Small pumps only, often used in wall fountains, hydroponic reservoirs and water features.

See examples on page 18



Example of Fountain Pump

Fountain Pumps

Suitable for garden ponds, usually come with an array of different fountain nozzles and a tee piece arrangement to run a waterfall or boiler at the same time. Fountain pumps have a pre-filter to screen particles from jamming the pump and blocking nozzles. These pumps should be mounted off the bottom of the pond, e.g. on a brick.

See examples on page 26



Example of Sump Pump

Sump Pumps

Sump pumps are inexpensive pumps used for draining ponds and transferring water. They are bottom suction and mostly come with a float switch. Sump pumps are inefficient in terms of electricity consumption and are often "non continuous" and for short intermittent pumping.

See examples on page 34

CORRECT FLOW AND PUMP HEAD

In order to choose the right pump for your pond you will need to identify both the (a) flow rate and (b) the head or pressure on the pump. This information is usually on the pump box. The manufacturer will state the maximum flow and the maximum head. This does not mean you will get the maximum flow at the maximum head height. The maximum flow is the volume of water from the pump with no hose attached. The maximum head is the height the water will reach when there is zero flow. i.e.: max head 0 litres per hour.

RELIABILITY

A pond pump is an amazing appliance. It not only pumps in a harsh environment but has to run 24 hours a day, 365 days a year. So when choosing a pump you need to be sure it will last and not let you down. Remember that the memory of inferior quality lasts longer than the brief joy of a cheap price. For your peace of mind you should make sure the pump is backed with a warranty and that spare parts are available. A product with a longer warranty will have a better track record and will indicate the confidence of the manufacturer in its quality.

POWER CONSUMPTION

With your pond pump working all day every day the cost to run it is an important issue. All pumps have the wattage stated on the packaging and the unit. To work out how much it approximately costs in \$ to run you use the following formula:

$$\text{Wattage} + 1.8\% = \text{Approx } \$ \text{ to run 24 hours/365 days}$$

Example

$$100 \text{ watts} + 1.8\% = \$180.00 \text{ to run}$$

STEP 4

Choosing the right pump (continued)



TUBING AND PLUMBING SIZE

To get the maximum performance out of your pump you need the biggest plumbing possible. The smaller the diameter of tubing/plumbing the more friction loss there is (the harder the pump has to work) restricting flow. It is also recommended that you use ribbed anti kink hose for your plumbing. This hose will go under rocks and around bends easily and won't restrict water flow like plastic fittings.

Calculating Flow

To determine the correct flow you will need the pond volume worked out in Step 1 (Choosing a Pond). Ponds should be pumped around and through the biofilter every 2 hours minimum. For Koi ponds it is recommended the rate be increased to every hour.

Example

Standard Pond

2,000 litres = pump 1,000 litres per hour

Koi Pond

2,000 litres = pump 2,000 litres per hour

You also need to factor in the flow calculated in Step 2 (choosing a waterfall/fountain/feature piece).

Calculating Head

For the pump or head/pressure measure or estimate the maximum total height that your pump must move water to. (Calculated in Step 2)

Calculating Size Of Pump

Once you have the maximum head and the total flow required, you need to look at the type of pump that does the required flow at the required head.

Example

Required Flow

= 3,000 litres per hour

Required Head

= 2 metres

Flow from Pump at 2.00m high

= 3,100 litres per hour

Total Flow Required*	
Flow Required (L/H)	
*Make sure the total required flow is circulating the entire pond as mentioned above.	

Total Head Required*	
Head Required (m)	
*Make sure you have remembered to add the head required to run biofilter in Step 3.	

THE GOLDEN RULE!

If unsure if the pump being is of adequate strength/flow, choose the next model up.

STEP 5**Year round maintenance**

A garden pond is a truly wonderful feature to have. To ensure trouble-free year round enjoyment of your pond it is essential that you maintain all features and fixtures. But, how do you truly care for your garden pond in order to ensure a long time of enjoyment from it? Here are some great tips that will tell you how to do just that.

**SPRING**

- » Kick-start your pond early to avoid problems.
- » Test the water with pond test kit to make sure it is healthy.
- » Kick start essential biological cycles by using bacteria.
- » Feed fish easy to digest pond food to rebuild energy stores.
- » Eliminate algae problems when the sunlight increase and plants are still dormant by using either a pond UV or pond liquid treatment.

**SUMMER**

- » Feed plants with pond tablets to keep them at their best.
- » Feed fish with quality nutritional balanced food.
- » Check water quality with pond test kit every two weeks.
- » Control any algae problems.
- » Prevent de-oxygenation by using air pump.
- » Consistent clouding may indicate the need for a pond clean out or the necessity to fit a biofilter.
- » Top up evaporated water & remember to condition tap water.

**AUTUMN**

- » Prepare the pond for it's winter dormancy.
- » Cut back/remove dying plant matter.
- » Net the pond to prevent leaves polluting pond.
- » This is a good time for a pond clear out.
- » Change half the water and remove pond sludge.
- » Prepare fish for winter and feed with quality fish food.

**WINTER**

- » Remove all debris from your pond.
- » Cut-off surface growth of underwater plants.
- » Bring surface aquatic plants indoors.
- » Reduce and eventually stop feeding pond fish.
- » Ensure that your Pond is deep enough.
- » Prevent frost from covering the entire pond surface.

