



## ***Common Questions on Building a Rubber Lined Pond***

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### **1. How do I dig out the pond and what should I do with the excess soil?**

A small backyard pond can usually be dug out by hand. However, if it is a large pond or too much labor for you to handle alone, use earth moving equipment or paid labor to get the job done right.

The excess soil can sometimes be smoothed over the rest of the yard. The soil can be used to build up a small waterfall or as backfill onto the liner for planting beds along the edge of the pond.

### **2. How deep should my pond be?**

This is a matter of personal choice. Usually back yard ponds range from 18" to 30" in their deepest areas. In the Pacific Northwest these depths are good for most fish and water lilies to over-winter safely. Koi, however, require a minimum depth of 36". Most Koi enthusiasts prefer ponds up to 5 feet deep as increased vertical swimming area allows for greater muscular development.

### **3. Does the pond need an outlet for overflow?**

During the winter, the pond level will rise from rain and snow accumulation. The excess water is likely to flow over the edge of the pond and out onto your yard. This is not a problem as the ground everywhere is wet. However, if you have a very small yard or other drainage concerns, then having an overflow outlet is recommended.

Locate the outlet along the edge of the pond at a convenient spot to divert excess water. Make that part of the pond's edge lower than the rest of the pond so the water will be channeled in that direction. The level of the outlet will determine the highest level of the water in the pond.

The overflow could be an inconspicuous low spot masked by decorative placement of rocks. An overflow drain box can be added to channel the water away via a drainpipe. Place the drainage box at the desired water level, then drape the pond liner into the box. A grate cover is then placed over the liner and the top of the box. This too can be camouflaged with rock. The overflow should feed into a new or existing drainpipe which carries the water to an appropriate area for release.

### **4. Should the pond sides be straight or sloped?**

Straight sides are often used in formal ponds and fountains. Also, steep vertical sides can discourage fish predators. However, shallow shelving along the sides of a water garden is necessary for planting water plants within the pond. Steeply sloped sides do not allow for placing plants along the pond's edge since most ornamental pond plants prefer a depth of only 3"- 6" over the crown of the plant. A uniformly deep pond will limit your plant selection to floating plants or lily-related deep water plants.

### **5. How should the sides of the pond be dug to allow for shelves or planting beds in the pond?**

As a guideline, you can start by digging a shelf that is 2'-3' wide and 6"-9" below the final water line. You may decide that a wider bog garden is desired or that a thinner ledge is more suitable to your yard.

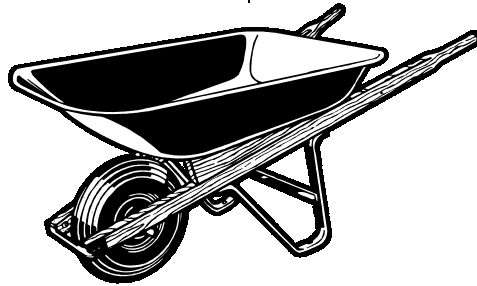
One long shelf can run the full length of the pond's perimeter but more commonly multiple smaller shelves can be spaced around the edge. Potted plants can be directly placed on the shelves of a lined pond or the shelves can be made into planting beds (see question 8). Once the shelves have been dug, dig out the rest of the pond according to your design.

### **6. Does the liner need any cushioning?**

If the ground is free of jagged rocks and sharp objects, then no cushioning is needed. The Firestone PondGard Liner is very tough. However, if your site has jagged rock edges or sharp protruding tree roots, then consider using sand or underlay fabric beneath the liner for added protection. Always use additional padding on top of the liner when placing large boulders.

### **7. How is the liner placed within the pond?**

If the pond is large, the liner can be heavy and awkward for one person to move. You will need others to help you. If you have adequate lawn or open space, spread the liner out flat, then roll each side up until they meet in the middle. Do not leave the liner laying on a lawn area for more than a few minutes. Place the liner down the center of the pond, the sides of the liner can then be unrolled out to the edges of the pond. Weigh the edges with rocks to hold the liner in place as you smooth out wrinkles.



## 8. After the liner is in place, how are the planting beds made?

Use mortar along the edge of the shelves to anchor in a single row of large rocks. Once the mortar has cured, backfill your planting media on the top of the liner, behind the mortared rock. The rocks will keep the media from washing down into the pool. You can then plant directly into the new planting bed.

There are multiple benefits to making your shelves into planting beds. First, the plants have more rooting area than if they are confined in pots. Also, the planting bed acts as an in-pond biological filter with the plants actively removing excess nutrients from the water. Finally, shelves can be used as a convenient step into the pond by predators (who usually knock over your potted plants at the same time). The steeper drop off at the mortared rock edge of a planting bed provides safety for your fish.

Note: if you want a planting bed for water lilies in the middle of the pond, mortar a circle of large rocks in the center of the pond. Fill the circle with planting media and place river rock on top to keep the media in place and discourage fish disturbance.

## 9. How is excess liner material trimmed off?

Once you are absolutely sure of the placement of the liner it cuts very easily with household scissors. However, we recommend that rather than cut the liner, fold the excess under the edge and leave it there for the first season. That way, if the ground shifts, which it sometimes does in excavated ground or as a result of frost action, you can pull up extra liner as needed.

## 10. How can you cover the liner material around the edges of the pond?

There are several ways to do this. You can bury the edge of the liner then backfill the edges with soil and grow grass or other plants on top of the soil. Be sure to keep the liner, as it emerges from the pond, above the surrounding soil line to prevent the dirt from washing into pond. The most common finish is a rock or paving stone edging. Try to avoid the “necklace effect” of an unbroken string of rocks. Trailing plants, downed logs or moss can be used to soften the edge and provide varied interest.

## 11. What shall I do if I don't want to look at the liner along the bottom and sides of the pond?

Boulders and rocks can be stacked or mortared along the edges and sides. River rock can be placed along the bottom of the pond.

Some builders apply cement on top of the liner. This works to even out the bottom and sides of the pond. Cement does not harm the rubber liner. However, it is difficult to obtain a healthy pH range in a new cement pond. Scrubbing the surface with white vinegar is helpful. See the next step for more information.

## 12. How do I secure the rocks in place?

Use mortar during construction. Generally speaking, an 80lb. sack of mortar is sufficient to lay 5 ft. of edge rock. When mortaring, *less is best!* Use it only to secure the rock in place. Mask as much of the mortar as you can by using smaller rock placed in between the larger rocks.

To balance your pH it is helpful to scrub your mortar work with white vinegar, then fill the pond & add additional vinegar. Allow it to remain in the pond to leach lime from the cement or mortar. If you have a waterfall or stream, run the pump to move water

through the system. After 7-10 days pump out the vinegar water and replace it with fresh water. Purchase a small pH test kit and check the water's pH. Your water plants will do fine within a pH range of 6.5-8.5. The ideal pH level for fish is a neutral 7. However, as soon as the pond is between 6.8 and 7.8, it is safe to add fish.

## 13. If I make a mistake and cut the liner in the wrong place, what can I do to correct it?

There are patching tapes that can be used for repair. These materials can also be used to add additional liner to create a larger pond or add a stream bed at a later time.

## 14. How much water will be lost from the pond due to evaporation?

Evaporation rates will vary with the amount of vegetative cover along the pond. A heavily shaded pond will lose less water from evaporation than a pond in full sun. Evaporation is also affected by low humidity or dry winds. Under those conditions, don't be surprised by a water drop of 3"-6" per month. Evaporation is greatly increased when you have a waterfall or long stream bed. With a very splashy falls or a long stream which drops into a fairly small pool you can easily lose an additional inch or more per week.

## 15. How do I determine the number of gallons in my pond?

Use the following equation (take measurements in feet):

**Length x Width x Average Depth = Total Area of Pond**

**Total Area x 7.5 gallons/cu. ft. = Number of gallons in pond**

## 16. Should the pond have a filter?

Ponds which are heavily stocked with fish (Koi in particular) always require filter systems. In a water garden, with a balance of fish and plants, a filter may not be needed. Keep in mind that algae outbreaks can, and do, occur. There are many ways to deal with algae. If, however, a crystal clear pond is desired then a filter is needed. There are different types and sizes of filters depending on your pond's size and particular needs.

## 17. Is the pond liner safe for fish?

Our Firestone PondGard liner has been determined to meet EPA standards for fish safety. Other materials may not be fish safe. It is important to determine the quality of any liner material you use and whether it is appropriate for use as a pond liner.

## 18. How do I determine the number of fish my pond can hold?

Generally it is good to start with a few goldfish. If they do well, you may add more or bring in Shubunkin or Koi. The quantity of fish should remain low to keep the water quality high. Only add a few at a time to preserve your natural balance. A common stocking rule is no more than 1" of fish per square foot of surface area. Cut that number in half if your fish are Koi. Each pond environment is unique and the above rate may not work well for every water garden.