Pond Construction: How to Dig a Pond and Install a Liner

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Designing and finding the best location for your pond is one of the most exciting parts of pond building. Digging and installing the liner are often considered the least fun and the hardest part of building a pond. Many people try to get this part over with as soon as possible but this may actually be one of the most important parts of building your pond and will greatly affect its health and longevity. So take some time during this stage and make sure you do it right to avoid problems later.

Digging the pond

Before you start digging, make sure you have researched your location, power source, shape, and lining material that will be used. One last chore before you start to dig is to double-check that there are no buried electric, water, phone, or septic lines anywhere near where you are going to dig. Many smaller ponds can be dug by hand with a shovel, but on larger ponds, a front-end loader or backhoe may be needed.

Having grown up on the farm and done my share of digging I have to interject a bit of advice here concerning your shovel. First, not all shovels are created the same. Buy a high quality narrow spade and a longhandled pointed tip shovel. Second, use a file and make sure the shovel edges are very sharp. Third, wear stiff-soled shoes and alternate feet when you push the shovel blade in. While this may seem trivial, it can make a big difference in how much dirt you move and how you feel the next day. And finally, helping you dig a pond is one of the best uses for a brother-in-law I have ever come across.

When placing the shovel, try to dig straight down at 90 degree angles. Use the spade and take small slices to help save your back. Pile the dirt where you want it or use a wheelbarrow. Moving dirt twice is just more work. As you dig your pond remember that you want to provide different depths and tiers for the plants and fish. The shallow end of the pond is usually between 4 and 12 inches deep. This is a good area for the fish to feed on insects and is needed for some shallow water plants. This is also very important as an escape area for any animal or child that accidentally falls into the pond. The deepest part of the pond should be between 24 and 48 inches deep. This will provide a secure hiding place for the fish as well as an area of temperate water in the summer and winter. The depth will depend on the climate. If fish are going to winter over, the depth needs to be below the frost line. Try to keep the tiers and bottom as level as possible, avoid corners, and try to use gentle rounding curves when possible. When you are finished digging, use the shovel to smooth the bottom and sides of the pond. Use a couple of pieces of 2x4s screwed together to make a stamping pole and firmly pack all of the dirt at the bottom of the pond. Make sure to remove all stones that protrude because they can cause punctures in the liner. Putting a firmly-packed layer of sand about 2 inches deep on the bottom of the pond will help prevent punctures or tears in the liner.

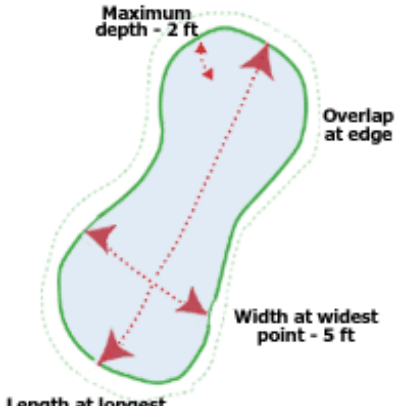
Choosing the right liner

There are many different types of liners that can be used. Pre-formed plastics ones are sturdy, durable, and relatively easy to install but do not allow you to customize your pond. Concrete liners are extremely durable and permanent but can be expensive, difficult to install, and should be left to professionals or serious do-it-your-selfers. The most common and versatile liners are the synthetic polyethylene and butyl rubber liners. These liners come in a variety of thicknesses and can accommodate any shape you can dream up. Polyethylene is one of the most common and affordable liner materials but lacks flexibility and tends to become brittle as it ages. It is better suited for temporary setups. Butyl rubber, PVC, and LDPE (low density polyethylene) are more expensive but are much more durable and will last much longer. They come in a variety of sizes and thicknesses to suit your individual needs. It is a good idea to use an underlay under any lined pond to prevent punctures and leaks from developing. Do not cut corners here because if your liner leaks you will need to tear your pond apart and start over. Commercial underlays are now available but in the past sand, old carpet, felt, or even polyethylene bags have been used.

Sizing your liner

Because liner material is expensive and a liner that is too small will not do you any good, it is important to calculate the correct sized liner that you will need. To calculate the size follow these simple guidelines:

- Measure the length of the pond at the longest point
- Measure the width of the pond at the widest point
- Measure the depth of the pond at its deepest point
- Take twice the maximum depth and add it to the length at the longest point to get the overall length
- Take twice the maximum depth and add it to the width at the widest point to get the overall width
- Then add 12 to 24 inches to the overall length and overall width to provide enough overlap around the edges



An example would be if the pond is 10 feet long, 5 feet wide, and 2 feet deep;

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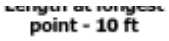

we would double the depth to 4 feet and add it to 10 feet, and then add 2 more feet for overlap to get a total length of 16 feet. To get the width we would double the depth to 4 feet and add it to the width of 5 feet, and then add 2 feet for overlap to get a width of 11 feet. We would end up needing a liner 16 by 11 feet.

Once the liner is sized, then we can lay it in the pond over the underlay and weigh it down with smooth stones to help it form the correct shape. Another option would be to slowly add water and allow the weight of the water to push the liner into shape while you make minor adjustments as necessary. You will want to secure the overlap with stones, rock, etc.

Digging a pond can be a lot of work, but by taking your time and getting some help it can also be a lot of fun. Remember to take your time and do it right the first time because you won't be able to change it after the pond is filled. Buy the best liner you can afford and don't forget the underlay to protect the fragile lining. When this part is done then you can get on to the real fun of filling and aquascaping your new pond.

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