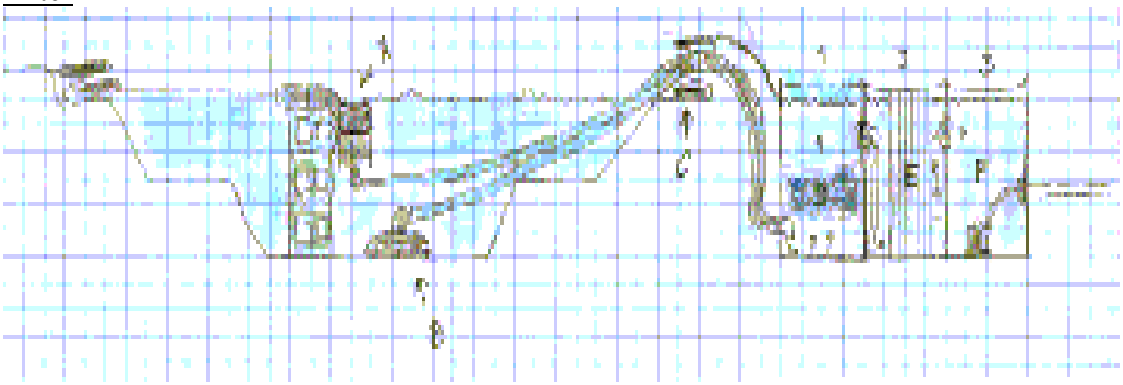
DISCLAIMER: Below are different filter and pond construction ideas I found online and saved. Maybe one of these will be what you are looking for. I take no credit to any of the ideas listed here, nor any of the responsibility.

FILTER CONSTRUCTION

Homemade bio-media. It's made of plastic snow fence. Cut into 4" strips, it was folded in a flag like fashion. There's a lot of surface area there.

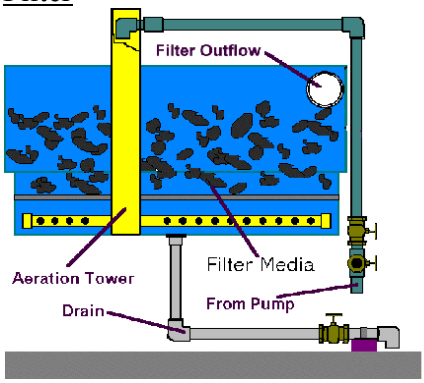
Filter



Above is a cross section of my lower pond and the filter. A is the skimmer using 1.5" tubing, B is a Tetra Bell Vacuum Bottom Drain using 2" tubing, C is a triple camlock fitting where the hoses can easily be attached or disconnected. This fitting connects to 3" ABS and connects to #1 barrel where the water comes in at the bottom and drops the muck there. It passes thru D, 25 yds of vinyl screening held down by hardware cloth. At the top of this filter I grow water hyacinths. Using a screen to keep their roots away from the bulk head fittings into the bio-filters. #2 barrels contains E open cell foam (20 psi) water flows horizontally thru to #3 barrel that contains only the pump, an automatic shut-off float switch (not pictured) and F water.

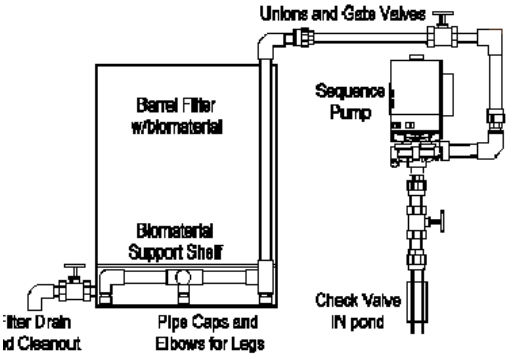
There are 2 types of filtration, mechanical and biological.
Mechanical filtration serves to remove the "hunks" out of your water, usually using a sponge or matting. These are used to keep the junk from clogging your pump and are usually at the inlet of your pump. Mechanical filtration can also be something as simple as a settling pond. This is an area where moving water slows enough for the "floaties" to sink to the bottom where they can be scooped out.
Biological filtration works on a different level. If you have fish in a pond, you have fish "by-products". Fish waste is composed of ammonia and nitrites, both of which will kill fish. Bacteria exists in the water that will convert these nasties into nitrates, fertilizer. Unfortunately, our ponds are not build to contain enough of these critters to do the complete job. A biological filter is designed to make a home for enough of them to grow and multiply and do their job. They grow on the surface of things and "eat" the stuff in the water as it passes by. And that's all a bio-filter is! You'll see all kinds of fancy things on a filter, but the real working guts is a box with an inlet and an outlet and something inside with lots of surface area where bacteria can grow.

Filter



Side view of the filter above. Notice pump outlets. Clockwise, the top right one supplies the filter, the bottom right attaches to a hose and nozzle to clean the filter, bottom left will supply a future small stream, top left is waterfall supply for any volume that is left over. The black pope on top is a manifold to attach to the waterfall supply to spread out the water behind the waterfall rocks. The water enters the aeration tower (PVC pipe) at the top and flows out holes in the bottom of the tower. The filter media is sitting on some of that florescent lighting fixture grid stuff that is plastic with little 1/4 inch squares. I cut it to shape and supported it with a few bricks.

Filter



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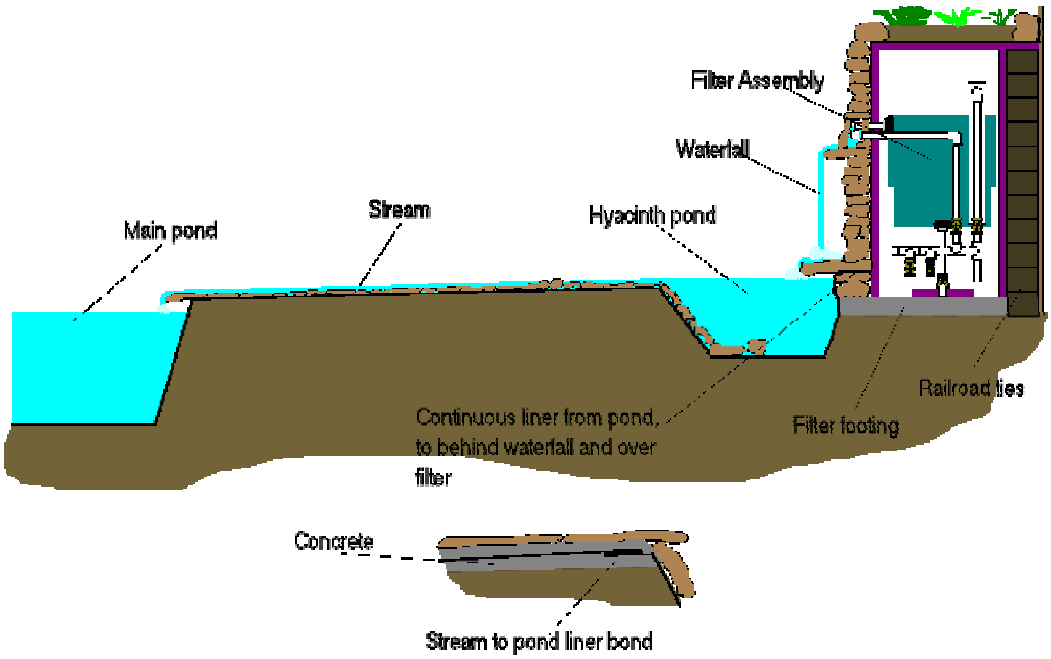

Homemade Bulkhead Fitting

I attached the tower to the tank using an ABS flange and silicone adhesive
I used stainless steel bolts in addition to the silicone adhesive to attach the pipe, and had to cut through the side of the tank with a jigsaw. On the inside of the tank, I used both rubber and stainless steel washers on each bolt to prevent leaks

Filter

A 50 gallon drum/barrel which serves as the prefilter. You can never forget the shut off valve at the bottom of the hill to prevent reverse flow from siphoning when the power is shut down. The barrel is fitted with a large tap at the base for emptying debris that settles to the bottom. This drum has 3 layers of fiber matting (furnace filters)and topped with a large mint plant. The strained water flows out the top through a 1 1/2 piping. The piping carries the water to the bottom of a 100 gallon Rubbermaid container filled with a combination of "plastic bits" (from the bio filter) filter mats and water loving plants (marsh marigold, mint and zebra grasses). After 10 feet of meandering stream-ways the water cascades into a 75 gl kidney shaped tub with a UV light mounted over it.

POND CONSTRUCTION

- There is also a concrete ring BELOW water level to support the rock edging. Below grade REALLY hides the liner

- Making Concrete Rocks: If you run into a situation where real rocks just will not work, or you need support for some real rocks, say for a waterfall, you can make fake rocks like you have seen in the water parks and putt-putt courses. The form is first shaped with the re-bar. Use pictures of real rocks to give you some shape ideas. Next attach the wire lath. This is the lath that is used for stucco work. Wire it on very solidly to the INSIDE of the re-bar form. Wire standard chicken wire to the outside of the re-bar. If the structure is solid enough to walk on, it is sturdy enough.
Mix the concrete very dry. If you do not use pre-mixed, use 30 shovels of sand to 1 bag of cement. If you use premix bags, use sand mix, not mortar. The mix should be very dry because you don't want it to run and creep. As with any concrete, drier mixes are usually stronger. Trowel on the first layer. The sample I saw had only 2 layers and the first was about 3/4 inches thick. Only mix as much as you can work comfortably. If you have some areas that hang upside down, you might want to rough up this section for the next layer to stick. Let this layer dry at least 24 hours. If you are constructing a waterfall, you can lay your liner on top of the first layer. Then cover the liner with a layer of chicken wire because layer 2 will not stick to the liner. Mix concrete for layer 2 like you did for layer 1. Once you get a section laid, rip off strip of heavy duty foil and spread over the area you just laid and, using a wet sponge, wipe the foil against the fresh concrete. Don't laugh, as the foil conforms to your shape, it will wrinkle, fold and whatever. This will give your "rocks" a more natural texture. If you leave the foil on the rock, you won't wash away the concrete you just laid when you foil the next section. After you remove the foil, use trowels, brooms, brushes, branches, whatever to put in the cracks, and textures you see in natural rocks. The professionals use molds from real rocks for this.

- The walls of the pond should be kept nearly vertical, a slight slope in the walls might appear as a bulge in the finished pond. Excavate the bottom of the pond with a slight slope to a deeper sump area.

Building Waterfalls

- Any stone that you want the water to run over in the waterfall should be placed onto expandable foam insulation that comes in a can and is available in most hardware and building supply stores. This foam will stick the stone to the liner and allow the water to run over instead of under the stone. Any foam that is exposed can be covered with sand or small gravel to camouflage.

- At the top of the waterfall we placed a new black plastic oil change pan, cut away the front, and would eventually fill this with water hyacinths. The water would go into the pump, through the hose, (hidden in the rocks), and empty into the pan filled

with plants. When it got to the right level the water would spill out and run down the waterfall. After a few adjustments of the angle of the pan we were done.

I then added more dirt in the trough area between the rocks, sloping the dirt down toward the pool. Next, I added a flexible liner over the dirt. The liner forms the catch basin for the waterfall. At the base of the falls, it overlaps with the liner for the existing pool. This way, it doesn't really matter how watertight my rock-work is, since anything that leaks through is caught by the liner and runs down into the pool. Next came my concrete trough. I placed wire mesh over the liner to serve as reinforcement for the concrete and then created a 3" thick trough over the liner. I didn't bother to set any rocks into this concrete, but did use some additives to darken it to a dark gray and to make it more waterproof. I used plastic cement instead of portland cement since it's supposed to hold up better in water. I let the concrete cure for one week before proceeding. At this point I had an outer shell of rock with a cement trough running through the middle over a liner. The next step was to use mortar and rocks to cover the trough to make it look natural. I did this in three phases, just because of the amount of time it took to place the mortar and rocks and the amount of mortar I could conveniently mix at one time. Again, I colored the mortar dark grey so that any that was left uncovered by rock would look like a shadow cast by the rocks. This trick works very well. First, I build a pool into the top of the falls using mortar and some flat rocks. I basically just built a "dam" across the trough near the top. I used a very flat rock at the top of the dam and made sure to set it level so that I'd have an even sheet of water passing over it. In the next phase, I used mortar to add small fieldstones to the edges of the trough to hide the exposed concrete and build up the sides of the trough to avoid too much water loss from splashing. In the third phase I covered up any remaining bare spots and added a "mirror" stone at the base of the top falls to divide the water into two streams and add some sound to the falls. After the mortaring was complete, I added several loose field stones on top of the original base stones to fill in any areas where concrete might still show through and to create a more natural shape to the whole mound of rocks.