

5000 Gallon Pond Filtration Design



By

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There are many considerations that need to be made prior to designing a koi pond filtration system:

- **Indoor/outdoor.**
- **Warm or cold climate.**
- **Heavily wooded or pasture around the pond.**
- **Source water considerations.**
- **High quality or mutt koi for inhabitants**

In order to specify the system, The following assumptions are made:

- **The pond is located outdoors.**
- **The climate is North Georgia.**
- **The area is lightly wooded.**
- **The source water is city (somewhat soft).**
- **High quality koi will be the pets of choice (7-8 large koi max).**

The ideal pond location and scenario would be:

- **Outdoor mud pond with natural flow-through stream in summer.**
- **Heated greenhouse pond in winter.**
- **Both greenhouse and stream water from the same source (Ph of 7.5 and relatively soft water).**

Construction Techniques

- *Concrete pond, oval shaped with a minimum of 5.5' of depth.*
- *Straight sided walls to pond with pond bottom sloped towards drain.*
- *Spray in liner (pond substrate needs to be all concrete including floor).*
- *No shelves, plants or rocks.*
- *All filtration equipment must be insulated from the elements. (ie winter cold, summer extreme heat and autumn leaves).*
- *If money is not an option, add a pond heating system.*
Recommendation is to let fish have cooler temps in the winter 55-60 degree max.
- *Use sloping elbows, check valves, unions, 3-way valves etc. to reduce flow restrictions and have the capability to isolate and or remove all filtration sub-components and still run the circuit pump.*

Filtration System Set-up Requirements

- *The pond must be designed with two separate and independent filtration systems (circuits) that can maintain the fish load independently.*
- *Each pond filtration circuit must be able to circulate the entire volume of water in less than one hour.*
- *Both systems must have mechanical and biological filtration capacity.*
- *The pond system (in my perspective) must be automatic, maintenance free and be able to maintain itself for several weeks unattended.*

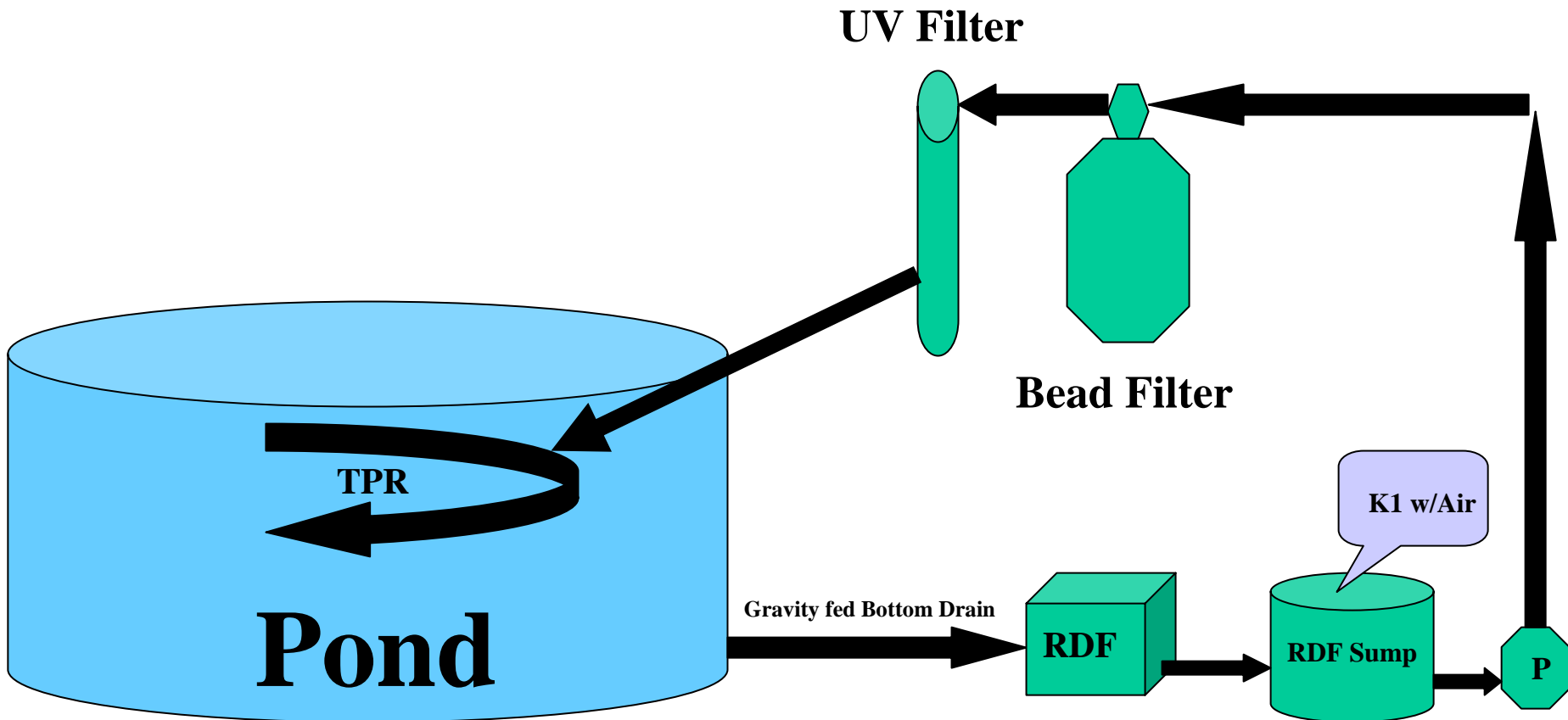
Bottom Drain Circuit

- *One 4" bottom drain (Rhino max with air).*
- *One liner piston air pump for bottom drain (min 40-60 LPM).*
- *One Rotary Drum Filter gravity fed from bottom drain (mechanical filtration with 60Um screens or lower).*
- *One Rotary Drum Filter Sump (500 gallon).*
- *Four (4) cubic feet of K1 type media submerged in RDF sump with 160 LPM air injection. Media contained in crates, fully submerged.*
- *One bead filter Aquadyne 2.2 BHE filter with blower.*
- *Mid level TPR returns.*
- *Appropriate valves to by pass each filter sub component.*
- *One Wlim Dragon pump series 1/4 HP.*
- *80 Watt UV filter*

Skimmer Circuit

- *Two or three no niche power skimmers.*
- *Shower filter with a minimum of 8-10 cubic feet of media. Shower filter must be able to flush solids as well as provide gassing off.*
- *Filter must be a high flow rate filter (min of 6,000 GPH).*
- *Upper level TPR returns and gravity fed back to pond.*
- *Appropriate valves to by pass filter sub component.*
- *One Wlim Dragon pump series 1/4 HP.*
- *Sodium Thiosulfate dosing system for automatic make-up water.*

Bottom Drain Schematic Circuit



Skimmer Schematic Circuit

