

Aquaponic Plumbing

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Decomplexing Plumbing

Hooking it all together from simple Aquaponics systems to mixed type
aquaponics systems



<http://www.aquaponiclynx.com/>

This Is NOT a Siphon Class

- ⇒ I have a demo we can play with if there is time.
- ⇒ Siphons can work anywhere you have enough fall and can adjust the flow rate in constant pumping but you do have to get the balance right.



Overview

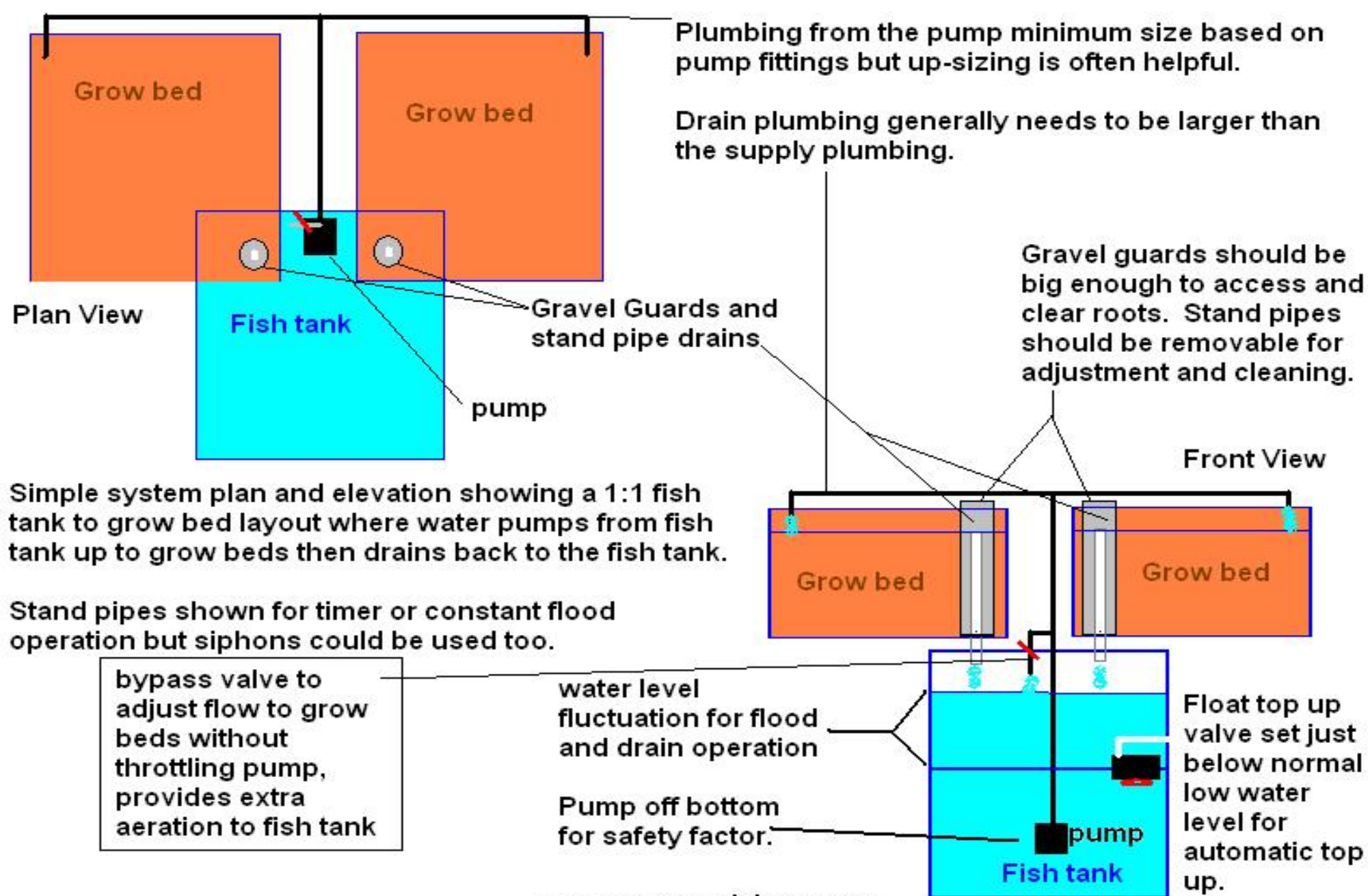
- ➔ Figure out your general layout
- ➔ Get an idea of flow rates and needed pipe sizes
- ➔ Get tools and materials on hand
- ➔ Do the ground work
- ➔ Hook up drain plumbing first
- ➔ Then run supply plumbing



☐ *Figure out your general layout*

- ⇒ Space you have to work with
- ⇒ Tape measure
- ⇒ Drawing
- ⇒ Grow beds
- ⇒ Fish tank
- ⇒ Walkways
- ⇒ Draw a picture or lay it out on site

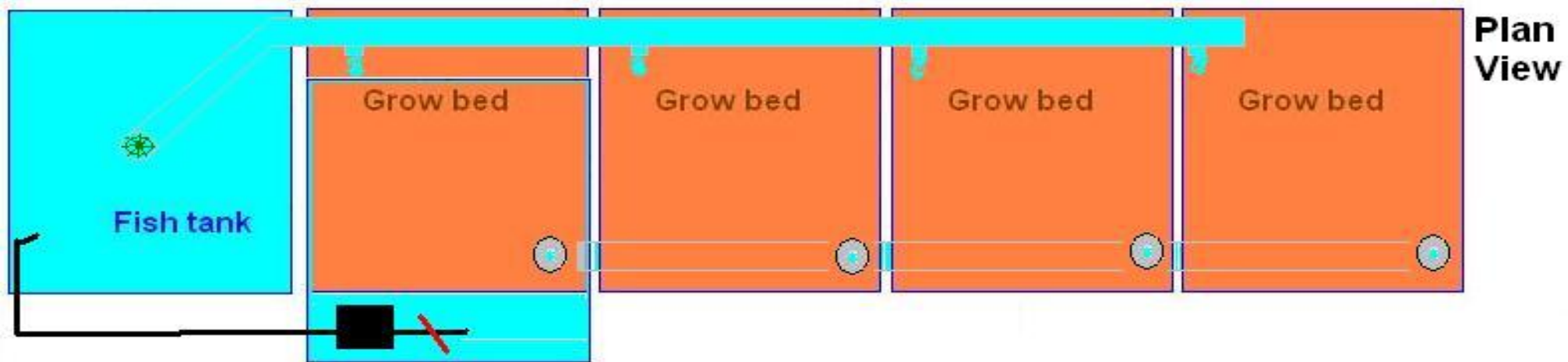




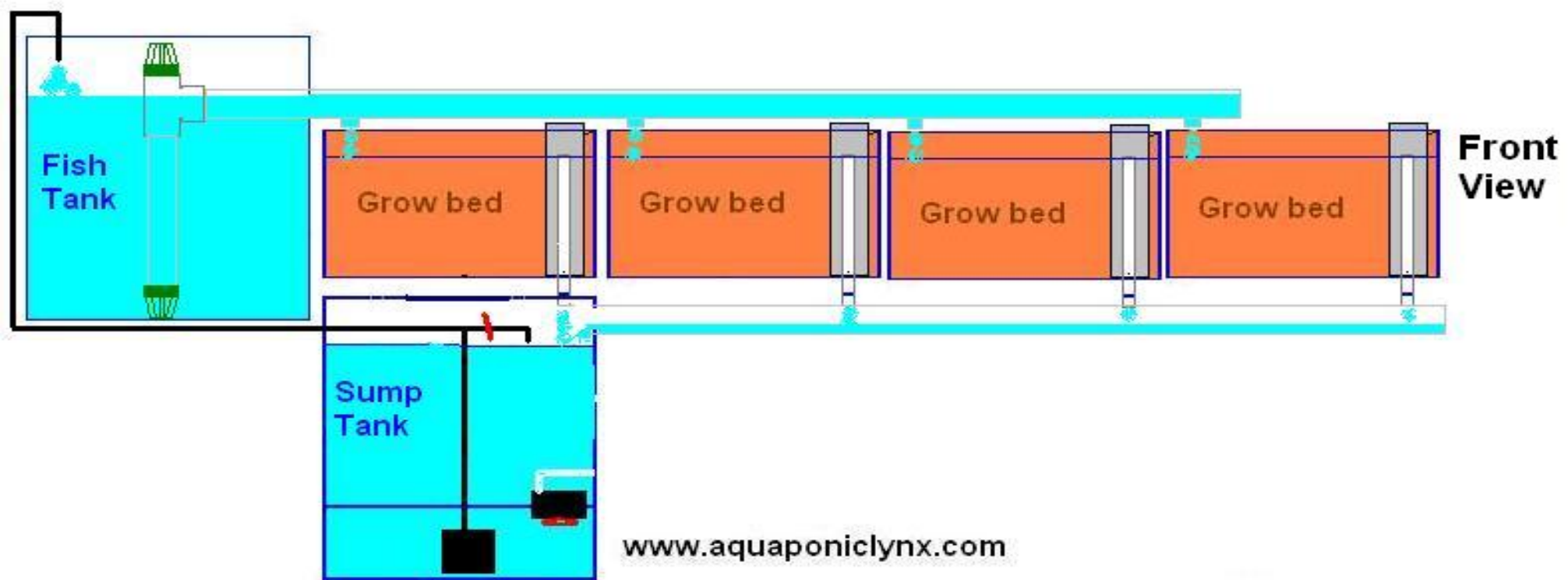
Important design tips

- ➡ Pump bypass, note that you can T off the pump line and add a ball valve to spray water back into the fish tank or sump tank, this is a better way to reduce flow to grow beds than simply adding ball valves at the grow beds.





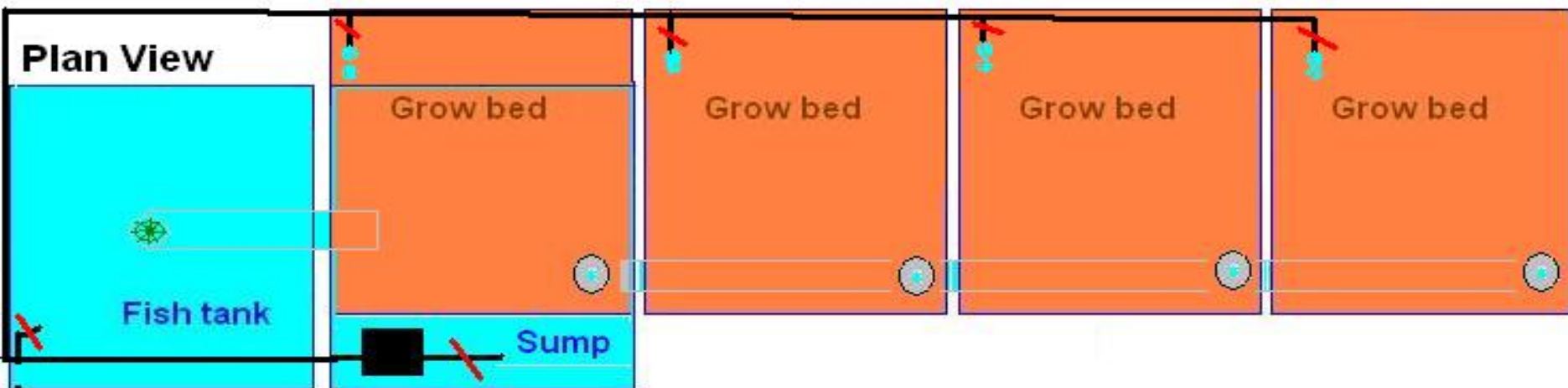
CHIFT PIST or CHOP



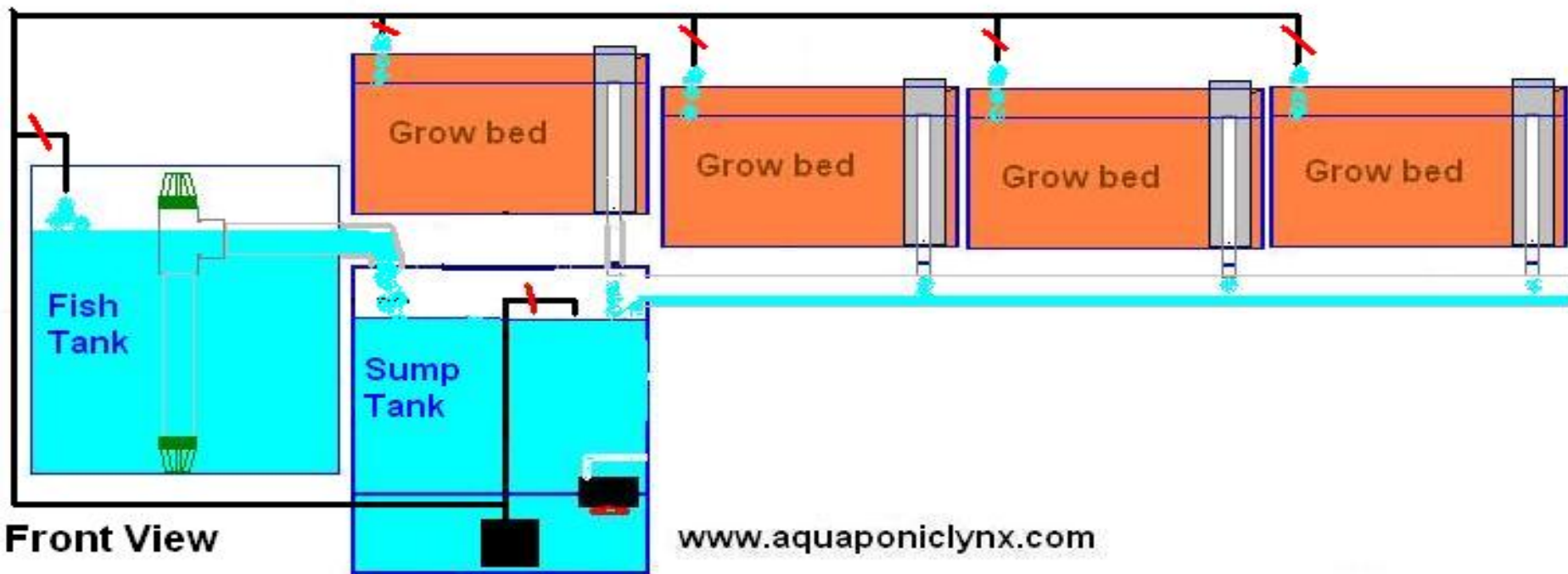
Important design tips

- ⇒ SLO drain. That stands for solids lifting overflow. This is a way to draw water from the bottom of a fish tank while still keeping the water level in the fish tank fairly constant.
- ⇒ CHIFT PIST as in last slide provides clean water sump.





CHOP Mark 2



Important design tips

- ➡ The CHOP Mark 2 method doesn't provide a clean water sump but it does provide more control and flexibility over layout.
- ➡ You can control the flow to individual beds easier and not worry about the fish tank overflowing since it overflows to the sump tank. This makes siphon operation easier.



■ *Get an idea of flow rates and needed pipe sizes*

- ⇒ I often start with the pump, what size plumbing does it take? Gonna upsize it?
- ⇒ Then make drain plumbing bigger, much bigger.
- ⇒ Siphons are a bit different, they require a balance



■ *Get tools and materials on hand*

- ⇒ Use your layout and pipe size figures to help you estimate the amount of pipe and what fittings you will need to hook it all together.
- ⇒ Tools and safety glasses for cutting.
- ⇒ Sandpaper
- ⇒ PVC primer/cement
- ⇒ Gloves unless you like purple stained hands



Tools



Or Power Tools



Don't Be afraid of PVC pipe

- ➔ Many people seem to want to use irrigation pipe or something because they feel it is more flexible and temporary but regular PVC pipe is not difficult to get, cut, or glue and the fittings are not that costly. You get far more flow through the PVC than you do irrigation pipe hooked together with barb fittings.



PVC Cement or Silicone



Temporary PVC Options

- ⇒ There are flexible couplers for PVC.
- ⇒ Some plumbing with no chance of getting knocked apart can be left dry fitted.
- ⇒ And if you need to secure plumbing temporarily a stainless steel screw can keep it from being knocked apart and some silicone can keep it from dripping.

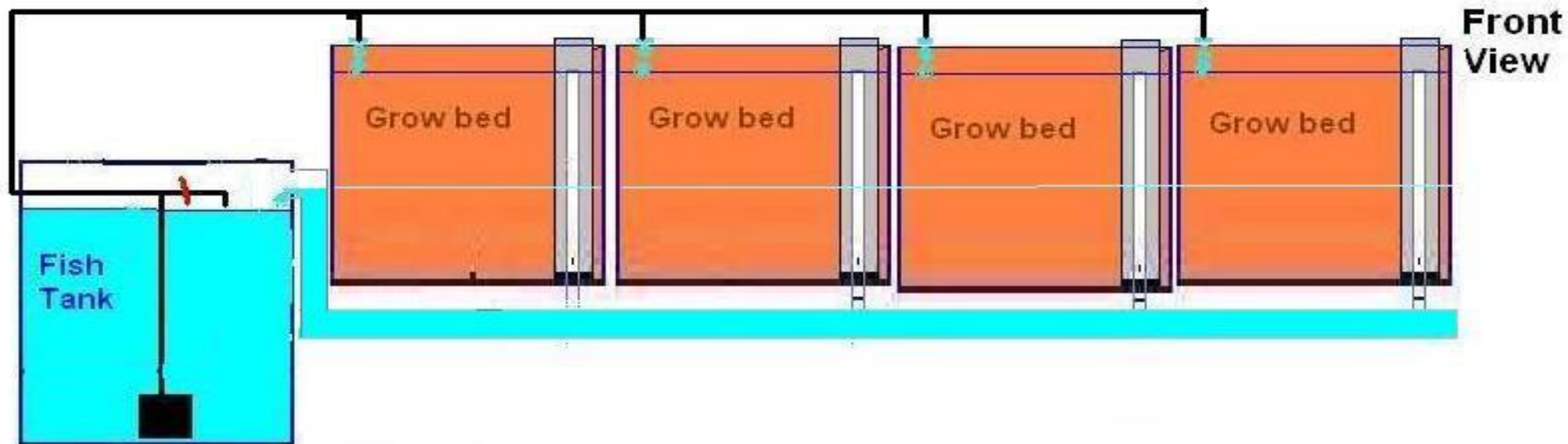


■ *Do the ground work*

- ➔ Place tanks and beds in correct location.
- ➔ Do any digging and leveling.
- ➔ Prep trenches for pipes.
- ➔ Look at everything and visualize the plumbing runs to make sure it will all work out.
- ➔ Drain plumbing outlet into sump or fish tank needs to be lower than the beds or water won't drain.
- ➔ Vents may be needed if gravity plumbing does much up and down.



For Deep grow beds being drained by stand pipes, it is not mandatory to drain them completely since the water will get mixed each time the bed floods and drains. 12 inches of flood and drain is sufficient and will allow deep beds to be installed at a reasonable height and still drain half way into a tank that is not below their bottoms.



■ *Hook up drain plumbing first*

- ⇒ Drill holes for grow bed drains and install.
- ⇒ Make sure stand pipes are removable.
- ⇒ Fit gravel guards.
- ⇒ If running siphons add extra overflow
- ⇒ Lay out drain piping and fittings.
- ⇒ Hook it all up without glue first.
- ⇒ Run some water to make sure drains work.
- ⇒ Glue or secure once satisfied.



Then Run supply plumbing

- ➔ From pump to beds
- ➔ Or from fish tank to beds for CHIFT (constant height in fish tank) system
- ➔ If CHIFT plumb supply from pump to fish tank. Make sure the Gravity drain from fish tank is plenty large enough that the fish tank won't overflow.
- ➔ Layout and dry fit first and make sure it all looks good before securing.



Test

- ➔ Once it's all hooked up, test it out.
- ➔ This is a good time to rinse everything off
- ➔ Without media in you may not be able to really test flood and drain.
- ➔ Run water around to let it air out and do a good test for leaks.
- ➔ After a day of circulating you can check your source water's “real” pH and also get a good baseline on other water tests. Prepare for gravel washing (test likely media for pH compatibility.)



So that was Basic

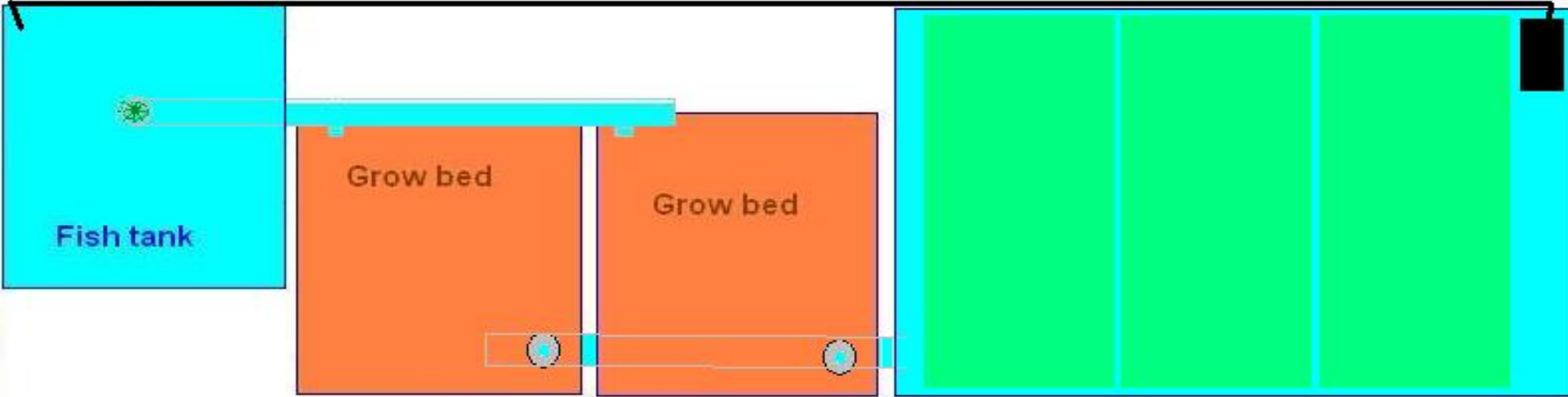
- ⇒ What about hooking up...
- ⇒ Rafts
- ⇒ NFT
- ⇒ Towers
- ⇒ etc



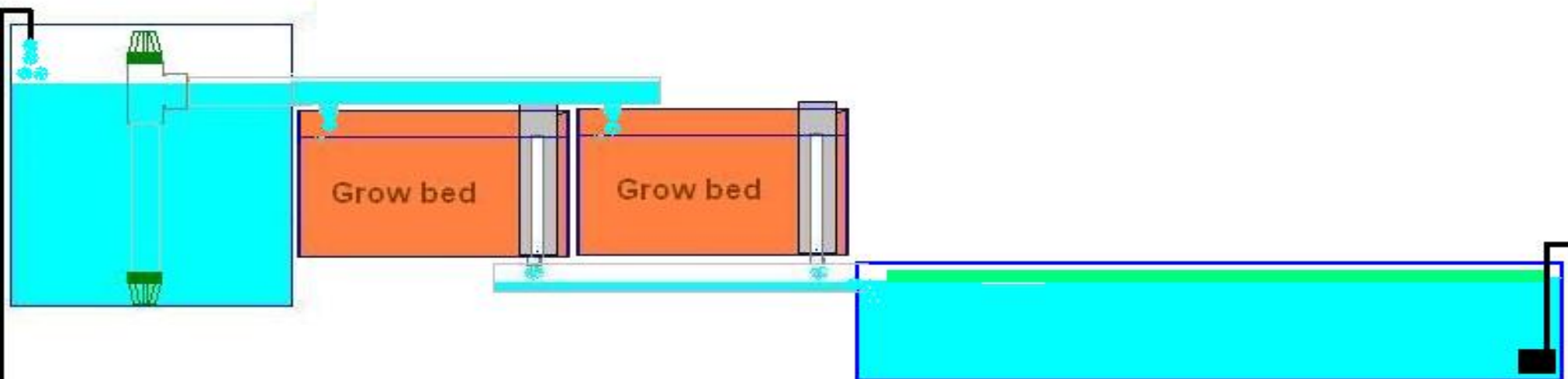
Clean Water Sump

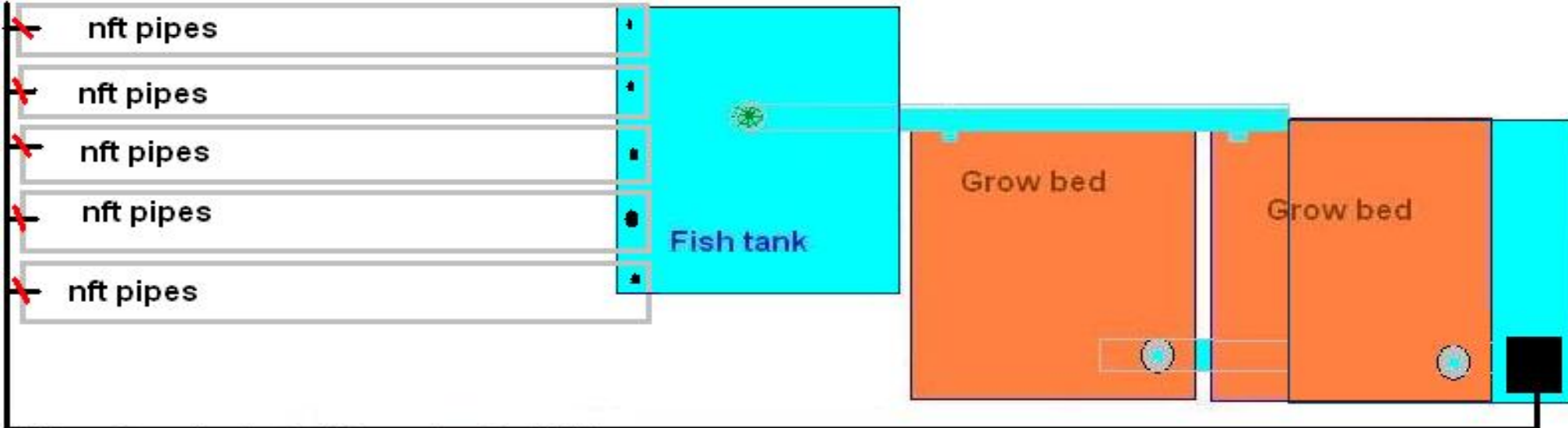
- ⇒ If you want a combo system a clean water sump CHIFT PIST (Constant Height in fish tank pump in sump tank) is a good way to go.
- ⇒ On the other had, if you do CHOP Mark 2 you can add additional filtration before the NFT, RAFTS or Towers if you add them.



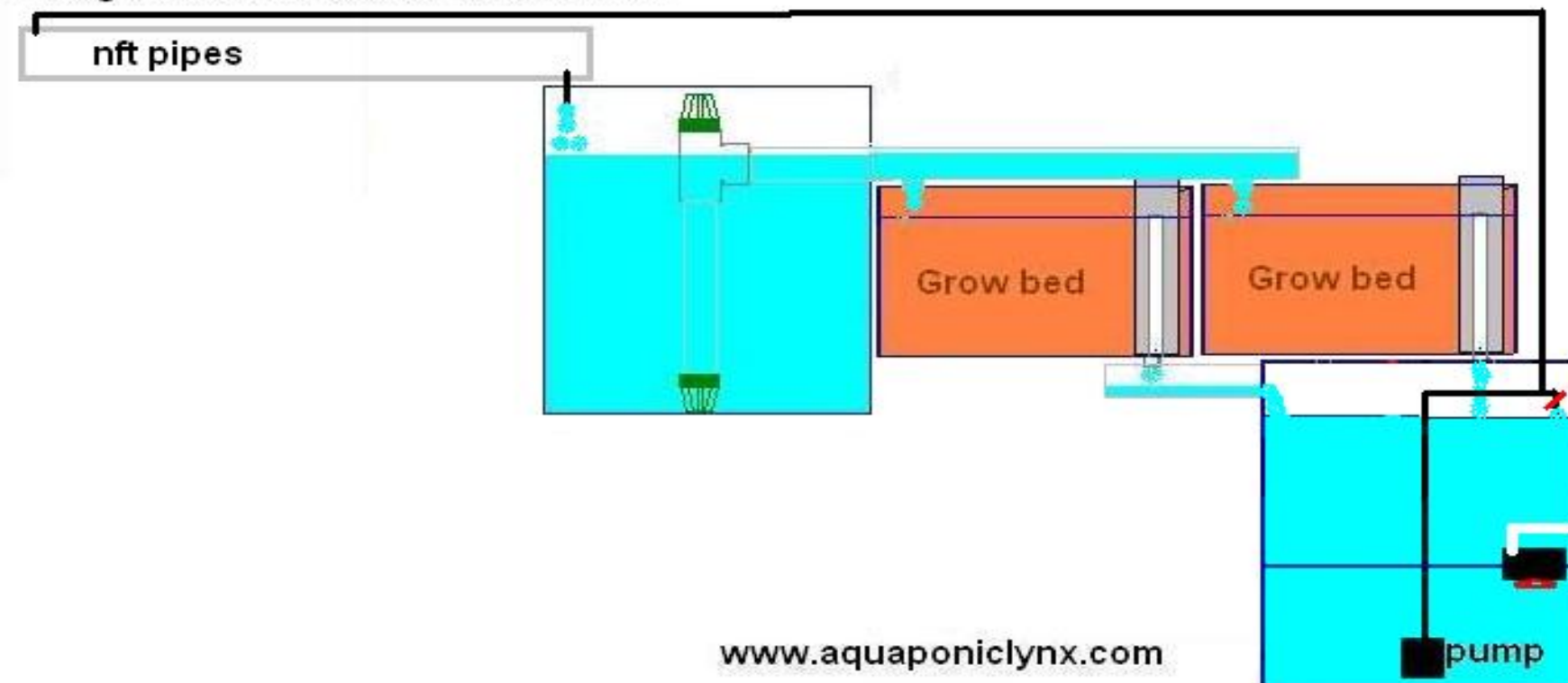


Using Grow beds to filter water for raft bed and the raft bed as sump.





Using Grow beds to filter water for NFT

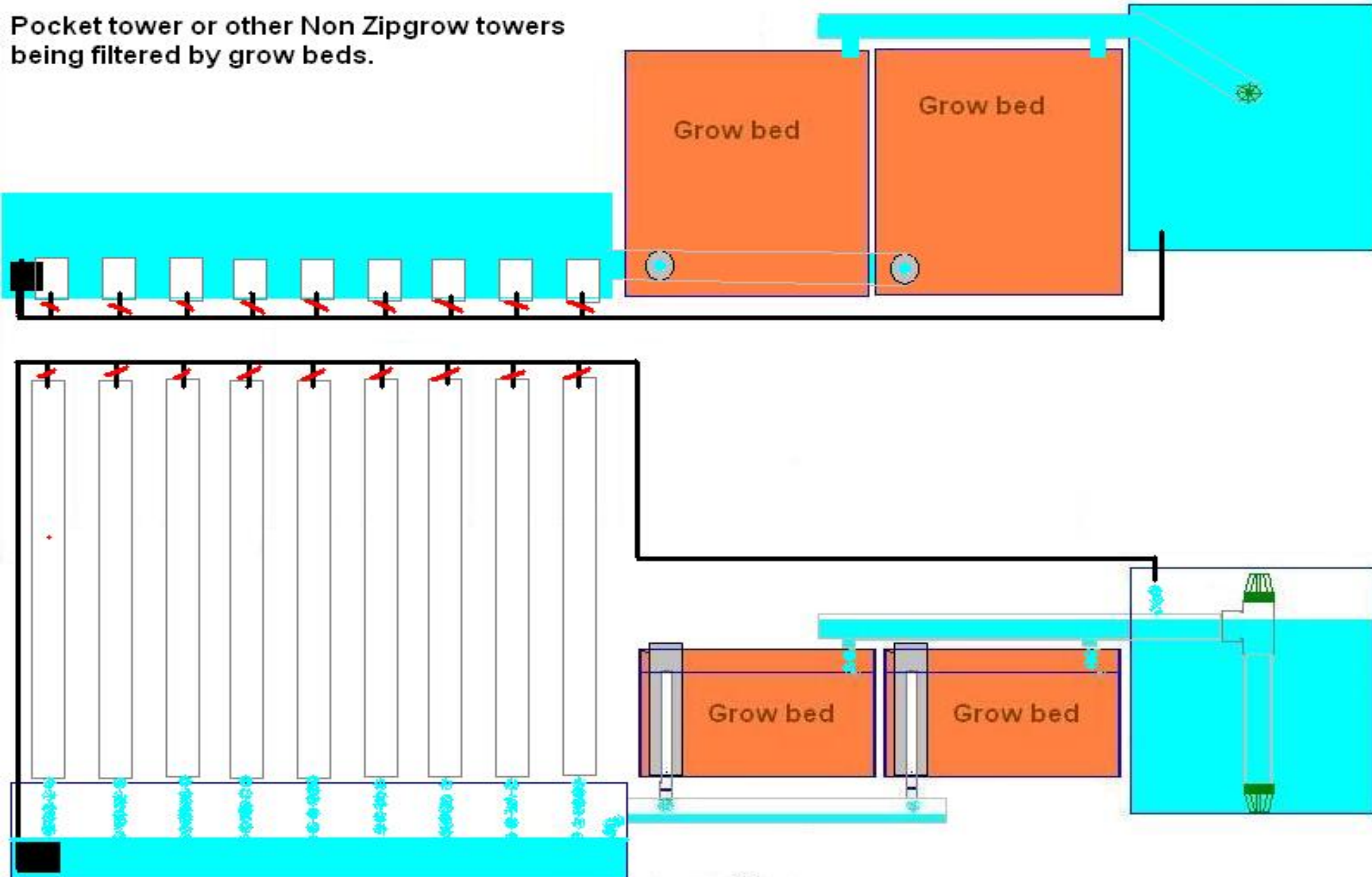


Towers

- ⇒ There are different kinds of towers.
- ⇒ Most require solids filtration and bio-filters.
- ⇒ Zipgrow towers are the exception.

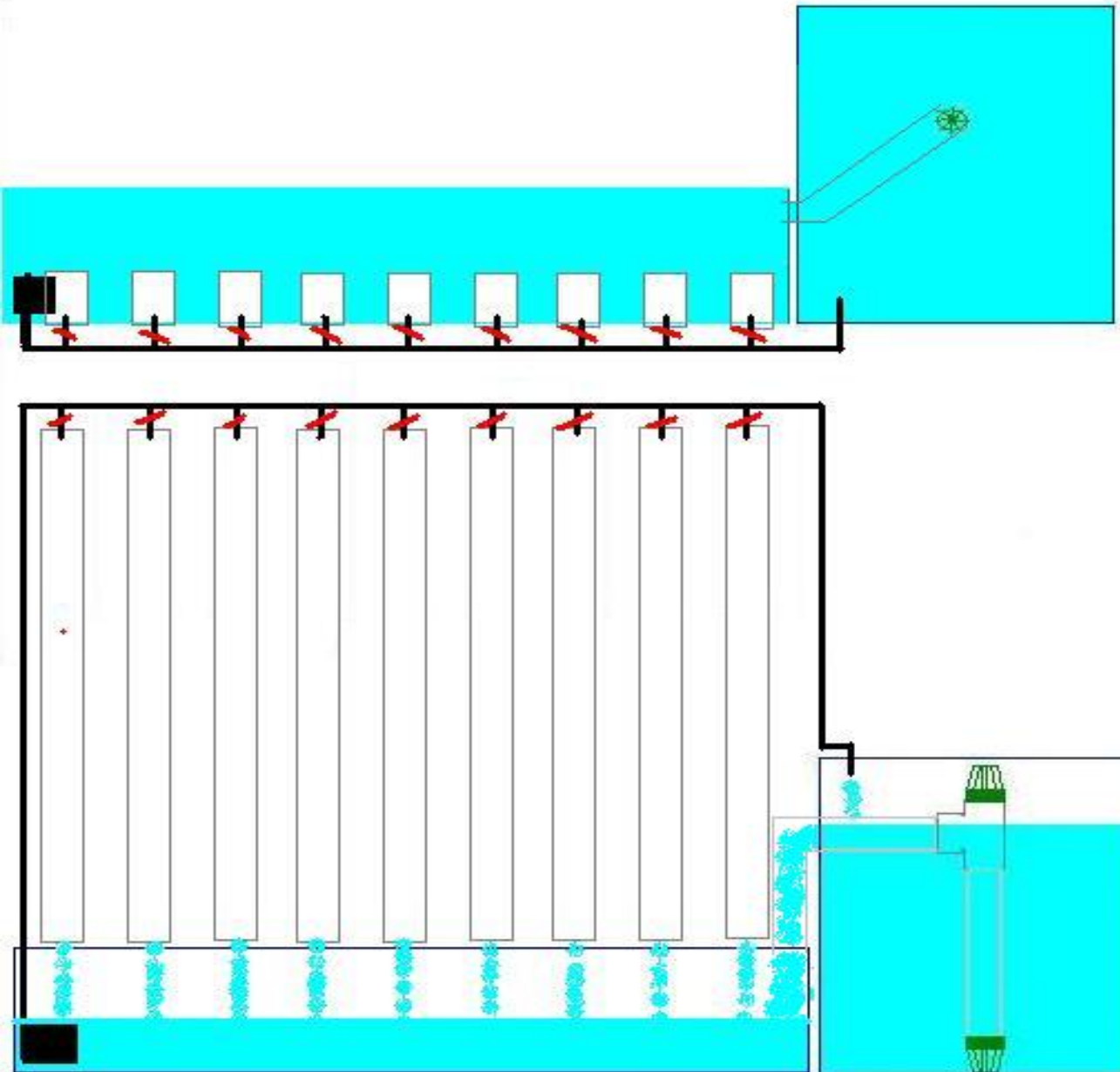


Pocket tower or other Non Zipgrow towers
being filtered by grow beds.



Zipgrow towers don't require filtration before the towers though keeping debris from getting into the feed to the towers will reduce clogging issues.

The Sump acts as a settling tank and can have extra filtration added to it if desired.



How much Media grow bed do you need For a Mixed System?

- ⇒ That is still being determined.
- ⇒ It will depend on many things.
- ⇒ There are only a couple of commercial scale aquaponics systems experimenting with media bed filtration instead of settling tanks and bio-filters.

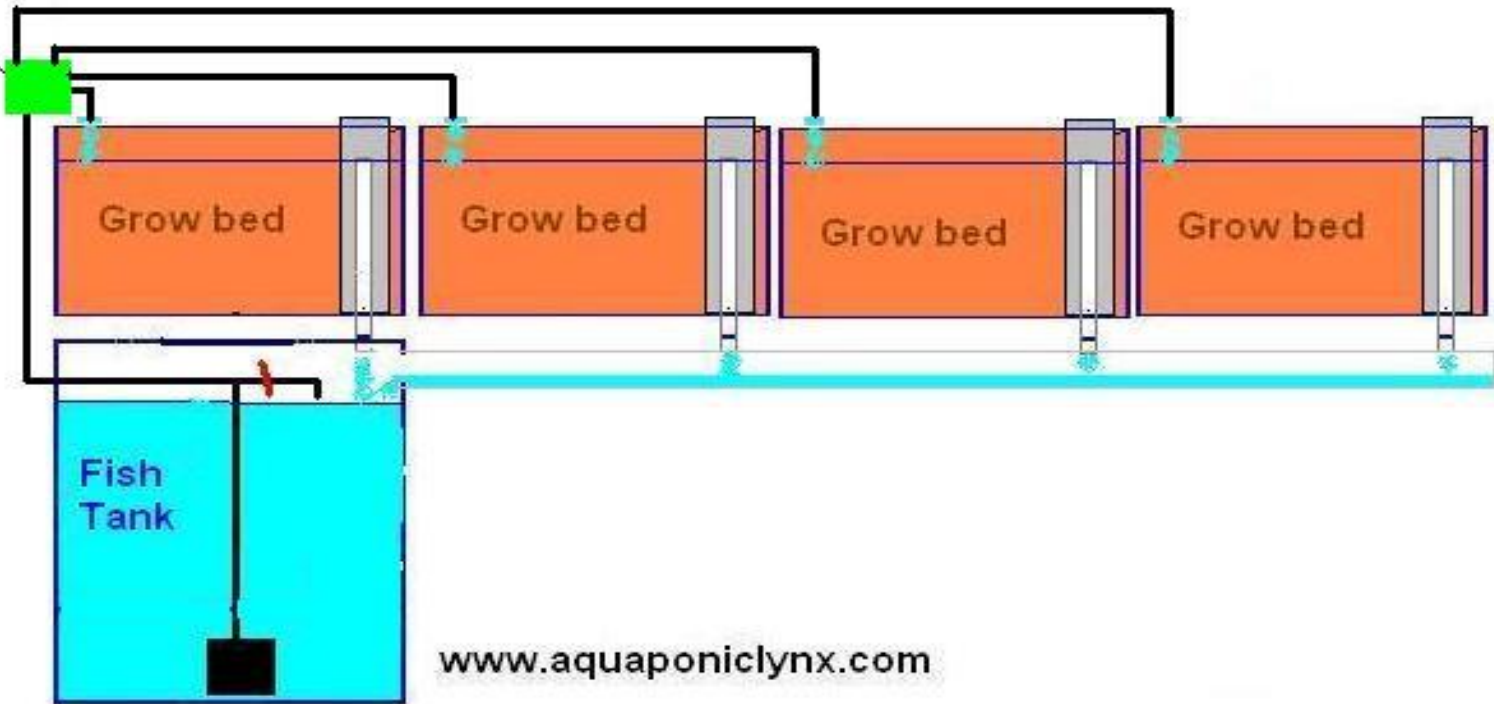


What about Sequencing?

- ➔ Aquaponics Indexing Valves allow for more grow beds with less water level fluctuation for flood and drain situations.
- ➔ Think of them as a Timed flood and drain system but the pump only stays off for short periods.
- ➔ Sequencing with Aquaponics Indexing Valves is most appropriate to simple and Chop Mark 2 systems.
- ➔ Pump sizing for flow and pressure is important For the Valve function.

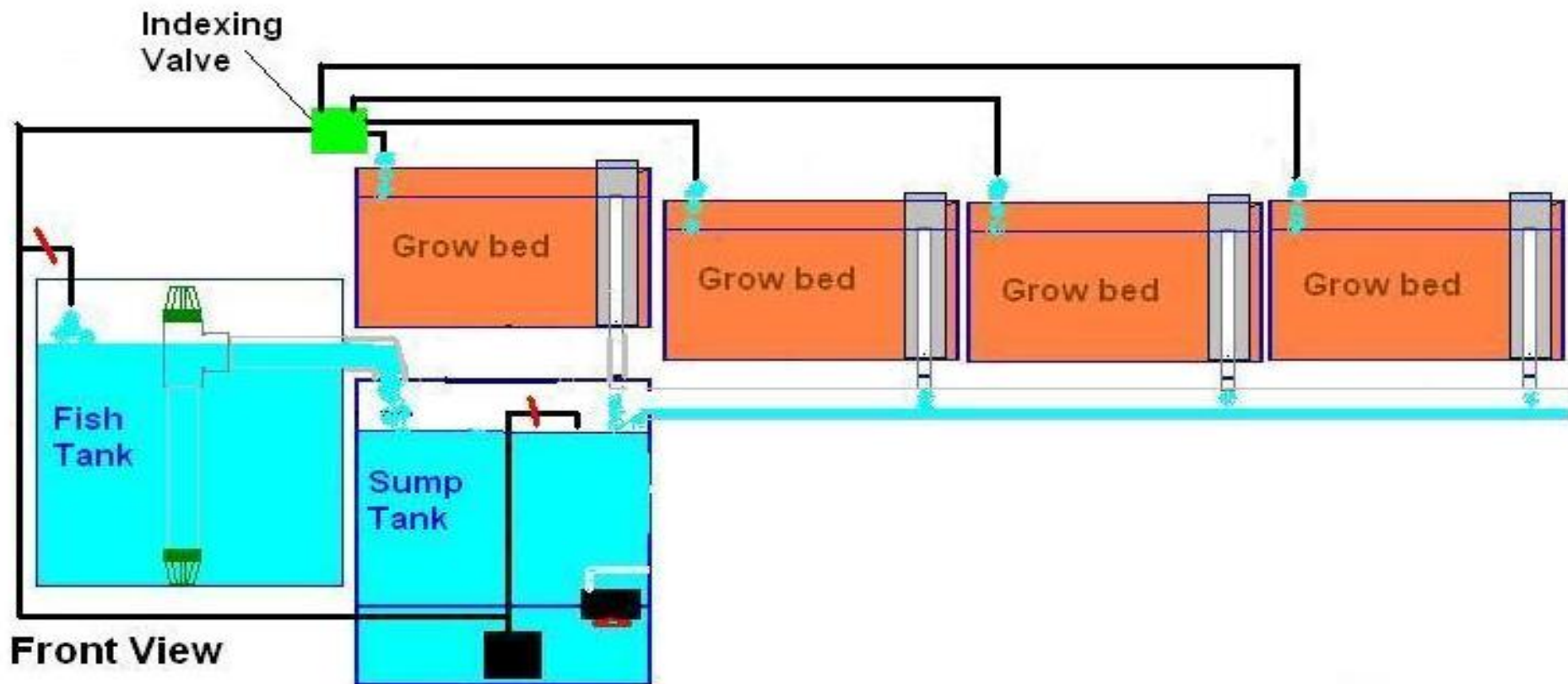


Simple System
Install with
Indexing
Valve



**Front
View**

CHOP Mark 2 With Indexing Valve



Front View

It's Only a ½ Hour Class

- ⇒ I would love to give tons more tips but I don't have time for everything right now.
- ⇒ Catch me online with some specifics of your proposed layout and I can help you out.
- ⇒ On the Web www.aquaponiclynx.com
- ⇒ TCLynx on Aquaponic Gardening Or the BYAP Forum.

