

Casa de Luz – Utilities

(Rev 2 – 4/8/18)

Table of Contents

- 1. Water Supply System2
 - 1.1. Well 2
 - 1.2. Well Water Filter System 2
 - 1.3. Water System Diagram 4
 - 1.4. Water Filter Cleaning 5
 - 1.5. Switching back to City Water Service 5
- 2. Sprinkler System6
 - 2.1. Sprinkler Controller 6
 - 2.2. Service of Sprinkler System..... 6
 - 2.3. Watering Garden 7
- 3. Swimming Pool8
 - 3.1. Maintenance - General..... 8
 - 3.2. Removing Leaves..... 8
 - 3.3. Filter Change..... 9
 - 3.4. Cleaning Filter (with pressure washer) 11
 - 3.5. Clean Rim (with “Limpa Bordas” 11
 - 3.6. Sanitation Treatment with IGUI “SOLO” 12
 - 3.7. Pump and Filtering time settings..... 12
 - 3.8. Ozonator 12
 - 3.9. Water Filling..... 12
 - 3.10. Shock Treatment, Flocculation – Special Instructions 13
- 4. Electrical System 16
- 5. Internet 16
- 6. Telephone..... 16
- 7. Garbage and Garden Waste 16

1. Water Supply System

1.1. Well

The well system operates fully automatic; the well pump comes on when the water level in the tank in the tower of Casa de Luz is low, or when the sprinkler system calls for watering.

Before water sees solenoid valves, it passes through a filter in the pipe from the well to the tank.

1.2. Well Water Filter System



Photo 2: Irrigation water filters (200 Mesh)

The two filters on the wall are in series and are both 200 mesh. (Coarser filter in front and finer following was intended but not implemented, because a finer, reusable stainless steel filter was not available). These filters are currently only used for the irrigation part of the well system.



Photo 3: Drinking water filter in fill line to tanks in tower of Casa de Luz

A third filter is mounted in the line to the CL water tower. It also has a 200-mesh SS element.

1.3. Water System Diagram

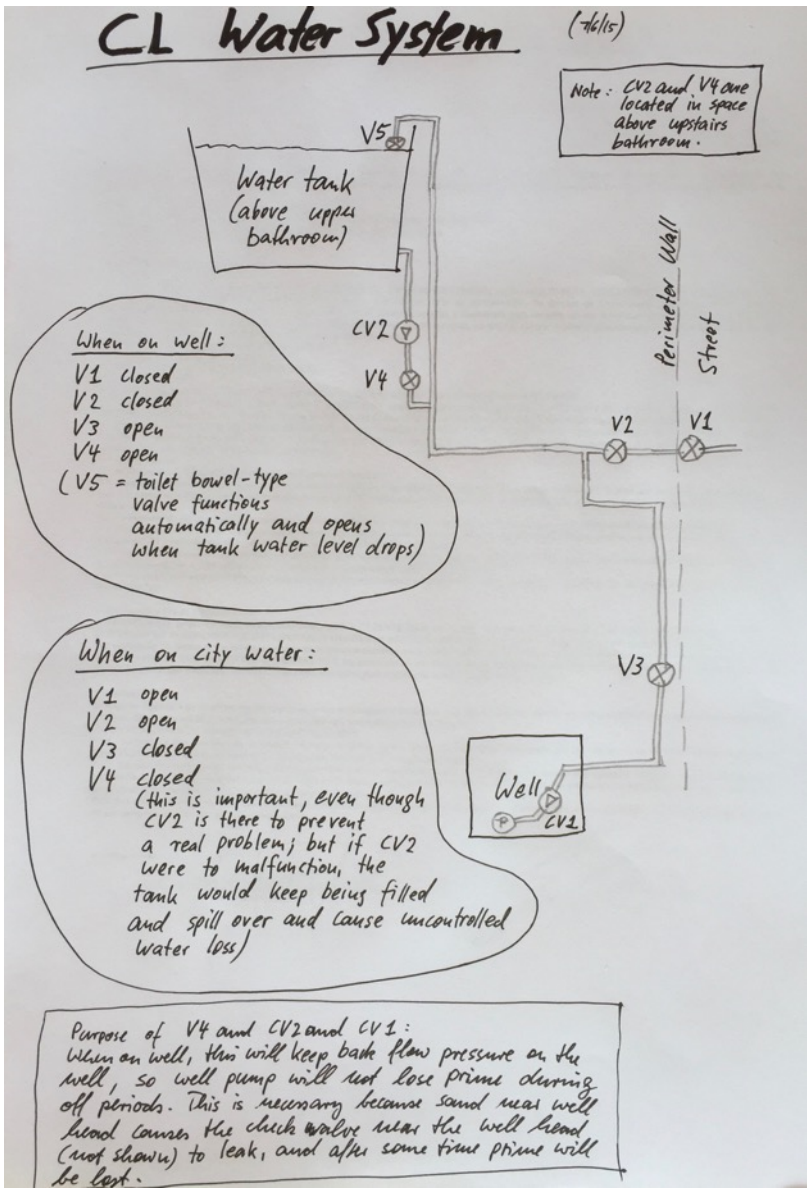


Photo 4: Rudimentary system diagram. The filter is located near valve V3.

Note the position and function of the valves and check valves.

1.4. Water Filter Cleaning

Forgetting to do this service will eventually prevent water from being pumped into the tanks and cause malfunction of the water distribution system inside the house. First, cold water flow will turn hot (i.e., cold water tank is empty, and water is now coming from the hot water tank).

Needed about twice/week:

-- open red ball valve of filter and flush until water is clear

Needed about once a month:

- turn off power to well pump (in control housing built into wall; left of two circuit breakers)
- close valve left of the filter (Photo 3)
- unscrew filter housing (caution: don't lose O-ring)
- clean under running water in utility sink
- re-assemble (insert filter element first, then housing over it; hand tighten shell.
- turn power to well pump back on



1.5. Switching back to City Water Service

This will likely occur very seldom.

- close V3 and V4 (see Photos 3 and 4)
- open V1 and V2 (Photo 4)
- turn off power to well pump.

2. Sprinkler System

There are 3 main sprinkler heads and circuits, and a few minor mist sprayers connected to each circuit. They run sequentially from a timer mounted in the control panel in the perimeter wall. Sprinkler valves are underneath the two in-series filters (Photo 2).

Run time is typically in the morning hours, approx. 15 min each circuit.

Note for Gardener: do not damage the wires to the sprinkler valves.

When sprinkling is activated, the black solenoid valve (bottom right in photo) turns on the well pump which provides flow to the sprinkler valves.



2.1. Sprinkler Controller

- Simply turn dial to “OFF” position during the rainy season, and to “AUTO-RUN” position at start of dry season. Programming will then automatically resume.
- The system has a Rain Sensor mounted on the wall. It prevents the sprinkler from running within 24 hours from a significant rainfall.

2.2. Service of Sprinkler System

- Pulsating sprinkler heads: adjust seasonally to make sure that they cover appropriate areas.
- Mist heads: may plug up with fine brown sand in spite of main filtering system; unscrew little heads and clean under running water by poking with fine solid wire
- If main heads are dripping in off position, sprinkler valves may be contaminated with fine brown sand. For cleaning do:
 - turn off valve V3 (Photos 3 and 4)
 - Carefully unscrew 8 (or so) screws with cross-head driver, lift gently straight up, and clean as needed. (May need to clip 24-VAC wires to solenoid)
 - reassemble, re-connect wires, test)

2.3. Watering Garden

During the dry season, the automated sprinkler system is likely insufficient, and supplementary watering by hand is needed:

- **first try to run sprinkler an extra cycle.** Observe functioning and sprinkling coverage (turn dial on sprinkler control to position “1,” “2,” or “3” and then press the button labeled “WATER ONE ZONE NOW”). This will water that zone for 10 minutes and then shut off automatically.
- use a hose connected to one of the 3 faucets in the perimeter walls
- **use only a short time – 5 min – in one position (ground is highly porous, and excess water will seep through and do no good other than waste precious water)**

3. Swimming Pool

3.1. Maintenance - General

Maintenance is required three times weekly. If maintenance is lapsed, problems quickly arise that cause extensive avoidable service.

Main potential problem: LEAVES

Raking leaves from top and bottom of the pool **three times weekly, or more frequently**, will prevent problems with the rover and the pump:

- leaves at bottom will clog the rover and prevent its proper functioning
- leaves getting into filter system will clog the filters
- leaves getting past the filter will clog the pump, venturi jet, or both. Pump will then start cavitating (pumping without moving water) and eventually burn out.
- It helps to **keep the stone deck free of leaves** at all times.

IF THERE IS A PROBLEM WITH THE POOL (SUCH AS PUMP NOT PUMPING CLOUDY WATER ETC.) GET IN TOUCH WITH KLAUS **IMMEDIATELY** !!! DO NOT WAIT A DAY OR TWO !!! It is likely that the problem can be solved when **immediate** action is taken; but there will undoubtedly be a MESS, TAKING A COUPLE OF WEEKS TO RESOLVE, if action is not taken **IMMEDIATELY**.

Contact Klaus at klaush@mcn.org (or WhatsApp at +1-408-731-0794). It will help to email a photo showing the problem.

3.2. Removing Leaves

THIS IS THE SINGLE MOST IMPORTANT POOL MAINTENANCE TASK.

Use fish net on pole. DO NOT SCRATCH POOL RIM WITH POLE (to prevent ugly, permanent scraping marks on the pool rim). Go after **EVERY** (!) leaf. Do **AT LEAST THREE TIMES PER WEEK**, more often when needed, such as after a storm.



Remove leaves



A clean pool

3.3. Filter Change

This must be done at minimum **THREE TIMES PER WEEK**

Follow these steps:

- turn off power at circuit breaker



- remove stone



- disconnect hose from vacuum plate
- remove vacuum plate
- remove stone on filter
- remove (now floating) plastic plug
- remove filter (by GENTLY *twisting*, until it's loose)



- remove white insert from bottom of the filter and insert it into the clean filter



- set positioning device into seat at bottom of filter well



- insert clean filter using positioning device



- GENTLY try to find seat position; remove positioning device; then, while keeping filter immersed with hand (so it will not float up) apply plastic plug and stone



- re-insert vacuum plate and stone holding it down
- attach hose from rover
- turn power back on
- do “Cleaning Filter” service

3.4. **Cleaning Filter (with pressure washer)**

Follow these steps:

- Do immediately following filter exchange
- turn on water to pressure washer
- spray with nozzle about 1.5 m distant from filter. Gently go up and down and all around, taking about 1-2 minutes for the entire procedure.
- Place cleaned filter in shade on stone deck
- Turn off water to pressure washer; close hose bib



3.5. **Clean Rim (with “Limpa Bordas”)**

This is not a critical task, should be done once per month, or when needed:

- Use a little bit of “**igui – Limpa Bordas**” (not more than 10ml) in a small bucket or plastic container; add a bit of water (perhaps 100ml)
- Use a soft sponge and apply to border (TRY TO GET AS LITTLE OF THE SOAPY SOLUTION AS POSSIBLE INTO THE POOL WATER – use pool water to wash excess soapy water from the rim to outside onto the stone deck.

3.6. Sanitation Treatment with IGUI “SOLO”

Must be done **Every Friday**.

- Fill measuring cup up to mark with “Solo”
- Empty into pool in several places (**AVOID SPLASHING Solo onto pool rim**)
- Clean glass with pool water
- Alert Horacio or Brunna if supply of Solo is dwindling.
- DO NOT DO “SHOCK” OR “FLOCCULATION” TREATMENTS (see 3.10) except when Klaus specifically authorizes this.

3.7 Pump and Filtering time settings



The pool pump requires no regular maintenance. (1/2 –HP pump; new in 2/2016). Do not change the filtering time settings. They are required for proper ozonation and cleaning. It is permissible to temporarily set the time to the “always run” position. **But make sure to set it back to normal timing within 24 hours.** (Timer settings: prongs in: pump off, prongs out: pump running; typical settings are 1 hr running, 1 hr off).

3.8. Ozonator

Requires no change, no service, no adjustments. Four green LED lights must be on when pump is running. **They are weak and can only be detected at night when dark.** If not, immediately contact Klaus.

Note: When pool pump is running, there should be air bubbles emerging from the two jets at the top of the pool. These bubbles contain mild residue of ozone, which an “experienced nose” can detect by smelling ...

3.9. Water Filling

Requires no service, no maintenance, **no adjustments.**

The pool is filled automatically with a very simple “toilet bowl”-type filler located in the filter compartment. There is an automatic drain in case the pool is over-filled in a rain storm. Natural drainage will take a day or so following the rain storm. However, we have intentionally plugged that drain with (an easily removable) black rubber cap.

3.10. Shock Treatment, Flocculation – Special Instructions

Follow these steps when shock treatment is necessary. (This should be necessary very seldom, perhaps not more than once or twice per year).

This procedure requires two service visits, the first will take about 30-60 min and should take place **in the late afternoon**, the second will take about 60 min and **must take place in the morning of the following day**. It will be necessary to wait or come back 1-2 hours after completion of the afternoon work, to turn the power off and prepare for vacuuming next morning.

1. **Measure PH** (with “OXI Medidor” -- in the example, “Solo (ppm)” shows ideal; “Cloro (ppm)” is irrelevant since we use SOLO treatment; “ph” is light orange, indicating that it is below 6.8, **and addition of 1 kg Barrilha Leve is needed (1/2 bag)**; and “Alcalidade Total” is ideal.



2. **Add Barrilha Leve** (as needed from step 1) and, **after 30 minutes running the pump**, re-measure to assure that ph is now in the required range between 7.6 and 7.8. Add more Barrilha Leve as needed to get to a ph value between 7.6 and 7.8. (To do this, add the powder into a bucket, fill it with pool water, mix a bit by squirling, and pour into the pool in various places, so it equilibrates all over the pool quickly). **To not splash chemicals onto the pool rim**. When the ph is OK, proceed to step 3.



3. **Turn off power and remove the filter cartridge**. Then turn **power back on** and set the timer switch to “run continuously.” Water is now being circulated (to mix the chemicals in the pool), but not filtered.

4. **Add ¼ liter of “OXI Algicida”** to pool. This is about 1 cup. (Fill the glass cup and carefully pour it into the pool, distributing it as well as possible over the pool; do not splash onto the rim).



5. **Add 1kg (1/2 bag) of Aluminum Sulfate** (same method to apply as described in step 2 above for Barrilha Leve).



6. **Add ½ kg (1/4 bag) of Barrilha Leve** to the pool (same method as before).

7. **After 60 - 120 minutes agitation turn power off** (let flocculation start).

8. **Prepare for removal of flocculants next morning:** disconnect the rover hose from the vacuum plate; introduce the orange hose with pole into the pool, making sure to fill the hose with water, and connect that hose to the vacuum plate.



9. Tell guests, if any, that pool must not be used until you are done next morning.

=====

10. **Next morning**, find the water clear, and flocculation settlements at the bottom and on the steps. These settlements are very volatile, and you must take care not to disturb them during the vacuuming process.

11. **Change the settings of the three valves in the pump box.** (The left and right valves, which are normally open, must now be closed, and the usually closed center valve – Esgoto -- must be opened).



12. Turn power on. Pump will start. **Carefully and slowly** pick up the pole and start vacuuming. The flocculation settlements are now being pumped out of the pool to waste. Slowly clean the entire bottom of the pool, then the stairs, **never moving so fast that the flocculants re-disperse in the water.** This process should take about 15 minutes. (During this process, the pool water level will sink; if you take too much time, too much pool water may be depleted and the pump starts cavitating -- which will get you into a whole lot of other problems). **When done vacuuming, immediately turn power off.**

13. Change the settings of the three valves (Step 11) back to their original settings.

14. Now disconnect the orange hose from the vacuum plate and remove the entire hose with pole from the pool; place it along-side the perimeter wall, where you found it.

15. Insert a clean filter cartridge and re-connect the rover hose to the vacuum plate as usual.

16. Turn power on, timer on 24-hour filtering.
(the photo shows the “normal,” not the 24-hour position).



17. On the next scheduled service day, do service as usual and set the filtering timer to its normal setting.

Note: The Filter will be quite dirty – clean it thoroughly. Use a **good** clean filter – it will likely again be quite dirty at your next visit. Depending on your best judgment, you might leave the filtering in the 24-hour position until your next service visit.

4. Electrical System

No service or maintenance required.

- **Circuit breakers:** at entrance door, inside, behind paper picture
- **220V 50Hz:** Mind that system operates at 220V, even though for convenience most of the outlets receive regular US-American plugs (220V service will burn out anything plugged into those outlets that is not fit for 220V, such as American hair dryers, Nutri-Bullet, and power adapters that do not auto-adapt to 220 Volts).
- **Nutri-Bullet: Connect to 110 Volts only !!!! Use big 1000-Watt transformer!**
- **Conserve energy -- lighting:** Off-position of outside lighting is marked at switches to facilitate easy-checking for lights on/off. However, the lighting along the perimeter wall is not marked and should be double-checked before leaving the house! Turn off perimeter lighting when you go to bed (so neighbors are not bothered by stray lights).
- **Conserve energy – A/C:** use sparingly; use miniblinds to keep sun out in late afternoon; use high cooling temperature settings (25 degrees)
- **AC instabilities:** Electricity service is often interrupted with short outages and spikes. Connect all sensitive equipment via **voltage stabilizer unit**, including: telephones, Internet power box, router, computer chargers, and alike. Note: the outlet of that device, going to the power strip **left** on the bench next to the dining table, is **110V**.

5. Internet

Provider is “EXPLORERNET.” Service is via microwave receiver from tower just south of house. A long, high-quality (CAT 6++) Ethernet cable gets the signal inside house. All Internet related devices (receiver power box, router, telephones) are connected via the power strip into the voltage stabilizer, which has a back-up battery that continues service during a power outage of a few minutes.

Note: If you are sensitive to electromagnetic noise, disconnect the gray Ethernet cable coming from the black box from the blue input port of the router and plug it directly into your laptop, and turn the power to router off.

6. Telephone

Our service is by Oi and is limited to **local calls only. DO NOT MAKE CALLS OUTSIDE THE 3343 prefix.** We suggest to use your Skype or similar VOIP facility.

7. Garbage and Garden Waste

Seal well in garbage bags (to control ants) and empty bin in kitchen **frequently**. Place bags into large green bin opposite to entrance of Pousada Amor e Luz close to the top of our road (Rua Infancia).