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- **Below we have explained in a step by step manner how to properly winterize irrigation systems. We understand that this can be a cumbersome and time consuming process. Natural Concept Landscape Co., Inc. performs this service every year for a vast majority of our builder, maintenance, and construction clients. Please use the contact information above to get all of your winterization questions answered or give us a call today and get your name on our winterization schedule and leave the work to us.**
- **Please be aware that certain municipalities require professional certification of the backflow device on your irrigation system. If you happen to receive a notice to perform this task, please call our office at 360-668-8530 and we will have our Certified Backflow Technician inspect, certify, and/or provide repair recommendations to ensure that you are compliant with all of your cities irrigation codes.**

Winterizing Your Irrigation System

1. Shut off the water supply to the irrigation system. The main shut off valve for your irrigation system needs to be "freeze proof". That means it should be below the frost line, inside a heated room, wrapped with insulation, or somehow protected from freezing. It doesn't do much good if the shut-off valve freezes and breaks! What if you don't have a main shut-off valve for your irrigation system? Then you'll need to install one!
2. If you have an automatic system then you will need to "shut down" the controller (timer) also. Most controllers have a "rain mode" which simply shuts off the signals to the valves. The controller continues to keep time, the programming information (start times, valve run times, etc.) isn't lost, and the clock continues to run, all that changes is that the valves don't come on. An alternative to using the rain mode is simply to shut off the power to the controller. If you do, you'll need to reprogram the time, and maybe all your other settings too, in the spring! How much electricity is saved by turning it off? That depends. Solid state controllers use very little energy-about the same as a night light. Mechanical controllers use more-as much or more than a 100 watt bulb in many cases. My rule of thumb is that if the controller has a digital time display you should use the rain setting on the controller. If the controller uses a dial, like a analog clock

face, turn off the power to the controller to save electricity. If a pump is wired to your controller you should disconnect the power to the controller rather than using the rain shut down feature. There is a remote possibility that the controller could damage the pump by accidentally starting it while the system is shut down.

3. Remove the backflow preventer, remove water from the risers, and cap the risers. (If you are lucky you can siphon the water out of the risers. More likely you will need to pump it out. I've found a wet/dry shop vacuum works fine with a few modifications. The hose on the vacuum is usually too large to work, you will probably need to rig a smaller hose onto it using duct tape.) Drain the water out of the backflow preventer and put it in storage for the winter. (You can reinstall it after the water's drained out if you want to, but I prefer to store it out of harm's way.) If you have valves installed above ground you need to drain the water out of them, it's a good idea to remove and store them also. An alternate method is to install pipe heating cables on the above ground valves and backflow preventer then install insulation over the heater cables. Of course you'll have to pay for electricity to run the heaters all winter, and if the electrical power goes off for an extended period... crack!
4. While we're on the subject of backflow preventers, your backflow preventer, along with any above ground pipe, should have permanent insulation installed on it. This is to protect it from those unexpected early and late season freezes! Those freezes are generally light, so insulation will give you the protection you need. Backflow preventers are very expensive to replace. A few years back an unexpected freeze resulted in so many broken backflow preventers that for a short period it was impossible to buy one due to lack of availability! One way to insulate the pipes and backflow preventer is to use the self-stick foam insulation tape which is available at most hardware and home supply stores. Do not block the air vents and drain outlets on backflow preventers! A cheap trick is to get some R-11 fiberglass insulation and wrap it around the valve or backflow preventer. (Crumpled up newspaper will also work for emergency insulation!) Then place a heavy duty plastic trash bag over the whole thing to keep it dry and use duct tape to hold it all in place. (For a more permanent installation you may want to use heavier plastic than a trash bag!) Don't seal the bag tightly, allow for an air passage at the bottom so water can run out and air can flow in! Just wrap it tight enough to keep the bag and insulation from blowing off. Insulation will not work if it gets wet! You can also buy ready-made insulation blankets for your valves and backflow preventers at most sprinkler supply stores. (You may need to special order them.) These consist of a large bag made from fiberglass filler sandwiched between soft vinyl cloth, much like a sleeping bag. This insulated bag goes over the backflow preventer and ties or padlocks in place. One brand that I have used is "Polar Parka". They get a free plug because they sent me a small sample insulation bag, about the size of a

bed pillow! I carry it in my truck where I use it as an emergency pillow, a hand warmer, or a great place to put six-packs of soda to keep them cold during the summer!

5. Now you need to remove the water from the pipes and sprinklers so that it won't freeze and break the pipe. There are two ways to do this, drain the water out through drain valves, blow it out using air, you can even suck it out sometimes with a shop vacuum (that's a lot of work though, you'll have to empty the shop vac over, and over, and over...!). Blowing out the system is the best method to use. I will detail how to do both blow the system and/or drain it, but I want to stress that blowing out the water is not a project I would recommend attempting for the average homeowner. I recommend that you hire a professional to do it for you. If you don't want to pay someone to blow the water out, then install drain valves and use the drain valve method below!

1. The Blow-Out method:

- This is not a method I recommend for amateurs! It is not a project for the average "do-it-yourselfer". Almost all big sprinkler systems such as golf courses and parks are winterized using compressed air. But one tiny little mistake-- and you will no longer own a sprinkler system. You will now be the proud owner of a bunch of buried plastic shards! So I recommend leaving this method to the professionals. If you try it and one of your sprinklers is launched like a bottle rocket, don't come crying to me!
- In order to blow the water out of the pipes you will need an air compressor, and it can't be just any air compressor! It needs to be a big, **BIG** air compressor. Probably bigger than that compressor you already own. In other words that high pressure, low volume compressor you use in the shop is not the right compressor to use! (Did I mention this isn't a project for the average do-it-yourselfer?) How big you ask? For a really small irrigation system (3/4" PVC pipe or 1" poly pipe) you will need at least a 20 cubic feet per minute air compressor. And that is so small that it is not going to do a very good job! Most experts recommend nothing smaller than a 50 cubic feet per minute compressor for a home sprinkler system. Professionals often use a large gas or diesel powered compressor that can discharge over 125 cubic feet per minute of air and can blow out a pipe as large as 3" diameter. For pipes over 4" they use a 250 cubic feet per minute compressor. Note: SCFM means "Standard Cubic Feet per Minute" and for our purposes here, it's the same thing as CFM. SCFM is a measure of CFM at a specific temperature and altitude.

- Here's what you should **NEVER** use. Do not use an air tank filled with compressed air or gas. Do not attempt to create more air flow by filling an air tank, then attempting to blow out the system with large bursts of air from the tank. Do not try to connect the exhaust pipe of your car up to the sprinkler system. Do not try to use a leaf blower or a vacuum cleaner with the flow reversed. Forget about using your electric tire pump.
- Each sprinkler system is different. I strongly suggest renting an air compressor rather than buying one until you have found an air volume that works well for you. Many variables effect the proper selection including local altitude, temperature, and type of pipe. Besides, it's probably a whole lot cheaper to rent one once a year.
- Start by removing the backflow preventer (for anti-siphon valves remove the whole valve). Hopefully the backflow preventer is installed right after the irrigation shut off valve where your irrigation system taps into the water supply. If it isn't you're in trouble. You could install a blow out fitting (usually a tee with a 1" side outlet, and a short length of pipe with a threaded cap on it) for connecting the compressor up to right after that shut off valve. Unfortunately, in most places you can't legally install a blow out fitting upstream of the backflow preventer(s). The reason for this rule is to protect against the possibility of some idiot hooking up some piece of equipment to the blow out fitting that would allow a pollutant to get into the pipe. Once in the pipe the pollutant could then be sucked into everyone's water supply (there's no backflow preventer to stop it upstream of the backflow preventer! OK, sorry, I know you're not stupid, and I didn't need to explain that.) Now, come on you say, what's going to be hooked up to it that would pollute the water? Well, a good example would be an air compressor. When you blow out that pipe out you are blowing more than air in, you are also blowing compressor oil into the pipe! Yuck. So if you do decide to go ahead and blow out the pipes upstream of the backflow preventer, and your family all come down with a bad case of the trots the next day don't say I didn't warn you! (Nothing like a little compressor oil to lubricate the old human plumbing system.) Fortunately, if your irrigation system is installed correctly you shouldn't need to blow out the mainline upstream of the backflow preventer! *Allow me to explain (like you have a choice!). The mainline between the water source and the backflow preventer is supposed to be installed in compliance with all codes that relate to potable water pipes (potable is a fancy term for drinking water). One of the requirements found in most plumbing codes is that potable water lines must be installed below the frost line to keep them from freezing, or some other method must be incorporated in the design to prevent freezing (such as a*

pipe heater). If your mainline upstream of the backflow preventer isn't designed not to freeze, see if you can figure out some way to drain the mainline (see the drain valve section above). If that won't work you may need to reinstall the pipe deeper, or install a pipe heater. Another option is to relocate the backflow preventer so that it is right after the irrigation shut-off valve so there isn't any mainline upstream of the backflow preventer.

- Next, connect the air compressor to the backflow preventer riser (on the downstream side). **Do not blow air through the backflow preventer or through a pump, you could damage them!** It is important that the air compressor has a pressure regulator valve with an accurate gauge on it. Do not turn on the compressor yet! If you have anti-siphon valves you'll skip this step (but don't skip the warnings!).
- Safety first! Plastic pipe is not designed to hold compressed air! Air does not behave the same way as water in a confined space. Weird and unexpected things happen! Put on eye protection and keep everyone away from the sprinkler heads. If the air becomes trapped by a pocket of water in the pipes it can suddenly "burp" free with enough force to explode the sprinkler heads! Always increase the air pressure in the pipes slowly. Never attempt to blast out the water with a sudden burst of air. If you can't get the water out with a steady flow of air, then you need a higher capacity air compressor.
- Using the automatic controller (timer), turn on the last valve that is furthest from the backflow preventer. Only turn on one valve at a time! If one valve is considerably higher in elevation than the others you may want to start with it rather than the last valve. But in most cases the last valve is the first one you should blow out. If you have manual valves just open the valve manually. If you have anti-siphon valves (which you removed earlier), you will not be able to open the valve (because you removed it?) So instead you will now need to hook the compressor hose up to the downstream side of one of the valve risers.
- Turn on the compressor and slowly increase the pressure. Carefully monitor the air pressure, never allowing the pressure in the irrigation system to exceed 50 PSI! You probably won't even need 50 PSI to blow out all the water. The lower you can keep the pressure, the better. Watch the temperature also! Air heats up as it is compressed (physics 101). The air can be very hot when it leaves the air compressor, hot enough to melt the plastic sprinkler pipe! It may be necessary to add some extra length of hose

between the compressor and the connection to the sprinkler system so the air can cool a bit before entering the sprinkler system piping.

- Allow the air to run until all the water is blown out and only air is exiting through the sprinkler heads. Don't blow air through the system any longer than necessary. If it takes more than 2-3 minutes for the water to get out, stop the compressor and let everything cool down for a few minutes, then start again. Be patient! Keep watching that pressure and temperature! The first valve will probably take a lot longer to blow out than the others because most of the water in the mainline pipes gets blown out of the first valve zone.
- After only air is coming out of the sprinklers, turn off the air compressor, and then turn off the valve. Open the next valve, turn back on the compressor and repeat the blow-out procedure. Continue until all the valve circuits have been blown out. Note that if you have anti-siphon valves you will need to switch the compressor hose to the next valve riser.
- Never turn off all of the valves while the compressor is still running! A valve must be open at all times. The goal is to blow OUT the sprinklers not blow UP the sprinklers!
- When all the valves have been blown out it is a good idea to repeat the entire process again, starting with the first valve.
- If you have a mainline section upstream of the backflow preventer that you are planning to blow the water out of, now's the time. Hook up the compressor to the blow out fitting just downstream from the irrigation system shut-off valve and blow the water out through the backflow preventer riser. Set out the Pepto-Bismol where the family can get to it easily!
- Put the automatic controller into "rain mode" when you're finished blowing the system out. (Or you can turn it off if you wish.) Install threaded caps over the open ends of the backflow preventer risers, anti-siphon valve risers, and any blow out fittings to keep garbage and critters out until spring. Store the backflow preventer inside for the winter.