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JP Landscape Services Maintenance Manual

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This Maintenance Manual will not only further your understanding of the basics of an irrigation system, lighting, lawn care, planting beds, trees and shrubs, drainage, hardscapes, and woodwork, but will also assist you with the identification and solution of any possible problems that may arise.

Irrigation

Basic Irrigation Systems: Most irrigation systems have similar components consisting of the mainline (the water supply connection to an irrigation supply pipe), and a backflow preventer (discussed during the backflow test). The mainline distributes water through remote control valves to smaller pipes called laterals; these laterals bring water to individual sprinkler heads or other water-emitting devices. There is not enough water to operate all of the sprinklers simultaneously, so the irrigation system is divided into different sections known as zones or stations. In most irrigation systems, only one zone (controlled electronically by a valve) operates at a time.

1. Winterization

- a. For freezing temperatures, irrigation systems should be winterized to avoid damage. This is done by blowing water out of an irrigation system using an air compressor. If water remains in the system, it will expand when frozen and could crack pipes, valves, and fittings.
- b. The **Blowout Method** is the most common way of removing water within an irrigation system before winter each year.

***JP Landscape Services can provide customers with this service each year.**

2. Spring Start-Up

- a. The following instructions are steps to turn your sprinkler system back on during spring.
 - i. First, turn on your sprinkler system and flush it out.
 - ii. To flush the system, open up the ends of the drip tubes. For sprinklers, remove head from at least the last head on each pipe, but for better results remove all of the heads.
 - iii. Run the water for several minutes to flush the irrigation system.
 - iv. After flushing, check the system by running it.
 - v. Look for any clogged emitters or nozzles.
 - vi. Replace any heads that may have been damaged or are spraying irregular patterns. Dysfunctional heads could create dry spots around your lawn in the long run.
 - vii. Check for leaking valves.
 - viii. Finally, check the controller for proper run times for each zone or station. This may be a good time to replace your controller's batteries.

3. Components of an Irrigation System

- a. **Controller** – Follow the directions from the actual manual for the controller
 - i. Irrigation controllers are used to schedule when an irrigation system waters by automatically opening and closing remote control valves according to the programmed schedule.

ii. **Two basic types of controllers:**

1. **Electro-mechanical controllers:** These are simple devices driven by motors and gears and are considered dependable, but they have limited features and are relatively inflexible in their ability to set different watering rates for different watering zones.
2. **Electronic controllers:** Although more complex, electronic controllers have more sophisticated programming capabilities allowing for more flexible irrigation schedules.

iii. **Installing controllers:** (follow actual manufacturer's manual for precision)

- Install controller indoors, if possible, in an accessible location.
- Harness wires from the remote control valves and pass them through a conduit in the wall near the controller.
- Connect the common wire to the common terminal.
- Take the other wire from each valve and connect it to a zone terminal on the controller. Connect them in the same order as the watering sequence.
- Turn on the power to the controller, and then test each zone.
- Program the controller.

iv. **Programming controllers:**

- Though different controllers have different methods of programming, they all require the following information to be entered:
 - Current day and time
 - What days to water
 - What time of day each cycle should begin
 - How long each zone should operate
- Once programmed, the controller may need to be modified from time to time by making adjustments in the program. Weather conditions or other factors may necessitate adjustments.
- Many controllers have a water budgeting percent key that is initially set to 100%. To double the run time of all zones, set the water budgeting key to 200%. To halve all station run times, set the water budgeting percent key to 50%.
- Most controllers have a semi-automatic mode that allows you to manually start a watering cycle.

v. **Best watering times:**

1. The best time to water is in the early morning or late afternoon.

b. **Sprinkler monitors**

- i. Environmental sensors are devices that interface with controllers shutting down an irrigation system when water is not needed. Different sensors are available that can monitor rainfall, soil moisture, humidity, or freezing temperatures.
 1. Rain sensors are the most common type and they have a collection device that gathers rainwater. When enough rainwater is collected, it disables the controller so the irrigation system cannot operate. Rain sensors are adjustable so that light showers will not shut down the system. When rainwater evaporates, the controller again operates as programmed.

c. **Valves**

- i. Valves are devices that regulate the flow of water in an irrigation system. Types of valves include main valves, flow valves, isolation valves, and drain valves. Valves are operated either manually or electronically. Most valves are directional, so when installing valves make sure the arrows point in the direction of flow.
- ii. Valves are usually located in an accessible location – in a buried plastic box that is usually green (sometimes purple for non-potable water).
- iii. **Common valves:**
 1. **Remote control valves:** Electronically-controlled valves that regulate the flow of water to different parts of a system. As previously discussed, irrigation systems cannot generally supply an entire system at once so they are divided into zones. Each zone has remote control valves that are normally closed. When power is supplied to the valve, it opens allowing water to flow to sprinklers.
 2. **Shut-off valves:** Manually operated valves that include gate valves, ball valves, disk valves, and butterfly valves. When installed near the water source, they can shut off an entire system in case work is needed on the mainline or control valves, or just in case of emergencies. Shut-off valves are not intended for frequent use compared to remote control valves.
 3. **Quick couplers:** Have a notched key that allows you to quickly connect a hose or sprinkler even while the system is still operating. Quick couplers on the mainline make water from an irrigation system instantly available for a variety of different uses.

d. **Sprinkler Heads**

- i. **Spray heads:** A continuous spray of water at distances ranging for 5 to 15 feet. There are two main types of spray heads: Risers and pop-ups.
 1. **Risers:** Fixed heads mounted on pipes projected from the ground. Permanently installed above the height of surrounding plants which is why they are best suited for planting beds or other areas where they are protected from damage, out of sight, or create hazards.

2. **Pop-ups:** Installed below turf line and when water is turned on, they pop up and spray. While water is turned off, they allow mowers to pass over them without any damage. Pop-up spray heads are available in a variety of different spray patterns including full-circle, half-circle, quarter-circle, and other special patterns for long, narrow strips. Pop-ups are most common in lawns and planting beds.

ii. **Rotors:** Rotors rotate in a full or partial circle and have larger spraying distances than risers or pop-ups, which is why they are best suited for large turf areas. Although rotors are higher priced than risers and pop-ups, they cover a larger distance causing fewer heads needed in a given area. Rotors also are available in pop-up models and in fixed versions for mounting on risers.

1. **Gear-driven rotors:** Similar to impact rotors, the water causes the gears of the gear-driven rotors to turn, which causes the head of the sprinkler to rotate.

4. Irrigation System Maintenance

a. **Controller:** Many possibilities could cause a disruption to the power supply that could cause controllers to malfunction. This could present as:

i. No display or the display is unreadable: In this type of case, the fuse may be burned out. In this case, first check the primary power source and if there is no power, there may be a build-up of static electricity. Disconnect the primary power source and backup battery for several minutes to allow static to dissipate.

ii. The time display is blinking: The program may have been lost, so check the program and reprogram if necessary. This would also be a good time to replace the backup batteries.

iii. If the controller is not opening and closing remote control valves properly, follow the following steps:

1. Check that you have power to the clock transformer, usually 110/120 volts.
2. Check that you have 24-volt AC from the transformer to the controller.
3. Check the fuse because a fuse may have been blown and this indicates a short in a wire or solenoid.

iv. If it has been determined that you have sufficient power, use the following steps to check valve wires for continuity and resistance:

1. Disconnect power to the controller.
2. Disconnect the common wire and one valve wire from the controller.
3. Put your maintenance check meter dial in the OHMS mode (Rx1) and calibrate the gauge.
4. Restore power to controller.

5. Place one probe on the disconnected valve wire and the other probe on the common wire. The meter will reveal the condition of the wiring and solenoids. Repeat for each valve.

5. **Things to watch for:**

a. **Over-watering or under-watering:**

- i. If you find that areas within a zone are being over-watered or under-watered, adjust the equipment for more uniform coverage. Once you have adjusted the equipment for different areas within a zone and determined the precipitation rate for each zone in the system, you can schedule your controller to apply the required amount of water. Uniform coverage of an irrigation system is important to prevent areas from being over-watered or under-watered. Sprinkler heads do not distribute water evenly throughout designated area because as distance from a sprinkler head increases, the amount of water reaching the ground decreases. This problem is solved by overlapping coverage in areas called head-to-head coverage.

b. **Problems with sprinkler heads:**

- i. **Distorted spray pattern:** If this is occurring with a sprinkler head, it is likely that the nozzle is clogged with debris. If this is the case, simply clear the debris. You may need to detach the nozzle to remove obstruction. Spray heads have a filter screen under the nozzle and if it becomes clogged then it should be cleaned or replaced.
- ii. **Heads discharge large drops:** If this is occurring, this could mean that the nozzle is clogged with debris or that the water pressure is too low. If debris is the case, follow the instructions above about a distorted spray pattern. If water pressure is too low, you can fix this by checking for leaks in the system. If the system is not leaking, you may need different sprinkler heads to operate at a lower pressure.
- iii. **Heads discharge a fine mist:** If this is occurring, this may mean that the water pressure is too high. Two ways to fix this are to install the remote control with flow control or to install pressure regulator valve on the mainline.
- iv. **Rotary sprinklers do not rotate or rotate too slowly:** Many of the following problems could occur:
 1. The water pressure is too low and this can be fixed by checking for any leaks in the sprinkler system.
 2. A bad gear drive mechanism (only in gear drive sprinklers), which can simply be fixed by replacing the gear drive.
 3. A break-up pin is improperly adjusted (only in impact sprinklers); this can be fixed by adjusting the break-up pin.
 4. Insufficient water is contacting the lever and the lever is impacting back of sprinkler head (both in impact sprinklers only); both can be fixed by adjusting the lever.

- v. **Pop-up sprinkler will not pop up:** If this problem occurs, this could indicate that the water pressure is too low and your irrigation system should be checked for leaks. Another reason the sprinklers might not pop up could be because there is dirt or debris in the spindle sleeve area and this should be fixed by removing debris or an internal unit may need to be disassembled for cleaning.
- vi. **Pop-up sprinkler sticks in up position:** The possible reason for this could be that there is dirt or other debris in the spindle sleeve area and can be fixed by removing debris or an internal unit may need to be disassembled for cleaning.
- c. **Basic field diagnostics:** Observation of an irrigated area can sometimes reveal problems with an irrigation system. Below are some conditions that may indicate problems:
 - i. If water continues to come out of the sprinkler head after the zone is shut off, this could indicate a leaking valve. A head located in a low point where water from the entire zone will drain can also cause this.
 - ii. If one part of the irrigated area is constantly wet, there may be a leak in the mainline.
 - iii. If grass in a particular zone is brown, the zone is not receiving adequate coverage, the following possibilities could be:
 - 1. Bad valve
 - 2. Bad wiring
 - 3. Leaking lateral
 - 4. Broken sprinkler head, which reduces pressure to the entire zone
 - 5. Insufficient watering time on controller
 - iv. If grass is brown around a single sprinkler head, the likely causes are a bad head or clogged/broken nozzle.

6. Backflow test

- a. **Backflow:** Each irrigation system has a backflow preventer so water cannot flow backwards and contaminate the water.
- b. **Backflow prevention:** To prevent backflow from occurring, all irrigation systems are required to have a backflow prevention device. Backflow preventers should be installed in an accessible location to facilitate servicing, testing, and inspection and also should be protected from freezing.

***JP Landscape Services can provide a backflow test for each customer each year.**

7. Water Freezing – Broken Pipes

- a. To prevent broken pipes within your irrigation system, make sure that you have your irrigation system winterized. (This method is mentioned previously within this section, and is also provided by JP Landscape Services for customers each year).

- b. If broken pipes do occur due to water freezing within the pipes, it is best to have professionals take care of it to avoid further costly damages.

Lighting

1. Replacing bulbs

a. Supplies

- i. Philips screw driver
 - 1. This is used depending on the lighting fixture, but some lighting fixtures may not need a screwdriver.
- ii. Rubber gloves
 - 1. Rubber gloves are recommended to use because the oils on your hands cannot get on the light bulb because it causes the bulb to burn out faster than normal.
- iii. Light Bulbs for the light fixtures

b. Steps to replace the light bulbs:

- i. First, make sure to turn off the transformer for the lighting system you are working on.
- ii. Use a Phillips screwdriver to unscrew the housing and lift the glass lens out of the housing and set aside. In most cases you will find the housing screws on the face of the light. On many newer light fixtures, the housings unscrew without the use of a screwdriver.
- iii. Once again, make sure to put on rubber gloves because most landscape lights use halogen bulbs and these require special handling. If the oils on your hands get on the bulbs, this could cause the bulbs not to last longer than normal. Remove the old bulb and handle the new bulb by touching the rim or reflector and not the actual bulb.
- iv. Next, check the old bulb and inspect the prongs for corrosion. If they are heavily corroded this could be the cause of the problem. There may be a leak in the watertight seal, which may cause you to have to replace the whole fixture.
- v. Place the two prongs on the bottom of the bulb into the two holes in the light fixture. Do this carefully while holding the reflector of the new bulb.
- vi. Finally, screw the housing back on. Then clean the lens and check the wire connectors for corrosion and then reposition the light to how you want it. This is a good time to check all the lights in the system and perform any preventive maintenance on the system.

c. **Reasons to replace bulbs annually:**

- i. A single burned out light bulb in your system increases the voltage to the other bulbs in the same line run, which greatly reduces the life expectancy of the remaining bulbs so replace the burned out bulb when first noticed.
- ii. If you live in a colder climate you may have an increase in bulb burn out due to the colder temperatures.
- iii. Although your lamp is still lit, the brightness of the landscape light bulbs decreases after 12 months.

2. Transformer timers

- a. **Seasonal:** check your transformer timers seasonally and change timers for the lights due to factors such as power outages or day lights saving.
- b. **Power outage:**
 - i. Unfortunately, the mechanical timer stops whenever there is a power outage. After a few power outages, your landscape light timer can be very inaccurate.
 - ii. A possible way to fix this problem all together could be a landscape light system that uses a light sensor to determine when to come on. This may not be a perfect solution to this problem because you may want the lights off late in the evening to save energy, or you might want to turn them on early for special occasions. This just depends on the owner's preference.

3. Low-voltage systems

- a. Low-voltage lighting systems run on 12-volt current and are popular for residential landscapes and are also popular in other locations where powerful light fixtures are not required.
 - i. **Advantages:**
 1. Inexpensive
 2. Simple to install
 3. Fixtures can be easily relocated if changes are desired
 4. You can do it yourself
- b. **Other information:**
 - i. 12-volt halogen lamps can be used with low voltage systems to provide effective lighting of an area.
 - ii. If long stretches of wire are used in a low voltage system, wire gauge size must be increased to compensate for the drop in voltage that occurs as distance from the transformer increases.

Lawn Care

1. Soil test

- a. A soil test for the pH levels should be done at least once a year.
- b. Soil testing can provide valuable information about the pH, nutrient deficiencies and compaction rate of the soil. This information will help you decide what fertilizers are necessary to prepare the soil for the grass.
- c. Soil testing samples should be taken at least 6 inches deep.

2. Core aerate

- a. Should be done at least once a year.
- b. Aerating creates small, evenly spaced holes throughout a turf area.
- c. **Aerating helps:**
 - Reduce soil compaction
 - Improve penetration of water, oxygen, fertilizer, and other nutrients
 - Break down the thatch (build up of debris and clippings)
 - Improve irrigation effectiveness
 - Create more room for roots to grow
- d. **When to aerate:**
 - i. Do aerate:
 1. Clay soils twice a year, in spring and fall
 2. Sandy soils once a year, in spring and fall
 3. Before fertilizing or reseeding
- e. **Do not aerate when:**
 - i. There is high heat or drought
 - ii. After applying pre-emergent herbicides
- f. **Aerating procedures:**
 - i. Make sure to water the lawn prior to the day of aerating. Moist soil improves the quality of aeration.
 - ii. Mark any sprinkler heads, power lines, or cables buried near the surface to prevent any damages.
 - iii. Run the aerator back and forth throughout the lawn as if you were mowing the lawn. Sandy soils and soils that are not highly compacted can be aerated in one pass, but in clay or compacted soil, it is recommended to make two passes. Make the second pass at a different angle.
 - iv. Extra watering is recommended after aerating, especially in hot conditions.
 - v. Finally, reseed or fertilize (if necessary) after aerating your lawn.

3. 60/40 Topsoil Mix

a. When to overseed:

- i. Overseeding can be done in the spring or fall – once a year.

b. How to overseed:

- i. Select a grass seed or blend that best meets your needs for color, texture, shade, drought tolerance and general maintenance.
- ii. Mow lawn shorter than normal, because this will allow seeds to fall to the soil and allow light to reach grass once it germinates. Make sure to remove clippings and other excess thatch in the lawn area. If soil is compacted, rake or aerate the lawn before overseeding.
- iii. Apply seed with manual seed spreader or power spreader.
- iv. Apply a slow-release nitrogen fertilizer.
- v. Water well keeping the seeds moist, this can take several watering per day. After seeds take root, watering frequency can be reduced.

c. Overseed – cover with peat moss:

i. Peat moss:

1. Aerates plant roots by loosening heavy soil.
2. Adds body to sandy soil.
3. Saves water by absorbing and holding moisture.
4. Reduces leaching of nutrients present in or added to the soil, releasing them slowly over time.

- ii. **Existing lawns:** Adding peat moss to existing lawns is easy. It saves you time and money in the long run by clearing up disease problems, thatch, and the amount of water your lawn requires. You do that by "top dressing" (adding a thin layer of peat moss) to the top of the lawn, gradually conditioning the soil. If you wish, supplement peat moss with an equal portion of well-sifted compost, which adds nutrients.

- iii. **Aeration:** To significantly improve existing lawns, aerate the lawn, and then apply a "top dressing" of peat moss. Aeration removes plugs of soil from the lawn, loosening compacted areas and promoting deeper grass root growth.

4. Dethatching:

- a. Thatch is the build-up of grass clippings and other debris that accumulate in the area between the soil surface and the blades of the grass.

i. When to dethatch:

1. When thatch is more than ½" thick
2. When turf is not under stress from high heat or drought
3. When turf is dormant until just before the growing season starts, as dethatching can severely damage the crown of the grass if it has actively started to grow

ii. **Procedure for dethatching:**

- Mow lawn half its normal mowing height
- Set blade depth and spacing; blade depth should be slightly below the soil and blade spacing for thick grass about 3 inches and thin grass 1 to 2 inches
- Make several passes across the lawn using a crossing pattern.
- Remove thatch
- Extra watering is recommended after dethatching
- Re-seed or fertilize (if required) after dethatching

b. **Basic Procedure to get rid of moss in your lawn (Black moss):**

- i. First, you need to kill the moss and there are several chemical mosskillers such as ferrous sulfate which the material most-often contained in such products and it will turn moss black in a short period of time. Once it has turned black, rake it out of the grass. Should bare spots remain, prepare the soil and reseed the affected areas.
- ii. Some of the spring fertilizers also contain a moss killer, so you can accomplish two jobs at the same time if you have not already fertilized. This may be the easiest way to remove the moss. Follow application directions on the label of the product you use.
- iii. Once the moss has been eliminated, it is time to correct the soil condition that caused it to flourish by taking a soil test.

c. **Tips to avoid moss from reoccurring:**

- i. Make sure there is a minimum amount of shade on the grass.
- ii. Keep of the lawn during the winter months to avoid compaction of the soil.

5. **Fertilizer schedules**

Fertilizer Supplier Recommended Lawn Maintenance Schedule

Item	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
22-3-9			1									
22-5-5						2						
21-4-2										1		
22-3-9											1	
Dimension pre-emergent for Broadleaf weeds			1							1		
Ferrous Sulfate			1							1		
Lime			1									

***Example:** If you were to use item Ferrous Sulfate, then the table shows that you need to fertilize one time during the months of February through April and one more time during the months of September through November.

a. **General information for fertilization:**

- i. Generally, lawns should be fertilized at least twice per year.
- ii. For lawns to have the best possible appearance, four or five applications a year may be required. Each application of fertilizer should be a fraction of the desired annual total. For example, if you fertilize three times a year, you should apply $\frac{1}{3}$ of the desired annual amount each time you fertilize.
- iii. Lawns should only be fertilized when actively growing.
- iv. **General Rule while applying fertilizer:** Apply 25% as much phosphorus as nitrogen, and 50% as much potassium as nitrogen.

b. **Fertilizer application:**

- i. Distribute fertilizer evenly over a lawn to prevent light/dark streaks from appearing.
- ii. After fertilizing with granular fertilizer, follow the watering instructions on the product package.
- iii. Different formulations may be appropriate in different seasons. For applications in late summer or early fall, formulations higher in phosphorus and potassium and lower in nitrogen may help prevent winter damage.

6. **Newly installed lawn**

- a. For newly installed lawn, it is important to be very careful mowing your lawn the first few times to prevent damage of the lawn.

b. **Sod**

i. **Possible problems with sod:**

1. **Sod not rooting:** Most sod varieties will begin to root within 10 to 14 days. First, check the watering schedule and adjust to deeper, less frequent soaking. Another cause could be excessive shade; this will slow down rooting.
2. **Foot traffic:** This problem could be drought-stressed spots in the lawn. This can be fixed by trying to increase minutes per watering or check/adjust sprinkler coverage.
3. **Mushrooms:** This may be because mushrooms usually grow in compost mixed into the soil at preparation. This is easily fixed from when watering gets deeper and less often, mushrooms usually dry up and wither away.
4. **Shrinking:** Sod is shrinking or has pulled up at the corners causing edges to turn brown or gaps. This is due to lack of water and can easily be fixed by increasing minutes per watering and frequency to minimize gaps. Also, hand watering sod will help shrink gaps. It may help to press down the edges with your foot after watering.

- i. **Care and maintenance:** For the first two weeks, water once a day unless the weather is very dry. After two weeks, sod should have developed a root system and watering can be cut back. Deep rooting is promoted by less frequent

watering, resulting in increased drought tolerance. Begin mowing when grass is securely rooted. Cut grass $\frac{1}{3}$ of its original height but be sure the grass is completely dry beforehand. Mow diagonally to the seams and remove excess clippings.

c. **Seed**

i. **Possible problems from brown spots or bare spots:**

1. **Too much fertilizer:** Applying too much fertilizer to your lawn could cause brown spots or bare spots. This can be fixed by watering the spot thoroughly and after about one month, try planting new seeds on it.
2. **Foot traffic:** Too much activity in the same area of your lawn may cause brown spot or bare spots. You can fix this problem by aerating the soil.
3. **Too much water:** Watering your lawn too frequently could cause your lawn to get brown spots or bare spots. Too much water will drown the roots causing them to rot. To fix this problem, try to water this area much less and once it has dried out overtime, try reseeding the area.
4. **Disease:** A lawn disease could be the cause of a brown spot or bare spot in your lawn. This problem does not ever completely go away because the problem is deep in your soil, so the best way to treat this problem is to continue watering and fertilizing the bare spot and possibly re-seeding it overtime.

- ii. **Care and Maintenance:** Once seed has been planted, it must be kept moist. It should be watered lightly several times a day. During the first three weeks, it is important to suppress weeds either manually or chemically. After one month, reseed areas in the grass where it did not grow as well or is unevenly grown. Begin mowing when grass reaches a height of approximately 4 inches. Cut the grass $\frac{1}{3}$ of its height and be sure the grass is dry before mowing for the first few times. Finally, remove any excess clippings.

d. **Hydroseeding**

- i. **Uneven growth:** To help prevent uneven growth from occurring when hydroseed is planted, make sure to take care of your lawn very carefully for the first few weeks because it determines how the entire lawn could turn out. See instructions for care and maintenance below.
- ii. **Care and maintenance:** Hydroseeding has slightly different maintenance than seeding and sod. First, do not water until hydroseed has completely dried because this allows the tack to set which helps hold the mulch, seed, and soil together. The soil surface should be kept moist for a period of 6 to 8 weeks. To prevent washouts, it is recommended to avoid watering when heavy rains are predicted. To prevent fungus, it is recommended that you water thoroughly every other day when temperatures are 85 degrees or higher.

- iii. **The right time to mow:** After maintaining your lawn for the first several weeks, you can finally mow it after the grass has reached a height of about 4 inches. Do not cut more than about $\frac{1}{3}$ of the grass off in the first cutting. Do these steps for the first 3 to 4 times you mow.

Planting Beds

1. Installing a Top Dress

a. Keep plants looking healthy

- i. Top Dressing is when you add fertilizer on top of the soil around the plant. The benefit of top dressing is that the fertilizer seeps into the soil slowly with watering and rain feeding over a longer period of time.

b. Roots need oxygen

- i. 2-inch bark mulch
 1. 2 inches of bark mulch in a planting bed is the maximum amount that should be applied at one time. This is because if there is too much bark mulch around the roots of the plants then it can damage the plants not allowing enough oxygen to reach the plants.
 2. When applying bark mulch, more is not always better.
- ii. Remove around the base of trees or shrubs
 1. For the proper procedure for the care of trees and shrubs, look at the next section on trees and shrubs.

2. Lack of cultivating moss growth

a. Moss growth within planting beds

- i. The growth of moss on the surface of flower beds and other areas is less a menace to other plants but is an indicator of soil and moisture conditions that may or may not be favorable for other plants.
- ii. In some instances, moss is viewed as a positive addition, providing soil stabilization, soil cooling, and companion planting for ferns and other shade garden plants.
- iii. The presence of moss is a symptom of soil conditions that keep some flowers and shrubs from thriving.

b. Removing moss

- i. **Mechanical removal:** Moss is shallow rooted, so you can scrape moss from the surface of your soil with a hoe or other light garden tool without disturbing the roots of your other garden plants. It will generally come back over time, but if

the area is small, or if you want to keep the soil acidic for your other plants, this may be all you need to do.

- ii. **Chemical removal:** For chemical removal of moss, purchase moss-killing products found at a garden store. These are not generally the best for vegetable or herb gardens, but can be used in lawns and flower beds. Application forms include liquid spray or granules that you sprinkle over the surface of the soil and moss. Pay close attention to application instructions on the containers so as to avoid accidental damage to other plants.

Trees and Shrubs

1. Care of each plant

a. Watering

- i. **Deep root watering:** Avoid frequent light watering because this promotes the development of shallow root systems that are susceptible to summer heat stress and winter drying. Less frequent, but deeper watering (12 to 18 inches) helps plants develop a deeper root system that is less susceptible to environmental stress. When watering, allow time in between for the soil to become partially dry.
- ii. **Winter watering:** Extended dry periods of time can damage root systems but damage is not noticeable until following spring or early summer.
 1. **Guidelines for winter watering:**
 - a. Water when temperatures are above freezing.
 - b. Water early in the day so soil will absorb water before evening temperatures drop below freezing.
 - c. Water the entire root system

b. Fertilization

- i. It is best to fertilize trees and shrubs when they are actively growing and have available water to absorb nutrients.
- ii. This period may change, but generally the best time to fertilize is in spring after new leaves emerge through mid season.
- iii. Avoid fertilizing in the late season and during periods of drought.

c. Pruning

- i. There are different methods and reasons for pruning, but the overall reason to prune trees and shrubs is to improve overall health and appearance or to control/stimulate growth.
- ii. **When to prune:**
 1. In many cases, trees can be pruned anytime of the year.

2. If you are pruning to remove dead limbs, prune when leaves are out so dead limbs can be identified. Another option is to mark the dead branches when leaves are out and remove them later in the year.

- iii. **What to avoid:**

1. Avoid cutting branches along the trunk
2. Avoid leaving a branch stub
3. Avoid pruning the trunk, including a divided trunk
4. Never top a tree

2. Tree stakes

- a. Remove tree staking material after about one year of growing season.
- b. Tree stakes are simply there to help support a freshly planted tree from wind in the area until the tree is stable enough to support itself on its own.
- c. **Choking**
 - i. Bark on a young tree should be protected with tree wrap, or a plastic spiral wrap, during its first year of growth. Place these wraps around the trunk of the tree, between the first set of branches and the ground. When placing any sort of bindings around a tree trunk, it's very important to check them from time to time to ensure they aren't choking the tree trunk as its trunk diameter expands.
- d. **Rubbing**
 - i. Tree bark protectors help protect anything from rubbing onto the freshly planted tree causing any sort of damage.
 - ii. Tubes that are slit lengthwise and gently coil around the trunk of sapling trees 1 to 3 inches in diameter, provide protection from:
 - rodent damage
 - string trimmers and “weed whackers”
 - lawn mowers

3. Soil type

- a. Know the soil type before planting trees (by conducting a soil test) in order to be able to give the correct fertilizer the trees or shrubs desire. There is a soil type for every plant to thrive in so make sure that newly planted plants can survive in your soil conditions.
- b. **Adapting to soil conditions:**
 - i. Larger plants generally need more time and care to adjust to planting than do small seedlings.

Drainage

1. Maintenance:

- a. It is extremely important to make sure to keep an eye on any areas that look like potential drainage problems. Regular maintenance of a drainage system including inspection of the surface of the drained areas will reduce any problems that could arise. If you notice

something small, it is likely that this problem will soon become a big problem that may be harder to fix compared to when it was a small problem.

2. **Types of drainage problems:**

a. **Standing water**

- i. If you have standing water for more than 24 hours, than you are experiencing a drainage problem.

b. **Foul odor**

- i. A foul odor in your yard is due to the lack of the water being able to drain, which is causing there to be an odor. To get rid of this smell, make sure that you inspect your yard and make sure that you don't see any standing water that could be creating this problem. Once you have gotten rid of all the standing water throughout your yard, the odor will disappear.

c. **Insects**

- i. Any standing water within your lawn attracts insects and other bugs. To keep insects away, just make sure your lawn does not have an excess amount of standing water.

d. **Plants dying**

- i. If you notice that plants are dying in your yard, this could be because there is once again an excessive amount of water around your plants. See excessive water below to learn how to solve this problem.

e. **Mud**

- i. If you are experiencing mud around your yard, this may be because the layout of your yard is not allowing water to drain properly. See yard layout below to learn how to solve this problem.

f. **Excessive water**

- i. An excessive amount of water can drown evergreens, flowers, and other landscape. To solve this problem, you could install catch basins and atrium grates to remove excess water to protect. This will help to prevent root systems from overwater and rot.

g. **Improper drainage**

- i. Without proper drainage systems, excess water around a home could damage the foundation and basement walls. Furthermore, water entering the home could promote growth of mold. To fix this problem, you could direct water from a downspout through a catch basin which prevents the clogging of your drainage system by roof debris.

h. **Yard layout**

- i. If your yard has dips and other slopes that meet, this could cause puddles of water to form and create a muddy mess. Puddles of standing water also invite mosquitoes and other insects. To solve this problem, you could once again install catch basins

and grates installed in low spots so it will not give water a place to stand. Water can be piped to a pop up emitter or a French drain allowing water to drain elsewhere.

i. **Clogged drains**

- i. It is very likely that drains throughout your lawn could become clogged from debris. If you notice a puddle of water surrounding your drains, this is because they are clogged and the debris blocking drain must be removed.

Hardscapes

1. Cleaning pavement

- a. **Cleaning:** Cleaning at least once a year by a high pressure cleaner is recommended.
- b. **Pressure washing pavers procedure:**
- i. Clean in a direction so the water drains and you are not fighting gravity.
 - ii. Select a nozzle which will determine the PSI, depending on the nozzle's opening. Most manufacturers suggest a higher PSI of 3000 or more for cleaning concrete and stone pathways and a PSI less than 3000 for brick surfaces. Also, most models include nozzles specifically designed for cleaning concrete, masonry and stone.
 - iii. Attach any accessories when you connect the nozzle.
 - iv. Start the pressure washer and test the spray. Begin by spraying away from the pathway and then slowly point the wand toward it from 3 to 4 feet away. Make a few passes and then stop for a moment to see if the surface is clean. If not, move closer to surface. Make slow passes to rinse the pathway of all dirt and other debris using water only.
 - v. Keep in mind that the grout between masonry and stone is vulnerable to pressure. Use care on these areas by not focusing the spray on them for too long or at a direct angle.
 - vi. After turning the pressure washer off, add a chemical for treating the pathway surface. The correct chemical will vary according to the surface material. Add the chemical using the injector or special nozzle on the pressure washer. If you won't be applying a chemical solution to the surface, proceed to step 9.
 - vii. Start the pressure washer and test the spray. Begin by spraying away from the pathway and then slowly point the wand toward it from approximately the same distance as when you rinsed the pathway surface. Make slow, systematic passes to coat the pathway evenly with the chemical solution.
 - viii. After waiting 5 to 10 minutes to let the solution work, pressure wash the pathway again using water to rinse away the chemical.
 - ix. Allow the pathway to dry for 48 hours before sealing or coating the concrete, masonry or stone.

- c. **Annual cleaning procedure:**
 - i. Wash concrete with a high-pressure power washer removing any contaminants and/or loose pieces of finished surface.
 - ii. Let concrete dry completely.
 - iii. Apply a quality penetrating salt guard sealer with a sprayer or a roller.
 - iv. Let the sealer dry for at least 24 hours before walking or driving on the concrete. Certain sealers may require a longer drying time.
- d. **Removing stains:**
 - i. Removing stains may take a few applications in order to achieve affective cleaning.
 - ii. **Possible stains and how to remove them:**
 - 1. **Grease from food:** For stubborn stains, apply liquid detergent full strength and allow it to penetrate for 20 to 30 minutes. Scrub and rinse with hot water. Removal is easier if these stains are treated immediately.
 - 2. **Caulking:** Scrape off excess and scrub with a poultice of denatured alcohol. Rinse with hot water and detergent.
 - 3. **Chewing gum:** Same as caulking or scrub with naphtha.
 - 4. **Oil grease that has penetrated:** Mop up any excess oil with rags and then cover the area with oil absorbent (kitty litter). Leave it on the stain for a day then sweep it up.
 - 5. **Paint:** Fresh paint should be mopped up immediately with rags or paper towels by blotting. Do not wipe as this will spread the paint and extend the job removal. If the pain is latex and water based, soak and then scrub the area with hot water, scouring powder and stiff bush until not more improvement is to be seen. Let the remaining paint dry and remove as described below.
 - 6. **Dry paint:** Scrape any excess oil based paint; varnish or water-based latex paint off the surface. Apply a commercial paint remover and let it sit for 20 to 30 minutes. Loosen with gentle scrubbing. Do not rub the loosened paint into the surface of the paver. Instead, blot up the loosened paint and thinner. Repeat as necessary.
 - 7. **Tire marks:** Scrub black area with water, detergent and scouring powder. In the case of small stained areas, removal and replacement with new pavers may be an option.
- 2. **Re-sand patio**
 - a. When re-sanding your patio, this needs to occur on a dry day.
 - b. **Supplies:** The supplies for dry paver sand can be found at Mutual Materials. Make sure to follow the proper procedure on the supplies that you purchase.
- 3. **Replacing pavement**
 - a. If pavers must be replaced, they may be a different color than the surrounding pavement. This variation may disappear, but if it is unsatisfying, controlled use of proprietary cleaners designed to improve the color of concrete pavers can minimize variation.

4. **Basic information for sealing your pavement**

- a. Sealing your pavement helps prevent damage from substances and allows your pavement to last longer in a better condition.
- b. Removal of accumulated dirt and efflorescence is the objective of cleaning. It is essential in preparing the pavers for sealing by removing dirt and efflorescence are a mix of detergent and acid. Cleaners with a strong acid may discolor the pavement slightly.
- c. If the base under the pavers drains poorly, the sealer is applied to saturated sand in the joints, or is applied to thick; the sealer can become cloudy and diminish the appearance of the pavers. In this situation, the sealer must be removed or re-dissolved. Consult with your sealer provider for advice on treating this situation. It is best if there are low wind conditions in case of blowing uneven application to the surface.
- d. Sealers can be applied with a hand roller which is more efficient in small areas, or a low pressure sprayer for larger areas.
- e. Generally, only one coat is required. For other applications, follow the sealer manufacturer's recommendations. Some sealers recommend two coats, the first coat is usually applied to a saturated surface and the light second coat (if needed) is applied for a glossy finish. For water-based sealers requiring two coats, always apply the second coat while the first coat is still very tacky.
- f. Be careful not to apply too much sealer to the surface because this could cause the pavement to become extremely slippery.
- g. Prevent all traffic from entering the area until the sealer is completely dry, typically about 24 hours.

Wood Work

1. **Structure:**

- a. For any concerns on the structure of your wood work, call Josh Polacek. See contact information on the front of the manual.

2. **Maintenance:**

- a. Make sure decks are taken care of periodically by cleaning them off, which will help them last longer and look better. Lack of maintenance will cause wood work to rot or breakdown, overall leaving damage to your woodwork.

3. **Washing and cleaning:**

a. **Proper procedures for cleaning a deck:**

- i. First, using a spray nozzle or a hose, try and remove all of the debris from the cracks of the deck.
- ii. Then using laundry detergent or other soap, scrub your deck using a brush. This could be all it takes to have your deck clean again.

- iii. If your deck does not become clean from just hand washing, you may need to use a pressure washer. See pressure washing below and follow the correct procedure and precautions.
 - b. **Eliminating discoloration:**
 - i. Discoloration among wood can be common. To achieve the best results for solving this problem, take care of it as soon as you have noticed the discoloration.
 - ii. **Wood turning grey:** Grey decking is usually the result of surface wood cells that have been broken down by weather and wear.
 - iii. **Products:**
 1. Bleach-based products eliminate mildew
 2. Acid-based materials handle graying and stain
 3. Some products may darken woods such as redwood and cedar, so be sure to test any material in an inconspicuous place
 - c. **Eliminating Mildew:** Apply a drop of undiluted liquid household bleach to a small, black spot. After a minute or two, see if the spot has disappeared and if the spot does disappear, clean the deck with a mild cleanser that contains no ammonia. Then rinse with a solution with a 1:4 ratio of household liquid bleach to 4 parts water, and then rinse. If the mildew still has not been removed, mix 1 cup trisodium phosphate and 1 cup household liquid bleach in a gallon of water and then scrub with a stiff brush. After about 15 minutes, rinse the spot that contained the mildew.
4. **Pressure washing**
- a. For most people, pressure washing gives the best results, but pressure washing any wood work without proper caution can cause long term damages such as scar wood.
 - b. While pressure washing a deck or any other wood, make sure you use precautions so you do not cause any damage.
 - i. Make sure you stay at least 6 inches away from the wood; any closer than 6 inches may result in damage to the wood.
 - ii. Never point the end of the pressure washer directly down at the wood because you may be applying too much direct pressure which could damage the wood. Always tilt the point of the pressure washer at an angle to the wood work.
 - iii. Excess cleaner left on the deck surface can have long lasting and detrimental effects.
 - c. No table of contents entries found.**Procedure for pressure washing a deck:**
 - i. It is recommended to keep the spay nozzle at a 40 to 60 degree angle towards the wood and no closer than 6 inches away.
 - ii. **Methods for cleaning:**
 1. **Sweeping:** Begin “sweeping” the deck from the house side out. Make sure to be consistent in the length you tip it from the surface because constancy will prevent lap marks. The goal in sweeping a deck with a pressure washer

is to remove the dirt leaving behind no traces of the pressurized water.

*Too high pressure, or too close to the wood will result in a stripped area.

2. **Feathering:** For feathering, you want to overlap the areas previously swept; making sure that the point where the nozzle is closest to the wood begins at the point where the sweep ended on the previous stroke. Always working with the grain or the length of the board. This method ensures that as much of the cleaner is removed as possible. Feathering is the most efficient method for using a pressure washer on a deck surface.

3. **Long Sweep:** You bring the fan to the surface and walk the fan along the length of the board. The tip should be at the same distance from the deck from the beginning through the whole length of the board. This method may require several passes. Long Sweep works fine for decks that have no railings or obstacles.

- iii. Corners can sometimes be a challenge for pressure washer operators. When approaching a corner, engage the fan and bring it into the corner first, spraying the debris out. Try not to work yourself into a corner, always work out of a corner.
- iv. Decks look very different from wet to dry so small imperfections can often go unnoticed when the deck is wet. Also, raised fiber will be virtually impossible to remove from a wet surface. If the topcoat (sealant or stain) you have selected is a one day application to be conducted after washing before the deck dries, it is recommended that you allow the surface to dry for at least 24 hours.
- v. Once the deck has dried inspect your work. There should be no lap marks, minimal raised fibers, and clean wood. The surface should be consistent with no areas over or underwashed.
- vi. Finally you need to seal your deck. See specific stain/paint recommendation and sealing wood procedure below.

5. Specific stain/paint recommendations

- a. When choosing your stains or paint for your woodwork, make sure to read all of the recommendations and directions before applying.
- b. For fully exposed decks, a water-repellent sealer or penetrating semi-transparent stain may provide the best finishing solution. Paint/solid color stains are more likely to peel this is why they are not recommended for areas of foot traffic for fully exposed decks.
- c. Pressure treated wood is protected against insects and decay but we still recommend applying a water-repellent sealer to exposed surfaces. This sealer will help reduce surface checking, cracking and splitting and help maintain an attractive appearance.

6. Sealing wood

- a. For best care of wood work, have it professionally sealed once a year to achieve the best results.
- b. **Recommendations:**

- i. Always make sure the deck is clean and dry before you begin staining. Surfaces must be free of all mildew, dust, dirt, oil, grease, and other contaminants. See above for proper cleaning methods.
- ii. Wait at least 24 hours after washing your deck to apply stain. Try to avoid staining your deck right before it rains because most stains require at least 2 to 3 hours to dry.
- iii. Always follow the instructions on the container for application.
- iv. It is best to stain the railings first because this allows you to clean up any drips on the floor surface afterwards. Apply throughout the wood work evenly.
- v. Wood surfaces such as decks, sidings, trim, and fences should be sealed for water protection.
- vi. Apply wood sealer with a brush, roller, sprayer, or by dipping.
- vii. The wood surface should be dry before applying topical water-repellant sealers.
- viii. All wood decks should be stained to protect the wood from ultraviolet sun damage and moisture damage. This will prevent your deck from weather damage including checking and cracking.
- ix. It is recommended that you use a high quality oil-based stain because the oil in the stain will help preserve the wood and keep it from drying out.
- x. For the best results you should stain cedar, redwood, exotic hardwoods, and clear pressure treated decks soon as possible after the deck is built and every spring afterwards.