Your Installation Checklist

The planning process is now complete and you are ready to install your landscape. The checklist below will guide you through the installation process step-by-step and includes some tips to get your new landscape off to a good start. Don't forget to call the Blue Stake Center at 1-800-782-5348 (1-800-STAKE IT) at least three days before you dig.

✔ Prepare Your Site

If you plan to contour or grade areas of your site, now is the appropriate time to complete this task.

Boulders also should be placed at this time, since they probably will require use of the same equipment needed for grading and contouring. It also is a good time to remove rocks and construction debris from the site. Completing this task now will make it easier to install your irrigation system and plants.

✔ Measure, Mark and Install Hardscape Areas

It is best to install most hardscape areas before the irrigation system and plants. (Although top dressing is considered a hardscape element, it is usually installed after the plants.) As a last check prior to installation, measure and mark off hardscape areas. Temporary marking paint and marker flags are two tools that can be used to mark landscape components. Both can be purchased from local landscape and irrigation suppliers.

This raised bed planting area is an attractive, water-efficient way to grow vegetables. Like the rest of the yard, it is watered with a drip system.

If irrigation lines run beneath fences, walls and other hardscape areas, it is a good idea to install a sleeve under those spots. Mark and install sleeves for irrigation lines and outdoor lighting now.

If possible, purchase the entire quantity of each type of hardscape material at the same time. This will help to ensure color consistency, as colors in natural materials may vary somewhat, and will save time during the installation process.

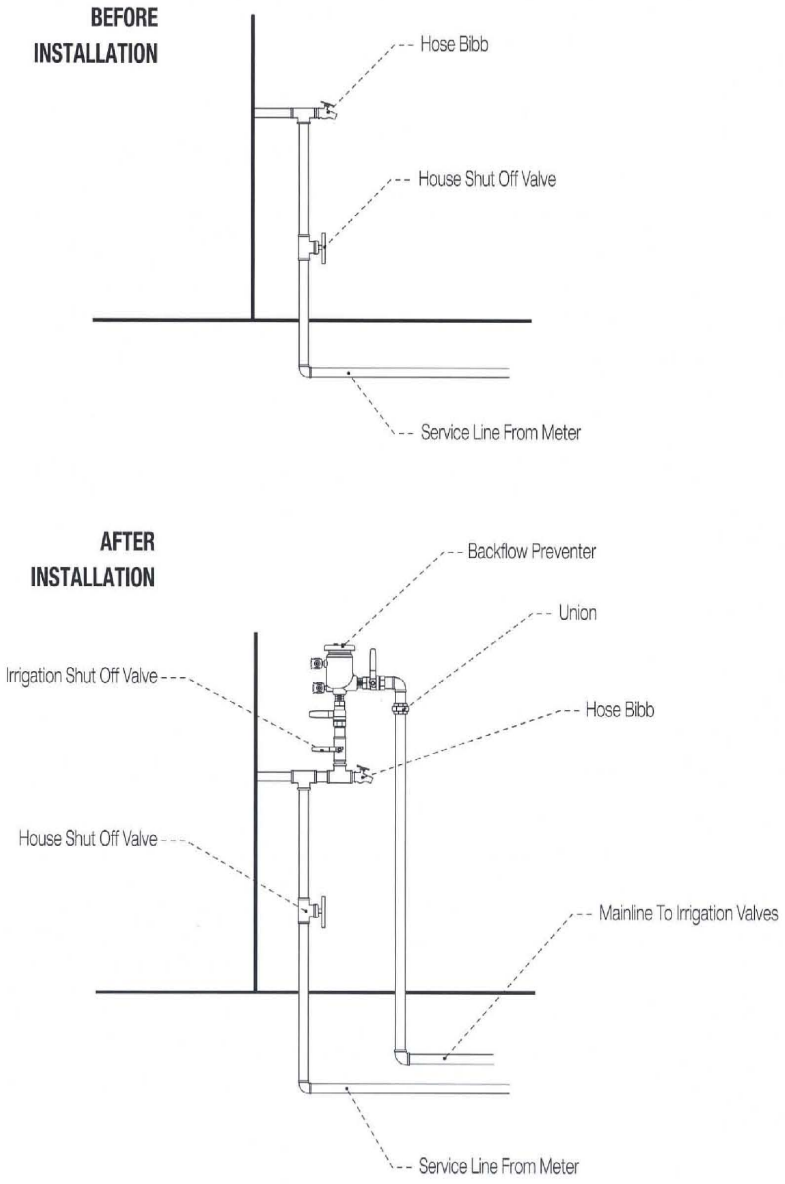
✔ Prepare the Soil

In most cases, soil amendments are not necessary for native and desert adapted plants. However, it is beneficial to loosen the soil in planting areas.

If your plans include a vegetable, herb or rose garden, planting beds for annual flowers, or a lawn, now is the time to prepare the soil in these areas. Cultivate the soil and add any necessary soil amendments prior to planting.

Opposite: Used as a temporary solution or as a staple in the landscape, wildflowers such as California Poppies, California Bluebells and Red Flax (shown here) provide a burst of seasonal color.

Standard Installation Detail And Examples For Points Of Connection



✔Mark Plant Locations

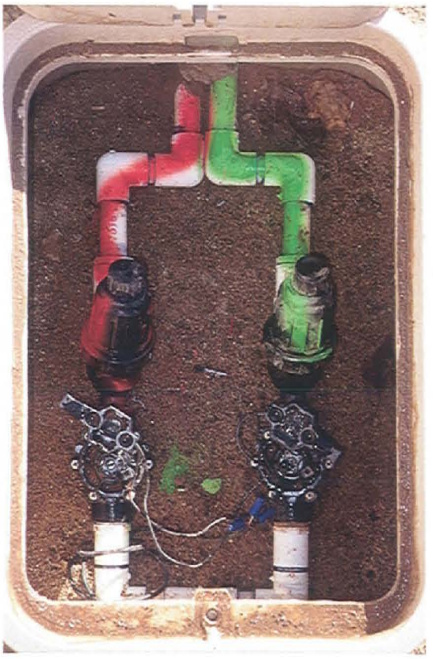
Using your completed landscape plan, mark the location of each plant with temporary marking paint or marker flags. Make a final check after marking all plant locations. Do the marks correspond with plant locations noted on your plan? Try to visualize the finished product. Are plants and trees spaced appropriately? Is this arrangement what you had in mind?

✔Purchase and Install Irrigation Materials

Get Prepared

The general instructions provided in this guide are for systems and components commonly used in residential landscapes but do not necessarily apply to all types of systems and components. Read and follow any instructions that come with your irrigation system components and contact your salesperson if you need advice. Construction drawings for the major irrigation system components are provided to the left and on pages 34 and 35 to serve as a guide during the installation process.

- Review your irrigation system plan thoroughly to get reacquainted with the plan and its components. Also, reread the section of this guide that



Irrigation components that are properly installed and easy to reach will contribute toward a water-efficient irrigation system.

pertains to developing an irrigation system plan (pages 13-16). A short refresher course now may save time and effort later.

- Take your plan to an irrigation supply store and ask for help with selecting the equipment. Take this guide along to show them the construction details for the backflow preventer and irrigation valves.
- If possible, purchase all of the irrigation system components at the same time. Don't forget smaller items like pipe cutters, Teflon® tape, primer, glue and temporary marking paint.
- Buy extra irrigation line and fittings to handle unexpected problems.
- Before digging, mark the locations of all irrigation lines and valves with temporary marking paint. This will provide a visual layout for the work ahead.
- Now is the time to make any changes to your irrigation system design to properly route the irrigation lines. If you do make changes, revise your irrigation plan accordingly.

Install the Backflow Prevention Assembly

Backflow prevention assemblies are required for all irrigation systems regardless of size. The purpose of these devices is to prevent contaminated water from getting into the drinking water system. If you need to install a backflow preventer, it is necessary to obtain a plumbing permit and follow all

Color-coded irrigation lines

city code requirements. If you haven't done so already, call your city for permit information. To ensure proper installation that will pass a city inspection, it is recommended that you hire a contractor to install this irrigation system component. Here are some guidelines that your contractor should follow during the installation process:

- Backflow preventer assemblies are typically installed near the water source at least twelve inches from a wall to allow for access. There are many types of backflow preventers available. The Uniform Plumbing Code (UPC) has specific installation requirements depending on type.
- Pressure vacuum breakers (PVBs) or reduced pressure assemblies (RPs) are recommended since one assembly can serve multiple valves. Although atmospheric vacuum breakers (AVBs) are easier to install, they cannot be tested to see if they are functioning properly. In addition, an AVB is required for every control valve.
- Type K copper pipe should be used for all above ground piping and requires a torch and non-lead solder ("sweat") to connect the copper fittings.
- A ball valve should be installed on the riser going to the backflow preventer to shut off the water during emergencies or repairs.
- At least one union should be installed within one foot of the backflow prevention assembly for ease of repair or replacement.
- With a PVB or RP, the irrigation valves must be installed **after** the assembly. However, the AVB must have the valve installed **before** the assembly.
- If your home already has a front yard landscape with a backflow preventer, it is fairly easy to extend additional valves from the front yard to the back yard. If you extend the existing system, follow the rules specified in the Uniform Plumbing Code.

Install the Valves, Filter, Pressure Regulator and Valve Box

- The valves, filter and pressure regulator are typically located inside a valve box which is usually placed near the backflow preventer.

Four Things You May Not Know About Mulches

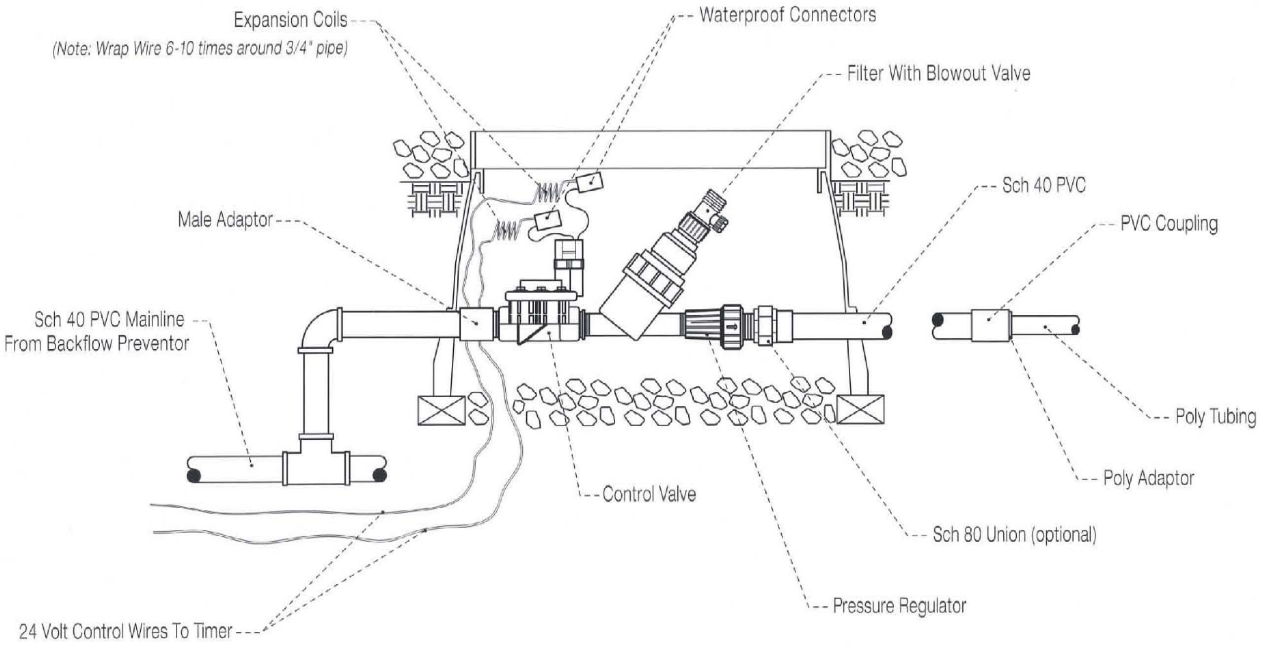
- Mulches cover and cool the soil. During the summer, cooler soil temperatures help to improve root growth.
- Water evaporates more slowly from soil surfaces that are covered and cool. Mulches help to reduce water use by reducing evaporation so more water stays in the soil for plants to use. They also help to reduce salt buildup in the soil.
- Mulches help water to penetrate the soil more effectively, reducing runoff from planted areas. Reduced runoff keeps water where plants can use it.
- Mulches help to keep sunlight from reaching weed seedlings in the soil. Less sunlight means less weed growth. Weeds use water that would otherwise be available for landscape plants. Fewer weeds means more water for your plants and less maintenance time for you.

- Do not put too many valves in one valve box. Two valves per box are recommended. Leave enough room in each valve box to allow yourself to work comfortably with the valves and wires and to easily remove and replace the filter later on during routine maintenance.
- For aesthetic and practical reasons, it is better to place valve boxes below ground, making the top of each valve box about two inches above grade (this will put valve boxes at ground level after the top dressing has been installed).
- After determining the best place for the valve box, dig out the area adequately so that the top of the valve box will rest at grade (it will be raised above grade as mentioned in the previous step later on during the installation process).
- Because the system will experience higher pressure before the valve, schedule 40 PVC pipe should be used between a PVB or RP backflow preventer assembly and the valve.
- After the control valves are installed, attach a filter and a pressure regulator to each one.
- Wrap a small amount of Teflon® tape around all threaded fittings to help lubricate and seal them. Make sure all fittings are good and tight.
- Now it is time to place the box over the valves. You may have to cut additional holes in the sides of each box to allow for proper location of the pipe/poly tubing.
- Place bricks or blocks strategically under the edges of each box to provide stability. This should raise your box two inches above grade.
- Be sure the box is level; then replace soil around the outside edges of the box. Cover excess openings around pipes with fabric or tape to keep soil from entering the box.
- Fill the bottom of each valve box with one to two inches of gravel to promote drainage and to avoid muddy conditions inside the box.

Dig the Trench

- If you haven't done so already, mark the location of all trenches with temporary marking paint.
- About two days in advance, soak areas to be trenched with water. This will make digging a lot easier.
- Dig the trenches six to eight inches deep, rounding corners to prevent the poly tubing from kinking during installation.
- You can use a common trench for pipe/poly tubing connecting to different valves and wiring for low-voltage outdoor lighting.

Standard Installation Detail For Valve Boxes, Valves, Filters, And Pressure Regulators



Install the PVC Pipe/Poly tubing

- If you are using PVC pipe, make sure the pipe and fittings are clean. Then apply a light, even coat of primer and glue to both the pipe and the fitting. After connecting the pipe and fitting, wipe off any excess glue. Allow the glue to set for twenty-four hours before pressure testing for leaks.
- Poly tubing has a tendency to roll back on itself. If you are using poly tubing rather than pipe, allow the tubing to warm in the sun. It will become softer and easier to work with. To hold the tubing in place, put some soil back in the trench (spot backfilling) about every five feet.
- If a common trench is used, consider painting each pipe or poly line a different color to identify the type of plant or planting area each line waters. Colors should correspond with those used on your irrigation plan.
- Leave fittings exposed so they can be pressure tested for leaks.
- Flush the lines before installing emitters. Open one flush cap at a time and let each valve run for about two minutes.

Install the Irrigation Controller (Automatic Timer)

- Indoor controllers plug into electrical outlets whereas outdoor controllers have wires that run directly to the breaker box. Do NOT mount indoor controllers outside.
- If possible, mount the controller in a shady location.
- **Danger: There is live voltage electricity in the circuit breaker box.** All 110 volt electrical work must be done by a licensed electrician. A permit may be required by your city.
- It is recommended that you connect the controller to its own dedicated breaker. Do not connect the con-

No Heroism Required

It is important to be realistic about your capabilities during the landscape process. Landscaping can be hard work and requires time and patience. Here are some suggestions to help maintain endurance and get the job done with fewer hassles.

- Take weather into account during the installation process. If you are installing your landscape during the warmer months, make sure to drink plenty of water, protect yourself from the sun (a hat, sun block, protective clothing) and avoid strenuous jobs during the hottest times of day.
- You may want to rent a trencher, a front-end loader and/or other labor saving equipment to make your installation job a little easier.
- Rest often.
- Get a good pair of garden gloves.
- Consider asking for help. Got a friend who owes you a big favor? Maybe you can ask for some assistance. Were you able to achieve some cost savings on another part of your landscape budget? You might want to use the savings to hire a few helping hands.

troller to a GFI (ground fault interrupt) circuit.

- Irrigation controllers must be properly grounded. Follow the manufacturer's instructions carefully.

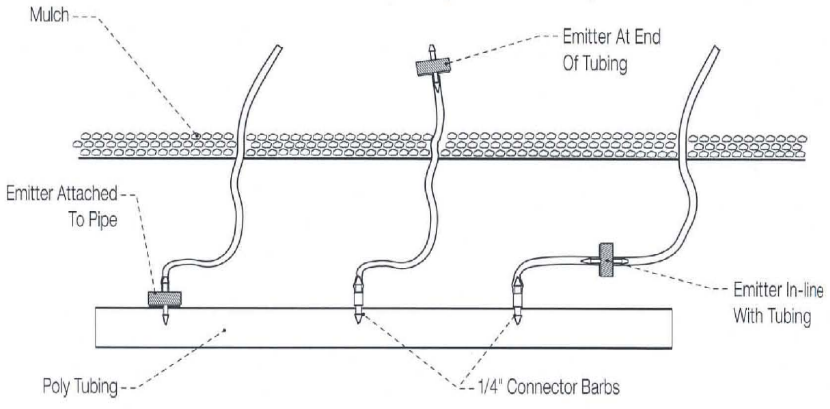
Connect the Controller to the Valves

- Use "direct burial wires" or an irrigation controller cable. The cable has color coded wires to make it easy to match the valves to the proper stations in the controller. For most residential irrigation systems, 18 gauge wire is acceptable.
- Wire expands and contracts with changes in weather. Leave some slack in the wire when running it from the controller to the valves. It also is a good idea to coil some wire at the end of each connection to give you ample wire to work with in the future, when it's time for maintenance or repairs.
- Connect the wire to the valves with waterproof connectors.
- If wire is being placed in the same trench with the irrigation lines, protect it from damage during installation and future repairs by tucking it under the lines.

Install the Emitters and Micro tubing

- Install micro tubing and emitters prior to planting so water is available immediately after plants are installed.
- Use self-piercing emitters or a hole punch that is the proper size for the emitter. Your irrigation supplier can help you choose the proper hole punch. If you make a mistake, use a goof plug to seal the hole.
- After installing emitters and micro tubing, spot backfill to keep them in place.

Three Emitter and Tubing Installation Options



Emitter tubing outlets should be placed between one and three inches above the ground. Proper placement will allow you to observe the wetting pattern for each plant and will reduce the likelihood that dirt from the surrounding area will clog the tubing. Emitters can be placed directly into the poly tubing or anywhere along the micro tubing as long as the tubing outlets are above ground. Above ground emitters are easier to maintain, whereas underground emitters cannot be chewed by rodents.

Take Photos and Update the Irrigation System Plan

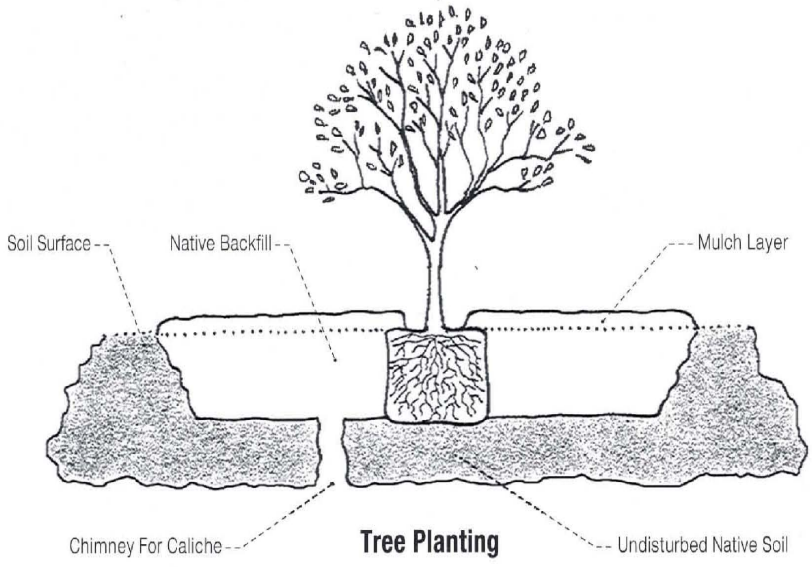
- Before backfilling the irrigation lines, photograph each section of the yard. Begin at one end and work in strips, either lengthwise or vertically.
- Label the photos to correspond with the sequence you chose and keep them with your irrigation system plan. These photographs will help to verify the exact location of your irrigation system components when it is time to make repairs.
- If you installed trenches or other system components differently than what appears on the irrigation system plan, revise the plan to show the actual location of each line. This updated "as built" plan can save time and labor in the future.

Inspect the System

- Before backfilling, turn on the irrigation system and inspect it for leaks.
- Also check to see if each emitter is operating properly.
- Make any necessary repairs, then run the system again as a final check.

Backfill

- Prior to backfilling, remove rocks and other debris from the surrounding soil. These might damage the pipe/poly tubing.
- Backfill the trench half-way, lightly tamping the soil with your foot. Then fill it with water to settle the soil.



Tree Planting

- Backfill the remainder of the soil. Then water again.

✔Purchase and Install Plants

Although native and desert adapted plants can be planted any time of year, plants installed during the summer will need more attention. Try to purchase plants just prior to installation. Plants dry out much more quickly when left in their containers, which may result in plant loss. Water containerized plants daily and, in hot weather, find shade for those plants that need protection from the sun.

Before installation, set plants on the marks made earlier in the installation process. This will help ensure that they are installed in the correct location. It also will give you a picture of what your yard will look like when the installation is complete. Make any last minute modifications now.

Planting

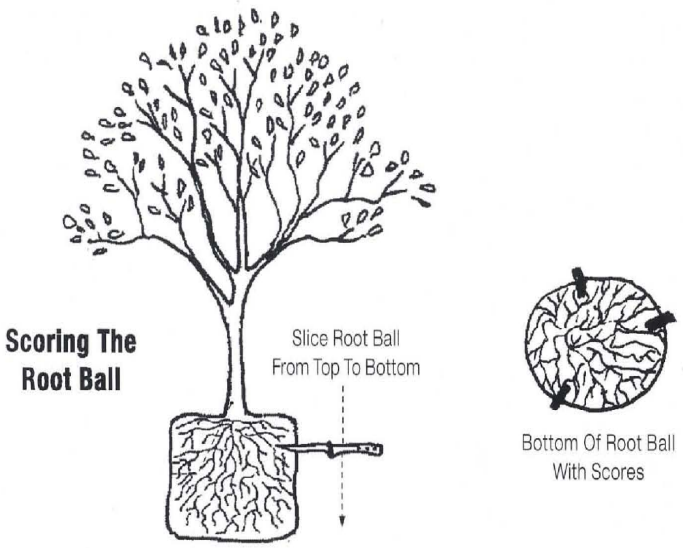
Here are some instructions for installing low water use plants:

1. Dig a hole for each plant that is three to five times wider but no deeper than the plant's root ball. This will help to encourage outward root growth and to prevent the plant from sinking below the surrounding soil surface.
2. Tap the side of the container with a hammer or trowel to loosen it from the root ball. (Place larger plants on their sides.) Remove the plant from its container taking care not to damage the roots. Handle plants by the root ball rather than the branches or foliage.
3. If the roots are compact or circling the container, score the root ball or loosen the roots around the circum-

The Health of Your Trees is at Stake

Here are some guidelines for staking newly planted trees:

- Use two wooden stakes, preferably two inches round or square. Place stakes outside of the root ball, inserting them at least six inches below undisturbed soil (go at least six inches below soil that has been tilled in preparation for planting).
- Ties should be made of smooth, flexible material such as horticultural tape, nylon tree ties, or wire securely wrapped in rubber tubing. Grasping the trunk with one hand, find the point on the tree trunk where the tree will stand upright. Place the ties six inches above this point.
- Loop the ties around the trunk and secure them to the stake. Ties should support the trunk but should not inhibit movement (trunk and ties should move as a unit). This is important for proper trunk development.
- To minimize damage to tree limbs, cut the stakes four to six inches above the tie.
- Check staked trees periodically, preferably once a month, and loosen the ties as needed. Ties that dig into the trunk can damage the tree.
- Remove the stakes as soon as a tree can stand on its own; almost always within one year of installation.



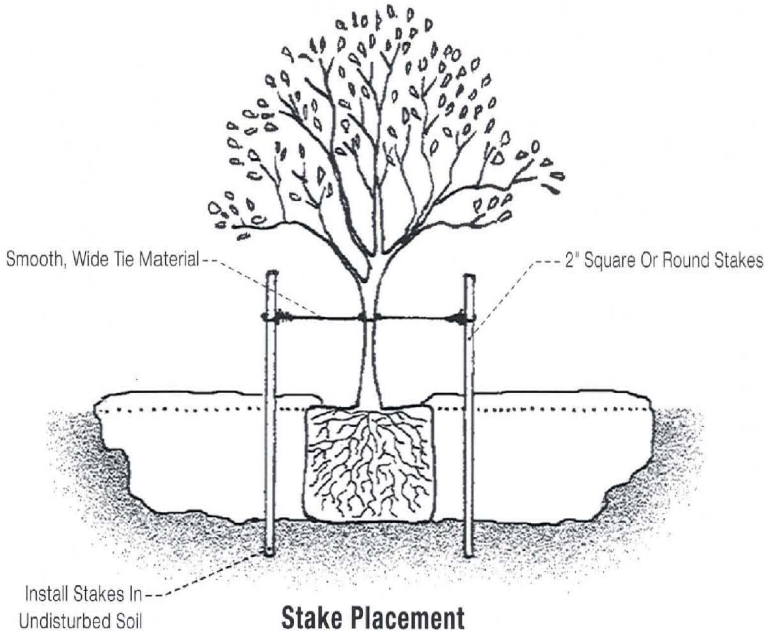
ference of the plant. This helps the roots to spread to the adjacent soil after planting.

4. Place the plant in the hole so that the top of the root ball is even with or just a bit above the soil surface. Fill in the hole with soil, pressing firmly around the root ball to minimize soil settling.
5. Remove nursery stakes (from trees) and trim off any dead or broken branches. No other pruning is necessary at this time.
6. If you don't have a drip irrigation system, make an irrigation well around the plant, forming the well at the outer edge of the plant's canopy. Although they are not necessary, shallow irrigation wells are suggested for plants on drip systems also. Water each plant thoroughly, wetting the soil to the bottom of the root ball.
7. Make any necessary irrigation system adjustments to ensure that water is going to the root ball of each plant.
8. It is a good idea to spread a thin layer of organic mulch around new plantings. Tips on application of mulches are offered on page 39.
9. Do not fertilize new plants. Although organic mulch is helpful to new plants, fertilizing immediately can damage them.

Staking

Under normal conditions, it is not necessary to stake trees after planting if they can stay upright on their own after the nursery stakes are removed. In very windy areas it may be helpful to stake trees for a while even if they are able to stand on their own. This will give new trees a little extra anchorage. In any case, staking should be temporary.

Opposite top and bottom: Although adjacent to a golf course, this homeowner-designed Xeriscape features the bold forms and textures of cacti and succulents.



Stake Placement

Staking trees improperly or for too long can weaken or damage them.

✔Purchase and Install Top Dressing and Other Mulches

After the irrigation system is installed and the plants are in, it's time to spread the decomposed granite or crushed rock and any other mulches planned for your landscape. If you have chosen to spread organic mulch around your plants, do this first. A layer one to three inches thick is sufficient. Top dressing can go right on top of the organic mulch. Take care to keep all mulches two to four inches away from the trunks of the plants.

It may seem as though you will never finish spreading that enormous pile of top dressing you ordered. Here's a tip: Start at the point farthest from the pile. This will help to avoid disturbing newly mulched areas. In addition, looking back on your work will give you a sense of accomplishment (and hope!).

✔Assess Your Accomplishments

Now that your landscape has been installed, it's time to assess your accomplishments. Make a tour of your yard and look at every detail. Remember to take pictures of your brand new landscape so you can chart its progress as it grows and matures. If you chose not to install all of your landscape at once, this is also a perfect time to begin planning for the next phase.

Just after installation, your new plantings probably will look very small and your yard may seem like a sea of decomposed granite. This is natural for a newly installed Xeriscape. If mature plant sizes were taken into account during the planning process, the landscape will be properly proportioned. It will take a few years to achieve the ultimate effect you visualized while preparing your landscape plan. Try to avoid the urge to purchase and install additional plants. Instead, consider seeding bare areas with seasonal wildflowers until your plants become large enough to hold their own.

It is important to note that some of your plants may not make it to maturity. A certain percentage of plant mortality is normal within the first few months of installation. Plants installed during the summer have a lower chance of surviving because extreme heat can stress plants regardless of how much water is applied. If you have installed the plants carefully and if you follow good maintenance practices, plant loss can be minimized. If you do lose plants, try to determine the reason. Were they overwatered? Not watered enough? Did they receive too much or not enough sun? Before replacing any lost plants, review available reference materials to determine whether or not they were planted in the right location. You may want to consider replacing the lost plant with a species that is better suited to the conditions present in that specific spot.

Opposite top and bottom: The plants in this newly installed landscape may look a bit lonely at first... but after a few years, the plants have grown and matured. With the help of seasonal wildflowers, this yard looks spectacular.