DESIGNING YOUR IRRIGATION SYSTEM

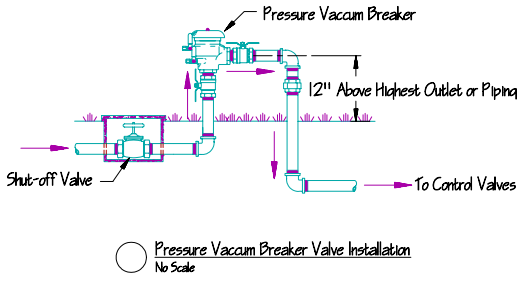
An irrigation system is necessary in our climate to properly water the plants in your landscape. The system's design must be planned according to the specific plants you have because they have different watering requirements. Some require a specific type of irrigation system. Turf areas will require an overhead spray system, while the majority of trees and shrubs will thrive with drip-type system.

The components differ, depending upon the type of system needed. Drip-type systems are the most appropriate method of irrigation for xeriscape.

Drip system components are:

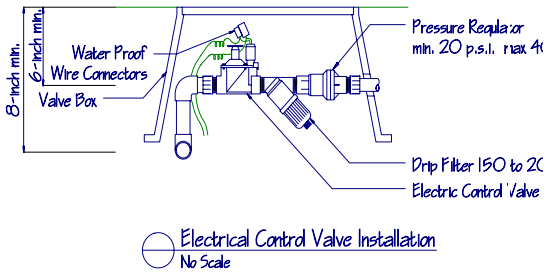
Point-of-Connection: The location where you tap into the water source. It's a good idea to provide for a shut-off valve at this point to allow for easy maintenance and repairs to the system.

Backflow Prevention Device: A valve to control the flow of water and prevent the irrigation water from flowing back into your home's potable water supply. **NOTE: This device is critical for health and safety and must be included in any irrigation system.** Local codes require the installation of a Pressure Vacuum Breaker, or PVB.



Controller: The Controller is wired to the electrically-operated valves and can be programmed to run the system automatically.

Electric Control Valve: An automatic valve controlling the flow of water to the irrigation lines. It is wired to your controller, or time clock, and opens and closes electrically according to the schedule you've programmed into the controller.

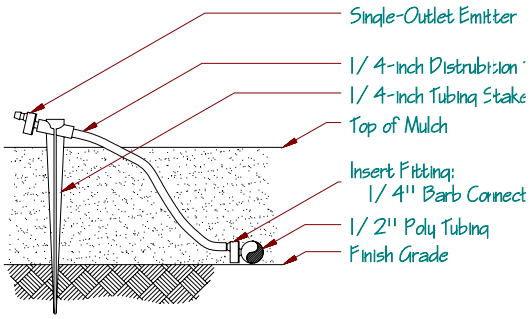


Filter: A filter must be installed after the control valve to trap any particles in the water that may clog the drip emitters. A minimum "150 mesh" filter is recommended.

Pressure Reducer: A device to bring the pressure down to the level required for drip systems, usually about 20-30 psi.

Pipe and Tubing: The pipes to carry the water from the valve to the plants you're watering. Pipes are generally either the rigid, white PVC pipe or the black, flexible polyethylene pipe.

Emitters: The parts of the system that actually deliver the water to the plants. Many different types of emitters are available, including single-point emitters, multiple-outlet emitters, micro-spray emitters, and driplines (emitters and piping combined in one continuous piece).



Emitter into 1/4-inch Tubing
No Scale

AVAILABLE FLOW RATE:
This is the total amount of water (flow rate) that you have available to operate your system. The flow rate is measured at the point where the electric control valve will be connected.

An easy way to measure the flow is to turn on the water at that point and fill up a one-gallon container. Time the seconds needed to fill the container, then divide that number into 60. This will give you the flow rate in Gallons-per-Minute (GPM).

Example: 60 ÷ seconds to fill bucket = Gallons-per-Minute

60 ÷ 12 = 5 GPM

Multiplying the GPM, by 60 will give you Gallons-per-Hour (GPH).

Example: GPM x 60 =GPH

5 x 60 = 300 GPH

Knowing your Flow Rate is important in determining how many emitters you can put on one valve of your system. The type of emitter needed depends on the plant type being watered.

Each emitter is rated at a specific flow, for example, 2 GPH. You must add together the flows for all the emitters you intend to use to make sure they don't exceed the total flow you have available to work with in your yard. That again is based on the Gallons-per-Hour that you have determined.

Example: Your GPH is 300.
You have determined based on the plants selected that your landscape needs 120, 2GPH emitters.

Now, multiply the total number of emitters needed by their flow rate:

Emitters x Flow rate = GPH needed
120 x 2 = 240 GPH needed
Your available flow of 300 GPH is sufficient to meet your needs of 240 GPH.

SOIL TYPE:
Your watering needs also will depend on the type of soil available. Water tends to move down more in sandy soils than it spreads out. In clay soils it's just the opposite: the water tends to spread out closer to the surface instead of moving downward.

This information is important to determine emitter spacing around the plants. In sandy soils the emitters will need to be spaced closer together than if in clay soils. It's easy to determine your soil type. Squeeze some damp soil in your hand. Sandy soil crumbles while clay will hold its shape. Many soils fall between these two extremes.

PLANT WATER REQUIREMENTS:
The amount of water needed by a plant is determined by the depth and spread of the root system.You should plan fo the number of emitters necessary to adequately cover the root-zone of each plant in your landscape.

Another way to determine emitter spacing is to install one emitter, run the system for an appropriate length of time, and observe the "wetting pattern" on the surface. This will tell you how close the emitters need to be spaced for adequate root-zone coverage.

In addition to the ***amount*** of water plants need is the ***frequency*** that they will need to be watered. This is what separates low-water use plants from those that need a lot of water to survive. If your landscape design contains bot high and low water-use plants, you will need to install a separate valve and irrigation circuit (a circuit is a group of emitters operated by the same control valve) for each type of plant to properly water them. This is the **hydrozone concept**, or grouping plants together with similar watering requirements.

DRAWING THE IRRIGATION PLAN
The easiest way to prepare your irrigation plan is to refer back to your landscape plan. Using your selected plants as a starting point, you will need to select the type of emitter needed by each plant type. Consider areas where you will need to form watering circuits and then compare the flow rate of all emitters on the circuit and compare to the maximum flow rate of the water source, which you've already determined. If the circuit's flow is more than 75 percent, you'll need to re-group the emitters or add another circuit.

Once you've figured out the best watering system, it's time to draw the irrigation plan. It will look just like the landscape design except the irrigation lines, valves, and emitters will be shown in their locations instead of showing the plants.

Your irrigation plan must show the locations of: the point(s) of connection to the water supply, the backflow prevention device, the valves, pipes, and all other components of the system including all spray heads and emitters. A legend detailing the type and size of all components used in the irrigation system also must be included.