Modifying Your Irrigation System & Converting to Drip

David Rice
Weber Basin Water Conservancy District

Efficient watering is the goal

Localscapes
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We want to give the plants the amount of water they actually need.

Best watering practices standards

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1. Lawn is always watered separately from other plants.

Localscapes watering standards

2. Planting beds are always watered with drip irrigation.

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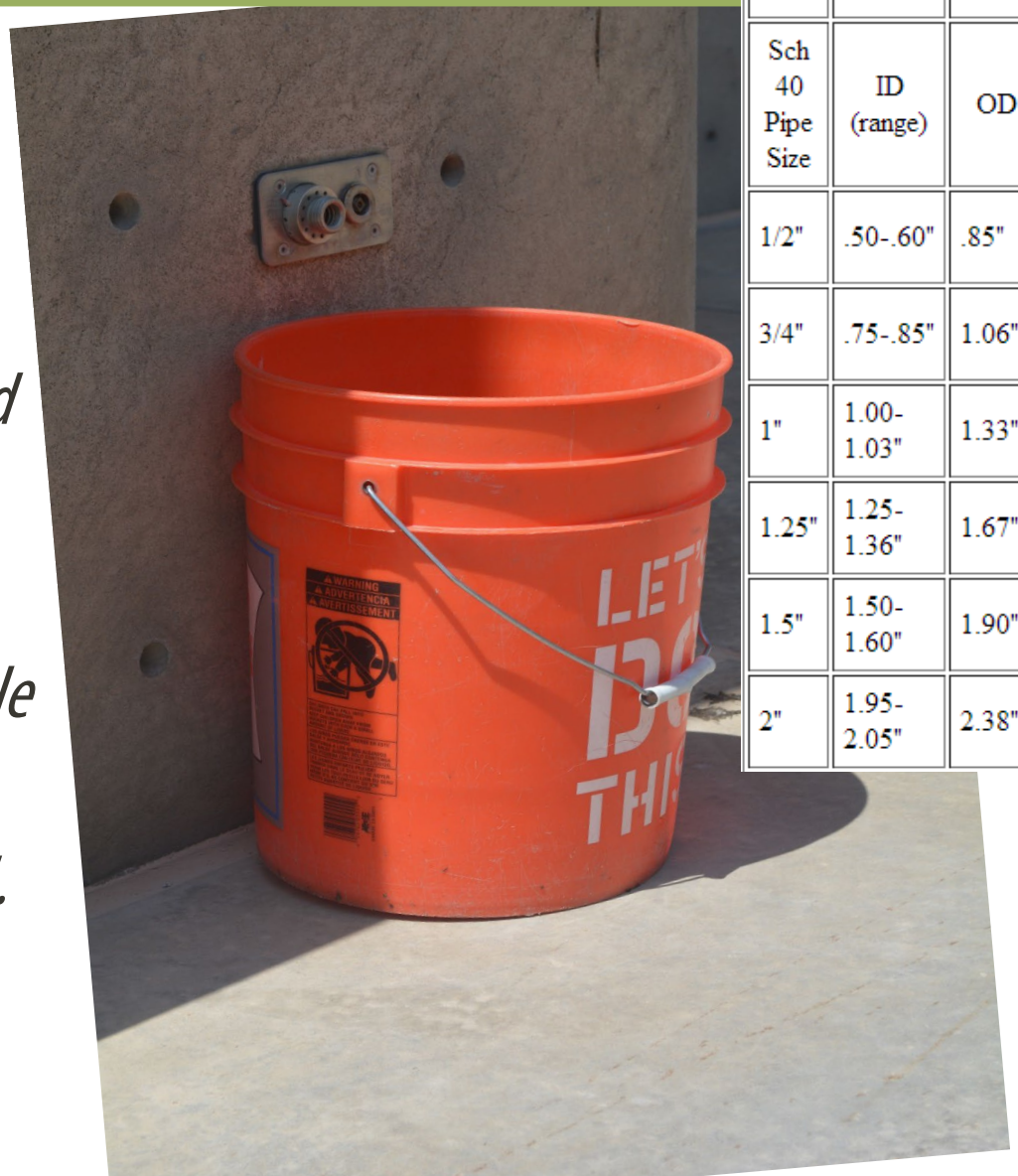
3. Use only one type of irrigation per zone. Don't mix spray and drip lines on same zone.

Water Pressure

- *Water pressure that is too high or too low can cause problems.*
- *Misting spray heads and water hammer are signs of high pressure*
- *Heads that don't pop up and dry spots are signs that pressure is too low*
- *Drip Irrigation- 10-30 psi*
- *Spray Irrigation- 30-50 psi*

Flow Rate

- Use an empty bucket.
- *Fill the bucket for a minute and you have your number.*
- *You can also. . .*
- *Fill for half a minute and double the gallons.*
- *Fill it for 15 seconds and x by 4.*



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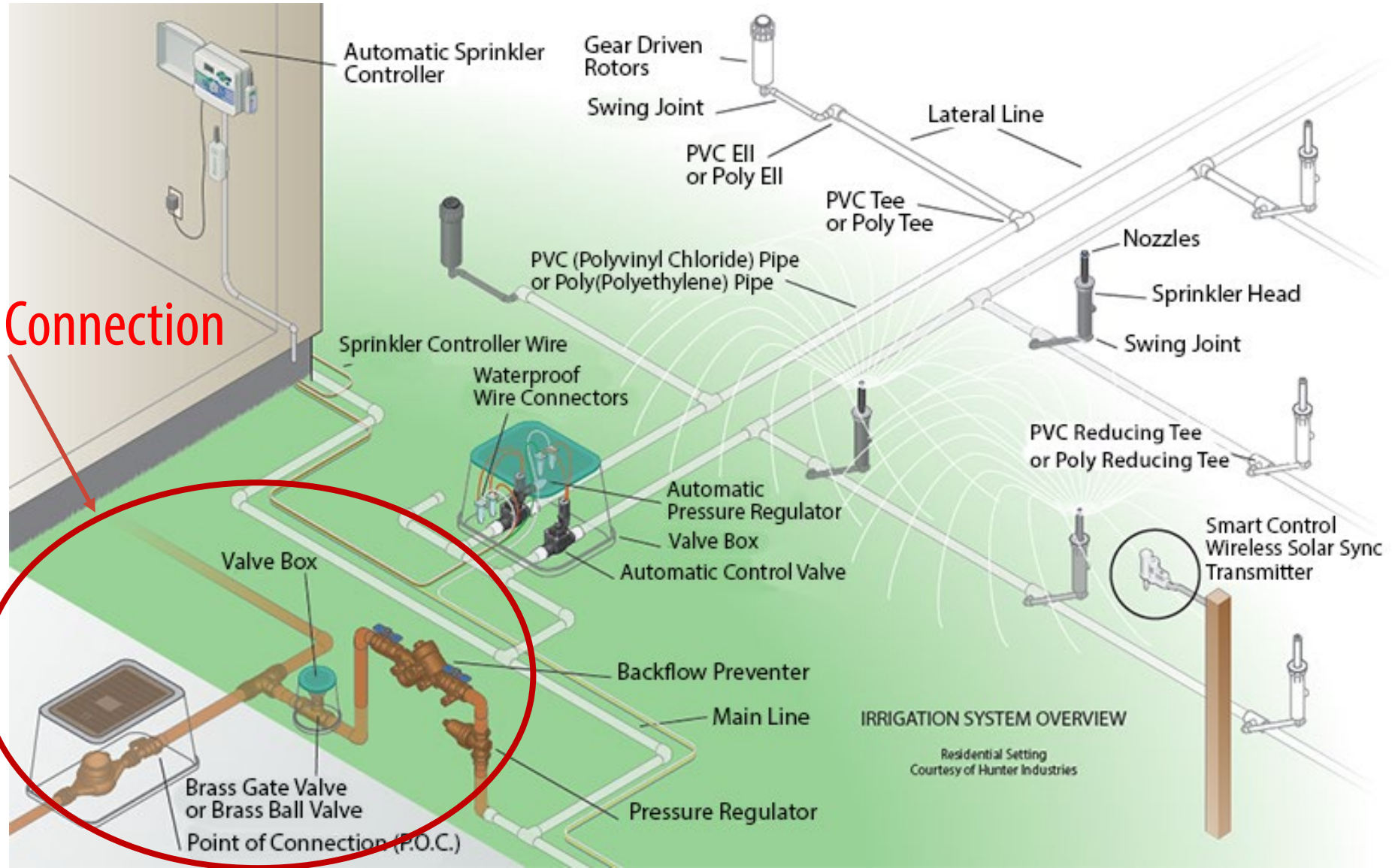
2"	1.95-2.05"	2.38"	55 gpm	3300 gph	127 gpm	7,650 gph	200 gpm	12,000 gph

Anatomy of a sprinkler system



Point of Connection

Graphic courtesy:
Hunter Industries

Backflow Preventer (culinary systems)

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Prevents contaminated water from being siphoned into the house.

Required by most city ordinances.

Pressure Regulator

Keeps system pressure within optimal range.

Reduces wear on equipment.

Improves system efficiency.

PVC vs Poly Pipe

PVC

Poly Pipe

PVC vs Poly Pipe

PVC

- Rigid/Inflexible
- Can break if water is frozen inside
- More available in warmer climates
- Fittings are secured with glue

Poly Pipe

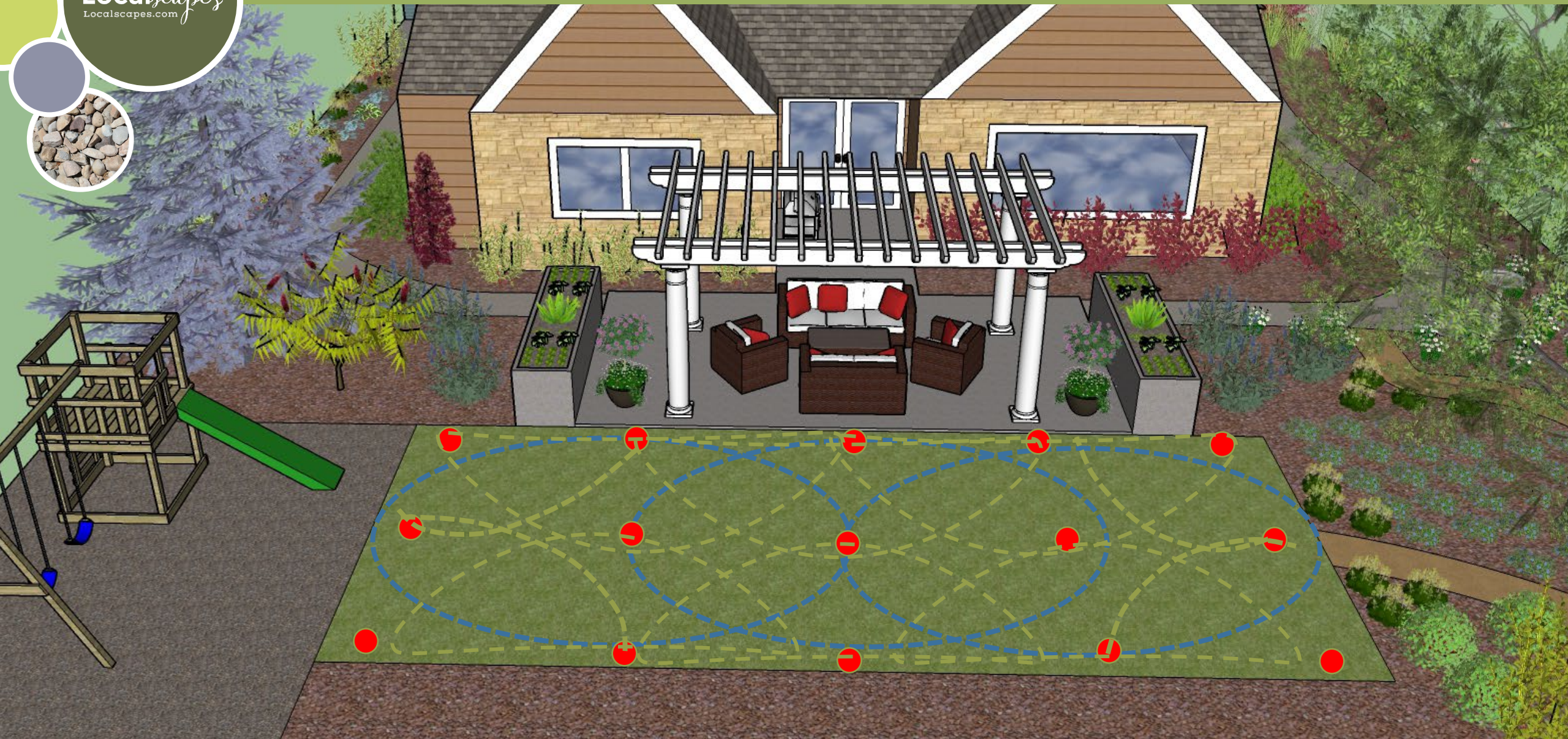
- Flexible
- Expands to allow freezing without breakage
- More available in colder climates
- Fittings secured with gaskets and barbs

Winterization

- Drains can automatically drain water from the system

- Compressed air can be used to clear water from the system after shutdown
  - Caution: use volume more than pressure to avoid damage to your system

Head-to-head coverage



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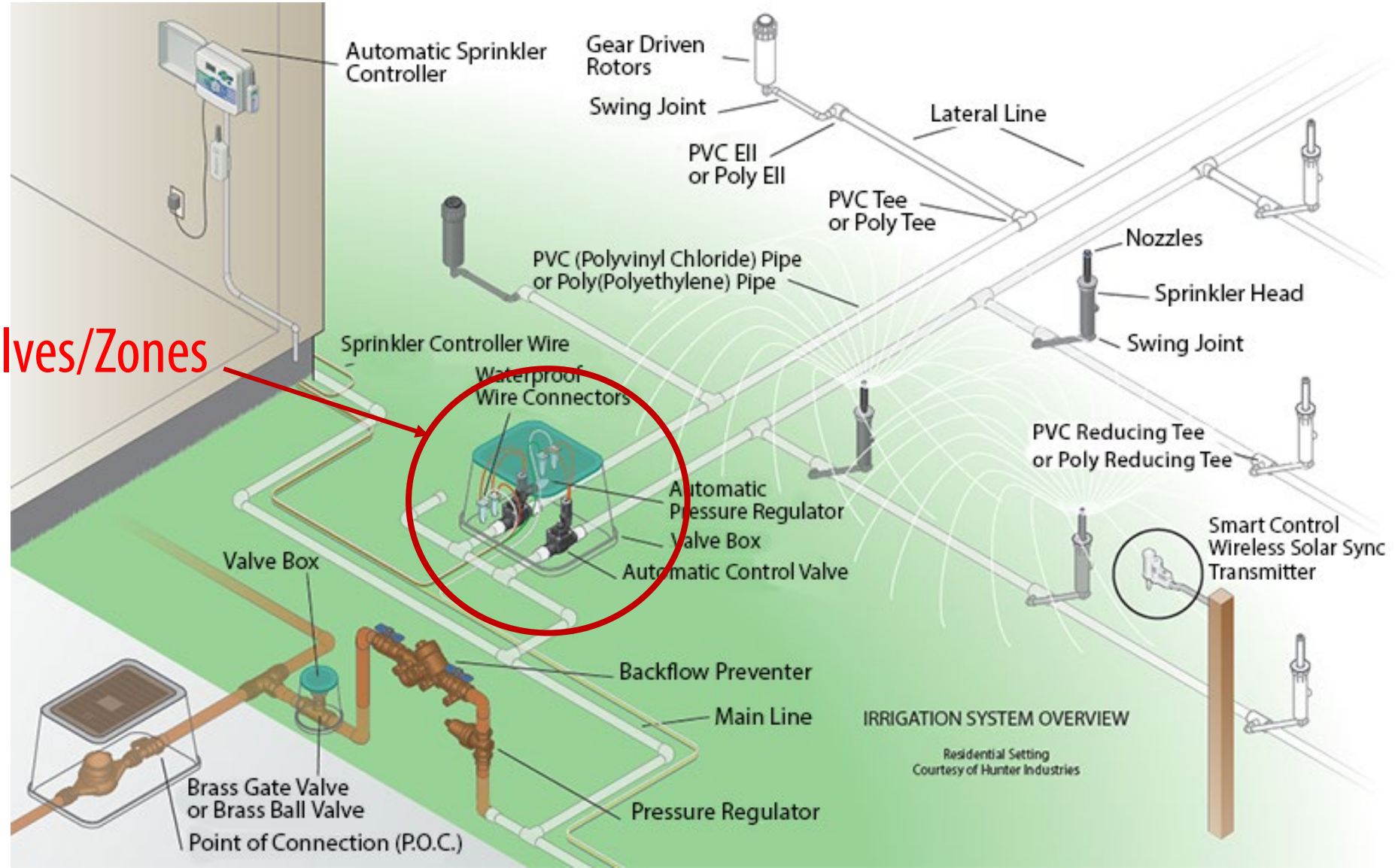
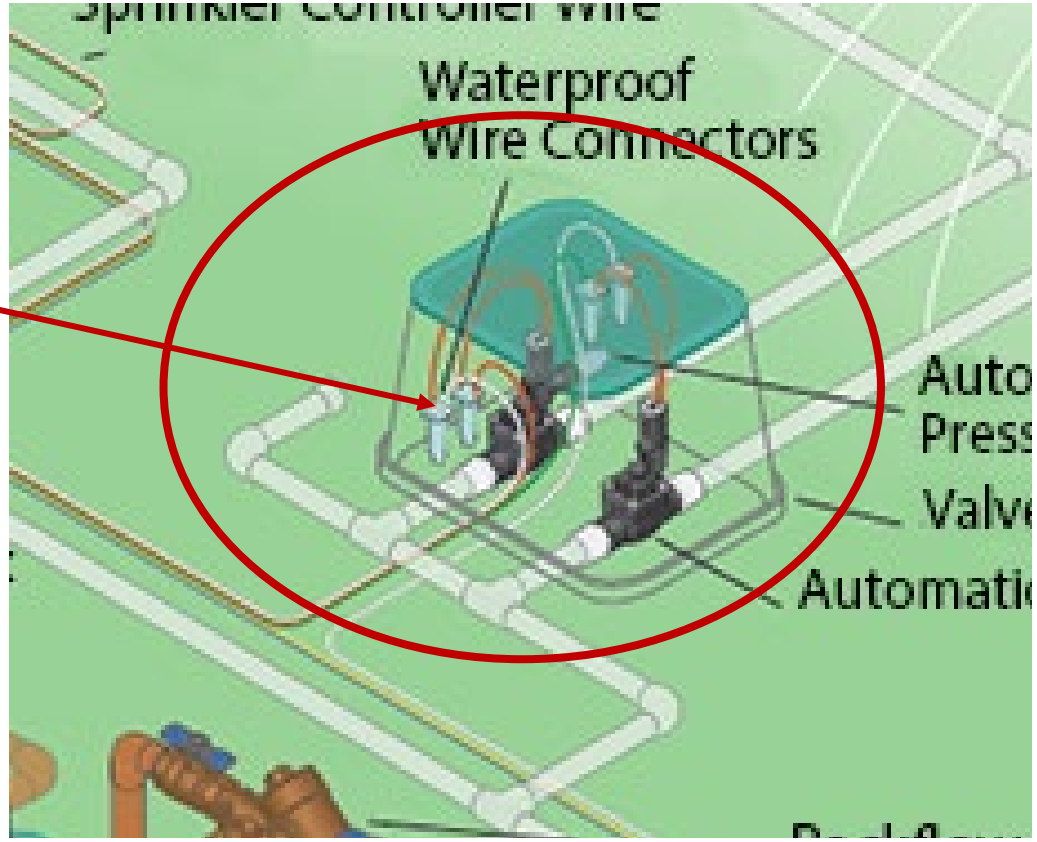


Graphic courtesy
Hunter Industries

Anatomy of a sprinkler system

Valves/Zones



Graphic courtesy
Hunter Industries

Sprinkler valves

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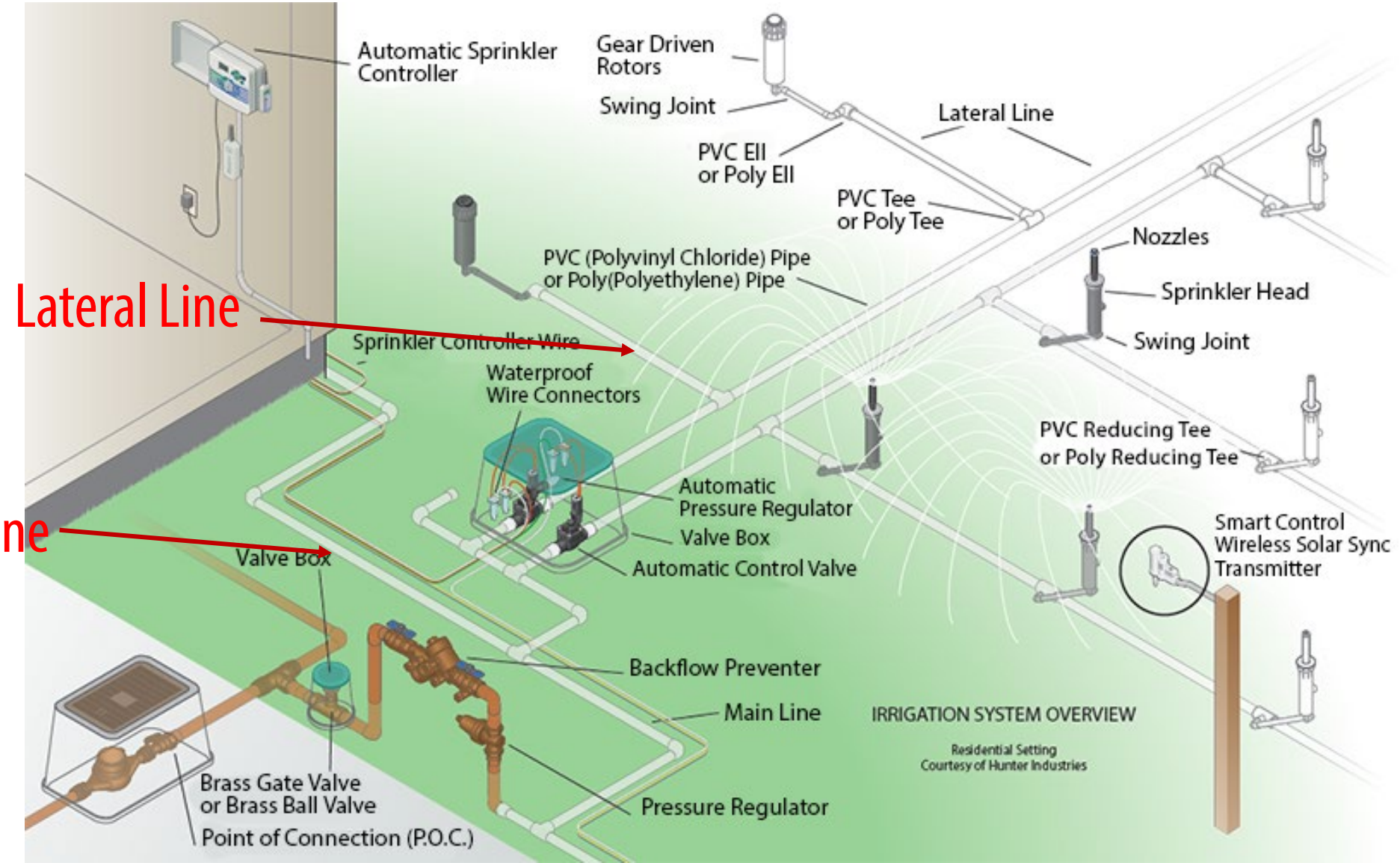
Standard Valve

Valve w/ pressure regulator

Valve considerations

- Location
  - Should be near area being irrigated, but not IN the lawn
- Each valve should water a zone with drip or spray but not both
- Valve manifolds help with later repair and replacement

Anatomy of a sprinkler system



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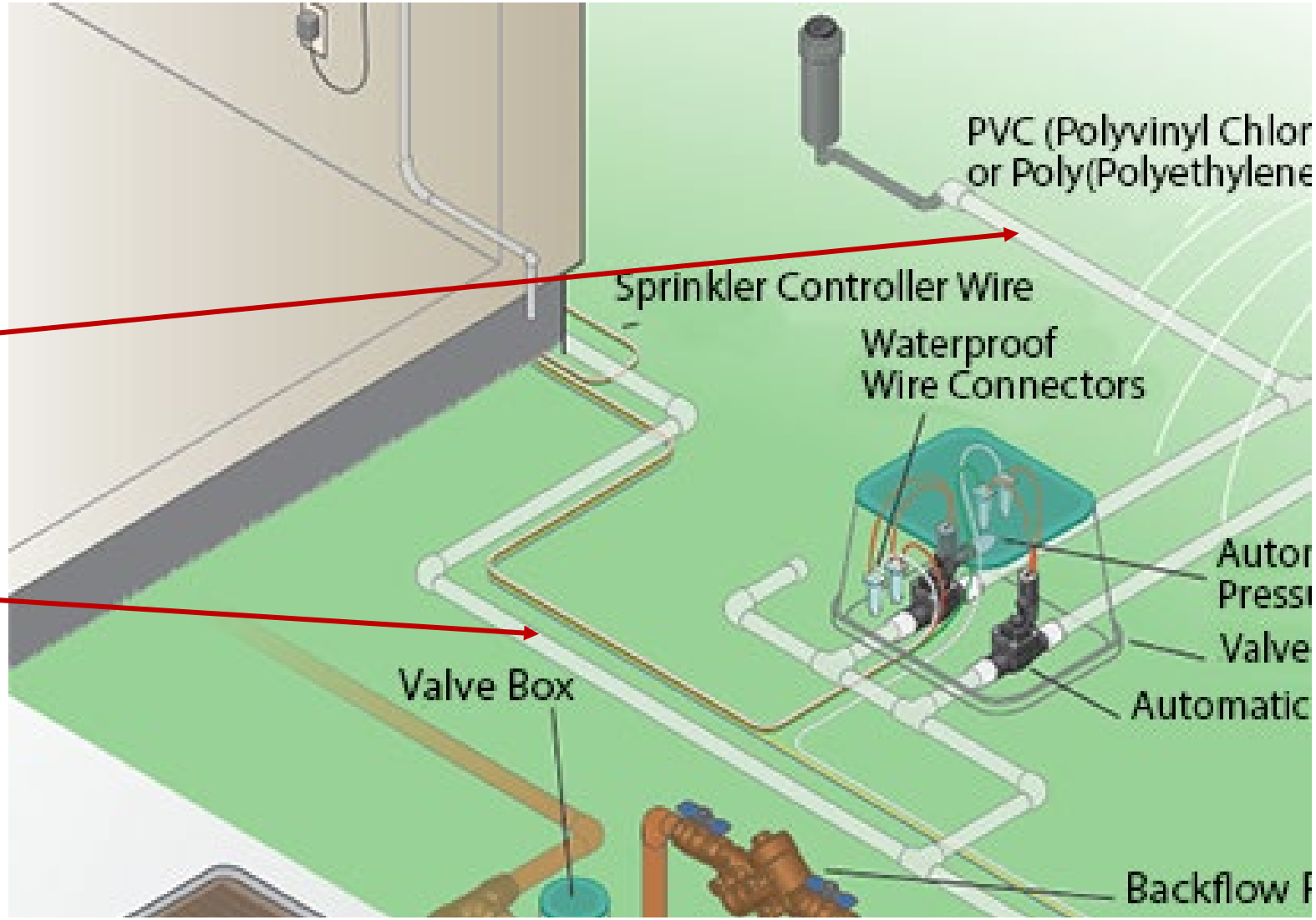
Anatomy of a sprinkler system



Graphic courtesy
Hunter Industries

Main Line

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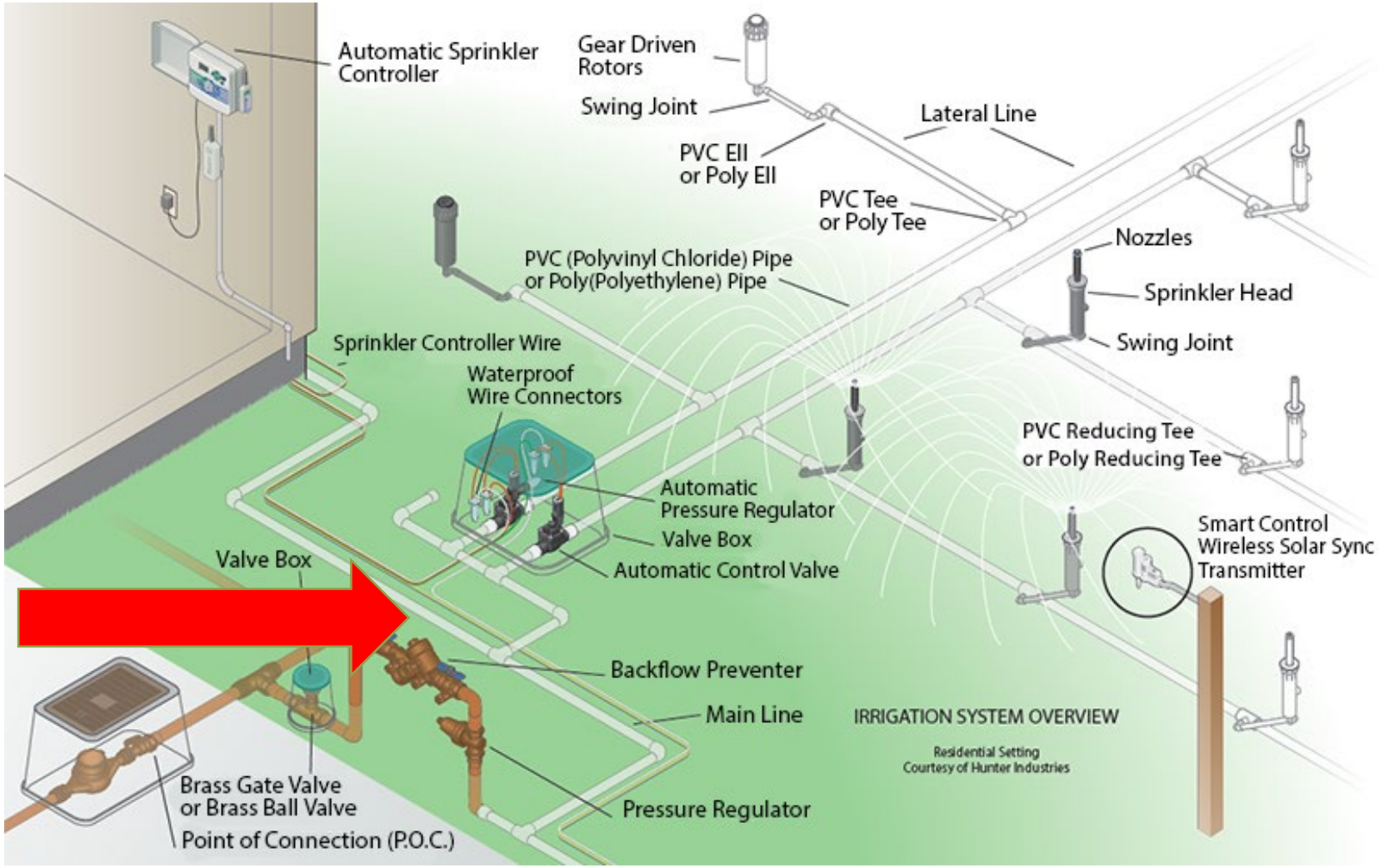
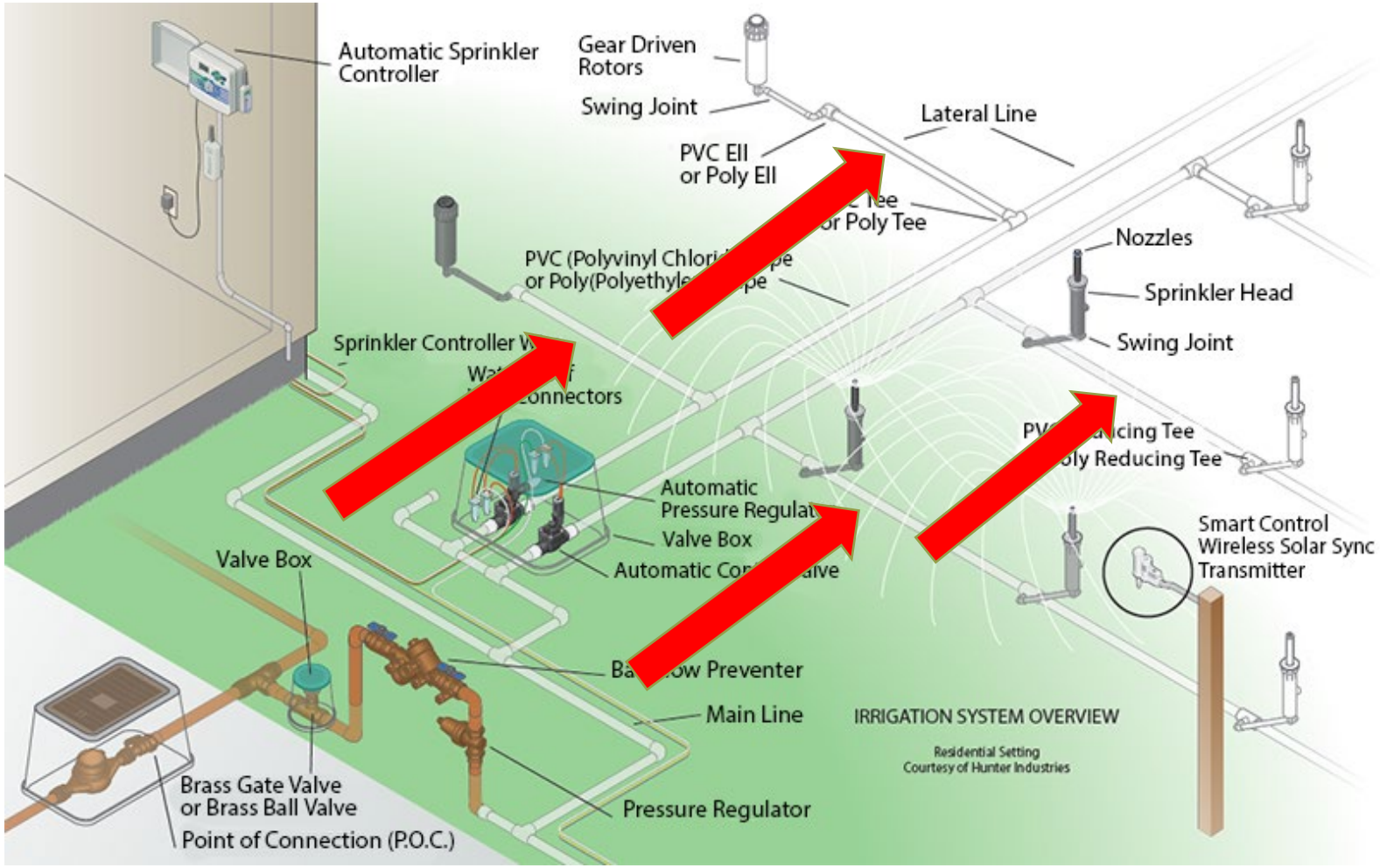
Constantly pressurized.

Should be larger or equal in size to lateral lines.



Lateral Line

Pressurized only when the valve is in operation



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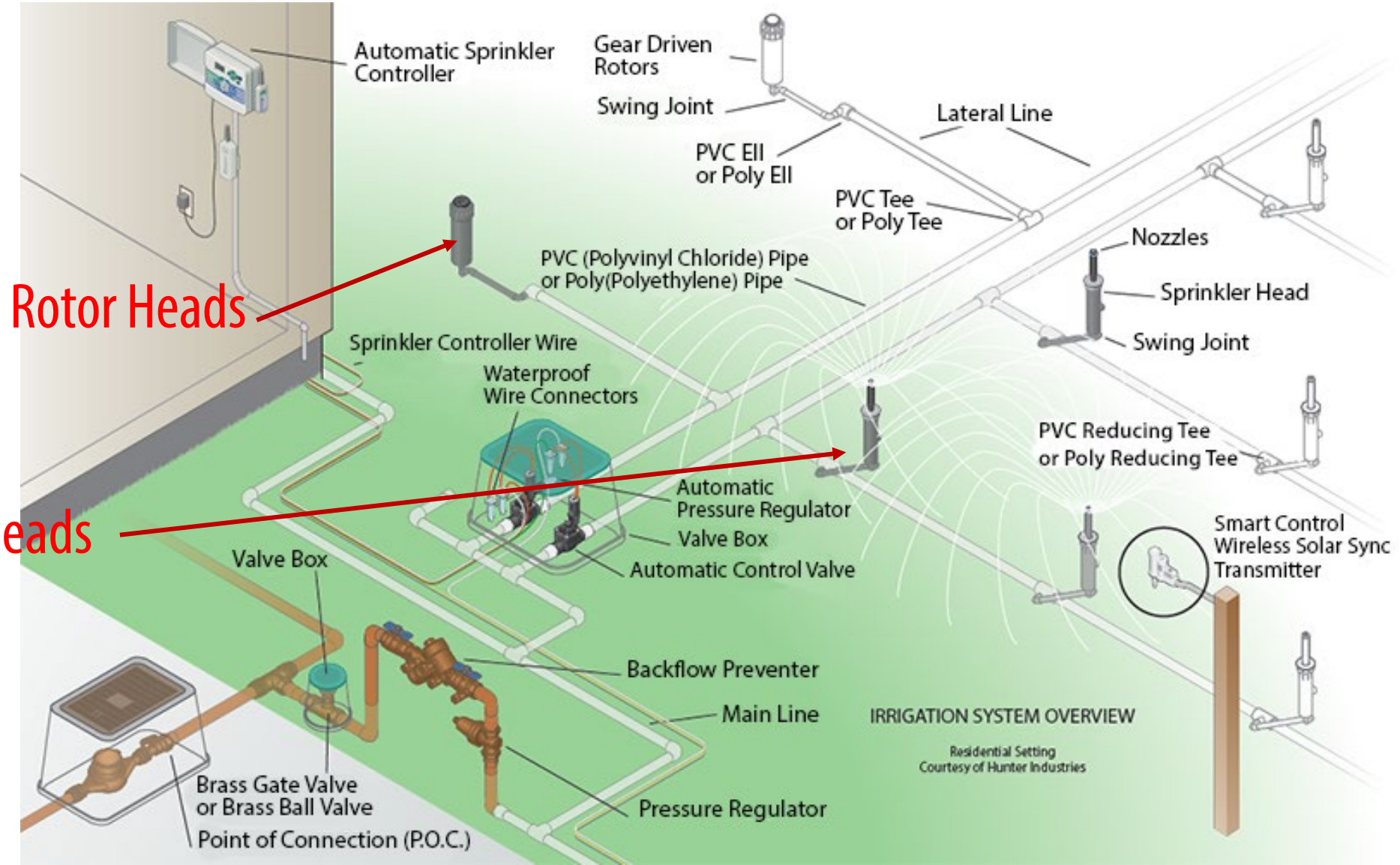

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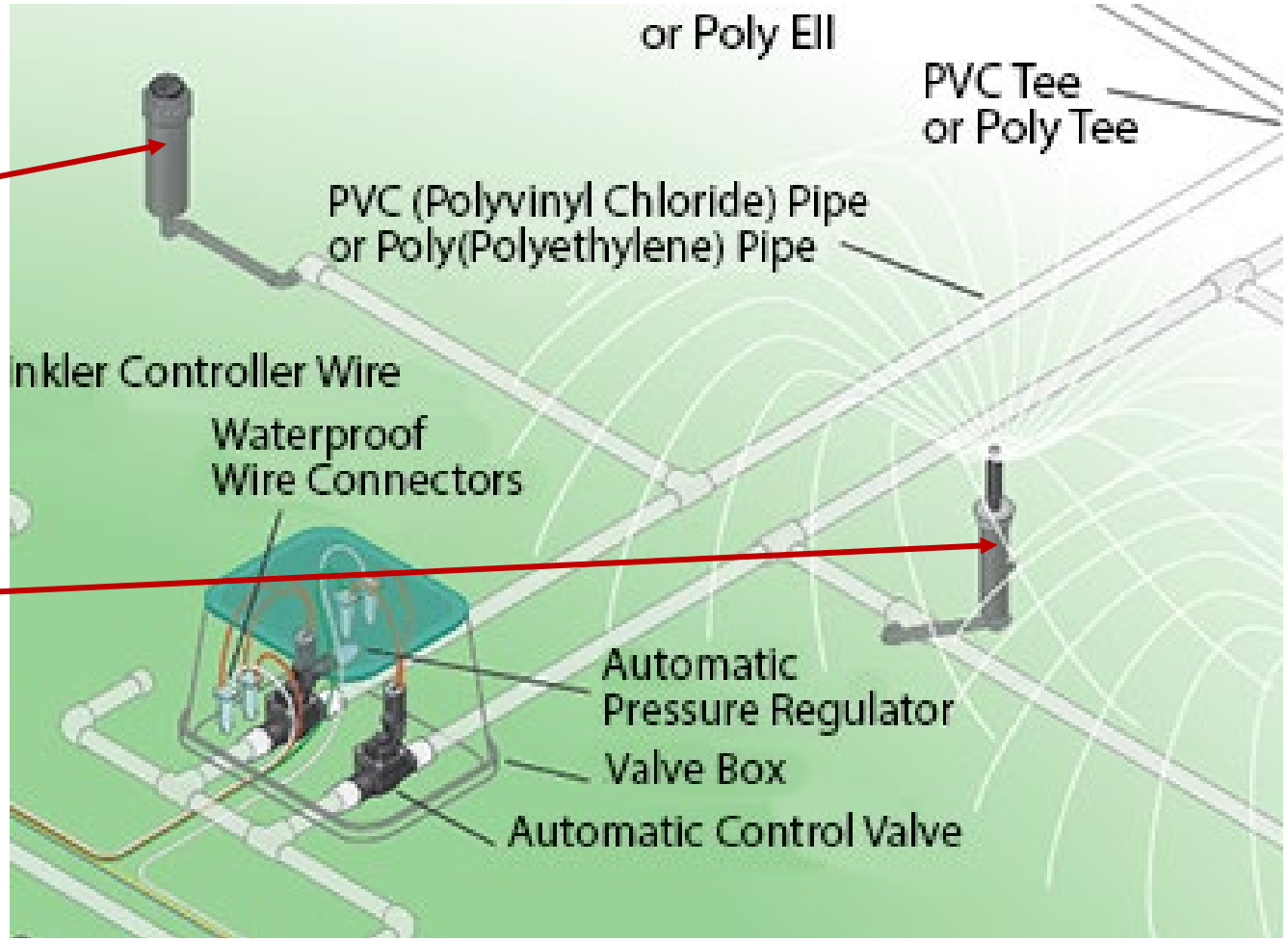
Hunter Industries

Anatomy of a sprinkler system

Rotor Heads

Spray Heads



Graphic courtesy
Hunter Industries

Fixed spray heads

Best for small areas

Highest precipitation rates

Fixed spray nozzles

Choose from
Full
Half
Quarter
SST
U

Rotor heads

Best used in large areas

Lower precipitation rates

Rotor nozzles

Choose the right Gallons Per Minute for the area the head is covering

Rotary nozzles

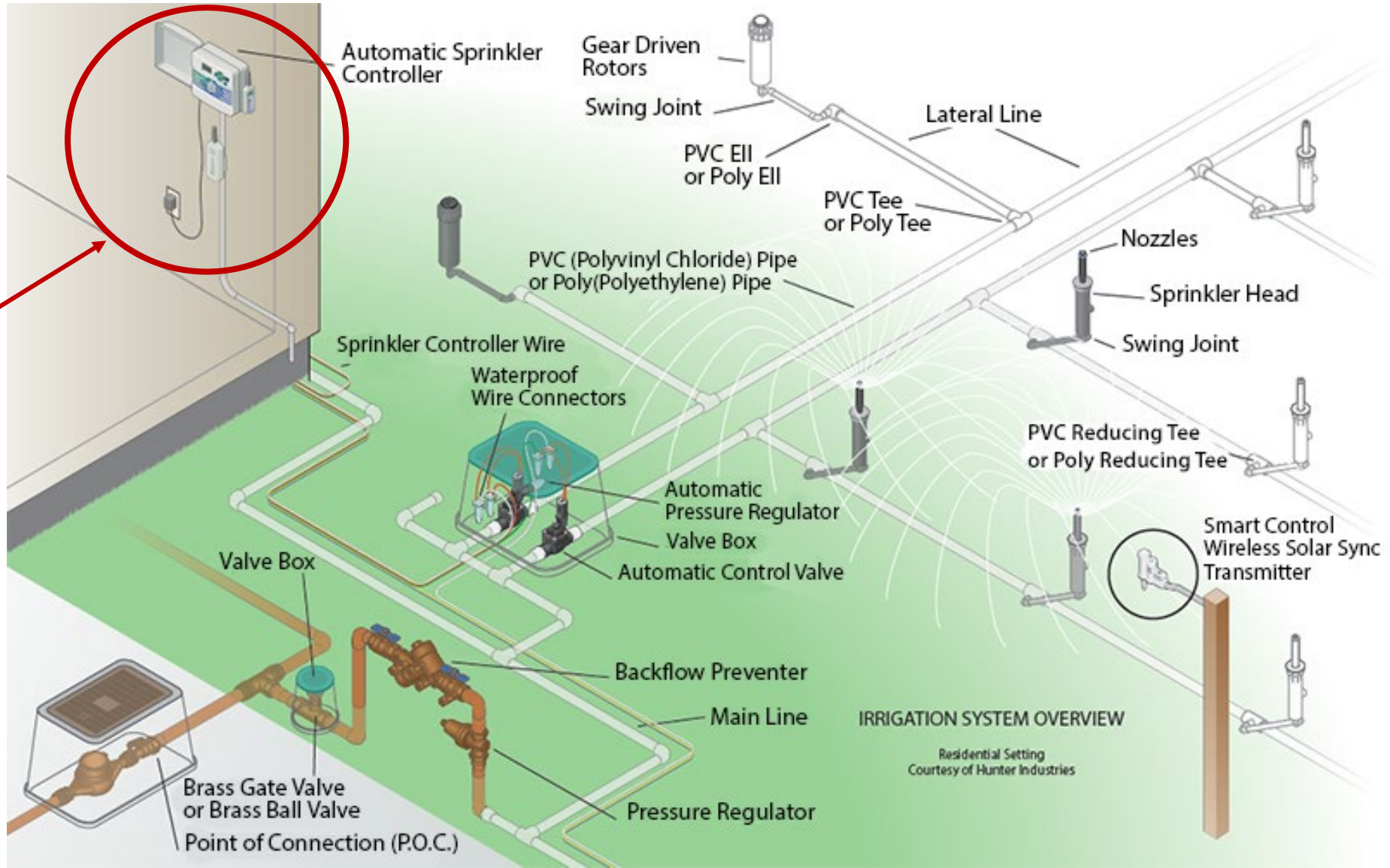
- Can be used in most area sizes
- Lower precipitation rate

Swing joints

Helps sprinkler heads be more adjustable and less prone to breaking when impacted

Anatomy of a sprinkler system

Controllers



Graphic courtesy
Hunter Industries

Drip irrigation overview

- Drip irrigation allows water to flow slowly to the root systems of the plants.
- Very little water is wasted because of evaporation or wind.
- Helps with weed control.
- Easier to install or change.

All drip systems need:

Drip irrigation types

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Localscapes.com

In -Line Drip

Point Source Drip

Drip Irrigation Basics

David Rice
Conservation Programs
Weber Basin Water Conservancy District

Drip Irrigation Advantages
(Why use drip?)

- Water delivered to where you need it without a lot of waste.
- Slow delivery of water so a benefit with all soil types.
- Reduced weed growth due to less water where you don’t want it.
- Can water at any time of day or night when spray restrictions may be in effect.
- No blockage of spray due to larger plant material.
- In most cases, easy to assemble and repair with no glued parts.
- Used in all types of plant combinations or specialty situations (i.e. Vegetable gardens, raised beds, etc).

Flow Rates, Drip vs. Spray

- It all depends on pipe size (flow) (see chart) and nozzles used.
- Spray head application rate varies:
  - 5000 series rotor at normal pressure can apply 3-5 gpm (1 head)
  - Fixed pop up can range from .25 to 3 gpm depending on the nozzle used.
- Drip on the other hand is in gallons per hour. Each emitter ranging from .5 to 10+ gallons per hour.
- A typical system using 1 gph emitters could run approx. 1,400 emitters and have enough flow through a ¾ inch pipe.

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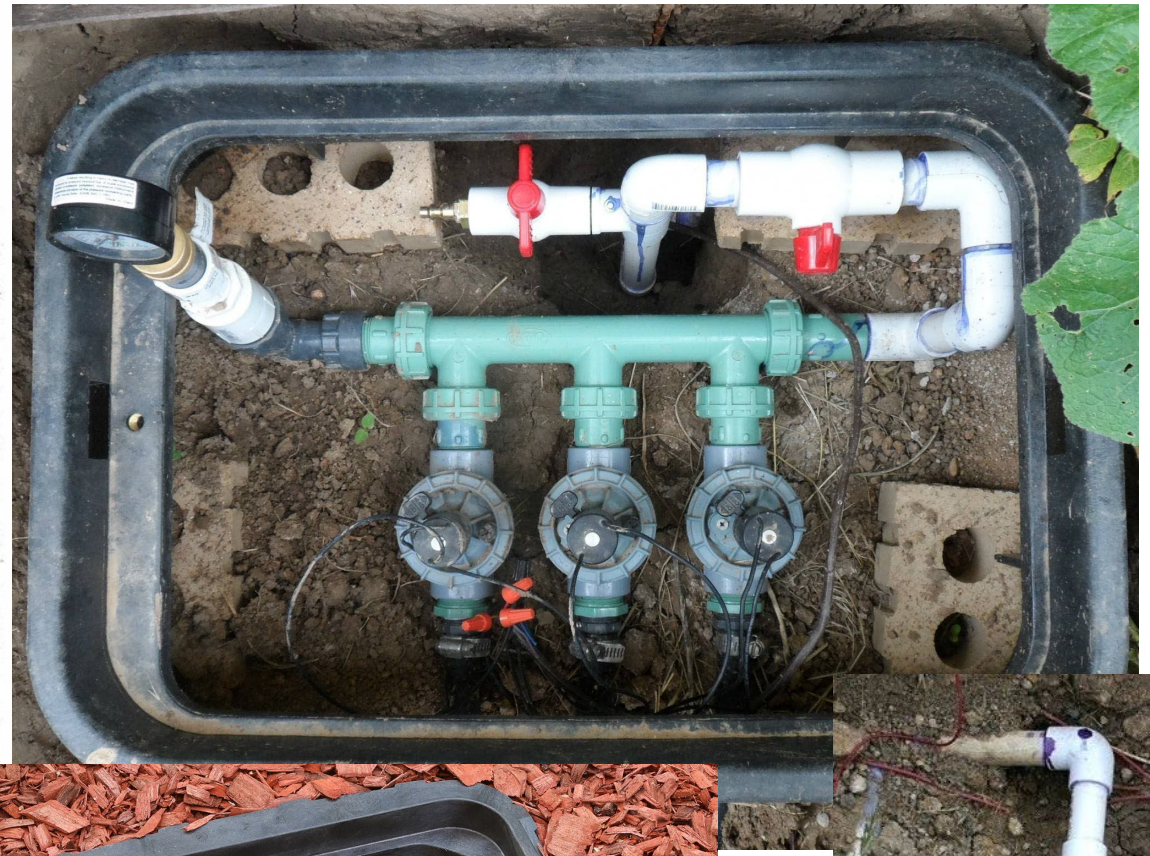
Determining Flow Rate for Drip Zones

Bucket method to determine flow
From the source

Drip Zone Set Up - Manifolds and Valves



Sprinkler Valves

Standard Valve

Valve w/ pressure regulator/ filter

Filtration- a necessity with secondary water

Filter

Pressure Reducer

For Drip a mesh/screen size of 150 is probably adequate. The higher the number the finer/higher the filtration.

pressure regulator/reducer

Hose end connections work also

You can even purchase battery operated valves for hose end applications

The quick set up of a drip zone manifold

Pipe types and terms

- PVC (schedule 40)
- Poly
  - ½ inch or ¾ inch.
  - Used for main lines or lateral lines.
  - Thickness varies depending on use (drip applications have thinner walled pipe)
- Lateral Line- line from valve assembly to delivery (heads or emitters)
- Main Line- supplies water to valve assembly (always pressurized)

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Drip irrigation types

In -Line Drip

Point Source Drip

In-line drip

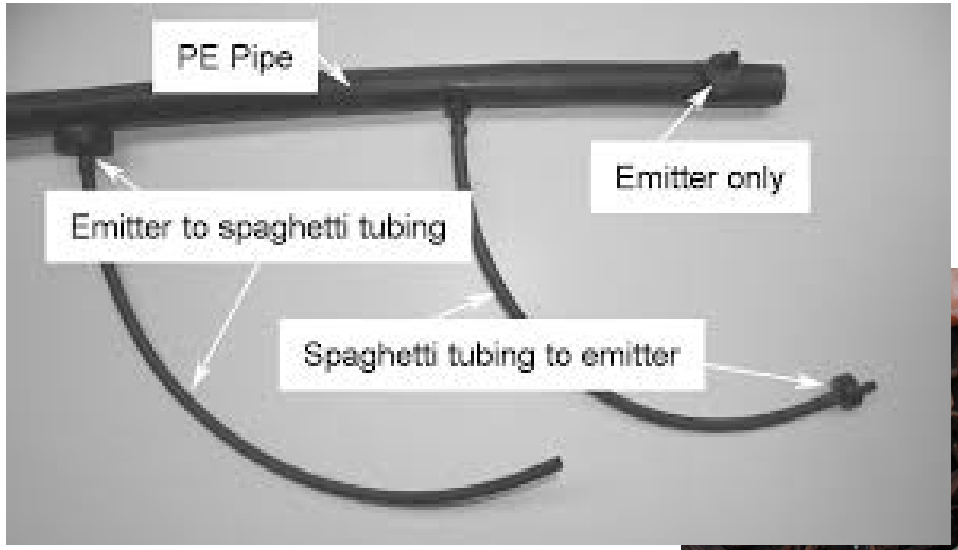
In-line drip is best for high density plantings.

In-line emitter poly around shrub

In-line drip emitters

- Drip emitters built directly into the lines
- This is meant to water the entire planter bed evenly
- Installed on the surface of the soil under a layer of mulch
- Maintenance of this style of drip line is easy

Point-source drip



- Drip emitters are attached to the main line with distribution tubing
- Emitter is meant to water individual plants
- Installed on the surface of the soil under a layer of mulch
- This is the best approach for maximum weed control

Point-source drip

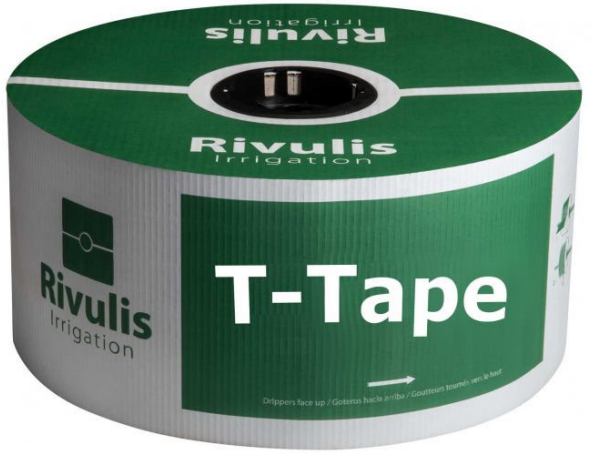
Point-source drip works well for low-density but can be used on higher density plantings as well

Drip irrigation retrofit kits

New technologies make switching from overhead spray to drip much easier.

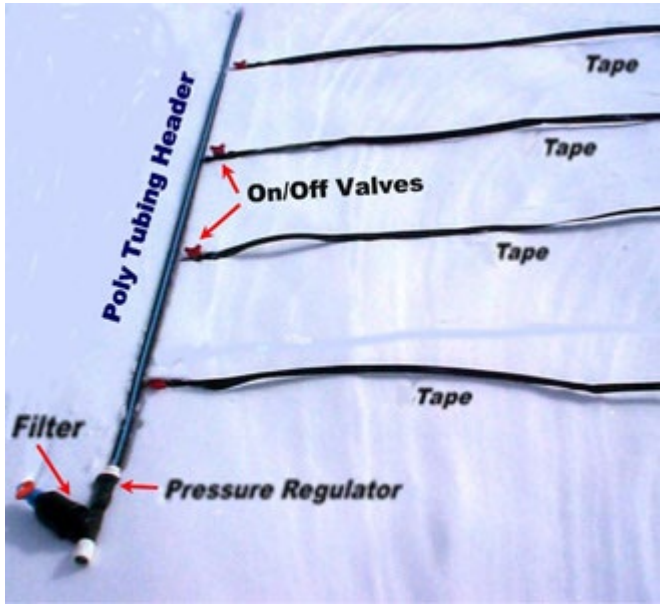
Spray to Drip Conversion

Drip Tape/ Trickle Tape/ T Tape



Drip tape used here in row crop applications, and dense plantings in raised beds

Drip Tape Continued



- It operates at 8-15 PSI at the head-lines to give 10 PSI in the drip lines. (other drip may run at 35 PSI)
- Drip tubing can last anywhere from 1-5 years depending on the quality (8 mil- 15 mil) and the application and if left in the sun, etc.
- Drip Tape can be buried, covered with mulch or left at the surface level.
- Pressure compensating along the length, works very well.

In-line emitters

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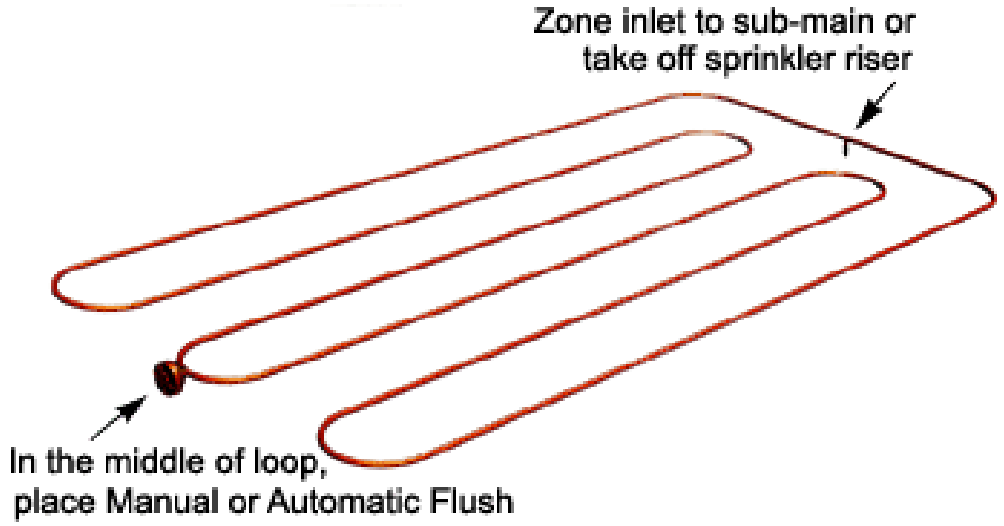
Point-source drip

Localscapes
Localscapes.com

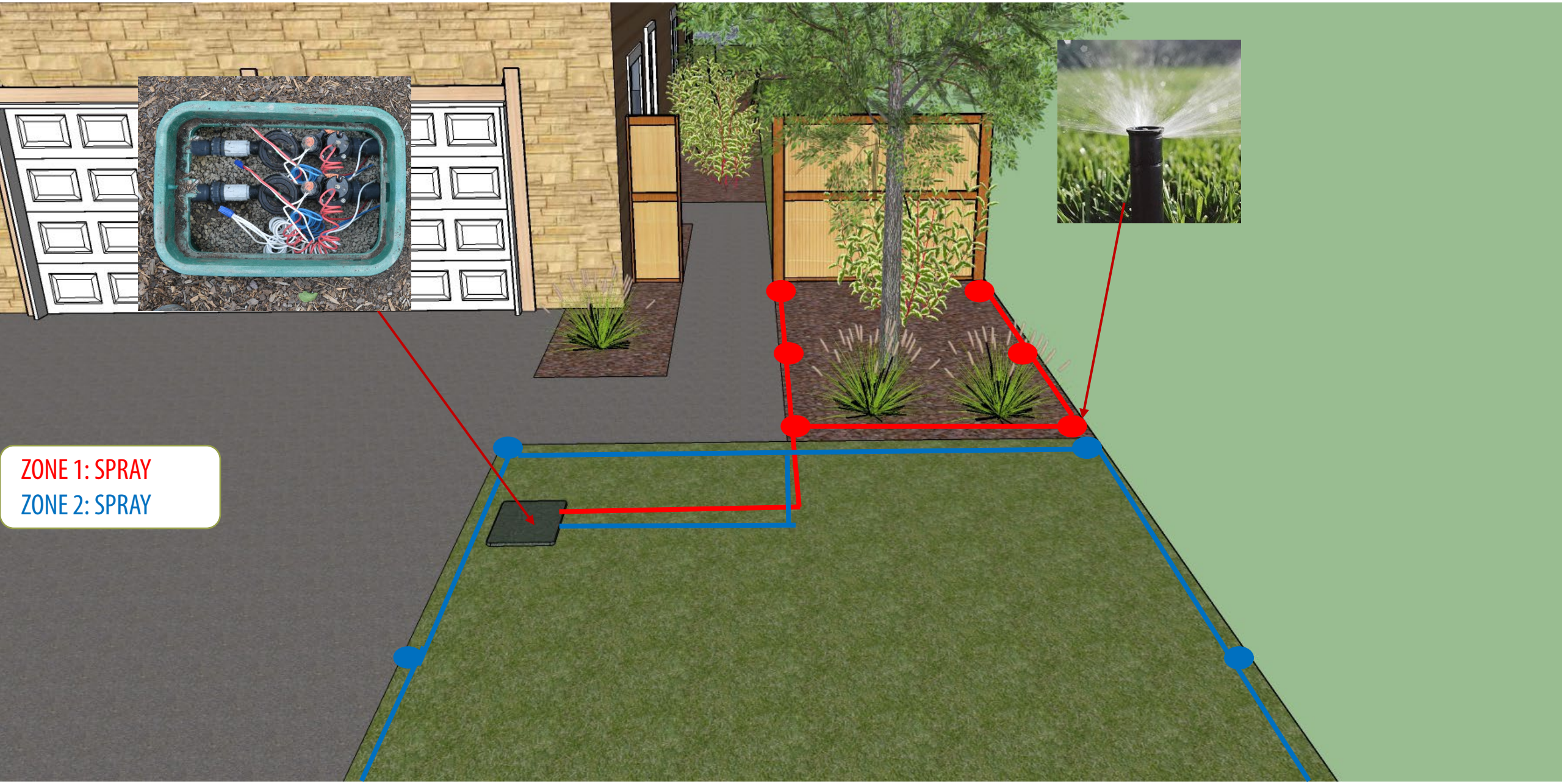
Point-source drip works well in low-density plantings.

Drip system considerations

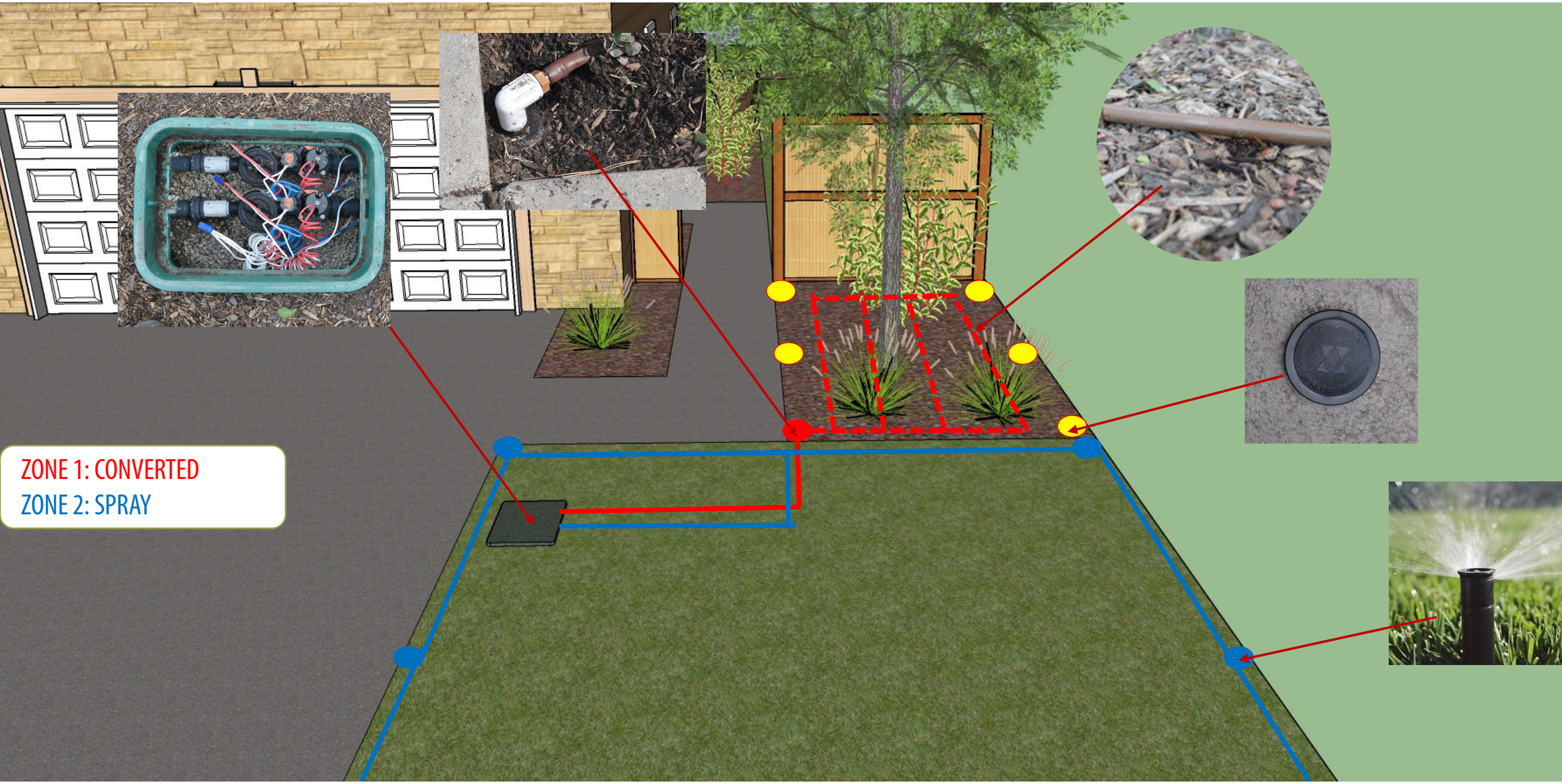
- Limit tubing runs to 200 feet
- Secure tubing with metal stakes
- Water deeply (between 1 and 2 hours)



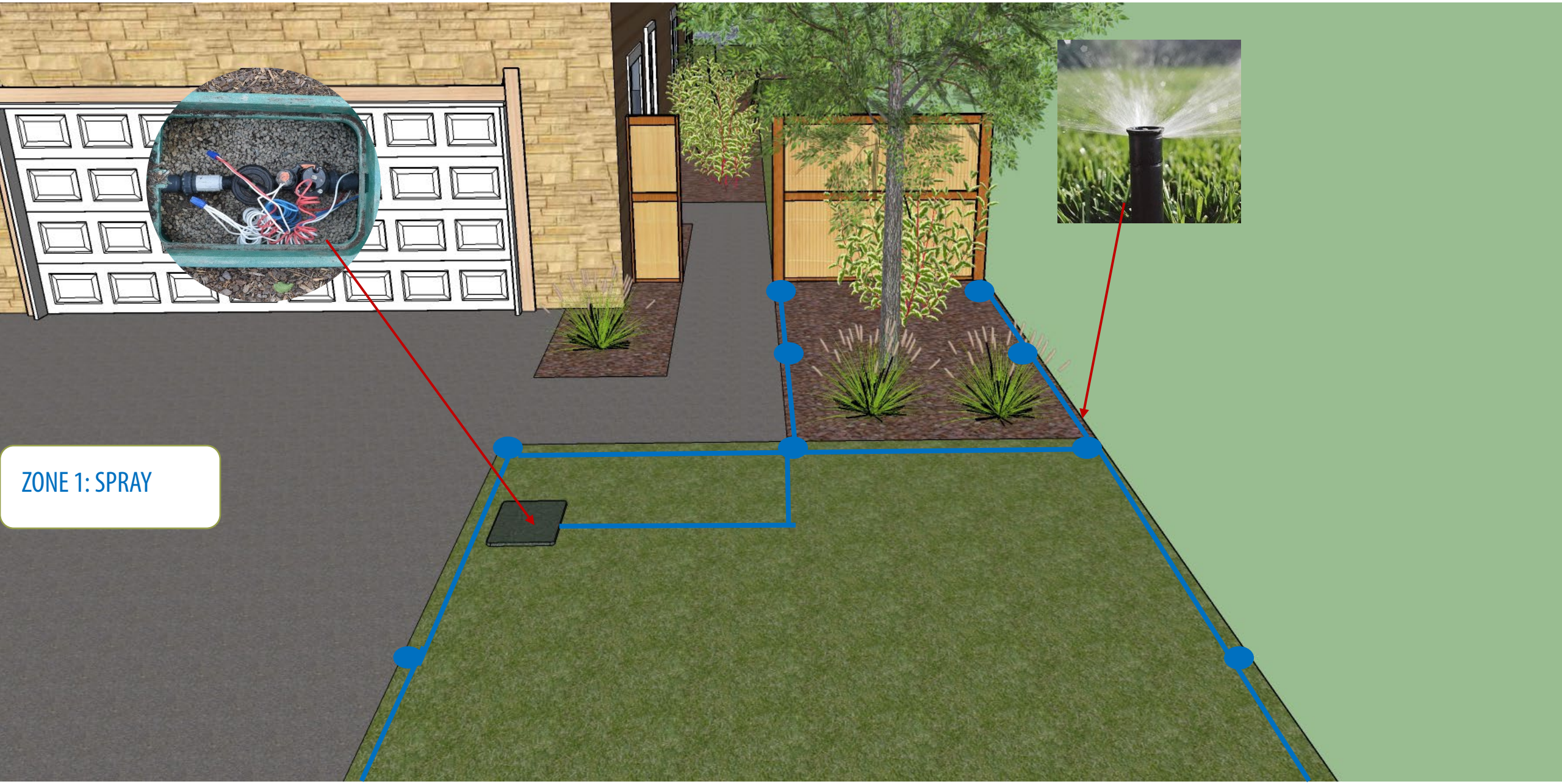
Scenario 1: Planter bed watered with spray separate from lawn



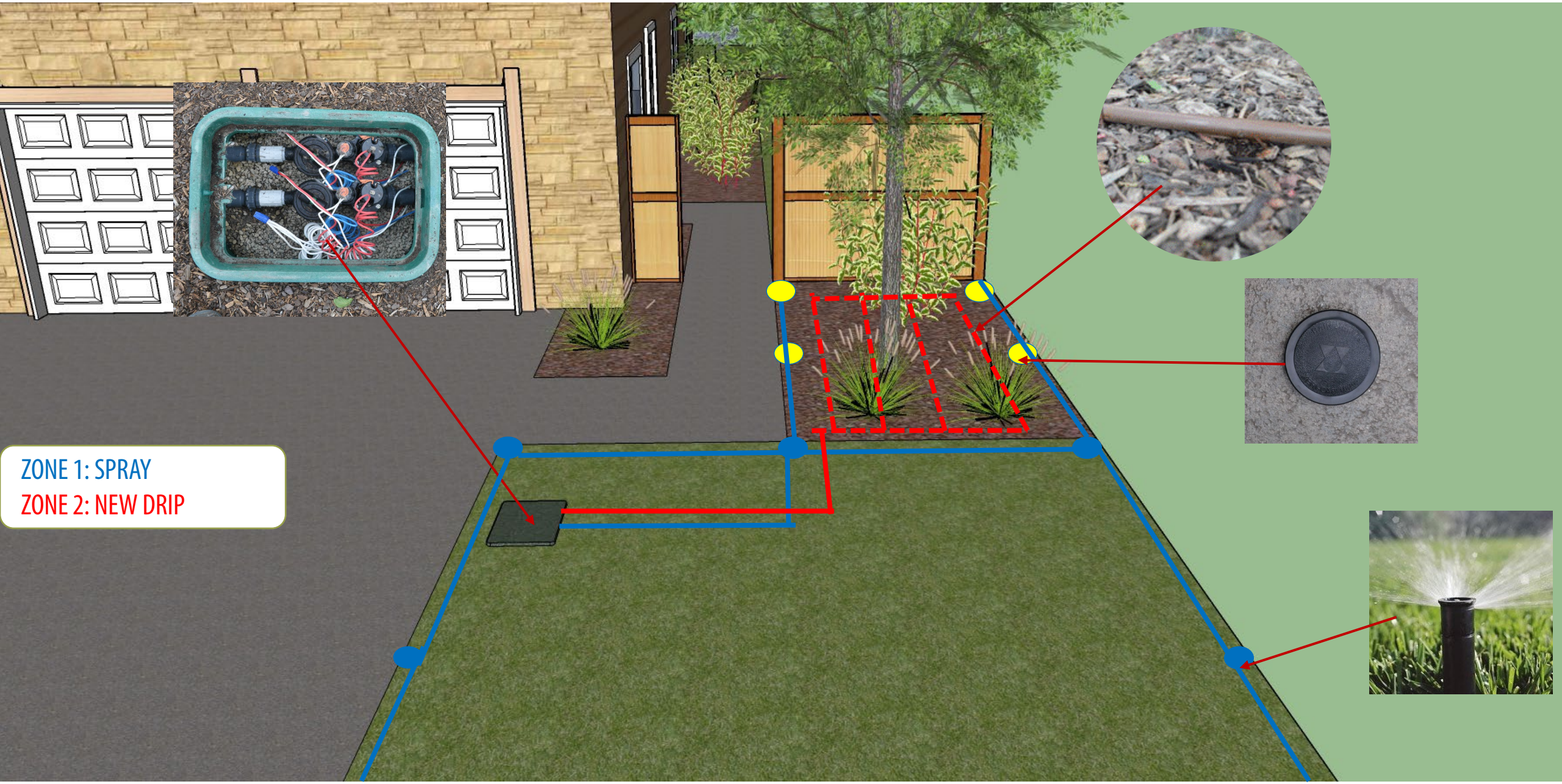
Scenario 1: Planter bed converted to drip



Scenario 2: Planter bed and lawn on the same zone



Scenario 2: Planter bed and lawn different zones by adding a valve



Discussion and Set Up

- Drip Irrigation for Veggies/Raised Beds
- Leaks
- Repairing broken items
- Relocating Heads as Turf is removed
- Conversion from Spray to Drip
- Scheduling over the summer
    - (Consider your soil reservoir and how often it needs filled/ how fast it drains for the plants/evaporation/transpiration)
- Fittings and Glue
- All other issues and parts

Questions ?

- You can do this
- Water Management is our personal responsibility
- Proper irrigation will result in healthy landscaped and a reduction in landscape water use.

- Thank You for Coming- Go help others with your knowledge when you can.