Irrigation System Basics

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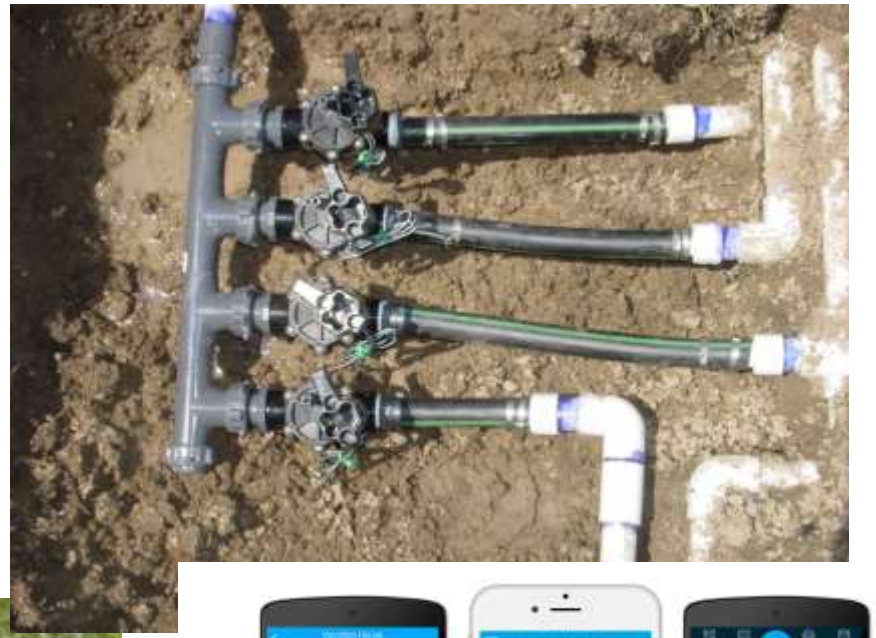
Weber Basin Water Conservancy District

Irrigation System and Product Improvements

WEBER BASIN WATER CONSERVANCY DISTRICT

Irrigation System and Product Improvements



WEBER BASIN WATER CONSERVANCY DISTRICT

Efficient watering is the goal

Localscapes
Localscapes.com

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

Why Irrigate?

- When a plant can’t get enough water from the environment
- Four irrigation situations
  - Temporary: after transplanting
  - Temporary: during drought
  - Permanent: Using plants not adapted to available moisture conditions
  - Permanent: in areas that have no natural water source (Pots and indoors)
- Irrigation systems
  - Sprinkler (spray) vs. drip/low volume

Irrigation Hydrozoning

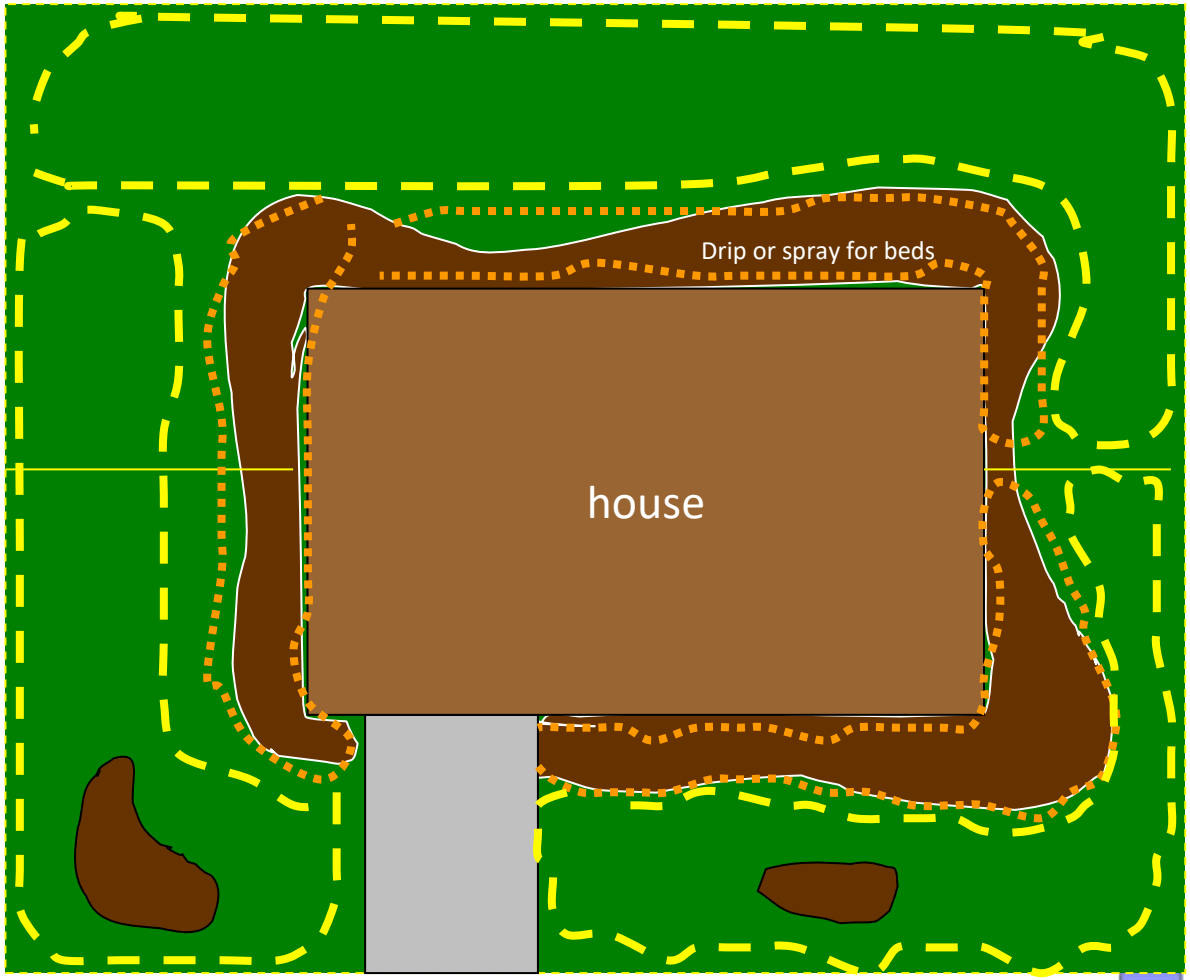
N

Separate irrigation zones should be based on:

- Turf
- Shrub/Flower beds
- Exposure/Micro-climate conditions
- Soil types

Run time is based on:

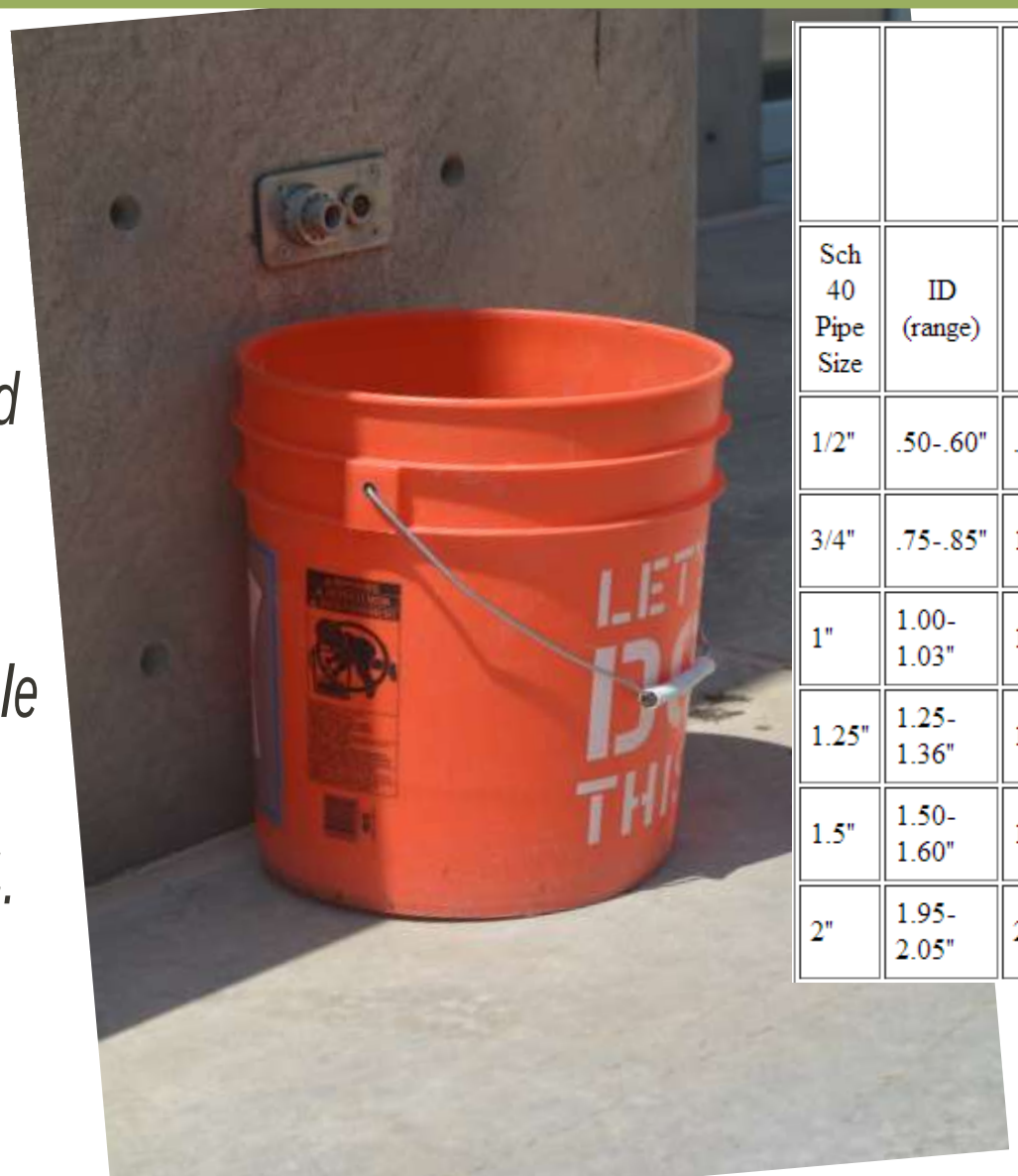
- **Seasonal changes in temperature.**



Weber Basin Water Conservancy District

Determining 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.*



			Assume Gravity to Low Pressure. About 6f/s flow velocity, also suction side of pump		Assume Average Pressure. (20-100PSI) About 12f/s flow velocity		Assume "High Pressure" PEAK flow. About 18f/s flow velocity*	
Sch 40 Pipe Size	ID (range)	OD	**GPM** (with minimal pressure loss & noise)	**GPH** (with minimal pressure loss & noise)	**GPM** (with minimal pressure loss & noise)	**GPH** (with minimal pressure loss & noise)	**GPM** (with significant pressure loss & noise)	**GPH** (with significant pressure loss & noise)
1/2"	.50-.60"	.85"	7 gpm	420 gph	14 gpm	840 gph	21 gpm	1,260 gph
3/4"	.75-.85"	1.06"	11 gpm	660 gph	23 gpm	1,410 gph	36 gpm	2,160 gph
1"	1.00-1.03"	1.33"	16 gpm	960 gph	37 gpm	2,220 gph	58 gpm	3,510 gph
1.25"	1.25-1.36"	1.67"	25 gpm	1,500 gph	62 gpm	3,750 gph	100 gpm	5,940 gph
1.5"	1.50-1.60"	1.90"	35 gpm	2100 gph	81 gpm	4,830 gph	126 gpm	7,560 gph
2"	1.95-2.05"	2.38"	55 gpm	3300 gph	127 gpm	7,650 gph	200 gpm	12,000 gph

Water Pressure

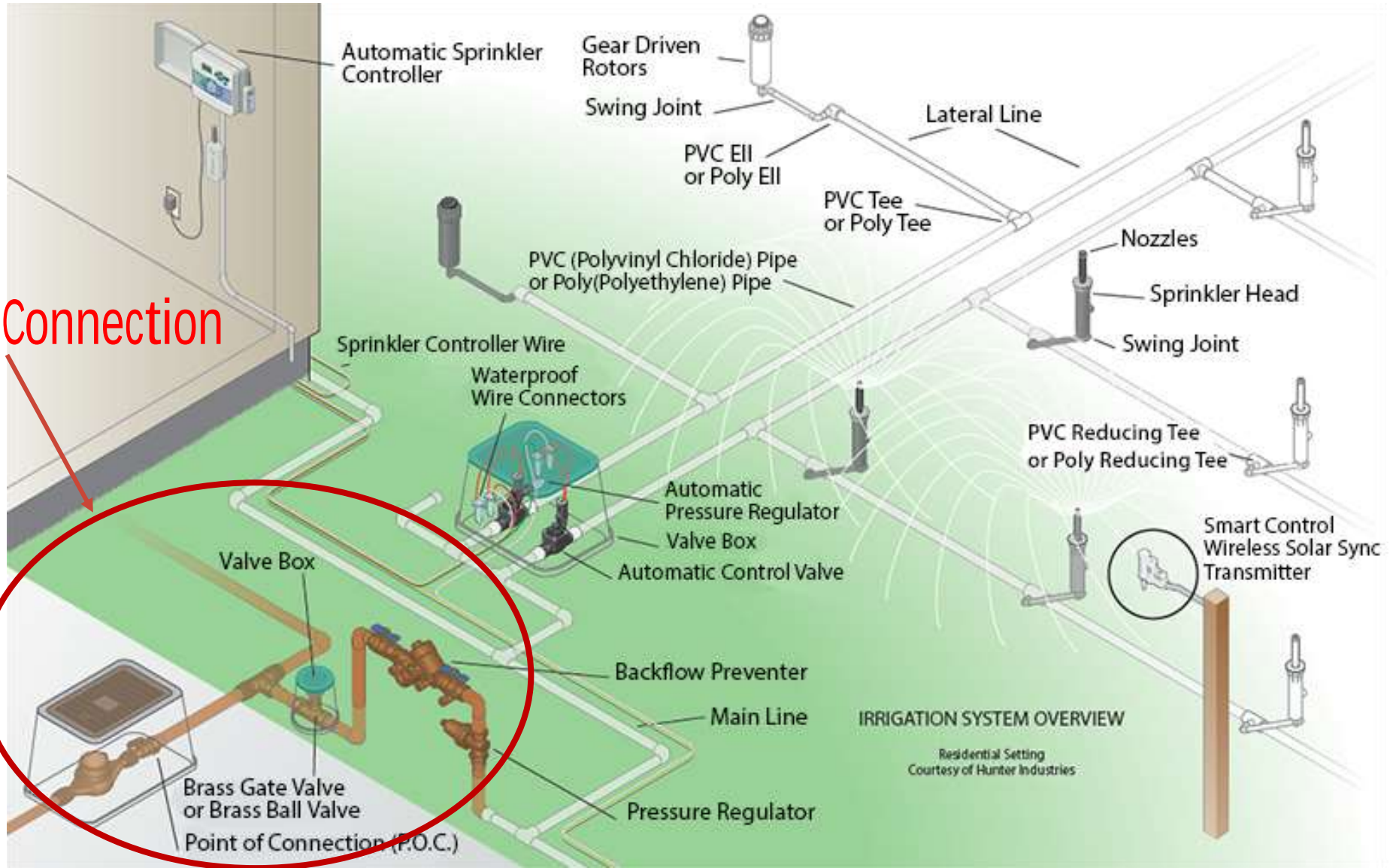
- *Water pressure that is too high or too low can cause problems.*
- *Misting spray heads and water hammer are signs of high pressure*
- *Heads that don't pop up and dry spots are signs that pressure is too low*
- *Drip Irrigation- 10-30 psi*
- *Spray Irrigation- 30-50 psi*

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

Anatomy of a sprinkler system



Point of Connection

Graphic courtesy:
Hunter Industries

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 (can still split)
- More available in colder climates
- Fittings secured with barbs and clamps

Backflow Preventer (culinary systems)

Localscapes
Localscapes.com

Prevents contaminated water from being siphoned into the house.

Required by most city ordinances.

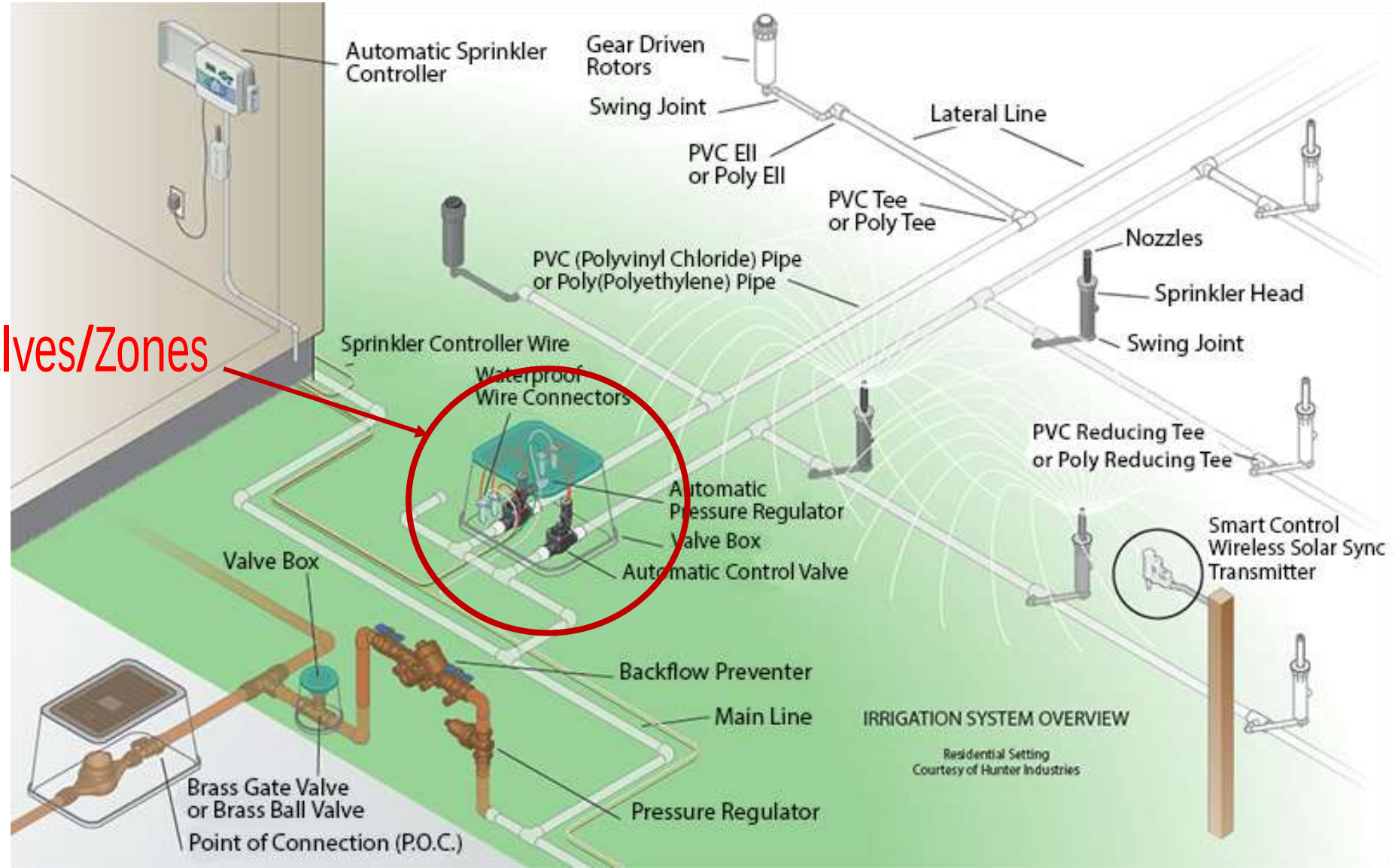
Pressure Regulator (PRV)

Keeps system pressure within optimal range.

Reduces wear on equipment.

Improves system efficiency.

Anatomy of a sprinkler system



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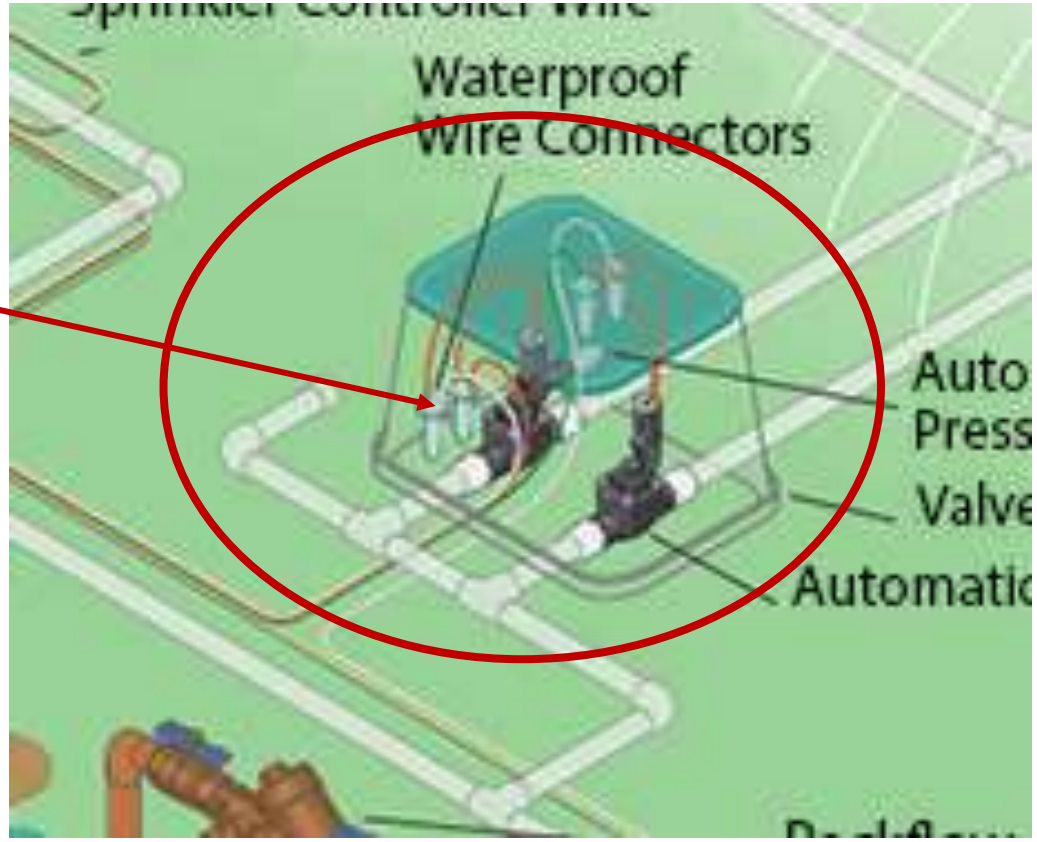
Anatomy of a sprinkler system

Valves/Zones



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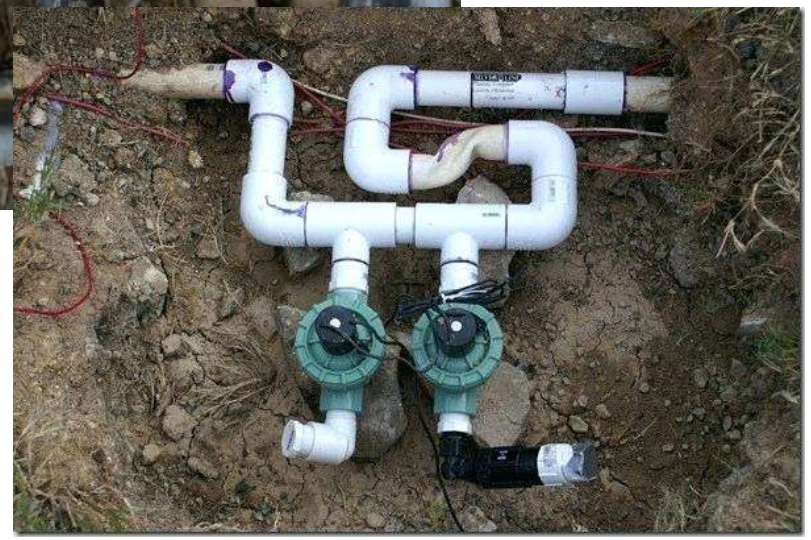
Zone Set Up - Manifolds and Valves



Sprinkler Valves

Standard Valve

Valve w/ pressure regulator/ filter

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 (using unions)

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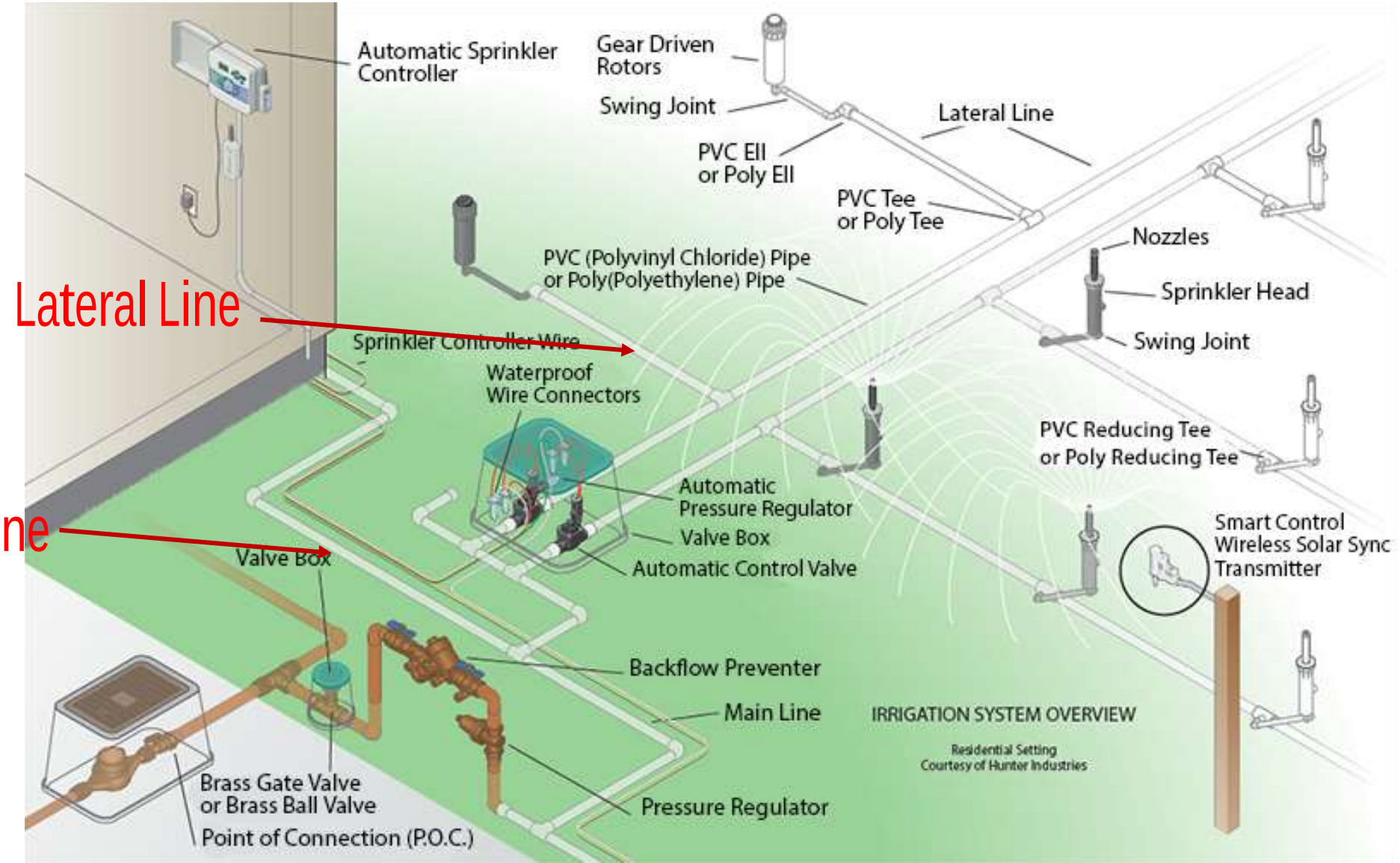

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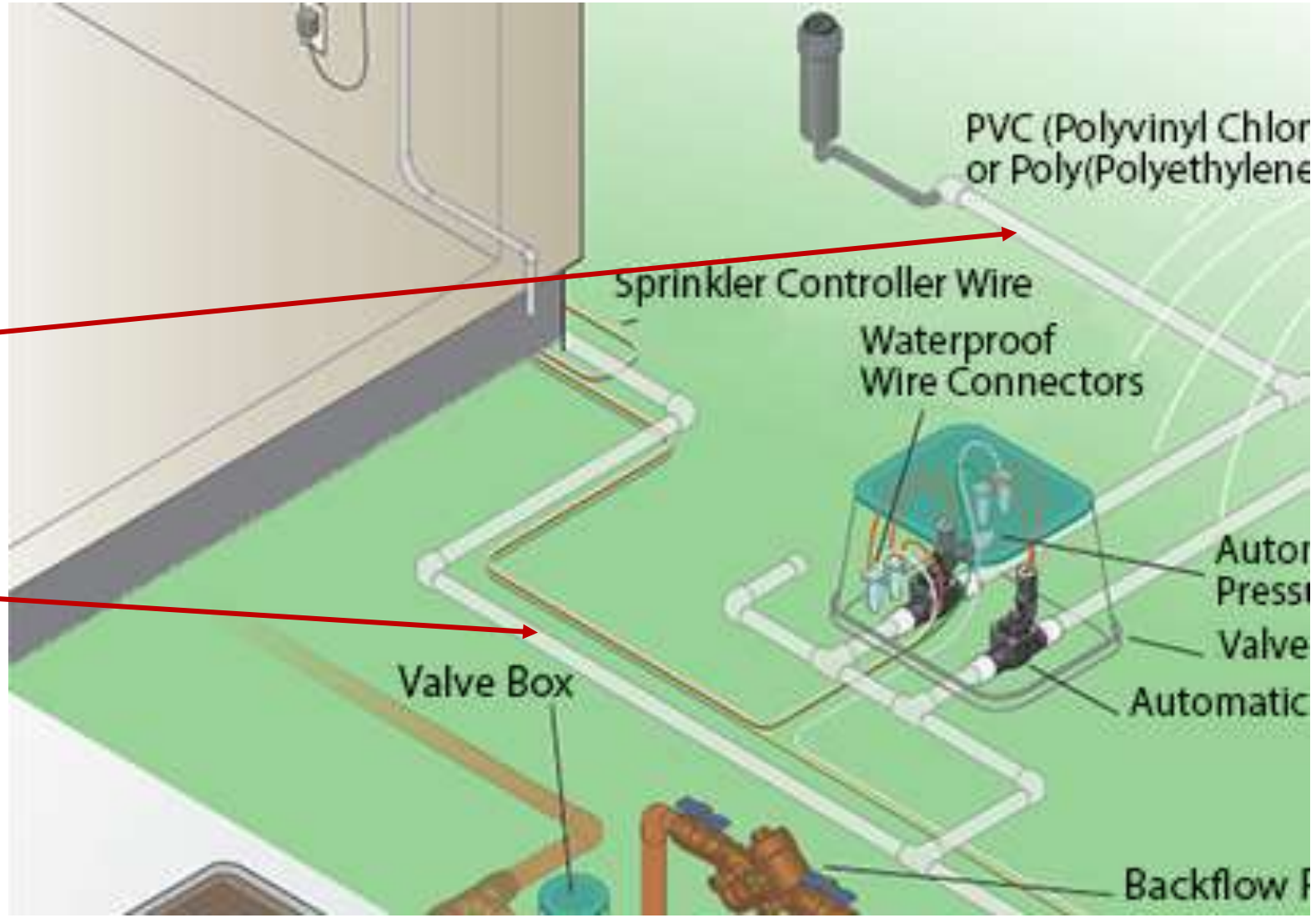
Anatomy of a sprinkler system



Lateral Line

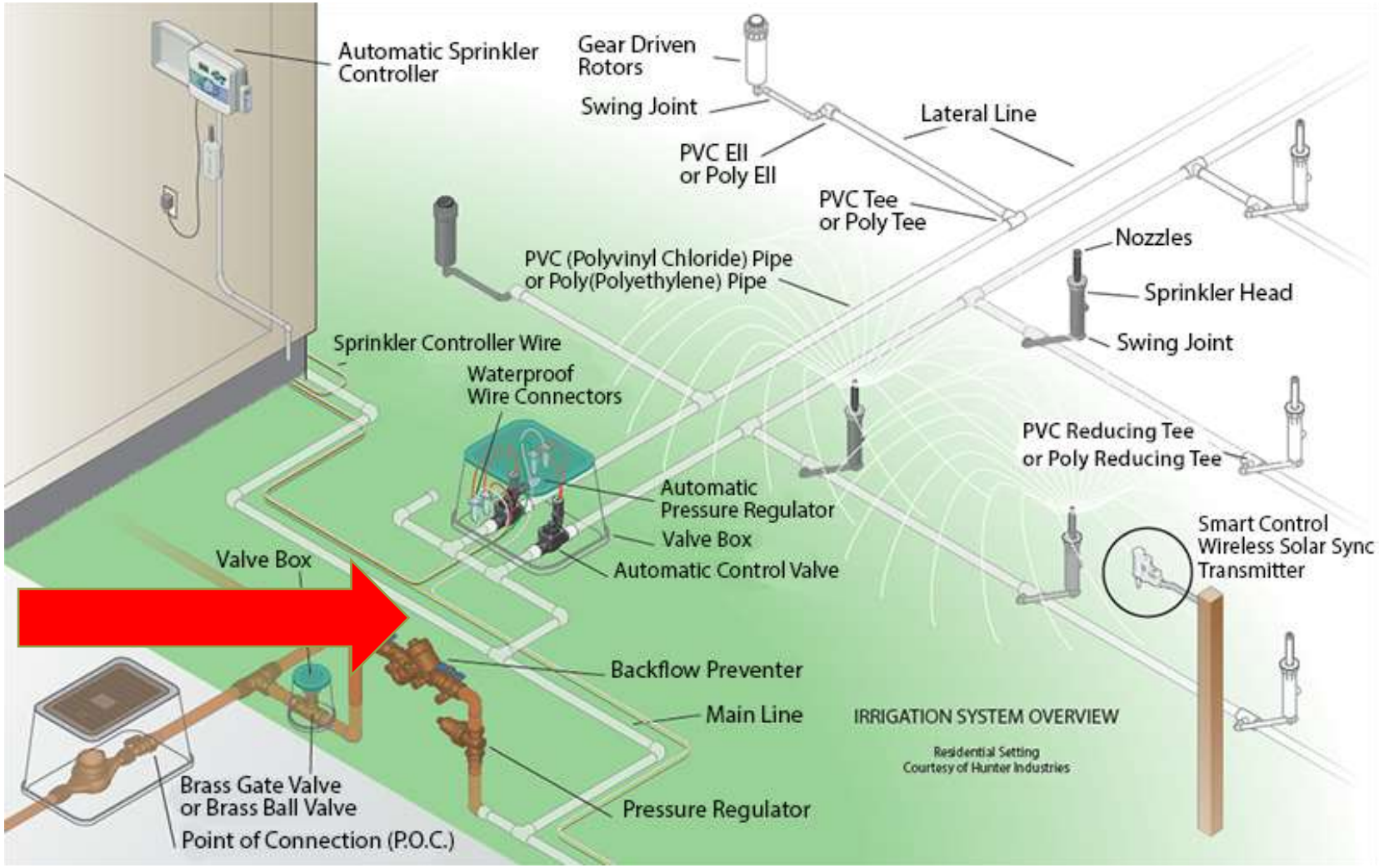
Main Line

Graphic courtesy
Hunter Industries

Main Line

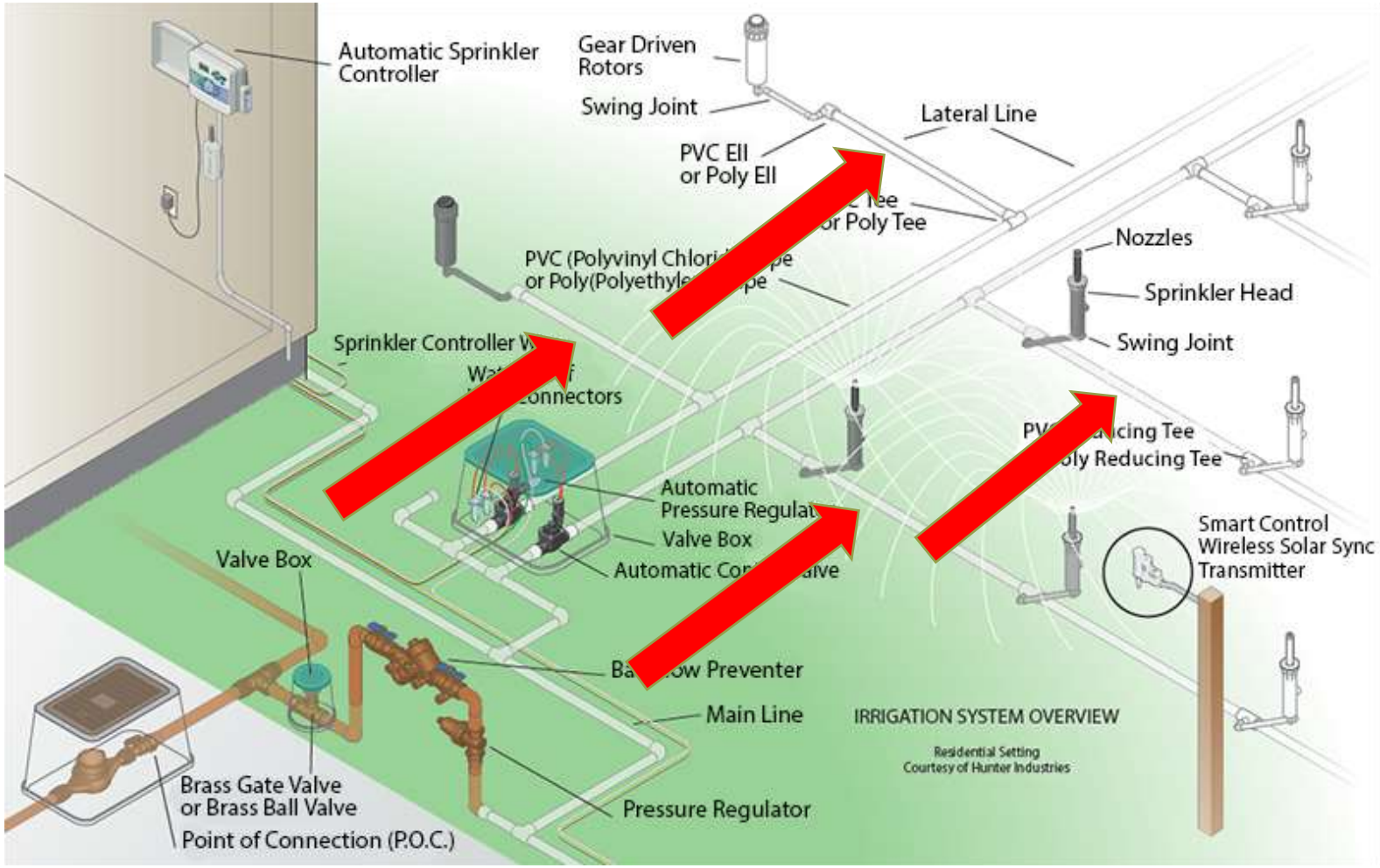
Constantly pressurized.

Should be larger or equal in size to lateral lines.



Lateral Line

Pressurized only when the valve is in operation



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.

All drip systems need:

pressure regulator/reducer

Pipe types and terms

- PVC (schedule 40)
- Poly
  - 1 inch, ¾ inch or ½ 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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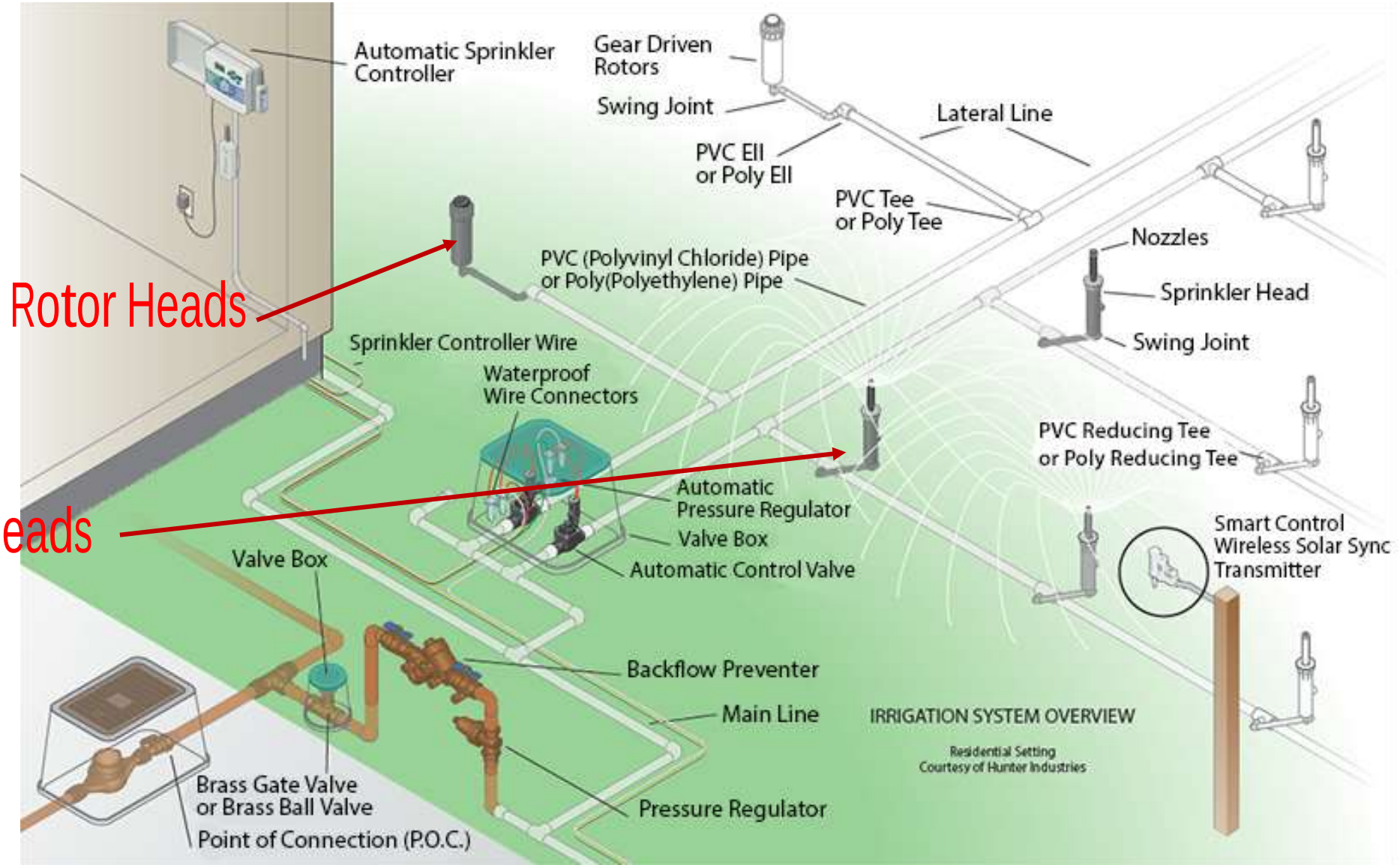

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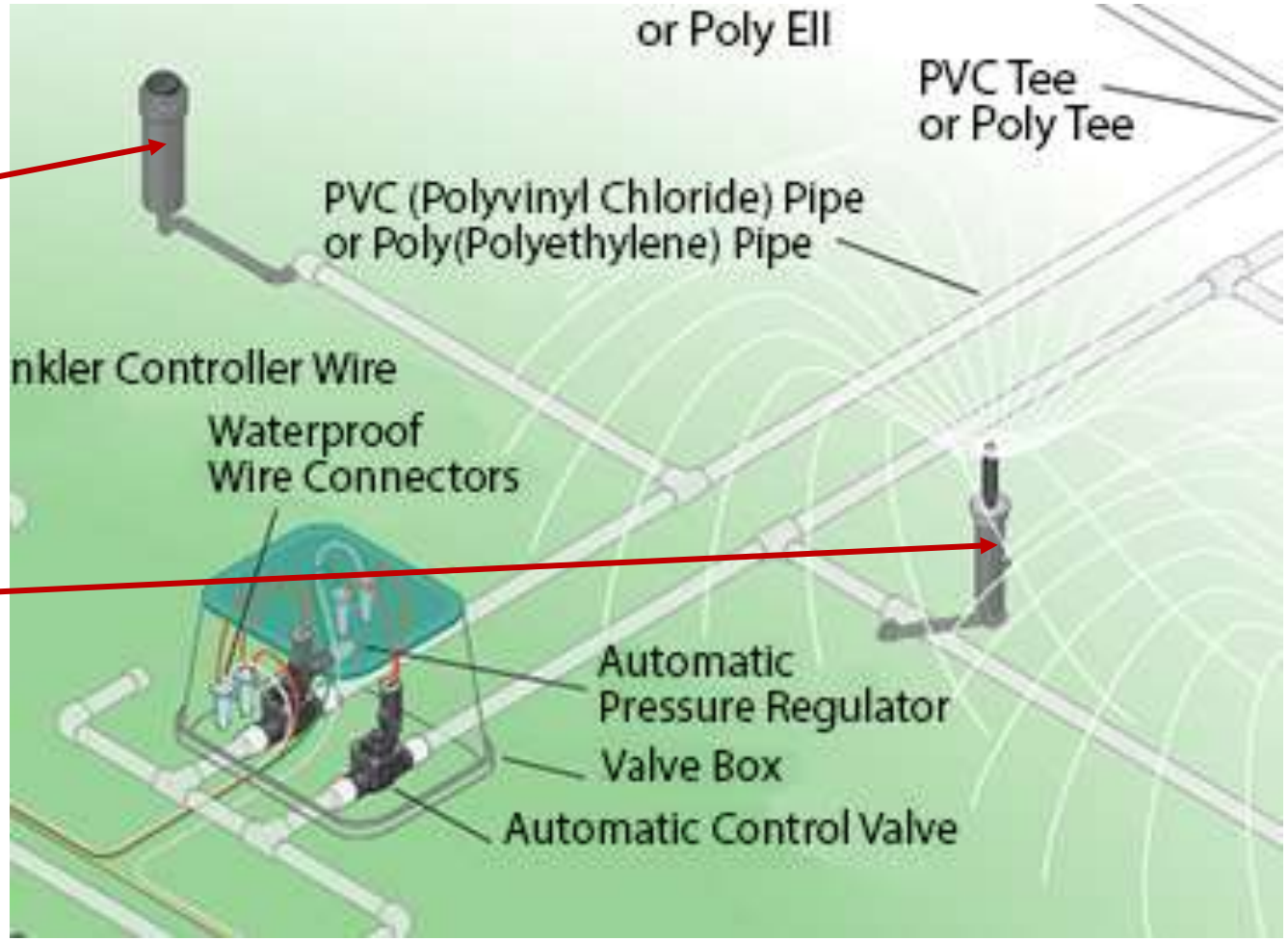
Anatomy of a sprinkler system

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

Broken Heads or Nozzles

- Results from snow plows or shovels
- Freezing
- Cars driving on it
- Lawn mowers

These should be fixed right away to avoid water waste and poor coverage issues

Examples of Water Waste

Water, Water, Everywhere

Best watering practices/standards

Lawn is always watered separately from other plants.

Flower Bed Best Practices

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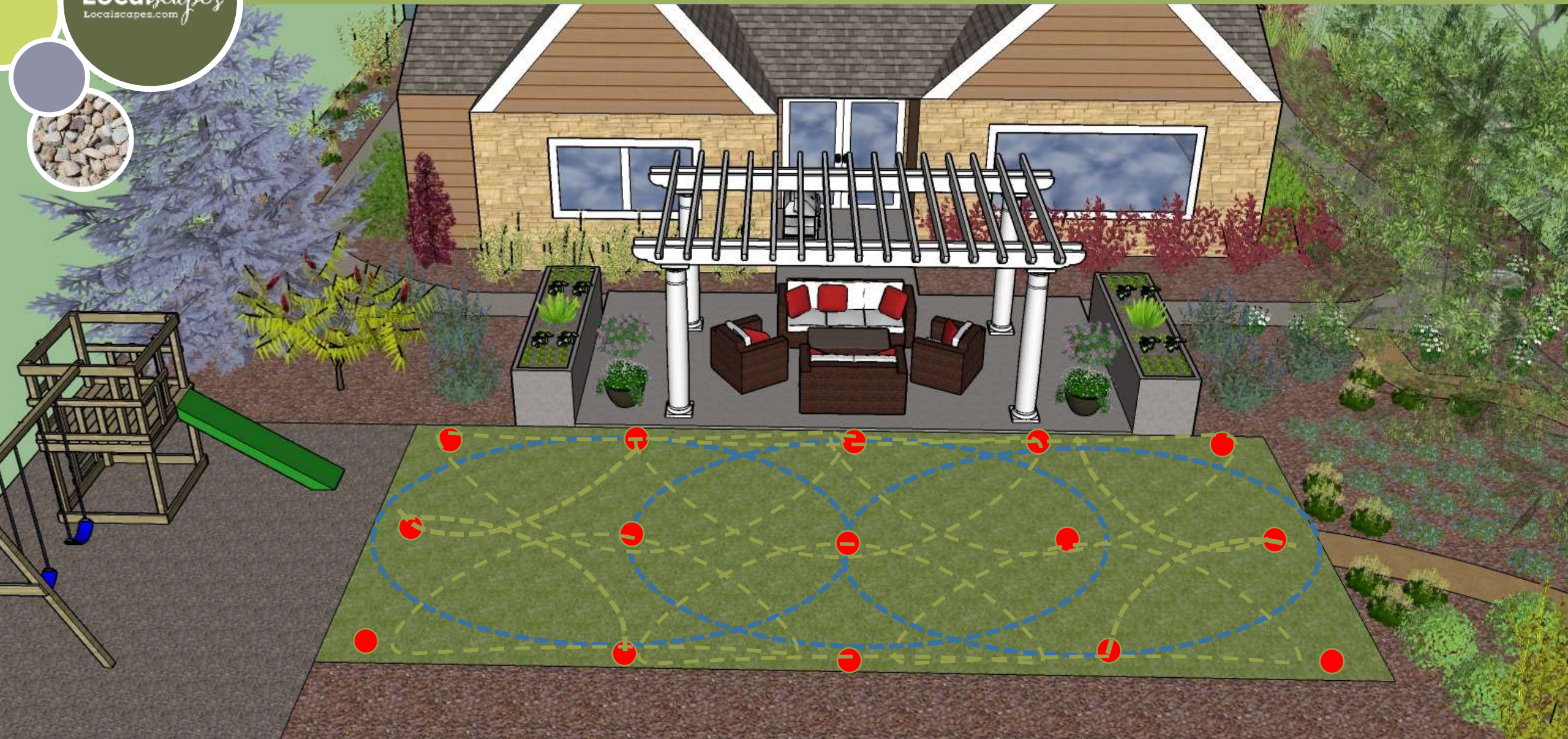
Localscapes.com

Planting beds are always watered with drip irrigation.

Watering Best Practices

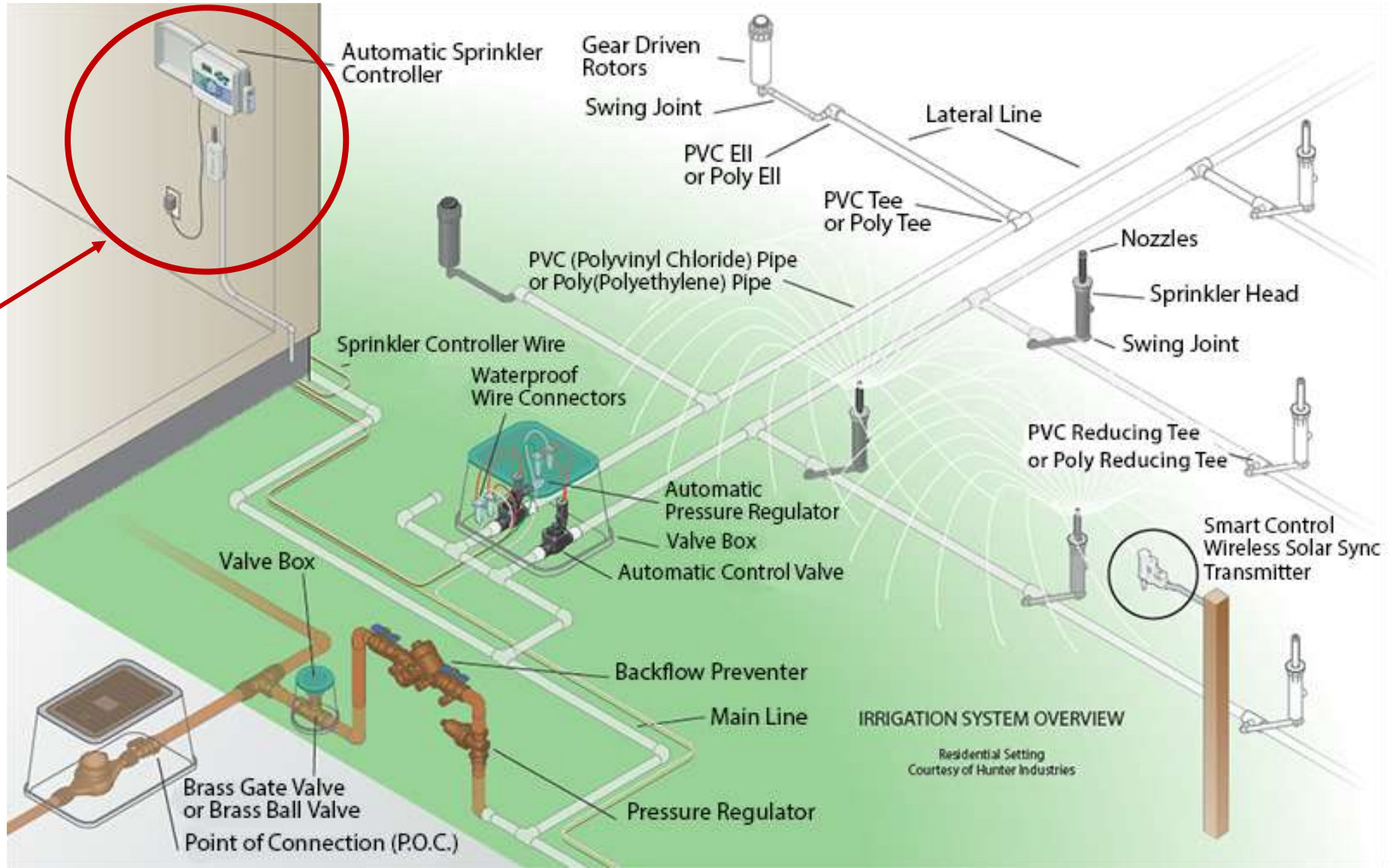
Use only one type of irrigation per zone. Don't mix spray and drip lines on same zone.

Head-to-head coverage



Anatomy of a sprinkler system

Controllers



Graphic courtesy
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How do traditional controllers work?

- Valves turn on and off at specified times for specified duration.
- Need to be reprogrammed (at least seasonally) to ensure water application matches plant requirements

How do weather-based irrigation controllers (WBICs) work?

- Calculate ET
- Analyze field data, plant water requirements, soil type and slope to determine how frequently and how long to water.

Smart Controller Rebate Program

Receive a $75 rebate for EPA WaterSense certified smart controllers that run on weather or soil moisture based operation.

Apply at www.utahwatersavers.com

Utahwatersavers.com

It Pays to Save

Ready to start saving water on your landscape or in your home? Create a Utah Water Savers account to view cash rebates and programs available in your area.

Programs and Rebates

Smart Technology still needs user input

Smart control will not fix poor design and requires smart input to be effective

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.

Drip irrigation retrofit kits

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

Spray to Drip Conversion