



How To Inspect Your Irrigation System ...so you can water efficiently!

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Get to Know Your System!

- Where the system begins...
- Service lines provide water to a residence via a Municipal meter
- Do you know where your meter is?



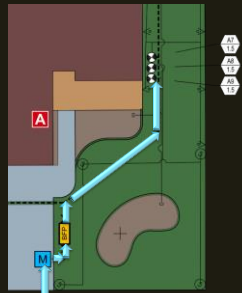
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Irrigation System Overview

- Water flows from supply lines (mainlines) to system control valves
- Find your valve boxes...



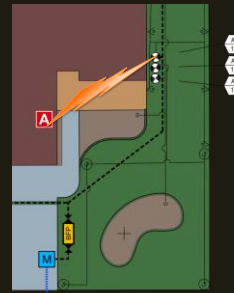
Source: www.landscapeline.com



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Irrigation System Overview

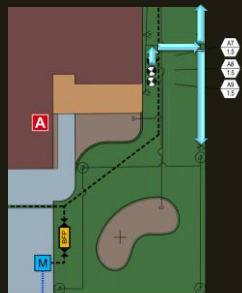
- An irrigation controller communicates electronically with remote control valves (RCV) to run each zone



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Irrigation System Overview

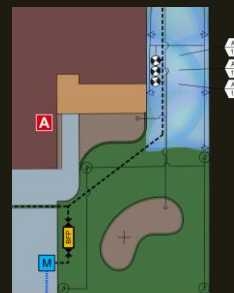
- Water flows from valves to sprinklers in individual zones



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Irrigation System Overview

- Water is distributed through sprinkler heads to nozzles that throw water in to the air for a specific distance
- Nozzles emit water at a specific rate
 - gallons/minute (GPM)
 - inches/hr (Precip. Rate)



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Point of Connection (POC) Inventory

WATER METER

- Municipal equipment for measuring water consumption



RDN Residential Water Meter

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Water Meter

TEST

- Mainline leak



Water Meter Reading

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PROCEDURE

- Turn off all water inside and outside.
- If water meter continues to count up then there is a leak in the mainline
- Call city / water provider

Water Meter

Test

- Consumption per watering event



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Procedure

- Write down the water meter reading before and after your irrigation system completes a full cycle
- Anything over 1-2 cubic meters (220 – 440 gallons) per watering event = excessive
- Reduce times, check for leaks!

Point of Connection (POC) Inventory

BACKFLOW PREVENTER

- Contributes to health safety
- Stops contaminated water (fertilizers, animal waste, road run-off, etc..) from backing up in to the municipal water system



Pressure Vacuum Breaker



Double Check Backflow Preventer¹

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¹Photo courtesy of PlumbingHelps.ca

Backflow Preventer

POTENTIAL PROBLEMS

- Leaking, plugging, malfunctioning

TEST

- Backflow preventers should be inspected and tested annually by a professional



Backflow Test²

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²Photo courtesy of W Landscape LLC, Oregon, WA

Controller Inventory

PURPOSE

- The irrigation controller opens each valve automatically, allowing water in to the lateral lines (zones) in order to operate irrigation emission devices (sprinklers)
- Controls watering days, times and intervals
- How might your controller waste water?



Typical Residential Irrigation Controller

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Irrigation Controller

POTENTIAL WATER WASTE

- Lawn and shrubs are running the same amount of time
- System runs in the rain
- System is running the same amount of time all year
- Zones are running for too long



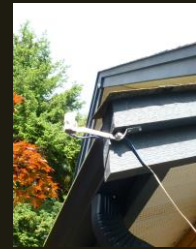
Controller Programming

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Irrigation Controller

POTENTIAL WATER SAVERS

- Reduce run times for shrubs
- Install rain, moisture or Et sensor
- Use budgeting tool on controller to adjust run times monthly
- Use the Irrigation Industry of British Columbia (IIBC) landscape irrigation calculator to determine watering requirements



Rain Sensor Mounted on Eave

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Remote Control Valve (RCV) Inventory

PURPOSE

- The irrigation controller opens each valve automatically allowing water in to the lateral lines to operate irrigation emission devices
- Malfunctioning RCV will affect the pressure of an entire system



RCVs in Valve Box

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Remote Control Valves (RCV)

POTENTIAL PROBLEMS

- Leaking
- Submerged
- Buried under soil
- Cannot locate
- Does not open
- Does not close

POTENTIAL SOLUTIONS

- Replace RCV
- Annual maintenance
- Repair/ replace wiring malfunction

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Station / Zone Inventory

STATIONS / ZONES

- The number of the Station on the controller corresponds with a valve in the field that provides water to a Zone.
- Know how many Zones you have and where they are located.



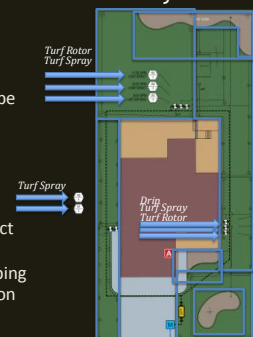
Station # = RCV #

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Station / Zone Inventory

ZONES

- Irrigation system should be designed based on plant water needs
- Lawn and shrubs should NOT share a zone
- Ideally zones should be separated based on aspect (ie: NE and SW)
- Sometimes new landscaping does not fit older irrigation zones...



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Station / Zone Inventory

PLANT TYPE

- Lawn
- Shrub
- Fruit / Vegetables
- Annuals / Flowers

= Different water needs



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Typical Emission Devices a.k.a Sprinklers

ROTOR⁵



POP-UP SPRAY HEAD



MP ROTATOR



*Photos courtesy of Hunter Industries Incorporated

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Typical Emission Devices

BUBBLER



DRIP LINE – AREA¹



Layout



Detail

*Photos courtesy of the Rain Bird Corporation

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Typical Emission Devices

DRIP – INDIVIDUAL PLANT



MICROSPRAY



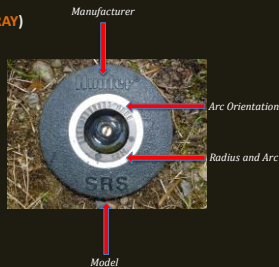
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Emission Device Inventory

NOZZLE RADIUS –

(HOW FAR THE SPRINKLER WILL SPRAY)

- Read the fine print...
- The manufacturer's name, model, radius, arc length and orientation is indicated on the top of the head & nozzle



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Emission Device Inventory

NOZZLE RADIUS – ROTOR⁵

- Rotor: the manufacturer's name and body model is indicated on the top of the head.
- The nozzle is colour-coded for cross reference to manufacturer's catalogue
- Fully adjustable (flow & distance)



*Photos courtesy of the Rain Bird Corporation

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Issues

SPRAY PATTERN ALIGNMENT[®]

- Overspray on adjacent structures, paving and properties

POTENTIAL SOLUTIONS

- Adjust nozzle radius to suit
- Replace fixed radius nozzles with adjustable radius nozzles to suit
- Adjust head orientation to accommodate fixed radius



*Image courtesy of the Rain Bird Corporation

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Issues

DRY AREAS

- Yellow/ brown areas in lawns
- Wilting plants among vigorous ones
- May be that the sprinklers are missing that area
- May not be lack of water, but rather poor soil or chemical burn



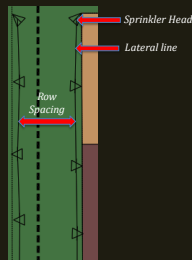
Photo courtesy of www.turfology.com

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Emission Device Inventory

ROW SPACING

- The distance between underground lateral lines
- Should be the distance indicated on the nozzle

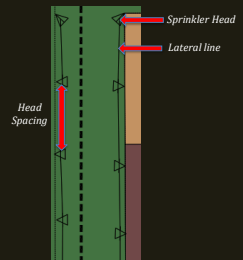


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Emission Device Inventory

HEAD SPACING

- The distance between sprinklers
- Should be the distance indicated on the nozzle

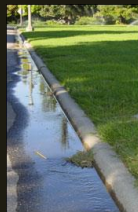


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Issues

RUN-OFF[®]

- When station has run for a full cycle (or less) & water runs over the top of the surface away from the intended watering area
- Do not apply water faster than soil can absorb it



*Photo courtesy of Christine Miles c/o NASA

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Issues

RUN-OFF SOLUTIONS

- Reduce station run times
- Program station for multiple start times to allow water to soak in
- Amend soil with organic material to increase its absorbcency

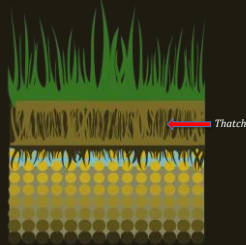


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Issues

COMPACTION & HEAVY THATCH

- Increases run-off
- Reduces the ability for water, air and nutrients to travel through the soil

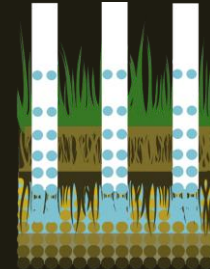


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Compaction & Heavy Thatch

SOLUTIONS

- Aerate lawns in spring or autumn
- Remove thatch annually



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Issues

WET AREAS / PONDING

- Standing water
- Soggy soil
- Mossy patches
- If not a leak....
- May indicate clay soils (low infiltration rate)
- **Overwatering** in shady areas



Photo courtesy of www.stonemaster.net

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Head / Nozzle Inventory

UNMATCHED NOZZLE

- The make and model of the nozzles in a single zone should not vary
- Precipitation Rates must match (inches/hour) for adequate pressure & coverage
- These rates are indicated in the Manufacturers Spec Sheet, usually available on-line



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Head / Nozzle Inventory

MATCHED PRECIPITATION RATE (MPR)

- Nozzles should apply water evenly over a whole zone
- Full and part circle rotors should not share a zone unless nozzles (GPM) are sized to compensate
- Every sprinkler within a zone should have the same head, nozzle and spacing

POTENTIAL SOLUTIONS

- Replace nozzles and adjust spacing as required



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Head / Nozzle Inventory

LOW PRESSURE

- Water does not throw the distance indicated on the nozzle or per manufacturer's specifications



Pressure Testing Spray Head

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Low Pressure

POTENTIAL PROBLEMS

- There are too many heads on a single zone based on the available pressure for the site ^{9/10}
- Valve is malfunctioning
- Filters are plugged
- Leak in the line
- The mainline or lateral line size is not adequate for the number of heads in a single zone

POTENTIAL SOLUTIONS

- System design change: split individual zone in to (2) or more zones, increase mainline or lateral line size as required
- Replace RCV
- Clean filters
- Check for leaks and repair

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High Pressure

- Spray heads and rotors mist or fog
- Test spray heads and rotors with pressure gauge
- Install a pressure regulator if necessary



Photo courtesy of The New Mexico Water Conservation Alliance

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Pressure Regulation

PURPOSE

- To maintain adequate and constant pressure to irrigation emission devices
- Generally residential spray and MPRotators require 30 PSI at the last nozzle on a given zone
- Drip systems often only require 15 PSI to function properly



Image courtesy of Hunter Industries

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Types of Pressure Regulation

PRESSURE REGULATING VALVE¹¹

- Installed after the backflow preventer
- Whole system pressure issues



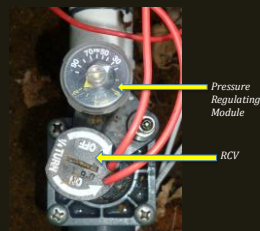
Photo courtesy of Zurn

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Types of Pressure Regulation

PRESSURE REGULATING MODULE

- Attaches to RCV
- Set to ideal pressure for specific emission devices
- Pressure issues in individual zones
- Easiest and most cost-effective solution for residential systems



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Types of Pressure Regulation

BUILT IN TO SPRAY BODY¹²

- Pressure regulators are built in to the stem of the spray or rotor body
- Pressure issues with specific sprinklers

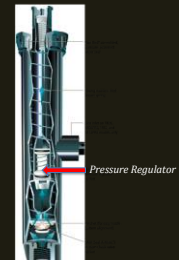


Image courtesy of the Rain Bird Corporation

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SUNKEN / OVERGROWN SPRINKLERS

INDICATORS

- Top of sprinkler head below grade
- Grass has grown up and around heads blocking spray / causing puddling around head
- Spray is blocked by plants or other obstructions

POTENTIAL SOLUTIONS

- Adjust/ dig up sprinklers and set to grade
- Trim around sprinkler heads
- Trim plants, increase/ decrease pop-up height
- Remove obstructions



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SPRINKLER ROTATION

INDICATORS

- Rotation time to make one complete rotation should be the same for each head in a zone
- Rotor does not rotate

POTENTIAL SOLUTION

- Worn gear driven assemblies may need replacement

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BROKEN SPRINKLERS OR PIPES

INDICATORS

- For broken heads look for:
 - Irregular spray pattern
 - a pop-up that does not pop
 - puddling around head
- For broken pipes look for puddling or 'springs' within a zone
- One broken head or pipe can reduce the performance in an entire zone

POTENTIAL SOLUTIONS

- Repair or replace



Broken Nozzles

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Head / Nozzle Inventory

TILTED SPRINKLERS

- Even a few degrees of tilt will affect the radius of a sprinkler head

POTENTIAL SOLUTIONS

- Adjust sprinkler head so it is perpendicular to grade
- On a slope the sprinkler should be installed at 1/2 the grade of surrounding slope



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Head / Nozzle Inventory

PLUGGED SPRINKLERS

- Dirt, sand, algae etc. can clog sprinklers
- Spray head does not pop-up the whole way
- Spray head does not throw the specified radius

POTENTIAL SOLUTIONS

- Remove nozzle and clean filter
- Install flush caps and turn on system to clean

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Head / Nozzle Inventory

LOW HEAD DRAINAGE*

- Emission device at the bottom of a hill continues to drain when zone is turned off resulting in puddling, run-off and erosion



*Photo courtesy of Waterboy Sprinkler Specialist's

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Low-Head Drainage

POTENTIAL SOLUTIONS[®]

- Replace with head with factory installed check valve

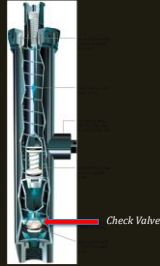


Image courtesy of the Rain Bird Corporation

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Now, try it at home!



A efficient irrigation system makes sense and saves you dollars.

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