In-Ground Irrigation

BEFORE BEGINNING

Determine your outside household water pressure and water flow. To determine pressure, Sharecost rents a water pressure gauge (Item **5912**) that attaches to any exterior faucet. Ensure that no water is running inside or outside of the home, attach the gauge to any outside faucet, open the faucet completely, read the gauge, and make note of the number. To determine water flow, use a measurable container (5 gallon bucket), ensure that no water is running inside or outside of the home, open the faucet completely, and time how long it takes to fill the container. To calculate gallons per minute (GPM) with a 5 gallon bucket: divide 300 by the number of seconds required to fill the bucket – this is your flow rate in GPM. If the water pressure is below 30 PSI or the flow rate is below 6 GPM you may wish to talk to a qualified plumber to determine if your pressure can be safely increased to allow for efficient irrigation.

For more information: https://media.toro.com/documents/irrigation/sprinkler-pig.pdf

IN-GROUND IRRIGATION

In-ground irrigation is used to automate watering of all plants including lawns, vegetable gardens, plant beds, trees, shrubs, and hedges. A system is set up using multiple zones to ensure each type of ground cover receives what it needs without getting overwatered. When planning your system, make sure you keep "types" of irrigation on separate zones – you should not mix drip or low-pressure emitters with high pressure pop-up sprinklers in the same zone. **Irrigation systems are designed to run one zone at a time to maximize available water flow and pressure.**

A typical multizone set up is shown below. For automatic systems you will need a timer that can control the number of zones in your system. For example, a four-zone unit can control a maximum of four valves and will require five-line wire (one wire for each manifold valve plus a common ground – the common wire is **ALWAYS** white) to install. A variety of automated timers are available; up to six zone units are typically stocked but up to sixteen zone timers are readily available on a special-order basis.

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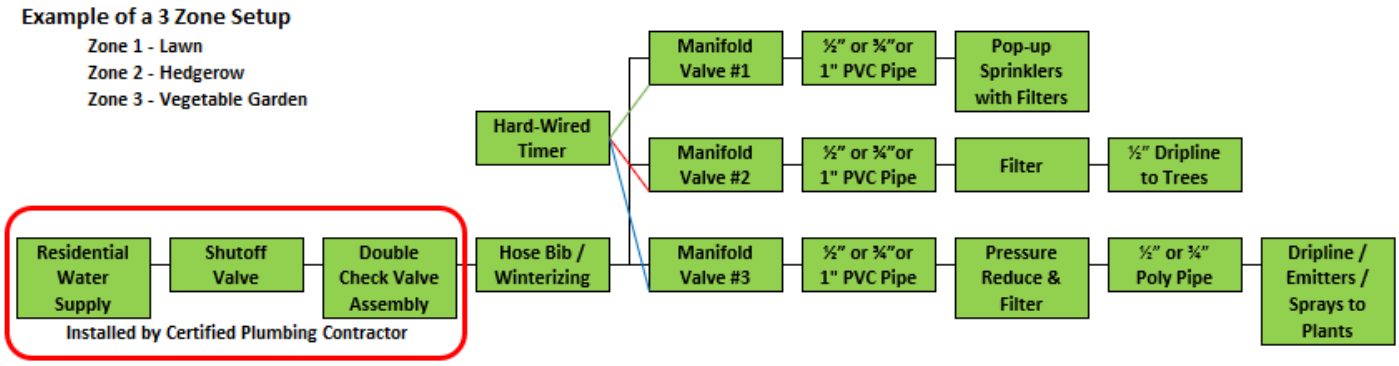
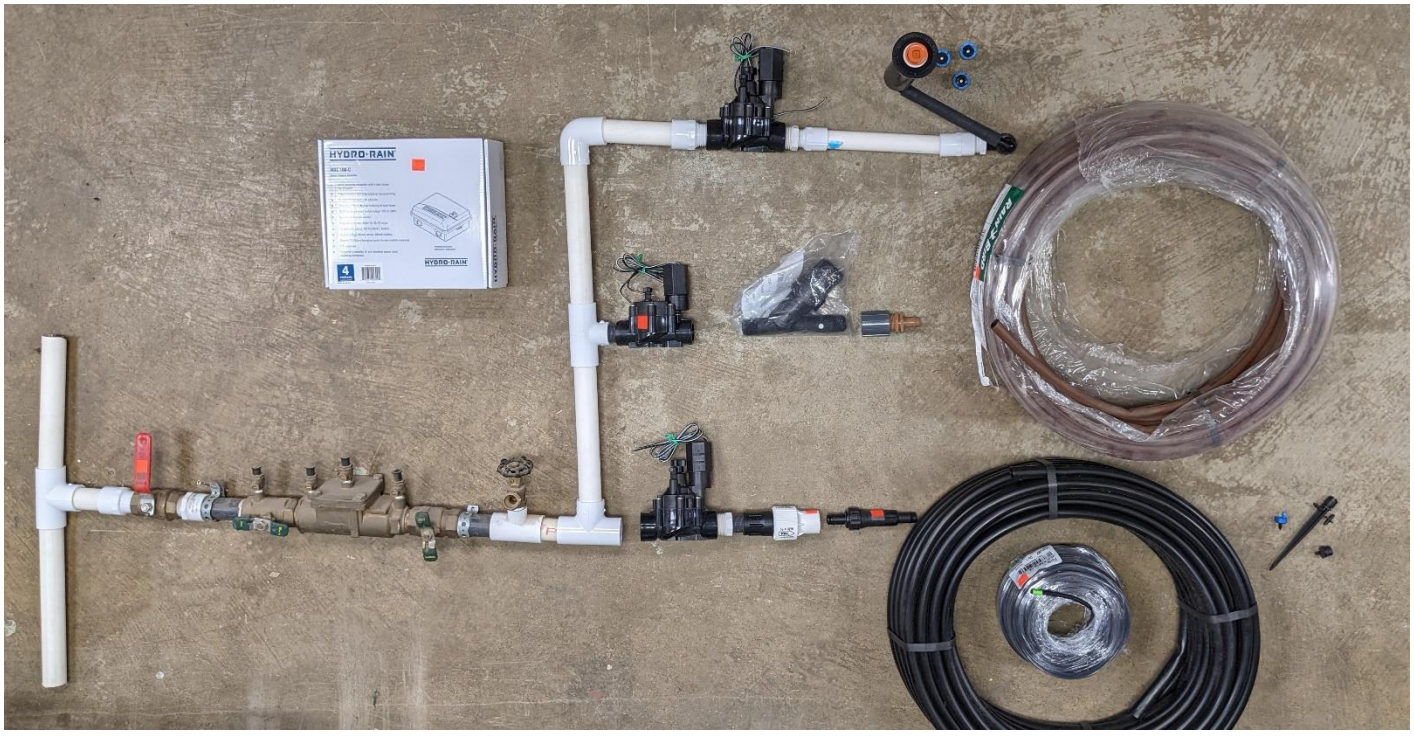
In-Ground Irrigation



The tie-in to the main water supply (from the city meter to your home) includes a shutoff valve and double check valve assembly to prevent back flow. This **MUST** be done to municipal building code and will need to be installed by a certified plumber. Backflow prevention is legally required on **ALL** irrigation systems to prevent irrigation water and possible contaminants from siphoning back into your residential water system.



BACKGROUND

Water is typically delivered to your house in 1" pipe. To maximize the available water, delay reducing your supply pipe diameter until absolutely necessary. Actual water availability is reduced with pressure loss caused by emitters, distance from the water source, changes in direction, changes in elevation, and internal friction. The greater the number of emitters on a zone, the faster the water pressure drops; when the pressure drops to zero, no water will be emitted!

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Water Volume Reduction Chart Based on Theoretical Maximums				
Pipe Size	1"	3/4"	1/2"	1/4"
Available Pipe Diameter	100%	56%	25%	6%
Gallons per Minute	16	12	6	N/A

This chart is based on theoretical maximums in a straight level Class 200 PVC pipe in an irrigation system. The actual waterflow will be reduced due to distance, changes in direction and elevation, and internal friction. The greater the distance from the water source the lower the pressure and the lower volume of available water.

*** Drip emitters are rated in Gallons per Hour (GPH) not Gallons per Minute (GPM)**

To determine how many sprinklers can be used per zone refer to the chart below; the total volume emitted per zone MUST be lower than your measured available water flow. The chart is based on water pressure at 30 PSI – if the actual pressure in your system is higher, each head will emit more water than listed. Usage charts for varying pressures are available in-store and online.

Water Useage in GPM @ 30 PSI

Sprinkler Head	Item	360°	180°	90°
5 Series MPR	2822	0.41	0.20	0.10
8 Series MPR	2822	1.05	0.52	0.26
10 Series MPR	2822	1.58	0.79	0.39
12 Series MPR	2822	2.60	1.30	0.65
15 Series MPR	2822	3.70	1.85	0.92
- Variable Heads -				
RB-RVAN 13-18	2956	1.65	0.85	0.42
MP1000 (8'-15')	2958	0.69	0.34	0.17
MP2000 (13'-21')	2958	1.28	0.64	0.38
MP3000 (22'-30')	2958	3.15	1.58	0.76
MP3500 (31'-35')	2958	N/A	2.24	1.13

Sprinkler Head	Item	270°	180°	90°
4 Series VAN	2824	0.73	0.45	0.29
6 Series VAN	2824	1.10	0.60	0.37
8 Series VAN	2824	1.55	1.19	0.72
10 Series VAN	2824	2.10	1.45	0.75
12 Series VAN	2824	1.77	1.18	0.59
15 Series VAN	2824	2.78	1.85	0.92
18 Series VAN	2824	3.99	2.66	1.33

Sprinkler Head	Item	PSI	Min	Max
Rainbird 3500	2919	25-55	0.50	4.60
Rainbird 5000	2820	25-65	1.12	9.63

* Water consumption increases with increases in pressure

When planning your zones, if possible, bring the water supply into the zone at the mid-point using a tee fitting; this maximizes available water pressure and flow. Where feasible, loop lines rather than using dead ends. All our dripline products indicate a maximum length of line that can be installed. For best results, keep lines below the maximum allowable lengths. Install pressure reducers as close as possible to low-pressure fittings to maximize water volume available for irrigation.

KEY COMPONENTS

Manifold is a valve or bank of valves that can be controlled automatically in a multi-zone irrigation system by hardwiring to a multi-zone controller. As a lower cost alternative with no timer, a system can be set up manually using a **Ball Valve** to control each zone, but each ball valve would need to be manually opened and closed to water the required zone(s). The larger the number of sprays/emitters in a zone, the less pressure, and therefore less water, is available to reach the end of the system. Zones are used to minimize pressure loss (limiting the number of sprays per valve) to ensure each emitter has enough water pressure to function properly.

In-Ground Irrigation

PVC Pipe comes in a variety of dimensions and classes. For all pressurized main lines (from the city water supply to the manifold valves) Schedule 40 pipe is required. Class 200 pipe can be used in non-pressurized lateral lines (lines between the valves and emitters).

Pressure Reducer reduces the operating pressure from city / residential pressure down to 30 PSI for micro irrigation. This is a **MUST** to prevent drip fittings from losing connection with the ¼" barbed fittings. Pressure reducers are not used on lines with pop-up sprinklers which can operate at higher pressures.

Filter is used to filter the water and prevent clogging in small drip fitting outlets – even treated residential water may contain particles large enough to clog a drip outlet.

Poly Pipe is black flexible tubing used to distribute water in a drip irrigation line that can be punctured for drip fittings in a low-pressure setting. It is typically run on top of the ground but can be covered by garden mulch. Emitters and dripline should **NEVER** be covered as they could clog and stop functioning over time.

Drip Emitters are small fittings that release **0.5-4** G**allons per Hour** (1.9-15 litres) of water in a drip.

Micro-Jets/Foggers/Shrubblers/Vortex Sprays are small fittings that spray water 1-8 feet (0.3-2.4 meters) in radius that release **0-31 Gallons per Hour** (0-117.3 litres).

Pop-up Sprays and Rotors spray water 4-35 feet (1.2-10.7 meters) in radius and are rated for release rates in **Gallons per Minute**.

SET UP

Planning is key to an effective irrigation system. Prior to deciding on your required irrigation components, lay out the area to be watered on a scaled grid-paper drawing. Ensure you make note of each grouping of plants and make sure any changes in elevation (slopes) are detailed on your drawing. Water will naturally go to the lowest point in a system so ideally each zone will be installed at a consistent height. On a slope, if at all possible, run lines laterally so individual lines maintain one elevation.

For turf or lawn areas, you must ensure that you have sufficient coverage; use enough sprinklers for "head-to-head" coverage. For example, if you are using sprinklers with a 15' radius, there can be no more than 15' between the sprinkler heads. Each sprinkler should throw water that just reaches the sprinkler beside it. Keep in mind that on a slope more water will end up below the sprinkler than above it so the sprinkler spacing must be adjusted. To prevent water loss or puddling at the bottom of a slope, use sprinkler pop-ups with a built-in SAM check valve (Item **2943**). When the valve closes, the check valve holds water in the line above it rather than releasing excess water into the landscape. The check valve also helps to minimize "water hammering" on the lowest sprinklers on system startup which reduces wear on the irrigation components.

When setting up your lawn zones, it is critical that you do not mix types of sprinklers. Any of our standard Rainbird "Matched Precipitation Rate" (MPR) nozzles (Items **2822** and **2823** and **2824 Van Series 12, 15, and 18 ONLY**) can be in used in one zone. VAN nozzles (Item **2824** Series 4, 6, 8, and 10), Rotary nozzles (Item **2956**), Rotator nozzles (Item **2958**), and stream sprinklers are not compatible with the MPR nozzles. Each type **MUST** be used in a separate zone. Please note, if using VAN Series 4, 6, 8, or 10 (Item **2824**), only use one type in each zone (for example, do not mix Series 8 with any other nozzle type).

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When planning your irrigation system, ensure you include required fittings (elbows, tee, reducers, etc), pipe, and tubing. **In addition to standard ½" PVC fittings, please be aware that three types of tube fittings are also nominally referred to as ½". These are ½" funny pipe (12 mm), ½" poly (15 mm), and ½" drip tubing (brown 17 mm). The pipe, tubing, and fittings are NOT interchangeable, but adapters are available to move between each type. In addition, hose thread and pipe thread are NOT the same. To transition from hose fittings to pipe fittings, ensure you use an appropriate adapter.** Please refer to the bin labels in our irrigation aisle for appropriate item selection.

Water is delivered to In-ground zones using PVC pipe that has been trenched into the ground. To minimize pressure loss and maximize available water, keep lines as straight as possible and delay reducing the pipe diameter until absolutely necessary. To avoid freezing and to minimize damage to underground lines from tools that will be used in your yard (shovels, aerators, rototillers, etc), the trenches should be dug 12"-18" deep. **Trenchers are available to rent from the Rental Department.** To bring pop-up sprinklers to the surface, install a tee fitting in the supply line with a ½" threaded central arm (Item **2741** for ¾" supply or Item **2744** for 1" supply) and screw on a swing arm fitting (Item **3026**). To install the sprinkler head on the pop-up, pull up on the orange cap, unscrew it from the pop-up (do not discard the cap – it may be required at a later date for maintenance purposes), and screw on the desired sprinkler head. Water direction and distance will be adjusted manually when you pressurize the system.

To water lines of trees, hedges, shrubs, or plants, ¼" or ½" dripline with pre-set drip spacing can be used. For runs exceeding 20' be sure to use ½" dripline (Item **22681** with 12" drip spacing). For smaller areas ¼" dripline can be used (Item **20643** for 6" spacing or Item **19792** for 12" spacing). For information on drip and micro irrigation installation, please refer to our **Micro/Drip Irrigation Guide**.

Once all the lines are in place and PRIOR to installing any emitters, <u>turn on the system to clear any dirt or debris</u> that accumulated during installation. The orange caps NOT the spray heads must be in place on all pop-ups during the initial blowout; if the orange cap is not on, dirt will flow back into the pop-up when the water is turned off. After the emitters and sprinklers are installed, adjust heads as required for direction and distance – be prepared to get wet. Do not fill in the trenches until a complete inspection for leaks has been completed on EVERY zone.

Please note – the system **MUST** be closed (all ends capped) to function properly. To close a dripline, a tee fitting can be used; insert one arm of the tee fitting into the line, insert an additional segment of line into the other arm, then bring the end of the line back in a gentle loop to the centre arm of the tee. You may also wish to consider a capped tee at the end of your manifold assembly to allow for future expansion of your system.

WINTERIZATION

It is important that the lines are cleared or "blown out" prior to the end of season freeze cycle. **We rent air compressors to winterize your system** – please inquire at the Rental Desk. Alternately, there are many irrigation contractors that can perform this service for a fee.

OTHER SUPPLIES

To create your irrigation system, Sharecost offers rentals of all the equipment you will need:

- Sod cutters
- Trenchers
- Mini Excavators
- Wheelbarrows (including ride-on and walk-behind gas units)

In-Ground Irrigation

We produce our own nutrient rich soils and carry vegetable, herb, flower, and lawn seeds for your garden. All of our proprietary soil blends are created from locally sourced light, humus-like soil, certified organic compost, and coarse sandy loam. Please review our **Bulk Organics** handout for complete details.

- **Growmix** is a nutrient dense soil that is ideal for vegetable gardens, flower beds, and hanging baskets
- **Turf Soil** is built specifically for new turf installations and starting a new lawn from seed
- **Bed Builder** is a good quality sandy loam with a lower organic content that is a good choice for building up beds or a more economical choice for larger installations
- **Dark Bark Mulch** is a rich chocolate brown soil topper for increasing moisture retention and weed control
- **Fir Bark Mulch** is tan/brown in colour and is used for increasing moisture retention and weed control

A large selection of vegetable, flower, herb, grass, and lawn alternative seeds are available in store from West Coast Seeds and select other suppliers. Dolopril lime and pelletized fertilizers are also available.

COMMON ITEM ORDER SHEET - IN-GROUND IRRIGATION								
Qty	Item	Name	Bin		Qty	Item	Name	Bin
	19917	Timer, 4 Station HYD-HRC 100	A3H			19918	Timer, 6 Station HYD-HRC 100	SD
	2844	Valve, Rainbird, 3/4"	A3H			2841	Valve, Rainbird, 1" Adjustable	A3H
	2869	PVC Pipe, 3/4" x 20ft - CL200	B9L			2867	PVC Pipe, 1" x 20ft - CL200	B9L
	2870	PVC Pipe, 3/4" x 20ft - SCHD 40	B9L			2868	PVC Pipe, 1" x 20ft - SCHD 40	B9L
	2768	Adapter, 3/4" Female SxT	A3P36			2769	Adapter, Female 1" SxT	A3P52
	2763	Adapter, 3/4" Male, TxS	A3P37			2764	Adapter, Male 1" SxT	A3P53
	20647	Ball Valve, TxT 3/4" PVC	A3D			20646	Ball Valve, TxT 1" PVC	A3D
	2737	Coupling, 3/4" TxT	A3P41			2723	Coupling, 1" SxS	A3P56
	2747	Elbow, 3/4" 90° SxS	A3P46			2748	Elbow, 1" 90° SxS	A3P62
	2739	Tee, 3/4" SxSxS	A3Q46			2740	Tee, 1" SxSxS	A3Q62
	2741	Tee, 3/4"x1/2" SxSxT	A3Q50			2744	Tee, 1"x1/2" SxSxT	A3Q67
	2958	Nozzle, MP Rotator, FOR Rainbird	SD			2837	Valve, 1/2" Hose Bib	A3G
	2822	Nozzle, Rainbird; Q, H, F	A3P03			22547	Filter, 3/4" AMIAD TxT	A3H
	2824	Nozzle, Rainbird; Variable Arc	A3P09			22548	Filter, 1" WYE Rainbird TxT	A3H
	2956	Nozzle, ROTARY 13'-18' Q, H, F	A3P12			22681	1/2"x100' NDS Dripline 12" Spacin	BW
	2942	Pop-up, 4" 1804 Rainbird	A3M01			2962	1/2" POLY Adapter Male, Bx1/2" M	A3P71
	2943	Pop-up, 4" 1804 S.A.M Rainbird	A3M04			2966	1/2" POLY Adapter Male, Bx3/4" M	A3P72
	3026	Swing Arm, 1/2" x 6"	A3P96					

ADDITIONAL ITEMS - IN-GROUND IRRIGATION		

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