

# INSTALLING AN IRRIGATION SYSTEM

## STEP 1: STAKE OUT THE SPRINKLER SYSTEM

Take the completed draft design or pace out on the site where each sprinkler head should be placed and put a flag or stake at that location. Different colored flags can be used for different kinds of heads or valves or to separately identify zones.

Contact the local utility companies for locating and marking any hydro, gas, telephone or cable lines on the site. Try to avoid running lines over these utilities. If you must then hand dig within 1 meter of distance from all markings.

## STEP 2: CONNECT TO WATER SERVICE

To get water to your valves the service main line must be attached to. Provincial plumbing codes may require that this be done by a plumber. A backflow prevention device should be installed to protect the water service. Permits may also have to be obtained for the plumbing work.

Be sure to include a shut-off valve for the sprinkler line and tag this for easy identification by the end user and any service personnel. Have a blow-out valve installed after the backflow preventer (if possible) for winterization purposes.

There are devices called through-wall shutoffs which allow for turning off the water inside a building from the outside. The blow-out valve can be connected on these devices directly.

## STEP 3: PIPE AND WIRE INSTALLATION

If the ground is very hard you may want to soak it with soaker hoses along the lines you intend to run pipes. If trenching by hand a v-shaped trench 6 to 10 inches deep for single pipe lines is sufficient. For multiple pipe runs in the same trench the trench must be widened to accommodate them.

Wire should be laid beneath the mainline. One wire should be allocated for each valve and an additional wire for the entire system (e.g. a 4 valve system should have 5 wires). It is always a good idea

to have extra wires available for expansion or service work. On residential and small commercial systems an 18-gauge multi-conductor cable with plastic sheathing can be used. See wire charts for maximum lengths of wire runs.

If you use polyethylene pipe a vibratory plow may be used to pull the pipe into the ground. Hand dig your valve box locations and start your pulls from there. In harder soil pre-digging your head locations can also make the pulling go easier. Pull your mainline in first and deeper than your lateral (zone) lines. Remember to tape up the exposed ends of your pipes until fittings are attached to prevent dirt from entering the lines.

PVC pipe can also be pulled if the lengths are glued together at least 3 hours ahead of time. Waiting overnight is better.

If you have to go under a sidewalk a tunneler can be made by attaching a high pressure nozzle to a length of pvc or steel pipe and a garden hose attached to the other end. Dig a hole on the side where you expect the pipe to emerge after tunneling. Trench back the length of the tunneler on the side you'll be pushing from and keep it level as you use the water pressure to force the pipe under the pavement.

#### STEP 4: CONNECT ZONE VALVES TO THE MAINLINE

Valves may be grouped together into a manifold. The manifold is made up of a series of tees put in line. Manifolds can be made before hand with all valve to pipe connections pointed in the right direction or pre-molded manifolds may be used.

As the valves are installed below ground they should be covered with plastic valve boxes set to grade. A bed of gravel is useful to encourage drainage. Landscape fabric may be cut in sheets and the valves and piping wrapped from below to prevent soil intrusion into the valve box area. Always allow for easy access manual operation of all valves located within the valve box.

#### STEP 5: INSTALL THE SPRINKLER HEADS

Install sprinkler heads one zone at a time. Pop-up sprinkler heads should be used in all turf areas and flower/shrub areas where they can be deemed a hazard to foot traffic or a vandalism risk.

Dig square holes for all the heads. Square shaped holes are easier for working the pipe fittings on and setting sod back in place. It is recommended to use plastic dropcloths or buckets to put soil in as this makes clean up faster.

Residential pop-up sprinklers should be set just slightly above grade to prevent their pop-up motion eroding the stem of the sprinkler head. Heads may be installed directly to pipe using threaded risers/nipples, or flexible connections may be made with swing pipe and clampless insert fittings.

Flush out the pipe lines prior to installing any nozzles in the heads.

Adjust the direction of spray head patterns by ratcheting the stem to aim correctly. Adjust the arc of rotary sprinklers to again match the shape of the area you are watering. Allow for wind by adjusting part circle heads a few degrees larger.

## STEP 6: INSTALL THE CONTROLLER

Install the controller in the garage or basement or location desired by the client. If located outdoors then the controller must have a built-in transformer and 120V AC power wired directly into it. Indoor controllers may have a plug-in transformer. An isolated circuit for the controller is best but a low power circuit with only lights on it will work and prevent unwanted power surges from upsetting the electronics.

Take one wire from each solenoid on the valves and connect them to a common wire (for ease of identification the white wire is often used). Connect the common wire to the common terminal on the controller. Connect the other wire from the solenoids to their own separate wire and connect these to the station terminals on the controller.

Use waterproof wire connectors for all outdoor wire connections. Use wire expansion curls at the valve box locations. Expansion curls are easily formed by wrapping a minimum of 5 turns around a 1" pipe and then removing the pipe. Curls eliminate wire stressing and also act as lightning protection in the field.