IRRIGATION MAINTENANCE HOLDS PROMISE FOR CONTRACTORS

One possible stumbling block to an otherwise rosy future for irrigation systems is maintenance and the apparent fear of property maintenance personnel to tamper with a complex and carefully balanced network of pipes, wires and controls.

In an effort to dispel some of the fear and to point out very good potential for irrigation maintenance as a business for contractors, the Associated Landscape Contractors of America's Maintenance Committee organized and presented a program at ALCA's recent annual meeting in San Diego.

For three hours representatives from Rain Bird, Buckner and Toro provided basic instruction on controls, pipes and heads. Rod Bailey of Evergreen Services Corp., Bellevue, WA, chairman of the Maintenance Committee for 1979, suggested that irrigation installers don't want to do maintenance. Manufacturers try to help managers of large systems with training programs and do send representatives to diagnose problems where practical. But the owners or managers of medium- or small-size systems depend almost entirely on the installer at present. The maintenance contractor, especially if he already performs a service to the account, can provide irrigation maintenance service, according to Bailey.

Ron Smith, Evergreen Landscape and Maintenance of Lubbock, TX, moderated the session from a position of experience since he has made the move into the area of irrigation maintenance successfully. He outlined some of the problems of irrigation maintenance today as inexperienced personnel, lack of standard installation procedures, missing 'as built' plans to assist in location of components, and the need for alteration of landscapes to improve irrigation design, system efficiency and maintenance. Smith stressed the need to flush out a newly installed system before placing valves and heads.

Vincent Noletti of Buckner began the program with controller troubleshooting. He likened electricity to hydraulics, saying amps are similar to gallons per minute and volts are similar to pounds per square inch. Resistance relates to both systems and is measured in ohms for electricity. An understanding of electricity is necessary to figure out problems with controllers and to insure against shock hazards.

Trial and error is too time consuming and too costly Noletti stressed. There are key indicators which direct the maintenance technician to the real problem and make trial and error unnecessary.

There should be three wires to the controller: one hot wire, one common wire, and one ground. Controllers today are either electromechanical or solid state. They are interchangeable. The solid state controller requires more thoughtful programming. A record of the program should be kept in a secure but accessible place for reference. The solid state controller will be cheaper in the future, is more precise from a time standpoint, and is more difficult to change programs.

A maintenance technician should keep an extra control panel for each controller under his care. He should also have a wire cutter, wire stripper, amp meter, volt/ohm meter, water tight connectors, solenoid wrenches, valve wrenches, a fault locator, and a two-way radio.

Noletti presented three problem situations and what to check.

No valves operate by controller

1. check time of day on controller clock
2. check start wheel for times
3. check day wheel for right day
4. check start wheel adjustment
5. check on/off switch
6. check fuse or circuit breaker
7. check reset
8. check power supply with meter
9. check transformer, should reduce 120 volts to 24-30 volts
10. check fuse on transformer
11. check common wire connections
12. check common wires to valves
13. check wire splices by using as built plans
14. note any wire damage
15. check water pressure
16. check gate valve to system or back flow preventer
17. does controller cycle properly, if not replace panel

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As-built plans are made after installation to record any variations from the original plans.

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One valve doesn't operate

1. try to turn on valve manually at controller
2. check power at terminal, at bad valve, and at controller connection board. If output is at connection board in the controller, then the problem is probably in the valve or the hot wire to the valve.
3. check valve wire connection
4. check resistance of circuit; should be between 15 to 25 ohms depending upon the manufacturer.

Valve won't close

1. advance control to off
2. check output to see if it is off; if not, replace panel

The best advice is always good checkout following installation to see that all circuits have .25 to .4 amps depending upon the manufacturer.

Rain Bird's Keith Kirby covered valve troubleshooting. He too stressed the need for as built plans, good water tight connection, and valve boxes.

Kirby narrowed valve problems down to four areas; no water in the system, low voltage, dirt clogging valve ports, and incorrect initial installation. There are basically two types of valves, electric or hydraulic. Hydraulic valves are usually found in warm climates only.

An electric valve is operated by current which causes the solenoid to open a port which bleeds water holding the diaphragm shut. It is a very delicate arrangement in which dirt can cause havoc. Any damage to the rubber diaphragm or blockage of ports hinders valve operation. A flow valve intended to regulate the flow of water through the valve can be closed by accident or by vandals. A closed flow valve would prevent the valve from opening even though current reached the valve as designed. A hole in the diaphragm or dirt in ports would keep the valve from shutting off. Solenoid failure would keep the valve from opening.

Kirby said there should be 40 to 50 psi in the main line for the valves to function properly. Flushing the lines twice before installing valves is recommended. When taking valves apart or putting back together care should be taken not to overtighten or strip threads.

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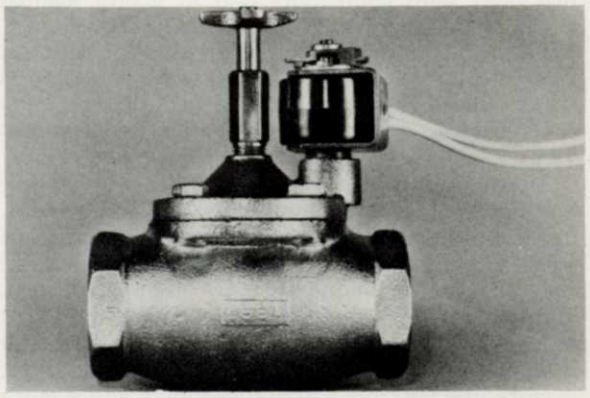

Electric valve with solenoid and flow valve.

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Extra steps during installation save in repair time later, such as this device which protects both heads and pipe from damage.

There are special electric valves for effluent water. Using effluent in a standard valve system is doomed to failure, Kirby said.

For finding electrical shorts, Kirby recommended fault finders made by Progressive Electronics Inc., or Hewlett Packard. The devices cost from $600 to $2,000 but perform reliably, he said. These devices not only tell you where a wire problem is, they will tell you how deep the wire is in the ground.

Chris Espinoza of Toro outlined the part of the irrigation system which takes the most beating, the heads. Espinoza said rotational heads (impact, ball drive, cam drive, and gear drive) wear even with proper use over time. Jamming from debris near the head, material in the water, or tampering by vandals should be carefully watched. Espinoza said replacement may be cheaper than repair due to labor costs in some instances.

Improper installation (not level with grade or lack of drainage for heads) and lack of safety devices invite head problems. The spray should clear surrounding grass without any special trimming around heads and puddling near heads should be corrected with use of gravel under and around the head. Correct water pressure is another major cause of malfunction for heads he said. Occasionally the problem will be traced to a backflow preventer which has its own gate valve. If this valve was tampered with, water flow will be incorrect for the design.

Espinoza suggested replacing shrub risers to pop ups for liability and maintenance reasons. He also suggested use of double swing joints during installation to prevent damage to lines underneath and to heads.

Overall, Espinoza proposed that the long term cost of a system should be considered as well as the short term. Using fewer heads, cheaper heads, less durable heads, and skimping on maintenance service could result in costs above those originally anticipated or desired. **WTT**