A poorly designed irrigation system can send a superintendent's...

Six-figure budget down the drain

MADISON HEIGHTS, Wis. —Golf course superintendents who spend six figures on sprinkler irrigation systems have learned — some the hard way — that the quality of the system's design can save them hefty sums over what appear to be less expensive systems.

That's the conclusion of Rick Manley, a certified irrigation designer for Century Rain Aid, which operates four outlets in the Great Lakes region and seven in Florida.

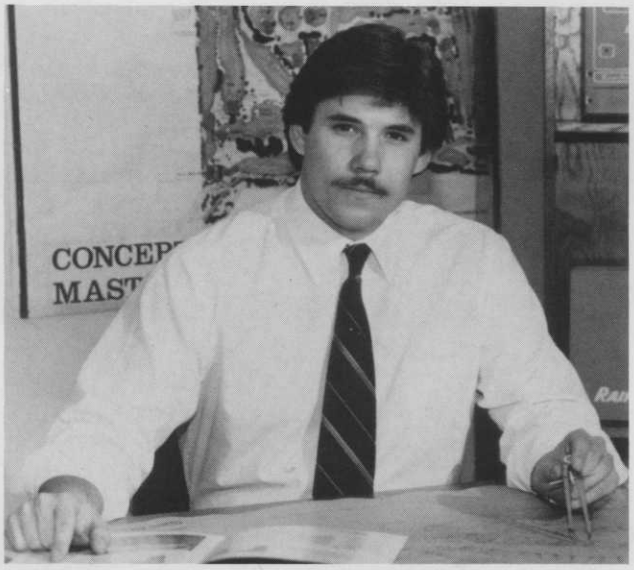
"Many superintendents have learned that a 'lowball' system they thought was a bargain turned out to be a bad deal that ended up costing them a lot more in the long run," said Manley. "That's particularly evident since the drought of 1988 put huge demands on poorly designed systems that couldn't stand up to the strain."

The result: yellow fairways, faded greens, parched roughs — and unhappy greens chairmen, club members, golf course owners and players. And you can add high repair bills, inefficient and wasteful operation and early replacement of major components.

Some sprinkler irrigation distributors include design as a service to golf course superintendents at no charge. However, Manley warns against the temptation to bypass professional design and rush to buy less expensive, inadequate components some companies sell to make a quick deal.

Manly says that golf course superintendents should educate golf course owners and executives that good design is a cost-saving feature over time. It creates a system that delivers optimum operating efficiency, reduced maintenance, repair and replacement expenses and assures greater longevity of components, says Manley.

"Sometimes irrigation salespeople want to close the sale by offering the lowest price," says Manley. "Golf course superintendents should develop a healthy skepticism of quick-and-cheap sales tactics. Buying that way hurts in the long run because it doesn't give the superintendent the insurance he should be getting."



Rick Manley is director of technical design for Century Rain Aid

By "insurance," Manley means margins that take into account greater-than-average water demand and strain on a sprinkler irrigation system.

Last year's drought — the worst in 100 years — has proven his point many times over, says Manley, an ex-Marine and second-generation irrigation designer with 10 years of experience.

Superintendents who bought sprinkler irrigation designs calling for the least capital cost learned the hard way that buying *value* is more important than buying *price* only.

Overloaded pipe wears out easily, overloaded pumps burn out early or consume unusually high amounts of electricity. Burst pipe, fittings and valves also add to the

(Continued on page 46)

Poorly designed systems can't hack it when the going gets rough, says designer

(From page 44)

headaches.

"If the drought of '88 demonstrated anything," says Manley, "it showed that a poorly designed system can't hack it when the going gets rough.

"And in the end, the golf course superintendent who was happy to save a few bucks up front was disappointed and angry that he has lost all his savings and more — plus he has inherited headaches he can do without.

"With golf courses, everything's amplified," says Manley. "You're dealing with 10, 15 to 20 times the amount of water you deal with in the average commercial installation. It becomes that much more important to make sure the job is properly designed and properly calculated.

"The superintendent must demonstrate to his bosses that good irrigation system design is worth its weight in gold. It's our job to help him demonstrate the point.

"When customers on large jobs such as golf courses are spending in six figures, they look for protection for their investment.

If a pump is too small, it works too hard and it will break under the strain. If it's too large, it's fat and lazy, delivering a low efficiency of 50 to 60 percent, versus 70 to 80 percent, which is ideal."

Adds Ben Taliaferro, Century's executive vice president, "If you use a pipe that's too small, you have to pay for it with more horsepower over the life of the system. It's better to spend more on pipe diameter once than to pay more on a continuing basis for energy.

"A good design loses no more than 20 percent of available pressure under highest demand," he adds. "A poorly designed system may lose 30 to 40 percent to the farthest sprinkler head. So we start at the farthest head and work back to the pumphouse. If we lose more than 20 percent pressure, we change the system to make it 20 percent or less. We can use larger pipe, smaller nozzles or loop lines so less pressure is lost."

Some things to consider when designing a system

Understanding factors such as soil type, water velocity and pressure are key to convincing those paying the bills of the cost-effectiveness of professional sprinkler irrigation design.

The factors to consider when designing a sprinkler irrigation system, according to Manley:

- **Auto CAD** — The most advanced computer-aided design for sprinkler irrigation systems. Computers with auto CAD digitize elements of sprinkler irrigation designs for quick turn-around and accuracy.
- **Coverage** — uniform coverage is vital to turf health. Close-in coverage of gear-driven heads can be spotty; Impact rotors can be placed farther apart and still get uniform coverage.
- **Distance** — How far water must be moved through the system. Maintaining pressure over distance is crucial to efficient design, particularly on lower-pressure systems.
- **Electricity** — Location of electrical power and how much is available is important in larger installations because it dictates pumphouse location.
- **Looping** — Running a circuit of piping instead of a straight line from the source reduces pressure loss and allows the use of smaller pipe.
- **Pressure** — Force of the water through the system.
- **Soil type** — Sandy soil accepts water quickly but loses it fast so that more frequent watering is needed. Loam, or decayed organic matter, receives and holds water most evenly. It is usually found in the topsoil.
- **Surge** — the rush of pressure when a pump-driven system is first activated. This rush can raise pressure by up to 300 percent and threaten piping, heads and connections if the system is under-designed.
- **Throw** — the distance a sprinkler head propels water. For large installations, impact sprinkler heads are recommended because they lose less pressure through the sprinkler body and give longer throw than gear-driven heads. Their lower trajectory minimizes loss of throw due to wind drift and delivers more uniform distribution.
- **Velocity** — The speed of water through pipes. It is regulated so as not to exceed five feet per second.
- **Water location and quality** — The location of the water source in relation to the farthest sprinkler head often dictates design parameters such as diameter of pipe, openings of sprinkler orifices and horsepower of pumps. Poor water quality may require heavy duty pumps, aerator fountains to clean up algae in ponds or filters to remove potentially harmful mineral elements from water before it enters the system.