RRIGATION: an athletic field necessity

by Ray Flood

■ Turf that provides athletes with a safe, playable surface must also look good. That can be difficult, especially with unfavorable weather, heavy play and tight budgets.

Irrigation should be an integral part of the basic field design. Even before the turf options are discussed, two questions should be answered: "Is water available?" and "How will watering be handled?"

Each athletic field has specific factors that must be considered in determining irrigation needs:

- typical weather patterns,

The Ten (Plus One)

I

Flow and psi. Determine these figures for the water source.

II

Sprinkler head layout. Based on water availability, what type of head pattern and spacing best supplies water?

III

Labels. Label the sprinkler head arc and gpm (gallons of water which pass through the sprinkler head per minute). The arc describes the spray pattern and will indicate the height to which water is thrown and the distance of flow.

IIII

Zoning. Group heads into zones. The main water source supplies a set amount of gpm, for example 50 gpm. Each sprinkler head uses a set amount of gpm, for example 10 gpm. In this example, the maximum number of heads that could operate on a zone would be five (50 gpm ÷ 10 gpm = 5).

IV

Main line. Locate the system's main line. It always contains water under pressure and should be positioned to feed water most efficiently through lateral lines to the sprinkler head locations.

V

Valves. Spot them. Each zone off the main line has a valve between the main line piping and the piping that leads to the heads within that zone. A controller with a clock is used to trigger the valves. The controller could be mechanical, with dials and physical switches to trigger as the clock physically rotates, or electric, using electrical impulses to trigger activity.

VI

Lateral piping. Locate the lines that extend outward from the valves to the sprinkler heads. These lines usually use smaller pipe than the main line, becoming progressively smaller as they extend from the main line. Because water is released from the system at each sprinkler head, less pipe diameter is needed to transport the remaining water to the next head. Using progressively smaller pipe reduces system costs.

VII

Friction loss. Calculate the amount of pressure that is lost to friction as the water works its way through the piping to the last head in the zone. Water pressure affects sprinkler head performance.

VIII

More labels. Label all the components on the design and prepare a legend to identify them.

IX

Water schedule. Determine how quickly the field's soil absorbs water. Water should be delivered at, or slightly below, the soil's capacity to absorb it. Too much water at one time will either puddle or run off.

Turf water use is reflected by evapotranspiration (ET) rates. ET is the amount of evaporation caused by weather factors, combined with the transpiration rate of the specific grasses. Irrigation makes water available to the turf to make up for this water loss.

X

Material. Determine how much material to purchase in order to install the system. It's most efficient to install in-ground sprinkler systems before field construction. Installing later means you disrupt the soil profile and established turf, which may lead to uneven settling.

✔soil type and absorption/drainage capacity,

✔desired turf varieties,

✔type and frequency of sports activities and

✔desired quality level.

The "Ten-Plus-One Commandments of Design" (as taught at the University of Maryland by the Professional School of Irrigation from Chantilly, Va.) lay the groundwork for installing a workable, in-ground sprinkler system or the basic considerations for an above-ground system.

Lay out the design on paper for accuracy.

Whichever in-ground system is installed, get a copy of the design ("as built" is the term designers use) to keep on hand in case of problems. Make sure at least one person on staff has a working knowledge of the system.

Whether installing a new in-ground system or upgrading an older one, take time to evaluate suppliers. Select a company that has the ability to analyze specific needs, design a

Irrigation test during reconstruction of Rosenblatt Stadium, Omaha, Neb. Determine how quickly the field's soil absorbs water. Water should be delivered at, or slightly below, the soil's capacity to absorb it.

THE ULTIMATE IN-GROUND SYSTEMS...

✔...have controllers connected to a computer. Valves are operated by radio waves from the computer to radio antennae hooked to the controllers in the field. The computer's clock is the only one needed.

✔...are especially beneficial in multiple-field operations in which the one-time major investment is quickly paid back by the reduced hours spent on irrigation operation.

✔...almost think for themselves. New software programs allow the computer to adjust scheduling according to information supplied on variable conditions. Information can be gathered and typed in manually or fed to the computer from in-ground sensors located at strategic places in the fields.

–R.F.

suitable system within budget restraints, and provide the back-up service required. When considering system options, examine both long-range and short-term cost-to-efficiency ratios. Irrigation systems should make turf maintenance easier and more effective—not add to the turf manager's workload.

—The author is commercial sales representative for Turf Equipment and Supply Co., Baltimore, Md., and an active member of the Sports Turf Managers Association.

ABOVE-GROUND SYSTEMS

■ If an in-ground system is too costly, steps *Plus 1-1-2-3-7-9-10* will help in pre-planning an above-ground system.

Options include:

- a manual system with a network of above-ground hoses and impact heads;
- travelling sprinklers; or
- a semi-automatic system using a retractable tripod-based sprinkler head run off 1 1/2- to 2-inch hose.

For in-ground installations, manufacturers offer heads designed for athletic field safety. When properly installed, these heads become a non-factor during play. The valves for athletic field irrigation should be positioned off to the side of the field for further safety.

- A basic in-ground sprinkler system could be manually operated. Gate valves—which are similar to the water outlet valves outside a home—on the main and lateral lines give immediate on-off response.
- To cut costs, quick-connect valves can be used in lieu of sprinkler heads, with a limited number of heads purchased to move from zone to zone for watering.
- A typical electronic system would use all electronic controllers to operate the system on a prearranged schedule with a manual override. Electronic systems nearly always operate with valves that remain closed unless electronically opened to prevent systems from turning on during electrical outages.
- Another mid-range system operates using hydraulics, with an electronic controller and tiny tubes of water channeled to and from each valve.

—R.F.