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14,000 lbs. of turf seed, he estimates.

Baran and his crew will seed tees and greens themselves with Providence bentgrass. They'll use walk-behind units. "We don't want the bentgrass seed to get into the roughs," says Baran.

Baran is a native of the Cleveland area. He spent five years as superintendent of Wooster Country Club, also in Ohio. He's worked 28 years on golf courses, and 18 years as a superintendent since graduating from Penn State University.

Baran joined Eagle Creek in March, just after the irrigation pond had been dug and land clearing began.

He'd been hired, at least in part, because course architect Huntley of Canton, Ohio, recommended that Norwalk Golf Properties hire an experienced superintendent prior to construction. The company, made up of 19 Norwalk-area investors, acted.

That was just one of several long-range adjustments that the owners made after starting the project.

"As the project proceeded, the owners made a decision that they didn't want just another public golf course. They wanted the best public golf course they could build," says Baran.

For instance, the owners had initially planned to save four holes of an existing nine-hole golf course on the property and add them to 14 new holes.

But Baran argued that the character of the new and old holes would be too dissimilar. Also, since the old greens were built on mounded native soil decades ago, Baran predicted never-ending maintenance problems.

Instead, he's building all 18 greens similarly, using about 5,700 tons of greens mix (85 percent sand and 15 percent peat).

Another positive change, said Baran, was allowing bentgrass, rather than Kentucky bluegrass, fairways. Baran said he'll be able to mow the fairways at a half inch or less, and golfers will appreciate the difference.

Among the other inputs offered by Baran included widening the aprons between bunkers and greens to better accommodate mowers, and reducing the steepness of some slopes, again to facilitate mowing.

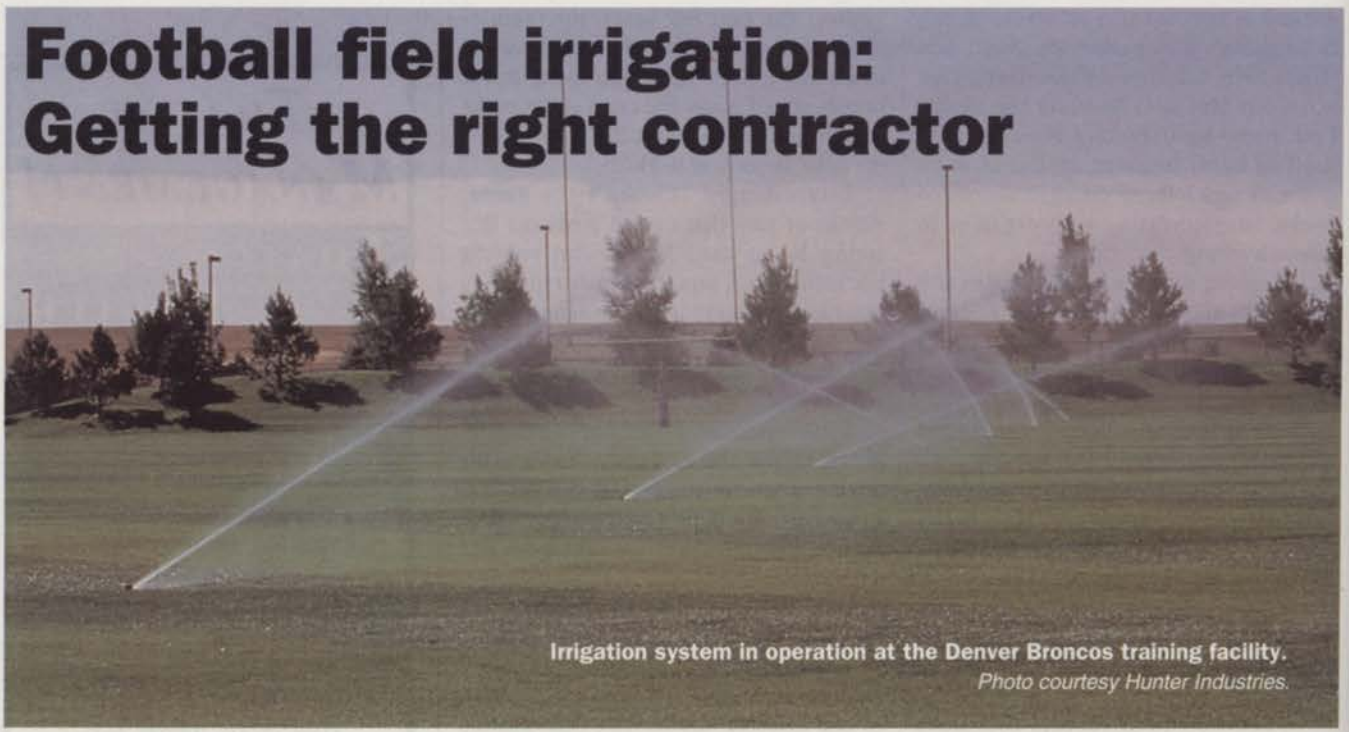
Baran credited the course owners, including director of golf Gary Wilkins, for their willingness to make tough financial decisions to build an exceptional public course. For 22 years, Wilkens served as both superintendent and golf professional at the original nine-hole course.

But maybe the toughest decision the owners made was to reduce the number of residential housing lots they would sell adjoining the course.

"I said we needed more room for the golf course," says Baran. "The golf course really is the number one priority at Eagle Creek."

It's no wonder Baran smiles so easily.

Football field irrigation: Getting the right contractor



Irrigation system in operation at the Denver Broncos training facility.
Photo courtesy Hunter Industries.

by Dan Almond

■ Football fields are the workhorses of sports turf, subject to wear and tear by "really big," determined athletes, often during unfavorable weather conditions. The irrigation systems of these fields simply must be safe, efficient and durable.

The first step in an irrigation project is selecting an experienced contractor who understands that the main focus is athlete safety.

Ideally, you should be involved from the beginning. It's more efficient for the contractor to work through key points of design, component selection, installation and maintenance with the person who will be controlling the system. At the end of the project, the contractor should supply you with a copy of the working design and the system design "as-built," showing exact placement of all components, includ-

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ing any alterations from the original design.

Certain factors must be known prior to design:

- the soil profile;
- the water source, quality and usable pressure;
- how turf will be established and restored;
- whether chemigation or fertigation capability is desired; and
- any constraints on water use.

If you have past experience with irrigation systems, your preferences also should be discussed up front.

Frequent, open communication is vital. Typically, an experienced irrigation contractor and an experienced sports turf manager will parallel each other in ideas. If you have concerns, the contractor should encourage you to visit another installation, or at least talk with another facility manager using a similar system.

Heads—The basic football field irrigation design uses a five rows running parallel to the length of the field. One row (or zone) is placed along each edge of the field, with three rows within the playing surface. Because so much of the game is played between the hash marks, this system configuration allows for individual zone control within that segment of the field.

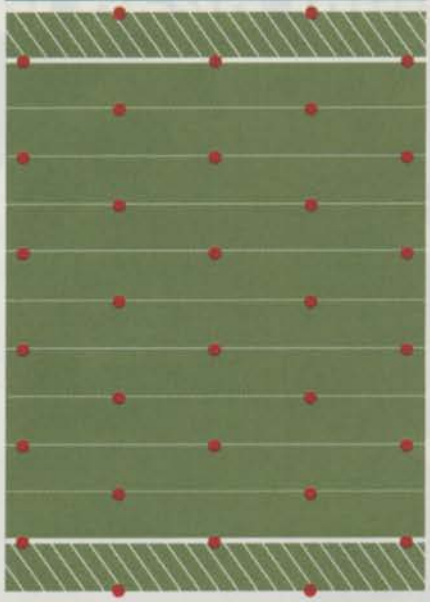
Individual heads are equally spaced along each row. The spacing is determined by the effective length of the watering stream (or throw) produced by each head. Generally, the effective throw of one head will reach to the head next to it (head-to-head coverage). By designing the layout with each head offset from the heads in the rows that parallel its row, a triangular pattern is created. In effect, each head then produces head-to-head coverage with four other heads. This layout should provide uniform watering, even during varying wind conditions.

The degree of flexibility required will help determine installation needs. For example, irrigation heads may be installed with triple swing joints, allowing movement from side to side and up and down.

Irrigation heads should be selected based upon their performance record under conditions matching those of the field—and above all—for their safety. The smaller the surface area (diameter) of the head, the better. In addition, rubber covers minimize injury potential.

The soil profile helps determine head selection. Sand-based fields require heads that perform well in sand, with the ability to withstand the abrasion that will occur. Different types of heads will be needed for native-soil or amended-soil fields, again selected specifically for proven performance and durability within that soil texture and structure.

Typical Football Field Irrigation



(Red dots indicate irrigation heads)

Head selection is also influenced by the water source, pressure and quality. Each head requires a specific level of water pressure (such as 50 pounds per square inch or psi) to produce the desired throw. The designer will need to know where the water supply will enter the facility and whether there is a master water line from which water will be channeled to the field (generally through a two- to three-inch pipe), or if there is a separate, dedicated water line for the field. If water is fed to the field from a master line, other demands on the water which could affect the static water pressure and available gallonage must be determined.

Heads should be placed with the rubber cover even with the soil surface of the field, allowing for a "pop up" capacity of at least four inches to rise far enough above the turf surface for efficient coverage. On new, seeded fields, it is recommended that each irrigation head be surrounded by a 24- to 36-inch "donut" of erosion control fabric or sod to prevent erosion around the head until the seed is established.

Other components—All of the valving for each irrigation zone is then located off the playing surface in an enclosed plastic box. There may be one basic valve box, or a valve box for each zone. Generally, the valve box or boxes are placed off the back of the end zone; in a stadium, between the end-zone and the facility wall.

Valve boxes may be buried two to three inches below the soil surface and covered with sod, or placed level with the soil surface and covered with artificial turf. This allows access to the valves within the boxes, yet helps the boxes "blend" with the surrounding turf and creates a safe, protected surface.

Typically, quick coupling devices also will be provided, especially in cold climates where they are used to blow out (or winterize) the system. Some systems will include rain shut-off devices to interrupt pre-programmed irrigation cycles in response to natural rainfall.

The clock and other "weather critical" control features will be housed in a protected box or building. The type and design of these components will vary with the complexity of the system and the preferences of the system operator.

Water quality also is important. A city water source with a high alkaline level may produce residue build up that could hamper system operation. With a non-potable water source, irrigation valves may require internal "scrubbing" components to remove contaminants that could clog heads and nozzles.

The heads, nozzles and irrigation clock must be capable of meeting requirements.

If the system will be used to inject fertilizer or other chemicals, the valves selected must resist corrosion and the clock must provide sufficient control capabilities.

Though budget limitations are considered in system design, it's important to use the best materials for the project. The initial cost differences will be recouped many times over by increased efficiency and lower maintenance.

Expect the irrigation contractor to provide a one year warranty on materials and the system. Individual components may carry a longer, manufacturer's warranty. The contractor also should help facility personnel establish a connection with a local distributor source, when possible. Finally, keep communicating. If problems arise, find out why and reach a workable solution.

—Dan Almond is a landscape architect for Randall & Blake, Inc. (RBI), a multi-discipline design-build company with branches in Litttleton, Colo.