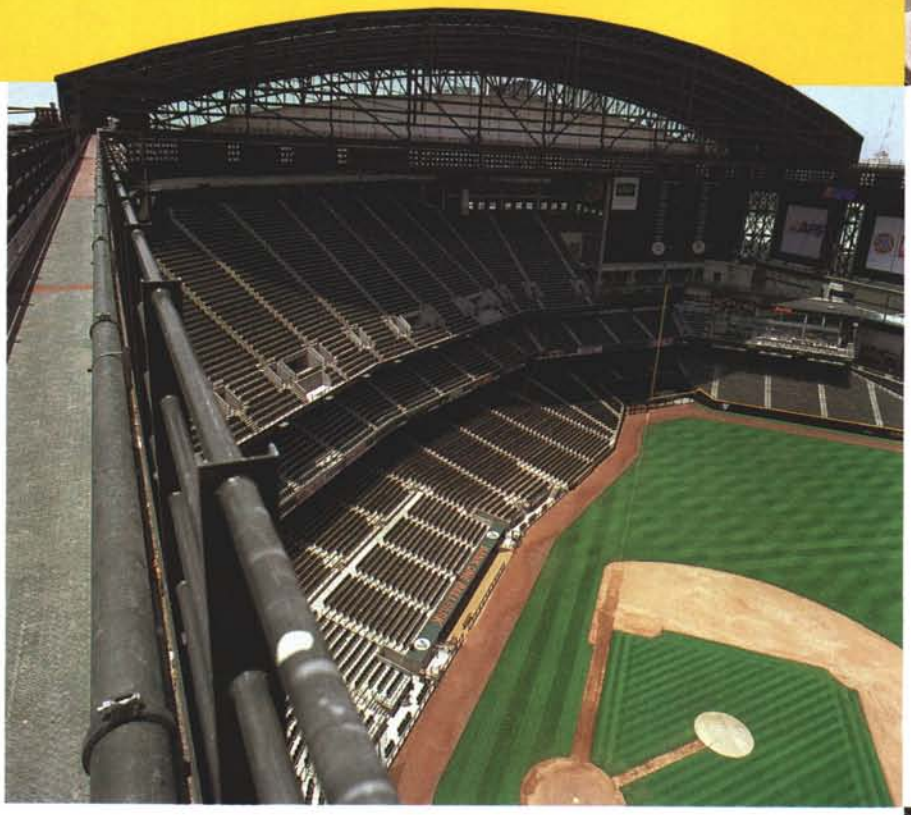
Phoenix.



The Bank One Ballpark's retractable roof can open or close in slightly less than five minutes. Either side of the roof can be opened to maximize sunlight on the turf and minimize it on the interior steel and concrete.

"This ballpark is unique to anything that's been done before," says Grant Trenbeath, head groundskeeper for the Arizona Diamondbacks Baseball Club, major league baseball's newest team. Like the Diamondbacks, Trenbeath was in his inaugural season as a major league groundskeeper during 1998. And it was a learning experience, to say the least.

"It's a world inside itself," observes Trenbeath about the Bank One Ballpark. "The roof, the air conditioning, the shade line, not to mention the heat factor. Also the newness of the park. There's a maturity process that goes on and it takes a certain amount of time to establish that."

To help bring a rookie field up to major league standards, Trenbeath relied on a proven veteran. "I've worked with John Deere equipment in the past, so when I was approached about using John Deere, it had my full support."

The John Deere 1200A Field Rake and the 220A Walk-Behind Mower are mainstays in the Arizona infield.

"John Deere takes their time, so by the time they come out with something, it's much higher quality. Prime example is the Aercore 800. I've messed around with other aerators and that's the Cadillac."

But according to Trenbeath, it takes more than equipment to make a winner. "Most groundkeepers will tell you the equipment is only as good as the service. And John Deere to me is the best service-wise. And that's peace of mind."

"You can go up and down our line of equipment – the 1200A Field Rake, the 2653 Utility Mower, the 1800 Utility Vehicle, the 220A Walk-Behind Mowers – all of them are mainstays here at Bank One."

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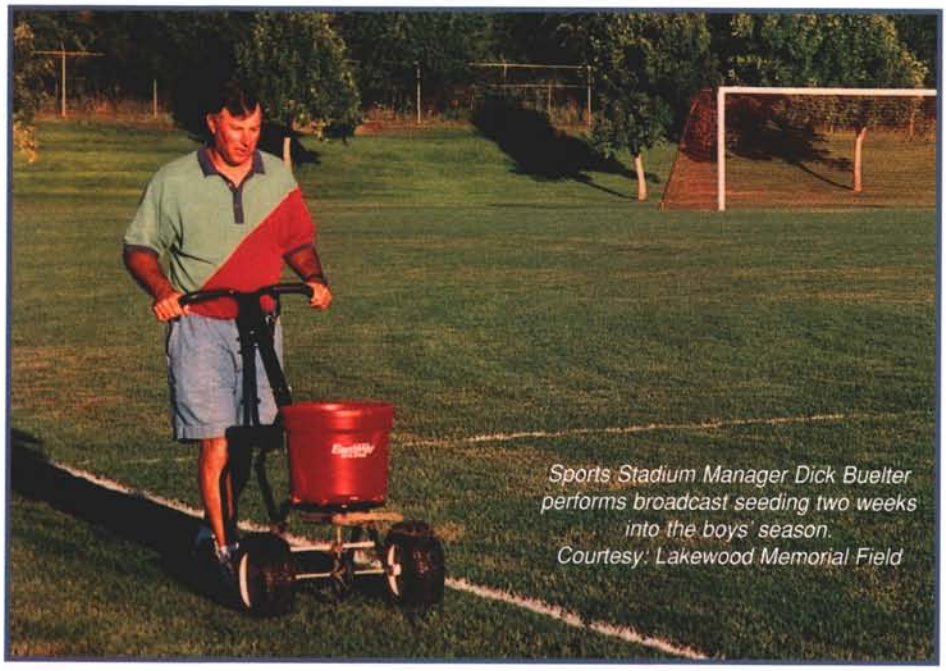


Sports Stadium Manager Dick Buelter performs broadcast seeding two weeks into the boys' season. Courtesy: Lakewood Memorial Field

Continued from pg. 19

Growth

Like many facilities around the country, Lakewood must continually adjust to accommodate community growth. Buelter explains, "The district will open another high school next year, which means five more football games and seven more soccer games each fall and spring. With regional growth, we probably will add another two high schools within the next five years.

"The up side of this is it works, due in large part to the high caliber of our people. We've developed the maintenance system over the years and continue to fine-tune it.

"The district allows us the luxury of downtime for rejuvenation on all three fields. We also have the authority to cancel games prior to the scheduled start if field conditions warrant it. Our standards on that are basic: if you wouldn't send your own child out there, don't send someone else's."

Field stats

Lakewood field consists of original heavy-clay native soil. The soil has been augmented over the years through topdressing with a planters mix consisting of 1/3 top soil, 1/3 peat, and 1/3 wood fines.

This same mix was used to augment a section of the field approximately 80 feet wide from goal to goal for a resodding project in 1995. The same sod, grown on a sandy-loam soil, has been used for goal mouth replacement, and additional sand has been incorporated into that area. The best drainage on the field is in the high-wear area.

With the age of the field, it's impossible to identify the original bluegrass cultivar. Replacement sodding has consisted of newer bluegrass varieties.

Maintenance

• Mowing

Buelter says, "Though we'd like to keep the turf shorter, we maintain a 2.5-inch to 2.75-inch height. We need that extra cushion of protection due to the volume of play.

"During the summer I mow Monday, Wednesday, and Friday. Once the fall season begins, I mow every game day to have the aesthetics set in. That drops to twice a week, generally Tuesday and Friday, as temperatures drop and turf growth slows."

• Seeding

Following core aeration in four directions each May, Buelter seeds with Sports Turf Mix containing A34 and SR 2100 bluegrasses, and SR 4200 and Manhattan III perennial ryegrasses at four to five pounds per 1000 square feet. In June, he overseeds weak areas of the sides of the field with Champion Turfgrass Mixture containing SR 4200, SR 4100, SR 4010, and SR 4000. In August, Buelter broadcasts this mix over the goal mouths, the center of the field, and referee running "paths."

• Painting

Buelter tackles field lining and marking on Monday or Tuesday, prior

to the week's first games. He monitors conditions on Friday, and touches up the paint if necessary. During the first painting of the season, he adds Primo to the paint to slow turf growth and extend paint life.

• Irrigation

Buelter says, "Before 1997, we had a manual irrigation system with quick couplers. Prior to the start of the girls' season in 1997, a five-row, modified Hunter football field irrigation system was installed by the athletic crew utilizing I-40 sprinkler heads.

"After that installation, we installed an irrigation system on the west bank of the complex, also using I-40 heads, and to the north of the concession stand using Rain Bird 1800 pop-ups. Lakewood now has three acres of irrigated turf."

• Equipment

Equipment purchased for the three district facilities is for their exclusive use, and they've gradually built up a fairly complete assortment. Whatever Buelter doesn't have on-site, he can borrow within the system.

Use of the John Deere 455 tractor, AerWay aerator, Ryan 48-inch pull-behind aerator and Turfco Top Dresser is coordinated between the three facilities.

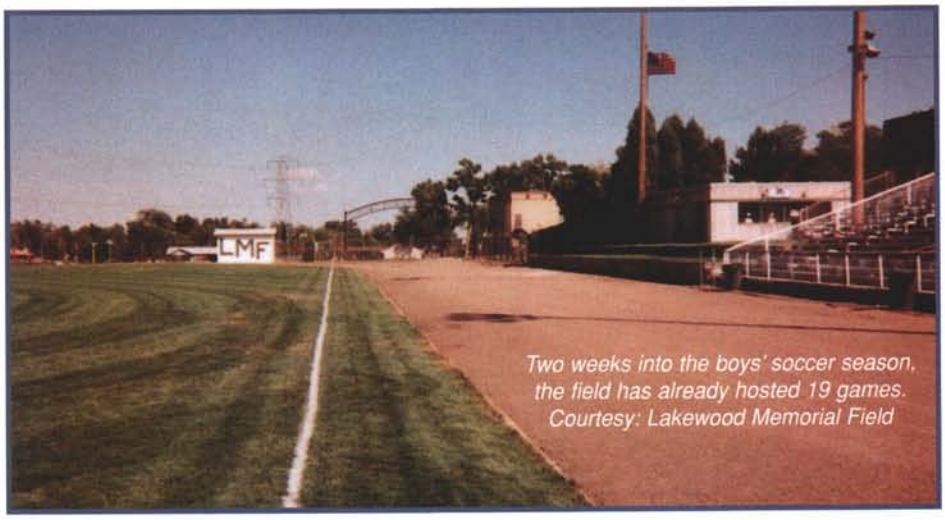
• Scheduling

Field maintenance must be coordinated with event scheduling and Colorado's widely fluctuating weather conditions. Buelter says, "During the boys' season, fertilization must take place when no games are scheduled to allow for proper irrigation. Aeration and broadcast seeding are done in conjunction with fertilization. Timing always depends on the weather patterns to avoid too much water during these processes.

"Springtime in the Rockies, the period of heaviest snow, coincides with our girls' soccer season. The east-west field orientation lets the spring sun help with snow melt and field drying.

"At times, we need to plow snow away using a rubber blade attached to our jeep. We follow that by dragging the field with a six-foot by 10-foot chain drag. That stands up the grass and allows the air and sun to help dry the field to allow play.

"We delay starting up the irrigation system until weather patterns warrant it. While we like to aerate every two weeks during the season, the weather dictates when aeration can occur."



Two weeks into the boys' soccer season, the field has already hosted 19 games. Courtesy: Lakewood Memorial Field

Future plans

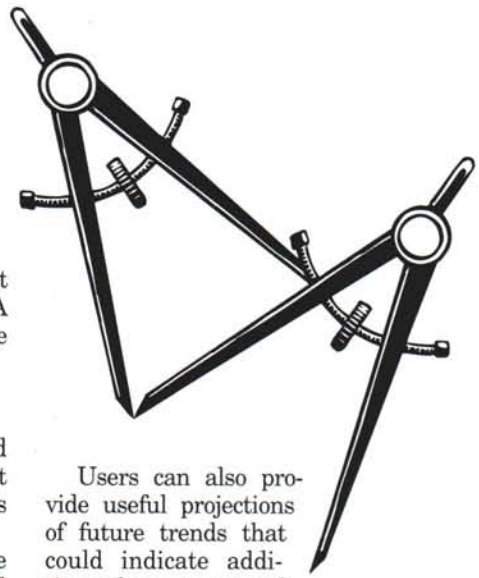
Always working to improve field conditions, Lakewood started top-dressing with the same sand material used at Jeffco this year, rather than using the planter mix. Buelter notes, "We've built up an adequate supply of organics, so now we're filling the aeration chimneys with sand. It also smoothes out the field surface a bit. Eventually we'd like to build up a sand cap to improve surface drainage."

Buelter is also trying to move away from the old football and track appearance at Lakewood. The immediate plan is to fill in the west end of the stadium and extend the grass outside the track to create a larger warm-up area. The long-term goal is to remove the track and widen the field. The gradual process will be determined by budget and manpower restraints.

Bob Tracinski is business communications manager for John Deere in Raleigh, NC. He is public relations co-chair for the National STMA.

Facility Design

Working with an architect



by Jeffrey L. Bruce, FASLA

Facility design is a collaborative project. The process can seem daunting at first, and it can take up to three years to complete.

Before embarking on such a long, complicated journey, it's a good idea to understand the design and construction process. This series of steps takes a facility from broad, conceptual ideas to highly detailed plans. With each step, the architect gains greater insight into the needs and preferences of the facility's team. The right decision at each step can make the difference between a smooth process and an over-budget nightmare.

Communication

Architects' decisions about your facility are only as good as the information you provide them. The better you understand what information architects need, the better your final product will be.

It's a good idea to form a committee of individuals that have a direct stake in the outcome of the design. This allows information exchange, and it facilitates decision making. Since most designs include program compromises, committees help involve all individuals who are directly responsible for the operation and maintenance of the facility.

The design process is a great educational tool. People involved gain understanding of why decisions are made, and what tradeoffs may be necessary to meet design and budget objectives. Having been through the process, committee members generally become strong advocates for the project.

Drawing plans

Successful projects start with two basic documents: a master plan and an operational plan. The master plan defines all of the physical elements of the project, and it outlines how they fit together on the site. It should anticipate and accommodate future needs. An operational plan is a workbook that lists necessary measures to maintain and operate the facility when the project is complete.

The master plan and operational plan need to be developed concurrently. It makes little sense to build a facility that is too costly to maintain and operate. A successful facility will balance the demands of both plans.

Master plan

A facility's master plan provides a road map of future physical development. It gives a framework for guiding decisions and improvements.

Like road maps, master plans are flexible. They may indicate a general destination, but there are various routes available. As conditions change, master plans should be updated and revised to keep them current.

• Condition assessment

The process begins with condition assessment. This documents all positive and negative attributes of your existing facility. It should contain an inventory that includes details of all facility resources: sizes, dates of construction, materials, descriptions, dates of major improvements and repairs, utilities, support equipment, and other relevant historical information.

Condition assessment questions include the following:

√ Are the playing fields regulation size?
√ Is the number of fields sufficient?
√ What is the condition of the turf?
√ Is spectator seating adequate?
√ Is there a problem with delivery service to the concession stands?

Condition assessments give architects an understanding of how sites function. They identify user patterns, and conflicts that need to be resolved during design.

• Program assessment

A program assessment includes an assessment of user needs. This involves a detailed interview of the groups that use your facility. All current and potential future users should be contacted, including interscholastic sports, physical education, intramural programs, club sports, and community groups.

Facilities should develop profiles of each user group. Each profile should include practice and game schedules, number of participants, number of fields required, length of practices, length of season, number of spectators, and equipment needs.

Users can also provide useful projections of future trends that could indicate additions of new sports and teams.

• Facility requirements

Facility requirements are based on condition and program assessments. At this point in the design process the architect joins facility representatives to develop a program schedule for the site.

The program schedule coordinates and optimizes all facility users. It identifies preferred uses of the site, and eliminates schedule conflicts.

A clear understanding of facility use allows architects to determine the number of fields, types of fields, turf selections, and opportunities for multiple-use sites. Architects usually call the facility requirements an architectural program. All of the elements needed to accommodate the desired activities appear much like a shopping list.

For example, a football team's facility requirements might include one game field, two practice fields, a 20-foot by 30-foot synthetic drill area, 200 square feet of equipment storage, portable bleachers for 30 spectators, restrooms, drinking fountains, and adequate parking for 40 cars per field.

For architects, architectural programs most clearly define what facilities should include and how they should function. The most common failure of facility design is a lack of clearly defined programs.

• Layout

With the program in hand, the architect designs a layout of the site that shows all proposed facilities. This step of the design process is like a jigsaw puzzle.

Program elements are pieced together, combined, and placed on the site. The architect considers how each piece of the puzzle fits with the site and budget, and looks at how compatible each piece is

with other pieces. The outcome is the master plan.

This aspect of the design process may seem overwhelming, but it's imperative that facility decision makers spend time and effort to really understand the proposed plan. They should not assume the architect has correctly interpreted the program. If changes are necessary, this is the time to make them. Changes made once the contract is awarded or facilities are under construction may be very expensive, and they can cause delays.

Operational plans

Operational plans define how facilities are operated and maintained. The steps required to develop operational plans are similar to those required for master plans.

• Assessment

Operational plans first assess existing operations. They inventory all staff resources and maintenance equipment. Staff resources include job descriptions, staffing costs, training requirements, qualifications, maintenance activities, maintenance schedules, and manpower estimates. The equipment inventory should identify the types of equipment, as well as the model, age, and condition of each piece.

At this time, improvements necessary to maintain and operate the facility should also be identified. All of this information will allow a detailed assessment of facility operation and maintenance costs.

• Schedule

Operational plans next develop operational programs and maintenance schedules that will compliment activity schedules. They plan and schedule time for maintaining the facilities, especially the fields. It's important to include turf recovery time in these calculations.

• Budget

Finally, operational plans develop an annual operating budget that identifies both capital improvements and recurring costs. Capital improvements include equipment acquisitions required to operate and maintain the facilities identified on the master plan.

Many new facilities are designed without regard to operation costs. Operational plans are usually included as part of the architectural services, but they are often overlooked.

Knowing what to expect cannot guarantee a problem-free project, but it can result in fewer and less-severe problems. It's most important to remain accessible to the architect, and to be actively involved in understanding the design. This will ensure a pleasurable experience that produces a facility that meets your needs.

Jeffrey L. Bruce, FASLA, is president of Jeffrey L. Bruce & Company LLC Landscape Architects & Planners. He has more than 21 years experience in all phases of landscape architecture, site analysis, development, urban design, and sports field and irrigation design. He was elected Fellow of the American Society of Landscape Architects in 1996, and has received ten separate service and leadership awards and 16 design awards.

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Chemigation

Product Spotlight

Chemigation is the process of applying an agricultural chemical (fertilizer or pesticide) to soil or plant surfaces with an irrigation system by injecting the chemical into irrigation water, according to a definition from the University of Minnesota. Depending on the type of agricultural chemical being applied, chemigation may be known as "fertigation," "herbigation," "insectigation," or "fungigation."

Carefully designed, safely managed chemigation systems can offer several advantages over other treatment practices, including more uniform distribution and reduced operator hazards. However, without strict controls, chemigation systems can contaminate surface and groundwater and lead to legal problems.

Legal regulations

Chemigation systems require very careful supervision to avoid over-watering with pesticide mixtures.

Most state agriculture departments have chemigation regulations and pesticide and fertilizer permit programs. Many state health departments also have rules on chemical storage tanks, chemigation systems, and water wells (irrigation, potable, and public water systems).

Since chemigation equipment can expose persons to pesticides, the Federal Worker Protection Standard protects employees who work on chemigation equipment. Only trained and equipped handlers are allowed to operate, move, or repair chemigation equipment parts that may contain pesticide residues.

Available safety equipment can help further protect against some legal ramifications of practicing chemigation. When properly installed, such equipment can prevent backflow and subsequent groundwater contamination.

According to Purdue University, liability-reducing safeguards may include the following:

- Requiring employees to obtain and maintain certified applicator status
- Pre-chemigation water analysis at the water source and locations near the water source
- Considering run-off direction
- Knowledge of potential plant toxicity when preparing chemical application schedules and dosage rates
- Judiciously adhering to recommended application rates
- Sound soil conservation techniques
- Periodic equipment calibration

Helpful hints

Here is a list of helpful guidelines for chemigation from the North Carolina State University Cooperative Extension:

- Don't apply pesticides through an irrigation system if the soil is wet. If one or more inches of irrigation or rainfall has occurred within 24 hours, the soil is probably too wet to apply pesticides.
- Use the least amount of water possible to apply the chemicals.
- Don't chemigate when you mean to irrigate.
- Use field borders to catch runoff water around treated areas.
- Use erosion and runoff controls.
- Avoid wind drift by considering weather and equipment.
- Use equipment with proper nozzle size and water pressure to provide large water droplets, which resist wind drift.
- Do not chemigate when wind speed exceeds five miles per hour.
- Do not use gun-type sprinklers that spray a fine mist high into the air.
- Design irrigation equipment to cover the entire field, but do not place sprinklers close to the field edge.
- Apply only pesticides labeled for use in irrigation systems.
- Regularly check equipment for the following:

√ Water leaks

√ Proper operation of antisiphon systems

√ Proper setting and function of relief and check valves

√ Clogged nozzles

Fertigation

Injection equipment is necessary to adapt an irrigation system for fertigation. The technique also requires a large reservoir (500- to 1500-gallon capacity) to store the liquid fertilizer.

Fertilizer may be added to irrigation water by using an adjustable metering pump or another injection device. The injection system may be controlled manually or automatically. Electronically monitoring the injection rate or volume can be combined with programming valves or injectors to be shut off after a prescribed injection volume. Chemigators should note that the uniformity of chemical application cannot exceed the uniformity of water application from the irrigation system.

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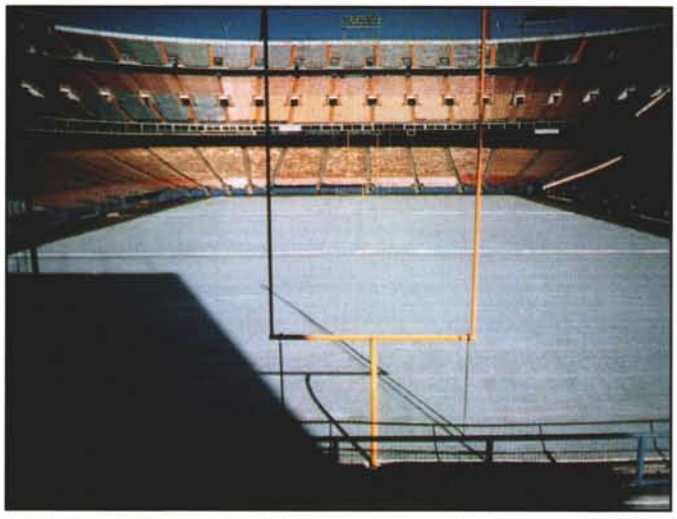

A turf blanket protects turf in winter at Denver's Mile High Stadium. Courtesy: Covermaster Inc.

Dunn Tire Park, Buffalo, NY. Courtesy: Covermaster Inc.

Continued from pg. 6

used to protect against morning frost. Covering areas where frost is forecast at night can minimize or eliminate the effect.

Construction

Blankets should be treated to withstand damaging ultra-violet sun effects. They must be highly rot and mildew resistant to hold up to the elements. Properly treated blankets should not show significant wear, even after years of use.

Turf blankets should have smooth surfaces to prevent dirt and debris accumulation. They should feature lightweight construction for quick and easy installation and removal.

Whenever possible, use a one-piece cover. Avoid overlapping sections to prevent quality and color variation of covered turf.

Bob Curry is president of Covermaster Inc. He also serves as STMA's commercial vice president. To contact the company, call: (800) 387-5808, or visit: www.covermaster.com.