



**"Changing the baselines to grass is one of the best moves we've made," says Schweitzer.**

Schweitzer develops and monitors the budgets, develops and coordinates the maintenance programs for a staff of 34 employees, prepares a horticulturally related campus newsletter and spends about 75 percent of his time on the grounds with the staff. In addition, he participates in the Texas Turfgrass Association, the Master Nurseryman program of the Texas Association of Nurserymen, the national Sports Turf Managers Association and the Texas College and University Grounds Managers Conference.

Schweitzer is very impressed with his staff. "The three full-time physical plant grounds maintenance employees who maintain the athletic fields do a super job," he relates. "Joe Rincon is our detail person. Eighty percent of his time is spent on E.M. Stevens Field. He mows the infield, does the daily dragging, lip washing, mound and plate preparation, skinned-area work, marking and safety checks. He also polices the stands, including litter pickup. Supervisor Pete Vasquez Jr. and assistant Juan Avila do the mowing on this and all other athletic fields. On game days, they all pitch in to prepare the mound, batter's box, bases and the skinned portion of the infield."

Schweitzer adds, "My good friend, Mel Lanford, head groundskeeper for the Yankees A team in Greensboro, NC, met with me during the renovation period. He said, 'Make your field *your* field. Make the changes, add the details that fit your needs and your maintenance program and that make the field unique. I took that to heart."

"We made straight cuts at the corners — rather than rounded — to coordinate with the untraditional straight lines utilized in both the fungo and

on-deck circles. The straight lines also can be seen along the warning track behind home plate. They coincide with the angles and point of home plate to create a striking effect.

"The warning track has a four-inch depth of very fine crushed granite from a Marble Falls, TX, quarry. The rose color is distinctive; there's no dust and no mud; and the surface provides an audible crunch when stepped on with steel spikes. The crushed granite is also used inside the bullpen and batting cage, which allows for usage even during periods of wet weather."

In another untraditional move, Schweitzer has changed to grassed baselines from home plate to first base and from third base to home plate. "I hear that



**Mike Schweitzer (in cowboy hat) is at home on this range with crew members Pete Vasquez Jr. (kneeling), Joe Rincon (standing, left) and Juan Avila.**

LSU did it, and won the College World Series a year later, so our hopes are up for 1995," he relates. "We made this change in the fall of 1993, so we've played two fall seasons and one spring season on it. We made the cuts, leveled the surface, sodded with Tifway 419 Bermudagrass and then topdressed with washed green sand to assure no surface transitions. The only other change needed was adjusting the irrigation heads from 180 degrees to 360 degrees.

"Changing the baselines to grass is one of the best moves we've made. When Floyd Perry conducted his Grounds Maintenance Seminar for Baseball Fields here in the fall of 1994, he said that grassed baselines with cutouts only for

bases could be especially beneficial at the Little League level, allowing personnel with limited time to concentrate on maintenance of areas other than the skinned surfaces.

"By grassing our baselines, we eliminate approximately 240 feet of lip maintenance from our daily program. Because this grass is painted just like the outfield foul lines, chalking is reduced to only the batter's box and the remaining skinned portion of the infield.

"Floyd Perry also recommended the artificial turf hitting mats we now use at home plate and in the bullpens. The mats are heavy and lay flat over home plate and the area that is used by right- and left-handed hitters. The mats are thick enough so players can dig in with their spikes. We use the mats for all daily practices except scrimmages.

"We've also buried a rubber mat 1.5 inches below the surface at the right side of the batter's box. We've gone just to the right side because currently we have far less traffic in the left-handed batter's box. This mat is the same color as the infield material. Even when hitters really dig in, they can't go beyond the mat, so we have only the top 1.5 inches of soil to repair.

"Our dugouts were initially flush with the brick wall, almost inviting players and coaches to pour onto the warning track in front of it. Three years ago, we paved the area in front of the dugouts and covered it with indoor/outdoor carpeting, and have been extremely pleased with the results.

"In recent years E.M. Stevens Field has been utilized for a variety of functions in addition to baseball that further increase maintenance requirements. Since 1991, Trinity University has been the summer training facility for the NFL's Houston Oilers. To better facilitate the Oilers' needs, it has become necessary to use the outfield portion of Stevens baseball field as a second practice location. Immediately following the Oilers' departure in August, the Trinity varsity football team begins two-a-day practices on this same outfield. In an effort to minimize wear on the varsity football game field, these practices are allowed to continue until October 1.

"At this time we aerify and begin the overseeding procedures in order to restore the playing surface for the fall and spring baseball seasons. We verticut on three-inch centers in four directions, in effect, chopping the Bermudagrass into one-inch squares. Then we sweep down nearly to the crown. We overseed with a blend of perennial ryegrasses at a rate

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## Diamond of the Year

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of 10 to 12 pounds per thousand square feet in the outfield, 12 to 15 pounds per thousand square feet in the infield. We then topdress with washed green sand.

"Because most of the fields are overseeded with perennial ryegrass and the transition back to Bermudagrass generally doesn't occur until early summer, play actually takes place on the perennial ryegrass with an underlying Bermudagrass cushion. We've only had one year — the spring of 1993 — when cool temperatures and rainy weather hampered the transition. Temperatures would spike into the 80- and 90-degree range for a week, reviving the Bermudagrass and stressing the perennial ryegrass. Then temperatures dropped, the Bermudagrass slacked off, and the ryegrass took off again. That pattern continued into the summer. It's the only time we've lost good turf cover, and we did have to do some resprigging in spots. On the baseball field there was some obvious damage, but no resprigging was needed.

"For general maintenance we aerify with the 'Aerovator' on all our athletic fields. As is often the case on sand-based fields, we have found it necessary to do some deep-tine aeration to alleviate the subsurface compaction in heavy use areas.

"Pete and I are licensed, non-commercial applicators, along with three other grounds-staff members. Pete generally applies the granular fertilizer, while Richard Martinez handles all fertilizer and pesticide applications that require the large spray rig. We follow an IPM program, only treating problems as necessary. We were able to eliminate a severe nutgrass problem during the first summer with a combination of MSMA and Image and, aside from treating occasional minor fire ant invasions, we apply very few herbicides or pesticides to the fields."

All five of Trinity's athletic fields are constructed with Tifway 419 Bermuda. Schweitzer believes that no better athletic turf is available in the South. He says, "We reel-mow the fields three times a week during the spring and summer, keeping the Tifway 419 at approximately a 7/8-inch height. Anything above a one-inch cut on the 419 develops a thatchy-looking, uneven growth that detracts from the appearance and playability of the turf. Fall mowing of the overseeded turf drops to twice weekly with the outfield cut at one inch, the infield at 3/4 inch.

"Because sand-based fields differ in makeup from traditional soils, we have found it necessary to make adjustments to both our irrigation and fertilization practices. Our prime fertilization is with slow-release granular materials, which we supplement with lots of micronutrients and liquid iron in foliar sprays. We've found that half-rate applications, one-half pound of nitrogen per thousand square feet, made every two to three weeks throughout the spring and summer months work well.

"With our erratic weather conditions, scheduled irrigation programs are often subject to modification. We monitor conditions closely and work with the coaches to coordinate schedules.

"Actually, on sand-based fields it's easy to create part of our own problems. Sprigging into a sand-based field requires keeping the surface moist, but that encourages horizontal root development. Consequently, deep watering to force deep root growth leaves us in danger of baking the top layer of soil. When we wet it down to compensate, the roots stay near the surface. If we don't wet it down, the plants face desiccation. The deep-tine aeration is helping to push deep root development. It's a constant adjustment that is "a trade-off for the great playability of a sand-based field.

"In addition to accommodating the Houston Oilers and the Trinity varsity football team, E.M. Stevens Baseball Field is also occasionally utilized for the purpose of playing baseball. Approximately 20 home games as well as daily practices occur on this field from November through April. In addition, the field is prized by other schools that may be experiencing rainouts on their home fields.

"During the spring of 1992, heavy rainfall in the San Antonio area had local fields unplayable. The high school bi-district playoffs were in danger of being settled by a coin toss, and preparations were being made to bus four teams to the nearest dry field 100 miles away.

"Early on a Sunday morning we were approached concerning the playability of our field. Naturally it was wet, but within three hours we had it prepared and ready. Two games were played that day, keeping those four teams from a 200-mile round-trip bus ride.

"Texas weather is either feast or famine. We have downpours and droughts and, throughout them all, the renovated field has been highly playable."

The challenges keep Schweitzer and his staff on their toes — and call for added support from their families.

Schweitzer credits wife Sharon for more than her share of support and adds that as director of public relations for Trinity University she also has a professional interest in the quality of the grounds.

More challenges are to come. "Trinity University is the host site of the 1995 U.S. National Senior Games. Their 'Alamo Village' will be set up on the intramural field. On the final Saturday morning of the event, from half to two-thirds of the baseball outfield will be covered by large tents. Up to 5,500 participants will enjoy a celebration breakfast under the tents. A mariachi band will perform, and left field will become a dance floor." Schweitzer sometimes cringes at this prospect but realizes that "it's only a part of what groundskeepers everywhere are experiencing as the use of natural grass fields continues to diversify and increase."

Schweitzer says, "The baseball field that we have established at Trinity University has become a source of great pride for the entire university community. We've provided a field with a distinct personality, and with a little imagination, we find that its personality is altered somewhat each season. This field was well planned and properly constructed. That, I believe, is the ultimate key to any successful endeavor. However, equally important is the dedication of the people who maintain this field."

That top-notch combination has made E. M. Stevens Baseball Field an outstanding sports facility — and the 1994-1995 College Diamond of the Year. □

*Bob Tracinski is the manager of public relations for the John Deere Co. in Raleigh, NC, and public relations cochair for the national STMA.*

*The Beam Clay Baseball Diamond of the Year Award is sponsored jointly by Beam Clay, the STMA, and sportsTURF Magazine in recognition of excellence and professionalism in maintaining safe, high-quality diamonds. Winning diamonds are named in the professional, college, and high school/municipal/park categories.*

*Judges for the 1994-1995 Beam Clay Baseball Diamond of the Year Awards are Bob Wilkinson, stadium superintendent, New York Yankees, Yankee Stadium; Brandon Koehnke, manager of field maintenance, Cleveland Indians; Pete Flynn, head groundskeeper, New York Mets, Shea Stadium; and Steve Wightman, stadium field manager, San Diego Padres, Jack Murphy Stadium.*



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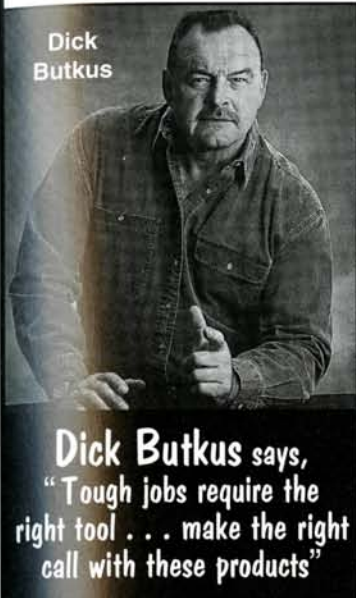
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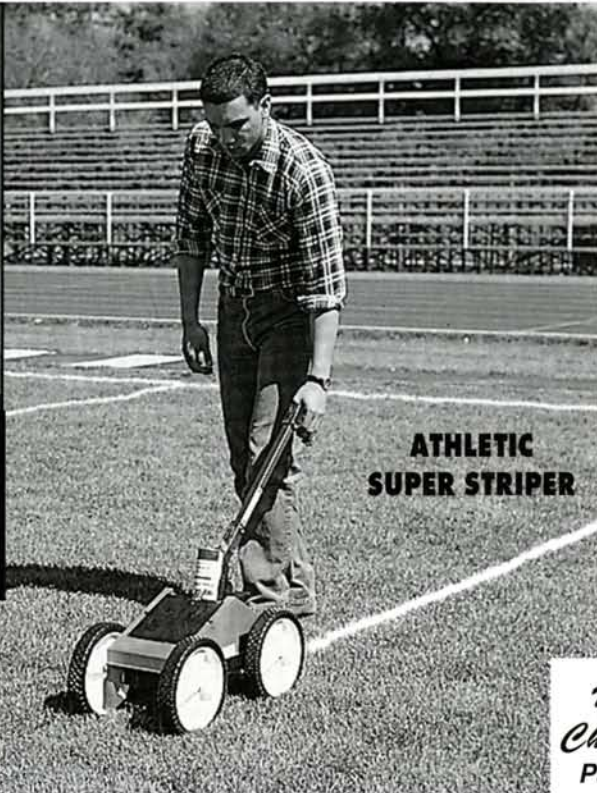
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## What a Safety Audit Can Do for You

By Floyd Perry and Steve Guise

**T**hough sports turf and sports-facility managers now are more concerned with designing and operating safe facilities and programs than ever before, it's impossible to prevent all injuries. In today's litigious society "covering your bases" is essential.

The most important aspect of field maintenance within this litigious environment is safety, both the users' and your own. When problems, such as a bad ball hop, do occur, it's not enough to say, "See my lawyer." The field must be properly maintained to protect users from injury and to protect field owners and operators from frivolous lawsuits.

The three key words are *prudent*, *reasonable* and *consistent*. If groundskeepers are prudent and reasonable in their maintenance — even if they don't have the most extensive equipment and supplies — if they do the best they can with what they've got, and they do it in a consistent manner, then they may be free of liability.

Many field operators often run a Monday-Wednesday-Friday maintenance schedule, meaning that Tuesday's game may be played on a field that has ruts and holes. If an accident takes place, you haven't been prudent and reasonable.

If a case is brought under such circumstances, it will be settled out of court because the field owners know they are wrong. If an injured player takes some pictures of the facility, and there are holes in the playing field, that's strong evidence of negligence.

If, on the other hand, the field is in top



**Field construction, maintenance and safety were key topics as STMA members toured McKechnie Field at the 1995 STMA meeting last February in Bradenton, FL.**

condition, and the team has the foresight to take pictures of the field right after the accident and has at least two eyewitnesses immediately file reports, the facility should be able to claim, "We are not liable. Our field care is consistent, and we did everything that was prudent and reasonable."

A workable program of safety audits and risk-management practices coupled with management and maintenance practices to get and keep facilities in the best possible conditions will help prevent injuries — and the resulting litigation.

If you don't look for problems, you probably won't see them. Changes may be harder to spot when you see the facilities on a day-to-day basis. That's why a formal safety-audit system can prove beneficial.

A safety audit protects your company, players, workers and patrons. Remember, no one segment of this group is more important than the other segments. You will assume some degree of liability if you know of a problem and do not rectify it or at least demonstrate a reasonable desire to address and rectify it.

### **Include Utility Companies**

A safety audit assesses not only field conditions but structural issues, including utilities — the electrical, water and gas lines into and within the facility. Local utility companies should be contacted and should be responsible for conducting a

safety audit on all mainlines into the facility on an annual basis. This should include such things as the integrity of the pipes or lines themselves, their ability to handle the volume of water, gas or electricity, the placement of wires and pipes, and the integrity of connections. For water systems, the integrity and efficiency of backflow valves should also be checked.

Structural audits include assessing the overall integrity of the basic structure and the exterior and interior space. How safe are your offices, storage rooms, restrooms, parking lots, walkways, fencing, field lighting, and dugouts? Audits include the big things, like the structural integrity of buildings, and the little — but also potentially dangerous — things, like the number of connections at an electrical outlet, the placement of electrical cords and the condition of the water heater.

Having an outside firm perform a safety audit puts more clout in the audit results. Though the information relayed may confirm what you have been saying, the external knowledge of the problem makes it a known factor that cannot be avoided.

Obviously, field conditions are a major focus of the safety audit. One area of concern is solid structures within the playing area. For example, the constant infiltration of skinned-area clay into the grass in front of the pitcher's mound and around home plate has led some turf managers to place artificial turf on top



of an asphalt or concrete base in these spots. Though these areas may seem easier to maintain, they can increase the risk of injury to players. The surfaces are less forgiving than soil and natural grass. Also, if a drain and drain cover are needed within these hard structures to permit proper drainage, a player's cleat could slip into the drain cover.

Improperly constructed, damaged or loose fencing all have potential for injury to players and spectators. A foul ball can fly through a loose strip of fencing and injure a spectator. A player can be hurt by coming in contact with fence poles placed on the inside of a fence or with barbs improperly installed at the top, rather than the bottom, of the fence.

The field itself — the evenness and relative softness and hardness of the playing surface — will be audited. Auditors will be looking for obvious unplayable conditions such as holes, ruts and rocks, but also for inconsistencies in the surface. All athletes — thoroughbred horses, baseball, soccer and football players — compete based on the field conditions, gauging their moves on the amount of available traction and the relative softness or hardness of the

surface. An inconsistency — a soft spot, a hard spot, more or less traction — may cause the athlete to exert an inappropriate degree of force and, thus, sustain an injury. The extent of turf cover — cushioning and traction — will be evaluated.

### Develop Safety Audit Committee

Don't stop the safety process with a one-time audit. Develop an inter-facility safety audit committee. Individuals involved with different areas of the facility should participate in the safety audit committee. Include financial decision-makers in the group, so they will be sure to understand the problems and help in setting priorities from the financial aspect.

The group can develop an audit sheet for the facility that will be used quarterly to spot wear and tear, turning up potential problems that might otherwise appear down the line. The group should review the safety audit to develop a checklist of concerns, then discuss these concerns and decide how to resolve them.

Install a reminder system to ensure that quarterly safety audits are carried out. Use a calendar or

computer tickler system, whatever it takes to ensure compliance.

Safety is an ongoing concern and requires the cooperation of all parties. Once a facility is proactive in safety auditing, that facility must be proactive in maintenance to be sure no problems are developing.

Design a daily checklist that maintenance personnel can use. Once an employee registers a concern on the daily audit checklist, that concern must be addressed and resolved.

Everyone has to take responsibility for resolving problems. If a field crew employee reports a problem, he or she has the responsibility to follow up to make sure action is taken. Each staff member becomes part of the solution.

Interim actions show awareness of a problem and willingness to rectify that problem. For example, coning off and posting warning signs to steer foot traffic away from an unsafe walkway are temporary measures to avoid injury until more permanent solutions can be made.

Some problems are temporary and warrant only temporary solutions, such as signs posted to denote a wet floor

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## Field Safety

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that may be slippery right after maintenance personnel have scrubbed it.

Products that make it easier to maintain facilities in a safe manner must be considered. Someone connected with risk management for the facility should be involved in field design. Fields that are safer by design are also cost-effective. The cost to players in terms of their longevity in the game is a loss that can be measured in both financial and personal terms.

Systems that improve field conditions may be more expensive to install initially but create a long-term, highly usable playing surface that is safer for the athletes. Consider the effectiveness of sand-based field construction systems employing USGA specifications. Consider a system that gives a uniform consistency to the rootzone media, such as the Netlon Advanced Turf System, which improves field drainage, relieves compaction and reduces surface impact resistance, giving athletes a playable arena that is stable, yet not too hard, with more consistent turf development and increased traction in unfavorable conditions.

Consider the improvements made in baseball fields because of the inherent problems with clay surfaces. Skinned-area clay surfaces now are being mixed and maintained to reduce the hardness of the infield. Sand, calcined clay and other additives are widely used to help smooth hard bumps and prevent spikes from leaving pick marks and divots.

Bring coaches into the field construction and maintenance equation. Coaches, from the high school to the professional level, know what an individual player's contribution can be to his team and can visualize that

contribution to the game throughout the player's career. The industry must deal with engineering and design that extends the active careers of players and their long-term contribution to their game. Just listen to what players have to say. (See the NFL Players Association sidebar below.)

### Prepare for Worst-Case Scenario

Despite your best construction methods and maintenance practices, injuries can occur. Prepare your facility to deal with the "worst-case" scenario.

Develop a plan of action in the event that injuries occur. Establish a review committee made up of the audit coordinator, a few of the people who serve on the audit committee, some members of the financial group and representatives from all other segments of the facility. This safety committee will serve as the risk-management arm of the facility, reviewing the process of rectifying concerns addressed by the safety audit committee and forming a unified action committee in the case of injury or litigation. In time, the facility may wish to hire a risk-management specialist.

Of the potentially dangerous areas on a field, the playing surface has come under the most scrutiny by lawyers. Many lawyers know of no such thing as a bad hop. Instead, poor construction or poor maintenance procedures are blamed for injuries.

Even if your actions are prudent, reasonable and consistent, do not assume you will have the opportunity to defend yourself in court in a liability situation. Studies indicate that more than 95 percent of all personal injury lawsuits are settled by insurance companies prior to trial.

According to a survey conducted by Gary R. Gray, Ed.D, an assistant professor

of physical education and leisure studies at Iowa State University, the main factors that influence the decisions of insurance company attorneys on whether to take a case to court fall into three general categories. The first is the uncertainty or risk of a trial. Given the quality of the factual evidence, witnesses and attorneys, the degree of preparation of the plaintiff's attorney and the degree of clear-cut liability, how solid is the facility's position? Second, consider the cost of a trial versus settlement. Will the facility face greater financial exposure with the added court costs and potential settlement should the verdict be in favor of the plaintiff? Third, settlement is the "expected" system of dispute resolution. Does the attorney for the insurance company have a reasonable expectation of reaching a settlement with a plaintiff who appears to be willing to compromise?

Strong facility safety programs significantly reduce liability exposure. Remember, liability litigation is not automatically settled in favor of the plaintiff. A system of safety audits and rectification of concerns combined with intelligent field construction methods and proper maintenance procedures, all practiced remembering the three key words — prudent, reasonable and consistent — can cover your bases. □

*Floyd Perry Jr. is a facility consultant and director of Grounds Maintenance Seminars, Orlando, FL. His book, Floyd Perry's Pictorial Guide to Quality Groundskeeping, covers all the bases. Steve Guise is a turf consultant, national sales manager for Netlon Advanced Turf, treasurer of the national STMA and a member of the association's Technical Standards Committee.*

## NFL Players Prefer Natural Grass

The National Football League Players Association recently announced the results of a league-wide player survey concerning NFL playing surfaces. The written survey, which was directed by the Board of Player Representatives at its March 1994 meeting, was conducted by NFLPA staff members at team meetings during the 1994 season. The players were asked a series of 13 questions concerning their preferences in field surfaces. The survey revealed that 85 percent of the 965 players who answered preferred to play on natural grass, seven percent preferred artificial turf and eight percent had no preference. Seventy percent of the players also indicated that playing on a natural grass surface was either very important or somewhat important in selecting the teams they would consider signing with as free agents.

Other results of the survey:

- 93 percent of NFL players believe that artificial turf is more likely than grass to contribute to injury.
- 96 percent believe artificial turf causes more soreness.
- 91 percent believe artificial turf is more likely to shorten their careers.
- 90 percent believe artificial turf is more likely to worsen their quality of life after football.
- 54 percent identified an artificial turf injury they suffered that they believe would not have happened on grass.

The NFLPA has asked the Centers for Disease Control (CDC) to conduct an epidemiological study of grass and artificial turf injuries. The National Center for Injury Protection and Control, which is part of CDC, will work in conjunction with the National Institute of Occupational Safety and Health (NIOSH) on the project.



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More than 85,000 fans scream "War Eagle!" unaware of all the hard work involved in maintaining the field at Jordan-Hare Stadium. The field is irrigated with six Nelson one-inch water cannons. Photo courtesy: Auburn University.

By Robert Reaves

In recent years college and pro teams have been using natural-turf fields as an important recruiting tool. However, 20 years ago, the sports industry was making a significant switch from grass to synthetic-turf playing fields. Some recruits wouldn't even talk to a school or team unless they played on AstroTurf™. Synthetic playing fields were promoted as low maintenance and even considered a status symbol. But as injuries escalated and the turfs color began to fade, many athletic directors started to rethink their philosophy on natural turfgrass.

If you are planning to install natural turf or upgrade your irrigation system, it's always a good idea to get advice from manufacturers, contractors and athletic directors. Even though every sports field offers unique challenges, the basics in irrigation planning remain the same.

After the decision has been made to convert to natural turf, you'll need to determine what type of irrigation system to install. Georgia Tech University's Bobby Dodd Stadium is returning to turfgrass and has hired McGovern Construction Corp. of Fort Myers, FL, to

do the installation. The project requires the removal of the synthetic turf, selective demolition, installation of a USGA-specified rootzone mix, construction of a new drainage system and installation of an automated irrigation system.

Butch McGovern, president of McGovern Construction, says, "There are several important considerations when initiating a new irrigation installation program. First, make sure you have selected the irrigation type that meets your needs. Second, choose a contractor that has good experience in athletic



The Nelson "Big Gun" is popular because it limits injury, requires lower capital investment and provides satisfactory performance. Photo courtesy: Nelson Irrigation Corp.

field installations. Third, budget enough money to complete the project."

Many teams believe that the liability risks of tripping over sprinkler heads are too great with in-ground systems and that any additional labor required to manually move the irrigation equipment is offset by the reduced exposure to injuries and lawsuits. Others believe in-ground systems offer the technical approach to irrigation. Both systems work well, but the choice depends on your needs.

### Cannon-Gun vs. In-Ground

Jordan-Hare Stadium at Auburn University, Auburn, AL, holds over 85,000 spectators. Auburn's irrigation system is the above-ground big cannon. According to information supplied by the university, a 20-hp pump supplies water through a three-inch line encircling the field that feeds six Nelson one-inch water cannons. The water cannons put out 330 gallons of water per minute at 120 pounds of pressure at the heads. The placement of the cannons ensures proper coverage of the field with an extra amount of water going to the most-used areas of the field. Jordan-Hare Stadium is watered three times a week with about a half inch of water being applied at each watering. A crew of seven does all the maintenance on the stadium field, three practice fields, baseball diamond, soccer field, track, band field and tennis courts.

According to McGovern, the University of North Carolina and University of Tennessee also use the "big guns." The University of Arkansas is also planning to use this irrigation type. "Because of the tremendous distance of throw of big gun sprinklers, the field can be covered from the sides of the field, keeping irrigation equipment off the playing field," says Mike Monahans from Nelson Irrigation in Walla Walla, WA.

Quick-coupling valves are located in underground valve boxes off the playing field. Semiautomatic systems are also available.

Another choice for athletic field irrigation is the in-ground system. Many professional teams and colleges choose an in-ground system because they believe it provides greater uniformity in precipitation. A pro team with long-term ownership prospects is more likely to make the larger capital investment for an in-ground system, as they definitely want the "manicured" look.



Mike Staley, national specification manager for Weather-matic in Dallas, TX, says, "There are several pieces of advice I'd give when installing in-ground sprinkler systems to athletic fields. It's imperative to use rubber covers over the sprinkler heads and install check valves to prevent low-head drainage problems." He recommends a design to allow for pressurized (main) lines to remain outside the playing field. Staley suggests use of a master valve to prevent excessive damage from mainline break or stuck zone valve. "There's nothing worse than having a sprinkler head running all night," says Staley.

Likewise, Todd Mohr, area specifications manager for Rain Bird in Glendora, CA, has some tips for those planning installations. Mohr says, "Sports turf managers need to choose a manufacturer that will service the equipment. They should select equipment that is easy to maintain and adjust, as well as good availability of replacement parts." Mohr also stresses the necessity of checking references on manufacturers to make sure they live up to their promises.

### Manufacturer Considerations

Several companies manufacture in-ground sprinkler systems for athletic fields. All systems are similar in design, but each manufacturer offers features that may be distinctive or unique. Network with other athletic field managers and ask how their irrigation equipment is performing. By doing so, you'll soon discover which irrigation systems have proven track records.

Owen Field at the University of Oklahoma now has a new natural turf playing surface. Don Hatcher, athletic maintenance supervisor at the university, says, "Owen Field is a sand-based field that we never let dry out. We water infrequently but deeply using Toro 640 sprinkler heads that we usually run for one hour per station." They use booster pumps where additional water is needed. To check for uniformity of application, Hatcher places 25 to 30 rain gauges on the field.

The three most common heads for large athletic fields are impact rotary, gear-drive rotary and cam-drive rotary. The impact rotary retracts into a can placed in the field. However, the cover

of the can must be absolutely flush with the soil surface. If the sprinkler is slightly cocked to one side or too high, athletes may trip over it.

Parts are easy to replace with impact heads. A washer or spring can be replaced without exchanging the rest of the components. Impact heads have been in use many years and have a proven track record.

Gear-driven rotary sprinklers have two important selling points. They can be installed below grade, and the surface area of the top of the sprinkler when retracted is smaller than the impact sprinkler. When installed properly, the head of the gear-drive should be one-half inch below the surface. Neither an athlete's shoe nor wheels of maintenance equipment should make contact with the head.

A very important characteristic of gear-drive heads is the smooth rotation of the head provided by the gears. This means better uniformity than impact-rotary sprinkler systems.

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# How To Spot A Well-Dressed Field.



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## Irrigation

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One key selling feature of the in-ground system is uniformity of application. Because of its uniformity, fertigation works especially well with an in-ground system. Still, attention to efficiency/uniformity is essential. With 80-percent efficiency, it's possible to see a two-to-one coverage ratio from the spot getting the least amount of water to the spot getting the most. Accept an efficiency rating of nothing less than 70 percent.

Another virtue of in-ground systems is adaptation to chemigation. Chemigation is the application of fertilizers, herbicides, insecticides and fungicides through the irrigation system. By using chemigation, labor costs and water-use efficiency are improved. Light and consistent applications of nitrogen throughout the growing season lower the risk of "turf torch" from mechanical applications of fertilizer.

"An in-ground system offers ease in fine-tuning the water distribution with a small adjustment at the top of the sprinkler head while the water is running," says Andy Wright. Wright is president of Muellermist Irrigation in Broadview, IL, the irrigation contractor at the new Comiskey Park in Chicago. Comiskey Park uses Hunter I-40 sprinklers. More than 50 sprinklers are installed on the infield, outfield, bullpens and along the baseline from home to first and third bases. Because this system is so easy to adjust, it is a real time-saver for the maintenance crew.

Manufacturers of in-ground systems for athletic fields reinforce the safety of their products. With rubber covers and below-ground pop-up features, the sprinkler heads remain well below the grass playing surface.

Staley believes the following should be components of in-ground systems:

- 1) sprinklers with high CU/CDU ratings for even distribution;
- 2) rubber covers on sprinklers to reduce injury potential;
- 3) check valves on sprinklers to prevent puddling from low-head drainage;
- 4) quality electric valves to minimize potential for valves sticking open;
- 5) controller with multiple programs

- for test and syringe cycles;
- 6) event- or time-block feature to prevent watering on the day of an event or game; and
- 7) radio-control maintenance.

For controllers, the most important attribute should be ease of operation. Some controllers are capable of monitoring or being overridden by remote sensors. Moisture sensors, rain gauges, pressure switches and vandal sensors are all possible with today's central controllers. Imagine the surprise of trespassers when the sprinklers, flood lights or a siren suddenly turn on!

Not only does proper drainage protect the turf from excessive surface water, it also aids in protection of high water tables and unwelcome salt from subsurface water. The drainage needs of an athletic field are unique. Control over water in the rootzone is essential to turf recovery from traffic abuse. It is the responsibility of the athletic-facilities manager to keep the field playable.

The two water sources involved in the drainage process are surface and subsurface water. Surface water is the most obvious and can be controlled by applying only the amount of water the turf actually needs. Controllers can be adjusted to reflect weather conditions.

Soil types also impact surface water and runoff. The football practice fields at the University of Oklahoma have a clay soil and are irrigated at short intervals, just to the point of runoff. After the water soaks in, irrigation is continued. This increases water-use efficiency.

Auburn University uses two-inch fabric polyester pipes, one foot deep, spaced five feet apart across the football field. Sand-filled slits 3/4-inch wide and seven inches apart run lengthwise across the field. The pipes run into four-inch PVC lines at the sidelines. High-density polyethylene pipes would be a better choice in colder climates, as they offer better resistance to freeze damage.

Subsurface water is also a problem. Dr. James Beard from Texas A&M University warns, "The presence of water table within six feet of the surface indicates the need for improved subsurface drainage." He adds that a high water table interferes with removal of excess water from beneath the rootzone.

A large network of drainpipe

prevents subsurface water from saturating the soil above — in addition to removing excess water from the surface. The drainpipe artificially lowers the water table. Those installing drainage systems are encouraged to speak with professional contractors and other athletic-field supervisors with similar soil/water tables.

### Filtration and Drainage

A great deal of expensive labor goes into cleaning sprinklers, regardless of the type of sprinkler used. Much of this labor could be utilized more efficiently by using the correct filtration equipment.

Sand is usually the biggest problem in any turf irrigation system; however, other impurities include algae, silt, organic matter and solids. The three common filters used are spin filters, media filters and hydrocyclone. The amount and type of impurities will determine the filter or combination of filters necessary to keep your sprinkler system working properly.

A good drainage system is absolutely essential to any irrigation system.

It also requires maintenance, just like a sprinkler system. The Toro Co. recommends that where systems must be winterized to prevent freeze damage, an air-hose connection of approved design will be required at the location or locations noted on the plans. The entire system can be drained by blowing out with compressed air, not to exceed 70 psi. Toro also suggests the use of automatic drain valves to drain lateral lines, their locations determined by elevation changes shown on the drawing plans.

Probably the most important parts of irrigation installation are planning and assessment of your needs. Budget a liberal amount of money for the irrigation project; otherwise, you could run into a shortfall. Don't be hesitant to ask for advice from your peers in the sports turf industry as well as manufacturers. □

*Robert Reaves is the irrigation editor for the green-industry trade publications produced by Adams Publishing.*