



Managers should set a point at which lip or edge buildup will receive attention. Photos courtesy: Floyd Perry.

be on the lookout for problems such as missing fence ties, missing caps, holes, or any other condition that impacts the effectiveness of the fence.

The foul ball fence or safety net also needs to be inspected for holes or missing clips or fittings. This safety device is key to keeping fans safe from stray balls. It is imperative that it be secure and free of defects.

Edges. Fifth on the checklist are edges and lips, another area of concern. Like holes, high edges present a hazard that could trip the player. The prep crews need to visually inspect all areas where skinned areas meet with turf. Although minor edge or lip buildup may not be repaired immediately, it is important that a supervisor or crew leader is aware of the condition.

On most skinned ball diamonds, the outer arc will be the area with the greatest problems. This is due to the movement of skinned-area material during the repeated preparation of the area with equipment-connected and manual scarifiers and drags. In addition, the running action of the players is concentrated toward the outer edge of the arc. This combined action tends to push the skinned-area mix to the outer edge of the arc and into the turf, creating a lip. It's important that a facilities manager set a point at which lip or edge buildup will receive immediate attention, and pass that information along to all prep crews. For example, the policy might be, if a lip or edge exceeds two inches, it should be removed.

Water. The sixth area of concern that the prep crew should take into account is water. At times during dry weather, especially in the mid to late summer, it may be beneficial to apply water to areas of your skinned fields. For example, applying the appropriate amount of water to your pitchers mound provides the pitcher with better contact with the soil. Proper water levels in the base-path areas give the runners better traction. Appropriate watering also will assist with dust control, a benefit for both the players and the fans.

Crew Safety

The second phase of safety is the ball diamond crew itself. Many times the fields take center stage, and we forget all the time and energy that goes into field preparation. The Waukegan Park District has put into practice some simple but effective rules to help keep the crews safe.

Clothing. First, all members of the crew need to wear appropriate clothing, which includes long pants, shirts and boots. All crew members have access to gloves, hearing protection and safety glasses, and the use of this safety equipment is stipulated when the task requires it.

Tools. Second, proper tools and equipment must be supplied. Appropriate training on all tools and equipment must be given to all crew members and a method developed to assure and note competence with the operation of each apparatus before the employee is cleared to use the tool or piece of equipment on the job. This not only addresses crew safety, but also increases crew member efficiency.

Our ball diamond prep crew trucks are equipped with a full contingent of hand tools such as shovels, rakes, string lines, water hoses, chalkers and a tamper. We also supply each crew with a 55-



On most skinned ball diamonds, the outer arc will be the area with the greatest problems due to the movement of material during repeated preparation of the area with scarifiers and drags.

gallon water barrel, a five-gallon bucket, and batters box frames for both softball and baseball. A vital part of each crew's equipment is a two-way radio. This open line of communication is most often used to increase operating efficiency, but it is also available to spread safety alerts or summon assistance if necessary in an emergency.

Weather. However, the most important safety information or tool that needs to be understood by all personnel relates to weather. The sun can have an enormous impact on the health of your crews as well as their efficiency. It is important to encourage the use of sunscreen and the consumption of water. It also may be a good idea to provide water coolers for each truck.

Thunderstorms, lightning, tornadoes, earthquakes and other acts of nature pose hazards that can be life threatening to your prepping crews. Pre-planning for such occurrences is the key for crew and participant safety. The Waukegan Park District's policy, as it relates to ball diamond prepping crews, is short and simple. If you hear thunder or see lightning, you stop work immediately and take shelter. Be sure that prep crew workers know what to do and where to go in such conditions. It may also be beneficial to have mock tornado, thunderstorm, or other disaster drills to ensure everyone knows what to do.

Obviously, proper storm and disaster procedures also must be established for facility users and steps taken to ensure that those in charge of events know when and how to follow those procedures.



Base-anchoring systems should be kept covered and below the playing surface.

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Ground Crew Safety

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Failure to care for skinned-area lips eventually causes the turf to suffer.

Overall, an integrated plan that focuses on maintenance and safety-related issues will assist in assuring safe fields and employees.

It may be impossible to create and maintain the "perfect" ball field. However, in taking the extra time to inspect fields consistently and carefully, to eliminate detectable hazards and to document the steps that have been taken, sports turf managers will be able to decrease the probability of injuries. □

Scott Maclean is parks supervisor for the Waukegan Park District, Waukegan, IL. He's a member of the

Midwest Chapter of the Sports Turf Managers Association and the Midwest Institute of Park Executives.

Skin Care

By Steve Wightman

Soil Composition

The ultimate goal of a baseball infield is to provide a true and consistent surface for the roll and bounce of the ball and a firm yet resilient surface for the players. This should be maintained throughout the entire game, even when the players are running, stopping, twisting, turning and sliding.

In order to maintain an acceptable surface under these conditions, it's important that the soil mix be composed of material strong enough yet flexible enough for both the players and the ball.

For the safety of the players and for a true ball roll and bounce, the mix should not contain any particle size over 1/8 of an inch in diameter. In order to provide the firmness and resiliency necessary for the action of the game, the mix should contain proper

amounts of sand, silt and clay. Successful infield skin areas usually contain a clay content of between 15 percent and 30 percent.

The amount of moisture maintained within the soil profile is another key ingredient to a safe and functional infield skin. Too much water obviously takes away from the soil strength necessary for quality play while not enough water yields a surface that is too hard and dusty for quality play.

Mound/Batters Boxes Composition

With these two areas being the most heavily concentrated areas of use on a baseball field, it is necessary that they be composed of a soil that provides for more strength than any other area. Soil strength is achieved by higher amounts of clay content within the soil profile. Successful soils for pitchers mounds and home plate areas normally contain a clay content of more than 30 percent.



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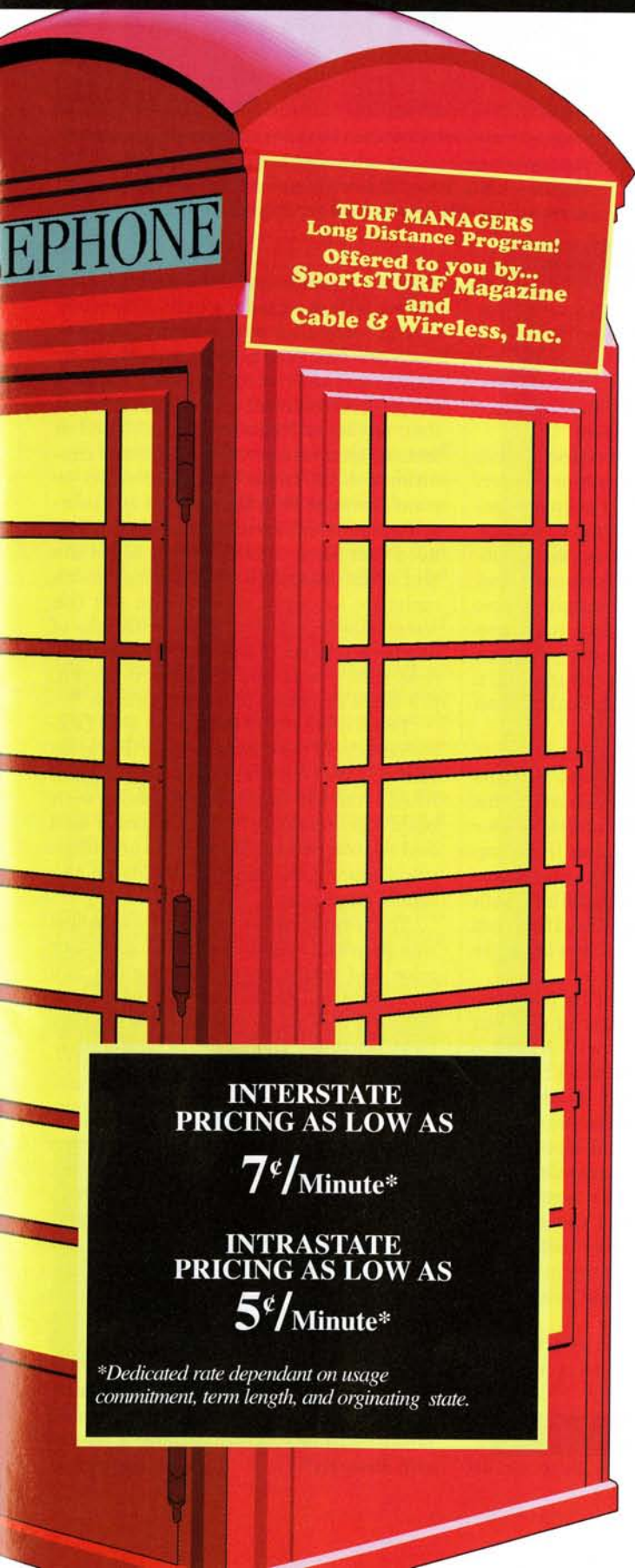


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From a Player's Perspective

By Bob Tracinski

The term “a level playing field” didn’t become a world-wide cliché for nothing. Though this term now describes equal circumstances for anyone involved in a competition, it grew from the realization that field conditions do impact the outcome of a game — and that unequal field conditions can help one team and hamper another. Ideally, field conditions consistently are so close to perfect that athletes can ignore them and concentrate totally on playing the game.

Baseball player Chip Rhea (pronounced Ray), the former University of Kentucky (UK) standout, signed with Arizona in this summer’s draft and is now playing with Arizona’s Leithbridge, Canada, Black Diamonds in the short-season league. Rhea “views” baseball fields more critically than most players. He’s an agronomy major, with 12 credit hours to wrap up before earning his BS degree. Rhea has spent one summer internship working on multiple sports fields under Bucky Trotter, UK sports turf manager. He’s also spent one summer’s internship working on a golf course. Rhea was one of three UK baseball players majoring in turf.

Trotter notes that the first thing Rhea did at a college away game, and now does in the pros, is seek out the sports turf manager and “talk turf.” Not only do these informal sessions give Rhea a broader picture of overall field management practices, they also provide insight on any potential problem areas that might affect play.

Rhea says, “As soon as we get to the site, I like to walk the field to see for myself how it looks and feels. This step alone reveals a lot about the maintenance program and how the field will play.

He’ll note which grasses are used and what condition they’re in for the time of year and weather conditions, including density, color and “lushness.” He may reach down, grab a handful of turf and give a tug to gauge whether root development and depth will keep the plants firmly anchored

during play. He’ll note the moisture level of the soil and height of cut not only relative to turf type and the season, but also as it relates to coaching reports of the speed and agility of the home team. Drier, shorter grass plays “faster,” giving an advantage to quick, highly mobile players.

“The skinned area is critical,” says Rhea. “When you’re the batter or runner, you’re always on the dirt. You feel more confident working from a skinned surface with a certain stage of hardness to the sub-surface layer and a light, fluffy coating about cleat-deep on top and just the right degree of moisture. The sub-surface hardness gives you a solid base to push off from, whether you’re putting everything into a swing as a batter, or trying to beat the ball to the base as a runner.

“If the skinned area is too hard, it puts more stress on your feet and legs. If it’s too soft, you sink in a little, which robs a bit of your confidence as a batter and slows your speed as a runner. With too little top layer, your cleats dig into the sub-surface base too much, which tears up the base path during the course of the game. If the top layer is too deep, you tend to slide a bit before your cleats touch solid ground.

“There’s a ‘just right point’ for the moisture level, too, not wet, soggy or dry, but moist to a degree that will hold up throughout the game. It shouldn’t be so dry and powdery that you slip on a sudden cut, or so wet it’s slick or sticks to your cleats.

“The ‘feel’ of the field, and especially of the skinned area, changes gradually during a game. If the surface is too dry to start with, it changes a lot. Heat and the sun dry out the field, making it play faster and, because some areas tend to dry out faster than others, making the field more likely to produce bad hops.”

Rhea emphasizes that getting the skinned area properly prepared is one of the hardest things to learn from the groundskeeping side. He says, “It’s not a static process because temperature, humidity, wind speed and direction all



An agronomy major who will soon earn his BS degree, Chip Rhea knows baseball fields from the ground up. Photos courtesy: Bucky Trotter.

affect the amount of moisture you apply. The surface will even react a little differently on an overcast, cloudy or sunny day.

“I got the feel of doing it right by watching exactly what Bucky was doing in the pre-game skinned area preparation and then paying attention to how it played at certain moisture levels in different conditions. Next came the opportunity to watch someone do it, then do part of it yourself under that person’s supervision. You need that hands-on experience to get the ‘feel’ of the dragging techniques, how much moisture to apply, and how to put the water down properly. Even with lots of hands-on practice, I was really nervous the first time I was one of the two-person, pre-game dragging and wetting crew.”

The University of Kentucky is in Lexington, part of the transition zone that gives turf the best and worst of all seasons. Rhea’s had the opportunity to work with both warm-season bermudagrass and cool-season perennial ryegrass and bluegrass among the multiple fields on the school’s campus.

The bermudagrass fields are overseeded with perennial ryegrass to provide consistent color and active growth during the cool spring and fall. Sections beyond the playing surface of the football practice fields are Kentucky bluegrass. There’s even a strip of zoysiagrass between two of the football practice fields.

Rhea says, “I prefer playing on bermudagrass. It forms a dense, well-rooted cushion that takes lots of traffic and still holds up. It takes mowing at an inch or less, which plays at a good speed, yet still has a ‘soft’ feel to it. Bluegrass and perennial ryegrass are more ‘clumpy,’ lower in density, more lush and slick when wet, and need a higher mowing height, which slows play a bit. I’ve seen more ‘true’ rolls and fewer bad hops in bermudagrass. Besides that, bermudagrass thrives during summer heat, while the cool-season grasses slow down, thin out and become prey to insects and diseases.”



"The skinned area is critical," says Rhea. "When you're the batter or runner, you're always on the dirt."

Much of the baseball season is played on overseeded bermudagrass, which Rhea feels plays better than cool-season grasses alone. The transition period into and out of bermudagrass dominance isn't as tricky to handle from the player's perspective as it is from that of the turfgrass manager.

"You're still playing on a dense turf surface during the transition," says Rhea. "If the transition is handled well, players notice the difference in the height of cut as much as the difference in grasses, and neither takes away from the focus of the game."

A level outfield with consistent turf density and moisture content gives the player confidence to run for the ball at full speed. Even a few ruts, depressions, mounds, rocks, exposed roots or wet or dry patches can cause a player to be tentative in the game, or to twist an ankle or knee.

Rhea says, "The warning track lets the player know where the fence is when he can't take his eye off the ball. The sound and feel of your feet hitting a different surface is a signal to cut off the jets. But, because you're moving fast and can't look down, the transition from turf to track must be smooth."

Rhea points out that the difference in cut outs for the skinned surface at the first and third base areas will affect how the ball plays. When he plays third base, he'll try to observe the ball movement patterns during warm-ups and the first few innings to



For turf, Rhea prefers bermudagrass, which provides more "true" rolls and fewer bad hops.

gauge his moves accordingly. Rhea also notes that he'll adjust his position to fit turf height and moisture levels, playing closer to the ball in damp, tall turf and further from it in dry, short turf.

Field conditions vary within categories as well as playing levels. Rhea has played on some good and some not-so-good fields in high school and college and now in baseball's minor leagues. A poor or mediocre field lowers the level of the game.

Rhea says, "Bad fields eat infielders. Lip formation, an uneven surface, or a field that

starts off too dry and bakes out in the sun is sure to cause bad hops during the game. The player can't tell if the ball is going to come up or drop down after it connects with the ground. When the field's in good shape, the athletes can play their game and focus on performing to the best of their potential." □

Bob Tracinski is manager of public relations for the John Deere Company in Raleigh, NC, and public relations co-chair for the national Sports Turf Managers Association.

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Winterizing Pump Stations



Winterization enables irrigation equipment to get a safe rest during the winter so it can go to work in the spring. Photo courtesy: Hunter Industries.

With all the heat we've been experiencing this summer, probably the last thing on your mind is winterizing an irrigation pump station. Winterization takes on different meanings for people in different areas of the United States. It basically entails shutting down the irrigation system in preparation for freezing weather. If a few simple steps are taken each year, a pump station will be ready for action come next spring.

If the truth be known, the winterization process actually begins during the design stage of the irrigation system. Lawrence Cammarata of Certified Consultants Ltd., Woodstock, IL, feels longevity of all irrigation equipment begins with a common sense approach. He says, "Designers must have a practical knowledge and thorough experience in winterization procedures so a system is easy to winterize and reliable for the long term." It involves things like a good foundation for the pump station, a pump house in very cold climates and other irrigation equipment that can endure long periods of freezing weather.

Even though pump stations are a separate item from the rest of the irrigation system, turf managers should still keep in mind the total picture. Cammarata says, "Those of us in northern climates contend with winter soil frost lines up to four feet in depth. We have a strong appreciation of nature and its power. Pipes, sprinklers, wires, valves, boxes and other parts are continually 'heaved' and moved all winter. Install something poorly in the fall and springtime will reveal the need to redo that work. In most cases, there is

little we can do to 'beat' our weather conditions, but there is much that can be done to make a system 'give' with the conditions."

Geography dictates when to winterize. In Massachusetts, winterization begins as early as September. As soon as the warm temperatures are over, there's really no need to irrigate unless you are putting in a lawn or re-seeding. In this case, you may have to wait until late October.

Freeze Damage Can Be Avoided

Anytime the temperature is at 28 degrees F or below for more than 24 hours, you stand to have major damage to a pump station. "Because of the expansion of frozen water in a pump station that has not been winterized, main control valve, check valves and isolation valves may all crack. But by following a simple 15-minute procedure, replacement costs of \$600 to \$4,000 and up can be avoided," says Bob Houle, operations director at Flowtronex PSI Ltd., Dallas, TX.

Mike Parilo, sales manager at Odell's Pump & Service, Sacramento, CA, knows first-hand the expense of damaged irrigation equipment. "We just finished a job close to Christmas. An unexpected freeze came in without a chance to winterize the pump station. The pump case, clay valves and backflow preventer all cracked — the parts alone were \$4,000. And with labor, the cost ran up to \$7,000. I'd like everyone to be aware of the damage a freeze can do to pump systems," he says.

"If a heavy freeze comes before you have an opportunity to winterize, about the only thing you can do is protect your pump with heat strips, a heater or electric light

bulbs. These may provide enough protection to prevent expansion of the water in the lines until you can properly winterize," says Daniel Behrendt, technical services representative, Jacuzzi, Little Rock, AR.

Jeff Nelson, sales manager for Watertronics, Hartland, WI, says, "The most obvious part of winterization is to drain the water out. Open a drain wherever there's a drain. However, if no drain is visible you can crack the flange and manually drain the pump. More and more people are heating pump houses to 40 or 50 degrees F during the winter. This temperature can be maintained by simply placing a small heater in the pump house, leaving it on all winter," Nelson says.

Nelson also advises removal of aluminum intakes during the winter, since even with good grounding electrolysis can still occur. "Whenever possible, pull the aluminum intake. Clean the interior and exterior of the inlet or foot valve screen," Nelson suggests.

Len Ring, P.E., CID, is owner of a firm specializing in turf and agricultural irrigation design in Raymond, Alberta, Canada. "Some pumps have a priming system. Make sure you get all water out. Also, manually drain the system and leave open the drain plugs. It's a good idea if the drain plugs are at the low spot on the system," Ring recommends. "In cold climates, many people have their pump stations covered or vaulted, so rust is not so much of a factor as if it were in open air. If the pump station is exposed, you can cover it with canvas. Plastic is not recommended

because it causes condensation underneath."

"Thermostatically controlled heat tape is popular in this area for wrapping the pump station," Parilo says, describing a practice in Odell's Pump & Service's business area. A specialist in pumps and pump maintenance for landscape irrigation, the company serves a very cold area in the winter — from the High Sierra to Truckee, NV. One aspect of their business is providing customers with a winterization program to help them avoid costly damage.

Pump Station Check List

The following is a winterization checklist that works for most pump stations. Maintenance on pumps should not be attempted unless you have the proper knowledge and tools to work on pumps. Before beginning a winterization program, consult the manufacturer's technical guidebook on winterization.

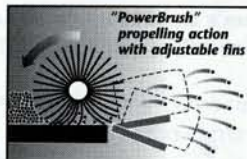
- Always refer to the maintenance manual for winterization details;
- Shut off the water source, drain and blow out irrigation sprinkler system;
- Drain the pump completely, leaving all drain plugs open;
- Blow out all pilot lines and the pilot device on the control valve, leaving tube disconnected;
- Make sure all of the water in the pressure switch is out, leave tube disconnected;
- Tighten all connections, electrical and mechanical;
- Use steel wool and/or sandpaper to remove any rust;
- Use a high-quality rust-proof paint to cover rusted areas;
- Grease all fittings on the pump station;
- Remove aluminum intakes for the winter, clean the exterior and interior of the inlet or foot valve screen;
- Change the oil (turbine pumps);
- For exposed pump stations, canvas may be used to cover the unit. Do not use plastic.

"Pump stations are not commodity items. They are an important maintenance item — the heart of your irrigation system. If they become a weakness, your entire system will suffer," advises Parilo. He's right. Just like a lawn mower or any other piece of equipment, proper maintenance will keep a pump station working like a champ. Winterization enables the equipment to get a safe rest during the winter so it can go to work in the spring. □

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Brown Stadium's field is marked and ready to go for an Ivy League football game. Photos courtesy: Pat Vetere.

The Greening of Brown

By Robert E. Reaves

Founded in 1764, historic Brown University is the seventh oldest institution of higher learning in the United States. This Ivy League school holds athletics in high esteem; however, the school has never sought to commercialize athletics, rather to give intercollegiate contests at Brown a "high purpose." While some outside New England may think that an Ivy League school might resist change, this does not hold true when it comes to sports facilities and athletic field management at Brown. The university's new irrigation system is an excellent example of the school's look to the future.

"We have approximately 25 acres of sports fields at Brown. This includes Brown Stadium (football), three football practice fields, Stevenson Field (men's and women's soccer and lacrosse), women's soccer and lacrosse practice field, baseball and women's softball, plus an intramural field," says Pat Vetere, grounds superintendent at Brown University. Except for a few months in the winter, the athletic fields see exten-

sive use. If weather turns completely foul, lacrosse practice and games can still be played on the Warner Roof, an artificial playing surface at the Olney-Marcolies Athletic Center.

For years the campus used water cannons and portable irrigation sprinkler systems to take care of its irrigation needs, but Vetere became increasingly aware of their inefficiency. "We ran the water cannons from 7 a.m. to 7:30 p.m. every other day and were still only able to water a field a day. And because of the extensive use of the sports fields, it was difficult to juggle the watering schedule. In some instances, we would water half a practice field to allow play on the rest of the field. For the baseball infields we would hook up irrigation pipe and use portable sprinkler systems," explains Vetere.

Besides obvious scheduling concerns, water pressure was also a problem. Stately Brown University sits atop College Hill overlooking downtown Providence, RI. "Because of the hill, during hot weather, the pressure could get very low — sometimes so low that we couldn't

run the water cannons," says Vetere.

"We let our athletic department know about our concerns with the irrigation here. They were very supportive when we asked for funds to install an in-ground sprinkler system," says Vetere.

Athletic Field Design

The university selected Brian Vinchesi, owner of Irrigation Consulting & Engineering, Pepperell, MA, to do the irrigation design. Vinchesi, a member of the American Society of Irrigation Consultants, designed a wall-to-wall sprinkler system that would irrigate the athletic fields quickly. Vinchesi was impressed with the great job Vetere and his crew were doing, even without a sprinkler system.

"There were four primary goals in the design of Brown's irrigation system. The first goal was to greatly improve the water window. The second goal was to have a design that would enable each zone to be treated as an individual. Third, since the athletic fields are spread over a large area, we would have a radio-controlled system. Finally, we wanted to build versatility into the system — because the fields get so much use," explains Vinchesi.



Shown here is Stevenson Field, the stadium for soccer and lacrosse. A sod cutter was used in the irrigation pipe installation to avoid as much disruption as possible to the playing surface.

The design called for:

- New six-inch tap of the street water line;
- Four-inch PVC main line, buried 2 1/2 feet deep;
- Three-inch PVC submains;
- Two-inch PVC laterals in a loop design, laterals buried 12 to 18 inches deep;

- PVC swing joints;
- 52 irrigation zones, eight sprinklers per zone, designed for 108 GPM;
- Hunter Industries I-40 Rotor Sprinklers;
- Two Legacy Genesis System Controllers, radio controlled;
- Rain sensor at each satellite;

- Buckner valves;
- Booster pump;
- Two two-inch water meters; and
- Three-inch backflow preventers.

The irrigation installation went out to bid and was won by Middletown Sprinkler Company, Port Monmouth, NJ.

"We decided to go with the I-40 full- and part-circle rotors from Hunter Industries throughout our sports fields," says Vetere. The I-40 delivers water at distances up to 74 feet, ideal for a wall-to-wall design at athletic fields. The sprinkler also has a safety feature that Hunter calls the ProTech™ safety system — a small, exposed, heavy-duty rubber cover and boot.

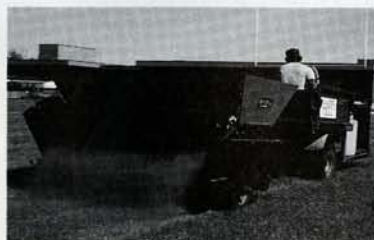
Time for Construction

Construction began on the irrigation project in June 1995 and was finished by the middle of September. "The installation crew worked on a field at a time to avoid as much disruption as possible. And, the new sprinkler system was put in live so as they finished we were able to irrigate," says Vetere.

"At the time we started the installation, we really expected to find some decent soil to work with. However, it

continued on page 20

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Greening of Brown

continued from page 19



A football practice field at Brown University benefits from the new irrigation system.

turned out there was a substantial amount of rock and gravel — typical of Rhode Island. Our crew removed more than 100 cubic yards of rock,” says Bob Dobson, owner of Middletown Sprinkler Company. “When the trenches were dug for the main lines, we replaced all the loam with gravel and a four-inch main line drain,” explains Vetere.

Many years before the construction

of the athletic fields, much of the land surrounding Brown was devoted to farming. “During the installation we uncovered a plow layer a foot below the surface — obviously from an old farm. The plow layer required us to make a change in our trenching equipment,” explains Dobson. “We came in with a trenching machine with alligator teeth. And to help soften the soil,

we laid out drip along the place where we would be trenching.

“At Stevenson Field, the stadium for soccer and lacrosse, we used a sod cutter where we were going to pull the irrigation pipe. This helped us avoid any tell-tale lines from the vibratory plow,” adds Dobson. Stevenson Field is one of the finest lacrosse facilities in the East.

“The results at the sports fields were dramatic. We normally topdress the turf in May, then overseed between May 1 and June 15. The addition of a new sprinkler really increased our seed germination — and gave us a jump start, especially after our winter with 100 inches of snow. Except for some goosegrass, we really haven’t had many problems this year,” says Vetere. □

Robert Reaves is the editor of Golf Course Irrigation and Irrigation Journal. He holds a master’s degree in horticulture from Oklahoma State University.

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