

That is why professional stadiums, many university facilities, and a growing number of park districts make the investment in tarps, water removal devices, supplemental drainage structures, and drying agents. These are not meant to be a substitute for adequate subsurface drainage, they are tools which restore good playing conditions quickly.

Keeping Park Tournament Ready

"On more than 12 occasions last year, we saved weekend baseball tournaments," boasts Mike Roybal, maintenance specialist for Foothills Park and Recreation in Lakewood, CO. The district maintains the 56-acre Robert F. Clement Park in nearby Littleton for Jefferson County Open Space. Under its care, the park has twice won the Gold Medal Award from the National Recreation and Park Association and the National Sports Foundation.

When Roybal moved over to the park from one of Foothill Districts' golf courses, he first attempted to solve post-storm problems on the park's four baseball fields by using squeegees to push water into temporary trenches. "The skinned areas turned into a soupy mess that took a lot of time to clean up," he remarks. "It's embarrassing to think about now, especially considering that all we needed was a hand-operated water pump. Since we bought the first pump last spring, we have the fields back in shape before the first game in the morning. Now, we have two and plan to buy a third."

The pumps Roybal is talking about are Kuranda Diamond pumps. They operate the opposite of a bicycle pump. As the handle is pulled up, water is pumped into a discharge chute on top. Roybal connects two-inch PVC pipe to the outlet with duct tape to dump the water into catch basins on the side of the fields. In this way, one of the district's three field crew members can pump a puddle three inches deep and 15 feet in diameter out of the skinned infield and rake the area smooth in less than 15 minutes.

Last fall, evening rainshowers threatened the Colorado Girls Fastpitch Softball

Sand volleyball pits at Clement Park must be pumped dry following rains.



Perimeter catch basin at the University of Florida. Photo courtesy: NDS.

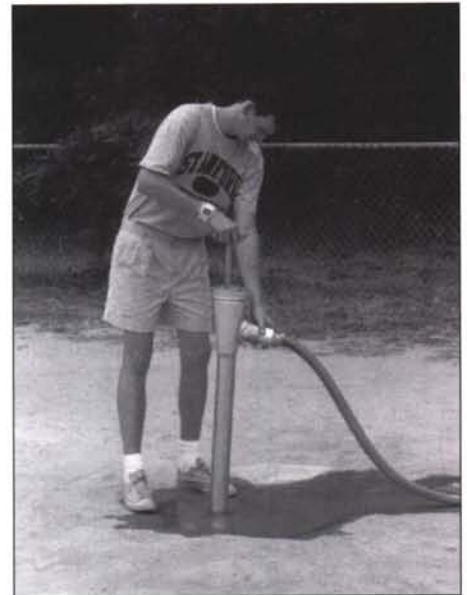
Championships. Roybal and his crew started working on the wet diamonds at 5 a.m. By 8 a.m., the skinned infields were groomed and ready for play. "The coaches were pretty impressed that we pulled it off," says Roybal. "Now, league officials are confident that we can get their tournaments in despite most weather conditions. It's also why so many tournaments are held at the park."

Protecting Revenue

The Foothill crew also helped protect an important source of income for the district. Sand-pit volleyball is popular in the Denver suburbs. Groups can rent any of six shelters surrounding the courts. "By February, all the shelters are reserved from April through September," explains Roybal. "But, they don't pay if their event gets rained out. With the pumps, we can get the courts back in play quickly and save the shelter revenue."

Revenue is the life blood of the Albany Colonie Yankees. The New York Yankee farm club depends upon ticket and concession sales. Rainouts are dreaded for good reason.

John Liburdi, head groundskeeper at Heritage Park, inherited a number of drainage flaws when he took over in 1983. The park is jointly owned by Albany County and Colonie Township.



Diamond pump connected to hose is a simple solution to infield puddles.

The Double A Yankee farm club leases the stadium for its 70 home games. The team averaged ten rainouts per season during Liburdi's first two years.

Liburdi, vice president of the New York State Turfgrass Association (NYSTA), is very receptive to helpful ideas from

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Pull-behind water removal device by Kuranda comes in handy at Buffalo's Rich Stadium.

Drainage And Water Removal *continued from page 11*

other groundskeepers, golf course superintendents and suppliers. By delivering a better field each successive year, he has earned the support of Jim Zamberdino, head of the Colonie Department of Parks and Recreation.

"The field was constructed from heavy clay without enough slope or drainage," he comments. "Like many older minor league parks, water drains off the stands onto the field. During the '80s, standards for minor league parks started to improve. Municipalities started doing more to keep professional baseball teams at their stadiums."

The first two years, Liburdi concentrated on the basics, such as mowing equipment, a balanced fertility program, improving the infield, and prepping the field to Major League standards.

The personable groundskeeper also spent hours getting to know the Park Department and Yankee staff. He was laying the groundwork for improvements he wanted to make in the next five years. His first step was to obtain a tarp for the infield.

A Long-Range Drainage Plan

"Too many teams are concerned only about the infield," adds Liburdi. "The outfielders are left standing in water after the tarp is pulled. That's not the way I wanted it to be for the Yankees." So, he

worked out a long-range plan for improving the field with Zamberdino.

The plan started with the installation of TerraFlow, a flat, fabric-wrapped drain line that fits in narrow trenches which are then backfilled with sand. A network of drain lines was installed in the outfield. In the warning track which surrounds the field, he installed new catch basins and channel drains to intercept water coming down from the stands. Brick dust was trucked in to resurface the warning track. Liburdi also instituted a program of aeration and topdressing to improve water infiltration and relieve compaction.

The outfielders began to benefit from better playing conditions the first year. The number of rainouts dropped to five. Still, Liburdi wasn't completely satisfied. "We only have five guys on the crew during the season," he states. "When we removed the tarp after a rain, we had to call down people from other stadium departments to help out. I thought the crew could handle the tarp if we were able to remove the water on top of it first."

He put in a budget request for a water removal machine for the next season. "We ordered a Marlin [Kuranda] tractor-pulled, six-foot-wide unit with two storage tanks instead of one," says Liburdi. "Each tank holds 500 gallons. We pull it over the tarp after it stops raining. That way the tarp is light enough for the grounds crew to remove without

help. It's not unusual to empty the tanks twice before the tarp is dry. That's 2,000 gallons of water sitting on top of the tarp! Before, all that water was getting dumped into the outfield." He has also discovered that he is using less calcined clay to touch up the basepaths after rains than before.

Liburdi runs the machine over the outfield if necessary after heavy rainstorms. Last year, the Yankees only called off two games, and in both cases, the reason was snow.

Fields Fit For NCAA Champs

The Clemson Tigers have also enjoyed better playing conditions since the South Carolina university took a closer look at drainage problems. The NCAA Division I school has strong football, soccer, and baseball programs which depend upon the campus facilities for games and practices.

Lane Miller, assistant superintendent of buildings and grounds, juggles threatening weather with the needs of the Athletic Department. Maintenance is subcontracted to Environmental Landscaping of Greenwood, SC, so Miller can concentrate on scheduling and preparing the athletic facilities.

The university has the 80,000-seat Clemson Memorial Stadium for football, the 4,000-seat Riggs Field for its soccer team, and the 3,000-seat Tiger Field for baseball. All three teams are ranked near the top every year. Baseball Coach Bill Wilhelm has led his Tigers to more than 1,000 victories during his tenure at Clemson. The soccer team won the national NCAA championship in 1984 and 1987. Last year, the football Tigers ranked in the Top 20 and played in the Citrus Bowl.

Teams like these can't play or practice on muddy fields. It's Miller's job to make sure they don't.

"The best thing we have done in the past few years is get a better handle on drainage," says Miller. "We had to add catch basins in the football stadium. But, most of our work has centered around the soccer and baseball stadiums and the six practice fields. We've found that by adding slit drains and getting water off the fields quickly, you can control field wear better."

Water was building up in the corners of the soccer fields resulting in

severe wear. Corner kicks are a major part of soccer. These areas would not hold up under wet conditions. Miller installed flat drainage structures in trenches crisscrossing the corners. Now, he can concentrate on typical wear areas such as the goal boxes.

The baseball stadium has an infield tarp which is dumped toward right field. This presented a problem for the right fielder and slowed down clean up after rains.



Marlin in action on golf course.

Since his mission is more game preparation than maintenance, Miller was looking for a quick solution to drainage problems. One day, Ronnie Oliver, president of Environmental Landscape, brought Miller an ad for a riding water removal device called the Whale. "He said that's what you need, why don't you try one," recalls Miller.

Today, Clemson has five water soppers which are used on all its fields. "We've saved many games with our units," adds Miller. "Now, when we dump the infield tarp, we go over right field with the machine. "Fifteen minutes after we pull the tarp, we can get the players back on the field. We don't run the machines on the skinned areas, just the grass."

With so much riding on sporting events today, turf managers may not want to rely totally on subsurface drainage. By having the option of removing water from the surface before subsurface systems have time to do their job, playing surfaces can be returned to use more quickly. This margin may be the difference between a rainout and another game on the books. □

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STMA IN ACTION

ASSOCIATION NEWS

GILL AWARD PRESENTED TO JIM WATSON

Dr. James Watson, who retired recently as vice president and chief agronomist of The Toro Company, was presented with the Harry C. Gill Award during the annual banquet in San Diego, CA. The honor is named for Gill, the founder of STMA and former head groundskeeper for the Milwaukee Brewers. It was previously known as the Lawn Ranger Award.

Watson's spectacular career spans 40 years, beginning with the first United States Golf Association (USGA) Green Section fellowship at Pennsylvania State University. He has authored more than 400 articles on turfgrass management, spoken at hundreds of conferences around the world, and served as a consultant to the National Football League.

In addition to the STMA, Watson has served the American Society of Agronomy, the National Golf Foundation, the USGA, the International Turfgrass Research Conference, the Golf Course Superintendents Association of America, and numerous state and national organizations.

Steve Wightman, head groundskeeper at San Diego Jack Murphy Stadium and former recipient of the Lawn Ranger Award, presented the award to Watson. "I can think of no other person who exemplifies what the award represents better than Jim Watson," Wightman said. "He has contributed more to the sports turf industry and the association in terms of dedication, passion, and spirit than anyone I know. He is indeed a person Harry would be honored to share his award with.

"The unique trophy depicts a groundskeeper armed with the tools of the his trade: a rake of hope; a hose of determination; a shovel of passion; a hoe of dedication; and a smile of spirited uncertainty as he rides off into the unknown atop a horse named desire."

PRESIDENT'S MESSAGE

Dr. Gil Landry, Jr.

Our game plan was set with a very productive annual meeting in San Diego last December. Our new officers and board members have gotten their feet wet and realize the tremendous challenge we face. As with any business, our objectives must match our limited resources. Those board members present in San Diego worked long and hard evaluating needs and prioritizing our goals.

The Gulf War and slow economy resulted in a budget deficit for 1991. Therefore, we begin the year under an austerity program which we are confident will bring about a financially sound organization soon. The net result is that our desires for association activities are restricted by our financial circumstances.

In September, 1991, the board identified the following needs:

1. To reestablish the newsletter to 1990 standards,
2. To concentrate on four or five successful institutes,
3. To focus on developing a successful annual conference, and
4. To establish a budget based on these goals. By the San Diego meeting in December, it also became clear that concerns about chapter development needed to be addressed. These evolved into five general priorities to which most of our resources are presently directed.

Part of our first priority is being realized today with the publishing of sportsTURF magazine. Beginning with this issue, STMA once again has an official national magazine. SportsTURF and Adams Publishing



Corporation will help us deliver our message to members, potential members, and supporters. Part of every advertising dollar will come back to STMA to help strengthen and expand our programs. This agreement will significantly improve our visibility and budget. In addition, we will also have a bimonthly newsletter.

In addition to providing an excellent educational opportunity, the annual conference and trade show also provided members a chance to discuss issues with the board of directors. What came through loud and clear during an informal meeting with members was the tremendous interest and desire for membership services and professional development. Our challenge is to meet these needs with limited resources while also planning for our future.

Although there were many honors bestowed on members in San Diego, added recognition in this message is due to the recipient of our association's highest honor, the Harry C. Gill Memorial Award. That individual is every bit as unique, both professionally and personally, as Harry. Dr. Jim Watson has served STMA and the entire turf industry so well and long that his recognition for service and contribution was well deserved. In fact, the board awarded Dr. Watson a lifetime membership and appointed him special advisor to the president.

Let me close by encouraging your involvement in your association because it is nothing without you. With the support of our board, our chapters, and our members, there is no reason 1992 can't be our best year.

BOBCAT STADIUM WINS FIRST FOOTBALL AWARD

Bobcat Stadium at Southwest Texas State University was recognized as the first recipient of the STMA Football Field of the Year Award during the annual conference in San Diego, CA. Randy Porter, manager of grounds and horticulture, accepted the award on behalf of the Grounds Maintenance Department at the university.

The Football Field of the Year Award, along with the Beam Clay Baseball Diamond of the Year Award and the planned Soccer Field of the Year Award, recognize sports turf managers who make exceptional professional contributions to the industry. When all award programs are fully implemented, winners will be selected in three categories, professional, college, and schools/parks.

Southwest Texas State University is located in San Marcos, 30 miles from Austin and 60 miles from San Antonio. The campus is composed of more than 300 maintained acres and has a student population of 21,000. Five of the university's 40-person grounds maintenance department work in the Athletics

and Intramural Maintenance Section.

Bobcat Stadium was completed in 1981 with no provision for subsurface drainage. Over the next several years, the grounds crew installed drainage in sections as time and budget permitted and instituted a program of aeration, sand topdressing, frequent mowing, complete fertilization, and weed control. The Tifway bermuda field is overseeded in the

fall with perennial ryegrass. Game preparation and field painting must be handled on a tight schedule because the field is used by high schools and professional football teams in addition to the school's Bobcats. The National Football League Houston Oilers and the San Antonio Riders of the World Football League have used the field for practices and scrimmages.

COMING STMA EVENTS

Midwest Chapter STMA Annual Meeting and Luncheon, March 5, Avalon Banquets, Elk Grove Village, IL. Contact: Mike Trigg, Waukegan Park District, (708) 360-4751.

Chesapeake Chapter Quarterly Meeting, March 5, Annapolis, MD. Contact: Ray Flood, (301) 808-3966

Florida Chapter STMA Bi-Monthly Meeting, week of March 23, Florida International University, Miami, FL. Contact: John Mascaro, (305) 938-7477.

Florida Chapter Workshop, May 11-12, Tallahassee, FL. Contact: Ed Birch, (305) 928-0217.

Chesapeake Chapter Quarterly Meeting, June 3, University of Maryland, College Park, MD. Contact: (301) 808-3966

California Sports Turf Institute, June 1992, Santa Anita Race Track, Arcadia, CA.

Contact: Stephen Guise, (818) 574-6378.

Colorado Sports Turf Institute, June 17, U.S. Air Force Academy, Colorado Springs, CO. Contact: Bill Whirly, City of Fort Collins, (303) 221-6660.

Midwest Sports Turf Institute, June 24, Wheaton College, Wheaton, IL. Contact: Greg Petry, Waukegan Park District, (708) 244-7275.

South Carolina Sports Turf Institute, June 26, Greenville, SC. Contact: Bucky Trotter, (803) 862-3071.

Colorado Chapter STMA Annual Golf Tournament, July 1992. Contact: Tom Lujan, Mile High Stadium, (303) 458-4851.

Northwest Sports Turf Institute, July 9, University of Portland, Portland, OR. Contact: STMA, (702) 739-8052.

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Erosion control products on test slope (L to R): wattles, wood fiber hydraulic mulch, paper hydraulic mulch, bare ground, jute, coconut fiber mat, polyester blanket, and hay with tackifier. Photo courtesy: Hydro Dynamics.

Erosion Control: **Keeping Sediment In Its Place**

By Matthew Trulio

Purely flat, featureless courses might be easy to maintain, but they aren't necessarily memorable. Topographical features such as hills, berms, lakes, ponds, rivers, and streams lift courses above the one-dimensional. These features enhance the beauty of the course, while adding challenges for the players. What they *shouldn't* add, however, is sediment caused by erosion. And such courses are particularly susceptible to erosion during construction and reconstruction.

"Sediment is the number one pollutant of our waterways now, and some of that comes directly from erosion on construction sites," says Ben Northcutt, executive director of the International Erosion Control Association based in Steamboat Springs, CO. "Golf course

superintendents and sports facility managers must be aware of the consequences of not controlling erosion on construction sites and wildlife habitats."

Sediment can foul watersheds. It can obstruct natural and manmade channels and cause flooding, which can result in serious property damage. Sediment deposits can cut the life of a reservoir in half.

Erosion, caused by either water (rainfall, irrigation, etc.) or wind, is the prime mover of sediment. And while the vast erosion that occurs every day in nature is beyond the control of the sports turf manager and others, the erosion that occurs on golf courses is not.

"In general terms, whenever you have a project that's being built, you're going to be disturbing the ground," explains Northcutt. "Whenever you dis-

turb the ground, the potential for erosion and sediment leaving the site exists. The thing you should consider, in terms of erosion related problems, is how to keep the sediment on the site."

No Time Like The Present

When it comes to erosion control, time *isn't* on your side. In fact, its short-term effects, in relation to sediment loss, are probably greater than its long-term ones. Northcutt explains, "Usually, a site is most susceptible to erosion problems during the first season of weather and construction activity, but it's also susceptible during the entire construction process, whether that's three months or two years."

The sooner you stabilize "erodeable" soil, says Northcutt, the better off you'll be. If a two-year project isn't stabilized,

he points out, two years of weather will affect it. "That's just an example, but that's a lot of time for weather events to be operating on that site, and taking sediment away," he says. "It's better to control erosion from the onset, than to go ahead with the project and worry about it later. If you put off erosion control, not only will you impact watersheds and drainage downstream, but also, when you get around to treating the site, it will be more expensive than if you'd taken care of it from the start."

In some parts of the country, Northcutt points out, developers cannot obtain building permits until they submit erosion control plans. The legislative trend toward erosion control has been propelled by the Clean Water Act, as well as the National Pollution Discharge System Elimination Act, which means that municipalities and industry, where applicable, must have erosion control plans in order to receive a permit to conduct business.

Erosion Control Armaments

"There are so many really good erosion control products on the market," says

Jerry Fifield of HydroDynamics, a hydrologic engineering firm in Parker, CO. "It's amazing to me that people aren't more aware of the options available to them."

Fifield and Northcutt travel the country presenting seminars on erosion control. In addition to the erosion control work Fifield's firm performs, it has also tested more than 40 different erosion control products, and can make specific recommendations. However, the two men note, it's important to first know the general product categories and uses before moving on to specify a specific product. Here's a look, from Fifield and Northcutt, at a few basic types of erosion control products, and a few of their applications.

Silt fences. Generally made of woven geotextiles (although straw bales are often used for the same purpose, with varying degrees of success), silt fences act as filtering systems for sediment. Typically, these fabrics stand two to three feet high and are attached to wooden posts. The bottom six inches of the fabric must be buried below the ground, Northcutt observes, for them to be effective.

Silt fences can be placed anywhere on a site where water may exit. They are not dams and should not be used in areas of high water velocity. Rather, they are filters, allowing the water to pass through them while keeping sediment on the site.

Covers, blankets, and mats. From jute netting to synthetic mats, these products serve as "coverings" for areas that are particularly susceptible to erosion. According to Northcutt, they are best used and most cost effective on steep slopes (3:1 or greater), or areas that have relatively low velocities of "channeled" flowing water. Natural blankets tend to be made of fibers such as jute, coconut, straw, and even recycled paper products. Synthetic mats can be made of various plastics and geotextiles.

"The synthetic mats will last longer than the natural blankets," says Northcutt. "In the right application, they both can work very well. What you use may depend on your budget, as well as your philosophy about what you put in the ground. The synthetic products cost more, but they last longer. The natural

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Erosion Control

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products can do many of the same things, for a shorter period of time, and they're biodegradable."

Hydraulic mulching and hydroseeding. Although it goes by many different names, depending on the part of the country in which you're standing, hydraulic mulching involves spraying wood fiber or recycled paper products, and water, often combined with a tackifier, a type of natural "glue," onto an area for erosion control. The application process, spraying, often hundreds of feet from where the operator is standing, makes hydraulic mulching ideal for erosion control in areas with limited access.

Hydroseeding, like the name implies, involves spraying seed mixes onto areas for both erosion control and *revegetation*. Vegetation is particularly important to long-term erosion control.

"Hydraulic mulching and hydroseeding are probably unsurpassed in applying mulch and seed to slopes—they really shine in this area," says Northcutt. Hydraulic methods are generally most effective on slopes that are 2:1 or less,



Silt fence installed to capture sediment. Photo courtesy: Jerry Fifield.

including flat ground, although other methods may be more cost-effective on flat terrain."

One of the most crucial elements in the hydroseeding process, Northcutt notes, is the seed mixture. Some mixtures are better suited to certain situations than others.

"If you specify a water-loving grass for a south facing slope, it's probably not going to do very well," he observes. "In terms of the seed mix, it's better to have more than one species involved because you have a better range of adaptability. That's particularly true on large sites, which may have their own range of soil and micro-climate conditions."

In addition to tackifier/mulch and tackifier/seed combination, there are also synthetic emulsions that can be sprayed onto the soil to hold it in place. Fifield says his company has tested some of these products, and that they offer promise.

Elements To Consider

Fifield works frequently with a variety of design professionals on erosion control plans. Although every site is unique and requires a different approach, or a combination of approaches to erosion control, a few things in his plans remain constant.

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"Any erosion control plan has to be effective, practical, understandable, and fairly simple, so that the contractor can do the job right," he points out. "If, for example, you have an area that's going to be overlot graded, you have to identify which area should be graded first."

In most cases, says Fifield, particularly in real estate development, erosion control must also be aesthetically pleasing—it can't be an eyesore if the goal of the project is to attract potential buyers or tenants. Appearance, both present and future, cannot be left out of an erosion control plan, and methods such as hydroseeding for revegetation, with an attractive yet durable seed mix, can offer nice looking and functional solutions.

One element frequently left unconsidered in erosion control plans, Fifield reveals, is wind. "Wind erosion can move far more sediment than rainfall," he says. "A lot of wind problems can be easily solved with products such as wind fences or tackifiers, but often nobody thinks about it. Another thing people tend to forget is irrigation—erosion control without irrigation is a whole new ball game. If you hydroseed a south or west facing slope, in an area of low rainfall, and it isn't irrigated, then that slope will probably fail in terms of erosion control."

Timing, says Fifield, is everything. "If you're going to establish a dryland grass, let's say, to control flat land erosion, when you choose to do it is very important. Here in Colorado, for example, it doesn't make sense to worry about rain erosion in the winter, because we don't have any rain in the winter. But we do have snow, and we do have plenty of wind erosion. So on a given project, you might want to consider a wind fence or tackifier to knock down wind erosion. But come spring, then you have to worry more about erosion caused by rainfall. And in either case, erosion control methods should be employed in a timely manner—not after the fact."

Stopping The Problem Before It Starts

Northcutt and Fifield agree that no matter how all-encompassing an erosion control plan may be, and how meticulous its implementation, a certain amount of sediment will *always* escape from a construction site. To expect no sediment to leave a site is unrealistic, they suggest. However, by becoming familiar with various products and their applications, working with hydrologic engineers

and erosion control specialists when necessary, and through actual experience, you can go a long way toward controlling erosion, and its resulting misplaced sediment, when such plans become your responsibility.

Says Northcutt, "You're not going to be able to control it all, but you can control it to the point where our natural systems can handle it. There are environmental and economic impacts to *not* controlling erosion, whether that means spending tax dollars to clean water,

dredge a reservoir, or even return soil to its original site. And if your project was to cause a flood, through, let's say, the deposition of sediment in a culvert or natural channel, and that water made its way into somebody's basement, liability issues could easily follow." □

Editor's Note: The International Erosion Control Association's annual Conference and Trade Exposition will be held February 18-21 in Reno, NV. For more information contact Ben Northcutt, (303) 979-3010.

Join the wise members of your industry who have discovered that to get the best sportsturf, you must:

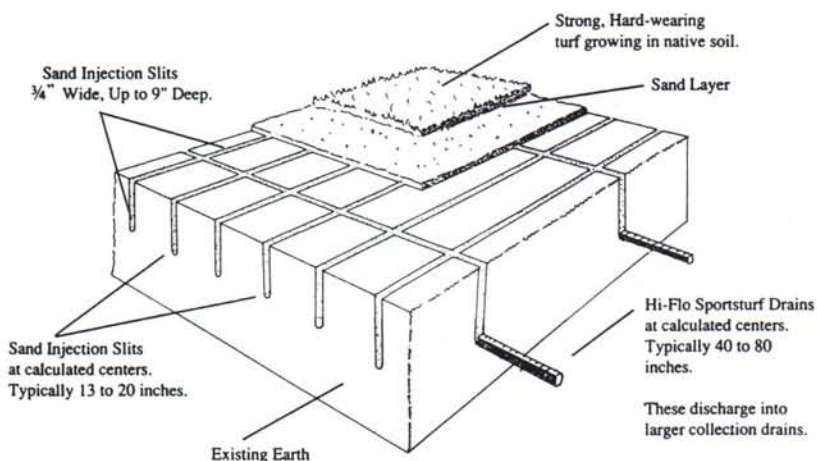
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Getting An Angle On Slope Mowing



On-demand four-wheel-drive, front differential lock, and roll over protection offer traction and safety on Deere's F1145.

Rolling hills of green turf are beautiful to behold, but often a nightmare to mow. Safety is paramount in mowing slopes. If an operator improperly tackles a slope with the wrong machine, the mower can roll. As a turf manager, you are responsible for not only providing an attractive site but also for ensuring the safety of your workers.

Slopes are rated in percentages, degrees and ratios. Degree measurements are often the easiest to visualize. A 90-degree slope is vertical, and a 0-degree slope is flat. Most commercial mowers are rated for use on slopes up to 15 degrees. If your site has many slopes greater than 15 degrees, select a riding mower that will handle the terrain or mow the slopes with walk-behind mowers.

Choosing A Mower

The best way to determine if a mower can handle your toughest slopes is to ask for a demonstration. Ask your local distributor to tackle your toughest slope on a damp morning.

The following are some features to consider when you purchase mowers for slopes. Not all mowers will have all features. Conversely, you may not have enough slope mowing to justify purchasing an extremely heavy duty machine. Ask lots of questions and purchase the best machine you can afford.

■ **Low Center Of Gravity.** Look for mowers with a low center of gravity. A mower that is low and wide spreads its weight out close to the ground. "It helps create a low center of gravity so when you mow on a bank, the center of gravity won't shift and cause the mower to turn over," says Bob North, Kut-Kwick Corporation.