



The Bear's 1988 season will provide an excellent comparison between natural and artificial turf.

The Battle for Natural Turf At Chicago's Soldier Field

The talk at the Chicago Bears' training camp this summer was not about Refrigerator Perry's weight or Jim McMahon's shoulder. Instead, the coaches and the players were "really excited" about playing their first home game on natural turf since 1970, says Ken Mrock, the Bears' head groundskeeper.

After two years of negotiations between the Bears and the Chicago Park District, the team got what it wanted, natural turf in Soldier Field. "The park district and Turf-grass Services Inc. really deserve a lot of praise for pulling this off," says Mrock, the former superintendent of golf courses for the park district. It took tremendous effort by many people to work out all the details and get the PAT (Prescription Athletic Turf) field installed in time for the exhibition game with the Miami Dolphins on August 6. But, they did it and everyone in the National Football League will be watching this fall to see if natural turf really makes a difference.

The Bears' 1988 season will provide an excellent comparison of the two surfaces. In previous seasons they played an average of only five games on natural turf. This year they will play 12 plus three preseason games on real grass. "Fifteen out of 20 games this year will be on natural turf, instead of four or five," says Mrock.

The players won't get to step onto the new field until the day before the Miami game. The Kentucky bluegrass sod has been down only six weeks, six of the hottest and driest weeks in Chicago history. The city has had a record five days of 100 degree plus temperatures and is behind ten inches in rain-

fall. A watering ban has made irrigating the fresh sod a subject of controversy.

It's ironic to think that too much water was one of the major reasons the PAT System was selected, says Roger Bossard, consultant to the park district for the project and head groundskeeper for the White Sox. Soldier Field is just a few blocks from blustery Lake Michigan. "A strong wind out of the northeast can raise the level of the lake as much as 15 inches and push the water table up with it." In the past, lake water has backed up into the storm drains blocking the runoff from the field.

"A professional football field has to remove rain almost as fast as it falls," Bossard adds. "With only ten home games, the team and the stadium can't afford a flood. It was important to separate the field drainage from the storm sewers and the water table. The plastic liner of the PAT System let us do that."

For Mrock, Bossard and park district personnel, the story began in the fall of 1986. Bears' owner Michael McCaskey and Coach Mike Ditka made it clear they wanted "to play on real green grass." They hinted strongly that they would build another stadium in the city if they had to. Jesse Madison, executive vice president of the park district, who is responsible for Soldier Field in addition to the city's golf courses, parks and gardens, took the threat seriously and assigned the project to Director of Landscaping Ira Berk. Berk called in architect Bob Megquir and Mrock from his staff and hired Bossard as a consultant.

AstroTurf was first installed in Soldier Field in 1971 when the Bears moved over from

Wrigley Field. The original carpet was replaced in 1979 before Monsanto developed AstroTurf 8, a drain-through combination of porous carpet, pad and asphalt base. Rain and melting snow had to run off the field to collector drains located on the perimeter.

Being a public agency, the Chicago Park District had to establish specifications and take bids from all qualified contractors. It took nearly a year to identify all the changes that needed to be made at Soldier Field and to hammer out the specifications. The bidding process didn't start until this past winter, just months before the Bears' exhibition game.

Not to be left out, AstroTurf Industries and Sportec International made their own proposals to the park district. AstroTurf was proposing its drain-through system and Sportec its sand-filled artificial OmniTurf. The Bears, represented by Tim Lefever, made it clear at numerous hearings that they wanted a PAT System.

David Heiss, president of Turf Services Inc. of Spring Lake, MI, the licensed PAT installer for the region, nevertheless understood that artificial turf companies were formidable competitors. He still had to win a price battle. "We weren't just fighting for PAT, we were fighting for natural turf," states Heiss.

One item that Heiss and PAT's Dr. William Daniel and Laurel Meade wanted to include was field heating. A number of European stadiums and Mile High Stadium in Denver, CO, have heating grids buried about

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Drainage/subirrigation lines are set in trenches on top of the moisture barrier.

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eight inches below the turf surface to warm the soil. Electric or hot fluid systems melt snow and keep the ground from freezing. This option would cost an estimated \$150,000 to \$200,000 and raise the price of the PAT System by more than 30 percent, explained Meade. The combination of heating and controlled drainage would provide the ultimate in natural winter turf.

Lefever surprised the park district and the PAT team by suggesting that installation of the heating system be delayed. The heating system was shelved and the bid submitted without it. "I hope the heating system can be installed in the future," says Mrock.

The final hurdle Heiss had to clear was the lack of competition to bid against for constructing a natural turf field to the city's specifications. In late February, the park district board voted to allow a single bid for the PAT system. Heiss waited nervously for more than a month for final details to be resolved and contracts to be signed. He wanted to give the sod ten weeks to knit with the soil.

To complicate matters further, Pink Floyd was scheduled to perform at Soldier Field on May 20. Heiss was not going to risk having thousands of rock fans trample the new sod. All the drainage, irrigation and soil work would have to be completed before the con-

cert so the sod could be laid immediately after. Fortunately for Heiss, the concert was cancelled.

In April, the park district removed the old surface and started excavation. The final grade of the new field would be just three feet above the average level of Lake Michigan. Park engineers decided to build a low wall around the field to serve as a dike.

With only three months to go before the first game, Heiss moved his crews and equipment onto the field. The first order of business was to make the subgrade perfectly flat. Once this was achieved, the field was divided into four separate drainage sections, two for the playing area and two on the perimeter. A network of trenches were dug in each section for the perforated drain pipe. But before the pipe was installed, the entire subgrade and trenches were lined with a plastic water barrier. The result was a two-acre bath tub about one foot deep.

Heiss and Daniel visited area sod farms in search of sod grown on sandy soil. They had heard the drought was forcing some sod growers to cut back on water. "We had to have healthy, established sod grown in sandy soil so it would take root as fast as possible," says Heiss. They found what they wanted 50 miles away at Huber Ranch Sod Nursery in Schneider, IN. It was a blend of five improved Kentucky bluegrasses growing in sandy riverbottom soil near the Kankakee River. "Our soil on the farm is 75 percent

sand," explains Bill Huber. "We grow a lot of Penncross bentgrass sod in the sand to eliminate soil interface problems on sand-based greens."

In the fall of 1986, Huber planted part of his 760-acre farm with a blend of Adelphi, Baron, Glade, Parade and Rugby Kentucky bluegrasses. "We are fortunate to have two spring-fed lakes to supply our irrigation system so our sod never lacked water. When Dave called up, I told him we had just what he needed."

The sod part of the Soldier Field story was strengthened further by Jim Walsh, president of Sportsfields Inc., who Heiss hired to lay the sod. Walsh had worked for Ben and Bob Warren for eight years at Warren Turf Nurseries. Walsh also knew chemicals from two years as a professional turf representative for Lebanon Chemical Co. While Heiss concentrated on construction at Soldier Field, Walsh coordinated preparation of the sod. That included applications of Alliete for *Pythium* control, Proxol for insect control and Agri-Plex to provide the sod with iron and micronutrients.

Heiss, Walsh and Bossard worked closely together so that maintenance of the sod after installation would be flawless. In the meantime, the drain lines were being installed. They aren't just drain lines, they are two-way conduits between the field soil and a water control station. Moisture sensors buried at various depths in each section of the field electronically report to a central control station. By setting moisture levels for specific depths, water is pumped into or out of the field through the drain lines. This subirrigation/drainage system can suck water out of the field as fast as rain can fall or fill it like a bathtub. By controlling the depth and amount of moisture, the sports turf manager can put water in the root zone while keeping the playing surface firm and dry.

The heart of the system is a sealed concrete tank. This air-tight tank holds 200 cubic feet of air in the upper portion and 400 cubic feet of water in the bottom. The main drains are connected to the tank. Inside the tank are two four-inch submersible pumps capable of expelling 700 gpm. There is also an air suction pump. The combined suction of the air pump and the sump pumps can remove more than 2,000 gpm from the field.

As Heiss arranged for delivery of more than 8,000 tons of sand, Mueller Mist installed the Toro irrigation system. Surface irrigation was not part of the original PAT System design. Subirrigation was the sole source of water when the system was first created more than 20 years ago. But experience has shown Daniel and Meade that it can save the day on many occasions. Sports turf managers are accustomed to surface irrigation and a sand field can be very thirsty when the pumps are down. As things turned out, there wouldn't have been natural turf in Soldier Field this month if it weren't for the Toro system. The pumps were not up and running until the end of July.

Access to the stadium added to the pressure of the job. Four out of six lanes on the



Temperatures soared during the three days the sod was installed.

Dan Ryan Expressway were closed for construction. The trucks had to use Lakeshore Drive and they weren't allowed on that between 6 am and 3 pm. Noise ordinances prevented nighttime deliveries to narrow the window even further. When the trucks did arrive they could not fit through the one tunnel to the field. Smaller shuttle trucks had to carry the sand from the large trucks onto the field.

Another challenge was only union crews could work at the stadium. Heiss wasn't about to risk delays caused by union unrest. Walsh contacted Tom Koch of Koch & Son, a Chicago landscape contractor who provided more than 15 union laborers at critical times.

By the middle of June, the sand was in place. Peat and calcined clay (Surface) were worked into the top few inches of sand. The surface was fine-graded to be as flat as a pool table. Four two-inch hoses were used to wet down the soil in preparation for delivery of the sod.

At 11 pm on Sunday, June 19, the sod harvesters at Huber Ranch were fired up and started cutting the Kentucky bluegrass with a third of an inch of soil. By 2:30 am, the trucks were loaded and on their way to Chicago 50 miles away.

Walsh and his crew were there at the stadium when the trucks started arriving. Again, the trucks could not fit through the tunnel so each pallet of sod was carried onto



Laurel Meade, Roger Bossard and David Heiss (l. to r.).

the field by forklifts with turf tires. Pallets were spotted at locations marked by Walsh. Starting on a line down the center of the field the crew began to lay the sod. They were followed closely by one person with a roller and another with a hose. As each section was finished, the Toro 640 heads were installed and the particular stations were turned on.

The first day Walsh and his crew laid 3,075 square yards of sod. The temperature soared to 104 degrees, but there was no stopping. The procedure was repeated the next day with 4,200 square yards. "The guys could see the field taking shape with each roll," recalls Walsh. "They weren't used to that kind of heat, but they worked fast and

really watched the seams."

Each night Huber would cut the sod and deliver it to the stadium before dawn. As the sun rose the pallets were already in position on the field. On the third day the remaining 3,000 yards were laid. Looking over the completed field, the exhausted crew knew they had accomplished something spectacular. The brilliant green surface was a stark contrast to the faded artificial surface of a few weeks before. The stadium itself was brighter with blue, yellow and orange seats, new paint and 50 new loges on the South end. The new color highlighted the Grecian columns atop the stands on both sides of the field. "You wouldn't think this stadium was built back in the '30s," remarked Meade.

The temperature still hovered in the '90s. Bossard, Walsh and Heiss were concerned that the heat would shock the turf and keep it from rooting as rapidly as possible. "Once turf starts wilting and turning blue it takes six to eight days just to get it going again," Bossard pointed out. "We couldn't afford that. We didn't have any choice. We had to keep the water on. The local media jumped on us because we were irrigating every day when everybody else in the city was under a water ban."

For the next three weeks Bossard checked the root depth of the field nearly every day. "The goal was to get the feeder roots down at least three inches and the

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hair roots spread throughout the top inch," said Bossard. He applied Scotts High K and Fairway fertilizers. He also sprayed Agriplex every week. "Normally you wouldn't push turf this hard, especially in the heat, but we had no choice," Bossard said. "We had Aliette and Subdue ready to go at the first sign of *Pythium*, but the wind off the lake must have kept humidity down."

By mid-July, Bossard decided it was time to stop babying the turf. He started cutting back the irrigation cycles while watching the turf for signs of wilt. The roots had to search deeper for water. This process would have been easier with the subirrigation system, but work on the water pit and pumping station was not yet completed.

Ten days later, the field was aerified to create channels in the soil for root penetration, something not generally recommended in hot weather. Sixty-five tons of sand and calcined clay were topdressed over the sod

and brushed into the core holes. "Basically, the topdressing stabilizes the sod by making it heavier," stated Bossard. "It also fills in any seams or spots that settled. The clay particles absorb their weight in water and hold it longer than straight sand does."

There were many other details to take care of before the Bears and the Dolphins could play on August 6. The field had to be surveyed from scratch. Templates for the team logos, NFL symbol and numbers had to be ordered. Turf paint in all the special team colors and white had to be ordered. And the park district crew had to be trained to paint natural turf as opposed to artificial.

Ira Berk wanted Soldier Field to look as good as the Super Bowl. So he called the same person George Toma calls for the Super Bowl, Larry Elliott, vice president of Missouri Paint Supply in Kansas City. Elliott proceeded to order the templates from his supplier of more than eight years, Calvin Autry, owner of Calvin Sign in Kansas City. Next he sent color swatches to Mautz Paint

in Madison, WI. The paint had to be custom-blended to exact specifications.

In the meantime, Elliott flew to Chicago to survey the field. As soon as the locations of the goal posts were spotted, footers were installed. The end zones, yard lines, hash marks and sidelines were carefully set. On July 22, the Kentucky bluegrass turf at Soldier Field became the canvas for Elliott and the park district crew. The field was painted as if the opening game was the next day.

"It's hard to describe how I felt when the painters finished," says Heiss. "I walked way up into the seats and just stared at the field for ten minutes. From the top row you look one way and see the Chicago skyline. Look the other way and you see the marina and the runway at Meigs Field. All I could think of was what a great stadium Soldier Field is... AND now it's natural turf!"

After 22 years at Comiskey Park, Bossard strongly believes that natural turf is the best surface for outdoor stadiums. "I've managed both in my time (Comiskey had artificial turf from 1968 to 1975) and natural turf is the only way to go." The new stadium to be built next to Comiskey for the White Sox will also be natural turf.

Two big challenges remain for the Chicago Park District. The first is to hire a head groundskeeper that understands the PAT System. The city is lucky to have Bossard and Mrock nearby for their advice. "The biggest problem we have today with PAT fields," says Meade, "is maintenance after installation. Stadium owners have to realize that maintenance is no simple matter. We're not just talking about mowing and marking the field. We're talking about a sand rootzone with a sophisticated drainage and irrigation system. These things require skilled, experienced management. To get someone like that, you have to be selective and pay them accordingly."

The second big challenge is field heating. "Football is tougher than baseball," explains Bossard. "Grass wants to grow during the baseball season, but doesn't during the end of football season."

"The Bears have games November 27 and December 11," says Mrock. "We used to put tarps over the AstroTurf and blow heat under them to keep the surface from freezing. The same has been tried successfully on natural turf. Eventually, all stadiums located in the North will have to address field heating. It has to be a lot cheaper than building domed stadiums." At the present time, Mile High Stadium in Denver is the only PAT field with a heating system.

"We learn something new with each installation," says Dr. Bill Daniel, who invented the system at Purdue University. "The more fields we install, the more we learn. We know that adequate infiltration, percolation and subdrainage along with moisture control, make it possible to provide and maintain a durable turfgrass cover that allows maximum use. That's the real name of the game today and that is what will preserve natural turf as the ultimate sports surface in the future." ☺

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