

Foxboro Stadium Goes Natural

By Matthew Trulio

Hitting rock was the only thing Randall & Blake, Inc., hadn't anticipated in the construction of the new, natural turf sand-based field at Foxboro Stadium in Foxboro, MA, so naturally they hit tons of it.

"When we started trenching to put in the drainage lines, we encountered 'rock ledge,' a condition which is very common in many parts of New England," recalls Dan Almond, registered landscape architect and design/build division manager for the landscape architecture and construction firm based in Littleton, CO. "The soil borings we performed very early on didn't show us how much rock was down there. About 90 percent of what was down there was rock."

Fortunately, they discovered the problem late in the week and had the weekend to solve it. By Monday, they were back in business.

"We had originally planned on using a Vermeer 450 trencher, but we switched to a 650, which is about twice the size, and it worked like a champ," says Almond. "We did go through hundreds of teeth, though. 'Hitting rock caused a little bit of anxiety because our schedule was so tight,'" he continues. "But we were able to regroup

over the weekend, bring in the new equipment, and make up what little time we lost. These are the things that happen in a project like this. You just have to make adjustments and go on."

Adjusting to improve a difficult situation is a subject the New England Patriots, the NFL team which calls Foxboro Stadium home, know something about. After suffering through one of the toughest seasons in the history of the franchise, a season filled with loss and controversy, the Patriots decided it was time to make some adjustments.

They hired Sam Jankovich as chief executive officer and owner's representative. They picked high in the NFL draft, which is perhaps the only consolation for a team with a losing season. And they turned their attention to the field itself and its well-worn artificial surface.

"Mr. Jankovich was the athletic director at the University of Miami, so he was used to natural turf," says Almond. "He was strong on the idea of going to it at Foxboro Stadium."

And go to it the Patriots and Foxboro Stadium owners did.

"This is a great commitment on behalf

of [Patriots owner] Victor Kiam and the New England Patriots organization to install a proven natural turf field," Jankovich said earlier this year. "This decision is in the best interest of not only the Patriots' football players, but also other players around the National Football League. In addition, such a surface is conducive to a better brand of football."

RBI finalized negotiations for installing the new field in January. The field had to be playable by June 1, when a soccer match between the national teams of the U.S. and Ireland would be held. Work began in mid-February. Missing the deadline was simply not an option.

Out With The Old

Before RBI could begin work on installing its GraviTURF Natural Turf Athletic Field System at Foxboro Stadium, the old surface had to be removed. That meant taking up 93,000 square feet of artificial turf and padding, 2,000 cubic yards of asphalt, and 4,000 cubic yards of soil. Although another outside contractor was hired for the removal chores, RBI was on-site when they took place.

"Because the field at Foxboro was arti-

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Foxboro's new turf ready for international soccer match.

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ficial, it had a crown," Almond recalls. "In the middle of the field, the asphalt was about 15 inches thick! Even on the sides, it was three or four inches thick. The nice thing was that they removed the surface and the pad and gave it to charity. Then they ground up the asphalt and used it in parking lot improvements at the stadium. Nothing was wasted."

In With The New

The GraviTURF system installed at Foxboro Stadium is a gravity-drained, sand-based athletic field set-up. The system was invented by RBI, which is in the process of having it patented.

The system begins with perforated pipe drainage lines, which vary from four to 12 inches in diameter depending on the drainage requirements of a particular project. "The pipe is all bedded in pea gravel—under it, around it, and on top of it—and we typically use a well-rounded material," says Almond. "On top of that, depending on the type of installation the client wants, we install our soil warming system."

The Patriots wanted the soil warming system. It consists primarily of electric heat cables which run the length of the field, from end zone to end zone.

"Most of the time, we have to upgrade the power a bit because the heating system requires something on the order of 500,000 watts," says Almond. "But it is a phased system—the whole thing doesn't run at once, because that way it's a lot more economical for the owner to run."

"Obviously, a soil warming system is rarely used more than 2-1/2 months a year, but it really helps extend a field's playability, as well as the ability to keep it green," he adds.

After the warming system, if specified, is in place, a peat and sand mix is put down. At Foxboro, the sand and peat were mixed in a Dakota Blender. The job of making sure the sand and peat were compatible went to Chuck Dixon, an agronomist and founder of Turf Diagnostics And Design, an Olathe, KS, firm which evaluates materials for suitability of use in putting greens and other sand-based systems.

"The sand fits United States Greens Association particle size criteria," he explains. "The gravel is about five to seven times larger than the sand."

"We mostly use Dakota Reed Sedge Peat," adds Almond. "A lot of people seem to be going to it now."

Lastly, there is the grass. RBI generally

seeds if time allows. "That way, we can seed into our root zone mixture exactly the type of grass mix we want to use," says Almond. "By seeding, we also avoid any soil interface problems."

Faced with Foxboro's tight time frame, however, RBI was forced to sod.

Getting The Old Team Together

Although RBI, founded in 1975, had constructed about 30 golf courses throughout the West, as well as a number of athletic fields, the first professional field installation of a GraviTURF system was at the Denver Broncos' training facility in 1989. Mark Altman, of Altman & Altman Turf and Soil Fertility Specialists, an independent consulting firm based in Marshall, MN, was brought in by RBI and the Broncos to perform soil analyses on the project.



Electric heat cables and irrigation installed in pea gravel base.

"That was about as close to a sterile media as I've run across," says Altman. "They [RBI] had planned on doing a standard soil analysis, but I suggested taking a number of soil samples because they were going with a sand-based field. With a sand-based field, you can create a designer mix of nutrients. That gives you some real options that you don't normally have."

Altman designed a soil fertility program, which included major and minor nutrients, for the seeded turf. "When the turf came up, it had all the nutrients it needed," he enthuses. "You can make a profound difference in turf establishment through proper soil fertility management."

"I think the system is a perfect marriage between drainage and water retention," says Ross Kurcab, field manager of the Broncos' training facility. "We have enough drainage where we never have any standing water. At the same time we retain enough water so we're not just flushing it through."

Once RBI secured the Foxboro project, the firm contacted Altman again.

"They called me and said we've got another project to do, but with a completely different set of circumstances than at Denver," says Altman. "This time, we were sodding instead of seeding. We started out with six weeks from sodding to playing time, but by the time everything came together, that was down to four weeks."

Building Bionic Turf

When RBI began its search for sod to be used at Foxboro, it was looking not only for a specific type of grass, but also for one that had been grown in a sandy loam that approximated the sand-peat-gravel mix they'd be using. Their search, with Altman's assistance, took them throughout the New England area, and as far west as Indiana. Finally, after exhaustive testing of sods and soils from various turf farms, they settled on a Kentucky bluegrass of 27 percent Merit, 30 percent Ram, 20 percent Glade, and 23 percent Eclipse from Gold Star Farms in Canterbury, NH.

"There were a lot of soil samples swapped back and forth," says Mack MacPhail, a customer service manager at Gold Star. "They wanted a sod that had been grown in a sandy loam to begin with, and our soil was very close to what they had been looking for."

The idea in testing the soil was not to "match" loam to loam, since the sod would be washed free of all farm loam after harvest, but to find a sod that was *already* at home in a medium similar to that used at Foxboro.

"The number one problem I see in sand-based fields is the sod-soil issue," says Dixon of Turf Diagnostics And Design. "A really fine-textured sod can seal off the sand base, and you never get rooting or other benefits. That's one of the benefits to sod washing—you eliminate the interface problem."

The sod RBI selected at Gold Star was strong and healthy, according to Altman and Almond. But, given the deadline for the Foxboro project and the impending soccer match, they knew it had to be even stronger.

"After we decided that Gold Star was the one, we sent their samples to Mark, who ran his tests to determine fertilizer rates," says Almond. "He did something that I think is unique. He came up with a pre-fertilizer program, including biostimulants, that was used at the farm to create a 'bionic' sod. And it paid off big time!" As for the "exacts" of the program he created for sod on the

farm, Altman isn't giving away any secrets. ("I need *some* competitive edge," he laughs.) However, he does provide a general description of the on-farm program.

"The idea was to bring the turf up to sports turf durability and playability before it came to the stadium," Altman reveals. "From the soil analyses at the sod farm, we were able to come up with a program of fertilization, Roots biostimulant, and foliar feeding."

"We understood that whatever process they were recommending, we were going to work with them," says MacPhail of Gold Star. "The material [specified by Altman] was shipped here, and we put it down at the recommended rates.

"We had to ship the sod by May 1, and that's just barely spring here. The sod was just starting to come out of dormancy, and we were happy to take any suggestions on 'waking it up.'"

After the sod was harvested, all 93,000 square feet of it were washed as planned. Gold Star used a special sod washing machine, patented in Tasmania and assembled in Toronto, Canada, to accomplish the task. The washing procedure, which used 400 gallons of water a minute at 45 psi, was done at the farm.

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"I think RBI was, among other things, looking for someone who had the most 'enthusiastic' way of washing the sod," MacPhail says. "Bringing a machine here assembled in Canada and patented in Tasmania is about as enthusiastic as you can get."

From Farm To Field

Before a foot of the washed sod was laid at Foxboro, a custom-designed, pre-plant fertilizer was incorporated into the sand and peat mix. "We incorporated major and minor nutrients into the mix, which was low in potassium and had a high percolation rate," says Altman. "We used a sulfur-

coated sulfate of potassium, so we could prevent the potassium from leaching away. We also included trace elements—manganese, copper, and zinc. Sands vary greatly from pit to pit, and you need to take that into consideration when you design programs for sand-based fields."

The soil fertility specialist having, Sustain, from W.A. Cleary Chemical, put down to inoculate the soil prior to sod installation, but because of a shipping problem they had to apply it after the sod was laid. Altman also wrote a fertilizer program for the field after sodding.

The results of the combined efforts of everyone involved have been impressive.

"In two weeks, we had roots down 2-1/2 to three inches," Altman says with relief. "And with what we did on the farm, we were able to reduce transplant shock to zero."

"One of the keys to this whole system is drainage," Almond points out. "We guarantee our percolation rates at five inches per hour, but at Foxboro we'll probably get a percolation rate in the range of six to eight inches per hour. According to tests we've done recently at the Broncos' practice facility, the percolation rate there now is 6.2 inches per hour."

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"Quality control is the key," he adds. "Every system is installed the same way, every time. We absolutely do not compromise on materials or installation."

Game Time

To protect and maintain their considerable investment—more than \$1 million were spent in the entire Foxboro Stadium renovation—the Patriots and venue managers hired Pierre Landry as field superintendent. The 29-year-old from Rochester, NY, has a degree in plant and soil science from



Dan Almond (r) and Ross Kurcab at Bronco's practice facility.

the University of Massachusetts and was previously an assistant superintendent at Monroe Golf Club in Pittsford, NY, and

Andover Country Club in Andover, PA. He was recommended for the Foxboro job by RBI.

"I've worked with USGA sand-based greens, so I have a good idea about their irrigation and fertilization needs," he says. "The stress on this field is going to be different than it is on a golf green—it's more physical than environmental. I understand turf really well and I just have to adapt to sports fields."

Landry's golf course experience came in handy during the first two weeks after the sod was laid at Foxboro. Using the field's five-row, gravity-fed (from a nearby water tower) irrigation system consisting of Hunter I-40s, a Weathermatic controller and brass valves, and Hydrovisor moisture sensors, he syringed the field daily. It takes approximately 1-1/2 hours for the system, which is designed with head-to-head coverage, to complete its entire cycle.

"Now that the roots are down 3-1/2 inches, I'm cutting back on water to get them to dive even deeper," says Landry.

Since the previous surface at Foxboro was artificial and, consequently, didn't require turf equipment beyond a vacuum, Landry is in the process of building his turf care arsenal from scratch. In the meantime, he's using demo equipment from various distributors, such as a triplex mower, three times a week, to cut the grass to a 1-1/2-inch height. He adds that he'll soon bring that cutting height down to 1-1/4 inch, and will begin an overseeding program this summer.

"We want to work to obtain a 50-50 bluegrass-ryegrass mix," he reveals.

The Patriots players and coaches, he says, are excited and curious about the new field, and he sees developing a relationship with them as vital to his success at Foxboro, as well as the success of the field itself.

"I think the biggest challenge is going to be satisfying the needs of the coaches and players, in terms of game condition and allowing them on the field," says Landry, who is currently renovating the Patriots' nearby soil-based practice field. "Of course, I want to keep them off it as much as possible [between games] but it's their field and they're going to want to practice on it. But that's mostly walk-through stuff, like setting formations.

"We'll work it out by developing a good relationship where we understand each other's needs."

Like RBI, the Patriots, and the Foxboro Field owners, Landry will make adjustments, and then go on. Sometimes, that's what winning is all about.



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