Making the Best Field from Existing Soils

How to create top-quality fields, by using the materials already on site and adding some minor amendments.

by Scott Pippen, Supervisor of Streets and Parks, Village of Lincolnshire, Illinois

North Park is a 63.5-acre site that was purchased by the Village of Lincolnshire, IL, in the fall of 1999. The site was acquired to maintain open space in the rapidly growing Village, and to provide playing fields for the residents of the area. Prior to the development of this project, the Village's parks contained only two small playing fields. The schools in the area were expanding their buildings to meet the rise in their student populations, and constructing these expansions over many of the existing fields on their campuses. The local youth sports organization was having a very difficult time meeting the communities needs with the limited facilities available to them. Thus, the $14 million North Park Project was born.

The skinned surface of the infield was 60-70% clay and 30-40% sand, with calcined clay incorporated to a depth of one inch.

The North Park site contains 28 acres for active use, and 35 acres for passive use. The 28-acre active area includes six soccer fields, two baseball fields, three softball fields, ice skating rinks (hockey and figure skating), a sled hill, tennis courts, basketball courts, a playground, a 280-car parking lot, a concessions building, and a maintenance facility. The passive use area is divided into a parcel which will be a dedicated Illinois Nature Preserve, and a transitional area from the Nature Preserve to the active use area. The Nature Preserve is an extension of one the Village had already dedicated to the State several years ago, which borders the southern edge of the property. The transitional area will have trails for cross-country skiing and hiking, and a picnic shelter. The park is scheduled to open either this coming Fall, or in the Spring of 2002, depending on the development of the turf.

One of the first decisions the Village had to make, was what kind of sub-base the athletic fields would have, sand or native soil. We toured several facilities of both types in the area and talked to the sports turf managers at each site. We discussed the maintenance and construction requirements for each type, and came to the conclusion that the native soil field would best meet the Village's needs due to ease of construction, and less maintenance requirements.

The next step was to see what kind of soil was already on the site and determine if it would support the quality of athletic fields the Village wanted to construct. We wanted a soil profile that would provide good support yet have some resilience, and would be a good growing medium for the turf. A soil test was performed, and the results showed the soil had a composition of 36.6% clay, 19% sand, and 44.4% silt. Although the soil test results showed that we had a silty clay loam, which is a heavy soil, we felt that with some amendment, it should meet our requirements.

The Village brought in Ken Mrock, Sports Turf Manager for the Chicago Bears, as a consultant for the project. Ken reviewed the test results, and examined the soil firsthand. He recommended that since the soil had remained untouched for a number of years, and that it had good structure and was friable, that it would be best to use the existing top soil as a base for the turf's growing medium.

The next area we needed to address is how the soil would drain. Since the soil was heavy, it had a low percolation rate. Our park design consultant recommended several alternatives to improve the soil's drainage capacity, including amending with dirty sand, tilled sand, or mineral topsoil, and including a large number of under-drains throughout the playing fields. The estimated costs of these methods ranged from

It was important that the topsoil (growing medium) was thoroughly blended with the subgrade to prevent layering.

$400,000 to $900,000, which based on the projected results, we felt was prohibitive. I began discussing this issue with every member of the Midwest Chapter STMA that I came in contact with, and everyone of them made the same recommendation—calcined clay. So, we looked into calcined clay, and found that it would provide the percolation rate we desired, as well as many other added benefits.

The calcined clay, installed at a rate of two tons/1000 sq ft, would improve the drainage, moisture retention and pore space, and reduce compaction of the soil. It would also assist in reducing leaching of phosphorous, which was important to the Village as the headwaters of the Chicago River are on the site. The calcined clay allowed us to eliminate $30,000 in under-drains and still maintain good drainage on the field. The only under-drains installed are around the perimeters of the soccer fields. I requested that these drains remain, so we would have a system to tie into in case we need to install additional drainage at a later date.

We specified that the calcined clay be spread uniformly to a depth of 1.5 inches, and then be incorporated into the top four to six inches of the soil. This would greatly reduce our maintenance, repair time, and irrigation requirements of the turf once play begins at the park. The total required to do the entire area of athletic turf, was approximately 1400 tons which, according to the manufacturer, is the largest application of calcined clay ever done in a new park construction.

Next, we had to decide how the soil would be handled during the sub-base preparation, and what methods would be used to reapply it to the site. The project specifications called for the soil to be spread to a minimum depth of six inches. We requested that the soil and calcined clay be stockpiled in the area where our fields that would receive the greatest use would be located. This was done because we knew that there would be some material that the scrapers would not be able to retrieve, and we would have a thicker layer of good topsoil and calcined clay left, which would subsequently lead to a deeper root zone.

We specified that prior to the topsoil being re-spread, the sub-grade should be scarified to a depth of eight inches. This was to allow for a blending of the topsoil with the compacted clay sub-grade to prevent a layering in the root zone. We also requested that the topsoil be re-spread and rough graded using tracked machines. We wanted to minimize compaction to the topsoil as it was being reapplied, and tracked machines apply less pressure than wheeled machines. Once the soil was spread and the calcined clay incorpo-

In the combination softball outfield and soccer field, calcined clay was incorporated into the soil to a depth of four to six inches.

The finished product, following hydroseeding.

rated, vehicular traffic was kept to a minimum, and the remaining work was completed by hand as much as possible.

Another soil or surface issue we needed to look at was the composition of the skinned areas of the baseball and softball diamonds. Again, we wanted a surface that would be firm and provide good footing, yet would be resilient and allow some cushioning for the athletes. We wanted a surface that we would be able to maintain, and that would be affordable to construct. We investigated the crushed aggregates, and the clay-sand fields.

I then went back to my Midwest Chapter STMA associates for feedback and guidance on this issue. After looking at all of the options, the decision was made to install the fields with a 60%-70% clay and 30%-40% sand blend material, with calcined clay incorporated into the top 1 to 1.5 inches. This is the composition of all of the existing fields in Lincolnshire, so my maintenance staff has experience with this type of surface. A one-inch quick connect port was installed behind each of the pitching mounds just below grade to allow us to maintain an adequate level of moisture on the skinned surfaces.

The Village will soon be purchasing an infield grooming machine to assist with the maintenance of the fields. The material installed, and equipment provided, will allow us to maintain top-quality fields with minimal maintenance time.

The Village of Lincolnshire is committed to providing the highest quality fields for the athletes possible, while maintaining fiscal responsibility. It was this objective that led to the decisions made in the development of this park. The processes used in the surface preparation and other areas will lead to a top-quality playing surface for a variety of sports, which are able to be maintained at a high level without breaking the bank.

These processes were developed through many interactions with other Sports Turf Managers both local and around the country. I am grateful to all of them for offering a few minutes of their valuable time to help the Village achieve its goals. ■