>> **BATTER BOARD** was used to define and elevate the infield arc to establish a diversion around the infield.

>> **Top Left: BASE PATH:** Offset foul lines minimize lip buildup in the grass adjacent to 1st and 3rd base.

>> **Middle Left: "WALK SOFT AND CARRY A BIG RAKE."** Low ground pressure equipment was used to install the big roll bluegrass sod.

>> **Bottom Left: RED SCREENINGS** were used to create wide paths and minimize turf wear.

Considerations in infield construction and renovation

MOST OF US have managed an infield under less than perfect conditions at one time or another. The infield may be in need of reconstruction due to years of use or it may have inherent problems caused by improper construction. Whether simply a facelift for an existing infield, or the construction of a new facility, a successful project requires consideration by those involved in the construction process and by those who manage the use of the field.

It's natural to want the best infield you can have when the opportunity arises to renovate or construct an infield. Typically, designers and engineers look to construction practices used on professional infields as a reference when designing for schools and municipalities.

For the sake of this article I would like to take the liberty of providing my perception of a professional infield. A professional infield is an infield constructed on a full gravel blanket below a loamy sand or pure sand root zone. It has a ½% slope radiating out in all directions from the area around the pitcher's mound. The skinned area is constructed with two distinct layers. The base is constructed using an infield mix with less than 70% sand. This mix is managed at a precise moisture level to provide just the right resilience to the players. The base is covered with a thin layer of topdressing such as calcined clay, vitrified clay or possibly a mixture of both. The integrity of these layers is protected with the utmost care. For most of us, managing a professional infield such as this would be like Charlie Daniels playing Tchaikovsky's Violin Concerto. Rather most of us maintain infields in the grey area of right and wrong somewhere between a professional infield and chase out the cows close the gate and play ball.

Some designers recommend a heavy textured clayey infield mix like XYZ stadium, not understanding that unless the moisture in that mix is impeccably managed, it's going to get hard as a rock.

PERCEPTION IS NINE TENTHS OF THE FLAW

I have witnessed municipal infields constructed on a full gravel blanket using heavy textured impermeable top soil and a heavy clay infield mix because the perception is that this gravel blanket is going to provide superior drainage for the infield. These designers don't realize that unless the root zone has a very high rate of hydraulic conductivity and is capable of allowing water to pass through it efficiently, the only real benefit to any subsurface drainage is the control of ground water or a high water table.

These same designers like the ½% slope because; actually I don't know why they use it other than because it's used on professional infields. What they fail to realize is that ½% slope is almost as ineffective as a gravel blanket in a turf area unless again, you have a very permeable root zone and some

form of subsurface drainage. On the skinned area, ½% slope is very difficult for the average maintenance crew to manage effectively and typically requires laser grading a few times a year to remain effective.

Some designers recommend a heavy textured clayey infield mix like XYZ stadium, not understanding that unless the moisture in that mix is impeccably managed, it's going to get hard as a rock.

I witnessed a regulation little league infield constructed with a conical grading plan similar to the professional field I described. In this case the designer was sharp. He understood that ½% slope isn't sufficient. He therefore recommended a 1% slope radiating out in all directions from a point centered on the infield turf. What he failed to realize is that you cannot construct a regulation pitcher's mound using this grading plan and adhere to the requirement that the pitching rubber be 6" above home plate. In fact, there would be no mound at all. A 1% rise from home plate to a pitching rubber at a distance of 46' would be about 5.5". This would however be a very effective grading plan for a softball infield with no mound.

This same consideration afforded to a little league infield is necessary for a 90' baseball infield where the height of the pitching rubber is required to be 10" above home plate. In this situation you cannot construct a regulation mound using any more than a ½ % slope from the pitcher's mound to home plate. Even at ½% slope, the mound would only be about 6" high allowing only enough elevation for a 6' landing zone in front of the rubber. In this situation the desires of the coaches and athletic director need to be understood and the requirements prioritized to allow for a successful project.

ST. ROSE HS GETS A NEW FIELD

I had the opportunity to be involved in a construction project at Saint Rose High School in Belmar New Jersey. The loss of a facility they had used for years required the school construct a new varsity baseball field at another site comprised primarily of soccer fields.

The project started with the inspection of the new site and selection of the location for the new field. The proposed location was in the corner of one of the existing soccer fields. The site was rectangular in shape with a diagonal slope of 1% across the entire tract. We had the option of selecting from two potential locations for the construction project. We could use the upper corner which would entail dealing with a diagonal cross slope away from the proposed home plate or we could use the bottom corner which would mean dealing with a 1% slope right down the center line of the proposed infield. Personally, I believe a cross slope is the most difficult slope to deal with on an infield. The excavation necessary to eliminate the cross slope was cost prohibitive so right or wrong we opted to deal with the 1% slope down the centerline.

After the site selection, all those involved

>> NO COWS on this infield.

>> A WALL was constructed to elevate home plate 24" and create an acceptable grading plan.

>> **Above left: CLAY BRICKS** were installed in the pitcher's mound and home plate.
>> **Above Right: 6"** of topsoil was applied to all turf areas.

in the construction process were assembled to provide their particular expertise in the project. Those involved were: the coach/field maintenance supervisor; the athletic director; the landscape architect; and me, the consulting construction contractor.

For a few different reasons including budget, it was decided that an engineer was not required for the project and the coach/field maintenance supervisor, Mark Fletcher would be serving as general contractor on the job.

Based on the combined input from Mark and the athletic director, the architect developed the footprint for the field, including dugouts, warning track, backstop, fencing etc. Mark and I took soil tests, evaluated the existing topsoil and chose an infield mix that was compatible with the level of maintenance he would provide. The mix was about 75% sand with about 1:1 silt to clay ratio. Tuckahoe Turf Farms in Hammonton, NJ was chosen as supplier for the bluegrass sod we would be installing. Mark also lined up an irrigation contractor to install the irrigation and quick connect behind the pitcher's mound. A mason was chosen for the dugouts and the retaining wall. A fencing contractor would be installing the backstop and perimeter fencing.

THE INFIELD GETS A PASSING GRADE

Literally every infield I have seen that is constructed in the corner of a multipurpose facility has a problem with home plate washing out due to the prevailing slope. For this reason we decided to elevate home plate 24" by means of a wall directly behind the back stop. Along with this a diversion was designed around the outfield radius of the proposed infield to divert the prevailing flow of surface water around the infield. By elevating home plate 24" we were able to create a grading plan with a level center line and approximately a 1% slope to 1st and 3rd base that continued beyond the infield. I believe 1% to be the optimum slope for a baseball infield at this level of maintenance and play. It's enough slope to get the water off the infield turf when internal permeability of the root zone isn't sufficient. 1% slope on the infield skin provides good sur-

face drainage, doesn't require quite the precision in maintenance a ½% slope requires and 1% slope minimizes the potential for erosion associated with a steeper slope of 1¼ to 1½%.

The elevation of home plate created a need for about 500 cubic yards of fill material to raise the entire infield. Luckily the original construction of the complex had left a mountain of material that would work as an excellent fill material. The material was similar in texture to a sandy unscreened infield mix. I would compare it to select fill which has a specified range of hydraulic conductivity between 2" and 20" per hour. Select fill is a material sometimes used to help regulate percolation in a septic system. Because the topsoil we would be using to cover the fill material was a heavy textured soil that was not very permeable and we all know that infield mix is not very permeable, we decided subsurface drainage would not be necessary. The only drainage pipe we installed was at the base of the wall and we installed a sand slit drain around the outfield radius of the infield to help with any water that might lay in the diversion. We did allow for channel drains to be installed in front of the dugouts at a later date if necessary. As with most any infield, we were relying on surface drainage to evacuate surface water from the infield.

>> SINCE THE TOPSOIL would be reused, we stripped and removed the sod.

Once the grading plan and the architect's footprint for the facility were finalized and documented, we were ready to begin the project. Consideration on the part of all involved in the construction project allowed for a successful project and the construction of a safe, durable and playable field that is currently the pride of Saint Rose High School. ■

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