

Construction and Maintenance Of Baseball Infields

INFIELD CONSTRUCTION

By Marc Van Landuyt

Development of a quality field requires proper design and construction, selection of high-quality soils, careful turf establishment, and proper field management after installation.

Each site is unique. Careful consideration of specific site characteristics, such as soil type, slope, drainage, and location of existing structures must be integrated into site planning. Field design is usually predetermined in the guidelines set by the affiliated athletic association, but these may only include field dimensions and markings. More importantly, good field design reduces the risks of hazards.

Funding ultimately will determine the attainability of any proposed construction. Each of five factors and their relative costs must be weighed equally during initial planning. They include: initial planning, field construction/materials, erection of site amenities (bleachers, lighting, etc.), and subsequent field maintenance and maintenance equipment. Don't plan for a professional-level field if you won't be able to afford its maintenance. Budget for these costs and then choose a plan that meets your needs *and* budget.

To put your plans into action, choose a contractor with the experience and equipment to successfully complete the project. Experience can be measured through reference calls and on-site inspections of similar projects. Ask how much of the work was done by the contractor himself and how satisfied the organization is with the work.

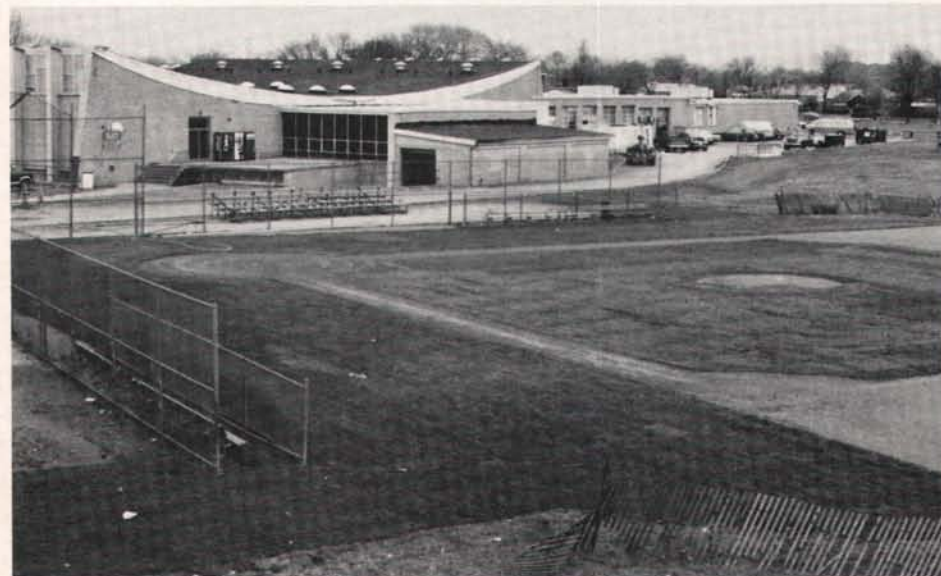
The fields we will consider here are high school and small college baseball infields. This pertains to site-specific soils, how to deal with them for drainage and turf establishment, and the aspects of infield materials.

Proper construction begins with using the right equipment. There are two types of construction equipment. The first type is what I call key equipment, and includes a level or laser and a grader. The level or laser is necessary to set the angles and check the grade properly. A lightweight grader is the only machine specifically designed for leveling material and adjusting the grade to the desired elevation.

The second type of equipment is called help equipment, because it is extremely helpful during construction. It includes small, lightweight loaders with enough capacity to move the necessary material without damaging the finish grade. A land pulverizer (Gill pulverizer) keeps the material loose while grading and prepares



Baseball diamond prior to renovation. Photos courtesy: Van's Enterprises.



Same diamond following reconstruction and installation of sod.

the seedbed. A lightweight roller is important in providing a firm surface without excessive compaction. A landscape rake is excellent for any handwork, because of its width and low surface weight.

Avoid using sod cutters, dozers, and tractors with attached implements. Sod cutters cut too shallow and only to the existing contour of the ground. Dozers and tractors with implements are not as adjustable as graders for leveling the surface.

Site construction begins with field layout. Working from the architectural plans or from permanent benchmarks, such as backstops or drain openings, the field elevations are established and marked. These marks indicate both the subgrade and the finished elevation so the correct amount of soil can be removed or added.

Emphasize accuracy when removing the existing soil to the designated elevations. The subgrade contour is more important than the finished grade because it provides for even drying, a stable crown, uniform settling, and lower maintenance over the years. To prevent uneven subgrade compaction, fill low areas with loose, consistent soil spread in even layers.

A soil mixture is prepared for the new turf areas before application. Blend the soil and amendments thoroughly and correct for pH. If sand is an amendment you are using, remember that the soil may already contain sand. Check the sand content of the soil before determining the volume of sand you want to add.

Apply the soil to the designated turf areas in even layers up to the indicated elevation. Blend the first few layers with the subsurface material to avoid an interface which may cause drainage or rooting problems. Before the turf area is seeded or sodded, spread the infield mixture in the skinned areas.

The most important consideration on a baseball infield is the skinned area surface material. Infield mixes vary greatly and selection is primarily governed by climate, available resources, and preference of the management. . . *not always the players*. Materials chosen should be safe. Avoid sharp, abrasive materials. If a material is sharp, but aesthetically pleasing, it should be used only on warning tracks or entranceways.

The skinned area *should not be hard*. It should be firm but loose. Apply the material in even, consistent compacted layers four to eight inches deep. A definite line should exist where the soil mixture meets the infield material. You don't want turf to encroach into the skinned area or loose infield material spreading into the turf.

With a properly formed subgrade, suitably amended soils, and an accurate finished grade, the field will have positive drainage. This promotes optimal plant growth and minimizes disrupted play due to rain.

If subsurface drainage was budgeted for during initial planning, a slit-trench method

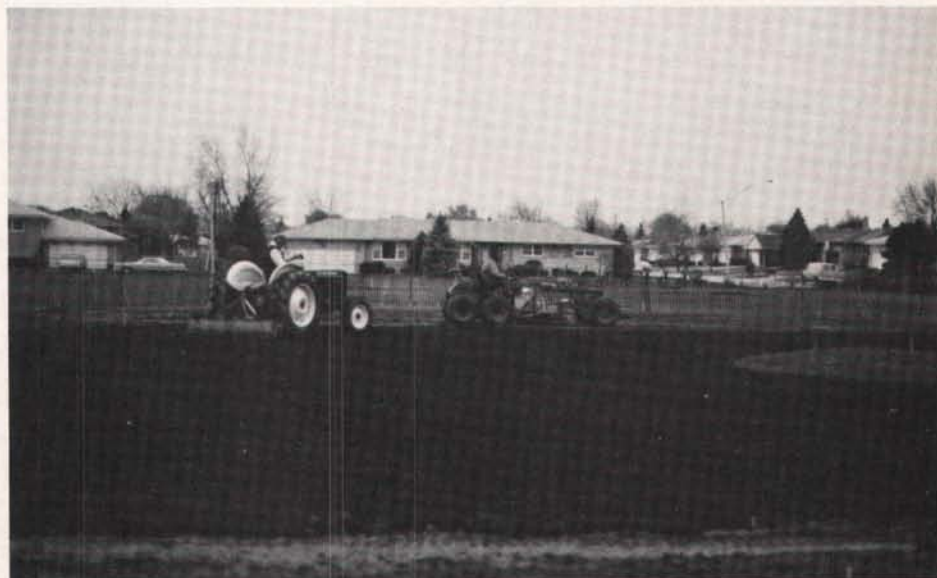
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Stakes indicate both the subgrade and the finished elevation.



Clay mixture is placed in basepaths, pitcher's mound and batter's box before the field is sodded.



Soil is applied to designated turf areas in even layers, blending the first layer with the subsoil.

should be chosen. Open trenches can be installed on both the turf and the skinned areas. For turf areas, cut narrow trenches up to 1/2 inch wide and eight to 12 inches deep on three- to four-foot centers. In skinned areas, the trenches should be two to four inches wide and eight to 12 inches deep on four- to eight-foot centers. These trenches can be filled with either a uniform sand approximately .5 mm or a calcined clay product. If a calcined clay product is used, it can also be incorporated into the top four inches of the skinned infield to improve drainage there as well.

When drainpipe is used it should be the wrapped vertical type. Install it on the perimeter of the infield with varied patterns in the outfield. The open slit trenches will deposit directly into these pipes, which in turn are connected to four- or six-inch round main drains on the edges of the field. Remember, do not install drainpipe under the skinned area of the infield. Most infield materials become compacted and sealed off. The pipe will not receive water to help playability after a normal rainfall.

At this time the soil areas should be prepared for seed or sod. Always consult your local seed distributor for the best seed mixtures for athletic fields in your particular region.

Remember, do not take short cuts to finish a job quickly. The safety of the playing surface is most important. With proper planning, construction, equipment, supplies, and maintenance any facility can look nice and be safe on a small budget. Stress that the layout and construction of a field must coincide with the available maintenance equipment and budget.

Editor's Note: Marc Van Landuyt, is vice president of Van's Enterprises, Ltd., Mundelein, IL.

MANAGING A BERMUDAGRASS INFIELD

Arlington Stadium, home of the Texas Rangers, has earned a reputation as one of the best fields in Major League Baseball. Players, coaches, and other groundskeepers are impressed by the condition of the bermudagrass field under the care of Head Groundskeeper Jim Anglea and his crew.

However, they might be shocked to see the stadium's field between home stands. That's when Anglea scares management with his renovation practices that leave the field looking thin and brown . . . but only for a few days. He's not guessing. After more than six years with the Rangers, he knows how the turf will respond.

In addition to the height of the bermuda, Anglea pays close attention to thatch and runners.

Frequent vertical mowing is part of Anglea's program to keep the 419 hybrid bermuda growing at all times to make it play up to professional standards. "If a field drains properly and you keep the grass growing, you can have good turf," he contends. "But in the big leagues, you need to treat the whole field as if it is a putting green."

Anglea spoon feeds the bermuda depending upon the game schedule, spe-

cial events, and weather. Some months he may apply two pounds of soluble nitrogen per 1,000 square feet, but he does this in quarter-pound doses. The day before a home stand he will spray with a quarter pound of nitrogen mixed with iron for "a little extra push."

The entire field is mowed daily, weather permitting, and the clippings are removed. With such a rich diet the turf can grow more than 1/4-inch per day. If rain keeps the mowers off the field for more than a day, the cutting height has to be raised. "The grass grows more under canvas," he points out. "If we don't raise the height of cut you can tell the field was scalped by that afternoon." Except for such occasions, the infield is cut between 3/8- and 1/2-inch with Jacobsen walk-behind greens mowers.

In addition to the height of the bermuda, Anglea pays close attention to thatch and runners. Based on the Rangers' schedule, the turf is verticut at least twice a month during the summer. "If the team is away for eight days, we'll put thatching reels on our Toro Greensmasters and thin the grass pretty heavily," says Anglea. "If they're out for four days, we do it lighter." As if that weren't enough, one of the walk-behind greens mowers is equipped with a groomer to lightly thin the infield almost every other day.

The only disease problems that crop up at times are brown patch and pythium. The Arlington crew treats at the first sign of brown patch with Chipco 26019. "Everyone on the crew knows what to look for and we are usually treating within an hour," says Anglea. The crew is also on the alert for pythium whenever the tarp is removed, especially when it's humid. After spraying curatively with Koban one or more times, he

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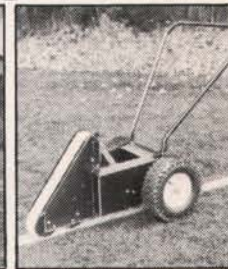


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SKINNED INFIELD RENOVATION



In many cases, skinned infields can be reconditioned by mixing processed clay amendment into the top three inches of soil. The total amount of amendment would be seven to 11 tons per average infield or one 50-pound bag every 60 inches.



The amendment is spread evenly over the infield with a drag. Photos courtesy: Aimcor, manufacturer of Turface.



A disk is used to mix the amendment with the existing soil. After allowing the field to dry for one hour, the infield is dragged again to smooth and level the surface.

turns to Subdue for preventative control.

Twice a year the infield and sidelines are aerified to soften the loam soil and to improve drainage. All cores and debris are raked and removed. Anglea has found aerifying is also a handy way to control lips of dirt in the turf. "We'll make two passes with a greens aerifier in slow gear, pick up the cores, then push the area down with a two-ton roller," he explains. "If you edge the dirt areas frequently and hose the dirt off the grass, you don't need to use a sod cutter to get rid of lips."

Brad Richards, Anglea's assistant, is primarily in charge of dirt work and pre-game preparations. "The goal is to have the field ready the day before a home stand starts," says Anglea. "That way you have time to correct any problems."

The dirt is worked and watered every day, whether or not the team is in town. One problem Anglea and Richards have noticed occurs when the team has been out of town for a few days: The dirt gets loose with no one playing on it. So, for the first game of a

home stand, the basepaths are watered and rolled to pack them down. Then a nail drag is used to loosen up the top 1/2-inch and blend in calcined clay as needed.

The turf is kept on the dry side for games. Any hot spots are hand-watered.

At the end of the season, Anglea and his four-man, year-round crew oversee the field with perennial ryegrass. The reason is to make sure the field will be in perfect condition for the opener the following April. While 150 pounds of a blend of three differ-

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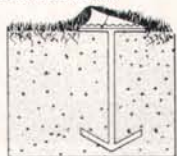
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Baseball Infields

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ent varieties would be enough for a standard infield, the Ranger crew sows almost 500 pounds. "On average, the 419 would be growing by April," admits Anglea. "But in this area we can have late cold spells or even snow in March. Overseeding is an extra touch that makes the field perfect for the players when the season opens."

By June, the ryegrass surrenders to the bermuda and Anglea's maintenance program. "We don't have a problem with tran-

sition here," he explains. "For 81 games a year, this field is the best we can make it."

The crew clearly shares his goal. In addition to Richards, Randy Cummings, John Kirchner, and Ron Masters are almost fanatical about details, from the straight lines in the mowing pattern to the matching slopes of the mound on the field and those in the bullpens. Arlington Stadium is smaller than some of its rivals. But visiting teams like to play there because of the field. It's enough to make all teams wish they had bermudagrass in their stadiums.

MANAGING A KENTUCKY BLUEGRASS INFELD

By Greg Petry

Maintaining bluegrass infields requires a combination of people management and agronomics. Although bluegrass "heals" relatively quickly following stress, it cannot take unrestricted use placed on it by scheduled games, practices, and special events. Whether the field is bluegrass or another species, guidelines or ground rules should be established to control its use. Cooperation and communication must exist between the groundskeeper, those scheduling the field, and those using it.

Kentucky bluegrass is characterized as a "cool season" grass but it must withstand extremely hot summer baseball seasons. It forms a dense, smooth, dark green playing surface ideal for baseball. Kentucky bluegrass spreads vigorously by underground stems called rhizomes to quickly fill in worn areas. The rhizomes also hold the turf together to help it resist damage from tearing.

Irrigation is a must to achieve and maintain a quality bluegrass infield. Often late spring and summer have high temperatures coupled with drought. Many bluegrass infields are installed with great pride and expectations, only to deteriorate because water is not available in sufficient quantities during critical periods of heat and drought. During the summer, when game play is at its peak, rainfall is at its lowest level and temperatures are at a maximum. The result can be fatal for a bluegrass infield.

Therefore, when constructing an infield, don't even consider a pure bluegrass infield unless an adequate supply of water is available at the site. If installing an irrigation system is not feasible, consider a "skinned" infield until irrigation can be installed.

The growth characteristics of bluegrass require that an intensive maintenance be established. Proper irrigation, fertilization, aerification, and overseeding must be programmed on a regular schedule to maintain quality bluegrass throughout the playing season.

The maintenance program begins in April with a soil test to check nutrients and

soil pH. Kentucky bluegrass grows best in a pH range of between six and seven. As the crew begins edging and dirt work, a preemergence herbicide (Balan) is applied to the turf.

In May, the infield is aerified twice with hollow 1/2-inch tines followed by treatment with granular sulfur as indicated by the soil test. A slow-release 19-5-9 fertilizer is then broadcast on the field. Emerged weeds are knocked out with Trimec and the disease-control program begins with an application of Chipco 26019 for brown patch. During May the irrigation system is checked, repaired, and adjusted. A twice-a-week mowing schedule is put into effect using reel mowers set at 1 3/4 inch.

As temperatures rise in June, a wetting agent is applied to assure deep and uniform wetting of the soil and to help reduce the frequency of irrigation. Grubs are treated with Diazinon and Bayleton is applied for dollar spot control.

Today people are very environmentally conscious of pesticide applications. Therefore consideration should be given to applying pesticides only when necessary and only at rates needed to control the problem. Consult a specialist before including pesticides in your program.

In July, humidity coupled with high temperatures requires close attention to irrigation and diseases. A half rate of wetting agent is applied and irrigation is scheduled only to run in the early morning instead of at night. Efforts to control brown patch, dollar spot, and summer patch are stepped up with an application of Bayleton early in the month and Daconil 2787 toward the end of the month. Fungicides are rotated to avoid any problems with resistance.

August is tournament time in our district's parks. The turf is aerified early in the month. Potassium and phosphorus are applied as a 6-25-25 fertilizer before overseeding with a mix of three Kentucky bluegrasses and three perennial ryegrasses. We borrow a topdresser from the parks district's Bonnie Brook Golf Course to apply a sandy loam for Grosche Field, our main stadium. Any low spots are

touched up by hand. By tournament time the turf is back in top shape. When the tournaments are over, Banner is applied to get us through the remaining hot portion of the summer.

Maintenance continues in September even though use of the field slows. When the weather cools, we aerify a third time and fertilize with a pound of nitrogen per 1,000 square feet of 18-18-18 sulfur-coated urea. Mowing continues while irrigation is set to be deep and infrequent.

Winter preparation begins in October. Another pound of nitrogen in the form of 27-3-12 with Nitroform and sulfur-coated urea is broadcast following aeration. Since we don't have time to spoon-feed the fields like a golf course superintendent might spoon-feed his greens, we rely on slow-release products. At the end of the month Chipco 26019 is applied for control of snow mold.

Winter preparation is completed in November by draining and blowing out the irrigation system. All accessories, such as foul ball netting and bases, are removed for repair and storage. Planning for the next year begins immediately.

In addition to a monthly schedule, a baseball facility needs clear pregame and postgame procedures. Pregame work is centered around preparing the dirt and marking the field. Postgame work is more oriented toward the turf.

A thorough inspection after each game or practice will help heal turf scars. Replace divots immediately. Apply a handful of seed (pregerminated preferred) and topdress mix to scuffed areas and where divots cannot be replaced. Turf areas in front of the mound, the batters' boxes, coaches' boxes, and on-deck circles receive more wear than others. For this reason they need frequent aerification, overseeding and topdressing. Eventually, wear and tear may take their toll and sodding may be necessary.

Cooperation between the groundskeeper and those scheduling and using the field is essential to its season-long quality. Create a positive working relationship with players and coaches. Educate the leagues, school, and park departments regarding turf management and field construction. Let them know about the personnel and budget constraints you work under. They will respect you and what you are trying to accomplish.

Communicate with a liaison from the groups and show them what it takes to monitor the quality field they expect. Explain that fields should be rotated to give them time to rejuvenate. If possible, practices or drills should be held on areas away from the infield of "showcase" fields. Establish ground rules for use with players and coaches so they can share in the resulting quality of their home field.

Editor's Note: Greg Petry is Park Superintendent for the Waukegan Park District, Waukegan, IL, and a previous winner of the Baseball Diamond of the Year Award.

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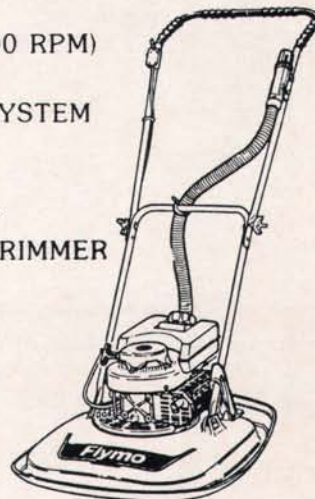
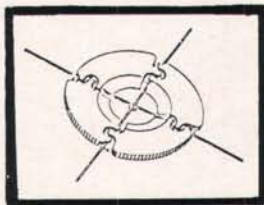
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MAINTAINING PITCHER'S MOUNDS

By Jim Kelsey

Maintaining a professional quality pitcher's mound takes more than just sprinkling some clay on the ground, raking it out, and forgetting about it. Properly maintaining a mound is an art, and there are probably as many techniques as there are good groundskeepers.

Here are 11 points that will work for you:

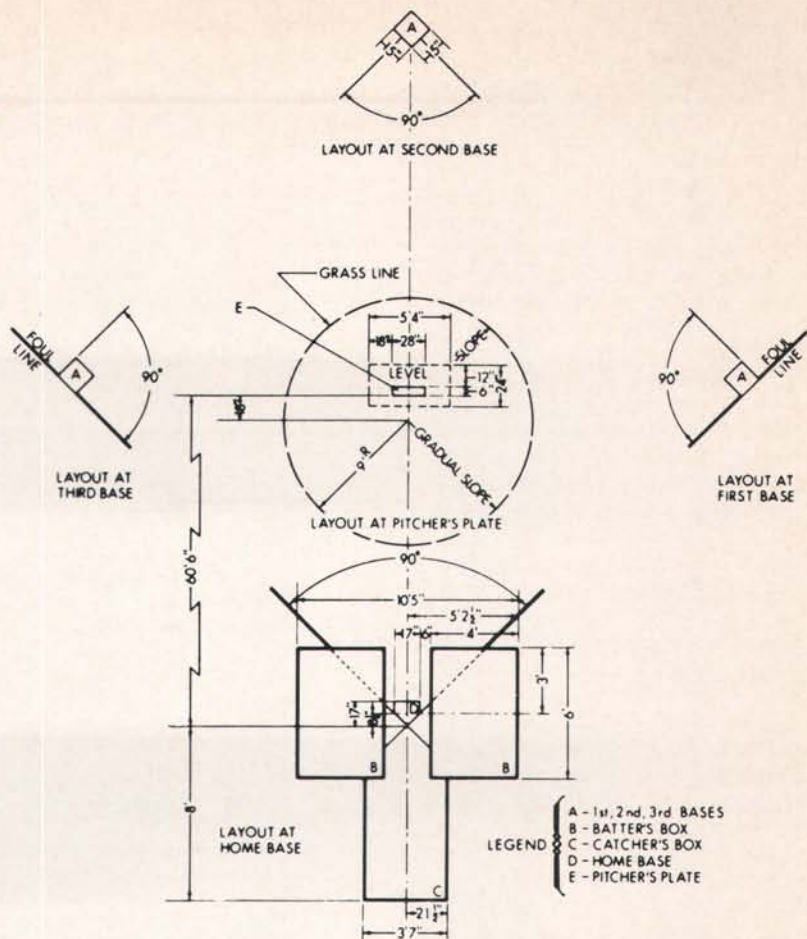
1. If the mound is too soft, recondition it. You can recondition the entire mound, the front triangle, or just the landing area or wear spots around the pitching rubber.

2. Don't use the same material on the mound and infield. What provides a well draining and easily scarified infield won't be firm enough for the mound. Use a firm clay mix.

3. The end result you are working to accomplish is for the entire mound to become one solid, integral unit of compacted clay without any loose layers within it. Otherwise the mound will continue to crack until properly compacted.

4. When conditioning a sandy mound for the first time, remove six inches from the area to be worked to ensure a good base that won't push out from underneath.

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least 1/2 inch of clay mix into at least the top one inch of old base. If not mixed, the two materials may crack where they interface and the mound will be difficult to compact properly.

6. Wet and compact the clay mix in layers two inches thick on top of the bonding layer until you reach final grade. Use a heavy mound tamper, and slam it down! If you get the mix too wet, just add more dry material. Put a damp cloth over your tamper to prevent sticking, or tamp over a heavy plastic bag.

7. Get the right moisture content by moistening mound material in a wheelbarrow, bucket, or outside pile, so that when a handful is rolled into a ball, you can just barely push your thumb 1/4 inch into the ball. Cleats will be able to grab yet come off cleanly.

8. Scarify the top surface of the mound so that you have 1/4 inch of loose material over the very firm base.

9. For patching, sweep aside dry material, moisten wear spots, and tamp mound mix back in.

10. For a quicker-drying surface, the mound can be covered with 1/4 inch of calcined clay or sandy infield mix. Be careful not to dilute the mound mix when making repairs.

11. Properly locate and contour the mound. The top of the pitcher's mound is exactly ten inches above home plate. The front of the pitching rubber is 60 feet, six inches from the apex (pointed end) of home plate. Drive a stake at the proper distance from home plate in line with second base and mark the correct elevation. This marks the front and top surface of the pitcher's rubber.

The mound is constructed with a nine-foot radius from a point 18 inches in front of the rubber. A flat area around the rubber should extend six inches forward, 18 inches on both sides, and 12 to 24 inches behind the rubber. The mound is *not* cone-shaped with a peak in the center. Instead it has a flat top 64 inches wide and between 24 and 36 inches deep starting 12 inches behind the center of the mound. The slopes behind and to the side of the top are steeper than the slope in front.



Place a plastic bag over the wet clay to prevent it from sticking to the tamper.

Maintaining a pitcher's mound takes more than sprinkling clay on the ground, raking it out, and forgetting about it.

If the base of the mound is the same elevation as home plate, the slope in front of the pitching rubber (allowing a six-inch plateau in front) is one inch per foot. Frequently the base of the mound is higher than home plate to allow for infield drainage. An adjustment in the slope of the mound would then be needed.

Further information on baseball specifications is available from the U. S. Baseball Federation, 2160 Greenwood Ave., Trenton, NJ 08609. The organization sells a booklet called "A Baseball Facility: Its Construction and Care" for \$5.00 plus postage.

Editor's Note: Jim Kelsey is president of Partac Peat Corp., Great Meadows, NJ.

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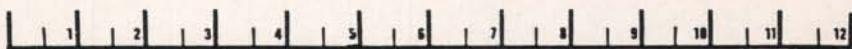
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