Baseball Field
LAYOUT & CONSTRUCTION

Properly laid out and constructed baseball fields are paramount to the game. Constructing a sports field from scratch can be an exciting group project that does not require a high level of expertise. Knowing a few basics and having some appropriate tools is all that is necessary before you can build your own field.

The instructions in this publication are designed to help set up a field from a relatively level, open area of ground. In addition to the field set-up requirements, keep in mind that a quality turfgrass playing surface for a sports fields must have the following: (1) adequate water drainage; (2) properly designed, installed, and maintained irrigation systems; (3) a sound maintenance program to address turf and clay conditions; and (4) the necessary field equipment (bases, pitching rubber) and surrounding structures, such as fences.

The following list describes a step-by-step process for laying out a baseball field (Figure 1). If you can follow these 13 basic steps, you can build your own field of dreams. A few tips and suggestions are included with the steps. Some basic tools and supplies are needed to complete this project. Tools include shovels, rakes, a couple of measuring tapes, a small sledge-hammer, and a tamp or roller. Supplies include stakes, string, paint (inverted aerosol spray cans), a pitching rubber, bases, and a home plate. Extra hands will make the project go much faster.

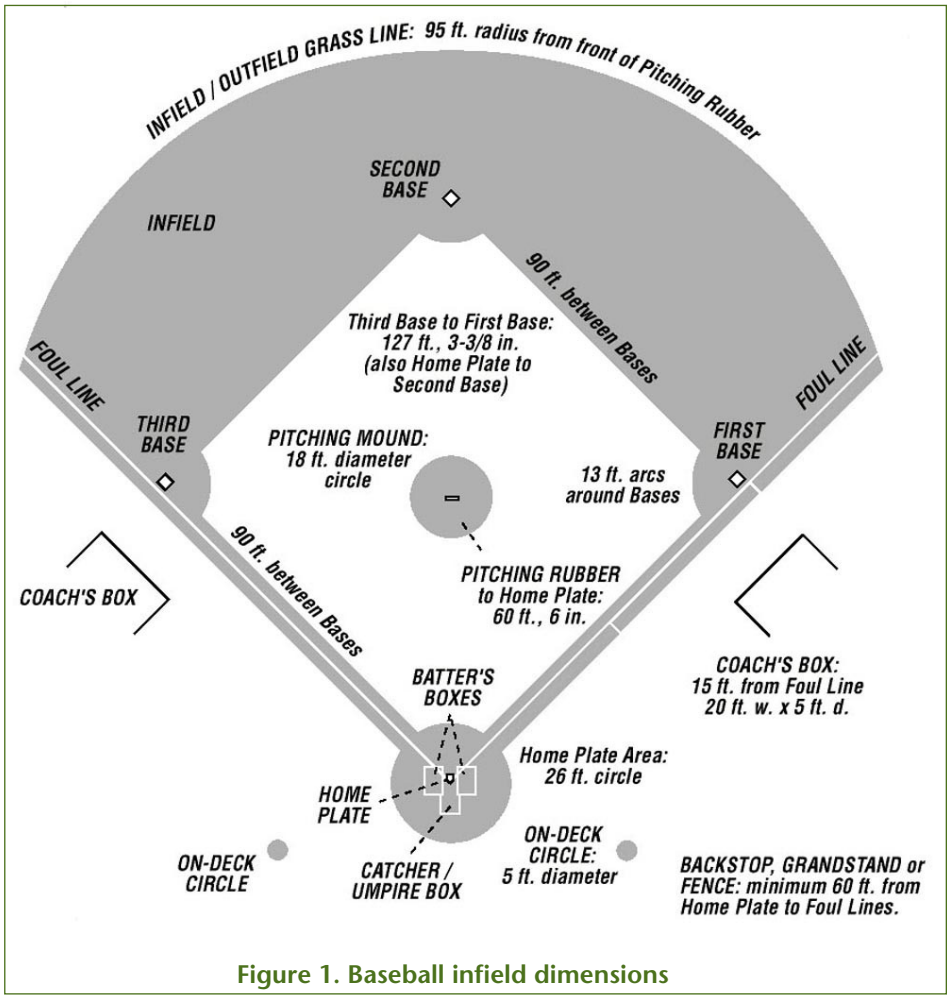

Figure 1. Baseball infield dimensions

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Table 1. Tools and Supplies for Building a Baseball Field

Tools	Number
Shovel	2
Rake	2
200-foot measuring tape	2
Small sledge-hammer	1
Tamp	1
Roller (optional)	1
Yardstick	1
Laser pointer (optional)	1
Supplies	
Stakes	5
Aerosol paint	2
Chalk box and chalk	1
Roll of string (at least 350 ft)	1
Pitching rubber	1
Bases	3
Home plate	1

BASEBALL FIELD LAYOUT: BASIC STEPS

1. *Start with a flat, open area.* If some elevation is on-site, it should be in the infield area. Ideally, the open area has a good dense stand of turf or conditions that will support a dense stand with minor renovation. If that is not the case, plan a turf establishment and management program to coincide with the construction of your ball field. It is helpful to mark out the components of an infield with paint as outlined below so you can visualize the field before you actually start removing turf.

2. *Placement of the home plate determines a field's layout.* If possible, locate home plate so the pitcher is throwing across the sun and the batter is not facing the sun. It is best if the line from home plate through the pitcher's mound and second base runs towards the east to northeast. Be sure to plan for some type of backstop to contain stray pitches and to protect fans from tipped balls. If it is truly a backyard field and fans are not likely to be sitting behind the batter's box, planting shrubs about 60 feet behind home plate may reduce the number of errant balls from rolling too far away from the field. A 60-foot distance is the minimum required for high school and college fields.

3. *Using the apex of home plate (its back corner), mark a 13-foot radius using an aerosol paint can tied to a piece of 13-foot long string that is anchored to a stake.* A screwdriver makes an excellent stake for this purpose. After marking this circle, return and use a shovel to cut out the turf within the line.

4. *Next, locate second base.* Measure from the back tip of home plate to a distance of 127 feet and $3^{3}/_{8}$ inches. (See Table 2 for distances between bases for different leagues.) Mark the end-point with a wooden stake. When installing base pads, this point will be the center of second base.

5. *With the tape measure still in place, it is easiest to go ahead and mark the location of the pitching rubber at this time.* The placement can be marked by measuring from the back tip of home plate along a string stretched to second base. The pitching rubber should be at 60 feet 6 inches from the home plate apex. For Little League or softball (fast or slow pitch), the distance to the pitching rubber (from home plate apex) should be 46 feet.

6. *Find first and third base by using two tape measures.* Stretch one tape from the second base stake toward the first base line. Stretch the second tape from the back tip of home plate toward the first base area. The point where the two tapes cross at the 90-foot mark is the back corner of first base. Repeat this step to find third base. A baseball diamond is actually a 90-foot square. For Little League or softball fields, use 60 feet rather than 90 feet for each base mark.

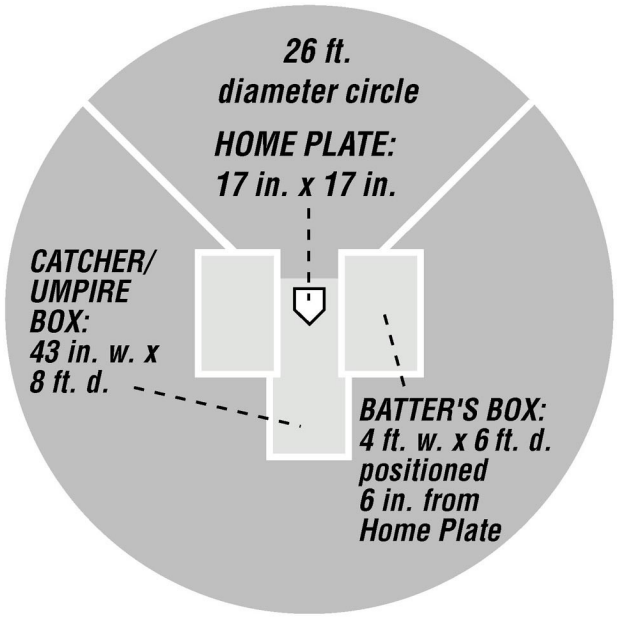

Figure 2. Batting area detail

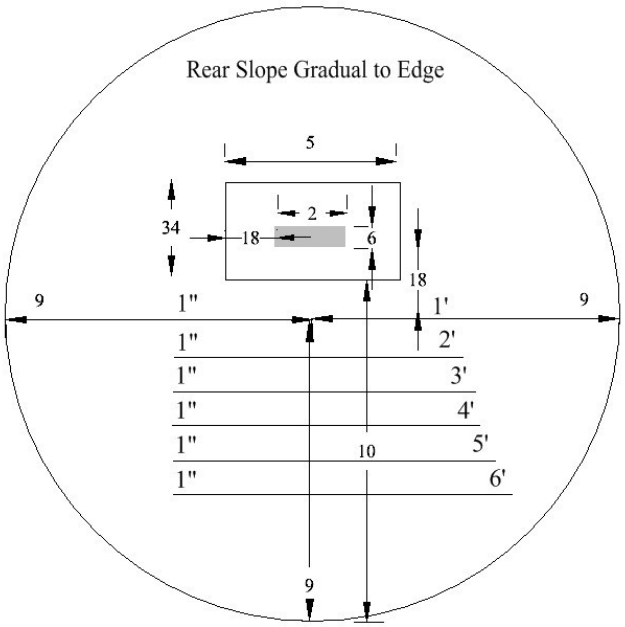

Figure 3. Pitching mound detail

7. *First and third base fit within the square, but second base is measured to the center of the base bag.* An improperly placed second base is one of the most common mistakes made when setting up a baseball field.

8. *To make a "slide area" around the bases, mark a 13-foot radius* within the 90-foot square using an aerosol paint can tied to a 13-foot long string. Then come back and use shovels to cut out turf. You can leave the base paths grassed if you like, or you can turn them into skinned base paths. Softball normally uses a skinned infield.

9. *Next, turn your attention to the pitcher's mound.* The diameter of a pitcher's mound clay is 18 feet: 10 feet from the front of the rubber toward home plate and 8 feet from the back of the rubber. The top of the mound consists of a plateau that is 5 feet wide.

10. *A regulation pitcher's mound is 10 ½ inches high (compared to the surface level of home plate).* Miscalculation of pitcher's mound height is probably the second most common error in setting up a baseball field. A transit or field level is best for setting the height; but in a pinch, other methods may also work. One option is to use your stakes with taut string and a ruler. Another method is to use a pocket laser pointer device held level on the pitching rubber pointed toward home plate. The height can be read at the point the laser hits the ruler. A standard pitcher's rubber is 24 inches by 6 inches.

11. *Building a pitcher's mound is as much an art as a science.* Build the mound from ground up, 1 inch at a time, keeping in mind the mound's slope (see step 12). As you add each layer, tamp or roll the soil. It will take 3 – 4 cubic yards of soil to build a mound.

12. *Begin 12 inches in front of the pitcher's rubber, and measure toward home plate.* For every 1 foot of distance, the slope should fall 1 inch (until the slope meets ground level). So keep the ruler and a level handy as you build.

13. *Finally, establish your foul line and erect something to serve as your foul pole.* Run a string from the apex of home plate, with the string just touching the first-base edge (sideline side). Continue running the string out to the "outfield wall." The foul pole should be placed on the inside of the foul line.

FIELD PLAYING SURFACES

Baseball and softball are the only major sports played on fields that have both turf and exposed soil for playing surfaces. Because about 66 percent of the game is played on the infield, "skinned" areas should receive as much attention as turf areas. Clay management is similar to turf management in that it is difficult to write a maintenance program for all infield skinned areas due to diversity among infield soils.

The soil and clay mix used to build the pitcher's landing area (and often the batter's box and catcher's box) should have a significant concentration of clay to provide the necessary stability to resist degradation from increased traffic. A good material will be about 40 percent sand, 20 percent silt, and 40 percent clay. Just be sure that individual components are evenly distributed throughout the material. This will make a harder surface than what you want on base paths. If necessary, you can mix individual components together. A number of companies offer special mixes for sale to use in constructing pitching mounds and batter box areas.

A quality infield material will have a lower concentration of clay than the pitcher's mound. The infield skin should be moist and firm, not hard and baked dry. To achieve firmness, an infield mix should not be too sandy. An infield mix with greater than 75 percent sand causes unstable footing for ballplayers and increases

infield skin maintenance problems. A sandy infield will create low spots more quickly and is more likely to create lips at the infield skin and turf interface. Ideally, the infield mix should be between 50 and 75 percent sand and 25 to 50 percent clay and silt. A combination that has been successfully used is a 60 percent sand and 40 percent clay base mix. If more firmness is desired, then replace up to 20 percent of the sand with silt. If the mix contains too much silt and clay, compaction and hardness become problems.

OUTFIELD FENCING

After building your field of dreams, you may want to erect an outfield fence. This distance varies with the level of play. Be sure the fence design selected will be safe when a player comes in contact with it, whether at its bottom, body, or along its top edge. Confer with league officials for the correct placement of an outfield fence and recommended data listed. Refer to Table 2 for a summary of base, pitching rubber, and outfield wall distances.

Table 2. Distances between Bases, from Pitching Rubber to Home Plate, and from Outfield Wall to Home Plate for Various Levels of Play

Field Use	Base to Base	Pitching Rubber to Home Plate	First to Third or Home to Second	Home to Outfield Wall
Baseball	90 ft	60 ft 6 in	127 ft $3^3/_8$ in	Varies
Little League	60 ft	46 ft	84 ft 10 ¼ in	180 ft radius
Pony League	75 ft	54 ft	106 ft ¾ in	250 ft radius
Babe Ruth League	90 ft	60 ft 6 in	127 ft $3^3/_8$ in	300 ft radius
Softball (Fast or Slow Pitch)	60 ft	46 ft	84 ft 10 ¼ in	185 – 300 ft radius
Female Fast Pitch Softball	60 ft	43 ft	84 ft 10 ¼ in	185 – 235 ft radius

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