



From Blueprint to Ballgame !

The Ins and Outs of Sports Field Design

By Brian Summerfield

Arthur Wellesley, 1st Duke of Wellington, the renowned British general who defeated Napoleon at Waterloo, reportedly said that critical battle was won "on the playing fields of Eton." Whether he actually said it or not, the implication of this now-popular quote is that the greatness of a community, region or nation is tied to the quality of recreation and athletics facilities for its young people.

With that in mind, it's important to ensure that the "playing fields" in your area give youth the opportunity to participate in the sports of their choice safely and properly. This will help them stay physically fit now, and also build strength, discipline and character that will sustain them for years to come. Here are the high-level issues you'll need to consider as you embark on a sports field project.

Getting Started

If you're constructing an entirely new sports field or making a major change or renovation to an existing one, there are a few questions you'll need to answer right off the bat:

- How much can I spend on the project?
- Which—and how many—sports does the field need to accommodate?
- How often will the field be used?
- How will the unique characteristics of the area (geographic location, urbanization, soil, etc.) impact the design and construction?

These questions, which we'll address in turn, will establish the approach you need to take.

How Much Can I Spend?

Most municipalities and other public and private institutions are under some level of financial strain right now. The economic downturn that began in late 2007 has lingered to the present day, and few see signs of a near-term turnaround in revenues. The bottom line: less—if any—available funding for sports field construction now and for the foreseeable future.

"People are delaying projects," said Jody Gill, grounds coordinator for the Blue Valley School District in Overland Park, Kan., and director-at-large of the Sports Turf Managers Association. "Capital projects are based on property values. Planned projects are usually delayed. If I don't have the funding for a special project, it's not going to get done. We'll keep making that request year after year until it's improved."

That said, the pricing for field design and construction has never been more favorable, and those organizations that can find the money to spend will discover some great values.

"When the economy first hit the skids, institutions hit the brakes," said David Nardone, a senior associate and one of the leaders of the sports group of Stantec, a company that provides design services and consulting for engineering and architectural projects. "But since the last half of 2010, there's an attitude of 'Let's take advantage of this market.' It's never going to be cheaper than it is now."

"If you've got a project that you requested last year, that [cost] should be lower this year," Gill acknowledged. "So yes, construction costs are lower right now, but you've still got to have the dollars to pay for it."

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Whether the market is up, down or sideways, though, the people who make spending decisions on sports field projects can control costs by picking the right design firm, Gill said. "The design firm is one of the most critical parts of the process," he explained. "It starts with good design. Quality project management is another one. Are the design folks going to be on site, and how often? On a big project, even if they're a thousand miles away, they should have someone on the site. Someone who's experienced can deal with problems that come up quickly. If you have a problem that comes up that requires the project to shut down for days, then your costs go up.

"If you're going to build a field, no matter what the economic situation is, it's important to have experience. If you hire someone with no experience in an attempt to cut costs, then you're going to end up spending a lot more. What do you do when you hire a new employee? You do reference checks, look at past performance and so forth. It's sad to see when institutions don't do that for contractors."

Should pricing resolve whether you pick natural grass or artificial turf for your field? Perhaps, but it probably shouldn't be the determining factor here. All things considered, the difference in cost between the two is negligible, Gill said. You will definitely spend more up front with a synthetic surface, he added.

"Synthetic turf requires a much more precise design and much more careful thought," Gill said. "You're putting a million-dollar product on a two-acre space. If something happens to the earth beneath it, it could cost a lot more money. Natural grass is a little more forgiving in that respect. You can always add more to the top."

However, the time and money put into maintenance of a grass field is significantly higher than non-natural surfaces, he said. "You're not fertilizing, you're not mowing. That's not to say there is no maintenance for the synthetic turf," he explained. "You're painting, vacuuming and doing other light grooming."

One other cost you have to consider with synthetic turf is the eventual replacement of the field. "These things don't last forever," Gill said. "You will need to buy and install a new carpeting and rubber."

Depending on the quality of the product and wear and tear from usage, this will need to be done every 10 to 15 years. Gill said you can expect to pay about 40 to 50 percent of the initial purchase and installation cost for a replacement project.

Which Sports Will the Field Accommodate?

Will different sports be played on the field, or will it be dedicated to one particular team? Will it accommodate athletes of widely varying ages and skills? Will it be used for full-contact sports? Will it serve as both a practice and playing field? These are some of the questions you have to answer before you start putting designs on paper.

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For understandable reasons, not least of which is cost, the multipurpose sports field has become a more popular choice in recent years. Of course, that may not be an option for a sport like baseball, which has highly specialized field requirements. But if you've got little land and funding to work with—and want to provide a space for sports such as, say, soccer, lacrosse and ultimate Frisbee, which don't require much beyond a big, open space and don't draw a ton of spectators—then a multipurpose field would probably be a good move for you. Plus, it may be used for non-sports activities, such as band practice or outdoor school gatherings.

At this stage, it's very important to communicate to the design firm about your needs. As a vendor, Nardone works closely with clients to figure out exactly what they want the field to be used for, now and in the future.

"Everyone's experience is unique," he said. "I really have to get to know them a bit to provide the best product for their athletes."

How Often Will the Field Be Used?

A sort of offshoot of the previous question, this is perhaps the most important thing to consider when dealing with the synthetic vs. natural issue. And when it comes to durability, it's no contest: Synthetic turf wins hands down. As mentioned earlier, these fields do need to be replaced after a while, but they can take a beating day-in, day-out for a solid decade.

"The big difference between synthetic and natural grass is maintaining the quality of the surface," Nardone said. "You have to really figure out how many hours you want to use it. You might play 12 hours a week and rough up natural grass."

Gill agreed: "The big advantage of synthetic turf is constant play. But natural grass is a bargain, especially when it isn't being played on a lot."

How Will the Location Affect Design and Construction?

Geoprobes. Nutrient analysis. Drainage. If you're not knowledgeable on these topics now, you will be by the end of your project. Here's a look at the most critical elements related to the location of your sports field site.

Soil

As any field design expert will tell you, soil testing is crucial. You've got to make sure that your field is on solid ground, and that—for reasons related to both aesthetics and athlete safety—the surface won't be negatively affected as the earth shifts beneath it. This applies to both natural and synthetic turf.

"Soil testing is critical, not just on surface, but also geo-technical, deeper investigations," Nardone said. "You should try to find out if you can dig and fill."

"You don't want to pick a site that will need extensive sub-soil drainage," Gill added.



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A soil analysis, which needs to take place before design and construction, starts with digging. Your design team should dig a few pits approximately seven feet deep throughout the site to check the quality of the topsoil and subsoil, the recent history of the site (i.e., whether it has been affected by major manmade or natural events), and the necessity and extensiveness of a drainage system.

There are a couple of different ways to facilitate drainage in a field, which are sometimes used in combination. The first is to dig into the site, reconstitute the soil composition with sand and gravel, and install an underground system of pipes that either distribute water through the earth underneath the field or move it out. The other way is to develop landscape features such as a slight overall grade and a "crown"—that is, a high point of elevation somewhere around the center of the field that rises above the periphery by about a foot to a foot and a half. These will allow gravity to do drainage work for you.

Even if you're redesigning an existing field, you'll still need to do soil testing. Important assessments include measuring sand, silt and clay percentages and—if you've got a natural grass field—analyses of the soil nutrients and rootzone.

Harvard 'Fields' a New Soccer Stadium

Harvard University's Soldiers Field sits on land next to the Charles River in Boston that was donated by poet Henry Wadsworth Longfellow and his son, as well as Henry Lee Higginson, an alumnus whose notable accomplishments included serving as an officer in the U.S. Civil War and founding the Boston Symphony Orchestra.

When the time came to construct a new soccer field on these grounds, Harvard sought a venue that was well designed but also more functional than nearby Ohiri Field, which, because of its proximity to a residential area, could not offer the lighting required for night matches. Also, it was often difficult to play in the notoriously inclement New England weather on a natural surface. Working with Stantec Sports Group, Harvard built an artificial turf field that seats 2,500-plus people—in addition to standing-room-only space—for the men's and women's soccer teams. The site was not without its challenges, said David Nardone, a Stantec senior associate. He said they realized the soil below the field would compress from the get-go.

"The new soccer field had to be created at or below the existing grade to help mitigate potential settlement," Nardone explained. "This requirement produced a large volume of soil that would be expensive to export off site."

To counter this problem, Stantec developed a design that proposed berms—that is, inclined earthen walls—on all four sides of the proposed field, creating an outdoor stadium field surrounded by vantages for spectators.

Harvard selected this option, and once construction was completed in 2010, dubbed the new venue Soldiers Field Soccer Stadium.

"After the fact, they named it a stadium," Nardone said.



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Grass

If you're dealing with a natural surface, then what grass you select and how you maintain it is of the utmost importance. Once you've determined that you have the proper nutrient and composition mix via soil testing, it's time to lay down some turf.

Your climate should determine which grasses you pick. If you're in an area that tends to have longer winters and shorter summers, you'll probably want a blend of Kentucky bluegrass, ryegrass and fescue. In regions where it tends to be hot and sunny throughout the year, your best bet is bermudagrass.

(Side note: If you're in the U.S. Sunbelt and your field will be used mostly in daylight, you may be better off choosing natural grass over synthetic turf, which augments heat and can create sweltering conditions.)

And if your area falls between one of those two extremes, you should consider combining cold-weather grasses and more hardy varieties of bermudagrass. After planting, you'll want to keep the surface at the length that the sports dictate—but be sure not to cut it too short, as overcutting can damage or destroy the grass. Also, you should regularly test the plant tissue to make sure the grass is getting the right nutrient mix.

Surrounding Area

Another critical consideration is the environment immediately around the site. Are there features near the field that will have an impact on what you can build, and where?

If it's in a densely populated or highly developed area, will you have room for parking and ancillary facilities such as a fieldhouse or vending stations? Will you be able to install lighting for night games? What about local traffic patterns—could they hamper access to the field or cause unwanted distractions for athletes and fans alike?

Also, consider the environmental implications of your proposal: Are there any wetlands or bodies of water around the field that could be negatively affected by your project? Conversely, could these features cause flooding or underground water saturation of your field? Additionally, what kinds of sports will be played on the field? Could wind patterns and the position of the sun at certain times of the day have an adverse impact on the games?

A further complication related to the location of the field is the paperwork. You should be prepared to file multiple permits and pay filing fees for each one.

"If you can obtain permits before you begin the project, that's great. A good design firm is going to be able to help you with that stuff," Gill said.

In summation, there is quite a bit involved in what—to the untrained eye—would seem to be a simple and straightforward project. Depending on how quickly you can select a design company and file all of the necessary permits, as well as whether you are doing a fresh build or a renovation, you can expect the project to take between six months to a year, Nardone said.

"It is valuable for folks to have an understanding of this process," he said. "It's not simply sending out the bulldozer and rolling out some turf."

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Synthetic Turf Equals Winning Teams ?

Synthetic turf has both proponents and detractors, but there's no questioning this: 12 of the top 25 Bowl Championship Series teams have synthetic turf at home, and these teams have a combined win-loss record of 133-29, a total 86 percent win percentage.

While there's no way to prove a connection between the turf type and the wins, the number of winning teams does highlight another trend: the growing reliance on synthetic turf.

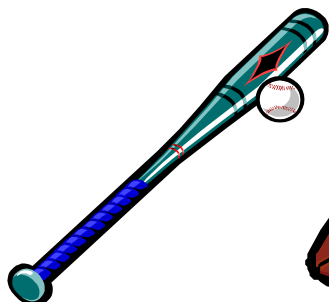
"Over the past decade, we have seen a steady increase in the amount of winning teams that play and practice regularly on synthetic turf," said Rick Doyle, president of the Synthetic Turf Council. "These fields have created more opportunities for America's amateur athletes to play and practice football without worrying about weather disruptions or over-used playing surfaces."

There are more than 6,000 synthetic turf playing fields in use throughout the United States, and their popularity continues to grow. According to Recreation Management's most recent State of the Industry Report, synthetic turf fields were among the top planned amenities at colleges and among local school districts.

Proponents of synthetic turf claim that they conserve water, drastically reduce the use of pesticides and fertilizers, and also recycle 25 million tires, which would otherwise end up in the landfill.

And they're not just popular for college-level play. About half of all **NFL** teams also currently play their games on synthetic turf, and it was approved by FIFA for the 2010 World Cup soccer competition.

Learn more about synthetic turf by visiting www.syntheticurfCouncil.org.



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