

K-12 Athletic Facilities: Synthetic vs. Natural Turf Fields

When a School District is considering improvements to their outdoor athletic fields, they must weigh a variety of factors in making their decisions, including cost, public support and the necessity for the improvements. Once it is determined that they need to add a new field or improve an existing field, one of the first decisions that must be made is whether it should be natural or synthetic turf.

Based on our experience, this is a decision that must be made on a case-by-case basis, with the overriding concern being the health and safety of the athletes that are using the fields. There are some rules of thumb we can go by in regard to whether or not a natural turf field can be properly maintained. For example, if there are more than forty games played on a field in one season, it is questionable if the maintenance staff can keep up with it. However, there are no strict rules that will work for all Districts.

In visiting literally hundreds of school sites, we have seen situations where the District's athletic programs are functioning well with natural turf fields, and others where the District does not have the ability to provide adequate facilities for the number of students it has participating in its physical education program, sport program, extra-curricular activities as well as community use.

The main situation we have seen that compromises a School's ability to provide adequate outdoor facilities is a basic lack of space on the site for athletic use, usually because they have a restricted site and no room for expansion. Some negative results of this situation we have seen are:

- Practicing and competing can be at many different sites, which is costly and often inconvenient for the coaches, players and parents. One School District we have worked with has nine different sites for its high school outdoor athletic programs.
- Schools will forgo having home games, either because they do not have the facility or it is not up to par for competition.
- Schools will limit their outdoor physical education to a minimum program.
- Use of areas with poor soils, excessive slopes and wet areas that are not conducive to healthy turf.
- Overused fields where the earth is compacted hard, and where goal and center field areas are bare of turf. This is a situation where the health and safety of the athletics is of concern. Sometimes an improved maintenance program can keep up with field use; however, there is a point where even the best maintenance cannot compensate for the amount of use the field gets.



Overused Football Field



Multi-purpose Field with Overcompacted Bare Areas

These are examples of instances where synthetic turf has a role to play in public schools athletic facilities. All types of turf must be maintained; however, from our experience, instances where a District is challenged to keep up with the maintenance of a field, synthetic turf has a better chance of maintaining a suitable “G-Max” rating (the rating of the ability of the field surface to “give” upon impact) than natural turf.

If synthetic turf is chosen, an important goal we would recommend is that the new facility be planned so that it will positively impact as many students as possible, whether they be athletes, sports fans, marching band members or physical education students. In summary, our recommendation to schools to guide in this decision is that a thorough study of their athletic facility needs, the physical site and their maintenance capabilities be provided (see following “Factors to Consider”) in order to determine which type of field is appropriate, to meet both their short and long term goals.





Synthetic Versus Natural Turf: Factors to Consider

1. **Field Usage:** The number of games played per season should be examined, including P.E. use, school athletics programs, extracurricular programs and community use. Does the natural turf field have adequate time to recover between games and between seasons? Factors to consider include –
 - a. Number of sports and the number of teams per sport versus the number of available athletic / PE fields.
 - b. Types of sports played – some take more of a toll on a field than others – for example, lacrosse and football can be more damaging to the grass than soccer or field hockey.
 - c. Is the field used for practice, regular games and exhibition games, or are separate practice and game fields available?
 - d. Do Varsity, JV and/or Modified teams share the same field?
 - e. Do the boys and girls sports share the same field?
 - f. Is the field lit and are night games a common occurrence?
 - g. Does the community or camps play on the field in the summer? If so, does the natural turf have time to recover between the spring and fall seasons?

2. **Maintenance:** Questions to consider –
 - a. Does the school have maintenance staff with the training and budget to maintain natural turf in a safe, playable condition? With additional staff training and/or equipment, could the maintenance staff keep up with the natural turf maintenance demands? It should be noted that neither natural turf nor synthetic turf can be ignored; however, synthetic turf has a better chance of maintaining a suitable “G-Max” rating (the rating of the ability of the field surface to “give” upon impact) than natural turf if not maintained in a consistent manner by knowledgeable staff.
 - b. Natural turf is more prone to problems due to weather. Are the soil and other field conditions prone to wetness, and can it be dealt with through normal remediation measures, such as underdrainage? Are the soil conditions prone to dryness and can it be dealt with through irrigation? Consider the costs of the remediation measures and any additional maintenance in comparison with the long term costs of a synthetic turf field. These are particularly important considerations when a field is used for sports that start early in the spring or is used late into the fall.