

# Creating "Fields of Dreams" that are Safe for Participants

DR. MITTELSTAEDT ADDRESSES SAFETY CONCERNS WITH SOCCER, RUGBY AND FOOTBALL FIELDS & FACILITIES

*Turf is only one factor in the safety equation...*

Soccer, rugby and football fields and facilities safety is an increasing concern in sports and athletics because of the alarming number of injuries being reported to the Consumer Product Safety Commission. This concern puts pressure on Field Operators, Turf Managers, Maintenance Supervisors and others to have safe playing fields.

A "field of dreams" is created from a consistent set of proven guidelines and safety standards to ensure consistency around the country. As opposed to synthetic or artificial turf fields, natural turf sports fields have a unique array of variable challenges because of the field conditions created by a multitude of environmental factors. Synthetic or artificial turf fields bear other challenges.

Turf is only one portion of the whole that makes a field safer. Hopefully, other researchers who also address turf field safety will outline the scope of clinical and scientific research into the standard guides or practices being developed for both natural and artificial turfs. This article addresses some of the other factors that make up the whole through the total plan/design process.

A planner should engage in various steps or phases in providing a sports field to create a safe environment for players as well as officials and spectators. The days of the makeshift open lawn must be forgotten or the injuries will continue to grow. The field and equipment used today is much more sophisticated and the influence of the player mind set and technology necessitates careful planning, designing and engineering processes to minimize the potential for injury prior to, during and after the game. All physical planning, designing and engineering is predicated on function dictates form.

Early in the development of a new field, the owner of the potential sports turf field

must apply sound and proven guidelines (which unfortunately are scattered throughout textbooks) in planning and designing or retain the best possible advice to reduce exposure to risks.

The planning process is often subject to analysis as a source for basic causes of injury which result in liability. For example, there is no complete list of such measures and the base norm for each cause of injury has not been compiled. Therefore, objective comparisons can not be made for the different types of fields. There is a composite list of ASTM specifications, ISO specifications, DIN specifications and others, with no cross comparisons available for objective analysis and decision.

The owner or operator of a field must in his/her designing/engineering process retain consultants who know and are responsible for the execution and implementation of the standards of *care* as well as *design* to reduce participant exposure to risks. They must be aware of the following guides:

## Program

The *scale* or dominance of the larger environs that the field is within must influence reasonable supervision and surveillance. The *extent* and *intensity* of programs that will use the field will influence the type of turf.

## Scale of Equipment

The user *age, sex and skill level group* must influence all equipment. The *type of game* being played must establish the field classification and boundaries. The *relationship* of fields and appurtenance and of facilities of one to another must be harmonious and complementary in encouraging and facilitating ball playing.

## Field Turf

The turf surface can be synthetic (artificial) or natural. Synthetic materials can

be soft or firm; they can be piled, turfed, graveled or smoothed; they can be rolled, poured, paneled or sprayed. The ingredients of the turf can be rubber, polymer, pigment, PVC, thermset, thermosplastic, and a host of other new high tech materials. Synthetic products also have substrates which are of varied ingredients.

*Synthetic or artificial turf* has both pros and cons for players and operators. To the players, the top coats and shoe or footwear has interaction, surface disfigures or stays in place; the surface has a resiliency or non resiliency; the ball responds or bounces; the surface dries rapidly, has a cooling effect, is picturesque, affects ball speed, has traction or gives, and a host of other factors.

To the operator, the surface has to drain, be easily repaired, be durable, stable, and easily installed.

In addition, there are a variety of other test methods that are measured to compare topcoat and substrate ingredients. These include linear coefficient of expansion, tensile strength, elongation, moisture absorption, hardness range, compression set, temperature stability, compression properties, density, pile height, thickness, coefficient of restitution, abrasion resistance, flame resistance, coefficient of friction, thermal conductivity, oil resistance, ozone resistance, solvent resistance, liquid extends, water resistance, low temp resistance, colour retention, tear resistance and other criteria.

*Natural turf* has a corresponding attraction to players and operators. As a result, the former debate over concern goes on. In addition to the real or perceived preferential concerns there are corresponding technical factors that can be measured as evidenced in the artificial turf. In addition, the hardness, growing treatments, drainage, aerating, mowing, vacuuming and a host of other conditions applicable to a natural material must be reviewed. In es-

sence, a natural turf is not more resilient than artificial turf. However, it is perceived to be softer to the player.

### **Illumination**

Lighting and the actual field lights are critical to safety. The illumination level for soccer is 20 footcandles for the field. The air should be checked for contaminants that can cause the reflector surface to change by increasing diffusion and decreasing total reflection resulting in less total light energy leaving the face of the light with less lumens. There should be no shadows on the field which may create unsafe catching, nor should there be any glare or irregular bright patches.

**Lumen – a measure of light, much like a mile is a measure of distance.**

**Footcandle – one lumen of light spread over one square-foot of surface. In other words, a light level of 30 footcandles means that 30 lumens of light are being projected onto each square foot of playing surface.**

All stanchions or poles should be out of the field of play. If because of space limitations they are in the outfield, they and any other obstruction should be super padded for impact attenuation of a crash encounter and a sufficient buffer or warning zone placed around the pole. There should be no other changes in grade around the pole that could create a tripping hazard.

### **Orientation**

There are various thoughts as to the orientation of fields. It depends upon where the field is and the time the games are to be played.

### **Barriers**

Throughout a field area and more particularly around the perimeter of the field, barriers are required for different purposes, i.e. security, isolation, enclosure, separation, noise abatement, wind screening, sun screening, pedestrian and vehicular traffic control along with protection. Each of these purposes must be kept in



mind when selecting the placement and type of barriers. However, the purpose is to prevent players from contacting obstructions and to prevent spectators from being hit by the ball.

The barrier should protect sideline spectators, bleacher spectators, players in player benches and pedestrians moving around the field. The barrier should be a minimum of six feet in height and without cross pipe or H beams that could be contacted by a player hitting or brushing against them. Outfield fencing netting should be placed on the field side of the post. Advertising boards placed on the fence should be outside the field of play.

### **Player Bench Space**

The space set aside for players, coaches and others involved in the game must be a protected area. Often it is thought that dug-outs are open, however, because of the number of injuries, a shield of shatter proof glass or plastic is in front of seated players and the entrance from it to locker rooms or area beyond. The barrier should be at least at the six foot height from a standing person in the space.

### **Kicking Cage**

The space for kicking practice should have perimeter barrier screening and screening around the area the ball is hit into – either a close-in net or a larger area. The screening should be doubled so that should a ball hit it and it gives with the impact, anyone standing or walking by the area will not be impacted.

The floor area should have a minimal pitch enough to run off any water and of a rough texture to provide foot transition. Appropriate warning signage should be displayed.

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**Editors note:** Dr. Mittelstaedt will be speaking at the 2003 Ontario Turfgrass Symposium. His session *Update on Sports Turf and Field Standards* is scheduled for Thursday, January 23, 2003.