

Organic matter accumulation in the top couple inches of the surface can begin to act like silt and clog the macropores that conduct air and drainage water.

Tom Serensits, manager of Penn State's Sports Surface Research Center, has done significant work using Primo on these sand-based fields. His research showed that if Primo is applied all growing season stopping sometime in early August, that a field can experience as much as a 20% reduction in divoting into November. You can watch a video of Tom's work by going to ssrc.psu.edu and selecting 'SportsTurfScoop' in the left hand menu.

Using all of these techniques often isn't enough to allow the turf manager to maintain a consistent turf stand. Thus all but a handful of natural grass NFL stadia resod at least 1.5 times per year and as many as four times per year, bermudagrass fields included. We have been working with sod companies to improve the quality of their sod for these in-season resod jobs. This has truly become a science. The team is on the road next week, so it is de-

cidated that the old sod will be stripped, new sod will be harvested and laid, and a game will be played on it 10 days later. Many of the techniques suggested above are employed in the sod field, before harvesting, to reduce the divot potential of newly laid sod.

Kentucky bluegrass cultivar selection is also a factor. Personally, I believe that Kentucky blue breeding is moving away from what sports fields need. I believe that the cultivars we used 20 years ago were more divot resistant than the cultivars today. We are looking for aggressive rhizome producers and typically those cultivars are poor seed producers and have been abandoned by growers in Oregon due to the low yields per acre during seed production. While today's cultivars are more attractive and more disease resistant, they are also more prone to divoting. We have begun to play with some old cultivars to determine their divot resistance and see if selections can be made in order to breed grasses specifically for these high-end sand-based fields.

Evan Mascitte, an MS candidate working

in our project, has decided to seriously investigate the preharvest conditioning of sod to be used for in-season resodding. We'll be reporting on that work in another issue.

And remember: some of the best, in any business, are so good they make their jobs look easy, when in reality they are hard-working professionals performing well. ■

Dr. McNitt has been with The Pennsylvania State University for 30 years. Presently he is Director of Penn State's Center for Sports Surface Research (ssrc.psu.edu) where he conducts research relating to athletic field surface characterization and golf green construction and maintenance. Dr. McNitt is also the Program Coordinator for the 4-year turfgrass science major and the Basic & Advanced Certificate as well as the Associate, Bachelors, and Masters of Professional Studies Programs offered through Penn State's World Campus Online Learning. In 2010 he was inducted into Penn State University's College of Agricultural Sciences Academy of Teaching Excellence.

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Field painting tips & disaster stories

- ⊙ What 3-4 factors do you consider most important for efficient and successful field and logo painting?
- ⊙ What is the worst painting disaster you've ever been involved with or seen happen?

MARTIN KAUFMAN, CSFM
Turf Managers LLC
Nashville, TN

Efficient and successful field and logo painting begins with: 1. Preparation; 2. Planning; 3. Observation; and 4. Focus (& double check).

The worst painting disaster I have been a part of is painting a 30 yard line from the west side of a football field to the 31 yard line on the east side of the field, letting it dry and not discovering the problem until I was painting hash marks on the east sideline. This game was on TV too.

ALLISON MOYER
Grounds Manager
Collegiate School,
Richmond, VA

Pre-paint by planning out on paper what needs to be painted. The colors needed, measurements of the logo and overall look of the project

Timing is crucial in getting a good logo. Give yourself plenty of

time to complete the logo. Also, make sure you paint it in enough time for it to completely dry before players arrive. Check with coaches and find out practice/game schedules before you start. Wet paint on a field does not mix well with people walking all over it!

Equipment. Always check your equipment before beginning. Check rollers, paint, strings, & tapes are good and usable.

Patience. Don't get frustrated. It takes time to create a logo. Things will always turn out better if you do not get frustrated

On the coldest night of the year, I painted an Arena Football field on an outdoor regular football field. It happened to be a synthetic field that had that needed to be painted with embedded regular football hashes, numbers, & lines. After much discussion, the complex made the decision to paint the embedded hashes, numbers, & lines with green paint to cover them up and then repaint

the correct lines for arena football. We tried to get a green as close as possible but in the end it looked tacky.

BILL CONNELL
Field Operations
Buffalo Bills

First, all equipment is in good working order (cleaned after last use, properly tuned, all parts, spray tips, etc., inspected).

Second, check weather, team schedule or any other source of disruption that would prevent the goals of the task from getting done.

Third, get proper amount of paint ready to go: mixing, cutting, and filtering.

Fourth, start job and be neat and precise. Don't get lazy or sloppy; be consistent from start to finish.

My worst painting disaster was painting the numbers college distance from the sideline (21 ft), not the professional distance (36 ft) from bottom of the template. I had to dye out wrong numbers during

the night. This was a practice field, but a disaster to me none the less!

RYAN NEWMAN
Director of Athletic Grounds
University of Colorado
Athletics

First factor for successful and efficient painting is monitoring the weather. Try to get ahead of forecasted precipitation to make sure the paint dries before it rains. If you can avoid painting in windy conditions, this will minimize the amount of drift you have. Also, as the season progresses, we get colder temperatures and shorter days, so we start the painting earlier to ensure the paint dries in time.

The second factor, and probably the most important, is having a knowledgeable crew; they need to know proper field dimensions, painting equipment operation, and be on the same page with one another. There is a lot of teamwork involved in painting; most processes involve multiple team members so knowing what the other guy is doing and when he is going to do it and vice versa will eliminate most mistakes.

The last one is using quality paint and reliable painting equipment, and making sure the paint is mixed properly and consistently. Taking care of your painting equipment by properly cleaning it when finished will ensure reliability and functionality.

The worst painting disaster I've seen was when I was a student at Iowa State. We had a stand alone unit in the back of a cart and were moving from one end zone to another along the perimeter. We did not wind up the hose for the painter, we were just pulling it behind the cart. We made the turn at the corner and the hose snagged the nail holding the sideline string and it jerked the paint and painter right out of the back of the cart. The other one I witnessed; we had the painter in the back of a truck heading to one of our faci-

ties when the tailgate came down and the painter fell out at about 35 mph. The handle bars were bent a little, but it started up on the first pull and we painted the soccer field with it.

ABBY MCNEAL, CSFM
Director of Turf Management
Wake Forest Athletics

Make a good “game plan” for painting by setting the pathway to get things done with the group; this keeps everyone on the same page so they should know what comes next in the process to best be prepared in case things occur.

Have a clear understanding of the layout and/or the logo and take pictures of the logo and field measurements with you into the field to ensure that you put it in the correct location. The picture also helps to make sure that you paint the logo correctly. Field layout information also helps to make sure you have all the correct markings for that particular sport.

Make sure that you have towels and water as paint spills happen and you will need to be prepared to clean them up.

Take extra string, nails, and tape measures of varying lengths to help make sure you layout the field or logo correctly.

Take a picture of the final product to be proud and to learn from in the future (teaching tool).

Worst painting disaster I have seen is an NFL field with the arrows on the wrong side of the numbers. I won't say which one but it was about 15 years ago.

Worst painting disaster I was a part of occurred when paint was spilled onto synthetic turf and the employee flooded/washed the spill are with water. The waste water, diluted white water, washed into a local stream and was reported. We then had to provide information (MSDS and labels) to the fire department and environmental police. The employee did the proper thing by washing the spill out, just a lesson learned to know remember where things drain too. The fire department flooded the area with more water to help the situation.

BRETT TANNER, CSFM
Sports Turf Technician
University of Virginia

Use a clean and dependable painter. A good paint job starts with good equipment. Consistent cleaning and maintenance of your paint machine will help guarantee its performance when called upon. It's also good to have a backup plan as well, aerosol, 4 inch rollers, or even chalk if needed.

Understand and communicate what is being done and expectations. I try to gather everyone who will be involved during the painting process and go over the steps and the order in which we'll complete each one. I also print out diagrams of the field being painted including field measurements and colors of logos.

I always want to make sure we have enough time to ensure we take all the steps to provide the highest quality product possible. It also helps in the event of inclement weather, equipment problems, or reduced staffing.

I think I've been fortunate, if you're prepared and organized I feel that you can avoid most mistakes. Some of the “disasters” I have been involved with the occasional upside down 3, an arrow pointed the wrong way, or stencil burn from marking a logo in the afternoon on a hot day. You learn from those mistakes and take the appropriate steps to avoid them the next time.

KEVIN WHITE
Athletic Grounds Lead
Seattle University

1. Be prepared; make sure you have everything you need and it is ready to go before you start painting.

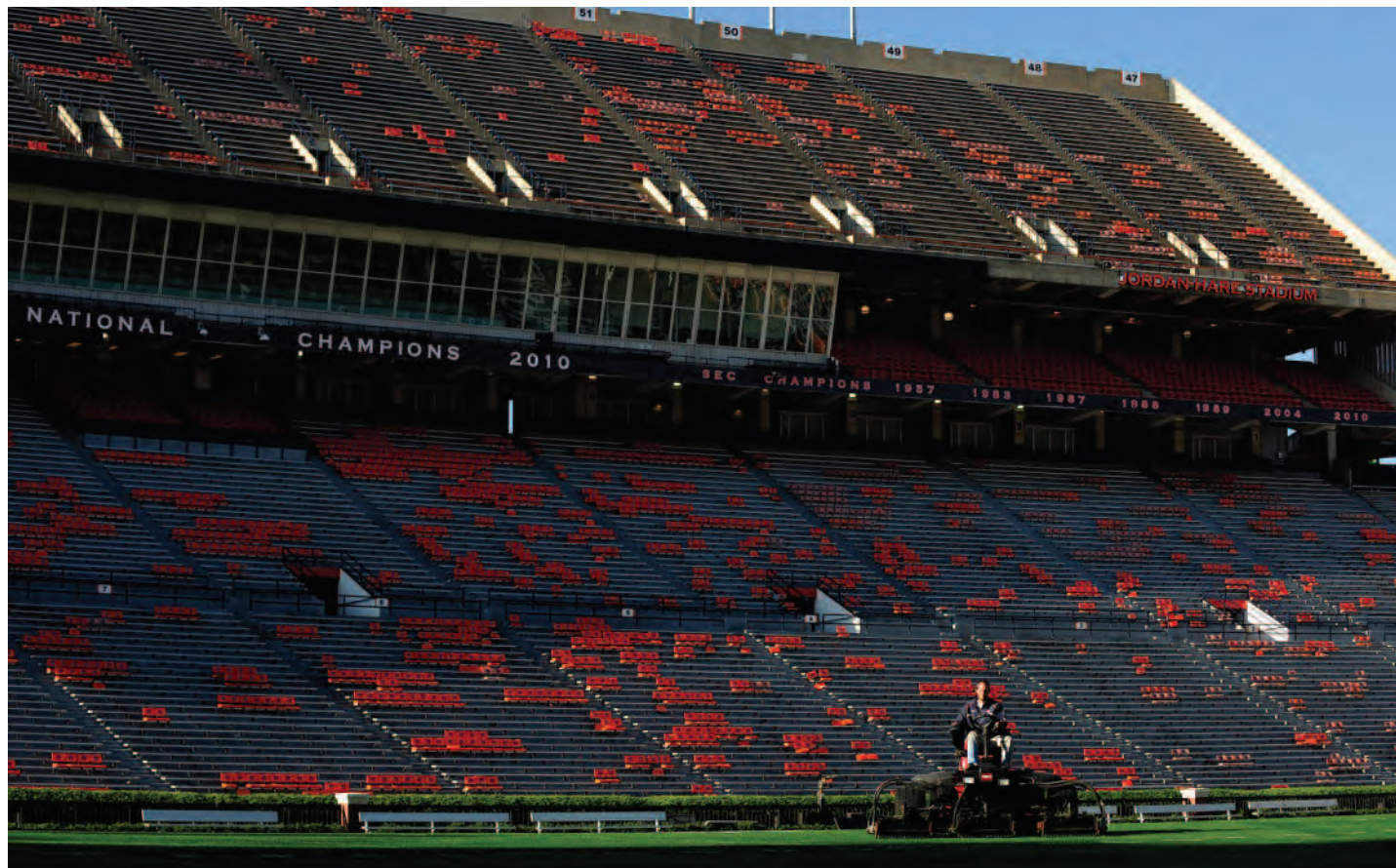
2. Pay attention to the radar (weather forecasts in Seattle are not always accurate!)

3. Double check the layout from the stands (or higher vantage point) just to make sure everything looks right.

4. Clean-up is just as important as setup!

My worst disaster happened a couple of years ago during our men's soccer home opener against the University of Washington. We had just purchased a new airless sprayer and wanted to use it for the first time to paint the field. Our men's and women's teams use our field for training and games, and because of scheduling we paint before each game so the lines are bright and crisp. We set up the sprayer and ran water through it the day before and thought we were good to go, but for some reason we couldn't get paint to come out of the tip on this day. We discovered we were missing the tip seal, but didn't have a spare and were running out of time. I managed to find an old aerosol sprayer and enough cans to at least put lines on the field (so I thought). Half way down one side, the cable breaks on the handle...I have 30 minutes left before the game kicks off, and I still need to paint AND wind up string. Needless to say, we now have spare everything, including a functioning aerosol sprayer and paint as a backup. ■

The advertisement is a vertical banner with a black background. On the left side, there is a vertical stack of five colored boxes, each containing an image and text. From top to bottom: a green box with a paint can and the text 'quality bulk paints'; a red box with a windscreen and the text 'custom windscreens'; a yellow box with a fan of aerosols and the text 'bright aerosols'; a blue box with a stencil and the text 'custom stencils'; and a green box with a paint sprayer and the text 'painting equipment'. To the right of these boxes, the text 'WE MAKE THE GAMES LOOK BETTER' is written vertically in white. In the center-right, the text 'JOIN THE WORLD CLASS TEAM' is written in a large, white, serif font. At the bottom right, the 'WORLD CLASS athleticsurfaces' logo is displayed, featuring icons of a soccer ball, a football, a baseball, and a tennis ball. Below the logo, the text 'Find it all on our website: www.worldclasspaints.com 1.800.748.9649' is written in white.



Gridiron maintenance challenges within the SEC

MEETING THE EVER-CHANGING MAINTENANCE NEEDS of college athletic fields must begin with a winning team of turfgrass managers. The grounds crew at Auburn University is well rounded with turfgrass management and horticulture graduates as well as former athletes who know how an athletic field should perform. The crew of seven full-time employees and six students is responsible for maintaining 15 acres of athletic fields, a 23-acre golf practice facility, and the landscaping around the athletic facilities. Directed by a graduate (BS and MS) of the Auburn Turfgrass program, Eric Kleypas, the crew fully understands the importance of football in the South, and especially in the Southeastern Conference (SEC).

With some of the best athletes in the country, delivering a safe and playable field is a must. Also it is important to keep the fields looking in excellent shape, as they are exposed to tens of thousands of live viewers and millions of eyes through TV coverage on Saturdays in the fall. And it doesn't end there: with a fierce recruiting race for the

best players, it is important to keep the fields in excellent shape year-round. Add special events to the mix, and maintaining fields in the SEC can become extremely challenging.

Facilities used by the Auburn football team include natural grass at Jordan Hare Stadium, with a capacity of 87,451 fans,

▲ **MOWING** at Jordan Hare Stadium.

two natural grass practice fields, and one indoor artificial turf field. Tifway bermudagrass is the turf of choice and all fields are overseeded in the fall with perennial ryegrass to maintain playability and aesthetics throughout the winter. Depending on the time of year, mowing heights range from 5/8" to 7/8". For the majority of the summer, height of cut is at 3/4" and fields are mowed six days per week. Fertility requirements are met with a combination of slow release, polymer coated products and supplemented with quick release, soluble sources as needed. Summers are spent frequently core aerifying to alleviate compaction, remove logo paint, and slow organic matter accumulation.

THE NEED FOR QUALITY TURF YEAR-ROUND

As with other schools in the SEC, recruiting has become a year-round process at Auburn, creating the need for pristine athletic fields 365 days a year. The turf

crew has been asked to transition from perennial ryegrass to bermudagrass in the spring/early summer while keeping the fields game ready for recruiting visits and summer camps.

Southern sports turf managers know and have been told by many experts that in order to maximize the health of bermudagrass, timely removal of the ryegrass in early spring is essential. Dense ryegrass stands can suppress bermudagrass growth and reduce development throughout the summer. Thus applying an herbicide is the most assured way to control the perennial ryegrass and encourage bermudagrass development. The problem with chemical removal is that we normally observe a 3 to 6 week period of low quality turf between perennial ryegrass death and bermudagrass development. Low quality turf is seen as a negative for recruiting.

The Auburn grounds crew has reached out to major league baseball groundskeepers to learn how they manage transitioning in the middle of a baseball season without using chemicals. After many conversations, the decision has been made use lower mowing heights, grooming, aerification, and soluble nitrogen to favor bermudagrass growth without a massive die-out of ryegrass. Mowing height is gradually reduced from 7/8" to 5/8". Vertical mowing occurs every other week as a groomer to remove ryegrass leaves and allow sunlight to reach the bermudagrass. Core aerification further thins the ryegrass canopy and increases sunlight into the soil surface. Light, frequent applications of soluble N supplement a slow release polymer coated urea application to

favor bermudagrass growth.

The needs of recruiting make the effort to minimize the time frame of visible grow-in necessary. If unsuccessful, the final option would be to re-sod the football fields each spring for an instant transition.



► **THE SHADE LINE** created by construction of indoor practice facility on outdoor practice fields.

MANAGING SHADE ISSUES

Recently, the Auburn grounds crew inherited a new challenge in turf management. Completion of an indoor football facility created instant shade issues on the outdoor fields. Building the indoor field on the south end of the football complex allows the athletes to walk straight from the weight room to the field without going outdoors. While convenient for the football team, the indoor facility is

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▲ **BEAUTY SHOT** of Jordan Hare Stadium, home of the Auburn Tigers.

not so convenient for maintaining the natural grass fields located to the north and west of the building. To make things even more interesting, the practice field to the west of the indoor facility also has a tree line on the opposite side of the field creating morning shade by the building and afternoon shade by the trees.

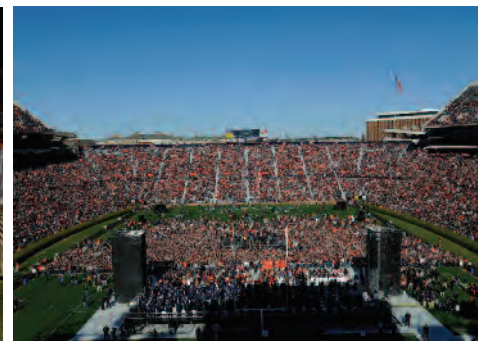
Irrigation zones are designed so that areas of adequate sunlight can be watered differently than shaded areas. Due to the angle of the sun, shade lines extend the farthest onto the fields in the winter and result in a poor stand of bermudagrass each spring. To determine the best strategies and/or bermudagrass variety for maintaining turf in the shade, the grounds crew has turned to the Auburn University Turfgrass Program for help. Auburn graduate student, Philippe Aldahir, is working on his second year of a research project testing bermudagrass varieties under different levels of shade, traffic, and overseeding to determine the best fit for the football practice fields at Auburn.

MORE HAPPENING ON THE FIELDS

For collegiate level turfgrass managers, the saying goes that “everything you see at the professional level will eventually trickle downhill.” While game days are still the first priority, college football stadiums have evolved into multi-use facilities. At Auburn, the turf crew has witnessed several additional events at Jordan Hare Stadium. The field has been the venue for concerts, grad-

uation ceremonies, autograph sessions, a finish line for 10K and half-marathon races, movie nights, television commercials, high school playoff games, and most recently, Café Jordan Hare.

For the 2012 football season, fans were allowed to attend three Friday night gourmet dinners on the field before the Saturday home game. The setup included tables, chairs, leather couches, serving lines, bars, grills, a jazz band, and the kitchen sink. The restaurant was purposefully set up on the home team sideline to allow turf damage to be covered by the sideline tarp each Saturday. The main challenge was moving all the furniture and food without damaging the turf. The turf crew started painting the field earlier in the week so that all paint was dry by lunch for the Friday restaurant setup. Irrigation was also adjusted to prevent rutting the turf while moving furniture for the dinner. Designs have been pro-



▲ **Left: CAFÉ JORDAN HARE**, serving Friday nights before Tiger home games! **Right: CELEBRATING AUBURN'S NATIONAL CHAMPIONSHIP** in 2010.

duced to install a roadway around the field to simplify setting up for Café Jordan Hare, as well as setting up the sideline equipment on game days.

COLLABORATING WITH TURFGRASS TEACHING PROGRAM

With increased events and new challenges each year, how does the Auburn grounds crew stay ahead of the game? Well, having a turf management program right down the road doesn't hurt. As mentioned, the athletic department has partnered with the turf program to develop research projects to help answer the challenges of maintaining athletic fields. The first project was to determine the best bermudagrass variety for shade tolerance that can handle athletic traffic. Future projects may include seedhead control of the bermudagrass varieties sold as shade tolerant grasses, infield skin research, and the relationship of spring moisture on bermudagrass transition.

Over the years, networking and discussing ideas with turf professors has developed into an extremely valuable relationship. Whether the crew is properly indentifying a turf problem, researching new products on the market, or questioning a management practice, the Auburn professors are eager to help.

The most exciting benefit of Auburn's turf management program has been working with the students. Each year, six turf students work with the grounds crew to gain experience with routine maintenance procedures, game preparations, and working special events. Students provide much appreciated help to the full-time members of the grounds crew. In return, the students are able to gain valuable experience and transfer knowledge from the classroom onto the athletic fields at Auburn.

Recently, the Auburn crew has concentrated on placing the turf students in professional level internships. Relationships established among professional level groundskeepers have benefitted both the students and the full time members of the turf crew. The goal is for Auburn turf graduates to obtain desirable jobs within the sports turf profession and, in turn, create a beneficial networking community between the Auburn University grounds crew and former students.

For the turf crew at Auburn University, each year seems to bring new challenges. Networking has become a crucial skill to prevent mistakes when special events occur on the football fields. As bizarre as some of the events appear, someone else in the sports turf profession has faced something similar and can offer valuable tips to ensure success. In today's era of recruiting, any opportunity to promote your brand must be explored. Marketing strategies to maximize the fan experience will only bring more events onto the gridirons of the SEC. Turfgrass managers must take a proactive approach and communicate effectively to meet each challenge, while never compromising the safety and playability of the playing surface. ■

Eric T. Kleypas is Director of Athletic Turfgrass, Auburn University; Philipe C. F. Aldahir, is a graduate research assistant in the Department of Agronomy and Soils.

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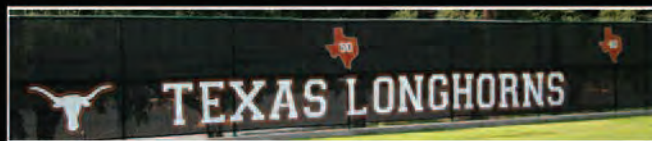
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Maintenance & performance guidelines for synthetic turf fields

RECENTLY the Synthetic Turf Council (STC) published its “Suggested Guidelines for the Maintenance of Infilled Synthetic Turf Surfaces.” The STC says routine maintenance, along with periodic intense maintenance, is essential to the life and performance of infilled synthetic turf. This maintenance manual provides owners and end-users with a way to realistically evaluate the maintenance recommendations for a synthetic turf surface, based on its intended use. To access the entire document, visit www.syntheticurf.org.

The STC says there are four key areas that drive the need for objective synthetic turf maintenance guidelines:

- Maximize the appearance and longevity of your synthetic turf. Improperly maintained fields will degrade faster and compromise playing conditions.
- Ensure maximum performance and playability.

Proper maintenance is essential for the performance and quality of any synthetic turf system. Through a combination of regular maintenance and performance testing, it is possible to track the synthetic sports field’s performance and anticipate the end of its useful life.

- Address field usage topics and special circumstances. Factors such as age, hours of use, type of use, climate, contamination and other situations impact the performance of the synthetic turf.

- Meet your field’s warranty requirements. While a maintenance regimen can support the requirements of a warranty, the details of a maintenance plan should be carefully reviewed with the field builder to assure that it complies with and does not



▲ **BAG OF DEBRIS** collected from the playing surface at Lucas Oil Stadium, Indianapolis.

Address field usage topics and special circumstances. Factors such as age, hours of use, type of use, climate, contamination and other situations impact the performance of the synthetic turf.

void any provisions of the warranty.

The information provided here focuses on infilled synthetic turf systems designed for sports fields. Please note that here a “field builder” is defined as the company having primary responsibility for installing the synthetic turf sports field, either directly or indirectly through a subcontractor or distributor, and providing the overall warranty for the installation and the field materials.

A field owner should take the following approach toward maintenance:

BEFORE YOUR PURCHASE

- Understand that no synthetic turf system is “maintenance free”.
- Obtain the field builder’s warranty and maintenance guidelines. Ask questions to understand the implications and requirements of each throughout the useful life of the synthetic turf.
- Discuss the anticipated usage of your field with your field builder. Obtain a maintenance plan that is designed for your field and its planned usage.
- Include in your purchase specific maintenance equipment, extra infill and repair materials (extra synthetic turf, seaming tape and glue).
- For synthetic turf fields with an irrigation system, consult an irrigation specialist to ensure that the system will not cause the field to become over saturated when irrigated. Only potable water should be used for irrigation.
- Design and locate the field to avoid contamination from adjacent areas.
- Ensure player walkways to the field are clean, and install a brush mat at the en-

trance. Where necessary, cross over covers can be used for player entry onto the field.

- Consider installing paved areas around the field to prevent contamination from nearby vegetation, spectators, maintenance vehicle tires, etc.

- If possible, locate the field away from sources of airborne pollutants, flood plains, and other problematic situations.

- Ensure that all surrounding surface water is directed away from the field.

- Understand who will perform the ongoing maintenance, including repairs and infill replacement, and its cost throughout the useful life of the field. The maintenance can be performed by the field owner with its own equipment and personnel, or outsourced to either a qualified maintenance firm or the field builder. If a third-party maintenance firm is to be engaged, make sure it is pre-approved by the field builder and it agrees to maintain your desired performance criteria.

- The field builder should confirm in writing before any maintenance work is performed on the field that the ongoing maintenance program, service provider, and maintenance equipment are acceptable, comply with and will not void any warranty provisions.

ACCEPTING YOUR NEW FIELD

Field owner personnel should be trained on the synthetic turf warranty, the field builder's maintenance guidelines and these STC Maintenance Guidelines. Training should include information about the specific components and materials of the installed system, the proper use of the synthetic turf maintenance equipment you will be operating, and the steps to ensure that optimal benefits are obtained while satisfying warranty requirements.

After a period of several months of initial use of the field and rainfall, the infill material will settle into the synthetic turf. During this period, more frequent brushing may be advised by your field builder. Once settling occurs, check the infill depth for consistency around the field and to ensure it is within the field builder's guidelines.

Conduct any on-site field testing by a recognized third-party lab that may have been specified during the purchase or bid process to determine if the field meets de-

sired performance criteria. This will help benchmark the performance characteristics of the field when it is new against test results taken throughout its useful life.

PROTECTING YOUR FIELD

- Establish signage and local rules for the use of the field to avoid field contamination and damage.

- If the field is in a flood plain, cover it when the threat of flooding exists with a specialized tarp designed to limit silt and debris from contaminating the field surface.

- Encourage coaches and players to rotate activities to different sections of the field to prevent high wear areas.

- Provide trash and litter containers on site and make sure there are enough containers to eliminate overflow.

- Route field access traffic in such a way as to minimize the tracking of mud and dirt onto the field.

- Set up drinks for players during practice breaks off of the field, if possible.

- Do not perform any maintenance or other activity that may invalidate the warranty.

- Report any field damage to the field builder immediately. Damages need to be immediately repaired to avoid an escalating problem.

- Plan to perform the maintenance recommended by your field builder. In terms of time, you should budget 1 hour of inspection and maintenance for every 10 hours of playing time.

- Ensure a maintenance and activity log is maintained. This is often required by the warranty. It is important that each and every maintenance operation, no matter how minor, be recorded in the log.

Please ask your field builder for a form, but in general, the following information should be logged: type of Activity during week; estimated number of hours used during week; average number of participants per hour; type of maintenance activity performed; remarks/notes; and signature of maintenance supervisor

ONGOING ROUTINE MAINTENANCE

- The basic components of effective, routine maintenance are to:

- Conduct inspections and perform minor repairs to avoid playing hazards.

- Keep the playing surface clean and free of debris and contaminants.

- Check and maintain proper infill levels to provide a consistent surface.

- Brush the surface to preserve appearance, keep grass fibers upright, and maintain even infill levels, making sure to use only approved bristles that will not overly abrade the fibers.

- Maintain a maintenance and activity log.

A maintenance person should walk the field daily and conduct more detailed inspections according to your field builder's recommended schedule. To avoid permanent damage to your synthetic turf or safety hazards, check regularly for and address such critical items as foreign debris, low infill levels, open seams, etc. Pay special attention to the most heavily used areas, such as midfield, goal mouths, corner kick areas, etc. Add new infill or redistribute migrated infill, where necessary, to the recommended depth. Look for foreign debris or contamination.

Check seams and joints where panels or any field markings are joined together. Open joints can create a tripping hazard and should be immediately repaired. An open joint of 12 inches in length or less may not be an indication of seam failure. Discuss with your field builder in advance for self repair techniques and if self-repairs are recommended. Note that open joints of greater than 12 inches in length should be reported to and reviewed with your field builder. Note any deteriorating grass fiber or infill conditions, visual or excess wear concerns, drainage concerns, performance concerns, etc. and report them to your field builder.

KEEP THE PLAYING SURFACE CLEAN

- Remove all waste items regularly.

Sweepers can assist in this process. Every loose foreign object, no matter how small, can damage your field by abrading the grass fibers and/or contaminating the infill.

- Remove airborne contaminants, such as leaves and other debris. If allowed to remain on the surface for any length of time,



they will migrate into the system, inhibiting drainage and causing infill compaction. Consider covering the field with pre-approved tarp when it is not in use.

- Remove organic material, including animal waste, as soon as possible to impede the growth of algae, weed or moss growth. Leafy trees should not be located next to a field, if possible. Brushing will help deter organic growth, as will the use of approved fungicides and anti-bacterial treatments.

- Don't allow food, sodas, chewing gum, sunflower seeds, chewing tobacco, smoking, etc. on the field.

- Do not use cleaning chemicals containing alcohol or acetone solvents. Chemicals should not be used without consulting with your field builder. Take care to avoid spilling any petroleum-based liquids including fuel onto the surface.

MAINTAIN PROPER INFILL LEVELS

The proper amount of infill is vital to the performance of the field. Infill also protects the grass fibers from damage, and helps keep them upright. Ask your field builder for the recommended infill levels. Be aware that:

- High use areas are prone to greater infill displacement.
- Brushing, drag mats, and proper rakes can help redistribute infill evenly.
- Infill may accumulate at the edges of a

field. If so, clean the material prior to brushing back into the main field.

- Replacement infill should meet the field builder's specifications.
- Using an infill depth gauge or a nail and tape measure on a grid pattern is the preferred way to measure infill depth and consistency.

GROOM THE SURFACE

Regular brushing is an important function that must not be overlooked or neglected. Brushing helps to maintain uniform infill levels, keep the grass fibers upright, remove debris, and improve the field appearance.

Conversely, the flattening of grass fibers can create a possible acceleration of wear as well as reduced field performance. While grooming, inspect the field for unsafe conditions. Use a static brush for general infill leveling and to stand up the grass fibers. A mechanical sweeper or other specialty synthetic turf cleaning equipment should be used to remove surface debris. Do not use maintenance equipment before receiving proper use and safety training. Use only equipment and vehicles that are approved by the field builder. Use only synthetic fiber bristles of recommended stiffness. Do not use metal or wire bristles. Do not use 6-wheel vehicles.

Using an average all-purpose vehicle, brushing a standard sized multi-purpose field takes about an hour. The vehicle speed should be low and sharp turns must be avoided. It is most effective to brush the surface when it is dry. The high-wear areas will require additional attention as these zones will obviously have the most disrupted infill and pile flattening due to the intensity of play.

The surface should be brushed in a number of directions, alternating the direction in consecutive activities, but generally in the direction of the individual panels to avoid crossing over the main seams. On different days, start at different locations so as to alternate the brushing direction for each panel.

The optimum brush height setting will depend on the model and type of equipment. Do not set the brush so low that it digs into the turf pile or backing. Too low a setting can damage the turf, the seams and

disturb the infill. Ask your field builder for the recommended grooming frequency. In general, the frequency will be related to the intensity of use; however, excessive brushing can cause fiber damage which over time will compromise the field's performance characteristics and longevity.

COMPREHENSIVE MAINTENANCE: SEMI-ANNUAL TO ANNUAL

Over a period of time, the following situations may arise which will require the need for more comprehensive maintenance: grass fibers become significantly bent, creased and flat; the playing surface becomes hard and compacted. While common to infilled systems, this impacts the players and also can create drainage issues. Dirt, debris and metal accumulate on or within the system despite routine maintenance. Seams become loose or panels shift creating a safety hazard. Infill levels become uneven, particularly in high wear areas, such as in front of soccer goals. This will impact player biomechanics and surface consistency, and will provide inadequate support of the grass fibers. When these situations or other concerns arise, contact the field builder and/or a third-party maintenance contractor approved by the field builder.

Comprehensive maintenance generally includes the use of specialty maintenance equipment by trained maintenance professionals. Depending upon the situation, the following actions may be performed:

Professional field inspection and corrective action. Assess the field surface, especially heavy wear areas, identify weak or loose seams and inlays, and repair the damage. Sport performance testing may also be desirable.

Decompaction of infill. Infill decompaction is important for improving shock absorption and synthetic turf drainage. Use only equipment specially designed to decompact and create loft in infilled synthetic turf systems.

Redistribution and leveling of the infill. Measure infill depth on a grid pattern, and add and level infill as needed to return the surface to the field builder's specifications.

Deep Cleaning. Use special equipment