

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.

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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

that combines mechanical brushing, suction, and an infill return system to remove surface debris and embedded contaminants.

Metal removal. Use a magnet attached to your maintenance equipment to remove ferrous metal objects from the field.

Weed and pest treatment. Treat with herbicides or pesticides, as required.

Partial removal and reinstallation of infill material. Remove the infill, as necessary, to get rid of embedded foreign matter that has contaminated the infill system, relieve grass fibers that may be trapped in the infill, or improve drainage.

FIELD REJUVENATION— AS NEEDED MAINTENANCE

As fields mature, the accumulation of unwanted or foreign contaminants is inevitable, especially deep within the infill layer. Events, such as flooding or dust storms, may introduce extreme levels of contamination.

This may cause surface hardening and water permeability issues, and compromise field performance. When a field begins to show signs of deep compaction, such as g-max readings that exceed desired levels or significant drainage issues, full field rejuvenation may be desired. These maintenance services are performed using specialized field rejuvenation equipment and personnel and may include: removal of the vast majority of dirty and contaminated infill; untangling matted and compacted fibers; a combination of re-installation of new infill and/or the cleaning of the original infill; and removal of dust, debris and application of a disinfectant to treat for bacteria, if the original infill will be processed and cleaned.

SPECIAL CIRCUMSTANCES— AS NEEDED MAINTENANCE

While not intended as a complete list, the Synthetic Turf Council wishes to provide guidance on certain special circumstances which may require solutions on an “as needed” basis.

Field Markings: Temporary paints can be used if formulated specifically for synthetic turf. Ideally, paint should be applied only to the turf fibers, and not into the infill; although this will not be possible if infill levels are too high. Remove and reapply paint after a maximum of four applications to

avoid hard-to-remove build-up.

Service companies with specialized equipment are available that can paint and remove lines, logos, end zones, graphics, etc. Permanent lines, logos, etc. can age differently than the playing field turf. They may harden or shrink at different rates that will affect Gmax. Special grooming or other techniques may be required.

Heavy Rain: If significant ponding occurs after heavy rainfall, it may be an indication of a variety of factors, such as clogged or damaged underground drain pipes or discharge outlets, base unevenness, debris in the infill, or infill surface tension. For infill surface tension, a field builder approved surfactant or laundry fabric softener can be used to break the surface tension allowing the turf to drain. After heavy rainfall, it is advisable to check the infill levels in case of migration with the field slope.

Snow and Ice: Generally snow and ice should be left to melt and drain off the system without assistance. At times, however, it is necessary to remove snow or ice to make the field playable for a scheduled event. The working principle for removing snow is to do so as near to game time as possible. This reduces the likelihood of new snow build-up and will reduce the risk of ice from cold winds whipping across a damp, newly cleared surface. Because ice and wet snow removal is particularly difficult, it is important that you take measures to prevent the build-up of ice and wet snow. Use only pneumatic tires on equipment used for the removal of snow and ice. If a snow plow is used, make sure the blade is guarded with PVC pipe and corner elbows or rubber tips, and the height is adjusted to leave ¼-½” inch of snow on the surface. This is to avoid surface damage. The remaining snow should be left to melt in the sunlight as brushing the remaining snow may also remove the infill. Avoid using a tarp on the field during freezing weather.

Tarps, unless vinyl or poly-coated, can freeze to the surface, and will be very difficult to remove.

In some cases it may be necessary to use a weighted lawn roller over the field to break up ice. The broken ice can then be swept off the field. Generally, if the sun is out and the ice or frost is not excessive, it tends to melt rapidly, especially when

players are on the field.

Static Electricity: Surfactants like liquid laundry fabric softeners can reduce static electricity.

Stain Removal: Most stains can be removed easily with a solution of hot, but not boiling, water and a field builder’s approved household detergent. Brush the stain with a stiff bristle brush, scrub the area with soap and water, rinse with clean water, and pat dry.

Equipment Leaks or Spills: Prevent leaks or spills by checking equipment and its components thoroughly before use on turf; do not fill fuels, oils, fluids while equipment is on the field. Wipe any excess grease from any/all fittings. Petroleum-based spills can damage the synthetic turf. Use only the newer biodegradable fluids, if available for your equipment. Don’t use petroleum-based fluids. Check with the equipment manufacturer to verify the biodegradable fluid is compatible with the equipment and its warranty. If a leak occurs when using petroleum-based fluids it is important to minimize the damage by stopping and capturing as much fluid as possible. If it gets on the turf, use spill leak towels to soak up the majority of the fluid. Vacuum out the infill in the affected area, use a solution of household dishwashing liquid and water to break down and clean any remaining fluid from the turf. Once the turf is clean, you will need to install new infill.

Gasoline and diesel: Don’t fill equipment while it is on the turf. Do not overfill. Newer equipment has an overflow tube that drains directly under the equipment and onto the ground. Use a catch pan while filling to prevent accidental spillage. Use



grease sparingly and wipe any excess off of all fittings, bearings, chains, etc.

REMOVING FOREIGN OBJECTS AND CONTAMINANTS

Chewing gum can best be removed by using either ice or an aerosol to freeze the gum, which can then be chipped or broken off the turf fibers. If gum has been smeared across fibers, peanut butter will soften and breakdown the gum so that it can be wiped off.

Sunflower seeds, peanut shells, pistachio shells, etc. should be removed as soon as possible by using a hand held or back pack blower. To minimize or eliminate the movement of infill, do not point nozzle directly into the turf. Use minimal throttle to decrease the volume of air.

Metal objects should be picked up by a magnet that is attached to grooming and brushing equipment.

Moss, mold, or algae may appear in underutilized areas of the synthetic turf, particularly if it is in shade and damp. Specialty products are available to treat these organisms and fungi; consult your field builder. If moss, mold, or algae are allowed to harvest and spread, the field may need to be rejuvenated.

Weeds are easily removed by hand if the infestation has not become too excessive. Treatments are also available.

USE CONSIDERATIONS

It is very important for a field owner to understand that certain activities, use and other circumstances may impact the field quality, wear and tear, appearance, warranty and performance of a synthetic turf field. If any doubt exists, the field builder should be consulted. The following are some of the suggested considerations for the field owner:

- Make sure in advance any maintenance equipment, personnel, techniques, repairs and materials comply with the field builder's specifications and warranty.
- Verify that the design, synthetic turf system and maintenance specifications will result in the desired performance outcomes prior to selecting your provider.
- Monitor the performance of your field throughout its useful life with periodic field testing and frequent inspections.
- The following may damage the syn-

thetic turf: accidents, vandalism, spiked shoes, animals, wire brushes, fires, fire-works, floods, chemical reactions, acts of God, the use of dry cleaning fluids or improper cleaning methods, high pressure sprays exceeding 500 psi, storage of heavy materials on the field; non-approved infill materials, and non-approved artificial lights.

- Certain activities may damage the synthetic turf such as bicycle traffic, track and field events, golf activities, concerts, etc. Special events and activities should be reviewed with the field builder before the event occurs to ensure that damage is not done. You should also consider consulting with a company that sells field protection.

- The quality of the sub-base will directly affect the appearance and performance of the synthetic turf system. Select a base contractor only after carefully checking synthetic turf experience and capabilities. Significant importance should be assigned to grade, stone quality, drainage, etc. If the base is compromised, then the surface will be compromised.

- Footwear. Suitable footwear should always be used. Metal spikes should be prohibited and cleats are preferred. Flat-soled rubber shoes greatly intensify the wear and tear on the synthetic turf.

- Use patterns. It is very important to spread the field use to various locations on the field to prevent uneven or accelerated wear in certain areas.

- Vehicles. Do not park vehicles on the field, especially in the heat of the day, or leave vehicles on a wet or hot field for long periods of time. Engine exhausts should not be faced down toward the playing field, and a hot muffler or exhaust pipe should not touch the surface. Use lighter vehicles with LGP (Low Ground Pressure) tires with round edges to prevent rutting. Do not use cleated or traction tires. Heavy vehicles (over 300 pounds) should have a maximum tire pressure of 35 psi. Make wide, not sharp, turfs, and only when the vehicle is in motion. All vehicles should move at slow speeds. All vehicles should move at a slow speed. Avoid abrupt and sudden braking, as well as sudden acceleration or spinning of the wheels, especially on wet surfaces. Consult the equipment manufacturer to learn load limits. All vehicles must be checked before use on the field to determine if they are

leaking oil or gas. If so, they should be repaired before entry onto the field.

- Concentrated heavy use protection. Stage or other set-ups for special events or activities, such as graduations, are normal. Proper field protection of the synthetic turf must be provided to prevent damaging it. Use plywood, interlocking plastic panels or similar weight distributing materials under all chairs and tables; consult the field builder or a field protection company. Use field protection that does not have a dimensional profile, e.g., corrugation, because the profile will transfer onto the turf and require heavy grooming to remove. It is imperative that no anchoring spikes, posts or footing be driven into the turf. Once the field protection is removed, the area should be groomed and swept with a magnet to remove any misplaced or dropped nails, screws, etc.

- Helicopter landings may be necessary to remove an injured player, for example; the rotor wash will likely cause infill to be displaced. As soon as possible evaluate the area and groom or brush as needed.

- Protect the synthetic turf as needed with approved tarps when nearby renovations, e.g., running track recoats or installations, cleaning or painting of bleachers, construction or repairs to lighting, renovations of adjacent natural turf fields, etc., may cause harm to the synthetic turf. Contact the field builder for a protection recommendation. Improper plastic protection will cause heat damage.

- Prevent heavy equipment from accessing the field or, if necessary, cover the field with appropriate protection to distribute the weight of the equipment.

DISCLAIMER

Due to the unique situation of each synthetic turf installation, other considerations may arise that are not addressed by these guidelines. Such considerations should not be ignored or minimized, but should be addressed by your field builder or industry specialists. This document does not in any way, imply, suggest or guarantee that a warranty, environmental, or performance issue could not arise if these guidelines are followed. These voluntary guidelines are not standards, and are not to be used as the basis for warranty or other claims. ■