Breese Stevens Artificial Turf Replacement Study

MADISON, WISCONSIN

GRAEF

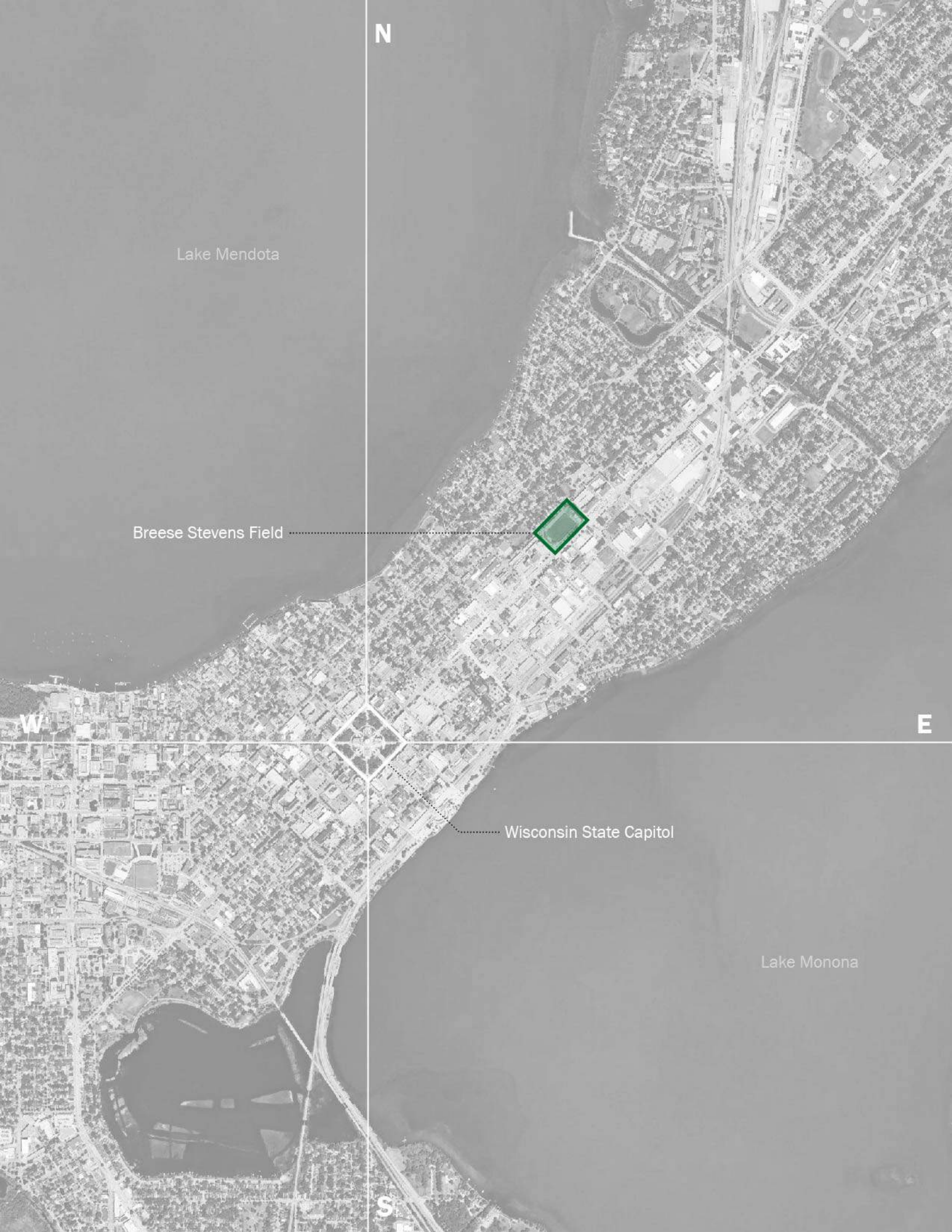
CITY OF MADISON WISCONSIN

DECEMBER 2024

What's in the study?

1 INFORMATION GATHERING

Picture: *View looking across Breese Stevens Field, highlighting the current condition of the synthetic turf.*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Lake Mendota
Breese Stevens Field
Wisconsin State Capitol
Lake Monona

Introduction

Beginning in the summer of 2024, the City of Madison solicited a request for proposals from design firms to study and evaluate the future replacement of synthetic turf at Breese Stevens Field. The original synthetic turf was installed in 2014. Now a decade later, the field has exceeded the 8 year warranty period, while seeing increasingly heavier usage. The heavier use has led to the degradation of the turf to the point of requiring removal and replacement.

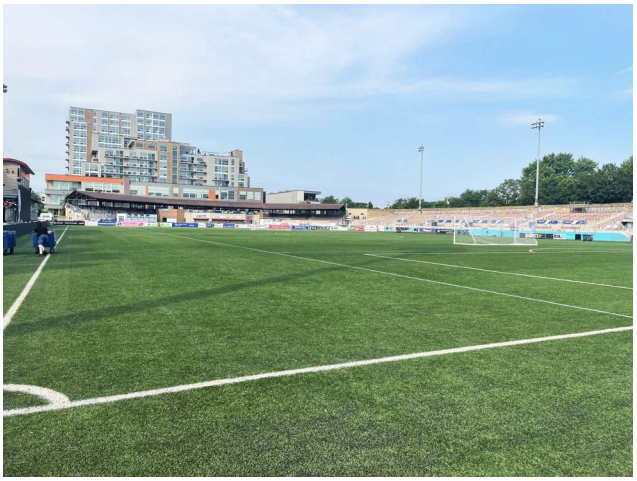
GRAEF had originally completed the initial turf study in 2013/14 and was the engineer of record for the design and installation of the original turf system. A general assumption of this turf replacement study is there should be little to no sub-grade work required as part of the improvements. The remediation of contaminated soils and sub-grade preparation were done as part of the original installation. This will focus on the latest turf products and systems available today. It will provide the City with detailed information on turf systems, cost information, and maintenance requirements.

It is anticipated that with the information in this study the City will be able to make an informed decision on the selection of a new turf system. Replacement of the turf is paramount in providing an elite soccer venue, and continuing to support the many other non-sporting events held at Breese Stevens.

Right: The original Breese Stevens Field playing surface, natural turf.
Below: The image below shows the completed (2014) synthetic turf field. Much has changed with the stadium in the decade since the turf installation including new seating elements, an expanded concession area, and the hosting of hundreds of new events.

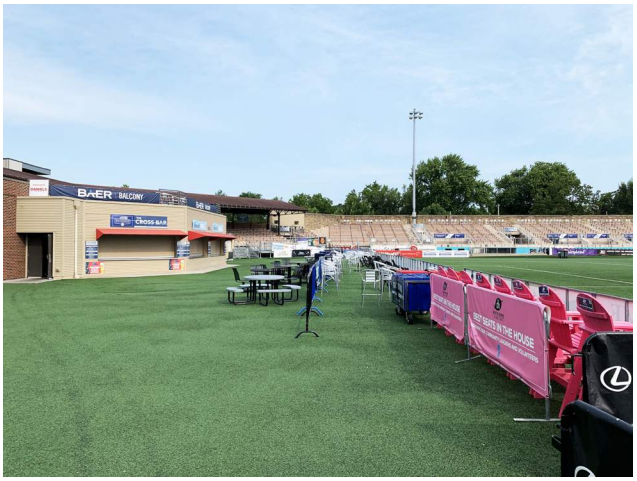
Site Observations

The photos and information presented below were collected during a site walk through on July 31st, 2024 by the GRAEF design team. Overall, it is evident that through the course of a decade's worth of use, the field is in need of replacement.



Looking west across the pitch. Areas of the pitch appear to be matted down, signaling a breakdown of turf fibers.

Removable patch of turf for goal post installation. The hatch cover is damaged and does not sit flush with the surface.



The field's turf extends past the playable area into the concessions zone.

Reused portions of old turf are installed throughout the facility outside of area of play.

Excessive buildup of infill is evident along the boundary areas.

LED video boards line the eastern sideline. Mounted directly to a concrete curb; this creates a possible challenge during replacement.

Existing Program

Over the last decade, Breese Stevens has seen a steady increase with over 300+ events held in 2023 alone. This year that total is expected to increase even further.

Evidence of wear and tear on the synthetic turf is evident, as shown in the existing photos. Originally installed in 2014, the synthetic turf has all but exceeded its intended lifespan and is in need of replacement. With the projected increase in use, and the desire to have a competitive level playing surface, it will become even more important to properly maintain and evaluate the field's condition. This is both important from a financial upkeep perspective, but also a safety perspective for athletes as well as community users.

The new turf will be required to host competitive soccer matches. With this in mind, the City has requested that any new field be installed per Federation Internationale De Football Association (FIFA) guidelines. In addition, the field needs to provide a durable surface for the many non-sport related events including acting as a large concert venue. These events create different levels of stress on the turf atypical of athletic events. Part of the evaluation process will include working with turf vendors to identify and recommend the appropriate turf system to meet the ultra heavy use of the playing surface.

Above: The image shows a major concert event being held at Breese Stevens Field.

Left: The calendar graphic shows just how many known events occurred during the peak summer months of June, July, and August.

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2 PRODUCT RESEARCH

Note: *The following synthetic turf selections were evaluated based on their quality, durability and playability with recommendations from the manufacturers to meet or exceed the intended use of Breese Stevens Field.*

Turf Manufacturers

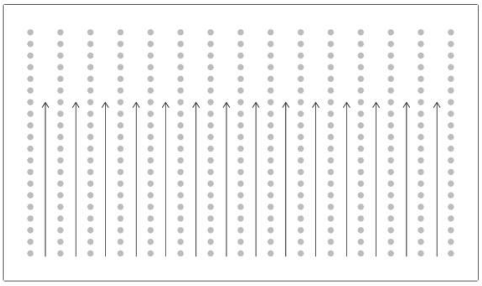
IRONTURF By Greenfields

THE MOST DURABLE TURF EVER TESTED

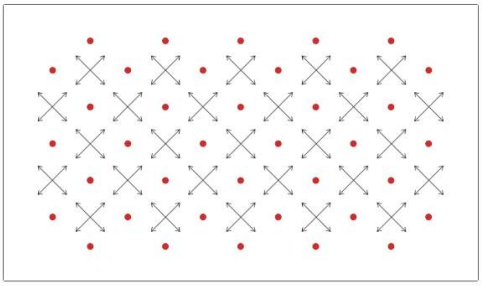
When it comes to durability, our woven technology has passed the test. Literally. Surpassing 300,000 cycles on independent Lisport testing, IRONTURF showed zero yarn loss while both slit film and monofilament fibers retained their integrity and remained upright. The only thing stronger? Your peace of mind when you choose IRONTURF.

Traditional tufted turf can experience tuft bind failures. We've eliminated the issue entirely with our patented MatriX woven technology. Tightly woven in a unique "W" pattern, the fibers create an unbreakable lock without the "lanes" of tufted products. Discover a 10-year warranty of unmatched durability, playability, safety, and appearance.

TRADITIONAL TUFTED TURF PATTERN



IRONTURF MATRIX WOVEN PATTERN



FIBERS OF STRENGTH

IRONTURF'S superior toughness and playability begins with an innovative dual fiber system – exclusive to TenCate – that utilizes a unique combination of the best fibers: The durable and flexible isotropic XP slit film fiber and the strong, thicker monofilament Diamond fiber.

XP FIBERS

- Proven over decades to be the most durable and sought-after slit film fiber
- Only isotropic fiber
- Soft on athletes' bodies, but resistant to damage from foot traffic and sunlight
- Made in the USA

DIAMOND FIBERS

- Thicker than other monofilament fibers
- Better "memory" (remains upright and non-directional)
- No spine to accelerates splitting
- Ridged design to reduce glare
- Made in the USA

Manufactured only at the TenCate Polyloom plant, the XP fiber is considered isotropic, meaning its physical characteristics will be similar along both axes. It is recognized as the most durable fiber on the market today. Highly flexible, the XP fiber can also stretch and twist under players' feet, thus further enhancing durability in high-impact North American sports. No fiber is better suited for lacrosse creases, batting areas and between the hashes on football fields. IRONTURF's Diamond fiber is a diamond-shaped monofilament that is thicker and stronger than competing monofilaments because it has no "spine," a weak spot that can accelerate fiber splitting and reduce its lifespan. Additionally, the diamond fiber has anti-glare characteristics built in.

Plus, it's longer-lasting: IRONTURF has been proven to survive over 300,000 cycles on the Lisport linear abrader test, which is used to categorize the durability of turf systems. No other standard tufted system comes close to this level.

PLAYABILITY

Because our fibers stand straight up, the foot doesn't have to fight a row of stitched fibers. And without directional lay, players enjoy more equal ball roll and natural bounce.

- Plays like natural grass
- Reduces splash
- Improves running and cutting by offering a more uniform, predictable surface

SAFETY

Our woven technology creates even spacing in all directions, allowing for freer infill movement in the turf and a safer playing experience, no matter the sport.

- Less infill compaction
- Consistent GMAX (impact absorption)
- Reduces lower leg stress and rotational resistance
- Uniform, predictable play

APPEARANCE

Split hairs over a bad call–not all over the field. Our fibers are less likely to pull out, meaning your field maintains a fresh appearance for longer. And since they stand up straight, they also reflect and disperse more light for less glare.

- 12-pic stitching for sharper lines and graphics
- Reduces glare
- Natural appearance from highest-quality fibers

Information direct from www.ironturf.com. Visit the website for additional information.

GreenFields™
HIGH PERFORMANCE TURF

ALLSPORT ULTRA: DURABILITY, LOW-MAINTENANCE, SOFTNESS: THE ULTIMATE TRIPLE THREAT

You need quality you can count on without needing to rely on constant upkeep. Luckily, GreenFields has developed turf with the perfect balance to suit your needs.

ALLSPORT Ultra is a combination of diamond shaped and XP fibers. ALLSPORT Ultra with 365 microns can withstand frequent use for many years. Together with the extraordinarily durable XP fibers, this system provides the ultimate combination of advanced performance and durability with a natural visual appeal.

Never compromise – GreenFields has the advanced solution you need without sacrificing safety, resilience or durability.

ALLSPORT DIAMOND: SCORES VICTORY WITH VALUE

Diamond technology, developed by TenCate, is a breakthrough in polymer processing. It provides turf fibers with unprecedented split resistance. Designed as diamond-shaped fibers with a ribbed surface, GreenFields ALLSPORT Diamond is the most advanced, ultra-durable turf fibers with high resilience and increased comfort and safety.

When you need turf that can stand up in the harshest of conditions without constant care, GreenFields ALLSPORT Diamond is the solution for you.

ADVANTAGES

HIGH COMFORT AND SAFETY

NATURAL LOOK (DUOTONE)

HIGH RESILIANCE

ULTRA DURABLE

SOCCER SYSTEMS

Information direct from www.greenfieldsusa.com. Visit the website for additional information.

AstroTurf®

THE 3D SERIES IS ASTROTURF'S MOST POPULAR PRODUCT LINE.

The 3D Series adds a RootZone® to basic infilled turf systems. The RootZone, a texturized layer of fibers that draw down to encapsulate infill, results in minimal rubber splash, better shock absorbency, and less infill migration than basic systems. The RootZone improves safety, playability, and durability, making 3D systems the top choice for athletes and field owners alike. Importantly, independently funded research by Michigan State University has shown the RootZone to reduce torque transmitted to lower extremities.

ROOTZONE BENEFITS

- Grass-like traction with reduced torque to lower extremities
- Less infill spray
- Consistent shock attenuation
- Improved durability

SYSTEM HIGHLIGHTS

- Manufactured with unmatched quality controls
- 3D Decade systems available with ten year, non-prorated warranties
- Multi-ply primary backing system for dimensional stability
- Available with a range of infill options
- Also available in the RootZone 3D HD line, which offers denser configuration for enhanced durability and a more plush appearance

FOR THOSE WHO MAKE SAFETY A TOP PRIORITY FOR THEIR ATHLETES

Shock pads are separate, elastomeric materials such as foam, rubber, beads or fibers bound together with a strong adhesive. Many pads have been available for decades while the size of the turf market today is attracting newer technologies. Our laboratory tests pads exhaustively before approval for field use.

BENEFITS:

- Provide better shock absorbency – and protection for players
- Create a smoother, more uniform field
- Increase lifespan of the turf itself
- Allow clients to "tune" fields and add more sand to speed up the surface
- Enable us to reduce the height of the turf to increase pile density and reduce the quantities of expensive alternative infills required
- Can often be used for more than one field life cycle, making costs over time very attractive

ROOTZONE 3D3 BLEND

MORE INFO -

By combining three unique fibers in one system (RootZone, Trionic Monofilament, and ultra-durable slit film), RootZone 3D3 Blend offers both durability and aesthetics. This is AstroTurf's most popular system

DETAILS

Usage	Heavy
RootZone	Yes (Nylon or PE)
Infill Splash	Minimal
Face Fibers	Slit Film AND Monofilament
Aesthetics	Great
Best Uses	Suitable for stadiums and practice fields

RHINO BLEND

MORE INFO -

By combining slit film and High Micron fibers into one system, the Rhino Blend system offers durability and aesthetics. Also available in the HD configuration, which is denser, for enhanced durability and a more plush appearance.

DETAILS

Usage	Heavy
RootZone	No
Infill Splash	Moderate
Face Fibers	Slit Film & Monofilament
Aesthetics	Good
Notes	Budget-conscious option that blends mono and slit film fibers for great looks and durability.

Information direct from www.astroturf.com. Visit the website for additional information.

MWSTS
MIDWEST SPORT AND TURF SYSTEMS

MST PRO-SLIT

MST
HIGH PERFORMANCE TURF

With the most durable slit film fibers, MST PRO-SLIT has exceptional strength. MST PRO-SLIT -- 100% slit-film fibers.

MST PRO-SLIT fibers are the most durable, high quality slit-film fibers available -- anywhere! The MST PRO-SLIT fibers will retain their structural integrity for longer, harder games and, minimize infill splash.

Recommended Applications:

If durability is your primary objective, then MST PRO-SLIT is the clear choice -- regardless of sport. Slit-film fibers, and, MST PRO-SLIT have been the fiber/turf of choice for football fields at all levels, baseball and softball fields, multi-sport fields, as well as for soccer and lacrosse.

MST PRO-SLIT SPECS

FIBER	100% slit film blade yarn, U.V. resistant, 10,000/1 denier, max 110 microns
PRIMARY BACKING	Double Layer Thiobac, black, U.V. stabilized, 8.0 oz/yd^2; Layer 1 - 100% PP, Layer 2 PET/PP blend
SECONDARY BACKING	Polyurethane coating with drainage holes
TUFT BIND	≥ 9 lbs
FIBER HEIGHT	1.5" -2.25"
FIBER WEIGHT	32 - 52 oz/yd^2
WATER PERMEABILITY	13.2 gal/yd^2/min (unfilled)

HIGH SPLIT RESISTANCE FROM UNIQUELY ENGINEERED SLIT FILM DESIGN

100% MADE IN THE USA

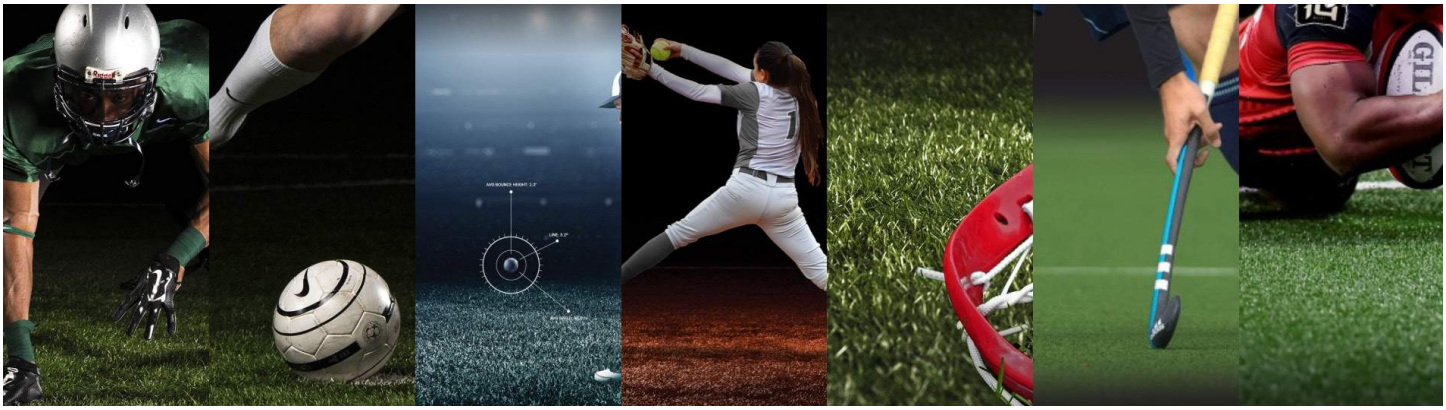
Information direct from www.midwestsportandturf.com. Visit the website for additional information.

FieldTurf®
A Tarkett Sports Company

THE WORLD'S MOST BEAUTIFUL GAME HAS ADOPTED FIELDTURF INTO ITS RICH TRADITION.

Designed to embody the key characteristics of a pristine natural surface, FieldTurf has developed ideal systems for soccer by ensuring proper ball performance, optimal safety and energy return for players.

FieldTurf is a FIFA Preferred Provider, part of the FIFA Quality Programme, having met the high quality standards required to deliver elite-level pitches worldwide. Learn more on the program here.



VERTEX PRIME

FieldTurf Vertex Prime is comprised of specially designed slit-film fibers and high performance ridged monofilament fibers. The fibrillation process of the slit-film component allows for proper infill encapsulation while the monofilament fibers facilitate grass-like ball roll. Both fibers are tufted together in the same stitch for a superior aesthetic appearance.

VERTEX CORE

Vertex CORE system is equipped with not only one of our legendary fibers, but two! We utilized our renowned Classic HD slit-film fiber and teamed it up with our CORE monofilament super fiber. The perfect combination of performance and beauty.

Information direct from www.fieldturf.com. Visit the website for additional information.

Shock Pad Options

BROCK®
IMPROVING THE FIELD OF PLAY

ShockPad/SERIES

The goal of any artificial turf surface is to mimic a high-quality, natural grass playing field. Achieving this requires a more sophisticated approach than laying "rug over rock". Think of Brock ShockPad/SERIES as the "intel inside" of your field.

The ShockPad/SERIES comes in several thicknesses, from 14mm to 20mm, depending on the turf you select, always keeping the performance of the overall system in mind. Fields that utilize a SP shock pad demonstrate the safety, speed and impact performance that replicates a quality natural turf surface; plus they drain fast and last longer.

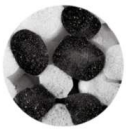
14 mm thickness | **17 mm thickness** | **20 mm thickness**

A shock pad for every turf

Brock's Shock Pad (SP) Series was engineered as a lower-cost alternative to our PowerBase products for when only vertical drainage is required. Series SP is often used in field replacements where a functioning drainage base is already in place.

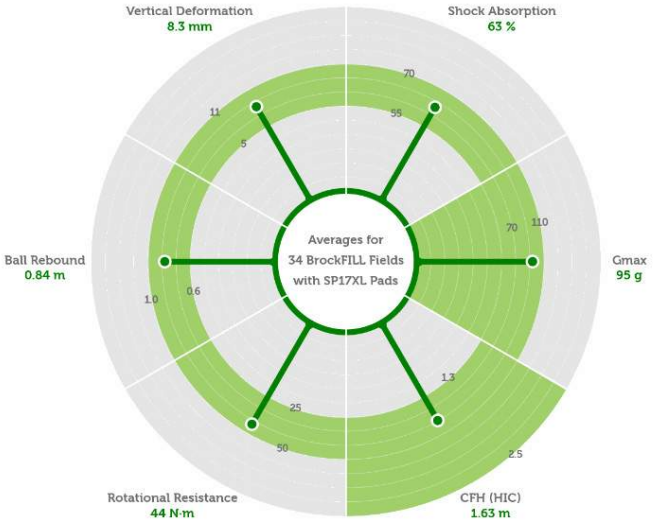
Quality features:

1. Stable – Large, robust dovetail interlock makes installation fast and easy.
2. Porous – The open-pore structure allows water to pass vertically through the material.
3. Durable – Micro coating bonds the material, maintaining the porosity of the pad.
4. Dynamic – Interaction of particles keeps field stiff for running, soft for impacts.



Microcoating Binder

Brock's Shock Pad (SP) Series will outperform other shock pads nearly twice as thick. That's because it's engineered for artificial turf and the impacts that occur during play. A patented material using polypropylene with a micro coating binder produces a material with an open pore structure for fast drainage and a unique impact profile ideal for artificial turf.



PowerBase/YSR

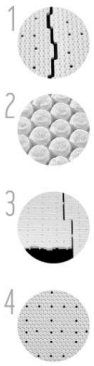
We view the field as a piece of equipment that has a significant impact on an athlete's safety. We are of the firm belief that a safer system not only enhances player protection, but also offers quicker drainage, prolonged durability, and environmental preservation.

PowerBase/YSR is made from expanded polypropylene, one of the most durable polymers on earth. Each panel is molded individually, allowing precise quality control. This results in a field that is flat and consistent underfoot. It is also recyclable without ever losing performance. A proper artificial sports surface is tuned for the athletes using it. PowerBase/YSR was engineered for schools, recreational fields and for use with organic infills.

Proven, fast drainage

Brock PowerBase/YSR has large lateral channels that transport water to the collector system along the edge. Even where the panels intersect, the drainage channels line up, so there is no interruption in water flow.

Top view features:



1. Smart – A stairstep edge supports the artificial turf and prevents gaps from shadowing on the field.
2. Responsive – Conical piston shape reacts dynamically to variable running loads for a more natural feel of play.
3. Dynamic – 6 mm crush ribs regulate thermal expansion; Accommodates 130-degree F change in temperature.
4. Permeable – Millions of drain holes on every field line up with channels on the bottom of each pad.

Bottom view features:

1. Precise – Crush ribs control fit during installation.
2. Responsive – Shock absorbing bottom of pad structures.
3. Dynamic – Drain channels are continuous between panels for water flow.
4. Draining – Large high volume drainage channels.

SPOKE KEY

SHOCK ABSORPTION TOO HIGH Field may be too soft underfoot. Increased fatigue.	**SHOCK ABSORPTION** TOO LOW Field is too hard underfoot. Increased injury risk, increased impacts to joints.
GMAX TOO HIGH Field is too hard. Increased impact injury risk at high levels.	**GMAX** TOO LOW Field may be too soft. No risk if other results are in optimal ranges.
CFH (HIC) TOO HIGH No risk. The higher, the safer.	**CFH (HIC)** TOO LOW Increased risk of serious head injuries.
ROTATIONAL RESISTANCE TOO HIGH Excessive cleat grab, increased risk of lower extremity injuries.	**ROTATIONAL RESISTANCE** TOO LOW Slipping, lack of stable footing during cuts.
BALL REBOUND TOO HIGH Ball bounce is unnaturally high. Hard to control ball.	**BALL REBOUND** TOO LOW "Dead" ball bounce. Slow game.
VERTICAL DEFORMATION TOO HIGH Field is too soft underfoot. Increased fatigue, less stable footing.	**VERTICAL DEFORMATION** TOO LOW Field is too hard underfoot. Increased muscle and joint soreness.

Information direct from www.brockusa.com. Visit the website for additional information.

ProPlay®
by Schmitz Foam Products

Made from top-quality foam

ProPlay is made of closed-cell crosslinked polyethylene foams (XLPE) that were originally produced for a different purpose in various industries where quality and product performance is key. Schmitz Foam Products combines these foams into a shock pad that delivers the required sports performance, player safety and field drainage.

DESIGNER

Applying ProPlay will reduce your projects carbon footprint

The shock pad is produced from XLPE foam remnants that were destined for landfill or incineration. ProPlay can be recycled repeatedly and comes with an end-of-life protocol.

OWNER

ProPlay shock pads have been around since the early 90s

Since 2017 ProPlay have been made in the US. We have documented evidence showing superior performance after 25 years installed.

✓ High durability

Our ProPlay shock pad is designed with an above average density and thickness. This combination is the reason our durability exceeds that of other high-end shock pads. ProPlay maintains its elastic properties for a period that exceeds the life-span of multiple synthetic turf surfaces and comes with a 25 year warranty.

✓ Excellent drainage capabilities

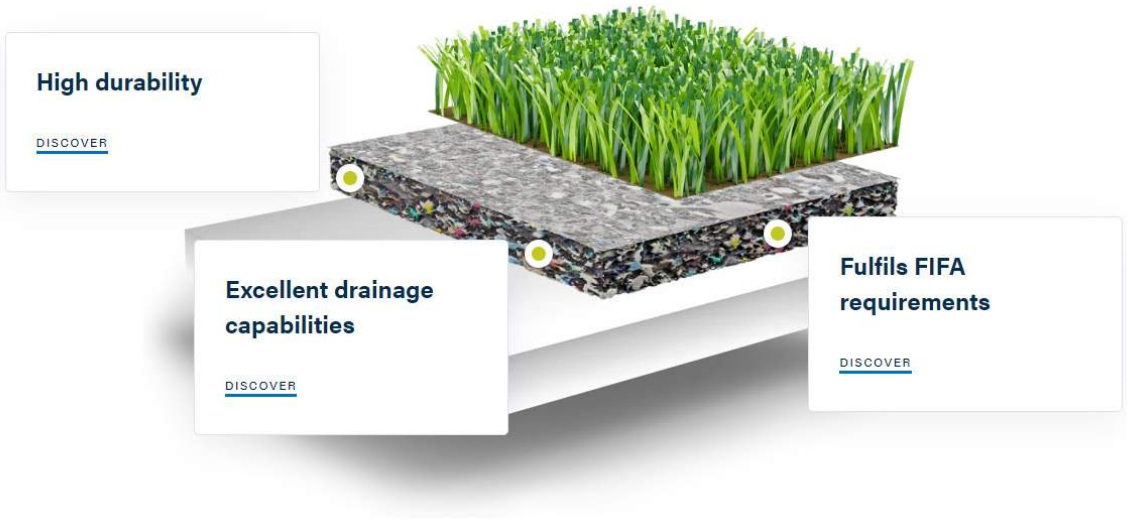
The drainage capacity of our ProPlay shock pad exceeds the FIFA requirements in all climatic conditions worldwide, not just vertically but also horizontally. This is what makes ProPlay shock pads unique.

✓ Fulfils FIFA requirements

The ProPlay shock pad is part of the certified soccer systems applied and installed by numerous synthetic turf manufacturers and contractors. As part of these systems our shock pads perfectly balance shock absorption and vertical deformation.

✓ Easy to install

The interlocking puzzle-shaped sheets with expansion slots are as easy to install as putting together a puzzle. It doesn't require special skills or equipment and is independent of weather conditions.



Information direct from www.schmitzfoam.com. Visit the website for additional information.

Infill Alternatives

Infill types and materials vary based on the turf manufacturer. Each manufacturer has specific infills that help their turf product to perform at a high level. A few of the before identified manufacturers infill options are below.

Depending on the selected manufacturer, they will work to provide an infill product that is best for the field and its intended use. It should be noted, while not listed below, Midwest Sport and Turf Systems offers the same identical infill options as the other manufacturers shown. Options include crumb rubber, both coated and non-coated. MWSTS also offers an EPDM infill, organic infill, silica sand infill, a coated silica sand infill, and a TPE infill.

Greenfields Turf Infill

GreenFields has FIFA certified and installed over 3000 fields around the world, many using the highest level of TPE infill available to the market. Holo by SO.F.TER. (www.tpeinfill.com) is a state of the art performance infill that consists of a special extrusion technique that creates a hollow, cylindrical shaped granule.

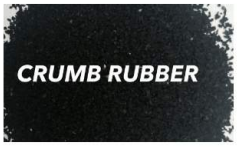
BENEFITS:
Flexible | No Toxins | Cooler | Open Space | 100% Recycled

GreenFields has found that there are several characteristics of natural infill that make it an excellent source when considering alternative infills.

BENEFITS:
Cooler through water retention | 100% Recycable | Bio-degradable

Ethylene Propylene Diene Terpolymer (EPDM) is a polymer elastomer with high resistance to abrasion and wear and will not change its solid form under high temperatures.

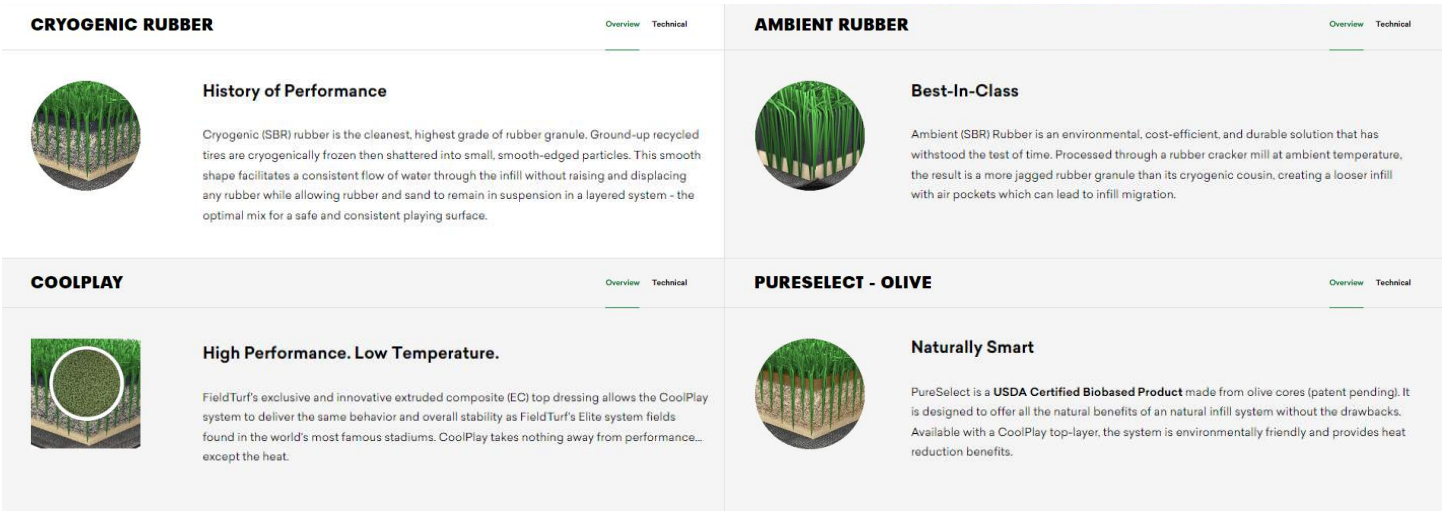
BENEFITS:
100% Recyclable | High Resistance to Abrasion | Non-flammable



SBR has been used for many years in turf industry and is a proven product offering safety, durability and a cost benefit to your overall field.

BENEFITS:
Proven with more than 12,000 fields in the US | Durable, low maintenance | Recyclable – 20,000 recycled car tires per field

FieldTurf Infill



AstroTurf Infill

SBR

MORE INFO -

SBR stands for Styrene-Butadiene Rubber. It is by far the most commonly used infill material in synthetic turf fields. It is made of ground up recycled tires.

Features:

- Most economical shock absorbing infill
- Most widely studied infill (70+ independent studies)
- No study has ever found ill environmental or human health effects
- Absorbs shock

EPDM

MORE INFO -

Ethylene Propylene Diene Monomer (EPDM) is a virgin rubber material. It is a high quality, high dollar replacement for crumb rubber.

Features:

- Few issues with quality in the marketplace
- Attenuates shock
- Very high melting point
- No negative perceptions in the marketplace

Z-CAP

MORE INFO -

Z-CAP is a very interesting infill. Used for industrial waste cleanup and sold in healthfood stores, zeolites have a honeycomb molecular shape that allows the material to absorb and contain toxins. This molecular shape also allows it to absorb and slowly release water for noticeably cool field temperatures. Z-CAP is an affordable top dressing to traditional SBR fields that reduces field temperatures substantially.

Features:

- Absorbs and slowly releases water for lasting temperature reduction
- Does not require water
- Does not require additional maintenance
- Inexpensive alternative infill

BROCKFILL®

MORE INFO -

BrockFILL is an engineered wood particle infill specifically designed for artificial turf. It's made here in the USA from a species of southern pine that is grown, harvested, and replanted in continuous cycles, making it ideal for a sustainable, renewable organic infill product.

Features:

- Durable
- Optimal Traction
- Low Splash
- Cooling properties
- No irrigation required

SILICA SAND

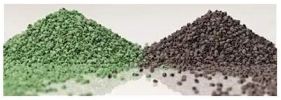
MORE INFO -

Silica sand is often used for synthetic turf ballast. It comes from multiple quarries throughout the country, contributing to its low cost. Silica sand is often used in combination with other performance infills.

Features:

- Very inexpensive
- Widely used and proven
- No negative market place perceptions
- Good ballast material

TPE



MORE INFO -

Thermoplastic Elastomers (TPE) are a class of copolymers or a physical mix of polymers (usually a plastic blended with a rubber). These are virgin materials that are either extruded or molded.

Features:

- Varied shapes of TPE are less likely to compact
- No perception issues of crumb rubber
- Attenuates shock

Federal Research Action Plan on Recycled Tire Crumb Used on Playing Fields and Playgrounds (FRAP)

In an effort to address safety concerns surrounding the use of crumb rubber in playing surfaces, the Centers for Disease Control, Agency for Toxic Substances, Environmental Protection Agency, and Consumer Product Safety Commission, launched a multi-agency research study in early 2016. The study contained these four major components:

- Literature Review/Gap Analysis
- Recycled Tire Crumb Characterization
- Exposure Characterization Study
- Playground Safety

Based on the size and scope of research, this study has became the largest tire crumb rubber study ever conducted in the United States.

The final portions of the study were released in April 2024. For more detailed information regarding the study, and its findings, please visit www.epa.gov for more information.

Photo Credit: The Motz Group

3 Turf Vendor Specifications

Turf Vendor Specifications

Note: *The following synthetic turf selections were evaluated based on their quality, durability and playability. The following manufacturers were asked to provide a turf system that would meet or exceed the intended use of Breese Stevens Field. An overall turf evaluation matrix is included at the conclusion of this study.*

GreenFields™ HIGH PERFORMANCE TURF

Company	Greenfields	
Product Name	**Iron Turf (woven)**	**All Sport Ultra (tufted)**
Turf Life/Warranty	10 years	8 years
Initial Cost	$7.00 square foot + pad	$6.00 square foot + pad
Maintenance Cost	$3,600 per year	$3,600
Total Cost WITHOUT Shock Pad	$673,400	$586,820
Total Cost WITH Shock Pad	$913,900	$731,120
Fiber Type	10050 XPS and GPC XWRD	5040 XP Blade Plus + 4PLX XWRD
Fiber Thickness	100 / 365 microns	100 / 365 microns
Pile Height	2"	2"
Pile Weight (per SY)	59 oz.	45 oz.
Tuft Bind	≥ 14 lbs.	≥ 9 lbs.
Impact Attenuation, Gmax	Varies (≤ 200)	Varies (≤ 200)
Infill Material	Silica sand / Crumb rubber	Silica sand / Crumb rubber
Infill Mixture	Sand as ballast	Sand as ballast
Pounds of Sand / sf	3.0	3.0
Pounds of Rubber / sf	2.5	2.5
Total Turf Weight	93 oz.	73 oz.
Sewn Seams	No - glued seams	Yes or glued
Shock Pad	Powerbase/YSR by Brock	ShockPad/SERIES 14 by Brock
Alternative Infill Material	As specified	As specified
Maintenance Equipment Included	As specified	As specified
Financial Backing		
Experienced Installation Crews	Yes	
Lead Time	Approx. 60 days (20 days for removal and install)	

Disclaimer: *Costs are intended to be high level estimates and are for budgeting purposes only.*

Turf Vendor Specifications

AstroTurf®

Company	Astroturf	
Product Name	**Rootzone 3D3 52 oz. Blend**	**Rhino Blend 42 oz.**
Turf Life/Warranty	8/10 years with professional maintenance	8/10 years with professional maintenance
Initial Cost	$5.20 square foot	$4.75 square foot
Maintenance Cost	Professional $3,200/year	Professional $3,200/year
Total Cost WITHOUT Shock Pad	$548,350 +/-	$505,050 +/-
Total Cost WITH Shock Pad	$692,640 +/-	$649,350 +/-
Fiber Type	Mono/Slitfilm/Rootzone A/B by row	Mono/Slitfilm A/B by row
Fiber Thickness	330/115 micron	330/115 micron
Pile Height	2"	2"
Pile Weight (per SY)	52 oz.	42 oz.
Tuft Bind	8+	8+
Impact Attenuation, Gmax	Under 165	Under 165
Infill Material	SBR and Silica Sand	SBR and Silica Sand
Infill Mixture	65%/35% weight	65%/35% weight
Pounds of Sand / sf	1.4 lbs/sf	1.55 lbs/sf
Pounds of Rubber / sf	2.65 lbs/sf	2.85 lbs/sf
Total Turf Weight	78.7 lbs per sq. yard	68.7 per sq. yard
Sewn Seams	Glued	Glued or Sewn
Shock Pad	Brock or Schmitz Proplay	Brock or Schmitz Proplay
Alternative Infill Material	Brockfill over SP17 shock pad	Brockfill over SP17 shock pad
Maintenance Equipment Included	Litter Cat and Greensgroomer	
Financial Backing	AstroTurf Warranty and 3rd Party Insured Warranty	
Experienced Installation Crews	Certified AstroTurf Crews	
Lead Time	Approx. 45-60 days from approved shop drawings	

Disclaimer: *Costs are intended to be high level estimates and are for budgeting purposes only.*

Provide any additional notes , clarifications or comments here:

AstroTurf 3D3 52 over pad 35% Rubber/65% sand (2 lbs rubber/4 lbs sand)
AstroTurf Rhino Blend over pad 50% Rubber/50% sand (2.5 lbs rubber/2.5 lbs sand)

Turf Vendor Specifications

Company	MWSTS	
Product Name	**Pro Blend (tufted)**	**Pro Slit (tufted)**
Turf Life/Warranty	8 years	8 years
Initial Cost	$6.00 square foot + pad	$6.00 square foot + pad
Maintenance Cost	$3,600 per year	$3,600 per year
Total Cost WITHOUT Shock Pad	$577,200	$586,820
Total Cost WITH Shock Pad	$817,700	$731,120
Fiber Type	5040 XP Blade Plus + 4PLX XWRD	5040 XP Plus
Fiber Thickness	100 / 365 microns	100 microns
Pile Height	2"	2"
Pile Weight (per SY)	46 oz.	46 oz.
Tuft Bind	≥ 9 lbs.	≥ 9 lbs.
Impact Attenuation, Gmax	Varies (≤ 200)	Varies (≤ 200)
Infill Material	Silica sand / Crumb rubber	Silica sand / Crumb rubber
Infill Mixture	Sand as ballast	Sand as ballast
Pounds of Sand / sf	2.5	2.5
Pounds of Rubber / sf	3.0	3.0
Total Turf Weight	74 oz.	74 oz.
Sewn Seams	Yes or glue	Yes or glue
Shock Pad	Powerbase/YSR by Brock	ShockPad/SERIES 14 by Brock
Alternative Infill Material	As specified	As specified
Maintenance Equipment Included	As specified	As specified
Financial Backing		
Experienced Installation Crews	Yes	
Lead Time	Approx. 60 days (20 days for removal and install)	

Disclaimer: *Costs are intended to be high level estimates and are for budgeting purposes only.*

Turf Vendor Specifications

FieldTurf®
A Tarkett Sports Company

Company	Fieldturf	
Product Name	**Rev360**	**Vertex Core**
Turf Life/Warranty	8 year warranty	10 year warranty
Initial Cost	$5.00 square foot	$5.50 square foot
Maintenance Cost	$5,000-$7,000 per year	$5,000-$7,000 per year
Total Cost WITHOUT Shock Pad	$481,000	$529,100
Total Cost WITH Shock Pad	Does not think it is needed	Does not think it is needed
Fiber Type	Monofilament	Dual Fiber
Fiber Thickness	Mono-360 microns	Mono-380 microns, Slit-130
Pile Height	2"	2"
Pile Weight (per SY)	36 oz. sq. yard	39 oz. sq. yard
Tuft Bind	8 lbs +	8 lbs +
Impact Attenuation, Gmax	< 200	< 200
Infill Material	Ambient Rubber/Sand	Cryogenic Rubber/Sand
Infill Mixture	3 layer	3 layer
Pounds of Sand / sf	3.65 lbs per square foot	3.65 lbs per square foot
Pounds of Rubber / sf	2.6 lbs per square foot	2.6 lbs per square foot
Total Turf Weight	958 sq. oz./yard	960 sq. oz./yard
Sewn Seams	Yes	Yes
Shock Pad	No (unneeded)	No (unneeded)
Alternative Infill Material	$.50-$.95 sq. foot + shock pad	$.50-$.95 sq. foot + shock pad
Maintenance Equipment Included	FieldSweep and GroomRight included	
Financial Backing	Owned by Tarkett	
Experienced Installation Crews	Our crews have installed thousands of fields nationwide	
Lead Time	Approx. 30 days (install another 30 days)	

Disclaimer: *Costs are intended to be high level estimates and are for budgeting purposes only.*

Provide any additional notes , clarifications or comments here:

As a reminder, the current 2 1/4" Vertex field is a FIFA Quality Pro field. In regards to shock pad, unless they plan on playing tackle football there's no need for a shock pad. Exception would be if you use an organic alternative infill system.

After discussing with FieldTurf, it is their recommendation that no shock pad is needed regarding this project. They identified a study that showed no direct correlation to the use of a shock pad and lower injury occurance.

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4 COSTS/MAINTENANCE

Picture: *Breese Stevens Field quickly transforming into a concert venue for a performance in early fall 2024.*

Cost Information

Many factors contribute to cost comparisons for replacing synthetic turf. Some of the factors include size of the field replacement, brand/product selection, subgrade and infrastructure improvements, as well as general availability of the synthetic turf product.

In consultation with turf vendors, the identified cost information is based on the assumption that only 96,200 square feet of playing surface is to be replaced.

Any pricing identified is subject to change and can fluctuate based on market conditions. Final pricing can be determined and locked in when a final vendor is selected and the final design is completed.

General costs range anywhere from:

$4.00/ sq. ft.

to

$7.00/sq. ft.

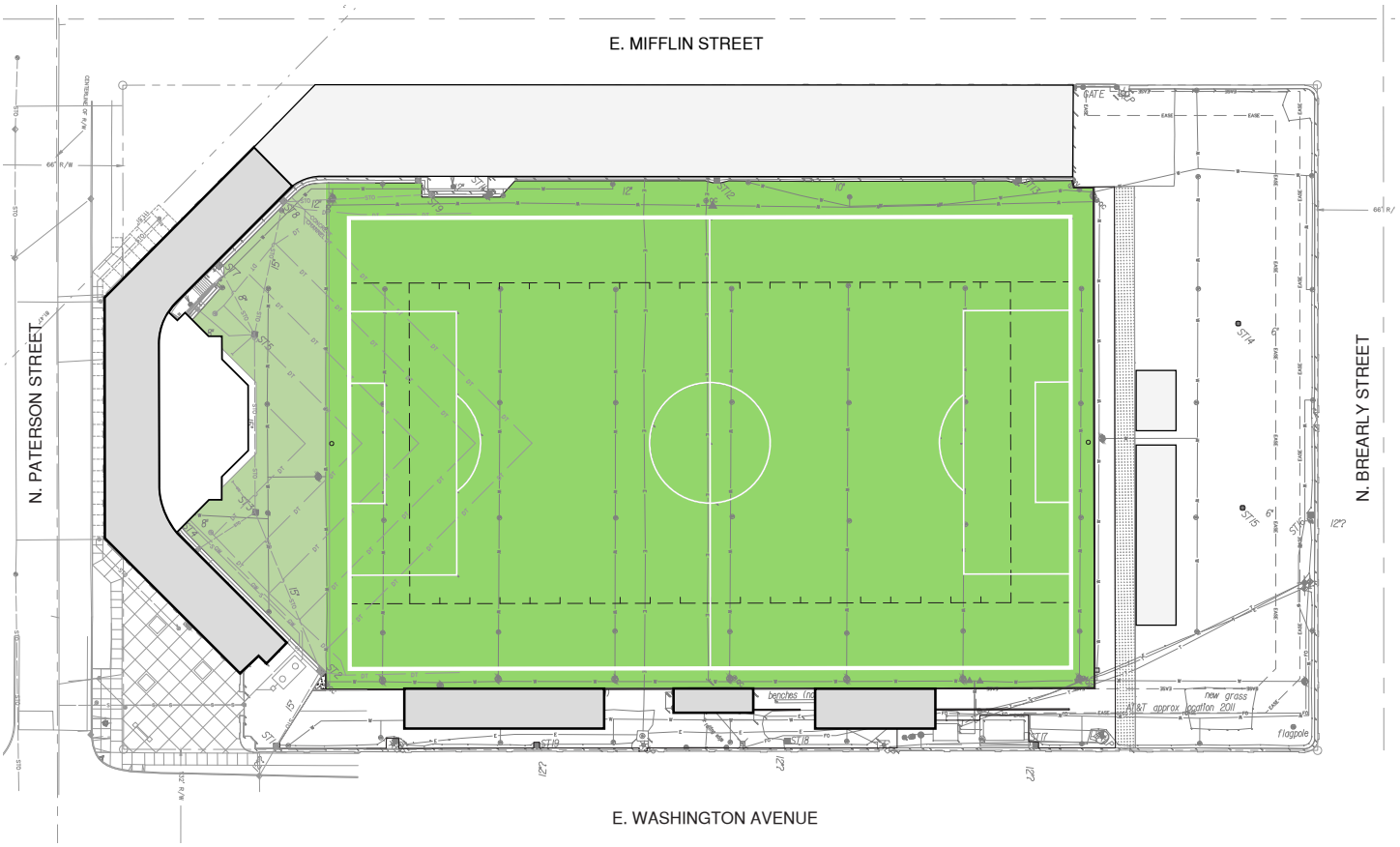
Note: The above costs are for synthetic turf and associated materials and installation. While sub grade improvements are believed to be minimal, the costs reflected do not include infrastructure improvements. See vendor specifications for each turf types approximate cost. Shock pads add an additional $1.50-$2.50 per sq. ft.

96,200

square feet of playable surface

10,300

square feet of non-playable surface



Maintenance Considerations

Proper maintenance of all synthetic turf installations is the key to ensuring the product reaches its intended lifespan; as well as maintaining the highest level of appearance and playability.

General maintenance is quite simple. Many of the turf manufactures recommend using either a groomer or sweeper type product after each use. Most have their own groomers that can be attached to small equipment and dragged along the playing surface. Based on the research for this study, manufacturers have recommended using a groomer or sweeper that also has a magnet included. The magnet helps to remove any larger pieces of debris that may have accumulated from the variety of events held at Breese Stevens Field.

Manufacturer Provided Maintenance:

$3,200 per year
to
$7,000 per year

Note: The figures above are based on conversations with the identified turf vendors in this study. Costs will ultimately depend on turf type and services provided. This cost is for a certified outside service to provide maintenance to the final product.

General Care Maintenance

- Sweep field for large debris with mechanical groomer or sweeper.
- Decompact the field to appropriate depth for age of fiber and field conditions.
- After decompaction, brush the field in multi-directions with brush to redistribute any loose infill.
- Re-sweep field to get any last fine debris.

Advanced Care Maintenance

- Sweep field for large debris with *magnetized* groomer or sweeper.
- Provide a deep decompaction of the field.
- After decompaction, use a rotary brush to raise the turf fibers and to guide infill through a filter to further screen out debris.
- Once infill is thoroughly cleaned, redistribute to the playing surface using a power brush and vacuum.
- Vacuuming the surface can provide one last effort at removing any remaining particulate or small debris.

Photo Credit: AstroTurf (technique and recommended equipment will vary per manufacturer.

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5 Appendix

Picture: *Subgrade work being completed during the initial installation of the synthetic turf at Breese Stevens Field in 2014.*

Turf Evaluation Matrix

Company	Greenfields		Astroturf		MWSTS		Fieldturf	
Product Name	**Iron Turf (woven)**	**All Sport Ultra (tufted)**	**Rootzone 3D3 52 oz. Blend**	**Rhino Blend 42 oz.**	**Pro Blend (tufted)**	**Pro Slit (tufted)**	**Rev360**	**Vertex Core**
Turf Life/Warranty	10 years	8 years	8/10 years with professional maintenance	8/10 years with professional maintenance	8 years	8 years	8 year warranty	10 year warranty
Initial Cost	$7.00 square foot + pad	$6.00 square foot + pad	$5.20 square foot	$4.75 square foot	$6.00 square foot + pad	$6.00 square foot + pad	$5.00 square foot	$5.50 square foot
Maintenance Cost	$3,600 per year	$3,600	Professional $3,200/year	Professional $3,200/year	$3,600 per year	$3,600 per year	$5,000-$7,000 per year	$5,000-$7,000 per year
Total Cost WITHOUT Shock Pad	$673,400	$586,820	$548,350 +/-	$505,050 +/-	$590,000	$590,000	$481,000	$529,100
Total Cost WITH Shock Pad	$843,000 (Brock14) / $913,900 (YSR)	$731,120	$692,640 +/-	$649,350 +/-	$760,000	$760,000	Does not think it is needed	Does not think it is needed
Fiber Type	10050 XPS and GPC XWRD	5040 XP Blade Plus + 4PLX XWRD	Mono/Slitfilm/Rootzone A/B by row	Mono/Slitfilm A/B by row	5040 XP Blade Plus + 4PLX XWRD	5040 XP Plus	Monofilament	Dual Fiber
Fiber Thickness	100 / 365 microns	100 / 365 microns	330/115 micron	330/115 micron	586820	100 microns	Mono-360 microns	Mono-380 microns, Slit-130
Pile Height	2"	2"	2"	2"	2"	2"	2"	2"
Pile Weight (per SY)	59 oz.	45 oz.	52 oz.	42 oz.	46 oz.	46 oz.	36 oz. sq. yard	39 oz. sq. yard
Tuft Bind	≥ 14 lbs.	≥ 9 lbs.	8+	8+	≥ 9 lbs.	≥ 9 lbs.	8 lbs +	8 lbs +
Impact Attenuation, Gmax	Varies (≤ 200)	Varies (≤ 200)	Under 165	Under 165	Varies (≤ 200)	Varies (≤ 200)	< 200	< 200
Infill Material	Silica sand / Crumb rubber	Silica sand / Crumb rubber	SBR and Silica Sand	SBR and Silica Sand	Silica sand / Crumb rubber	Silica sand / Crumb rubber	Ambient Rubber/Sand	Cryogenic Rubber/Sand
Infill Mixture	Sand as ballast	Sand as ballast	65%/35% weight	65%/35% weight	Sand as ballast	Sand as ballast	3 layer	3 layer
Pounds of Sand / sf	3.0	3.0	1.4 lbs/sf	1.55 lbs/sf	3.0	3.0	3.65 lbs per square foot	3.65 lbs per square foot
Pounds of Rubber / sf	2.5	2.5	2.65 lbs/sf	2.85 lbs/sf	2.5	2.5	2.6 lbs per square foot	2.6 lbs per square foot
Total Turf Weight	93 oz.	73 oz.	78.7 lbs per sq. yard	68.7 per sq. yard	74 oz.	74 oz.	958 sq. oz./yard	960 sq. oz./yard
Sewn Seams	No - glued seams	Yes or glued	Glued	Glued or Sewn	Yes or glue	Yes or glue	Yes	Yes
Shock Pad	Powerbase/YSR and ShockPad/SERIES by Brock	ShockPad/SERIES 14 by Brock	Brock or Schmitz Proplay	Brock or Schmitz Proplay	ShockPad/SERIES 14 by Brock	ShockPad/SERIES 14 by Brock	No (unneeded)	No (unneeded)
Alternative Infill Material	As specified	As specified	Brockfill over SP17 shock pad	Brockfill over SP17 shock pad	As specified	As specified	$.50-$.95 sq. foot + shock pad	$.50-$.95 sq. foot + shock pad
Maintenance Equipment Included	As specified	As specified	Litter Cat and Greensgroomer		As specified	As specified	FieldSweep and GroomRight included	
Financial Backing			AstroTurf Warranty and 3rd Party Insured Warranty				Owned by Tarkett	
Experienced Installation Crews	Yes		Certified AstroTurf Crews		Yes		Our crews have installed thousands of fields nationwide	
Lead Time	Approx. 60 days (20 days for removal and install)		Approx. 45-60 days from approved shop drawings		Approx. 60 days (20 days for removal and install)		Approx. 30 days (install another 30 days)	

Local Projects					
Menomonee Falls Installed 2018 Crumb Rubber w/sand ballast no pad Pile Height 2.25", 62oz.	**Voigt Soccer Park - Brookfield WI** Installed 2024 No Pad Pile Height 2", 52oz.	**New Glarus High School - New Glarus WI** Installed 2024 Brock SP 14mm XL Pad Pile Height 2", 42oz.	**Reddan Soccer Park - Verona WI** Installed 2020 Crumb Rubber w/sand ballast No Pad Pile Height 2", 46oz.	**Verona High School - Verona WI** Installed 2019 Ambient Rubber infill w/sand ballast No Pad Pile Height 2", 36oz.	**Warren Township High School - Warren IL** Installed 2024 Cryogenic Rubber infill w/sand ballast No Pad Pile Height 2", 39oz.
Deforest High School - Deforest WI Installed 2020 BrockFILL w/sand ballast Brock SP 17mm Pad Pile Height 2", 59oz.	**Nicolet High School - Glendale WI** Installed 2023 Brock SP 14mm XL Pad Pile Height 2", 52oz.	**Wauwatosa East HS** Installed 2019 Rhino SF - Brock infill w/sand ballast Brock SP 17mm Pad Pile Height 2", 38oz.	**West Allis Nathan Hale** Installed 2022 Brock infill w/sand ballast Brock YSR 1" Pad with Brockfill Pile Height 2", 46oz.	**Badger High School -Lake Geneva WI** Installed 2017 Ambient Rubber infill w/sand ballast No Pad Pile Height 2", 36oz.	**Richmond Burton High School - Richmond IL** Installed 2022 Cryogenic Rubber infill w/sand ballast No Pad Pile Height 2", 39oz.
Englemann Stadium - Milwaukee WI Installed 2024 Crumb Rubber w/sand ballast Brock YSR 1" Pad Pile Height 2", 59 oz.	**Tomasini Stadium - Mequon WI** Installed 2022 No Pad Pile Height 2", 52oz.	**Fitting Field - Mequon WI** Installed 2024 Rootzone 3DM Mono No Pad Pile Height 2", 52oz.	**Hart Park** Installed 2020 Brock infill w/sand Brock SP 17mm Pad with Brockfill Pile Height 2", 46oz.		**West Aurora High School - Aurora IL** Installed 2022 Cryogenic Rubber infill w/sand ballast No Pad Pile Height 2", 39oz.
	Horlick Athletic Field - Racine WI Installed 2020 No Pad Pile Height 2", 52oz.				