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Town of Trumbull
CONNECTICUT

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Additional information related to the installation of Synthetic Athletic Turf (SAT) at Trumbull High School

Advantages of SAT

SAT has proven to be the most desirable surface for a variety of sports. The most significant advantage is the consistency of the playing surface. Even the finest maintained grass field will deteriorate as a result of over use of play during inclement weather. SAT provides a uniform surface and allows play to continue in any weather.

Ball sports, such as, field hockey, lacrosse and to a lesser degree, soccer find the SAT more desirable that even a well maintained grass surface as a result of faster more uniform roll. Trumbull High School currently transports the field hockey team to Indian Ledge turf when the High School Turf field is unavailable to take advantage of the premium conditions and avoid playing on grass.

SAT allows an intensity of use that far exceeds a grass playing surface. This is a critical factor when considering installing SAT at the High School Varsity grass field. The Town has invested in the installation of lights at this location, yet the lights are not fully utilized as efforts are made to reduce use to maintain an acceptable quality of grass. The combination of SAT with lights allows the field to be scheduled as much as 3 times that of a grass field with no lights.

Why Geofill

The recommendation to install the Geofill product is based on several factors. The Parks and Recreation Department and Athletic Director have researched the various playing surface alternatives and visited a variety of local facilities with an assortment of playing surfaces. We are recommending the Shaw Sport turf product based on several criteria.

- Safety – The Shaw installation utilizes a shock pad below the playing surface to assure a guaranteed G-max rating for the life of the field. This eliminates the variation in infill material as a factor in this important safety factor for a multi-sport facility.
- Environmentally Friendly – Geofill is an organic product (90% Coconut fiber and 10% cork) that eliminates the environmental concerns that have arisen regarding the use of crumb rubber.
- Temperature – Geofill fields are proven to be considerably cooler than rubber infill fields. This makes the fields safer and more comfortable to play in particularly during the summer months in the local environment.

- Performance – Geofill provides a minimal infill splash compared to crumb rubber, provides a controlled ball roll best suited to field hockey and lacrosse and performs under foot more like natural grass.
- Proven product - while relatively new in this area Geofill has been used since 2005 and there are currently over 500 fields in use. Locally Wilton High School and Masuk High School in Monroe have recently installed Geofill fields.

What Alternatives were Considered

The standard for many years in the SAT industry has been crumb rubber form recycled tires. There has been considerable debate on the potential environmental and health issues posed by the use of this product in these applications. Given that the science in this area is still being debated and the existence of proven alternatives we do not recommend this product at this time.

The other most common alternative available is a post industrial rubber infill that is represented as avoiding the environmental issues related to the previous generation of crumb rubber. While this is a viable alternative it still relies on black crumb rubber and does not have the advantage of the cooler playing surface of Geofill.

Estimated Construction Cost

Based on 87,00 sq/ft

Turf	5.90/sq.ft	513,300.00
Site Work	5.50/sq.ft	478,500.00
Engineering and Construction Supervision		45,000.00
Access and Site Amenities		70,000.00
Sub total		1,106,800.00
Contingency		110,680.00
Project Estimate		**1,217,480.00**

Maintenance and Life Cycle Cost

SAT is relatively maintenance free, with approximately 20 hours of grooming annually required to maintain the surface. The Geofill product does require periodic replacement estimated at $3,000 per year. Based on an anticipated 12 year life the maintenance cost per field is estimated at approx. **$51,600** over the life of the field. (A relatively small additional cost may be incurred for field lining based on the exact use of the field.) Including replacement cost the lifecycle cost (not including the initial installation) is estimated at approx. $675,000.

The estimated cost of maintaining a first class grass field including mowing, painting, annual turf maintenance, irrigation repairs and annual field renovations and at least one major renovation over the same 12 year period is estimated at over $500,000.

Life Cycle Cost Analysis

		Grass	SAT
Materials (Annual)			
Paint		3,000	300
Seed, Fertilizer, Pesticides		750	
Renovations		3,000	3,000
Irrigation Repair		100	
	Total Materials	$6,850	$3,300
Labor Hours (Annual)			
Marking		300	30
Mowing		104	
Turf Maintenance		40	20
Renovations		100	
Irrigation Repair		20	
	Total Hours	564	50
	Total Labor @ $20/hr	$11,280	$1,000
Misc - Mowing equipment (replacement, repairs, gasoline), Irrigation (replacement, water)		$3,000	
Total Annual Maintenance Cost		$21,130	$4,300
12 year Maintenance Cost		$253,560	$51,600
Major Renovation		$250,000	
Cost of Replacement			$625,000
Total Life Cycle Cost		**$503,560**	**$676,600**

Scheduling and Revenue Generation

The Parks and Recreation Department and the Trumbull High School Athletic Department work cooperatively on field schedules and assignments. Trumbull High School is the priority user of the fields and it is anticipated this field will be utilized by all of the field sports teams (field hockey, boys and girls soccer, boys and girls lacrosse, football) as well as the THS Marching Band. The additional SAT surface will address current scheduling conflicts, eliminate the need to transport teams to Indian Ledge and provide upgraded field quality opportunities for sub varsity teams and address any inequities in field scheduling related to Title 9 opportunities.

The Parks and Recreation Department will make the field available on a priority basis to Trumbull Youth Sports Organizations. These organizations including Trumbull United, Trumbull Youth Lacrosse, Trumbull Field Hockey, AYSO and Pop Warner Football serve thousands of youth sports participants in the community. The addition of a lighted SAT field will serve this community which is restricted to playing after 5pm during the primary spring and fall seasons.

Additional opportunity to utilize the SAT fields will also result in an improved quality of the town's grass field inventory as the demand to play on the field in bad weather is reduced.

Additionally, the increased inventory of a premium lighted athletic field may potentially result in revenue opportunities related to field rentals at off peak hours.

Additional Information

Additional promotional material on the Geofill product provided by Shaw Sports Turf are attached.

Prepared S. McCarthy

11/13/16

// FAQs

Geofill

What is GeoFill?

GeoFill is an environmentally-friendly alternative infill for synthetic turf systems.

How long has GeoFill infill been used and how many GeoFill fields have been installed?

GeoFill has been used since 2005. Over 500 GeoFill fields have been installed world-wide. (Reference List Available)

What is the make-up of the GeoFill?

GeoFill is 90% coconut and 10% cork.

Where is the source for the coconut raw material?

The coconut for our Geofill system comes from Sri Lanka or India.

Is there any performance data for a FIFA 2 Star recommended product which includes GeoFill?

GeoFill Product Performance Properties

PROPERTY	FIFA 2 STAR LIMITS	ELITE GEO 45P	ELITE GEO 45G	ELITE GEO 25
g-max		98	100	118
Force Red (%)	60-70%	65	65	66
Vertical Deformation (mm)	4-11 mm	9.0	9.6	10.0
Rotational Resistance (NM)	30-45 NM	40	40	36
Vertical Ball Rebound (m)	0.6-0.85 m	0.75	0.71	0.82
Ball Roll (m)	4-8 m	5.0	5.0	5.1

How does the infill splash (fly) of GeoFill compare to fields with crumb rubber infill?

A properly maintained GeoFill system has little to no infill splash or fly.

Do GeoFill systems require a pad?

All 100% GeoFill systems require a shock pad. A system containing a combination of GeoFill and SBR crumb rubber can be installed without a pad.

What is the warranty of a Shaw Sports Turf synthetic turf field with the Geofill infill mixture?

Shaw Sports Turf systems with the Geofill infill mixture carry the same standard 8 year warranty as all other Shaw Sports Turf systems.

// FAQs

GeoFill

Does it require a watering source and what is the optimum moisture percentage?

The watering requirements for the GeoFill system are directly related to the amount and frequency of rainfall and the relative humidity at a given location. The optimal level of moisture in the GeoFill system is between 30% and 40%. If an installation is located where occasional precipitation and humidity is in the 30-50% range, less mechanical irrigation is required. However, the system's moisture content should be monitored at least twice a week when no precipitation has taken place to naturally add. If the system drops below a 30% moisture reading, approximately 3,200 gallons of water should be added to an 80,000 square foot field (5 oz. per square foot). Typically, during a dry period this would not have to be done more than two times per week. Cloud cover and sunlight will affect the evaporation of the water from the system, and need to be monitored with the other variables noted above.

What happens in drought conditions when watering restrictions are in effect, and the system cannot be watered?

If the proper moisture content is not maintained, the system can become dusty, more splash can be seen, and the playing speed can be slower. Under these conditions, additional GeoFill may need to be added more frequently (dry GeoFill breaks down more quickly than properly maintained GeoFill).

How is the moisture content of the GeoFill system measured?

Moisture content can be measured by using a meter such as the Extech MO210 Moisture Meter.

What is the moisture content when the GeoFill is shipped?

The moisture content at shipping is generally around 20%.

What routine maintenance is required?

The synthetic turf system with GeoFill should be maintained in accordance with the Shaw Sports Turf Maintenance Manual as written for routine maintenance. If larger issues arise that are not covered in the maintenance manual, a solution would be developed on a case by case basis.

Is there any additional yearly maintenance required?

Shaw Sports Turf GeoFill systems should be de-compacted on yearly basis by a Shaw Sports Turf crew or a Shaw Sports Turf certified maintenance crew. This is typically a one-and-a-half to two-day process.

Can the customer do their own yearly decompaction?

With the proper equipment and training, a customer could do their own yearly decompaction; however, we would prefer that a properly trained Shaw Sports Turf crew or a Shaw Sports Turf certified maintenance crew do the yearly maintenance.

// FAQs

GeoFill®

When does the system need to be topped off, and how much?

If the moisture content of the GeoFill is maintained correctly, approximately 10% of the GeoFill will need to be replenished every 2-3 years. Based on an 80,000 square foot field requiring 1.5 lbs. of GeoFill per square foot, 12,000 lbs. (or 7 bags) would need to be added every two to three years. This process will include a decompaction, the addition of the new GeoFill, and a final grooming. This process will take two to three days.

Does the degradation of the GeoFill over time affect the drainage properties?

Experience with these fields has not shown drainage to be negatively affected.

Will dry GeoFill blow away?

Dry GeoFill will not typically blow away; however, if the proper moisture content is not maintained, the dry system can become somewhat dusty.

Are there any limits to hours of play on a GeoFill system?

No, there are no limits on hours of play. However, higher usage will require more frequent routine maintenance. As with any Shaw Sports Turf system, all high use areas should be monitored frequently for proper infill depth. If the infill depth is low in any area, it should be brought up to the proper depth immediately.

Does the GeoFill system freeze or get hard in the winter?

The system typically contains moisture, so without any type of treatment it stands to reason that some freeze/thaw will take place. We recommend a pre-winter treatment with a salt solution of 0.2 lbs. salt/sq. ft. mixed into the GeoFill infill system. While this will decrease the freezing potential, GeoFill, like natural grass and traditional synthetic turf fields, will become harder during freezing weather.

Will heavy rain affect the playability or drainage of the field?

During heavy rains the GeoFill may become saturated, but the drainage and playability should not be affected.

Do weeds grow in the system, if so, how are they treated?

While this does not happen in most environments, some environments have led to weed growth. The system has been treated with a herbicide (that is naturally washed out of the system) to effectively to kill the weeds. A pre-emergent has also been used to further control weed growth in those areas.

Will GeoFill be more likely to harbor bad bacteria such as MRSA than traditional synthetic turf systems?

There is no documented proof of this being the case. With respect to our systems (GeoFill/Sand), and the benefits of sunlight/UV, these systems will closely match natural grass fields as it pertains to harboring any contaminant. Coconut, or Coir, fibers are completely natural and biodegradable. They are used as a growing medium in greenhouses because it retains moisture very well and is free of bacterial and fungal spores.

// FAQs

GeoFill®

Are birds and animals attracted to GeoFill more than traditional synthetic turf?

GeoFill is not a food source, so there has been no evidence that this is the case.

Will the GeoFill system pass synthetic turf flammability tests?

A properly maintained (proper moisture content) GeoFill Field will pass ASTM D2859 (pill burn test) and ISO 11925-2 (filter paper test).

How is the GeoFill delivered to the field?

GeoFill comes in 1784 lb. super sacks loaded on a flatbed truck. Typically 22 bags/truck.

How is GeoFill Installed?

GeoFill is installed with the same equipment and the same techniques as standard infill. GeoFill cannot be installed when the field is wet or when it is raining.

Can game lines be painted on a GeoFill system?

Yes.

If a GeoFill field is painted and then groomed, is there any impact on the aesthetics of the field?

The grooming process should not affect the overall aesthetics of the painted game lines.

Are people with peanut allergies at risk on a GeoFill field?

No. Coconut is not a nut or a legume (like peanuts). Coconuts are part of the palm tree family.

Explain the cooling effect of GeoFill.

The excellent moisture retention capabilities of GeoFill allows the infill system to absorb water which is released when sunlight warms the field. The release of water removes heat from the field by evaporative cooling. The surface will remain cooler as long as there is water present in the system. When compared to crumb rubber infilled fields, GeoFill fields have been seen to be 40 degrees F cooler than traditional synthetic turf fields. Test result are available upon request.

Can GeoFill be recycled or re-used?

A large percentage of the existing GeoFill can be removed from the synthetic turf system and the mix is perfect for top-dressing of natural grass fields or landscaped area. Coconut, or Coir, fibers are completely natural and biodegradable. It is used as a growing medium in greenhouses because it retains moisture very well and is free of bacterial and fungal spores.

How do you remove snow and ice from the GeoFill system?

Refer to the Shaw Sports Turf Maintenance Manual for the recommended guidelines for snow removal. If these recommendations are followed, there should be no adverse effect to the GeoFill system. It is important to point out that no removal method should dig into, or gouge the surface.

We do not recommend breaking up ice from the surface and removing, as infill may be stuck in the ice.

THIS IS CONSIDERED A GENERAL GUIDELINE. IF YOU HAVE ANY QUESTIONS, PLEASE CONTACT YOUR SHAW SPORTS TURF REPRESENTATIVE, AND WE WOULD BE MORE THAN HAPPY TO ADDRESS ANY QUESTIONS YOU MAY HAVE.

REGIONAL PROFILE

shaw SPORTS TURF

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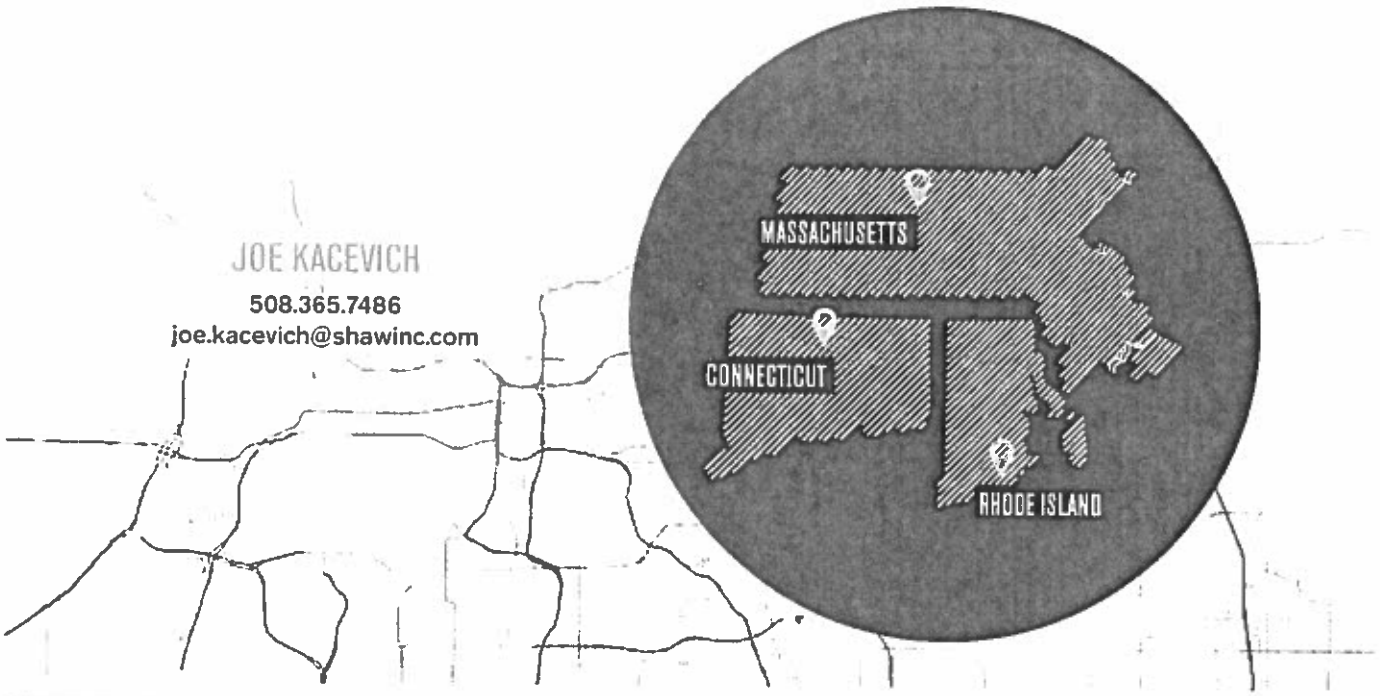


WILTON HIGH SCHOOL, multi-purpose — Wilton, CT

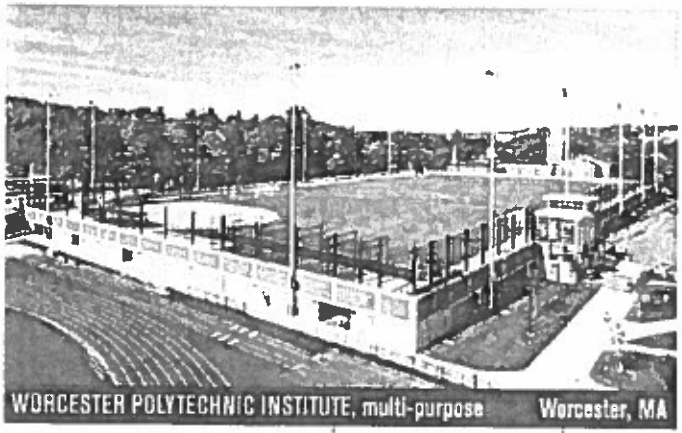
Product: Momentum Pro with Geofill	SQFT: 80,000	Year: 2016

CHESHIRE ACADEMY, multi-purpose — Cheshire, CT

Product: PowerBlade HP	SQFT: 89,446	Year: 2011

ENDICOTT COLLEGE, multi-purpose — Beverly, MA

Product: Legion HP	SQFT: 123,312	Year: 2012

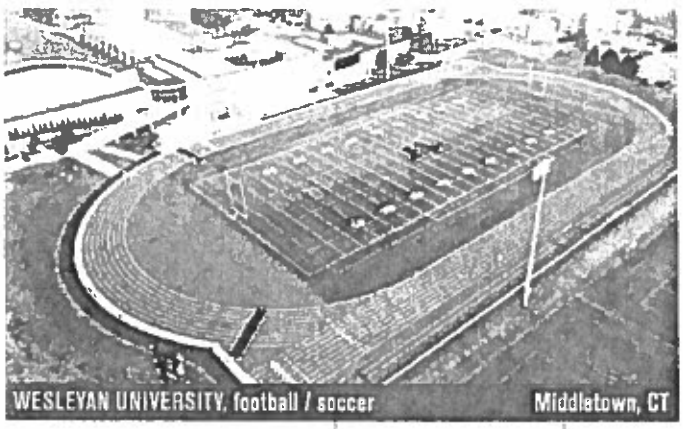


WORCESTER POLYTECHNIC INSTITUTE, multi-purpose — Worcester, MA

Product: Legion HP	SQFT: 135,000	Year: 2013

PROVIDENCE COLLEGE — Providence, RI

Product: Legion HP	SQFT: 96,700	Year: 2013



WESLEYAN UNIVERSITY, football / soccer — Middletown, CT

Product: Momentum HP	SQFT: 90,942	Year: 2013

IN THE SUMMER OF 2013 WESLEYAN ATHLETICS INSTALLED SHAW'S MOMENTUM 51 FOR PRIMARY USE FOR OUR FOOTBALL AND MEN'S LACROSSE TEAMS. OVER THE PAST TWO SEASONS WE HAVE SEEN A SIGNIFICANT REDUCTION IN REPORTED CONCUSSIONS BY MEMBERS OF THE FOOTBALL TEAM. I AM VERY SATISFIED WITH THIS PRODUCT. IN ADDITION TO OFFERING CONTACT SPORTS AN OPTIMAL LEVEL OF SHOCK ATTENUATION, WHAT IMPRESSED ME THE MOST ABOUT THE COMPANY WAS THEIR OUTSTANDING PRODUCT PRESENTATION AND THEIR ATTENTION TO DETAIL DURING THE INSTALLATION.

MIKE WHALEN, DIRECTOR OF ATHLETICS/HEAD FOOTBALL COACH, WESLEYAN UNIVERSITY

OTHER INSTALLATIONS

INSTALLATION	CITY	STATE	PRODUCT	SQ FT	AGE
Simmons College	Boston	MA	Momentum HP with Geofill	89,168	2016
Simmons College	Boston	MA	Legion HP with Geofill	87,665	2016
Thayer Academy	Braintree	MA	Legion HP with Geofill	153,200	2016
Tantasqua Regional High School	Fiskdale	MA	Legion HP with Geofill	166,300	2016
Lauralton Hall	Milford	CT	Legion HP	100,786	2015
Pomperaug High School	Southbury	CT	Legion HP	83,000	2015
The Loomis Chaffee School	Windsor	CT	Momentum HP	84,096	2015
Notre Dame High School	West Haven	CT	PowerBlade HP	89,749	2014
Brunswick School	Greenwich	CT	PowerBlade HP	63,984	2014
Assumption College	Worcester	MA	Legion HP	111,137	2015
University of Massachusets-Garber Field	Amherst	MA	Momentum HP	84,915	2015
Beaver Country Day School	Brookline	MA	Legion HP	141,340	2014
Blue Hills Regional High School	Canton	MA	PowerBlade HP	77,774	2014
Clark University	Worcester	MA	Legion HP	96,942	2014
College of the Holy Cross	Worcester	MA	PowerBlade HP	89,100	2014
Georgetown High School	Georgetown	MA	Legion HP	119,531	2014
Nobadeer Farms	Nantucket	MA	PowerBlade HP	99,450	2014
Peabody High School	Peabody	MA	Legion HP	88,548	2014
Williams College	Williamstown	MA	VictoryTurf HP	63,951	2014
Providence College - Anderson Stadium	Providence	RI	Legion Pro	99, 251	2015