



Oyster Bay-East Norwich Central School District

Capital Project Discussion

January 9, 2018



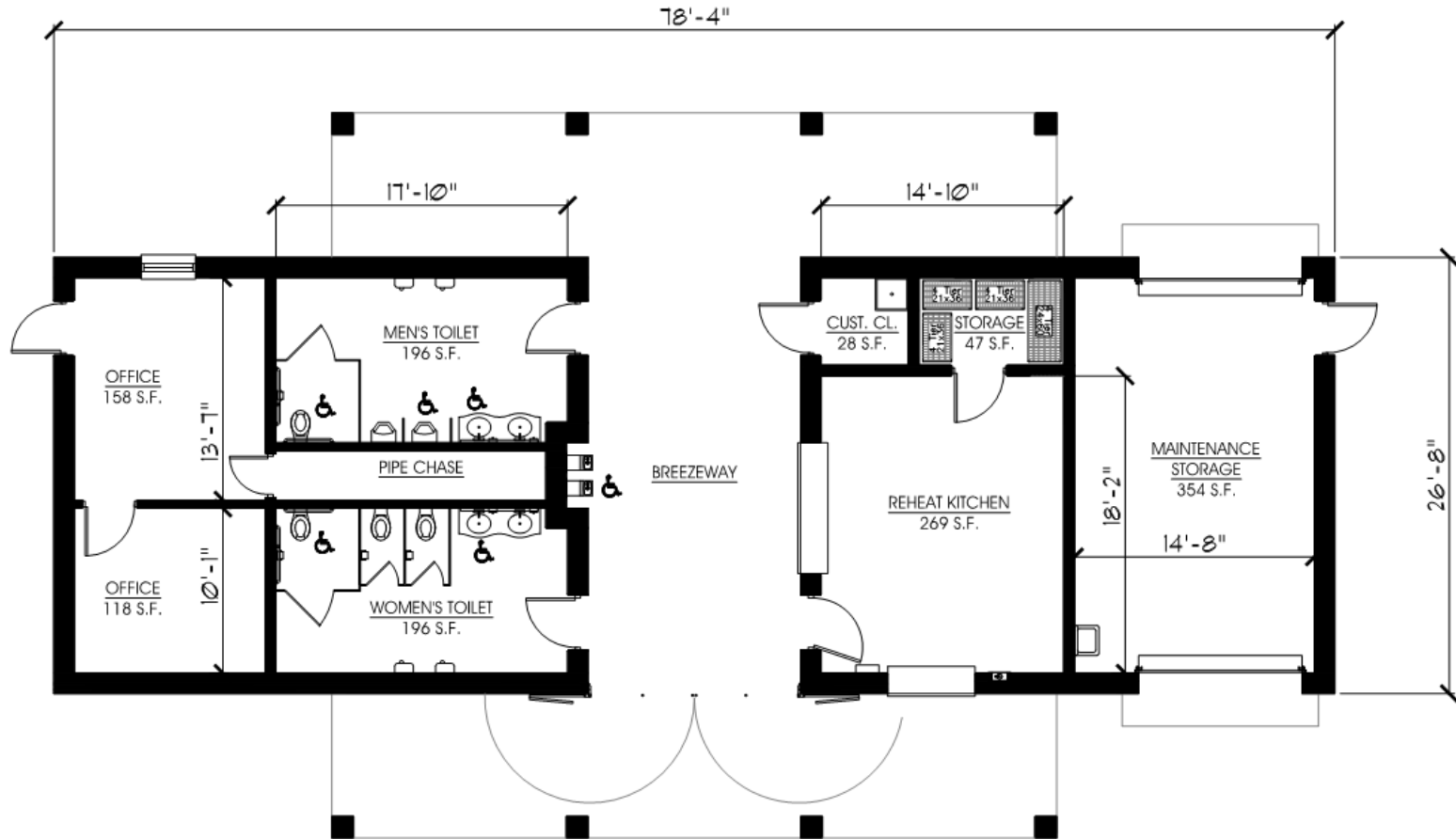
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PROPOSED SYNTHETIC TURF FIELD



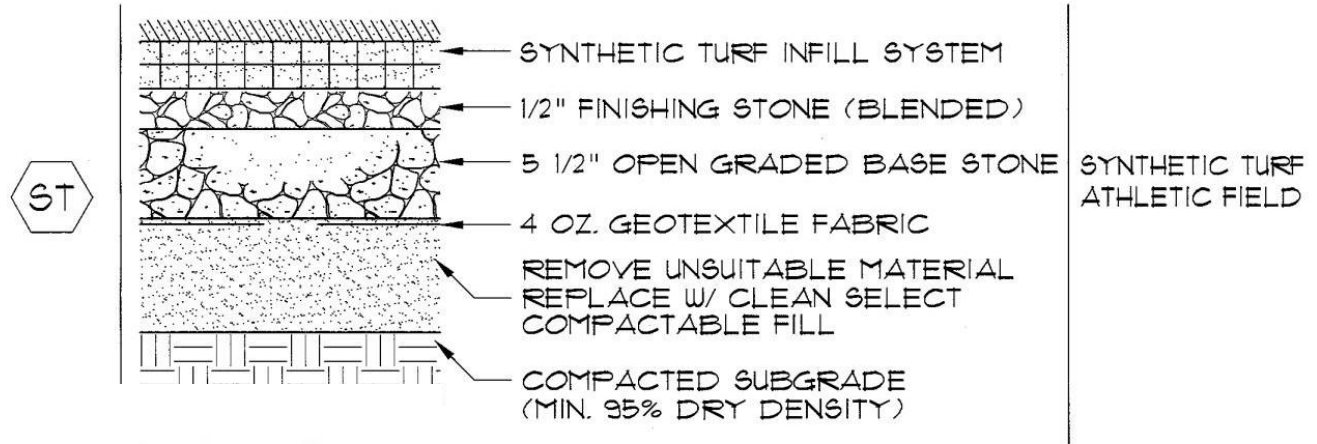
Proposed Field House



Synthetic Turf Discussion

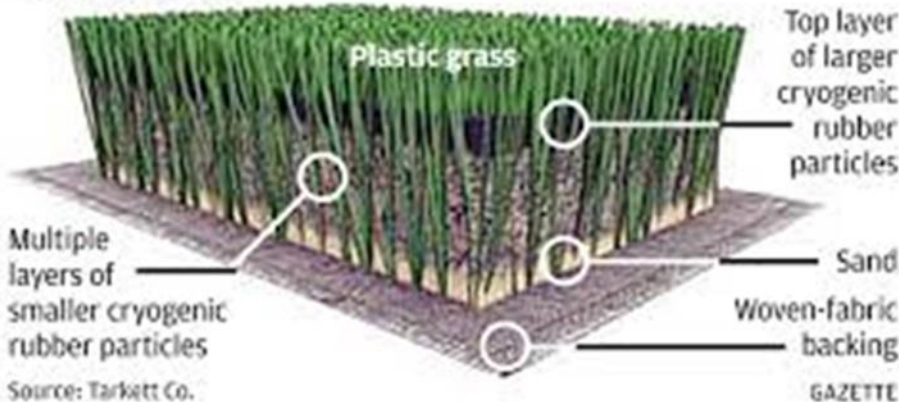


What is Synthetic Turf?



What's in Field Turf?

An artificial turf field like FieldTurf is made up of plastic grass fibers held in place by up to 21 layers of different-sized cryogenic rubber particles and sand.



What is Synthetic Turf?

Date Issued: November 2, 1999
Re-Exam Date: December 8, 2009
Re-Exam Results: Patent Upheld
Description Of Technology: All rubber infill with a woven / non-woven/ woven backing

The technology cannot be sub-licensed without the expressed written permission of ITS-Sprinturf Holding, LLC



44oz ULTRABLADE MX - STANDARD PRODUCT SPECIFICATION

Grass Yarn	Polyethylene Spinneret Monofilament
Yarn Supplier	ITS - Sprinturf
Yarn Denier	12,000
Yarn Thickness	260 Microns
Finished Pile Height	2.25"
Pile Fiber Weight	44oz/yd2
Primary Backing	Triple Backing
Primary Backing Weight	9oz/yd2
Primary backing Composition	Woven/Non-Woven/Woven
Secondary Backing	Polyurethane
Secondary Backing Weight	22oz/yd2
Total Weight (w/o infill)	75oz/yd2
Tufting Gauge	1/2"
Tuft Bind	>10lbs/force
Permeability	>60 in./hr./ft.
Infill	Crumb Rubber 10-20 mesh, Rounded Silica Sand 20-40 mesh
G Max Warranty	All Rubber: Under 150G's; Sand/Rubber: Under 175G's

The information provided above represents the standard characteristics for the named product. If required this product can be manufactured to meet alternative specification requirements within our manufacturing tolerances.

The above referenced data and supporting documents apply only to the sample tested and do not necessarily indicate the qualities of all products, materials or materials.

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Version One 9/10/13

INFILL NEEDS TO MEET STANDARDS SET FOR GMAX, PERMIABILITY AND OTHERS



Performance Guidelines

Sport Performance

ASTM F1936 (*g*-max)—Gives an indication of high impact shock absorption.



Shock Absorption and Vertical Deformation—Measures the impact absorption provided by synthetic turf to a player running (lower extremity impact) or falling on as well as the foot stability of the surface as a player runs across it. Excess deformation of a surface could lead to over strained joints and fatigue.



Rotational Resistance (Traction)—Measures the interaction between the shoe sole and the surface of artificial grass relating to the ability of a player to change direction.



Slip Resistance Scale and Deceleration—Measures the ability of studs to slide through the surface without causing the player to slip over. Slip resistance deceleration measures the deceleration experienced by the players shoe as it makes contact with the surface. If the deceleration is too high, damages to joints and ligaments may occur.



Skin Abrasion/ Skin Friction—Measures the abrasiveness and friction of artificial turf on the skin of the player when sliding.



Vertical Ball Rebound—Measures how high the ball bounces when falling vertically onto a synthetic turf field. (Although a method for soccer, this also gives an indication of consistent infill levels throughout the playing surface in a low cost tool).



Performance Guidelines

Guidelines for Synthetic Turf Performance (*continued*)

Performance Guidelines			
ASTM F1936	Impact Attenuation (<i>g</i> -max)	Below 165	Below 165
FIFA 04 and FIFA 09	Shock Absorption	55% to 70%	60% to 70%
FIFA 05 and FIFA 09	Vertical Deformation (foot stability)	4mm to 9mm	4mm to 8mm
FIFA 06 and FIFA 09	Rotational Resistance (traction)	25n to 50n	30n to 45n
FIFA 07	Linear Friction—Deceleration	3.0g to 6.0g	3.0g to 5.5g
FIFA 07	Linear Friction—Slide	120 to 220	130 to 210
FIFA 08	Skin Abrasion (dry)	< 30%	< 30%
FIFA 08	Skin/Surface Friction (dry)	0.35 to 0.75	0.35 to 0.75
FIFA 01 and FIFA 09	Vertical Ball Rebound (soccer)	60cm to 100cm	60cm to 85cm
FIFA 02	Angled Ball Behavior (soccer)	45% to 70%	45% to 60%
FIFA 03	Ball Roll (soccer-specific)	4m to 10m	4m to 8m
Testing Frequency Guidelines (according to Client requirements and budget)			
Client Requirements	Laboratory Testing	Pre-purchase and as QC Measure	Pre-purchase and as QC Measure
Client Requirements	Field Testing	After Installation	After Installation
Client Requirements	Field Testing (follow-up)	Every Four Years	Every Year



Glossary of Infill Materials

Crumb Rubber

Crumb Rubber is derived from scrap car and truck tires that are ground up and recycled. Two types of crumb rubber infill exist: Ambient and Cryogenic. Together these make up the most widely used infill in the synthetic sports field and landscape market. Crumb rubber infill is substantially metal free, and, according to the STC Guidelines for Crumb Rubber Infill, should not contain liberated fiber in an amount that exceeds .01% of the total weight of crumb rubber, or .6 lbs. per ton.

Coated Rubber Infill

Both ambient and cryogenic rubber can be coated with colorants, sealers, or anti-microbial substances if desired. Coated rubber provides additional aesthetic appeal, reduction of dust by products during the manufacturing process and complete encapsulation of the rubber particle.



Glossary of Infill Materials

EPDM Infill

EPDM (Ethylene Propylene Diene Monomer) is a polymer elastomer with high resistance to abrasion and wear and will not change its solid form under high temperatures. Typical EPDM colors are green and tan. EPDM has proven its durability as an infill product in all types of climates. Its excellent elasticity properties and resistance to atmospheric and chemical agents provide a stable, high performance infill product.

Organic Infill

There are several organic infills available in the North American market, all utilizing different organic components, such as natural cork and/or ground fibers from the outside shell of the coconut. These products can be utilized in professional sports applications as well as for landscaping. At the end of its life cycle it can be recycled directly into the environment.



Glossary of Infill Materials

Sand (Silica) Infill

Pure silica sand is one of the original infilling materials utilized in synthetic turf. This product is a natural infill that is non-toxic, chemically stable and fracture resistant. Silica sand infills are typically tan, off-tan or white in color and - depending upon plant location – may be round or sub-round in particle shape. As a natural product there is no possibility of heavy metals, and the dust/turbidity rating is less than 100. It can be used in conjunction with many other infills on the market to provide a safe and more realistic playing surface. The round shape plays an integral part in the synthetic turf system. It is important that silica sand have a high purity (greater than 90%) to resist crushing and absorption of bacteria and other field contaminants. Silica sand can either be coated with different materials as a standalone product or can be used to firm up in combination with traditional crumb rubber infill systems.



Glossary of Infill Materials

Coated Silica Sand Infill

This class of infill consists of coated, high-purity silica sand with either a soft or rigid coating specifically engineered for synthetic turf. These coatings are either elastomeric or acrylic in nature (non-toxic) and form a bond with the sand grain sealing it from bacteria to provide superior performance and durability over the life of a field. Coated sand is available in various sizes to meet the application's needs.

Depending on the amount and type of infill, coated sands can either be used with or without a pad and are available in various colors. All of the coatings are non-toxic and are bonded to the quartz grain for superior performance and durability over the life of your field. These materials are typically used as a homogenous infill which provides both ballast and shock absorbing qualities to a synthetic turf application.



Glossary of Infill Materials

TPE Infill

Thermo plastic elastomer (TPE) infill is non-toxic, heavy metal free, available in a variety of colors that resist fading, very long lasting, and 100% recyclable and reusable as infill when the field is replaced. TPE infill, when utilizing virgin-based resins, will offer consistent performance and excellent g-max over a wide temperature range.

Hybrid

Constitutes the use of sand, rubber, or other suitable materials in various combinations. (This should not be confused with hybrid carpet systems that consist of a combination of fiber types.)



Samples of Infill Materials

PureFill



GeoPlus



TPE



EPDM



NIKE GRIND



Envirofill



Cost of Infill Materials



Are there other infill options?

Yes. There are many other infill options. However, there are drawbacks to everything. And, frankly, nothing has been tested to the extent that crumb rubber has, especially for the price. As a point of comparison SBR sells for around \$0.20 per pound.



Nike Grind – Of the all of the non-crumb rubber infill options, this is the most attractive. It is gathered from the waste of Nike's manufacturing process. While Nike Grind adheres to Nike's stringent environmental and quality standards, nevertheless it has not been subjected the same degree of scrutiny that crumb rubber has undergone.

Cost estimate: \$0.56 per pound.



TPE – Thermoplastic Elastomer is a polyolefin infill option. Much (but not all) of the TPE around the world comes from China. One problem associated with TPE is the varying quality from a hodgepodge of suppliers. A particularly worrying trend we have seen in the industry is the low melting point of some TPE formulas, which have caused field failures. Additionally, there have been few if any studies on the human health effects of TPE, and AstroTurf has no information about the dyes used in this infill.

Cost estimate: \$1.24 per pound.



EPDM – EPDM stands for ethylene propylene diene monomer M class. EPDM does not come from car tires but is still a rubber. The cost is very high and, again, has not been studied extensively. Dyes are also used in EPDM.

Cost estimate: \$1.19 per pound.



EnviroFill – This is acrylic-coated sand and is not a replacement for rubber. Drawbacks include the risk of chipping of the coating, use of dyes, and lack of testing. Moreover, acrylic-coated sand does not absorb shock and requires the use of a pad.

Cost estimate: \$0.22 per pound.



Organics – Various organic options exist, including coconut husks and cork. Organic infill has seen some success in the cool, damp regions of Europe. However, these organic options risk decomposition and breakdown. Organic infills can float and migrate away, and most need to be regularly watered in order to mimic the European climate.

Cost estimate: \$0.94 per pound.



Cost of Infill Materials

Alternative Infills:

- | | <u>Approx. up charge over SBR</u> |
|--|-----------------------------------|
| • Organic | |
| ○ Purefill | |
| ▪ Cork and Sand System | \$1.75 per sq ft |
| ▪ <i>(system require the use of a pad)</i> | |
| ○ Geo Plus | |
| ▪ Coconut fibers, cork and rice husk blend | \$1.60 per sqft |
| ▪ <i>(system require the use of a pad)</i> | |
| • TPE | |
| ○ Thermoplastic Elastomer | \$2.25 per sq ft |
| ▪ <i>(system require the use of a pad)</i> | |
| • EPDM <i>(not recommended)</i> | |
| ○ Ethylene Propylene Diene Monomer | \$1.75 per sq ft |
| ▪ Synthetic rubber elastomer | |



Cost of Infill Materials

- **Envirofill**

- Coated rounded and highly uniform quartz sand \$2.75 per sq ft
- pigmented and sealed with an acrylic polymer
 - *(system require the use of a pad)*

- **Nike Grind**

- Nike Grind is produced from recycled high-performance athletic shoe materials \$1.25 per sq ft

NOTE – Turf systems properties will vary with each of the alternate infills. (Pile Height, Face weight, Tuft gauge and Pad type and thickness have all designed based around the infill choice.)



Cost of Infill Materials

Sprinturf CoolFill™ Technology

Vibrant.

Sprinturf's CoolFill™ system delivers a bright vibrant appearance all year round. The infill system blends with the fibers and eliminates the dark shadowing often seen with black infill systems.

Durable.

CoolFill™ is UV-resistant and will enable the infill system to retain it's elasticity throughout the life of the athletic field. It is also proven to reduce static-cling!

Safer.

Sprinturf continually strives to keep safety as our number one priority and CoolFill™ takes our systems, already EPA-approved and eco-friendly, just one step further. By coating the crumb rubber, any organic compounds within the material are encapsulated. Additionally, the combination of Sprinturf's dual-fiber technology with CoolFill™ will provide a noticeable difference in surface temperature over that of other synthetic turf fields.

Benefits of CoolFill™.

- 1) Bright green encapsulation of rubber crumb material contributes to vibrant, more realistic-appearing surface.
- 2) Extends life of crumb rubber and is UV-resistant, helping fields retain their shock-absorption properties and reducing static.
- 3) Lower the surface temperature of a synthetic turf field when compared to traditional black rubber infill systems by up to 30%.
- 4) CoolFill™ provides additional aesthetic appeal, reduction of dust by products during the manufacturing process and complete encapsulation of the rubber particle.
- 5) Sprinturf's dual-fiber technology combined with CoolFill™ will maximize field performance and safety for the athlete.





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Thank you.

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