

GRASS OR SYNTHETIC TURF?

WHAT'S BETTER FOR GROTON AND
WHY



“I’m worried about the long-term effects on children of playing a lot on plastic fields.”

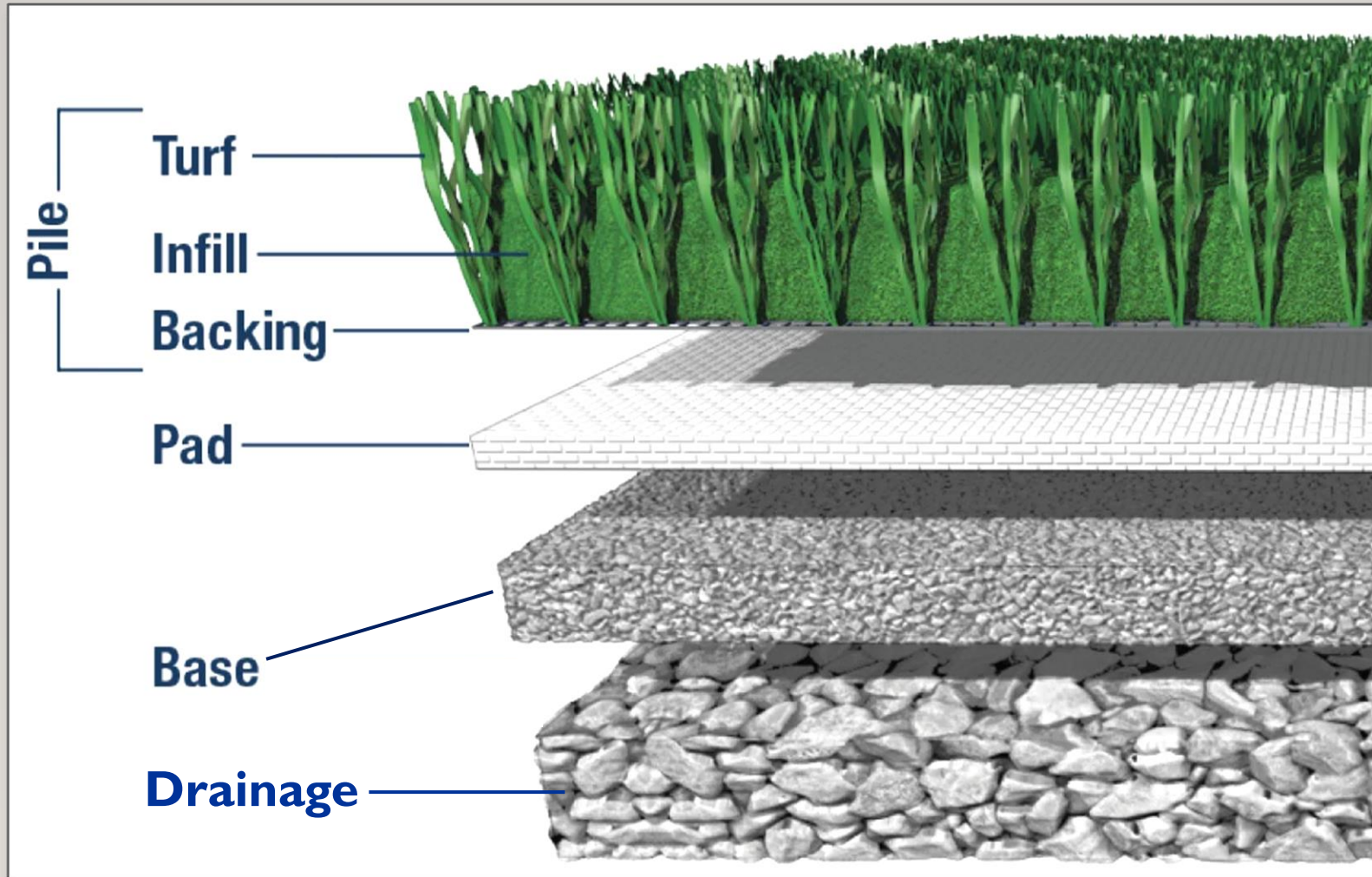
Groton coach

BACKGROUND



- Groton's Athletic Fields Task Force (AFTF) has brought its fields-need investigation to a conclusion after many months of review and meetings. **The Task Force is recommending that Groton add about 5 synthetic turf fields.**
- There is broad agreement that Groton's 60-year-old Fitch HS sports infrastructure needs an overhaul. GCA supports building the new fields that the town needs. The question is, **What kind of fields should Groton build? Synthetic turf or natural grass fields?** And at what cost? What will be the financial costs, environmental costs, and health and safety costs to our children?
- The town already has one ST field at Groton Middle School. GCA's investigation provides evidence that more ST would create acres of **non-recyclable and environmentally-harmful plastics** around Groton, counter to the Town's short or long-term interest.
- We have concluded that there is no question that organically-managed **grass fields are far less costly to the community and safer and healthier for our athletes and our environment.**

What Is Synthetic Turf?



INITIAL COST: SYNTHETIC TURF VS. NATURAL GRASS FIELD



- [\\$1,000,000 for one turf field](#)
- Additional charges for alternative infill, shock pads and irrigation systems
- Site preparation and drainage system installation are a significant part of overall cost.
- Sites with a significant slope, such as Fitch High School, inflate costs.
- Natural grass offers a low-cost playing surface for athletes. [Click here](#) for an excellent and balanced review of the benefits, limitations, and cost effectiveness of natural grass fields for recreation.

Natural grass field options and costs:

- Natural with On-site Native Soil (no added top soil or sod) - \$0.90 - \$1.50 per sq. ft.
- Natural with Native Soils - \$2.25-\$5.25 per sq. ft.
- Natural with Sand Cap - \$4.00 - \$6.50 per sq. ft.
- Natural with Sand and Drainage - \$7.00-\$10.00 per sq. ft.
- Comparison Synthetic Infill - \$6.50-\$11.00 per sq. ft.

MAINTENANCE COST: SYNTHETIC TURF VS. NATURAL GRASS FIELD



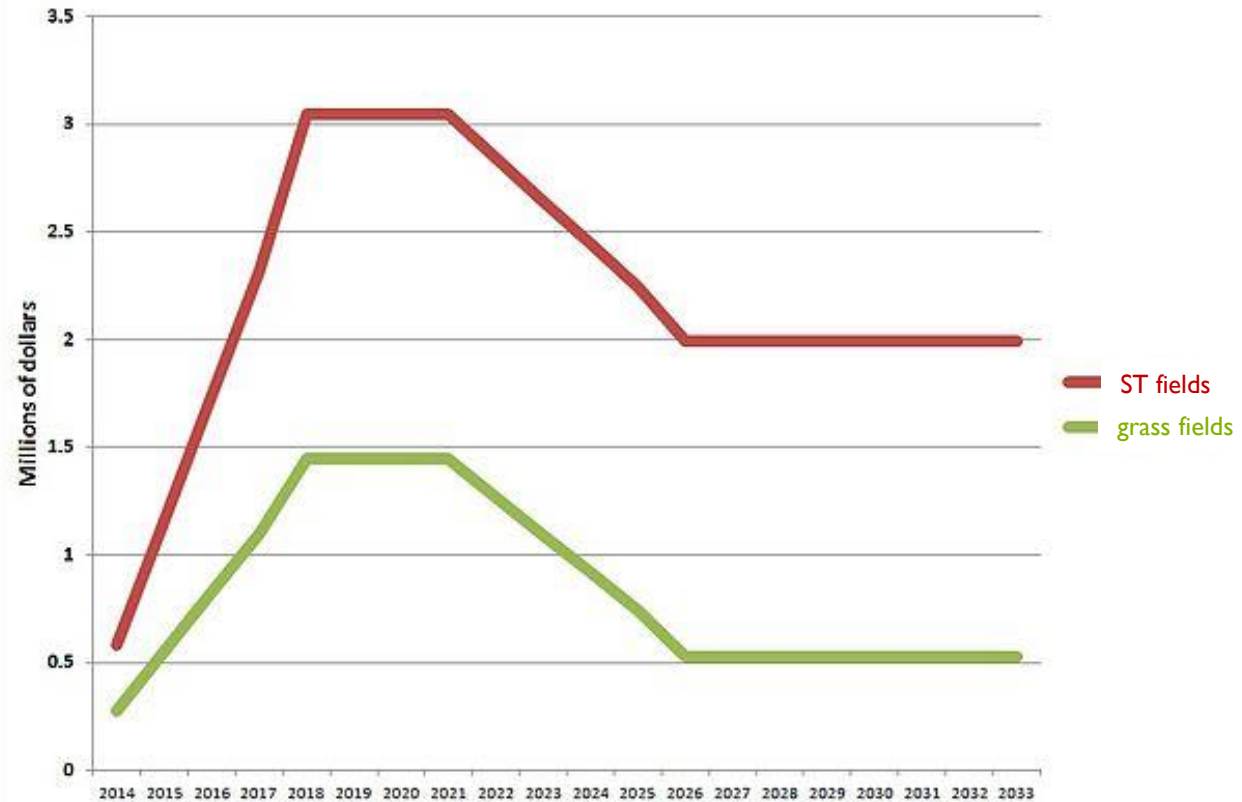
- ST proponents point to the fact that while ST is more expensive to install, it has lower maintenance costs than grass. That can be true in the short term, but older ST fields catch up in cost as the plastic crumbles and needs repair, removal or replacement. The total maintenance cost in 2019 for an outdoor **ST field could be in the \$40-50K range**. For a **natural grass** athletic field (native soil with a 4" sand cap with conventional or organic management) \$14K *including \$5K for water*. Additional expenditure for sod repairs of goal mouths and field center \$5K. **Total \$25K.**

"Maintaining a natural grass field is slightly more expensive than a turf field, but not by a significant margin. Plus, if one takes into consideration the \$500,000 that must be paid every 8-10 years to replace the carpet of an artificial turf field, and the fact that it is at least \$250,000 more expensive to implement, then using **natural grass ends up being cheaper in the short and long run.**" Brian Wolfson, Duke University Soccer Politics Blog, 2015

- According to the Massachusetts Toxics Use Reduction Institute in September 2016, **"in nearly all scenarios, the full life-cycle cost of natural turf is lower than the life-cycle cost of a ST field for an equivalent area."**

COST OVERALL

TOTAL ANNUAL COST of 21 SYNTHETIC TURF or NATURAL GRASS FIELDS



This chart, derived from the **costs of installing and maintaining both artificial turf and natural grass fields** in Montgomery County, MD, was created to calculate the true cost of ownership to a school district (and state) in converting 21 high school fields from grass fields (none of which are currently properly built or maintained) into artificial turf fields. **The costs for grass fields** assume each school field would need to be completely rebuilt, so the costs are in the highest range. **The cost for a new artificial turf field** over the two life cycles of these fields (20 years) is a guess due to rising material costs, changing technology and the actual timing of breakdown of the fields which makes it impossible to know when they will fail or the cost to replace at the time each fails.

Source of graph and information: <https://www.safehealthyplayingfields.org/cost-grass-vs-synthetic-turf> More info on grass [here](#).

COST: FINANCIAL ENVIRONMENTAL HEALTH



Disposal is costly and difficult

- **Removal and Disposal** of 500,000 pounds of plastic waste just 8 to 10 years after installation **is expensive**. It's heavy: 50K lbs. of plastic grass carpet; 450K infill. Football field **removal** costs \$115K; soccer field \$173K. Transportation and landfill fees combined at least \$130K. Synthetic Turf Council: "Cost of shipping one of the biggest challenges." **Total: \$250K end-of life removal, transport and disposal cost.**
- **Groton Transfer Station won't accept it.** Burning acres of plastic turf creates a serious health issue and emits 113 tons of CO2 per field.
- With **no state or federal regulations** on ST disposal, the **acres of turf** installed across the country in the last decade or more are **often illegally abandoned and left for towns to clean up.**
- **Recycling myth** Despite industry claims that ST is recyclable, there are **no companies in the U.S. that can completely recycle them.** Only one recycling "facility" in the world has the technology to recycle 95% of a synthetic turf field: ReMatch in Denmark. Other recycling "services" in North America and Europe (with older technology) recycle parts of the fields. **Why so few facilities? It's not profitable.** Plastics used in synthetic turf are dirt cheap to make but very expensive to separate. As a result, the discarded fields end up in landfills, in rural and urban stockpiles, and scattered in ravines, deserts, woods, and empty lots across the country.
- Any ST contract the Town signs should have a clause requiring a deposit to cover the cost of disposal.



*Turf is already piling up on the sides of roads and being stored on private properties throughout the US because there are so few recycling facilities and **it is prohibitively expensive to ship them**. Without any rules or oversight, disposed turf becomes the burden and responsibility of anyone who lives around it. Photo by CAMERON CLARK, YORK PA DAILY RECORD*

SYNTHETIC TURF:

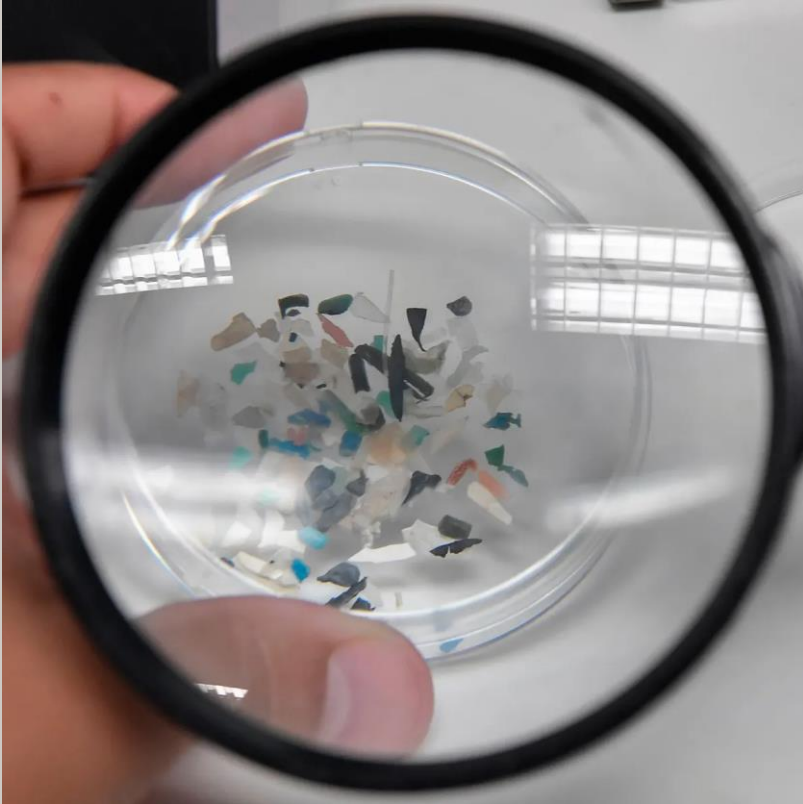
ENVIRONMENTAL CONCERNS



This is what can happen to cork infill after you get 2" of rain in 20 minutes. It floats!

Infill: Is Alternative Infill Safer?

- Research on the environmental effects of ST has focused mostly on crumb rubber, the cheapest and most commonly used infill ingredient in ST.
- Fortunately, town staff recommended alternative infill for the new Groton Middle School field because it is well known and documented that aging crumb rubber releases toxic substances into our air and water systems, endangering children and the environment.
- New alternative substances, like coconut and cork fibers and ground olive pits, are untested. However, plant-derived infill contains a small amount of plant material and a large amount, up to 85-90%, of silica sand. Silica dust is a known carcinogen. When inhaled, it can cause cancer and silicosis. Even tiny amounts are dangerous.
- What is also known is that over time, corkonut turns to dust, blows away and floats readily during storm events, fouling waterways with suspended solids and nutrients. Any commonly used binders/adhesives and biocides/antifungals used on the field will also end up in our waterways.



Top layer

- There are **acres of plastic in the blades** covering the infill.
- **Research** on these blades and their potential health and environmental impacts **is still limited**, but inadequate testing does not prove safety. Studies take time and are expensive. In fact, rather than have the multi billion-dollar ST industry demand proof by the public that their product has serious risk issues, the industry should bear the burden of proof to show that the material is safe.
- Blades are exposed to the elements and rough play for years. When UV rays hit plastic, they break the bonds holding the plastic together. The plastic becomes brittle and breaks into lots of little pieces that enter into our groundwater, streams, the Sound and ultimately oceans, where they further degrade into microplastics. On average, one synthetic turf field disperses 7000 lbs of microplastics into the environment. It is well known that “microplastics are a present and emerging threat to terrestrial ecosystems.”

SYNTHETIC TURF: HEALTH AND SAFETY ISSUES



Exposure to chemicals

Public Employees for Environmental Responsibility (PEER) is tracking studies of the chemicals in synthetic turf. PEER has found that:

- ST is apt to include per- and polyfluoroalkyl substances (PFAs) in its composition. PFAs do not break down and they accumulate in people and other living creatures. They have been associated with cancer and birth defects and are being banned in many manufacturing processes.
- Two **big concerns about PFAS in turf** blades and backing are the potential for PFAs to be released into the air by players' feet and into their breathing zone and leach off PFAs into the fields and into surface water, groundwater and eventually, drinking water.
- PEER Science and Policy Director Kyla Bennett, formerly with EPA, stated that **"PFAS in synthetic turf should sound alarm bells for parents and for all municipalities with these fields...**For the health of our children and communities, we urgently need to take a hard look at PFAS in synthetic turf."
- Antimicrobials, which are **pesticides, are used to disinfect synthetic turf fields** on a regular basis to neutralize any potential issue from bodily fluids or any other decomposition of organic residues. This is because "the relative abundance of potentially pathogenic bacterial OTUs [organisms] was higher in synthetic than in natural samples." Despite this, in 2018 a football coach noted a sharp increase in staff infections in his players after building a new ST football field.

Our response to the AFTF January 12 statement that there are "no health concerns" with synthetic turf:

- That statement was based entirely on an outdated, long discredited 2010 study cited by the Ct. Department of Health. For example, that study cited UConn Health Center blood test results showing that "lead levels were low and not a concern at the **five fields tested.**" According to the World Health Organization "There is no known 'safe' blood lead concentration."

Heat

- Other plastics in ST are known to leach out when exposed to ultraviolet light, heat, or natural breakdown.
- **Heat itself is a big risk factor for children playing on ST fields.** Hot fields emit volatile organic compounds and can cause skin injury and heat exhaustion or heat stroke. A press release issued in 2018 by the National Center for Health Research, a nonprofit think tank, revealed that an elementary school playground in Washington, D.C., reached a temperature of 170 degrees Fahrenheit, about 80 degrees warmer than nearby natural grass. Although Cork fields can be kept cooler, they require frequent watering to do so, adding significant expense. In Burlington MA only a grass surface may be used when it is 85F with 60% humidity.



Noncontact
injury rates to
the lower body
on synthetic turf
vs. natural grass

27%
higher
on synthetic turf



Injuries

Research shows that **ST fields are associated with a greater incidence of mechanical injury to the joints (ACL tears) than natural fields.** This is caused by the very feature—greater traction—provided by ST. Where natural grass tears under stress, with ST it is the human body that gives way. [An August 2019 sports medicine article](#) found that:

- **High school athletes are “58% more likely to sustain an injury during athletic activity on artificial turf.** Injury rates were significantly higher for football, girls and boy’s soccer, and rugby athletes. Lower extremity, upper extremity, and torso injuries were also found to occur with a higher incidence on artificial turf.”
- **Professional athletes on both the U.S. Men’s and Women’s Soccer Teams view artificial turf as inferior to natural grass for playing quality and safety.** More info [here](#).
- ["TOM BRADY WOULD LIKE TO SEE PATRIOTS DITCH TURF, SWITCH BACK TO NATURAL GRASS"](#) New England Sports Network, November 25, 2016 Sept. 30,2020

The **NFL Players Association president cited the league’s official injury reports from 2012-2018 to state his case that natural grass fields provide a much lower risk for injuries, compared to artificial surfaces, during practices and games.** The analysis shows that players have a 28% overall higher rate of non-contact lower extremity injuries on turf. Non-contact knee injuries occur at a 32% higher rate and non-contact foot or ankle injuries are 69% percent more likely on artificial fields. **1565 NFL players from 32 teams or 71% of the players preferred natural grass.**

THE CHOICE: REAL GRASS FIELDS

Natural grass is a **living, sustainable system**, and with good cultural practices it gets better and better over time.

Grass fields cost less and when properly maintained contribute to the environment and players in many ways:

- The surface is cool. On a hot day, **grass releases small water droplets cooling the air and improving air quality**; ST contributes to global warming.
- Healthy, organically-maintained **grass soils contain microorganisms which neutralize pollutants** like bird droppings without using chemicals.
- Grass **produces oxygen** for players to breathe. In fact, a 5'x5' area of good density turfgrass produces oxygen for one adult/day. It also **removes CO₂ from the air and stores it in the soil** as carbohydrate or food for microbes.
- Grass fields **absorb and filter huge amounts of rainwater**.
- Organically-maintained natural grass contributes to **Groton's Resilience and Sustainability climate-action plans**.

Sports Turf Managers Association: *“The environmental and human health benefits alone make natural grass fields a desirable option when considering keeping or building a high school athletic field. The cost effectiveness of construction and annual maintenance only add to their appeal. **It is important to have a complete understanding of the costs and benefits associated with both natural and synthetic surfaces when considering converting from natural grass to a synthetic surface.** Oftentimes many of the benefits of natural grass systems are overlooked because of strong arguments and marketing efforts of synthetic turf companies.”*

Conclusion of an article titled [Natural Grass Athletic Fields](#) from STMA.org

Expert opinion on AFTF recommendations: *“To try to design five synthetic athletic fields along with redoing several grass fields is a massive project. The price tag is enormous.”*

CONCLUSION:

NATURAL GRASS FIELDS ARE BETTER



Groton
Conservation
Advocates

GCA email: groconadv2017@gmail.com

GCA website: grotonconservationadvocates.org