



Renovations to Doug White Memorial Field

Concord-Carlisle Regional High School
Synthetic Turf Replacement Project
March 19, 2025

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Project #719720



Doug White Field

Synthetic Turf System Options

1. Replacement of synthetic turf in-kind with crumb rubber (SBR) infill
2. Replacement of synthetic turf with crumb rubber (SBR) infill and shockpad
3. Replacement of synthetic turf with a non-synthetic infill material and shockpad
4. Removal of synthetic turf field in its entirety and conversion to a natural grass field



Today's Turf Systems

- Made with polyethylene and/or nylon fibers
- Can be infilled with different mixes of sand and synthetic granules or non-synthetic granules
- The combination of fiber and infill provides a performance-based playing surface
- Cleats sink well into the surface much like they do with natural grass, putting less stress on the players joints



Today's Synthetic Turf Systems

Synthetic Infill Options



SBR

Non-Synthetic Infill Options



Olive "Pit"



Engineered Wood



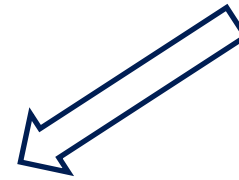
Coconut Fibers



Cork



Walnut Shell



Turf Fiber Systems



Slit-Film

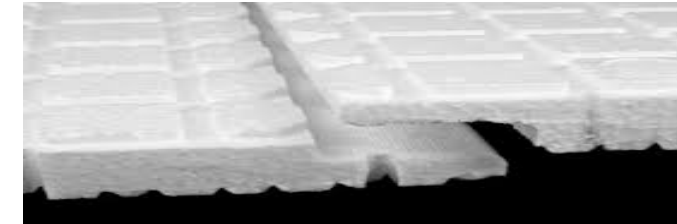


Monofilament



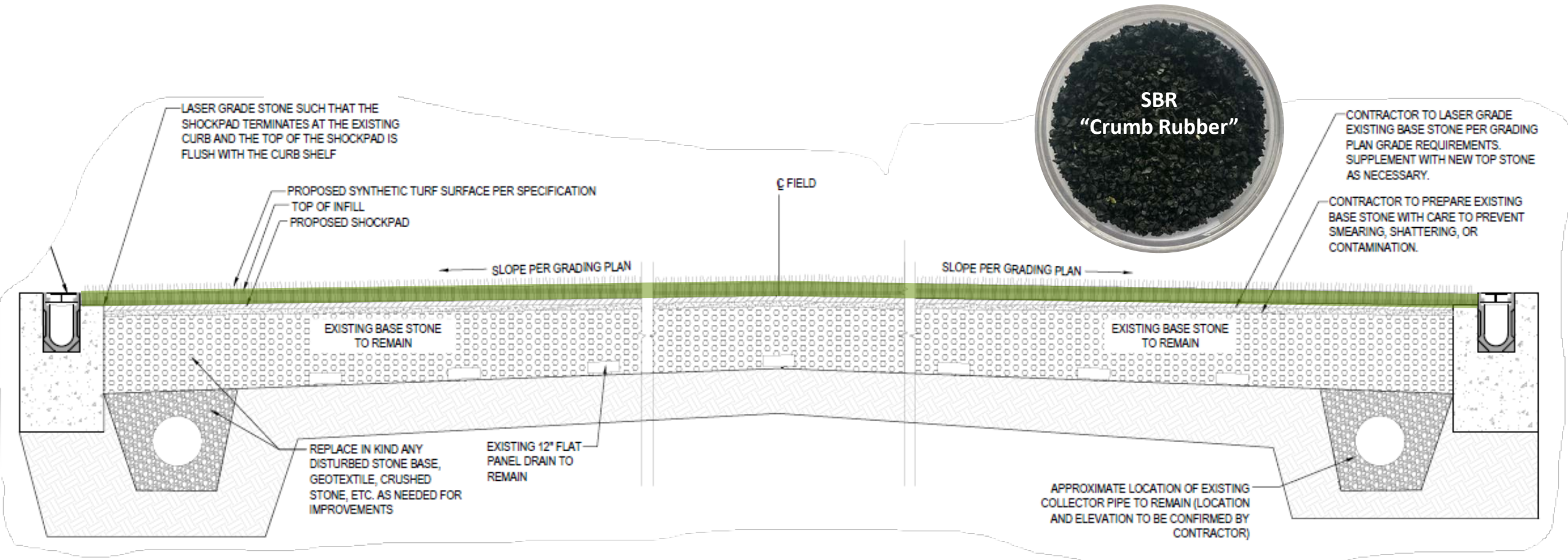
Dual Fiber

Turf Underlayments



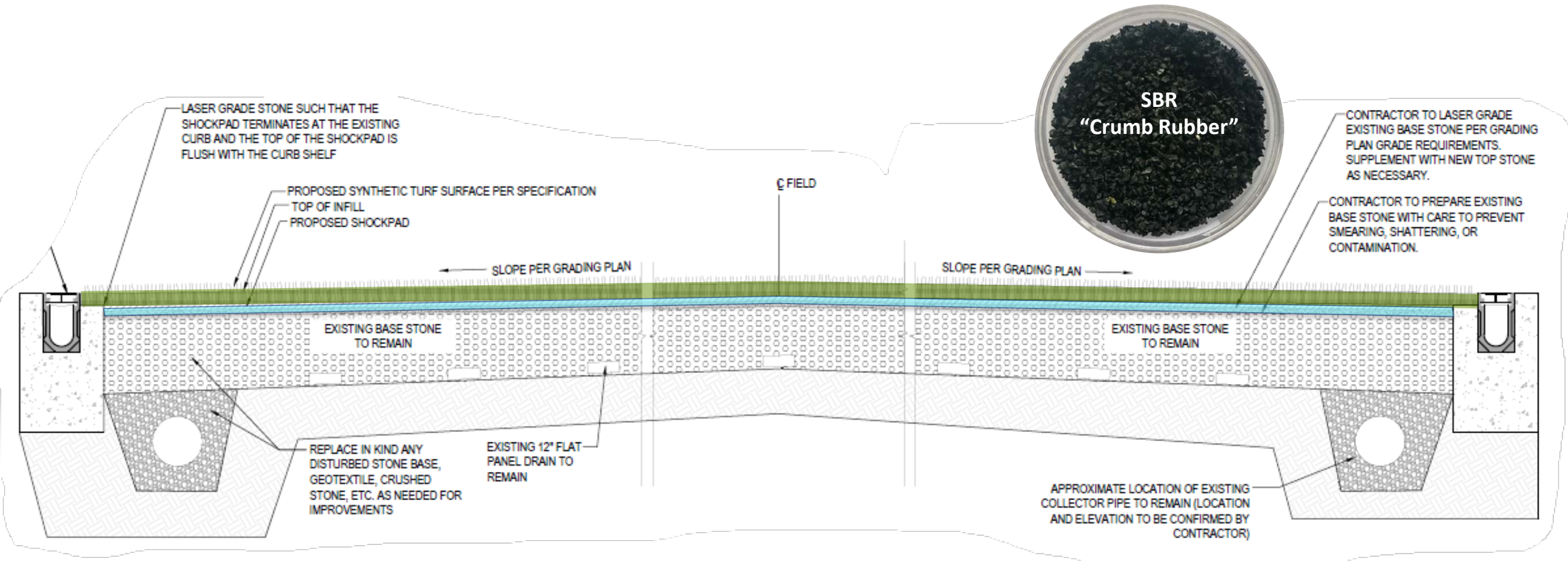
Today's Synthetic Turf Systems are designed with both Performance and Safety Considerations in mind.

1. Replacement of Synthetic Turf Field (In-Kind)



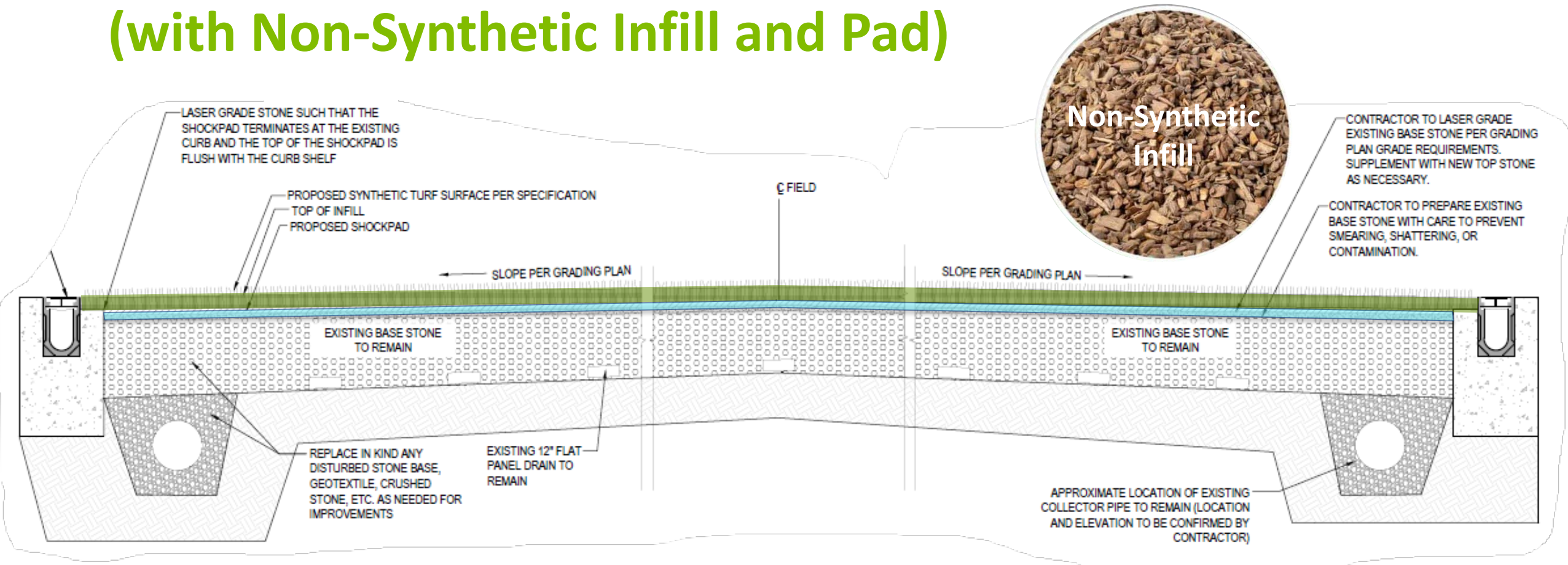
- Remove existing turf carpet and infill
- Laser grade/supplement top stone
- Install new synthetic turf carpet
- Install new infill (SBR/Sand)

2. Replacement of Synthetic Turf Field (with Pad)



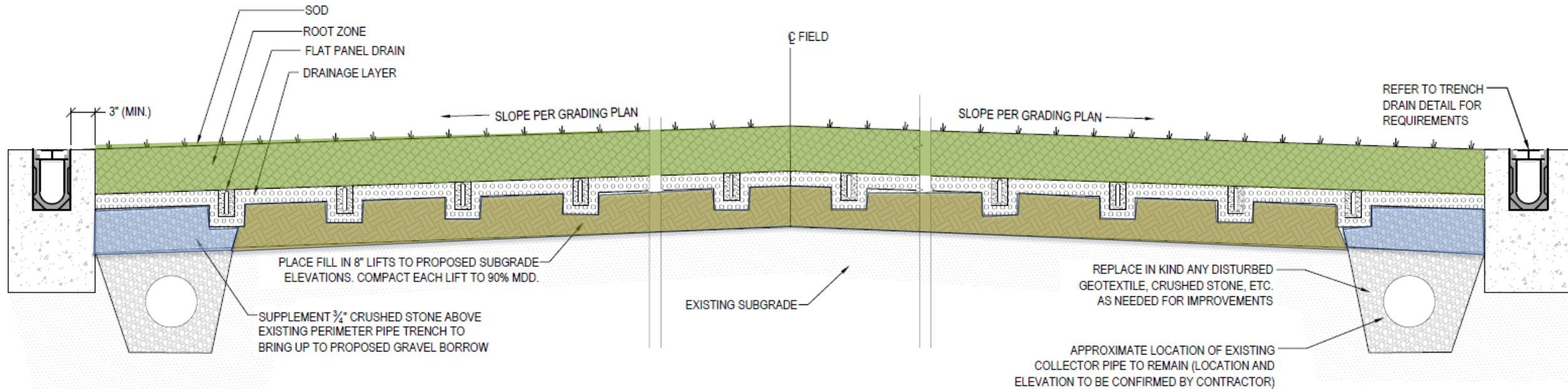
- Remove existing turf carpet and infill
- Laser grade/supplement top stone
- **Install new shock pad**
- Install new synthetic turf carpet
- Install new infill (SBR/Sand)

3. Replacement of Synthetic Turf Field (with Non-Synthetic Infill and Pad)



- Remove existing turf carpet and infill
- Laser grade/supplement top stone
- **Install new shock pad**
- Install new synthetic turf carpet
- **Install new infill (non-synthetic/sand)**

4. Conversion to Natural Grass Field



- Remove existing turf carpet and infill
- Remove existing stone base and drains
- Install new topsoil
- Laser grade field
- Install new irrigation system
- Install new underdrain system
- Install new sod

General Comparisons Synthetic vs. Natural Grass



Maintenance: Synthetic Turf vs. Natural Grass

Maintenance Costs Can Decrease by \$22,000/year (New England)

Uses Can Increase by 300% with a Synthetic Turf Field
(Applicable to Single Field)

Natural Turf Field Maintenance Cost (3-5 Staff):

- | | |
|--|----------------------|
| ■ Mowing, 30 cuttings | \$5,500 |
| ■ Watering – ½-1 in./week @ 20 weeks | \$6,000 |
| ■ Irrigation Winterize/De-winterize | \$3,000 |
| ■ Fertilizer x 3, lime, pesticides | \$5,000 |
| ■ Aeration, topdressing, overseeding | \$6,000 |
| ■ Line markings (bi-weekly @ 24 weeks) | <u>\$3,500</u> |
| | \$29,000/year |

Synthetic Turf maintenance (1-2 Staff):

Routine and deep grooming \$4,000 - \$7,000/year



Estimated Costs for Renovations Options:

- | | |
|--|--------------|
| 1. Synthetic Turf Field w/SBR Infill | \$1,300,000 |
| 2. Synthetic Turf Field w/SBR Infill & Pad | \$1,500,000 |
| 3. Synthetic Turf Field w/Non-Synthetic Infill & Pad | \$1,600,000* |
| 4. Conversion to Natural Grass Field | \$1,800,000 |

*Cost may increase contingent on non-synthetic infill selection, up to \$2,100,000

Hours of Use Comparison (New England):

- A well-maintained natural grass field with lights can typically sustain about 250 organized uses before degradation to turf root zone.
- A synthetic turf field with lights can handle minimum of 750 uses (3 times more).
- Conversion of Doug White Field to a natural grass field would require the additional uses lost to be reallocated to other fields increasing maintenance.
- Due to its all-weather surface, a synthetic turf field is not susceptible to late fall and early spring season “mud” conditions (longer season).



Pros & Cons

All Options



Pros: SBR Infill (1 & 2)

- Most economical
- Known performance of last 30 years
- Readily available
- Provides resiliency to aid in shock attenuation
- Most widely studied (EPA)
- Can design without shock pad



Cons: SBR Infill (1 & 2)

- Perceived health/safety concerns
- Perceived environmental concerns
- Heat Impact



Pros: Non-Synthetic Infill (3)

- Manufactured from naturally occurring materials (ex. cork, coconut husks, walnut shells, wood)
- Organic colors and texture closely imitate a natural grass field
- Some material can absorb water and are cooler than SBR infilled fields due to evapotranspiration.
- Can be used for soil amendments at end of life



Cons: Non-Synthetic Infill (3)

- May require replenishing and watering
- Higher tendency to freeze because of material's ability to hold moisture
- Can add approximately \$50,000-\$200,000 per single field to initial costs along with \$100,000 per field for a shock pad



Pros: Natural Grass (4)

- More closely resembles natural conditions
- Perceived environmental benefits
- Non-permanent
- Does not require replacement



Cons: Natural Grass (4)

- Would require removal of current subsurface drainage systems and stone base
- Requires design and installation of new irrigation system (excess water usage)
- May require fertilization
- Increased annual maintenance costs
- Full growing season prior to use
- Decreased usage (750 to 250)
- Synthetic drainage material



Synthetic Turf Replacement Options 1 - 3



Advertised Synthetic Turf Advantages

Low
maintenance

Lower overall
lifetime costs
per use

Permanent
lines &
markings

Nearly all-
weather use

Grass-like look
and
performance

High
utilization

Revenue
opportunities

Immediate
availability

Typical Construction Sequence for a Turf Replacement



Protection and Erosion Controls



Removal of Existing Turf and Infill



Laser Grading of Stone Base



Installation of Shock Pad (if required)

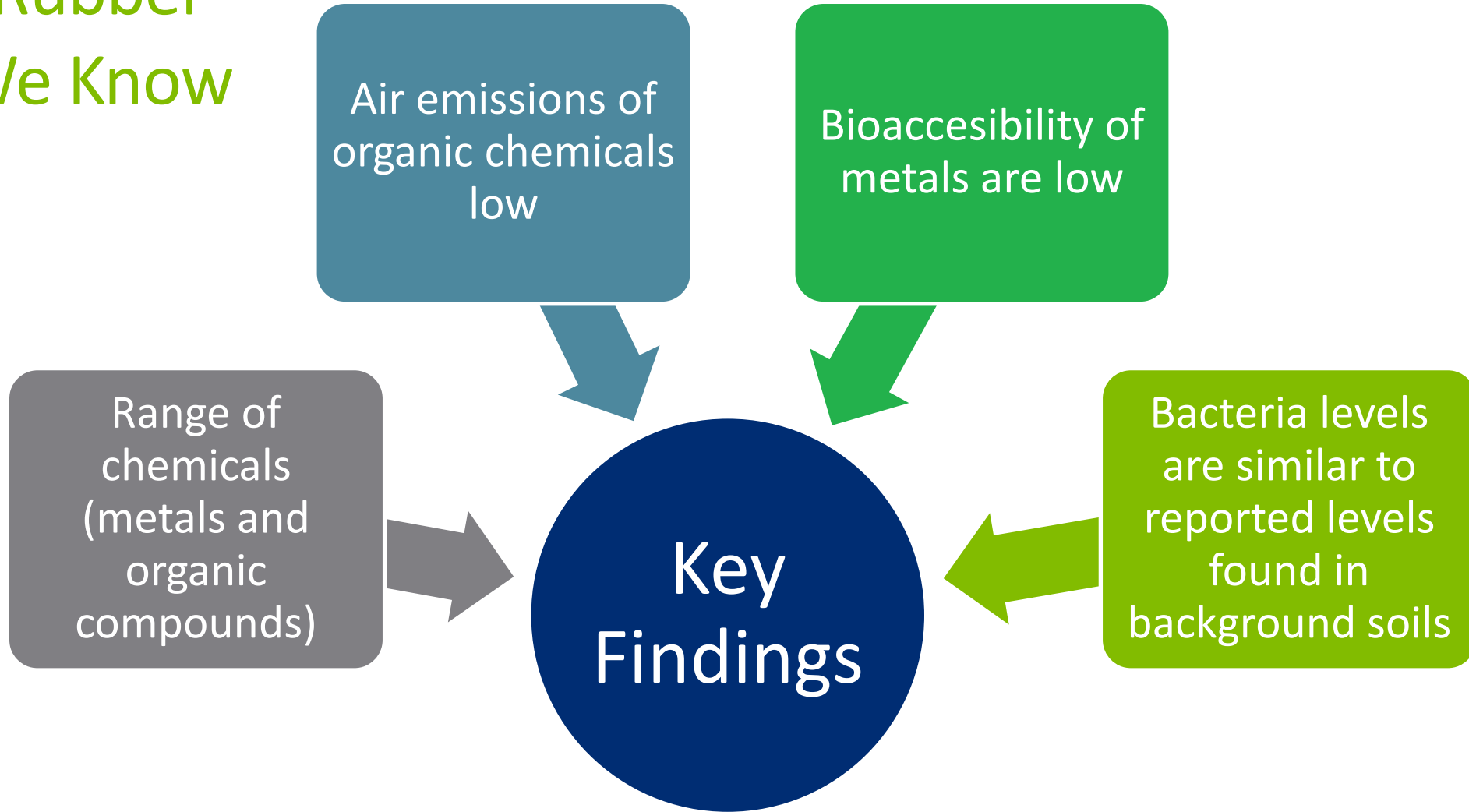


Installation of Turf and Inlaid Markings



Infill Installation and Final Grooming

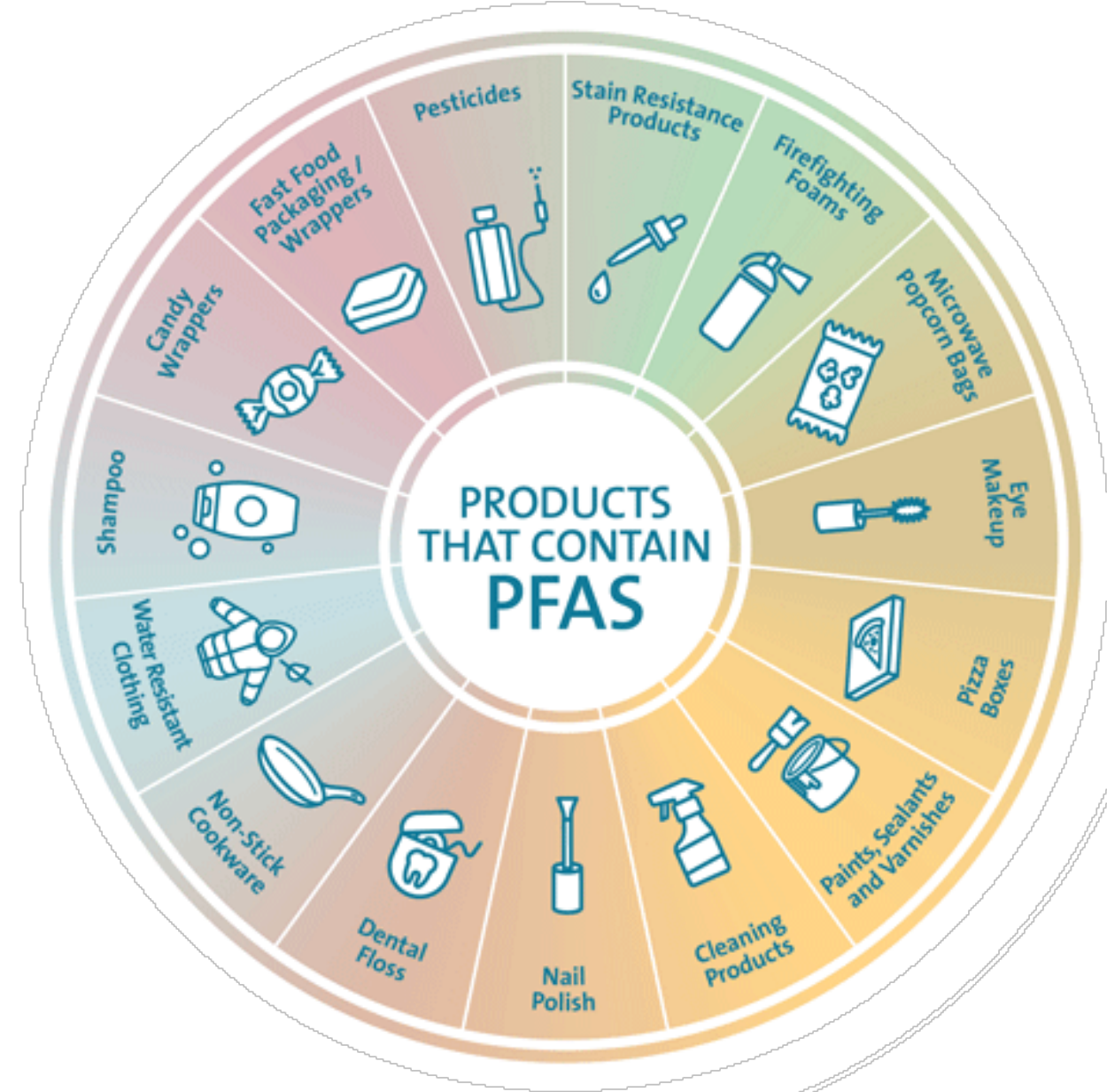
Crumb Rubber – What We Know



EPA’s Federal research Action Plan (FRAP) was released April 2024: “No significant difference in the exposure from chemical found between players who played on synthetic turf fields that use crumb rubber infill and those who played on grass fields.”

PFAS – What We Know

- Per and polyfluoroalkyl substances
- Ubiquitous - found in water, soil, air and food
- Leading Turf Manufacturers now able to certify that PFAS is not intentionally added in their products
- Monitoring options include turf system PFAS testing of actual materials manufactured for the project (using latest EPA 1633 method)



Source: EPA; Veolia website

Turf System Disposal/Recycling

- **Conventional landfill (decreasing in popularity, local regulations)**
- **Growing Market - Infill recycling/repurposing**
- **Growing market - Turf recycling/repurposing**
- **Bid Documents have chain-of-custody certification requirements**



Recycling Synthetic Turf



Turf Recycling/Repurposing

- Different polymers in the carpet are not easily recycled. Infill can be reused and/or repurposed.
- Chopped, pelletized and extruded into other products (plastic lumber, shockpads, etc.)
- “Cradle-to-Cradle” Turf processing facilities will soon be online (2025 – 2026)



Image from Shaw Sports Group

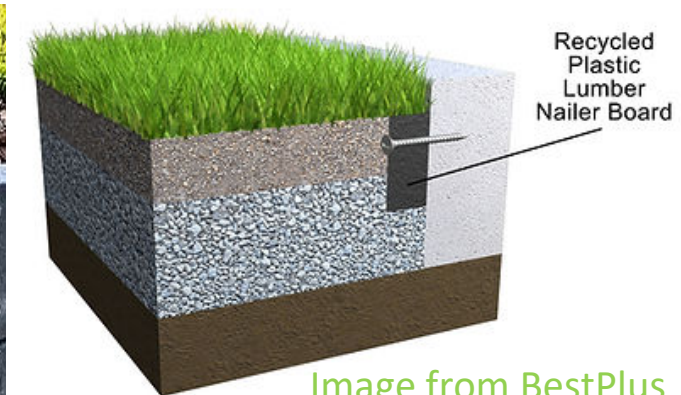


Image from BestPlus

Thank you!





2019 ASBA Distinguished Single-Field Facility Award

The Wheeler School, Seekonk, MA

Converted the existing natural grass soccer field into a synthetic turf field with athletic lighting and a new scoreboard. This field is the first in New England and second in the United States to install the “Safeshell” infill system, which consists of sand and crushed walnut shells.

Typical Maintenance Equipment for Synthetic Turf



Turf Groomer (level infill and decompact)



Multi-Angle Drag Brushes and Adjustable Tines



Tow Behind Magnet (safety pins, bobby pins)



Sweeper (debris, sunflower shells, shoe spikes)



Dual Vibrating Motors (no infill displacement)

Town of Concord – Doug White Fields Turf Replacement Project

Recreation Commission Meeting – March 19, 2025

Responses to Questions from the Public

Introduction

In keeping with the Inter-Municipal Agreement (IMA) with the Concord-Carlisle Regional School District (CCRS) and the Memorandum of Agreement (MOA) with the Friends of Concord-Carlisle Fields (Friends), the Town of Concord is leading the effort to coordinate the replacement of the synthetic turf at the Doug White Fields. The project team – comprised of representatives from the Friends, CCRSD staff, the Recreation Commission, and Town staff – engaged Gale Associates as the project designer. Gale has prepared a proposed project timeline ([Available Here](#)) that will allow for completion of turf replacement in time for the Fall 2025 sports season.

As part of the Town’s commitment to transparency, sustainability, and public engagement, the Recreation Commission hosted a public information session on March 19, 2025, during which Gale Associates delivered a detailed presentation ([Available Here](#)). The meeting was well attended, and while many questions were addressed during the session, several required further follow-up. The responses below address outstanding questions and summarize key project details, including cost, infill options, recycling, environmental considerations, and field usage.

Recycling & Reuse

- **What percentage of project cost is attributable to recycling or reuse? What is the estimated cost?**

Recycling efforts are expected to account for a small portion of the overall project cost. Based on Gale Associates’ presentation, the recycling of synthetic turf and infill materials – rather than landfilling – could represent approximately **3%–5%** of total project costs. Estimated recycling costs currently range from **\$5 to \$10 per square yard**, depending on vendor and material condition.

- **Where can recycled materials be taken?**

Vendors currently active in synthetic turf and infill recycling include, but are not limited to:

- **Shaw Sports Turf** – Recycles turf into performance shock pads.
- **BestPLUS** – Produces GreenBoard using 98% recycled plastic, including synthetic turf.
- **TenCate** – Converts used turf into a liquid feedstock for reuse in new turf and other products.
- **AstroTurf + TRP (Calhoun, GA)** – Offers comprehensive system recycling.
- **NXTPlay** – Manufactures shock pads using reclaimed synthetic turf.

New “cradle-to-cradle” recycling facilities are expected to come online in **2025–2026**, potentially improving affordability and reducing landfill reliance.

Project Cost, Infill Options, and Timeline

- **What are the most current cost estimates for the turf replacement options?**

The following **schematic-level estimates** include demolition, materials, and installation. All values are approximate and based on 2025 market conditions:

Option	Estimated Cost
SBR (Crumb Rubber), no shock pad	\$1.30 million
SBR + Shock Pad	\$1.52 million
Organic/Natural Infill + Shock Pad (e.g., cork, coconut, walnut shells, wood)	\$1.57–\$1.82 million
Virgin EPDM + Shock Pad	\$2.00 million
TPE (Thermoplastic Elastomer) + Shock Pad	\$2.05 million
Acrylic Coated Sand (Envirofill) + Shock Pad	\$1.95 million
Natural Grass Conversion	\$1.80 million

- **Notes:**

- Shock pads are **required for all options other than SBR** to meet safety performance standards and add approximately **\$220,000** to total project cost.
- Organic/natural infill prices vary based on availability, type, and sourcing.

- **What are the lead times for non-SBR infill alternatives?**

- **SBR:** 2–3 weeks (readily available)
- **Organic infill:** 6–10 weeks (varies by vendor and volume)
- **EPDM, TPE, Envirofill:** 6–12 weeks; longer for specialty orders or colors

- **How does maintenance differ by infill type?**

While most infills require standard maintenance (e.g., grooming, leveling, cleaning), **organic infills** may require **periodic watering and replenishment**, and are more susceptible to **freezing** due to moisture retention. Overall, annual maintenance costs for alternative infills are estimated to be **20–30% higher** than those for SBR.

- **How common are alternative infills and shock pads?**

- **SBR** remains the most widely used infill due to cost and performance.

- **Shock pads** are used in **30%–40%** of new installations and are often paired with non-SBR infill to meet safety and impact attenuation requirements.
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General

- **How often are the Doug White Fields in use?**
Doug White Fields host an estimated **500–750 organized uses per year**. According to Gale Associates, synthetic turf fields can accommodate **up to 3x more use** than grass fields, especially in poor weather conditions or shoulder seasons.
 - **Where was lead detected in the original turf system?**
Preliminary testing indicated **trace levels of lead in the infill material**, not the turf carpet. The levels were **below applicable health and safety thresholds**. Additional testing may be considered as part of final removal and replacement planning.
 - **Will the Town conduct a full carbon lifecycle analysis?**
While the Town's **Sustainability Division** is exploring tools to compare the environmental impact of synthetic turf and natural grass – including water usage, fertilizers, maintenance, and recycling options – a full **carbon lifecycle analysis** will not be conducted for this specific project.
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Additional Items for the Record

- **EPA Study on Synthetic Turf:**
The U.S. Environmental Protection Agency (EPA), in partnership with the Centers for Disease Control and Prevention (CDC) and the Consumer Product Safety Commission (CPSC), conducted the **Federal Research Action Plan (FRAP)** to evaluate potential health risks related to crumb rubber infill used in synthetic turf fields and playgrounds.
 - **Key Findings (April 2024):**
 - No significant difference in chemical exposure between players using synthetic turf with crumb rubber and those using natural grass.
 - Air emissions of organic compounds were low.
 - Bioaccessibility of metals was low.
 - Bacterial levels were comparable to those in background soil.

For full details, visit the EPA's official site:

 [Federal Research on Recycled Tire Crumb Used on Playing Fields and Playgrounds](#)

- **Proximity to Hugh Cargill Well:**
The Doug White Fields are located within the Zone II water resources protection district of the Hugh Cargill Well. All design and materials selections will comply with MassDEP and local water protection standards.

- The Doug White Fields are **near**, but **not within**, the most sensitive groundwater recharge areas associated with the Hugh Cargill Well. All design and material selections will comply with **DEP and local water protection standards**.
- **Successor Agreements for Maintenance:**
The Town of Concord, CCRSD, and Friends of CC Fields will **establish successor agreements** to clearly define ongoing **maintenance responsibilities** and future **replacement planning**.