Wayland

Massachusetts

Public Forum on Natural and Synthetic Turf Field Systems

March 14, 2018

Introductions

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Meeting Agenda

1. High School + Loker Project Update
2. Preliminary Design Plans - High School | Loker Conservation and Recreation Area
3. Synthetic Turf Field is Recommended | Why Synthetic Turf?
4. Synthetic Turf System Components
5. Synthetic Turf Infill Options
6. Concerns About Synthetic Turf Systems
7. Toxicology of Synthetic Turf Systems
8. Summary | Open Discussion | Q+A

High School + Loker Project Update

1. Fall 2017 Town Meeting design funds authorized (2 phases at High School + multi-use synthetic turf at Loker)
2. Design process has commenced
3. Regular PMBC meetings
4. Public Meeting held
5. Public input received
6. Designs will respond to resident concerns
7. April 2nd Town Meeting | Warrant Articles
8. If YES, design and permitting efforts continue
9. Additional opportunities for public input

Wayland High School

Phase 1 Preliminary Design Plan – In Progress

Loker Conservation + Recreation Area

Preliminary Design Plan – In Progress

Why a Synthetic Turf Field?

Pro's + Cons for Natural Turf Fields:

- Initial cost - cheaper to construct and replace/re-sod
- Playability can be limited by weather
- Higher maintenance costs
- Limited playing time - it is recommended that use of high performance fields be limited to 400-600 hours per year
- Native soils may contain elevated levels of various metals, carcinogens, etc.
- Environmental impacts related to improper maintenance
- Requires irrigation for proper turf maintenance

Why a Synthetic Turf Field?

Pro's + Cons for Synthetic Turf Fields:

- More Playing Time - Can support higher intensity of use and can extend the playing season
- Less intensive maintenance program
- Conserves water
- Fewer Injuries due to even playing surface and consistent G-max performance
- Higher Initial Cost - More expensive to build, repair and replace
- Potential heat hazards

High School - Why Synthetic Turf?

1. Consistent with multiple planning initiatives
2. Precedent well established
3. System has performed well
4. Supports heavy use
5. Reduces burden on other field assets
6. Without, shifts use to other over burdened fields
7. Limited renovation options for several other High School field facilities
8. A pledge to manage + monitor the installation
9. Materials can be recycled

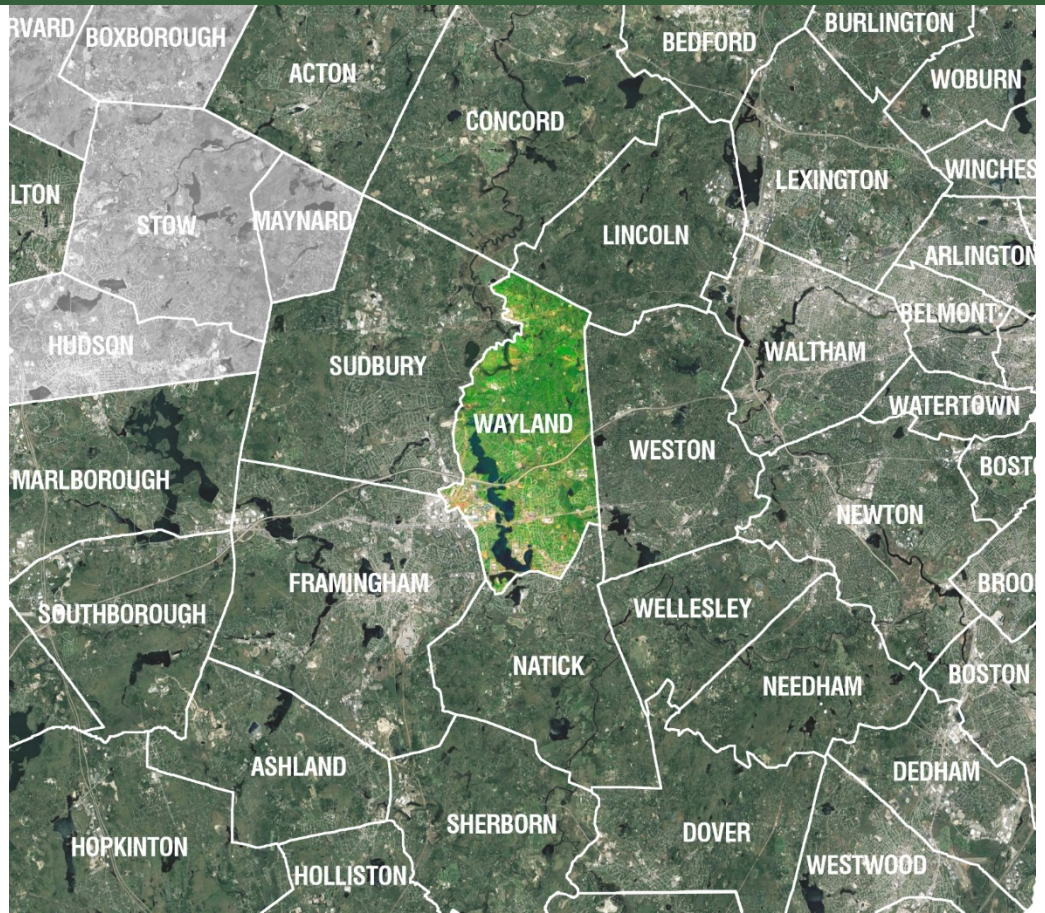
High School Field Usage

Hours of Usage + Performance

2017 Fall + Spring (March 1 - June 30 and August 15 - November 30)			
	Time in Use	Hours/Day	Total Hours
Weekdays (August 15 - September 1)	8:00a to 8:00p (school)	12	180
Weekdays	2:45p to 7:00p (school)	4.25	637.5
Weekends - Saturday	8:00a to 12:00p (school) and 12:00p to 8:00p (rec)	12	372
Weekends - Sunday	8:00a to 4:00p (rec) and 4:30p to 8:00p (school)	12	372
Total Aggregate Hours in Spring + Fall			1561.5

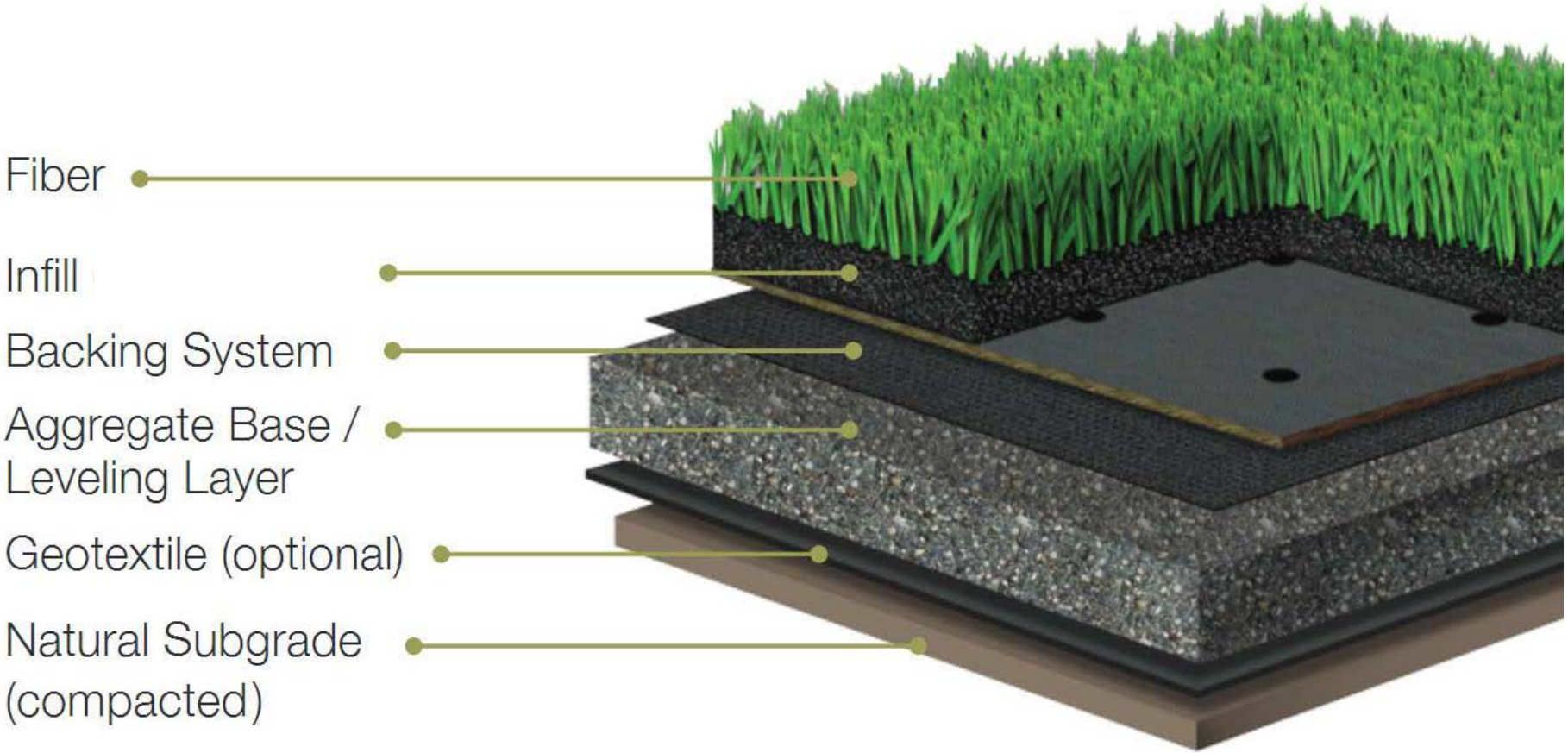
2017 Summer (July 1 - August 14)			
	Time in Use	Hours/Day	Total Hours
Every Day	8:00a to 4:00p and 6:30p to 8:30p	10	450
Five (5) Days/Week	8:30p to 10:00p	1.5	45
Total Aggregate Hours in Summer			495
Total Annual Hours			**2056.5**

Neighboring Communities with Synthetic Turf Fields



Dual County League Members With Synthetic Turf Field(s)

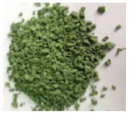
Synthetic Turf System Components



Synthetic Turf Field Infill Options

Rubber | Plastic	Natural | Organic	Minerals/Coated Minerals
Wide use, best performance + resiliency	Organic	Longest life before replacement
Some recycled	Prone to migrating, more maintenance	Less resiliency, harder surface
Perception of toxicity	Requires shock pad, higher cost	Requires shock pad, higher cost
Heavy metals in trace amounts, not releasable	Moisture required to retain resiliency, can freeze	Can be abrasive
Shock pad required with some products	May contain pesticides, heavy metals in trace amounts that are releasable	

Synthetic Turf Field Infill Options

	Infill Type	Life Span	Maintenance	Irrigation System	Estimated Infill Cost - HIGH SCHOOL (90,620 s.f.)	Estimated Infill Cost - LOKER (75,250 s.f.)	Annual Maintenance Cost
	Crumb Rubber Infill	Life of the carpet	- Grooming per 100 hours - Decompaction every 3-4 years - Top dressing every 2-3 years - Annual G-MAX monitoring	Not required	---	---	$5,000 - $10,000 (Plus 300 hours of labor)
	EPDM Infill	8-10 years	- Grooming per 100 hours - Decompaction every 3-4 years - Top dressing every 2-3 years - Annual G-MAX monitoring	Not required	+ $181,240	+ $150,500	$5,000 - $10,000 (Plus 300 hours of labor)
	Coated Silica Sand Infill	16 year maximum	- Grooming per 100 hours - Top dressing every 2-3 years - Annual G-MAX monitoring	Not required	+ $181,240	+ $150,500	$5,000 - $10,000 (Plus 300 hours of labor)
	Cork & Coconut Fibers (GreenPlay)	8 years	- Grooming per 100 hours of play - Replace 10% of infill every 2-3 years - Decompaction 2 times a year - Annual G-MAX Monitoring - Monitor moisture content twice a week	$40,000.00	+ $181,240	+ $150,500	$12,000 - $18,000 (Does not include cost of water. 12,000 gallons twice a week is the recommended average)
	Coconut Husk, Rice Husk and Cork (Infill-Pro Geo)	8 years	- Grooming per 100 hours of play - Replace 10% of infill every 2-3 years - Decompaction 2 times a year - Annual G-MAX Monitoring - Monitor moisture content twice a week	$40,000.00	+ $181,240	+ $150,500	$14,000 - $20,000 (Does not include cost of water. 12,000 gallons twice a week is the recommended average)
	Walnut Shells (SafeShell)	Life of carpet	- Grooming per 100 hours - Decompaction every 3-4 years - Top dressing every 2-3 years - Annual G-MAX monitoring	Not required	+ $158,585	+ $131,688	$5,000 - $10,000 (Plus 300 hours of labor)

Concerns About Synthetic Turf Systems

1. Infill Composition
2. Heat
3. Bacteria
4. Injury Prevalence and Abrasive Qualities
5. Maintenance
6. Infill / Fiber Migration

Toxicology of Synthetic Turf Systems

Risk = Exposure x Toxicity

- Bioavailability of chemicals in synthetic turf fields
- We will analyze proposed crumb rubber prior to installation
  - Metals
  - Benzothiazole
  - PAHs, SVOCs
  - VOCs
- Ways we looked at available data to determine if the risks are acceptable
  - Comparison to applicable standards
  - Ingestion of crumb rubber particles (CRP)
  - Dermal contact with CRP and turf bed
  - Inhalation of chemicals that may volatilize from the synthetic field
  - Leaching of chemicals into groundwater
- We will evaluate data we collect from proposed fields in the same manner

Toxicology of Synthetic Turf Systems

Comparison to Applicable Standards

Constituent	Maximum Detected Concentration mg/kg	ASTM (American Society for Testing and Materials) F3188-16 Safety of Toys mg/kg		European Standard EN 71-3 Category III Safety of Toys mg/kg	
Metals					
Antimony	4	60	Pass	560	Pass
Barium	6	1,000	Pass	18,750	Pass
Cadmium	0.5	75	Pass	17	Pass
Chromium(III)	2	60	Pass	460	Pass
Cobalt	120	NA		130	Pass
Copper	27	NA		7,700	Pass
Lead	26	90	Pass	160	Pass
Molybdnum	2	NA		NA	
Nickel	34	NA		930	Pass
Vanadium	0.8	NA		NA	
Zinc	14000	NA		46,000	Pass

Toxicology of Synthetic Turf Systems

Comparison to Soil Background

Constituent	Maximum Detected Concentration in Crumb Rubber mg/kg	Soil Background Concentrations from Massachusetts 90th Percentile mg/kg	
Metals			
Aluminum	68	10,000	
Antimony	4	1	
Barium	6	50	
Boron	9	Not Determined	
Cadmium	0.53	2	
Chromium(III)	1.7	30	
Cobalt	120	4	*
Copper	27	40	
Lead	26	100	
Manganese	8	300	
Molybdnum	2	Not Determined	
Nickel	34	20	*
Strontium	10	Not Determined	
Titanium	5	Not Determined	
Vanadium	0.84	30	
Zinc	14,000	100	*

Toxicology of Synthetic Turf Systems

Evaluation Through Risk Assessment

Risk Assessment is a way to estimate potential health risks from exposure to chemicals

Risk = Exposure x Toxicity

Conclusion: Potential Risks are an Acceptable Exposure/Negligible Exposure

- Residential Receptor
- Age 1 through 31 years
- 30 year exposure

Toxicology of Synthetic Turf Systems

Conservative Risk Assessment Assumptions

- Maximum detected concentrations were used
- Subchronic exposure (1 yr old) 2 days/wk/30 weeks
- Chronic exposure 3 days/wk/30 weeks
- Exposure through ingestion and dermal contact
- Ingest 100 mg/kg crumb rubber on each day of exposure
- Crumb rubber sticking to face, forearms, hands, lower legs and feet
- Assumes crumb rubber can be ingested like soil and adheres to skin like soil. Reality: far less exposure!

Summary | Open Discussion | Q + A