

Piedmont Unified School District – Havens Playfield Analysis Summary Chart
Board Meeting of November 17, 2009

| | Synthetic Turf: Crumb Rubber Infill (Sportexe + FieldTurf) | Synthetic Turf: Plastic Infill (Mondo) | Synthetic Turf: Encapsulated Sand Infill/Other (Flexsand + Sportexe/FieldTurf) | Synthetic Turf: Coconut Husk & Cork Infill (GeoTurf Play) | Grass: (Bermuda varietal) |
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| 1. Describe the manufacturer recommendations concerning annual maintenance and repair. Include whether water or chemical agents (including anti-bacterial agents) are recommended and, if so, the quantity and frequency of application. | <p>Cost = \$3k - \$5k</p> <p>Sportexe: Thorough inspection once or twice each year. Each panel and all seams inspected, as well as under-padding. Minor damage (loose areas, rips and tears) should be repaired Routine brushing with a "drag broom" every 80 to 200 hours of usage. Additional grooming may be necessary if infill becomes displaced due to excessive use in certain areas (such as a goal). Rain is the best cleanser. When there is little rain, occasional watering is recommended to clean the surface. Cleaners may be necessary to remove stains.</p> <p>FieldTurf:</p> <p>Field should be groomed every 2-3 months depending on usage and other factors. "We do not recommend any additional chemical agents be used on the field but certain anti-bacterial agents won't hurt the field either."</p> | <p>Cost = \$3k - \$5k</p> <p>A "field sweeper," provided with installation, is the primary equipment needed to maintain the field.</p> <p>It is recommended that the field be swept monthly, or more frequently if the field is heavily used or if it accumulates debris such as leaves and litter.</p> <p>Water is the preferred cleaning agent for spills and surface stains.</p> | <p>Cost = \$3k - \$5k</p> <p>Flexsand is an infill product only.</p> <p>See Sportexe/FieldTurf responses concerning maintenance.</p> | <p>Cost = \$3k - \$5k</p> <p>Weekly checking and removal of dirt, checking areas of heavy rainfall, and checking to see if "refilling" is necessary in high use areas.</p> <p>Monthly brushing of fibers, checking of seams, checking of drainage and irrigation systems, and watering and cleaning is also needed.</p> | <p>Cost = \$24k - \$30k</p> <p>Annual Maintenance of \$.80 - \$1.00/sq. ft. (approx. 25K sq. ft).</p> <p>District estimates \$4,000 in annual water costs based on comparison with Witter Softball Field as a percentage of the total water use for the Witter Field complex (baseball, softball, and other grounds).</p> <p>Annual maintenance requires fertilization</p> |

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| <p>2. Describe the durability of the field, including the hours of potential use per day and number of days of potential use per year. Indicate whether the durability changes over the estimated lifetime of the field.</p> | <p>Unlimited.</p> <p>Durability is dependent on both use (total hours of play, not years), climate, maintenance, type of sports played, type of shoes used, the age of the users and other usage and environmental factors.</p> <p>Sportexe: Manufacturer claims no limits to the amount of time that a Sportexe field can be used & "the durability will remain constant if you following the maintenance guidelines & properly clean any debris off the field."</p> <p>FieldTurf: Durability is dependent on both use (total hours of play, not years), climate, maintenance, type of sports played, type of shoes used, the age of the users and other usage and environmental factors. District "should only base the life span of these fields on their warranty period, which is for 8-years."</p> | <p>Unlimited.</p> <p>Warranty does not list any maximum towards number of hours per month of use. Up to 4 times that of a natural grass field."</p> <p>The total number of hours will be dictated "by the amount of maintenance performed on the field."</p> | <p>Unlimited.</p> | <p>Unlimited.</p> <p>However, "the greater the use the greater the need to properly maintain the surface."</p> <p>Durability will not change over the life of the field. However, "there would be a potential rise in Gmax, but not exceeding the 145 specified limit."</p> | <p>Seasonal</p> <p>Current fields are "rested" from mid-November through the end of January, with restricted use (type of sport, age of users) for most months.</p> <p>Fields are closed in wet weather, and must properly drain.</p> |

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| 3. What is the claimed "lifetime" of the product? | <p>Sportexe: The estimated life of the field is 8 to 12 years; it depends on use, maintenance, and UV and weather exposure.</p> <p>FieldTurf: The estimated life of the field is 8-10 years, but company advises planning on replacement after 8 years.</p> | The estimated life of the field is 8 to 10 years, depending on use, maintenance, and UV and weather exposure. | The estimated life of the field is 8 to 12 years, depending on use, maintenance, and UV and weather exposure. | Manufacturer guarantees the field for 8 years but claims that with proper maintenance, can last 10 to 12 years. | Indefinite. Requires annual maintenance that includes reseeding, aeration, fertilization, etc. |
| 4. What is the product warranty (for what period is the field guaranteed to be usable and meeting applicable standards, and what is the remedy if it does not)? | <p>Sportexe: Third-Party Insured Warranty covers the field for up to \$5 million per year for eight years even if the turf company goes bankrupt. This covers the turf and infill system (not the base and drainage systems).</p> <p>FieldTurf: "With over 3,000+ fields installed in the ground over 12-years, Fieldturf has never had a claim filed against our warranty or insurance policy."</p> | <p>Standard 8-yr warranty for turf fiber + backing and infill, with a separate 20-yr warranty available for underlayment and drain pad.</p> <p>A third-party insured warranty is available as an alternative.</p> | <p>See Sportexe/FieldTurf responses.</p> <p>Inclusion of infill warranty by other vendors unknown</p> | <p>Standard 8-yr warranty for turf, infill + installation. Warranty is voided if maintenance is not performed.</p> <p>The warranty is "backed" by third-party insurance.</p> | Not Applicable. |

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| 5. Does a single warranty cover all aspects of the artificial field's soil base preparation, base materials, artificial turf materials, etc.? Will there be separate warranties and warranty voiding conditions for each element, some of which could contravene each other? | <p>Sportexe: The warranty only covers the manufactured & installed turf system. The base & drainage construction should be covered by the general contractor (unless otherwise negotiated with the contractor).</p> <p>FieldTurf: The warranty will cover the base prep and materials only if the company performs this scope of work.</p> | Warranties do not cover earthwork, such as rock laid underneath the field. | See Sportexe/FieldTurf responses. | <p>If the field falls below standards, the manufacturer will repair or replace at its expense.</p> <p>Manufacturer will not install a system unless it approves the sub base.</p> | |
| 6. Cost of replacement at end of warranty? | <p>Estimated cost = \$112,500</p> <p>Sportexe: The <i>estimated</i> cost to replace the turf is \$4.50/sqft.</p> <p>FieldTurf: <i>Removal</i> costs are \$.80 psf in today's dollars if put in a landfill and \$.50 psf if recycled. Replacement cost not provided.</p> | <p>Cost = Unknown, but not less than initial installation.</p> <p>Current removal costs are <i>approximately</i> \$0.30 sqft.</p> <p>Manufacturer does not estimate cost of replacement.</p> | Cost = Unknown, but not less than initial installation. | <p>Estimated cost = \$125,000</p> <p>Sub base work needed to prepare for a replacement field can vary, but is usually cheaper than preparing the initial base.</p> <p>Field replacement typically costs the same as the initial installation.</p> | <p>Estimated cost = \$192,000 to \$240,000</p> <p>Cost represents accrued annual maintenance costs of \$24k to \$30k multiplied by eight years (typical synthetic turf warranty).</p> |

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| 7. Are recycled materials used to manufacture the field material? | <p>Sportexe: EcoSport has “an all polyolefin backing system, and all other components of the turf product (grass fiber and primary backing) are polyolefins¹ as well. The product line is 100% recyclable.”</p> <p>FieldTurf: Fieldturf “is 100% recyclable” and the company claims it uses the highest amount of post consumer recycled content of any turf company.” The company also notes its use can contribute to Leed points.</p> | <p>Yes.</p> <p>The percentage of recycled material varies by product. Ecofill Star is 22% post-consumer content. FTS is 90% post-consumer content.</p> | <p>Yes.</p> | <p>Yes.</p> <p>The infill is 100% pre-consumer recycled material: the coconut fiber is from coconut processing; the cork is from wine bottle corks.</p> <p>The turf backing contains up to 30% recycled vegetable matter in the polyurethane blend.</p> | <p>Not Applicable</p> <p>Natural grass is 100% organic</p> |
| 8. Is the field material recyclable upon replacement? | <p>Sportexe: “all components of the Sportexe turf will be either reused or recycled.”</p> <p>FieldTurf: “Product is “100% recyclable and we are the only company to have recycled a field to date and turned the entire field into new consumer products.”</p> | <p>Yes.</p> | <p>Manufacturer ‘s website states that “at the end of their useful life, the elastomers in FlexSand Action can be reprocessed and recycled.”</p> | <p>The infill can be reused or recycled as mulch.</p> <p>The synthetic fibers are also recyclable.</p> | <p>Not Applicable</p> <p>Grass clippings are composted</p> |

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| <p>9. What is heat of the field compared to conventional grass on a warm, sunny day? What can be done to mitigate excessive heat?</p> | <p>Sportexe: Replacing the carbon black with other pigments or using pigments that absorb less IR are ways that infill producers and yarn producers are lowering the surface temperatures of turf components.</p> <p>FieldTurf: Fieldturf, in conjunction with our fiber supplier, TTC, has developed a new heat resistant fiber called the Fieldturf DuraSpine Pro HR. This new fiber looks to reduce field temperatures by 10-15 degrees. Using a green or tan colored rubber like our EcoGreen infill can also help reduce temperatures a very slight amount by about 3-5 degrees.</p> | <p>Manufacturer cites independent, third-party test of fields in Japan finding that its fields are cooler than crumb rubber infill fields.</p> <p>Manufacturer's own tests indicate that its fields are 20 degrees cooler than crumb rubber infill fields.</p> <p>Manufacturer claims the fields are safer on hot days, and use less water for temperature control.</p> | <p>Flexsand's "White Paper" notes temperatures 20-30 degrees above "bare soil temperatures" as well as temperatures that are 10-25 degrees below standard crumb rubber.</p> <p>FieldTurf states its alternative infill product does not significantly reduce surface temperature though notes overall reduction of 3-5 degrees.</p> | <p>Manufacturer claims the infill retains water and thereby maintains cooler temperatures. Compared with natural grass, "it will heat up a little more, but in comparison to other infills such as sand, rubber, or thermoplastic there is a significant reduction."</p> <p>Water can be used in the cooling process and since the fibers can absorb the water, the cooling effect is much longer . . . "</p> | <p>Not Applicable.</p> |

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| 10. What certification does the manufacturer supply regarding presence or absence of chemicals on California's Prop 65 list? | <p>Sportexe: Refers to ASTM - Volatile tests for fiber, rubber, sand, backings etc.</p> <p>Fieldturf: States it can supply written certification regarding the <i>absence</i> of chemicals on California's Prop 65 list.</p> | <p>Manufacturer claims that no Prop 65 chemicals are used to manufacture these fields or their constituent parts.</p> <p>The company is currently working with the Air Quality Science (AQS) and the Greenguard Environmental Institute (GEI) to establish a testing protocol for its turf system.</p> | <p>Flexsand Elastomer is "food-grade, FDA-compliant and utilized in medical + personal hygiene applications...It contains no lead or other potentially harmful metals or chemicals...and poses no run-off or disposal issues."</p> | <p>Manufacturer states that its product has been tested "for presence of toxic chemicals, lead, and other heavy metals. The only findings were of natural plant extracts."</p> | Not Applicable. |
| 11. What is the risk of bacteria and mold growth in the material? What can be done to mitigate this risk? | <p>Sportexe: "The risk of bacteria & mold growth is minimal as there are know organics found in our turf system."</p> <p>FieldTurf: Manufacturer claims growth of bacteria in natural grass" is approximately 80,000 times more than that of artificial turf. Artificial turf is not a breeding ground for bacteria. Due to the fact that our system is inert, bacteria will not survive."</p> | <p>The company reports that it has never had any instance/problem with respect to bacteria or mold on any of its fields.</p> | No information provided | <p>Manufacturer states "cork is a bark which is naturally resistant to bacteria and growth. In regards to concerns about MRSA and other spread of disease, an anti-bacterial treatment can be applied but it is not deemed mandatory by our factory."</p> | |

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| 12. What is the risk that the field material will aerosolize (become respirable)? What can be done to mitigate this risk? | <p>Sportexe: cites Office of Environmental Health Hazard Assessment, California Environmental Protection Agency report of July, 2009 “suggesting negligible risk.”</p> <p>FieldTurf: company cites report that finds “under most severe conditions, air quality over synthetic turf fields poses no health risk; air quality over turf fields similar to air quality over grass fields and in upwind locations.”</p> | <p>Manufacturer cites testing, under EPA guidelines, that indicate “no chance of harmful toxins being released” from the field material, and no concern that the constituent “field material will aerosolize.”</p> | <p>MSDS for Flexsand indicates “high airborne levels of dust may cause irritation to the eyes, skin, and mucous membranes of the upper respiratory tract.”</p> | <p>Manufacturer claims that it is possible the infill particles could be respirable but, because the material is “100% non-toxic and natural there is no associated health risks. There is also no risk of water or soil contamination.”</p> | <p>No information available</p> |
| 13. What is the risk that the field material will migrate off the field, including but not limited to migration into the storm drain system? What can be done to mitigate this risk? | <p>Sportexe: Manufacturer states that, to reduce migration of infill, the customer should choose a heavier turf.</p> <p>FieldTurf: states that its heavy weight infill system “stays in suspension and we have never had to come back and add infill to our fields, even 10-year old fields.”</p> | <p>Manufacturer claims infill is denser and heavier than crumb rubber infill, and does not have same tendency to migrate “or float and obstruct water intake system.”</p> <p>Manufacturer claims that its infill does not retain the type of static charge that is typical of crumb rubber granules.</p> | <p>Manufacturer claims that the product “won’t cling to skin or uniforms” because it “has no static charge”</p> | <p>Manufacturer claims the field system was designed to reduce migration.</p> <p>“Fibers absorb water upon installation and weave themselves together and around turf fibers while compacting. There will be the need for minor ‘refilling’ with use as covered under maintenance.”</p> | <p>Safe to assume minimal risk of migration (e.g. mud and grass stains on clothes).</p> |

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| 14. What is the longest period of time the field being specified has been in use at another school, college, or university? | <p>Sportexe: Slit-tape fibers combined with sand rubber infill has been in use for 25 years; fourth generation product claimed more durable + elastic with greater UV protection.</p> <p>FieldTurf: company reports "over 100 fields in the ground that have made it past an 8-year warranty period, some now 11-years old and we have over 400 field installed in N. California alone."</p> | Longest in-service field installed 2003. Mondo has been in business for 60 years | No information provided | First installation in 2007. 200 field installations world-wide. Two of these fields are in the US. | Indefinite. |