MEMORANDUM



To: Sarah Price, City of Long Beach

From: Robert Harding, D.A. Hogan & Associates, Inc.

Date: April 13, 2015

Re: Turf 101

Sarah,

In preparation for the "Turf 101" education session scheduled for April 27, please find the following documents:

- 1. General Outline of items that I will cover in Turf 101.
- 2. Comparison Matrix of different vendors and products in the marketplace. This includes brief summaries of products offered, company background, products etc. It is not practical to compare and list all products listed by all vendors as that would represent in excess of 100 separate and unique turf products. We will review this with the team during Turf 101. I anticipate this will be able to be refined, following a narrowing/focus on specific products or vendors. The matrix is partitioned to the 5 primary vendors currently most active in the local market, a second grouping of vendors with limited examples in southern California, and 4 additional products.
- 3. A listing of recent synthetic turf installations, as provided by the 5 primary vendors currently most active in the southern California marketplace. My suggestion for review of the most convenient and adjacent facilities is (in alphabetical order by vendor):
 - a. Toyota Sports Park Torrance: Astroturf 3D Extreme 244,000 SF (Premier Product)
 - b. El Camino College Torrance: FieldTurf Revolution 2.5" 92,000 SF(Premier Product)
 - c. Smith Park Pico Rivera: Hellas Matrix 46 -100,000 SF
 - d. Rosecrans Sports Park Gardena: Shaw Classic 71,400 SF
 - e. La Paz Sports Park Laguna Niguel: Sprinturf Ultrablade Slit Film 2.25" 157,700 SF

The first 4 of these sites are relatively adjacent, and relatively near to Long Beach. The Sprinturf site is a relative short (45 min) drive south to Laguna Niguel.

4. A memorandum summarizing the issues/products related to infill materials including SBR and alternative products currently in the market place. I will bring samples of the primary products available.

I look forward to seeing you and the rest of the team on April 27. I will call to coordinate time and location.



Synthetic Turf Workshop Agenda

1. Introductions

2. Synthetic Turf Surfaces

- Synthetic Turf History & Evolution
- Synthetic Turf Manufacturing & Materials
 - o Fiber
 - Monofilament
 - Long Parallel Slit Film (XP Type)
 - Root Zone/Thatch Zone
 - Combinations
 - o Backing
 - o Coatings
- Synthetic Turf Infill Materials
 - o Rubber and Sand Infill
 - o All Rubber Infill
 - SBR ambient/cryogenic
 - Coated/Painted SBR
 - Silica Sand
 - Nike Grind
 - TPE
 - o Organic
 - Geofill
 - Cork
 - o Coated Sands
 - o EPDM
- Supplemental Pad System
 - o Elastic Layer Pad
 - Pea rock/Polyurethane/SBR
 - o Premanufactured Panel
 - Brock
 - Schmitz Foam
 - Roll goods Surface America/Regupol/Ecore shock pad
 - o Drainage Composite
 - Versatile
- Synthetic Turf Products & Vendors Locally Represented
 - o Astroturf
 - Field Turf / Tarkett
 - o Hellas
 - Shaw Sports Turf
 - o Sprinturf

Other products in the Marketplace

- o A-Turf
- o **Domo**

- o ProGrass
- o UBU
- o Greenfields
- o Mondo
- o Polytan
- o X-Trass

4. Products Available through Purchasing Cooperatives

CMAS (California Multiple Award Schedule)

FieldTurf Hellas

TIPS-TAPS

Sprinturf Hellas Shaw

TCPN

Astroturf

5. Questions and Answers

City of Long Beach

| Company | AstroTurf | FieldTurf/Tarkett | Hellas | Shaw | SprinTurf | A Turf | Domo | Prograss | UBU | Greenfields | Mondo | Polytan | X-Grass |
|------------------------------|--|--|---|--|---|--|--|---|--|-------------|-------|---------|---------|
| Vendor | Astroturf | FieldTurf | Hellas Construction | Shaw | SprinTurf | A-Turf | West Pac Sports Systems | Prograss | UBU | | | | |
| Manufacturer | Synthetic Turf Resources | FieldTurf / Tarkett | Spears Industries | Shaw | ITS/Nexcel | Controlled Products | Varies | Nexcel | Turfstore | | | | |
| Installer | Independent 3rd Party Contractor | FieldTurf | Hellas and Independent 3rd Party Contractor | Shaw | SprinTurf | Independent 3rd Party Contractor | Independent 3rd Party Contractor | Independent 3rd Party Contractor | Independent 3rd Party Contractor | | | | |
| Local Representation | Yes | Yes | Yes | Yes | Yes | Unknown | Mission Viejo | Unknown | Central Califonia Coast | | | | |
| Company Background | Astroturf is located in Dalton, Georgia. Parallel company to Synthetic Turf Resources which provides coating services to many other companies in the carpet industry. Well financed and stable in the market place. Fields constructed and used at professional, collegiate and high school venues throughout the US. | FieldTurf was the first of the new generation of resilient infilled turf products. They are an industry leaders with acceptance at the top levels of athletic completion including numerous professional and collegiate installations. Vertically integrated with control over fiber production, tuffing and coating at own facilities and install with own crews. Fields constructed and used at professional, collegiate and high school venues throughout the US. | Hellas Construction management previously associated with other companies, including SRI Sports. In the competelive market since 2005, with primary offices in Texas and manufacturing of product in Georgia. Fields constructed and used at professional, collegiate and high school venues throughout the US. | Shaw Sports Fields, include previous product line of Sportexe is a wholly owned subsidiary of Berkshire Hathaway. Manufacturing facilities in Dalton, Georgia. Independent research and fiber prodution capabilities. Fields constructed and used at professional, collegiate and high school venues throughout the US. | SprinTurf was the first all-rubber infill synthetic turf surface. They emphasize higher fiber weights and backing strengths with their product. Vertically integrated, as they produce their own fiber, with tufting and coating products in their own facilities and typically install with their own installation teams. Fields constructed and used at professional, collegiate and high school venues throughout the US. | Sister Company to Surface America A-Turf is independent turf vendor which is part of the ECORE Group (originally Dodge Corc Co.). Surface America is an established playground surfacing company. Fields constructed and used at professional, collegiate and high school venues throughout the US. Offering extended warranty. | Domo Sports & Leisure Grass is a unit of a larger company with 2,500 employees and \$850M Euro based in Belgium. Established European Vendor with installations for LA Unified and several Parks and Division 2 collegiate installations. Fiber manufactured in Belgium | 10 year old company, with manufacturing facilities in Georgia. | UBU is 5 year old Company with management team experienced from other turf vendors. Extensive documentation materials. Fields constructed and used at professional, collegiate and high school venues throughout the US. | | | | |
| Approximate Annual Volume | 150-200 | 1000+ | 150-200 | 150+ | 150+ | 50-100 | 50-100 | 50-100 | 50-100 | | | | |
| Product | | - | | | , | | | 1 | | | | | |
| Infill Materials | Typical infill is less than 10% sand, with remaining rubber. Typically using ambient rubber but will use cryogenic rubber. | Always sand and cryogenic rubber installed in layers in accordance with patent; sand on bottom with blended sand & rubber in the middle and 100% rubber on top. Parallel Tarkett product with 100% sand on bottom and 100% rubber on top. | Typical infill is less than 10% sand, with remaining rubber. Typically using ambient rubber but will use cryogenic rubber. Strongly promoting organic infill | Typically infill is less than 10% sand, with remaining rubber. Typically using ambient rubber but will use cryogenic rubber. | Typically all rubber infill but will provide sand and rubber if desired; | Sand and rubber with 100% rubber on the bottom and blended sand and rubber on top; larger sand & rubber particle sizes are utilized, will also use all rubber | Typical infill is less than 10% sand, with remaining rubber. Typically using ambient rubber but will use cryogenic rubber. | Typical infill is less than 10% sand, with remaining rubber. Typically using ambient rubber but will use cryogenic rubber. | Typical infill is less than 10% sand, with remaining rubber. Typically using ambient rubber but will use cryogenic rubber. | | | | |
| Fiber Type | Long parallel slit film or Monofilament polyethylene & polypropylene blend. Proprietary blend with nylon rootzone/thatch. Tencate or own fiber. | Long parallel slit film or Monofilament manufactured by own resources | Long parallel slit film or Monofilament. Sometimes with combined fibers. | Long parallel slit film or Monofilament polyethylene & polypropylene blend manufactured byTencate or self manufactured fibers. New product with PE thatch/rootzone. | Long parallel slit film or Monofilament. Sometimes with combined fibers and offer of root zone/thatch with PE fiber. | Long parallel slit film or Monofilament. Sometimes with combined fibers. | Long parallel siit film or Monofilament polyethylene / combined and manufactured by Domo | Long parallel slit film or Monofilament Sometimes with combined fibers. | Long parallel slit film or Monofilament. Sometimes with combined fibers. Fiber from Polytex. | | | | |
| Pile Weight | Typical range from 38-52 oz/sy with single or multiple fibers | 33 - 40 oz/sy | Typically over 40 oz/sy | Typically 41-51 oz/sy | 40-50 oz/sy | 40-48 oz/sy | 40-48 oz/sy | 40-48 oz/sy | 40-48 oz/sy | | | | |
| Pile Height | Typically between 2" and 2.50" | Typically between 2" and 2.50" | Typically between 2" and 2.50" | Typically 2.00"-2.50" | Typically between 2" and 2.50" | Typically between 2" and 2.50" | Typically between 2" and 2.50" | Typically between 2" and 2.50" | Typically between 2" and 2.50" | | | | |
| Backing | Multi-layer backing material with polyurethane coating | Patented permeable backing with partial polyurethane coating | Multi-Layer backing material with polyurethane coating | Multi-Layer backing material with polyurethane coating | Patented triple layer backing material with urethane coating | Double backing with urethane coating | Double backing with urethane coating | Double backing with urethane coating | Double layer backing material with latex coating | | | | |
| Backing / Coating Weight | Typically +26 oz/sy | Typically +22 oz/sy | Typically 22 oz/sy | Typically 34 oz/sy | Typically 22 oz/sy | Typically +26 oz/sy | Typically +26 oz/sy | Typically +26 oz/sy | Typically +26 oz/sy | | | | |
| Total Weight | Typically over 70 oz/sy | Typically +57 oz/sy | Typically over 70 oz/sy | Typically 75 oz/sy | Typically over 80 oz/sy | Typically over 70 oz/sy | Typically over 70 oz/sy | Typically over 70 oz/sy | Typically over 70 oz/sy | | | | |
| Supplemental Pad | No restrictions | No restrictions. Typically installed without pad. | No restrictions | No restrictions | No restrictions | No restrictions | No restrictions | No restrictions | No restrictions | | | | |
| Experience | | | | | | | | | | | | | |

| Football Experience | The surface has been widely accepted for football use with numerous installations. NFL Field | Market leader with multiple NFL and Division 1 NCAA football field installations | The surface has been widely accepted for football use with numerous installations. NFL Field | The surface has been widely accepted for football use with numerous installations. | The surface has been widely accepted for football use with numerous installations. NFL Practice Fields | The surface has been widely accepted for football use with numerous installations. NFL Field | Mutliple field installations for LA School District. | Multiple High School and Park installations with some University installations | The surface has been widely accepted for football use with numerous installations. Multiple NFL Fields |
|------------------------|--|--|--|--|---|--|--|--|---|
| Soccer Experience | The surface has been widely accepted for soccer use with numerous installations. | Has FIFA 2 Star Installations. The surface has been widely accepted for soccer use with numerous installations. | The surface has been widely accepted for soccer use with numerous installations. | The surface has been widely accepted for soccer use with numerous installations. | The surface has been widely accepted for soccer use with numerous installations. | The surface has been widely accepted for soccer use with numerous installations. | The surface has been widely accepted for soccer use with numerous installations. | The surface has been widely accepted for soccer use with numerous installations. | The surface has been widely accepted for soccer use with numerous installations. |
| Regional Installations | Numerous throughout SOCAL Market, with greater than 10-50 fields | Numerous throughout SOCAL Market, with greater than 100 fields | Numerous throughout SOCAL Market, with greater than 10-15 fields | Numerous throughout SOCAL Market, with greater than 10-15 fields | Numerous throughout SOCAL Market, with greater than 25 fields | Numerous throughout SOCAL Market, with less than 10 fields | Numerous throughout SOCAL Market, with 5-10 fields | Numerous throughout SOCAL Market, with less than 5 fields | No fields in SOCAL Market |

| | Rece | ent Synthetic Turf Installat | ions by Vendor | | |
|--------------------|--|-------------------------------|---|-----------------|----------------------|
| | | | | | |
| <u>Turf Vendor</u> | Project | <u>Product</u> | Location | <u>Year</u> | <u>Size</u> |
| AstroTurf | Toyota Sports Park Soccar | GD 3D52 Extreme | 555 Maple Ave. Torrance. CA 90501 | 2014 | 244.000sf |
| Astronum | Cilbert Lindson Rec Conter Soccer | Goldon Sorios DT22 | 425 E 42rd Place, Los Angelos, CA 90011 | 2014 | 175000cf |
| | Damona High School Soccer | Golden Series DT32 | 423 L. 4210 Flace, LOS Angeles, CA 50011 8101 W. Pomona Dr. Aryada, CO 80005 | 2015 | 175000si 155000cf |
| | | GD 2D52 Extromo | 405 Hilgard Avenue, Los Angelos, CA 90095 | 2013 | 220 000cf |
| | Marine Ave Bark Soccer | GD 3D Extreme | 1400 Highland Avenue, Manhattan Beach, CA 90266 | 2012/2013 | 90000si |
| | Initialitie Averank, Soccei | OD 5D Extreme | 1400 Highland Avenue, Manhattan Beach, CA 50200 | 2015 | 5000031 |
| FieldTurf | Culver City High School | Revolution 2.5" | 4401 Elenda St, Culver City, CA 90230 | 2014 | 80,000sf |
| | Colton High School | XT 2.5" | 777 W Valley Blvd, Colton, CA 92324 | 2014 | 88,000sf |
| | El Camino College | Revolution 2.5" | 16007 Crenshaw Blvd, Torrance, CA 90506 | 2014 | 92,000sf |
| | Newbury Park High School | Classic HD 2" | 456 N. Reino Road Newbury Park, Thousand Oaks, CA 91320 | 2014 | 88000sf |
| | Westlake High School | Classic HD 2" | 100 Lakeview Canyon Rd, Westlake Village, CA 91362 | 2014 | 88000sf |
| | Orange Coast College | Revolution 2.5" | 2701 Fairview Rd, Costa Mesa, CA 92626 | 2015 | 100,000sf |
| | | | | | |
| Hellas | Oaks Christian High School, Football Stadium | Matrix 46 | 31749 La Tienda Rd, Westlake Village, CA 91362 | 2009 | 89,500sf |
| | Oaks Christian High School, Baseball/Softball Fields | Matrix 46 | 31750 La Tienda Rd, Westlake Village, CA 91362 | 2014 | 204,000sf |
| | City of Westlake Village YMCA, Baseball/Softball | Matrix 46 | 31200 Oak Crest Dr. Westlake Village, CA 91361 | 2014 | 240,000sf |
| | City of Pico Rivera - Smith Park | Matrix 46 | 6016 Rosemead Boulevard Pico Rivera, CA 90660 | 2012 | 100,000sf |
| | Santa Monica High School | Matrix 46 | 601 Pico Blvd, Santa Monica, CA 90405 | 2012 | 92,000sf |
| | Granada Hills Charter School | Matrix 46 with e-layer | 10535 Zelzah Ave, Granada Hills, CA 91344 | 2012 | 96,000sf |
| | | | | | |
| Shaw | Rosecrans Sports Park, Soccer | Classic | 840 W 149th St, Gardena, CA 90247 | 2013 | 71,400sf |
| | Aspire Charter School, Soccer | PowerBlade HP | 6005 Stafford Ave Huntington Park, CA 90255 | 2013 | 85,000sf |
| | Orange County Great Park, Soccer | Legion | 1 Civic Center Plaza Irvine, CA 92606 | 2013 | 91,768sf |
| | Orange County Great Park, Multi-use | Legion | 1 Civic Center Plaza Irvine, CA 92606 | 2013 | 91,768sf |
| | City of San Clemente High School, Multi-use | Legion 46 | 700 Avenida Pico, San Clemente, CA 92673 | 2012 | 240,000sf |
| | | | | | |
| SprinTurf | La Paz Sports Park, Soccer/Baseball/Multi-use | 2.25" Ultrablade Slitfilm | 28051 La Paz Rd, Laguna Niguel, CA 92677 | 2014 | 157,750sf |
| | Connors Park, Soccer/Football | 2.25" Ultrablade Slitfilm | 320 W San Marcos Blvd, San Marcos, CA 92069 | 2014 | 74,877sf |
| | El Cariso Park, Soccer/Football | 2.25" Ultrablade MM | 13100 Hubbard St, Sylmar, CA 91342 | 2014 | 83,000sf |
| | Royal High School, Soccer/Football/Lacrosse | 2.5" Ultrablade Slitfilm | 1402 Royal Ave, Simi Valley, CA 93065 | 2014 | 106,600sf |
| | Glendale Sports Complex, Soccer/Football/Lacrosse | 2.25" Ultrablade Slitfilm | 2200 Fern Ln, Glendale, CA 91208 | late March 2015 | 131,000sf |
| | Los Alamos Hills Sports Park, Soccer/Football | 2.25" Ultrablade MX | 37000 Ruth Ellen Way, Murrieta, CA 92563 | 2014 | 130000sf |
| | University of California San Diego, Muir Field Soccer/Lacrosse | 2.00" Ultrablade DFE w/thatch | 9500 Gilman Dr, La Jolla, CA 92093 | late April 2015 | 103,900sf |
| | Long Beach City College, Veterans Memorial Stadium Football | 2.50" Ultrablade Slitfilm | 5000 E Lew Davis St, Long Beach, CA 90808 | 2004 | |



MEMORANDUM

To: Sarah Price, Capital Projects Coordinator Department of Public Works City of Long Beach

From: Robert Harding, D.A. Hogan & Associates, Inc.

Date: April 17, 2015

Re: Synthetic Turf Infill Products

Sarah

Please see the following summary of information related to basic and alternative infill products. I will review samples with you during our Turf 101 session on April 27.

We have been very active in the discussion industry wide, related to alternative infill products. Much of the summary of scientific studies leads one to understand there is no causal link between the use of SBR (recycled tire) products and increased health risks specific to cancers. There are a lot of "studies" and news reports regarding purported health risks, however ultimately those tend to be opinion based or anecdotal in nature. Right now, and based upon independent studies commissioned measuring heavy metals as well as other PAH levels, the risks involved trend to the greater than 1:1,000,000 chance of increased health risks - which is classified as de-minimus.

Further, and for another project, our client retained the services of a certified industrial hygienist to evaluate current published literature regarding the ongoing issue of crumb rubber infill. Based upon a review of 32 documents the conclusion is:

"Based on the scientific research, there is neither the dose, nor the exposure route, to indicate a health hazard for artificial turf/crumb rubber field users.

All studies acknowledge that additional data is needed to more fully assess potential exposures and possible health risks associate with the use of artificial turf fields with crumb rubber. In the meantime, leading public health agencies, such as the EPA and Consumer Product Safety Commission, are supporting continued use of artificial turf fields with crumb rubber."

I look forward to discussion the various products with you and other evaluators of products.

<u>SBR Infill</u>

There have been a number of studies or documents from various agencies relative to SBR infill and synthetic turf. As noted in these studies, there are heavy metals and other carcinogenic materials that are in the chemical make-up of the SBR material but these are essentially locked into the material and are typically not considered as being bio-available. I am not a chemist or health expert so I cannot interpret or summarize all this data but I do know that these SBR materials have been commonly used in playgrounds and running tracks long before they were first used for synthetic turf infill starting in the late 90s. These infill materials are used on the overwhelming majority of the 1000 +/- synthetic turf fields that are installed each year. This includes all of the synthetic turf fields installed at our local universities, the stadium fields for the Seahawks, Sounders, and Timbers, etc.

Using a reliable and proven source for infill material is critical. There has been a significant amount of study and experience with the SBR infill material. The alternative infill materials are less proven and have not been studied as extensively as the SBR material. As an example, nine of fields installed for the Los Angeles Unified School District (which was referenced in the NBC report as not allowing SBR) used TPE infill manufactured in Asia that has melted or clumped together. It is my understanding that the decision to move away from SBR infill in 2008 had to do with concerns about lead and the variability of the SBR materials. It should also be noted that during that time frame, the State of California was awarding grants up to \$50,000 or \$100,000 for field and track projects that incorporated SBR materials as long as they were recycled from within the State. One of the studies completed on synthetic turf with SBR infill was commissioned by the State of California Department of Resources Recycling and Recovery produced by the Office of Environments Health Hazard Assessment. Current cost for SBR is approximately \$0.15 per lb.

Alternative Infill Products

If the District would like to consider either removing and replacing infill on their current synthetic turf surfaces or incorporating an alternative infill into any new synthetic turf surfaces, the follow is a summary of the other options available.

Coated Rubber:

This material includes use of SBR rubber materials, and applying an acrylic coating to the exterior of the granulate, effectively encapsulating the SBR particle. Typically available in color green or tan, this product retains the resilient performance characteristics of the SBR material, and binds the "black" tire particle within a coating. Current pricing for this material is approximately \$0.40 per lb. or \$0.25 per lb. more expensive than SBR. The nearest coating facility is in Vancouver B.C.

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Nike Grind:

This material includes ground rubber from either residual material from the shoe manufacturing process of from recycled (used) shoes. This material is multi-colored but has similar physical characteristics (size, shape, and resiliency) to the established SBR material. Current pricing for this material is approximately \$0.60 per lb. or \$0.45 per lb. more expensive than SBR. Here is a link to the Nike Grind material information:

http://www.nike.com/us/en_us/c/better-world/reuse-a-shoe

http://www.sole-

revolution.com/system/files/1/original/Sole Revolution Specifications Sheet.pdf?1290182575

We have requested more detailed health and environmental information on this material. However, their product literature says that this material does not include any heavy metals. Supply and demand will impact the availability of this product.

<u>TPE Infill:</u>

TPE is an acronym for Thermo Plastic Elastomer. This infill material has been used more extensively in Europe but has also been used on a number of fields in North America. It is my understanding that this material does not contain any chemicals or substances that are on the State of California Prop 65 list of know carcinogenic materials. This material is typically green or tan in color and will typically result in somewhat lower field surface temperatures during periods of warm or hot weather. This material is expensive but can be re-used on future turf replacements. Current pricing for this material is approximately \$1.20 per lb or \$1.05 per lb more expensive than SBR. Here is a link to the product information:

http://www.ttiionline.com/

As noted above, using a reliable source for this material is critical. Nine of fields installed for the Los Angeles Unified School District and a number of others that used TPE infill manufactured in Asia have failed. With high surface temperatures, the TPE infill melted and clumped together.

Organic Infill

These are granulated plant derived materials that include coconut husks, cork, and rice husks. I feel strongly that fields with this infill should include a supplemental pad system as the organic materials could/will break down over time resulting in a loss of resiliency. Also, keep in mind these have not been installed on a wide spread basis and typically in much drier climates. They

Synthetic Turf Infill Products Summary April 17, 2015 PAGE 3 OF 5 will require regular irrigation as well during any periods of dry weather even when they are not in use.

Also, in my opinion additional study will need to be completed to insure that the MRSA studies previously performed on fields with SBR infill would apply to fields with organic infill. Cleanup procedures after any bleeding or vomiting on the field surface would probably also be much more involved with the organic infill materials.

Whereas these infills have been used more extensively in Italy and other warmer and drier climates, there is more limited and short term experience in wetter and cooler climates. Several track vendors are embracing this product, including Hellas and Shaw. With high temperatures fields with this infill material will require regular watering – as often as 2-3 times each week in order to keep the infill in place. A supplemental shock pad should be an absolute requirement with this infill.

Looking at the Shaw product first may be warranted as they should be able to provide a very strong warranty (as they are part of Berkshire Hathaway). Here are some links to the organic infill options:

From Shaw (including the field on the Google corporate campus)

http://www.shawsportsturf.com/geofill/

From Limonta (two recent installations in the Bay Area at a park and elementary school):

http://www.geoturfusa.com/

Coated Sand Materials:

There is a number of different infill products comprised of coated sand materials. Some of these include resilient coatings and others include harder coatings and rely on the sands displacement to absorb impacts. The resilient coatings include FlexSand. However, this material no longer listed on the manufacturer's website and may have had some ongoing performance issues (unconfirmed). I am trying to confirm what I heard may have been problems. When I previously reviewed their samples under a scope, the resilient coating around the sand was far from uniform and appeared to be easily worn off. Also, there is not much health/environmental information that I could find on the coating itself. With the harder coatings, it has been our experience with previous generations of synthetic turf systems that included 100% sand infill was that the sand particles tended to lock together over time resulting in a fairly hard and compact surface.

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EPDM:

EDPM is a manufactured rubber product typically used as the wearing course on running tracks as well as the colored fall protection areas below playground equipment. Current pricing for this material is approximately \$1.00 per lb or \$0.85 per lb more expensive than SBR. There have been a number of issues with the EPDM (track rubber) fields where it has either gummed up or reacted with the turf fiber resulting is a color change. Melos & Gezolan are typically the only sources we pre-approve for tracks although Melos sourced some of their product from Eastern Europe and it failed on some tracks (Stanford among a few others). Again, there is less study and data on this material than the SBR material and given the high price point, TPE may offer a better option at a similar price point.

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