

April 3, 2020

Mr. Alex Elvin, General Planner  
Martha's Vineyard Commission  
PO Box 1447  
Oak Bluffs, MA 02557

Re: Martha's Vineyard Regional High School – Athletic Field Improvements  
(Amended DRI # 352)

Dear Mr. Elvin;

I am in receipt of your email and staff questions dated March 30, 2020 regarding the MVRHS's application for an amended DRI, as referenced above. The following is a summary of your questions and our responses.

#### **LOGISTICS**

**1. What role is Daedalus still playing?**

*Response: Daedalus Projects Inc. is the Owner's Project Manager overseeing the project through planning, design and construction for the District and is represented by Mr. Joseph Sullivan.*

**2. Has the high school committed to more than phase 1?**

*Response: Not at this time. Our application is limited to the scope of work outlined in the plan set entitled "Athletic Field Improvements – Phase One", dated January 20, 2020, Prepared by Huntress Associates, Inc.*

#### **SPECS**

**3. What are the Gmax ratings of the existing and proposed grass fields?**

*Response: We have not taken GMax readings of the existing grass fields. I would expect the reading of the proposed natural grass field to fall within the range of 90 to 125 upon completion.*

**4. Please provide the MVC with samples of the BrockFILL material.**

*Response: I have requested that the Manufacturer send a physical sample, MSDS sheets and product data directly to your office.*

**5. Please provide the MSDS for the Greenfields carpet material.**

*Response: I have requested that the Manufacturer send a physical sample, MSDS sheets and product data directly to your office.*

**6. What are the square footages for 1) the synthetic field, 2) the renovated grass field, and 3) the JV baseball diamond?**

*Response: Field #1 (Synthetic Turf Field) is 105,252 square feet in size.  
Field #2 (Natural Grass Field) is 75,600 square feet in size.  
The existing JV Baseball field is approximately 120,000 square feet.*



**7. Does the current grandstand have 500 or 800 seats? (We have conflicting information.)**

*Response: According to Mark McCarthy, the HS Athletic Director, the current High School Grandstand has an approximate capacity of 800.*

**MAINTENANCE**

**8. Please provide the recommended maintenance program for the synthetic field.**

*Response: The following is our recommended Post-Construction Field Maintenance Program. This scope has been included in the project specifications and will be performed by the selected turf manufacturer on an annual basis. This annual maintenance would be supplemented by weekly/monthly inspections and grooming to be completed by in-house staff at MVRHS on an as-needed basis. All required grooming equipment is included in the project specifications and will be delivered to MVRHS upon substantial completion of the synthetic turf field.*

*We have also included below the warranty requirements which are included in the specifications and will remain a responsibility of the Synthetic Turf Vendor for a period of ten (10) years after final acceptance.*

**A. Maintenance Training**

a. *Prior to acceptance of the new synthetic turf field, the Synthetic Turf Vendor shall provide maintenance training to the Owner and all in-house staff. In-house staff shall include all maintenance personnel, coaches and athletic department staff who will have regular contact with the field, athletes and the user groups who are allowed access to the field. The maintenance training shall include the following:*

- i. Inspection and repair techniques for minor damage to seams, inlays, logos, penetrations and connections.*
- ii. Inspection of Carpet Pile for premature fading, excessive fibrillation, wear and/or decreased height.*
- iii. Inspection of the Infill for depth and consistency.*
- iv. Complete brushing of the field with a motorized rotary broom to redistribute and level the Infill and rejuvenate the Carpet Pile. This training shall utilize the maintenance equipment specified and delivered to the job site as part of the project specifications.*
- v. Review of maintenance log procedures and record keeping.*
- vi. The Synthetic Turf Vendors shall, at this time, provide contact information for all warranty claims and repair calls, as outlined in the project specification.*
- vii. The Synthetic Turf vendors shall leave an appropriate amount of supplies, including excess turf, infill, resilient underlayment, seaming tape and glue as needed for minor repairs.*



**B. In-House Maintenance Responsibilities:**

- a. *On a weekly basis the Owner shall:*
  - i. *Inspect seams, inlays, logos, penetrations and connections.*
  - ii. *Inspect Carpet Pile for premature fading, excessive fibrillation, wear and/or decreased height and weight.*
  - iii. *Inspect the Infill for depth and consistency.*
  
- b. *On a monthly basis, or as needed, the Owner shall:*
  - i. *Complete brushing/grooming of the field with a motorized rotary broom to redistribute and level the Infill and rejuvenate the Carpet Pile. Brushing/grooming of the field to include the use of a magnetic bar to remove any bobby pins, cleats or other debris.*
  - ii. *Bodily Fluids/Germs/Disinfectant: If there is an incident involving blood or vomit, note where it happened and spray it down with water first and then alcohol/Purell/hand sanitizer or similar then dab with a towel. Small areas can be managed with OTC antibacterial cleaners.*

**C. Post Construction Field Maintenance Program**

*Subsequent to Final Completion the Synthetic Turf System Vendor shall provide the Owner with two (2) years of Post Construction Field Maintenance Services including but not limited to:*

- A. *A complete inspection of the entire field area to include:*
  - 1. *Inspection of seams, inlays, logos, penetrations and connections.*
  - 2. *Inspection of Carpet Pile for premature fading, excessive fibrillation, wear and/or decreased height and weight.*
  - 3. *Inspection of the Infill for depth and consistency.*
  - 4. *Inspection of the Infill for consistency of feel and excessive hardness or softness.*
  - 5. *Immediate repair or replacement to correct deficiencies noted during inspection.*
  - 6. *Complete brushing of the field with a motorized rotary broom to redistribute and level the Infill and rejuvenate the Carpet Pile.*
  - 7. *Provide G-Max and HIC testing per the Project Specifications.*
  
- B. *Provide a Complete Field Service Report of all observations and activities to the Owner and Landscape Architect.*
  
- C. *Post Construction Field Maintenance shall be performed a minimum of two (2) times during the first two (2) full years after Final Completion. Post Construction Field Maintenance shall be performed at the discretion and approval of the Owner, and with at least fourteen (14) days prior notice to the Owner.*



**D. Ten (10) Year Warranty**

A. *Warranty: The Infilled Synthetic Turf System Vendor shall provide a third party insured warranty guaranteeing all manufactured and procured Infilled Synthetic Turf System materials and workmanship against damage by climatic conditions or proper and normal use (including the use of cleats) for a minimum period of ten (10) years from the official date of Substantial Completion. In addition, the Infilled Synthetic Turf Warranty shall guarantee all manufactured and procured materials and/or workmanship including such defects as premature decrease in infill height, premature decrease in pile height or weight (stipulated as more than 10% decrease), UV degradation, fading, seam rupture, dislodgement, inadequate drainage or inadequate air transmission. The guarantee shall be in writing, stating the any defects, including the need to remove and replace manufactured and/or procured materials will be repaired at no cost to the Awarding Authority within 7 days written notice of the Awarding Authority. The warranty coverage shall not be prorated nor limited to the amount of the usage. Warranty coverage shall provide for \$15 million per year in the aggregate and \$5 million per claim minimum.*

B. *Performance Testing:*

1. *The Infilled Synthetic Turf System Vendor shall, at their own expense, have G-Max testing performed by an approved and certified independent testing laboratory prior to requesting Substantial Completion. Testing shall consist of shock attenuation per ASTM F-355-A. The Awarding Authority and Landscape Architect shall be provided with copies of all testing.*
2. *Testing shall be performed at the field's center, the goal locations for all sports and at 10 yards inside each corner of the field. Tests shall also be taken at 4 random spots as chosen by the Landscape Architect or Awarding Authority.*
3. *At no time shall the G-Max be less than 90 nor exceed 125 at any one point of the field. (Refer to Section 32 18 23.30 SYNTHETIC FIELD UNDERLAYMENT, for additional GMax information)*
4. *In cases where the result of a test falls outside the specified values, additional tests shall be taken in 10-foot increments in 4 opposite directions (north, south, east and west) from the failing test point and each subsequent failing test point until all tests fall within the specified values. The failing area shall be marked off, repaired and retested by the Infilled Synthetic Turf System Vendor until all tests fall within the specified values.*
5. *G-Max testing during the remainder of the warranty period will be performed by and at the discretion of the Awarding Authority. Results of these tests will be provided to the Contractor and Infilled Synthetic Turf Vendor.*



## MATERIALS

### 9. What is the material for the new running track?

*Response: Please refer to Section 32 18 23.39 RESILIENT TRACK SURFACE, attached.*

### 10. Are there fire test reports for the proposed synthetic carpet and wood infill materials that you can provide to the MVC?

*Response: Attached you will find fire testing results in compliance with **ASTM D2568 Ignition Characteristics of Floor Covering Material** from both manufacturers of the infill and the synthetic turf carpet. Please note that all testing has been performed by third-party independent testing labs and certified by the same.*

*In addition, Brock USA has provided the following links to burn testing completed on their infill product.*

Flammability Video (BrockFILL in turf):  
<https://brockusa.egnyte.com/dl/6a1RO42b2r>

Flammability Video (BrockFILL alone):  
<https://brockusa.egnyte.com/dl/gl9BiCUvTY>

### 11. How will the plastic fibers be prevented from entering the watersheds over time?

*Response: The stormwater report prepared by Marchionda & Associates LP dated January 22, 2020 shows compliance with MA DEP Stormwater Standard up to and including the 100-year storm event.*

*Stormwater that enters the limits of the synthetic turf field would have to pass through two layers of a needle-punched nonwoven geotextile filter fabric (Mirafi® 140N) before being able to enter the native soil. The apparent opening size of the specified nonwoven geotextile fabric is 0.212mm (0.0084"). This apparent opening size is significantly smaller than the proposed turf fibers and would not allow migration of the fiber within the stormwater system. I have attached the MSDS and product data sheets for the above referenced product.*

*Finally, should be concern be related to windblown distribution of turf fibers, I can add that the synthetic turf 'tuft bind', which is the force required to physically pull fibers from the turf, is in excess of 18 lbs and is also covered under the proposed 10 year warranty as noted in our answer to question #8, above.*

## USE

### 12. Would there be user fees for the new track and field?

*Response: According to Mr. Richard Smith, Assistance Superintendent, MVRPS has never instituted fees for participation in MVRHS athletics and does not intend to do so based on the proposed construction. Community organizations using our facilities are required to complete a permit application which requires the user to abide by certain*



*conditions, as well as the payment of a reasonable user fee, in accordance with the policies established by the MVRHS School Committee.*

**13. What rules would exist for users of the new track and field?**

*Response: Huntress Sports typically recommend the following list of rules be placed at the entrances to the track and field facility. **No food or gum, no sports drinks, no sunflower seeds, no tobacco products, no driving stakes, NO vehicles, no dogs or pets, Authorized use only.** Clients will occasionally add additional rules or guidelines as they see fit. I have attached a standard entry sign for your records.*

**14. Could this project lead to an increase in use?**

*Response: This project is being constructed to accommodate the existing users and the existing sporting activities currently contained within the MVRHS complex. No additional increase in use is proposed or anticipated as part of this project.*

**OTHER FEATURES**

**15. Are there any electric vehicle charging stations for the parking spots?**

*Response: Not at the present time.*

**16. Will the buildings be all-electric?**

*Response: Yes, the building and sheds being proposed will be all electric.*

**WASTEWATER**

**17. Please provide plans and details for the septic tight tanks and future tie-in to sewer.** *Response: We are working with our design team to prepare those now and will provide them as soon as they become available.*

Thank you for your time and consideration. Please let me know if you have any questions or require any additional information to begin your review.

Sincerely;  
Huntress Associates, Inc.

Christian C. Huntress  
President

Cc: Matthew D'Andrea – MVRPS Superintendent  
Richard Smith – MVRPS Asst. Superintendent  
Kimberly Kirk – Chair, MVRHS School Committee  
Joseph Sullivan – Daedalus Projects, Inc.  
Oak Bluffs Planning Board

SECTION 32 18 23.39  
RESILIENT TRACK SURFACE

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

1. Include GENERAL REQUIREMENTS and SUPPLEMENTARY CONDITIONS as part of this section.
2. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.
3. Coordinate work with trades affecting, or affected by, work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

1.02 WORK INCLUDED

1. Contractor shall furnish and install EPDM rubber granules with acrylic resin or polyurethane binder as specified herein and in accordance with the drawings, manufacturer's specifications and directions of the architect/engineer.
2. Track surface work includes, but is not limited to: Both "D" areas in their entirety. The finished surface shall appear as a new resilient track surface throughout.

1.03 RELATED WORK

1. Site Preparation
2. Earthwork
3. Bituminous Concrete Paving
4. Concrete
5. Lawns
6. Drainage

1.04 QUALITY ASSURANCE

1. Experience: Track surfacing shall be performed by an experienced specialty firm which shall have laid at least five (5) track surfaces of the type and installation process herein specified within the last three-year period. Contractor shall submit references, with contract name, address and telephone number to enable such data to be validated at the time of the submission of bids.
2. Installer of track surfacing shall be a member in good standing with the ASBA (American Sports Builders Association), with specific qualifications in building and maintaining tracks. Approved installer of running track resurfacing must employ a **Certified Track Builder** as designated by the ASBA, fully knowledgeable and completely experienced with the

manufacture and installation of running track surface systems for outdoor use.

3. Guarantee: The Contractor shall guarantee all materials and workmanship against damage by climatic conditions or proper and normal use (including the use of running spikes) for a minimum period of five years from the official date of substantial completion.
4. The Contractor shall inspect the subgrade, sub-base and bituminous pavement construction to verify their acceptance of installation and condition. Commencement of track surfacing installation in a given work area indicates acceptance of underlying substrates. The track surfacing contractor is responsible to make any necessary corrections to deviations in the planarity of the new asphalt concrete prior to starting work on the new resilient track surface.
5. Security: Contractor shall be responsible for the proper protection and watching of the works at all times to ensure both uncured and cured surfacing is not subject to casual damage or vandalism.
6. Restoration of Damage: Contractor shall exercise care in the execution of his work and avoid damage or defacement of adjacent or surrounding areas by using suitable protective means. Damage or defacement which occurs shall be remedied at Contractor's cost to the satisfaction of the Owner.
7. Planarity and Grade: Deviation in planarity of the finished surface shall not exceed 1/8" beneath a 10' straightedge. Deviation from a straight grade between levels on drawings shall not exceed 1/8".
8. Thickness: The finished thickness shall be a minimum of 1/2". For purposes of this specification, surface thickness is defined as the dimension from the top of the bituminous concrete to the lowest point in the finished surface texture of the resilient track surface.
9. Heavy equipment or vehicles of any kind should not be allowed on the surface for a minimum of four weeks, after which time, only where protected by a sufficient crossing mat.

#### 1.05 SUBMITTALS

1. General: Submit the following in accordance with Conditions of the Contract and Division 1 Specification Section.
2. Shop drawings which illustrate the scope of work, including layout of all track events, materials and colors. (Red track surface throughout).
3. A reference list of at least 5 tracks of the type and installation process specified herein.
4. Five Year Written guarantee.
5. A general statement of the method by which the surface is laid, including method of mixing and

chief items of equipment used.

6. Statement of method by which small repairs or retexturing may be achieved.
7. A set of maintenance instructions for the surface.
8. Samples of the proposed surface for use as a control for site work. Samples of 1/2" thickness as follows: two (2) samples minimum 4"x 4", two (2) samples minimum 12"x 12".
  1. These samples should be representative in every way of the composition, strength and texture of the material to be produced on-site and may be tested for comparison with submitted test data and to establish a datum performance for subsequent site quality control purposes.
9. Statement of the curing conditions necessary to achieve full cure of site samples within three days.
10. Statement indicating the name of the registered engineer, land surveyor or certified track builder who will layout the track, and a copy of his/her registration.
11. Color samples of line paints.

#### 1.06 DELIVERY, STORAGE AND HANDLING

1. Deliver, store and handle products in exact accordance with the manufacturer's requirements and specifications.

#### 1.07 PROJECT CONDITIONS

1. Weather Limitations: No part of the construction shall be conducted during a rainfall or when rainfall is imminent, or unless both ambient and materials temperatures are at least 50°F and rising
2. After a rainfall, sufficient time shall be given to allow the surface to dry before resuming work. Surface shall be dry, as well as clean. The binder should not be applied within 12 hours after rainfall, or when rainfall is forecast.
3. The facilities shall not be used for a minimum period of one week after completion of the track.

#### 1.08 APPROVED OR EQUAL CLAUSE

1. Throughout the specification, types of materials may be specified by manufacturer's name and catalog number in order to establish standards of quality and performance and not for the purpose of limiting competition. Unless specifically stated otherwise, the Bidder may assume the phrase "or approved equal", except that the burden is upon the Bidder to prove such equality, he must

### RESILIENT TRACK SURFACE

request the Architect's approval in writing to substitute such item for the specified item, stating the cost difference involved, supporting data, and samples, if required, to permit a fair evaluation of the proposed substitute with respect to quality, serviceability, warranty and cost.

## PART 2 - PRODUCTS

### 2.01 GENERAL

1. This specification covers the installation of a new, high performance resilient track surfacing system for new asphalt surfaces. This track system utilizes specially compounded, pigmented, water-based binders and select EPDM rubber granules to provide strength, flexibility and to prevent ultra violet degradation. A top coat is applied to further protect against harmful UV rays and to reduce wear. The system provides a durable, resilient, spike resistant surface for recreational and competitive use.

### 2.02 MATERIALS

1. Synthetic Track Surface
  1. 100% latex/polyresin binders containing no clay or mineral fillers
  2. A controlled gradation of EPDM (ethylene propylene diene monmer) rubber granules between 4 mm and 1 mm containing no dust, less than 4% retained on a No. 50 sieve. No string-like rubber particles shall be allowed.
  3. Pre-pigmented latex/polyresin Topcoat: Latex/polyresin sprayable binder pre-pigmented by manufacturer.
  4. Line Paint: Latex line paint. (Three colors including white. Two other colors shall match Town colors, as approved by Architect.)
  5. Surface: 1/2" minimum thickness, color BLUE.
  6. Physical properties of Resilient Track Surface:

Thickness	1/2"
Color	BLUE
Elongation (ASTM D-412)	60%
Tensile Strength (ASTM D-412)	.45 N/sq. m.
Compression Set (ASTM D-395)	90%-95% @ 70°F
Abrasion Resist. (ASTM D-501)	0.25 to 0.425 grams loss after 1,000 cycles.
Resilienc (ASTM D-2632)	37% to 44%.
Tear Resistance (ASTM D-624)	40 to 50 PSI.
Chalking (ASTM D-822)	No change after 1,000 hours in weather meter
Hardness (ASTM D-2240)	55 lbs. +/- 5 lbs
Coef. of Friction(ASTM D-1894)	Dry 0.70-0.75, wet 0.80-0.95

Acceptable manufacturers whose products may be incorporated in the work shall be one of the following:

California Products Corporation

## RESILIENT TRACK SURFACE

32 18 23.39-4

150 Dascomb Road  
Andover, MA 01810  
(978) 623-9980

Resilient Surface: Plexitrac Accelerator

### PART 3 - EXECUTION

#### 3.01 GENERAL

1. Surface Inspection: Prior to the application of the resilient track surface, the bituminous concrete pavement base shall be inspected for conformity to planarity requirements. The surface shall not deviate more than 1/8" in 10' from the specified grade when checked with a 10' straightedge. This surface shall also be flooded with water to verify the drainage. Any areas found not to be in conformance with the above requirements shall be repaired and allowed to cure prior to the application of the synthetic surface with compatible materials as approved by the manufacturer.
2. The completed bituminous concrete pavement base shall not be used for access by vehicular or foot traffic. Areas where trafficking is essential shall be covered by suitable approved means to avoid contamination.
3. The bituminous concrete pavement base surface shall be clean and free from contamination by oils, grease, diesel, gasoline, hydraulic fluid, anti-freeze or other chemical agents or excessive amounts of dust, dirt or organic matter before layering the surface or it will be cleaned to the satisfaction of the Owner's representative by pressure-washing or replacement of the contaminated bituminous concrete.
4. At least fourteen (14) days shall have elapsed between completion of the bituminous concrete pavement base and commencement of the synthetic surfacing work. If no rain has fallen since completion of the bituminous concrete, The Contractor shall provide for hosing down the bituminous concrete once during the period, not less than two (2) days before commencement of the synthetic surfacing.
5. No surfacing work will proceed when there is moisture on any of the surfaces to be coated. Surfacing shall be laid only on completely dry sub-surfaces.
6. All machinery and tools shall be clean and serviceable and hold no accumulations of cured material. Machinery and tools will be cleaned at the end of each day's work.

#### 3.02 INSTALLATION

1. Synthetic Track Surface

1. A latex emulsion tack coat consisting of 100% SBR resin emulsions shall be applied at a rate of 0.04 gallons per square yard. Allow to dry thoroughly.
2. Track surface materials shall be applied to achieve a dense uniform surface of not less than the specified thickness in not less than three layers. The binder must be evenly distributed amongst the rubber granules upon the application of materials. Coverage rates (measured in accordance with I.A.A.F. standards:

<u>COLOR</u>	<u>THICKNESS</u>	<u>RUBBER GRANULES</u>	<u>BINDER</u>
Black	3/8" (9.5mm)	10.5 lbs/sy	.60 gal/sy
Blue	1/8" (3.0mm)	5.0 lbs/sy	.21 gal/sy

Coverage rates based upon undiluted product. Binder to rubber ratio shall be 1 gallon of binder to 18 pounds of black SBR rubber, or 1 gallon of binder to 24 lbs of EPDM red rubber, as specified.

3. An additional 5 gallons of pigment shall be added to each 55 gallon drum of binder to be used in the final spraycoat (Black or red, as specified). This operation may take place in the field under the supervision of the Architect.
4. The final spraycoat shall be applied in two (2) lifts, by an approved spray equipment at a rate of not less than .30 gallons per square yard. The first lift shall be allowed to dry thoroughly prior to application of the second and final spraycoat.
5. Finished application shall contain no seams or joints in base or topcoat.

### 3.03 QUALITY CONTROL

1. The Landscape Architect reserves the right to make any and all tests it may deem necessary to determine the physical properties, thickness and quality of the synthetic materials being installed. The Contractor shall supply samples of ingredients or mixed materials whenever requested to do so. Contractor shall supply trays 1/2" deep, not less than 12"x12" and coated with release agent for the purpose of sampling
2. During the course of the work, Contractor shall maintain at the site, accurate weighing scales for the purpose of checking batching ratios.
3. Samples taken from the site and submitted to accelerated curing in accordance with the Contractor's statement shall be expected to achieve ninety (90%) percent of the performance of the control specimens submitted.
4. Prior to application of the final spraycoat the Landscape Architect may require the contractor to perform three (3) core samples in random locations to verify the finished depth of the surface. This work shall be performed by the contractor under direct supervision of the Landscape Architect, and the contractor shall repair any such locations prior to application of the final spraycoat.
5. No part of the construction shall be conducted during rainfall or when rain is imminent.

### RESILIENT TRACK SURFACE

6. Allow 4-5 hours to cure at 70 degrees. Lower temperature and higher humidity will increase the dry time.
7. Do not apply when surface temperature is above 130 degrees.
8. Apply only when ambient temperature is 50 degrees and rising.
9. Keep product from freezing, and do not store in the hot sun.
10. Use caution when applying materials to prevent overspray. Mask adjacent areas when necessary.

### 3.04 MEASUREMENTS AND MARKINGS

1. Wait forty eight hours before applying line paint.
2. All work of this section shall conform to IAAF and NCAA specifications.
3. The Contractor shall supply all labor, materials and equipment necessary to perform the following:
  1. Locate and establish all radius points.
  2. Establish and set all necessary control points.
  3. Lay out all lines and markings to within ½ inch (13 mm) tolerance.
  4. Prepare all necessary drawings.
  5. Provide all computations and measurements in organized form.
  6. Establish all locations on the curves using a transit or Theodolite capable of reading direct to 20 seconds.
  7. Identify all markings, where appropriate, by painting the identification directly onto the track surface in 4 inch (10.16 cm) letters just below or in front of each mark in the right hand portion of the lane.
  8. Paint all the large 3 feet (91.4 m) high land numbers, 4 sets in 2 colors with shadowed backgrounds.
  9. All lines shall receive sufficient paint to assure complete opacity and uniformity of color.
  10. Paints shall be used directly from original containers and shall be thinned only when hot weather dictates some thinning for purposes of smooth application.
  11. Amount of paint used shall be as recommended by the manufacturer.
  12. All measurements shall be made by competent, experienced and fully qualified personnel.
  13. Upon completion of the track markings, a licensed professional engineer, registered land surveyor or certified track builder shall furnish an acceptable letter of, or certificate of, accuracy to the owners attesting to the accuracy of the track markings and measurement and shall include copies of the computations, calculations and drawings that were used to obtain this accuracy. The engineer or surveyor should affix his stamp to the drawing and the certificate.
  14. The paint used shall be a latex line paint made especially for the painting of lines on tracks such as outdoor 400 meter running tracks. Paint shall be latex line paint compatible with the synthetic surface, as recommended by the track surfacing manufacturer.

15. The marking shall include all existing markings and all the events and marks required or recommended for the following track events:
    - a. Starting Line (white): 55/60 meters, 55/60 meter hurdles, 100 meters, 100/110 meter hurdles, 200 meters, 300 meters, 400 meters, 1,500 meters, mile, 3,000 meters, steeplechase, 5,000 meters, 10,000 meters;
    - b. Starting Line (green): 800 meters;
    - c. Starting Line (red): 800 meter relay;
    - d. Starting Line (blue): 1,600 meter relay;
    - e. Multiple waterfall starting lines: (white with green dashes)
    - f. Finish Line (white): All Events;
    - g. Relay exchange zones: 400 meter relay (yellow), 800 meter relay (red), 1,600 meter relay (blue), 3,200 meter relay (green);
    - h. Hurdle locations: 100 (yellow), 110 (blue), 300 (red), 400 (green), s
    - i. Break line: (green)
  16. Coordinate all line markings with Landscape Architect prior to installation.
4. Clean-Up: Clean up and remove all excess materials as a result of this section.

END OF SECTION

DATE: 09-21-2017

TEST NUMBER: 0402805

CLIENT: Green Fields

TEST CONDUCTED: Surface Flammability of Carpets and Rugs (16 CFR Chapter II, Subchapter D, Part 1630 CPSC FF-170) also referenced as ASTM D2859



PRODUCT NAME: Iron Turf

**TEST CRITERION**

The uncharred area of the test specimen must be greater than one inch in at least seven of the eight specimens tested in order to meet the acceptance criterion.

**TEST RESULTS**

	SPECIMEN NUMBER							
	1	2	3	4	5	6	7	8
Uncharred Area (Inches)	3.4	3.3	3.3	3.2	3.0	3.1	3.2	3.0

*NOTE: This Sample was tested on the face side.*

*Sample was tested with infill per manufacturer's specifications.*

This sample **[PASSES]** the Federal Flammability Standard DOC FF 1-70

APPROVED BY: *Gary Anthony*

This report is provided for the exclusive use of the client to whom it is addressed. It may be used in its entirety to gain product acceptance from duly constituted authorities. This report applies only to those samples tested and is not necessarily indicative of apparently identical or similar products. This report, or the name of Professional Testing Laboratory Inc. shall not be used under any circumstance in advertising to the general public.

## TEST REPORT

### Laboratory tests of an infill material for synthetic turf product

Tests performed according to ASTM D2859 and ASTM E648 standards

**Report Number** R18152US-A1

**Product**  
BrockFill  
Brock USA

**Client**  
Derek Neill  
Brock USA LLC, 3090 Sterling Cir, Boulder, CO 80301

**Date** February 08<sup>th</sup>, 2019

*This report contains 3 pages in total. Reproduction of this report is authorized only in its entire form. Results reported are valid only for the products tested. To declare the conformity (or not), the uncertainty of the results was not taken into account. Detailed results are available on request.*

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## INFORMATION

Product description	Organic infill material for synthetic turf product			
Product name	BrockFill			
Manufacturer	Brock USA			
Sample number	CAN003309			
Date of reception	January 11 <sup>th</sup> , 2019			
Date of the tests	January / February 2019			
Temperature (°C)	Min	23	Max	24
Humidity (%)	Min	48	Max	50



Sample general view

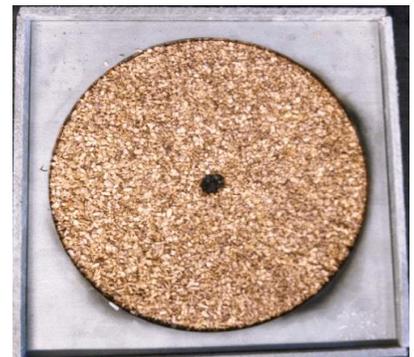


Sample microscopic view

## RESULTS – PART 1

Property	Test method	Condition	Requirement	Results
Ignition Characteristics of Floor Covering Material	ASTM D2859	New – Dry	Minimum 7 on 8 test specimen must pass	8 on 8 Pass

Specimen 1, 5, and 8 after testing:



**RESULTS – PART 2**

Property	Test method	Condition	Individual results		
			Specimen 1	Specimen 2	Specimen 3
<b>Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source</b>	ASTM E648	Radiant Flux at 10 min	0.25 W/cm <sup>2</sup>	0.24 W/cm <sup>2</sup>	0.24 W/cm <sup>2</sup>
		Flame spread at 10 min	595 mm	600 mm	600 mm
		Radiant Flux at 15 min	0.16 W/cm <sup>2</sup>	0.17 W/cm <sup>2</sup>	0.15 W/cm <sup>2</sup>
		Flame spread at 15 min	745 mm	730 mm	780 mm
		Radiant Flux at 30 min	0.11 W/cm <sup>2</sup>	0.11 W/cm <sup>2</sup>	-
		Flame spread at 30 min	930 mm	930 mm	1000 mm
		Critical Radiant flux at Extinguishment	< 0.00 W/cm <sup>2</sup>	< 0.00 W/cm <sup>2</sup>	< 0.00 W/cm <sup>2</sup>
		Extent of flame travel	955 mm	960 mm	1000 mm
		Burning Characteristics	n/a*	n/a*	n/a*

\*(1) Premature ignition, (2) delamination, (3) melting, (4) sagging, (5) shrinking, (6) swelling or n/a.

Specimen 2 after testing:



**REPORTED BY**

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## Mirafi<sup>®</sup> 140N

Mirafi<sup>®</sup> 140N is a needlepunched nonwoven geotextile composed of polypropylene fibers, which are formed into a stable network such that the fibers retain their relative position. Mirafi<sup>®</sup> 140N is inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids. Mirafi<sup>®</sup> 140N meets Aashto M288-06 Class 3 for elongation > 50%.

Mechanical Properties	Test Method	Unit	Minimum Average Roll Value	
			MD	CD
Grab Tensile Strength	ASTM D4632	N (lbs)	534 (120)	534 (120)
Grab Tensile Elongation	ASTM D4632	%	50	50
Trapezoid Tear Strength	ASTM D4533	N (lbs)	223 (50)	223 (50)
CBR Puncture Strength	ASTM D6241	N (lbs)	1380 (310)	
Apparent Opening Size (AOS) <sup>1</sup>	ASTM D4751	mm (U.S. Sieve)	0.212 (70)	
Permittivity	ASTM D4491	sec <sup>-1</sup>	1.7	
Flow Rate	ASTM D4491	l/min/m <sup>2</sup> (gal/min/ft <sup>2</sup> )	5500 (135)	
UV Resistance (at 500 hours)	ASTM D4355	% strength retained	70	

<sup>1</sup> ASTM D 4751: AOS is a Maximum Opening Diameter Value

Physical Properties	Test Method	Unit	Typical Value	
Weight	ASTM D5261	g/m <sup>2</sup> (oz/yd <sup>2</sup> )	163 (4.8)	
Thickness	ASTM D5199	mm (mils)	1.0 (40)	
Roll Dimensions (width x length)	--	m (ft)	3.8 x 110 (12.5 x 360)	4.5 x 110 (15 x 360)
Roll Area	--	m <sup>2</sup> (yd <sup>2</sup> )	418 (500)	502 (600)
Estimated Roll Weight	--	kg (lb)	74 (164)	89 (197)

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# MATERIAL SAFETY DATA SHEET

DO NOT USE THIS PRODUCT UNTIL YOU HAVE READ THIS INFORMATION

## MSDS Prepared By:

TenCate Geosynthetics North America  
365 South Holland Drive  
Pendergrass, GA 30567

## Chemtrec Emergency:

24-hour Phone: (800) 424-9300  
Ten Cate Nicolon Phone: (770) 689-2627  
Date Prepared December 2003  
Revised:

## Section 1: General Information

Trade Names and Synonyms: Mirafi® Products: N-Series and S-Series, MPV, Mscape Nonwoven Fabrics

Chemical Names and Family: Polypropylene nonwoven fabrics

Product Use: Construction Products

HMIS Ratings: Health 0, Fire 1, Reactivity 0, PPE (see section 8)

## Section 2: Hazardous Ingredients/Identity Information

<u>Ingredient</u> (Chemical Name, CAS#, and Common Name)	<u>OSHA PEL or TWA</u>	<u>ACGIH TLV</u>	<u>Weight %</u>
Polypropylene resin(9003-07-0)	n/a	n/a	98 – 100 %
Minor Additives (Mixture)	n/a	n/a	< 1%
Carbon Black(1333-86-4)	3.5 mg/cm TWA	3.5 mg/cm TWA	< 1%

## Section 3: Hazards Identification/Potential Effects

**Overview:** Based upon pertinent data available, polypropylene cloth products are not hazardous under OSHA Hazard Communication Standard (29 CFR 1910.120).

### Routes of Exposure:

Inhalation: Not likely, under normal use  
Skin contact: Yes  
Skin absorption: No  
Eye Contact: Yes

**Symptoms of Acute Overexposure:** Product may contain surface applied process lubricants that may cause skin to dry out.

**Symptoms of Chronic Overexposure:** No known health effects have been observed with normal use.

**Medical Conditions Aggravated By Exposure:** Persons with preexisting skin disorders may be susceptible to effects of the material.

**Carcinogenity:** See Section 11

#### **Section 4: First Aid Procedures**

**Eye Contact:** As with any foreign object, flush with water. If pain or irritation persists, consult physician.

**Skin Contact:** Wash with soap and water. In case of irritation, consult physician.

**Ingestion:** N/A

#### **Section 5: Fire and Explosion Hazard Data**

**Flash Point (Method Used):** Greater than 300°C

**Flammable Limits:** LEL: N/A UEL: N/A

**Extinguishing Media:**  Water Fog  Carbon Dioxide

Regular Foam  Dry Chemical  Other

**Special Fire Fighting Procedures:** Material will not burn unless preheated. Over heated or molten material may burn slowly with dense smoke. As with any fire, wear approved self-contained breathing apparatus.

**Unusual Fire and Explosion Hazards:** Not applicable

#### **Section 6: Accidental Release Measures**

No environmental threat is expected from release.

#### **Section 7: Handling and Storage**

**Storage:** Store away from oxidizing materials, in cool dry area. Avoid direct sunlight.

**Handling:** No special handling unless large rolls are used. Use lifting devices as necessary. If product is molten, avoid contact with skin or eyes

#### **Section 8: Exposure Controls/ Rolls may be heavy; use lifting devices for moving Personal Protection**

**Ventilation Requirements:** Not required for normal use. If process generates dust, use ventilation

to keep exposure below exposure limit.

**Personal Protective Equipment:**

**Eye Protection:** Not normally required.

**Skin Protection:** Not normally required. Persons with exposure sensitivity may need suitable gloves.

**Respiratory Protection:** Not required, unless dust generated

**Other Clothing and Equipment:** Normal work clothing.

## Section 9: Physical and Chemical

**Boiling Point:** N/A

**Vapor Pressure (mm Hg.):** N/A

**Vapor Density (Air =1):** N/A

**Solubility in Water:** Not soluble

**Appearance and Odor:** Fabric wound on a cardboard core.

**Specific Gravity (H<sub>2</sub>O=1):** Less than 1

**Evaporation Rate (Butyl Acetate=1):** N/A

**Melting Point:** about 320 degrees F

## Section 10: Stability and Reactivity

**Stability:**  Stable  Unstable

**Conditions to Avoid:** Keep away from sparks or flame

**Incompatibility (Materials to Avoid):** Strong oxidizers.

**Hazardous Polymerization:**  May Occur  Will Not Occur

**Hazardous Decomposition Products (Including Combustion Products):** carbon dioxide, carbon monoxide, hydrocarbons, etc.

## Section 11: Toxicological Information

**Eye Effects:** Not toxic

**Skin Effects:** Not toxic

**Target Organs:** None

**Carcinogeny:** Carbon black is classified as a Group 2B possible human carcinogen. When encapsulated in a plastic matrix, risk of exposure is minimized.

**Mutagenitive and Reproductive Effects:** Not considered to be a hazard

## Section 12: Ecological Information

**Environmental Data:** Not expected to be hazardous to the environment in present form.

## Section 13: Disposal Considerations

**Disposal:** Spent material should be recycled or disposed according to current regulations

**RCRA Hazard Class:** Does not contain RCRA regulated materials.

## Section 14: Transport information

**DOT Classification:** Non-hazardous

## Section 15: Regulatory Information

This product may contain ingredients in the fiber lubricant and additives in “De Minimus” quantities, which would be listed in SARA 311/313: Acute Health Hazard. At levels under 0.01% by weight, no “Reportable Quantities” will be reached with typical fabric inventories.

The information and recommendations contained in this publication have been compiled from sources believed to be reliable and to represent the best current opinion on the subject at the time of publication. Since we cannot anticipate or control the many different conditions under which this information or our products may be used, we make no guarantee that the recommendations will be adequate for all individuals or situations. Each user of the product described herein should determine the suitability of the described product for his particular purpose and should comply with all federal and state rules and regulations concerning the described products.

# **PROTECT YOUR TURF**

**NO FOOD OR GUM  
NO SPORTS DRINKS  
NO SUNFLOWER SEEDS  
NO TOBACCO PRODUCTS  
NO DRIVING STAKES  
NO VEHICLES  
NO DOGS OR PETS  
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