

December 17, 2020

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

Re: Unanswered Questions - LUPC Hearing 12/14/20 - (Amended DRI # 352)

Dear Mr. Elvin.

In our most recent LUPC hearing you identified a list of questions that we had not yet responded to in writing regarding the MVRHS's Application for an amended DRI, as referenced above. I have reviewed those remaining questions and coordinated our reply with the MVPS and project team.

The following is a listing of outstanding questions and our responses.

1. *What qualifications and requirements will there be for specialized contractors and equipment? Will this specify experience in natural grass field maintenance?*

Response: This construction project will be publicly bid under MGL Chapter 30, section 39m, which outlines requirements for 'horizontal construction' services. Bidding for the construction services will require specialized contractors with at least five years of athletic facility construction experience for municipal and public entities. Bidders will be required to submit references with their bid, and the award will be made to the lowest responsible bidder. As defined by MGL, the term "lowest responsible and eligible bidder" shall mean the bidder: (1) whose bid is the lowest of those bidders possessing the skill, ability and integrity necessary for the faithful performance of the work; (2) who shall certify, that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work; (3) who shall certify that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; (4) who, where the provisions of section 8B of chapter 29 apply, shall have been determined to be qualified thereunder; and (5) who obtains within 10 days of the notification of contract award the security by bond required under section 29 of chapter 149; provided that for the purposes of this section the term "security by bond" shall mean the bond of a surety company qualified to do business under the laws of the commonwealth and satisfactory to the awarding authority; provided further, that if there is more than 1 surety company, the surety companies shall be jointly and severally liable.

The bidding for natural grass maintenance services would not be included in the same construction bid process outlined above and would likely follow completion of the proposed construction work. MVRHS staff presently subcontract the grass field maintenance, including fertilization and soil amendments to Dennis Brolin of Sports Turf Specialties (STS). STS is recognized as one of the best turf and athletic field maintenance companies



in the country and continue to work locally on Martha's Vineyard for the MVRHS and several other clients. As per the project specifications, STS will be conducting annual soil testing to determine the condition and needs of the existing topsoil fields and calibrating their equipment to ensure compliance with the MVC's Island Wide Fertilization requirements.

More information regarding STS and their capabilities can be found on their website at <https://www.sportsturfspecialties.com/>

- 2. Are Huntress and MVRHS willing to work with a natural sports turf specialist to finalize/revise the construction and maintenance plans for Field 2, provide education to the school, and carryout maintenance?** *Response: This question is similar to question #15 and was addressed in our December 1, 2020 response to MVC staff questions. To help expand upon our reply we would offer the following:*

Our project team includes natural turf specialists, including Huntress Sports, Turf and Soil Diagnostics, Geotechnical Services, Inc (GSI), and Sports Turf Specialties (STS). Huntress sports has provided overall design and detail, while subsurface soil investigation has been provided by GSI, and topsoil analysis and amendment recommendations have been provided by Turf and Soil Diagnostics. Sports Turf Specialties (STS) is contracted directly by the MVRHS and presently provides turf grass maintenance services to MVRHS. We have previously submitted the subsurface soil investigation, topsoil testing results and recommendations, rootzone sand, top-dress compost, and bluegrass/ryegrass seed specifications. Please let us know if you need any help in locating these materials.

All proposed improvements to the natural grass field are shown on the plans and documents provided to date. Improvements proposed for Field #2, which mirror the recommendations provided by TURI in their case study of athletic fields for Springfield, Massachusetts, including the following:

- a. Soil Testing:** *The soil testing results and recommendations provided to Alex Elvin on November 13, 2020 under separate cover were prepared by Duane Otto of Turf & Soil Diagnostics and are dated November 5, 2019. The results of the soil testing for Field #2 show a sandy loam with the percent organic matter content at 3.63%, which is within the specifications but is considered a bit low. Also, "the soil has a saturated hydraulic conductivity (infiltration) rate that is low, and the aeration porosity is low and capillary porosity is high.... These results suggest that the soils should have poor drainage and potential for low aeration and excessive water retention. With low infiltration rates, these fields should be crowned to ensure adequate surface drainage." The plans show a crown at the ridge and a 1.5% slope to each sideline.*
- b. Soil Amendment & Aeration:** *Given the above referenced soil testing results we will be stripping, screening, and amending the existing topsoil to provide better infiltration and increased porosity. We have previously submitted the sand, soil amendments and athletic field grass seed specifications to Alex Elvin of the MVC under separate cover. Aeration is recommended annually, as determined by existing field conditions*



and continued soil testing. A subsurface drainage system and new irrigation system will also be included in the renovated field.

- c. Fertilization and Soil amendments:** *MVRHS staff presently subcontract the fertilization and soil amendments to Dennis Brolin of Sports Turf Specialties (STS). STS is recognized as one of the best turf and athletic field maintenance companies in the country and continue to work locally on Martha's Vineyard for the MVRHS and several other clients. As per the project specifications, STS will be conducting annual soil testing to determine the condition and needs of the existing topsoil fields and calibrating their equipment to ensure compliance with the MVC's Island Wide Fertilization requirements.*

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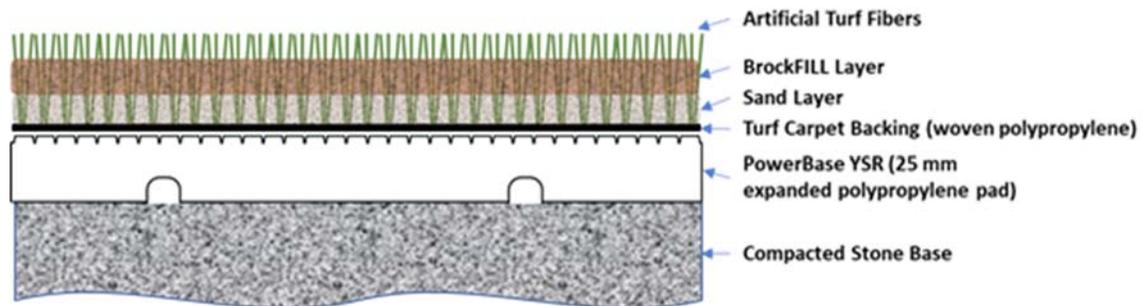
- d. Mowing:** *The fields will be mown regularly by MVRHS staff and detailed maintenance will be conducted by STS, as noted above.*

The MVPS is always willing to work with the MVC staff to review educational opportunities associated with this project and other environmental/scientific initiatives.

- 3. What is the current square-foot price for synthetic turf?** *Response: Our current unit price records for synthetic turf surfacing are \$4.50 per square foot. This is consistent with the unit process carried in our original construction cost estimates provided to date.*
- 4. Clarify whether maintenance costs refer to all the grass fields, or just the one in the proposal.** *Response: The maintenance costs provided to date are typical for one natural grass field at a public high school in Massachusetts and can be applied to Field #2.*
- 5. Who is being consulted to determine the location of the proposed groundwater monitoring wells, and are two wells enough?** *Response: We reviewed the proposed well locations with our geotechnical engineer (GSI), and Marchionda & Associates, our project civil engineer. The two wells are sufficient to perform the testing outlined in Question #10 of our December 12, 2020 response to MVC staff questions.*
- 6. Talk more about the proposed infill for the synthetic field, including how it is spread out, where it sits in the system, and whether it migrates over time.** *Response: The following information was provided by Thomas Murphy, Ph.D. Senior Materials Engineer – Brock USA LLC.*

During installation, the infill is deposited into the installed turf carpet in stages – first, the sand is added until the specified amount has been deposited (i.e, a desired depth of sand has been achieved, or a specified loading has been achieved – for example, 4 lb of sand per square foot). Next, the BrockFILL (or other performance infill) is added atop the sand layer. To deposit the infill, a tow-behind drop spreader or broadcast spreader is typically used. Multiple passes are usually made, often with grooming or leveling taking place

between passes (i.e., not all the sand or BrockFILL is deposited in one pass, but rather in multiple passes, with steps taken between passes to ensure the finished field has a uniform, level surface and consistent infill depth). The drawing below shows an example of a turf system with a Brock PBYSR pad, turf carpet, and sand/BrockFILL infill. Regarding migration, we have not seen or been made aware of any notable issues with BrockFILL. One of the primary concerns with some infills (cork, for instance) is that they can float, which may cause infill migration during heavy rains (if the field drainage is not adequate) or during flooding events. Even infills that are denser than water can float if the particle surface is irregular and not easily wetted, leading to tiny air bubbles that can increase buoyancy and lead to floating and migration. Floating can result in small piles of infill collecting near the edges of the field as water drains out of the system. BrockFILL is easily wetted and denser than water when fully saturated, so it does not typically float. All infills can potentially be carried off the field by players (particles sticking to uniforms, shoes, etc.), but this is typically a very minor issue. Additionally, since BrockFILL is a completely natural wood product, environmental concerns about infill that leaves the field are minimal.



7. Explain the reduced impact associated with the shock pad under the synthetic field. Why is the range of risk reduction so large? What is the stated reduction relative to? Response: The following information was provided by Thomas Murphy, Ph.D. Senior Materials Engineer – Brock USA LLC.

The 23% - 50% range of reduction in the relative risk of common head injuries from the playing surface come from a 2009 report prepared by Biomechanica. This study compared HIC results at a 1.0 m drop height for turf with a Brock pad vs. the same turf without a Brock pad. The data they analyzed was collected by Sportslabs UK using a 63 mm monofilament turf with sand/rubber infill. Biomechanica used the Prasad-Mertz curves for HIC vs. injury risk to determine risk reduction with a pad vs. without a pad (for various levels of injury severity - see screenshot below, specifically the red boxes, and the attached report). The 23% number comes from the relative risk reduction for an AIS1 'Minor' injury for a field with simulated age of 5 years ($1-0.77 = 0.23$ or 23% reduction), and the 50% comes from the reduction in AIS 2 'Moderate' injuries ($1-0.51 = 0.49$, which is roughly a 50% reduction) - see red box at bottom for a definition of inverse relative risk. These two numbers were likely quoted since AIS 1 and AIS 2 injuries would be more common than more severe injuries (AIS > 2). The range of risk reduction is large because



they are looking at head injury risk reduction for different levels of injury severity – **based on the data, the reduction in injury risk when using a Brock pad is greater as you go up the injury severity scale, rather than being uniform across all the levels of injury severity.** The values quoted relate to the more common injuries considered (AIS 1 and AIS2). The stated reduction is relative to a turf system without a Brock pad (but with the same turf and infill).

Results

Surface		Impact Test Results and Calculations				Prasad-Mertz Injury Risk								
		F355-A g-max	EN 1172* HIC	g-max	Biofidelic* g-max	HIC	Injury Severity*	AIS 1 Minor	AIS 2 Moderate	AIS 3 Major	AIS 4 Severe	AIS 5 Critical	Fatal	
New	Control	119	860	127	104	604								
	Brock	85	492	97	89	444								
							Δ	18%	18%	21%	9%	2%	0%	0%
							Rel Risk	0.39	1.25	1.69	1.85	1.93	2.23	2.78
							(Rel Risk) ⁻¹	2.55	0.80	0.59	0.54	0.52	0.45	0.36
5 years	Control	165	1050	140	110	680								
	Brock	100	500	98	90	448								
							Δ	21%	21%	31%	14%	3%	0%	0%
							Rel Risk	0.25	1.30	1.97	2.34	2.54	3.15	4.33
							(Rel Risk) ⁻¹	4.06	0.77	0.51	0.43	0.39	0.32	0.23

* 1.0 m fall height

Δ is the absolute difference in risk between the control surface and that surface with underlayment.
Rel Risk is the "relative risk", the ratio of the risk posed by the control surface to that of the surface with underlayment. A relative risk of 2.0, for example indicates that the probability of injury on the control surface is double that of the surface with underlayment.
(Rel Risk)⁻¹ The inverse of the relative risk, i.e. the ratio of the risk imposed by a surface with underlayment to that of the control surface. An inverse relative risk of 0.5, for example, indicates that the probability of injury on the surface with underlayment is 50% of that on the control surface.

* See Appendix 1: Abbreviated Injury Scale

8. What about the Marblehead fields? Why are their field usage rates so high and why can't the Vineyard duplicate their usage?

Response: Please refer to our written correspondence dated 12/16/20 regarding the Marblehead Fields and the TURI study.

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

Sincerely,
Huntress Associates, Inc.

Christian C. Huntress
President

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