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Martha's Vineyard Commission

DRI #352-M4 – MVRHS Athletic Fields
MVC Staff Report – 2020-12-30

Note: This staff report includes hyperlinks to documents that are online or part of the public record. In some cases you will need to scroll down or search within the document to find the relevant section. Please direct any questions DRI Coordinator Alex Elvin at elvin@mvcommission.org.

1 DESCRIPTION

1.2 Applicant: Matt D'Andrea, Martha's Vineyard Public Schools Superintendent

1.3 Designer: Huntress Associates, Inc. (HAI), Andover, MA

1.4 Owner's Project Manager: Daedalus Projects, Inc., Boston, MA

1.5 Project Location: Martha's Vineyard Regional High School, 100 Edgartown-Vineyard Haven Road, Oak Bluffs, MA 02557; Map 55, Lot 2, and Map 55, Lot 4

1.6 Proposal: Construct a new 400-meter, eight-lane running track, one multi-purpose synthetic turf field with sports lighting, a 704-seat grandstand with pressbox, a 4,800 ft^2 fieldhouse (to be constructed once it can be serviced by a wastewater connection), a track and field equipment storage shed, reconfigured parking and pedestrian areas; and renovate one existing natural grass multi-purpose field.

1.7 Zoning: Residential (R3)

1.8 Local Permits: Oak Bluffs Planning Board special permits for sports lighting and site plan review; possible special permit from Oak Bluffs Planning Board for construction in Zone 2 (Water Resources Protection Overlay District); building permits for grandstands, sports lighting, scoreboard, field house and storage buildings; Oak Bluffs Board of Health permit for sewer connection; MVC DRI permit

1.9 Surrounding Land Uses: R3 Residential

1.10 Location: The site is just east of a Water Resources Protection Overlay District, and is within both the Lagoon and Sengekontacket pond watersheds. A portion along the north border is in the Island Roads District. Single-family developments abut the property to the west, and an undeveloped strip of forested land abuts to the east. Other community and institutional buildings, including the YMCA, Martha's Vineyard Community Services, MV Ice Arena and the Martha's Vineyard Skatepark, are located across Edgartown-Vineyard Haven Road. About 46 acres of the high school campus are used for athletic use, including 8.67 acres of natural turf playing surfaces. The main high school buildings are located just west of the athletic field campus, across Sanderson Ave.

1.11 Project History: The MVC first reviewed the Martha's Vineyard Regional High School in 1979, approving its plan for a 21,600 ft^2 addition for 600 students (DRI 109). The high school returned for DRI 352 in 1992, with a proposed 81,000 ft^2 addition that the MVC approved with conditions; and in 1995 for the addition of the running track with associated track-and-field areas and a fence (modification review DRI 352-M). In 2006–2007, the MV Sharks built a new baseball field on the high school campus, which should have been referred as a modification but was not. In 2013, the Sharks added lighting to the baseball field and that project was later referred to the

MVC as DRI 352-M2. The MVC voted not to accept the referral, since the lights were already in place. In June 2016, the MVC voted not to accept the referral of a proposal by Vineyard Baseball Inc. to construct a 28'x10' bathroom building near the Sharks field.

Plans to renovate the high school playing fields have evolved since 2015, when MVRHS commissioned a study that highlighted the urgency of replacing its running track, and voted to move forward on a three-phase plan by the community group MV@Play. The plan involved upgrading all the playing facilities, beginning with a new track and synthetic field, stadium seating for 500 people, sports lighting and storage facilities. MV@Play had proposed a public-private partnership with the school, and the upgrades were to be funded mostly by donations. MV@Play hired Gale Associates as the designer and general contractor. In response to public concern, the original proposal for the synthetic field was amended to specify a plant-based infill, rather than crumb rubber. MV@Play projected 2,339 events per year for the fields, accounting for both high school and community use. The school district committee signed a licensing agreement with MV@Play, and voted to support phase one of the project. The Chilmark and West Tisbury selectmen, along with MV@Play, later referred the project to the MVC.

Another community group, Vineyarders for Grass Fields, was established during that period and began raising money to support the improved maintenance of existing fields at the high school.

The MVC Land Use Planning Committee (LUPC) met with the high school in February 2016, and a public hearing was set to begin that April. Concerns focused mostly on the synthetic field, including the health and environmental safety of turf products and the long-term cost of maintenance and replacement. (The field surface was expected to be replaced every 10–12 years at a cost of about $500,000.) Other concerns focused on traffic, since the proposed lighting would allow for more evening games in the summer. Vineyarders for Grass Fields later presented the high school with an alternative plan based on natural grass maintenance for 17 school fields across the Island, and the MV@Play proposal (along with the MVC hearing) was put on hold. MV@Play offered to provide Vineyarders for Grass Fields with the plans developed by Gale Associates, but later learned that was not possible since Gale Associates owned the plans. Vineyarders for Grass fields was later renamed the Field Fund. The school adopted a 10-year grass fields policy for its playing fields, but the Field Fund and the high school could not agree on the terms of a licensing agreement, so the project was abandoned. As a short-term fix, the high school voted to repave the running track, which would allow for another 3–4 years of use. The Field Fund went on to develop grass maintenance programs for the other schools on the Vineyard.

In 2018, the high school decided to move forward, hiring Daedalus Projects as a consultant and agreeing to consider both synthetic and natural turf fields at the school. Also in 2018, the school hired Huntress Associates, which presented a master plan with three options for renovating the athletic facilities. The plan recommended at least one synthetic field, and a grass maintenance program for the other fields. The high school committee voted in December 2018 to pursue "Option B" of the master plan, with phase 1 now before the MVC. Island towns held special town meetings to approve the high school's use of excess and deficiency (E and D) funds to develop construction plans to present to the MVC. Edgartown, Tisbury and Oak Bluffs decided not to hold

special town meetings, in effect approving the expenditure, while West Tisbury and Aquinnah approved the spending and Chilmark voted against it.

In January 2020, the high school sent its plans to the Oak Bluffs Planning Board, which later referred the project to the MVC.

1.12 Project Summary: The athletic campus currently has nine playing fields (one field with a 400-meter track, four multi-purpose fields, two baseball diamonds (including the MV Sharks field) and two softball diamonds). (See figure 1.) The track and field are in poor condition and cannot be used for matches. The multi-purpose field used for football games (located at the front of the site) includes an approximately 800-seat grandstand, along with a pressbox, lighting, concession stand, and other features, and the grass is in poor condition. The remaining grass surfaces suffer from varying levels of degradation, and much of the seating and access are not ADA compliant. Some of the fields also overlap.

Figure 1: Existing fields and locations.

Phase one of the athletic fields project (see site plan parts 1 and 2) includes a new 400-meter synthetic track surrounding a 105,252 ft^2 synthetic field (Field #1); a 704-seat grandstand including a pressbox; lighting and associated features; a 4,800 ft^2 fieldhouse with locker rooms, bathrooms, trainer's room, concessions, weight room, classroom and storage (to be built once it can be serviced by a wastewater connection); and other outbuildings. An existing multi-purpose field just north of the Sharks field will be renovated with a 75,600 ft^2 natural grass field (Field #2).

(See figure 2.) The proposed buildings are designed with a barn-like appearance and shingle siding, and will be all-electric. The high school has stated that it is likely to pursue other phases of the Athletic Fields Master Plan as well, but not at this time. Construction of phase one is expected to cost $7,729,928 and to be paid entirely through donations that will be raised after the project is approved and conditioned.

The Athletic Fields Master Plan as a whole reorganizes the fields so that they do not overlap, and relocates the track from the rear to the front of the site. If pursued, later phases would involve relocating the baseball field and two softball fields to the southeast corner of the site, with the baseball field replacing about 120,000 square feet of forested land. The total cost of all phases was originally estimated at $11,343,164, not including maintenance or the replacement of the synthetic field as required every 10–12 years.

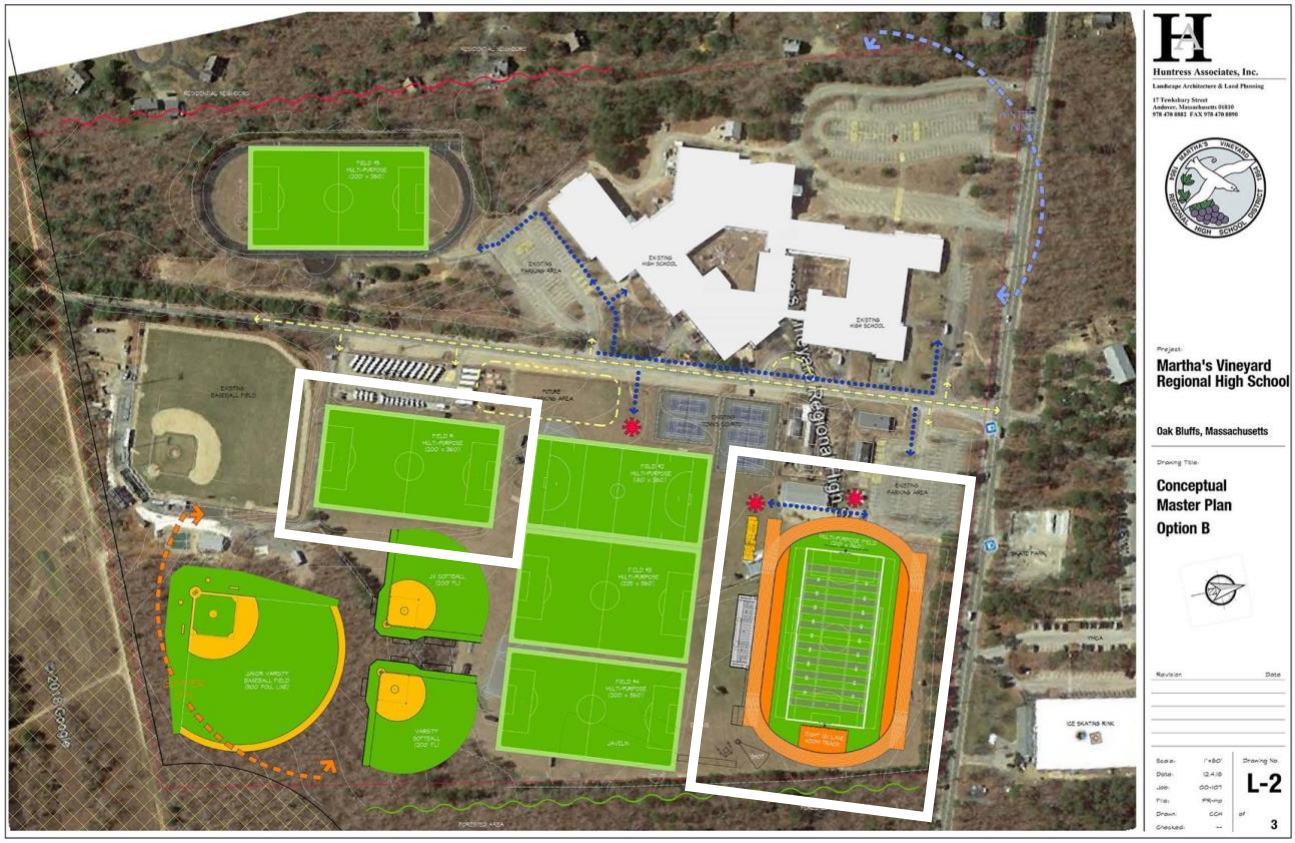
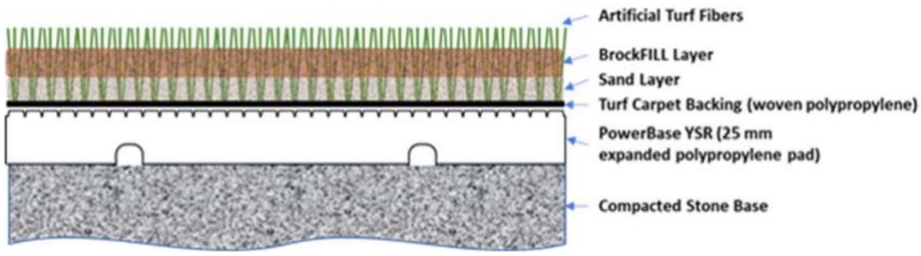


Figure 2: Option B of Master Plan (phase 1 fields outlined in white).

Huntress specifies the following products for the synthetic field in phase one:

- Greenfields woven turf system (Iron Turf Ultra Green) – recyclable, 10-year warranty
- Brock USA Power Base YSR Resilient Pad – expanded polypropylene, recyclable, 25-year warranty
- Brock USA infill (Brockfill) – Plant-based, sustainably harvested from pine trees in Georgia, does not require irrigation



Each of these products will come with its own warranty provided by the general contractor. The drainage system beneath the synthetic field is expected to last 30–40 years.

The current 400-meter track is beyond its life expectancy and the high school plans to remove it within five years. The new track is expected to last about 24 years, after which the surface could potentially be recycled as playground surfacing, and the asphalt base would be pulverized in place and compacted to prepare for a new surface. The track would consist of the following materials:

- Latex/polyresin binders
- EPDM (ethylene propylene diene monomer) rubber granules
- Latex/polyresin topcoat (blue)
- Latex line paint (white and other colors)

2 ADMINISTRATIVE SUMMARY

2.1 **DRI Referral:** Oak Bluffs Planning Board

2.2 **DRI Trigger:** The plan triggers several DRI Checklist items, including 1.2 (modification of a previous DRI), and 6.2 (public facilities); future phases may also trigger 8.3 (clearing of significant habitat).

2.3 **LUPC:** October 19, 2020; November 16, 2020; December 14, 2020

2.4 **Site Visits:** Not yet scheduled

2.5 **Public Hearing:** January 14, 2020

3 PLANNING CONCERNS

3.1 **Impact on Taxpayers:** The new athletic facilities are one of several large capital improvement projects facing MVRHS in the coming years, including a renovation of the high school building. The high school has stated that a new track is currently its top priority in terms of facilities.

Construction of phase one is expected to cost $7,729,928, paid entirely through donations that will be raised after the project is approved and conditioned. The synthetic field would cost about $985,000 to install, not including the track or other facilities; the grass field would cost about $250,000. The high school has stated that because the project is privately funded, it will not affect financial planning for the new school building, other than showing community support, which could benefit future applications for Massachusetts School Building Authority (MSBA)

funding. The applicant has requested that a condition be placed on the project to require the future cost of replacing the synthetic field to also be covered by donations.

Maintenance costs associated with the project will become part of the school's annual operating budget, which in 2019 included about $153,600 for the existing athletic fields. The proposed annual; maintenance costs total $25,084 for the renovated grass field, and $7,454 for the synthetic field (equipment for the synthetic field is included in the construction costs). The natural grass maintenance costs provided by the applicant are for Field #2 and do not apply to the rest of the grass fields at the high school. The high school has stated that it does not expect maintenance costs to increase as a result of the new field house and other non-field facilities. (See section 3.4 on maintenance and long-term costs.)

3.2 **Island character:** The project proposes the addition of a 105,252 ft^2 synthetic playing field surface in phase one, which would be a first for the Island. The project would seem somewhat at odds with Island values as indicated by the Islandwide adoption of single-use plastic bag prohibitions in 2016 and 2017, the prohibition of plastic water and soda bottle sales under 34 ounces in Aquinnah, Chilmark, Tisbury, and West Tisbury in 2019 and 2020, and other community initiatives surrounding plastic and waste reduction. However, many Islanders also see the project as a major improvement and a point of pride for the community.

3.3 **Usage:** Based on the high school's annual summary of athletic events, Huntress estimates that the current fields (excluding the baseball and softball diamonds) receive about 3,850 hours of use per year, including PE classes and youth programs, but not including MV Soccer United and the MV Adult Leagues. (More information on the specific PE activities is available here.) Each of the five playing fields accordingly receives an average of about 770 hours of use per year. The applicant has stated that the project is designed only for current and future high school users, and for community programs that currently use the campus.

Huntress has stated that the synthetic field can accommodate over 1,800 hours of use, which would alleviate much of the pressure on Field #2. Based on the field use analysis, phase one of the master plan with one synthetic field would reduce the use of each remaining field to 511 hours per year. (See figure 3.) Earlier estimates projected that phase one using only natural grass would reduce the average usage to 583 hours per year.

Following a recommendation by Horsley Witten, the applicant applied an intensity factor to the current field usage numbers, with each activity assigned a multiplier of between 0.9 and 2. That led to a 23% increase in the figures for field usage (from about 770 to 995 hours/field/year).

The Athletic Field Master Plan sets an upper limit of 680 hours of use per year for grass fields in the Northeast. More recently, Huntress has stated that the grass fields at MVRHS could withstand 425 hours of use per year. The Sports Turf Managers Association (STMA) was unable to confirm any hourly use recommendations they have for grass fields, but stated in an email that a field's carrying capacity "varies greatly depending on the sport being played, athlete size, number of athletes, climate, turfgrass species, rootzone, etc."

MVRHS - Proposed Athletic Field Use Analysis					
Plan Title	**Annual Events**	**Hours/Event**	**Total Use Hours**	**Number of Fields**	**Annual Hours/Field**
Existing Conditions					
High School Sports, Youth Sports & Summer Camps	1,404	2.5	3510		
High School Physical Education Classes	340	1	340		
Total Average Existing Use (per field)			**3850**	**5**	**770**
Phase One - Proposed Field Improvements (All Natural Grass)					
High School Sports, Youth Sports & Summer Camps	1,404	2.5	3510		
High School Physical Education Classes	340	1	340		
Total Phase One Use - Five (5) Natural Grass Fields			**3850**	**5**	**770**
Master Plan Alternative - Use of Synthetic Turf					
Phase One - Stadium Field - One (1) Synthetic Turf Field					
High School Sports, Youth Sports & Summer Camps	586	2.5	1465		
High School Physical Education Classes	340	1	340		
Total Phase One Use - One (1) Synthetic Turf Field			**1805**	**1**	**1805**
Total Phase One Use - Four (4) Natural Grass Fields	**818**	**2.5**	**2045**	**4**	**511**
** Does **NOT** include 848 annual events associated with MV United, and 84 annual events associated with adult leagues.*					

Figure 3: Existing and projected use of fields. Does not include community uses. Provided by Huntress Associates.

Maximum Use Recommendations for Natural Fields

Source	*Recommendation*
Sports Turf Managers Association (STMA)	Depends on various factors; no rule of thumb
SportsTurf magazine	450-600 hours/year
Dr. Grady Miller (cited by HAI)	400-600 hours/year for "good" field conditions
HAI (final recommendation)	425 hours/year

Compiled by MVC.

The high school does not expect the project to lead to an increase in field usage, and the seating capacity at the primary game field will decrease from about 800 to 704 seats. The high school also does not anticipate instituting user fees for the new facilities, except for community organizations, as is already the case. Huntress typically recommends the following rules for a 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."

3.4 **Maintenance:** Huntress recommends that the high school commit to a natural grass management program, including annual funding, that sustains the grass fields for at least 20 years. The company has submitted a draft annual maintenance plan for Field #2, in the form of a proposed scope of work, and a fertilization program has been designed to comply with the Island fertilizer control DCPC. Annual maintenance of the synthetic field by the turf manufacturer would be supplemented by weekly or monthly inspections and grooming by MVRHS staff, who will receive training from the turf vendor. A two-year maintenance package for the synthetic field will be included in the project specifications. After the first two years, the high school would likely take on all of the maintenance duties itself. The purchase of the synthetic field would include a field groomer and field sweeper to keep the surface consistent.

In light of concerns related to Covid-19, the STMA has noted the effectiveness of using certain soaps or detergents to disinfect synthetic field surfaces. Huntress has encouraged the high school to continue following CDC guidelines to reduce the risk of Covid-19 infection, and to spot-clean the synthetic field with rubbing alcohol as needed.

MVRHS spends about $150,000 per year on athletic field maintenance, but has not provided a breakdown of those costs. It currently subcontracts its grass maintenance (including soil amendments and fertilization), to Dennis Brolin of Sports Turf Specialties (STS), while high school staff handles mowing from April through October. The high school purchases its grass seed and lawncare products through Tom Irwin Advisors. MVRHS Facilities Director Mike Taus has stated that he does not believe the natural grass fields could withstand greater usage, even with additional best management practices. Additional information about current maintenance practices is available here.

The project team for phase one includes the companies Turf and Soil Diagnostics (for topsoil analysis and amendment recommendations) and Geotechnical services, Inc. (for subsurface soil investigation). A subsurface soil investigation, topdressing and compost sample results, and spec sheets for the proposed grass types for Field #2 have been provided.

Phase one including the proposed maintenance plans relates only to Fields #1 and #2 and related facilities, not the seven other fields at the high school, with the exception that a synthetic field could reduce their usage. Field #2 is currently irrigated, but the system will not be upgraded to further irrigate the other fields as well. The applicant has stated that "Irrigation requirements for future fields would be sized when those future improvements are scheduled."

Independently of the applicant, the Natural Grass Advisory Group, which has worked with the Field Fund on other grass fields on the Island, submitted an evaluation of the current field conditions, the proposed natural and synthetic field designs, and the proposed maintenance program for the grass field. The evaluation is available here.

3.5 **Long-term costs:** Huntress calculates that installing and maintaining a grass field would cost about $525,542 over the first 10 years, and $400,840 over the second 10 years ($926,382 total), which includes a 10-year, $150,000 renovation. The renovation would include regrading the field contours in order to maintain proper drainage, along with soil amendments and resodding, and the field would need to rest for a season until the root zone has established.

Huntress calculates that installing and maintaining a synthetic field would cost about $1,059,500 over the first 10 years, and $616,292 over the second 10 years ($1,675,834 total), which includes $541,750 for removing and replacing the carpet at the end of its life. Based on the estimates by Huntress, installing and maintaining a synthetic field would cost about $749,452 more than a natural grass field over 20 years, although 91% of the cost would be in the installation and replacement, compared to 46% for natural grass, and annual maintenance costs would be lower. The high school has stated that all construction costs and the replacement of the synthetic field will be covered by private donations, but has not detailed what specific amounts have been pledged, or if any contingencies apply.

Long-term maintenance costs for natural grass vary depending on field usage, soil types, and other factors. The Natural Grass Advisory Group (NGAG) has argued that a full reconstruction of the high school field after 10 years would not be necessary, and that with proper maintenance, a grass field might never need to be fully resodded. NGAG estimates that a "light" renovation via fraze mowing would cost about $10,000 every five years. The STMA similarly states that natural grass fields that are correctly built and maintained may not need resurfacing within 20 years.

ITEM	Hours	Cost/hour	Product Cost	TOTAL
SYNTHETIC TURF FIELD - ESTIMATED ANNUAL MAINTENANCE COSTS				
Field Grooming & Sweeping (16 time @ 2.25 hours ea)	36	$42.39	$0.00	$1,526.04
Topdressing and leveling Infill	16	$42.39	$1,000.00	$1,678.24
Seam repair and warranty issues (no charge for the first eight years)	-	$0.00	$500.00	$500.00
Gmax Impact Testing (one time annually)	-	$0.00	$1,250.00	$1,250.00
Deep Tine Cleaning (two times annually)	-	$0.00	$2,500.00	$2,500.00
TOTAL	**52**	**$42.39**	**$5,250.00**	**$7,454.28**

* Based upon actual employee cost/hour provided by MVRHS.

ITEM	Hours	Cost/hour	Product Cost	TOTAL
NATURAL GRASS FIELD - ESTIMATED ANNUAL MAINTENANCE COSTS				
Mowing & Trimming (28 cuttings @ 2.25 hours ea)	63	$42.39	$0.00	$2,670.57
Aeration, 5 times per year	40	$42.39	$0.00	$1,695.60
Fertilizer @ 3.0#s N / Year	12	$42.39	$2,295.00	$2,803.68
Soil Amendments	3	$42.39	$551.04	$678.21
Herbicide Applications	3	$42.39	$45.32	$172.49
Pre-emergent	3	$42.39	$158.65	$285.82
Weed Control - spot spray	3	$42.39	$40.00	$167.17
Game Day Prep - Soccer (1.5 hours x 6 games)	9	$42.39	$500.00	$881.51
Game Day Prep - Football (2.5 hours x 6 games)	15	$42.39	$750.00	$1,385.85
Weekly Practice Prep - All Sports (6.0 hours x 28 weeks)	168	$42.39	$500.00	$7,621.52
Overseeding	30	$42.39	$1,710.00	$2,981.70
Insecticide Applications	8	$42.39	$623.10	$962.22
Irrigation (Operation & Repair)	8	$42.39	$1,500.00	$1,839.12
Verti-drain Decompaction	8	$42.39	$600.00	$939.12
TOTAL	**373**	**$42.39**	**$9,273.11**	**$25,084.58**

* Based upon actual employee cost/hour provided by MVRHS.

Figure 4: Estimated annual maintenance costs for synthetic and natural turf. Provided by Huntress Associates.

Cost Estimate Comparisons for Natural and Synthetic Fields

Natural	HAI (2020)	STMA (c. 2018)	TRC (c. 2004)	NGAG (2020)	Marblehead (Hopkins Field)
Construction	$250,000	$207,900–$302,400	$250,000–$350,000	$225,000–$275,000	
Maintenance	$25,084	$20,300	$8,133–$48,960	$32,500	$13,200–$15,400
Renovation	$150,000/$45,360 [1]	$18,900 [2]		$20,000 [3]	

[1]Full reconstruction/sod only

[2]Resurfacing only: includes removal, rolling, topdressing, and seeding

[3]10-year cost for "light" renovation via fraze mowing every 5 years

Synthetic	HAI (2020)	STMA (c. 2018)	TRC (c. 2004)	NGAG (2020)	Marblehead (Piper Field)
Construction	$985,000	$630,000–$1,076,000	$850,000–$1,000,000		$887,585
Maintenance	$7,454	$15,000–$20,500	$8,500–$29,000		$7,400 (not including vehicle and brusher)
Replacement	$541,750	$483,000	$500,000+		

HAI: Huntress Associates, Inc.
STMA: Sports Turf Managers Association
TRC: Turfgrass Resource Center
NGAG: Natural Grass Advisory Group

Figure 5: Cost estimate comparison for natural and synthetic fields. Complied by MVC.

Life-cycle cost analyses for synthetic vs. natural turf have been undertaken by TURI, STMA, and the Turfgrass Resource Center, all of which conclude that the overall cost of synthetic turf is higher. (See figure 5.)

3.6 **Disposal/recycling:** There are currently no facilities in the US that recycle synthetic turf fields, although the company GBN AGR, in a joint venture with Tencate Grass, has opened a facility in the Netherlands. The final construction plans by Huntress will require the turf manufacturer to remove and recycle the turf carpet at the end of its life, and a $50,000 escrow account (details available here) will be established to cover those costs. (Comparative cost estimates for recycling a synthetic field were not available, but the Turfgrass Resource Center estimates that removing and disposing of a synthetic field alone could cost up to $191,000; the applicant has maintained that recycling the field will not cost more than $50,000, but the applicant has not provided an alternative analysis for removal and disposal in a landfill.) An end-of-life determination for the high school field would likely depend on various weighted factors, including impact safety tests, carpet degradation, infill distribution, and ball and player interaction with the field. The president of Tencate Grass Americas stated in letters to the MVC in February and October 2020 that the Netherlands facility would be able to recycle any turf field installed on Martha's Vineyard, with chain-of-custody documentation, and that another facility is expected to open in the US in the next two years. However, the CEO of GBN AGR has stated that he does not think moving fields across the globe would make sense from an environmental point of view.

3.7 **Economic development:** The athletic fields will be utilized by MVRHS, as well as summer camps and youth sports organizations, and the development will create a small number of temporary jobs in the professional and construction industries.

3.8 **Fire safety:** The proposed infill for the synthetic field is made of wood pellets but does not contain additional chemicals that could combust. Huntress has provided fire testing results for both the infill and carpet materials. The Greenfields turf product passed the Federal Flammability Standard COD FF 1-70, which is intended for carpets, and the Brockfill material complied with ASTM International (formerly American Society for Testing and Materials) standards. Fire safety standards applied to synthetic turf may also include NFPA 253, and FTM Standard 372. An Island group known as the Fire Emergency Coalition has raised concerns about the toxicity of the synthetic products (including the track surface) when burned, and their proximity to the state forest, high school building, and other high-use structures in the area. Huntress has not provided a fire safety plan for the synthetic field, but has provided Material Safety Data sheets for the synthetic field products (carpet, infill, shockpad), which outline basic fire-fighting procedures.

3.9 **Player safety:** Concerns about synthetic fields and player safety generally focus on the firmness, temperature, and abrasiveness of the products used.

Firmness: The proposed underlayment for the synthetic field provides a shock-absorbing layer, and the type and depth of infill also affects the firmness of a field. According to Huntress, the G-Max rating of the field (a measure of firmness on a scale of 0–200, with 200 being about equal to concrete) is guaranteed to fall within the range of 90–125 at any one place during the warranty

period. G-Max testing has not been done on the existing grass fields at the high school, but the general range for a grass playing field is between about 80 and 140, according to the STMA. The Synthetic Turf Council recommends a maximum G-Max rating of 164 for the life of a field. The STMA recommends that G-Max be tested at least annually, and at various locations throughout a field. Horsley Witten recommends that the twice-a-year G-Max test results "be summarized and publicized so that users know any potential risks with using the field. This information could be posted along with injury/illness tracking statistics."

The critical fall height for head injuries on the shock pad is 1.2 meters, which aligns with the World Rugby standard of 1.3 meters. Critical fall height is determined by applying the Head Injury Criterion (HIC) Impact Test, which measures the impact of a 10-pound weight on a scale of 0–2,000. The drop height that produces an HIC score of 1,000 is the critical fall height. (The higher the fall height, the safer the surface.) BrockUSA has stated that the risk of head injury on a field with BrockFILL and a Brock YSR shockpad is reduced by about 50% compared to synthetic fields that don't have a shockpad, or natural fields that are compacted.

Temperature: Synthetic fields can produce potentially harmful temperatures at and above the field surface, and methods of cooling synthetic turf, such as adding water, have been shown not to last the length of a game. The Penn State Center for Sports Surfaces found that synthetic fields can get 35°–60°C hotter than natural grass, but those studies were conducted on fields with crumb rubber or other synthetic infills. Testing by BrockUSA found that a field with Brockfill (made from pine trees) can stay about 33° cooler than a field with crumb rubber, and transmit less heat through shoes and skin. Independent data confirming the BrockUSA testing results was not available. The STMA recommends that sports turf managers and coaches monitor surface temperatures and adjust game and practice schedules accordingly. MVRHS currently has a policy for athletic concerns related to heat, and Huntress has stated that the policy would apply equally to activities on natural and synthetic fields. MVRHS also follows the guidelines of the MIAA Heat Modification Policy.

Friction and other concerns: The proposed Greenfields turf product has been tested and approved by FIFA (Federation Internationale de Football Association) in regard to skin abrasion, rotational resistance, vertical rebound, and other player safety standards. Friction is a concern partly in regard to the spread of bacteria such as *S. aureus*. A 2011 study found that synthetic turf itself did not act as a harbor for *S. aureus*, but noted that synthetic turf is more abrasive than grass, so breaks in the skin could lead to infection from other surfaces. (See also section 3.4 on maintenance and long-term costs, which relates to disinfecting synthetic field surfaces.)

3.10 **Noise:** Some abutters have expressed concern about noise during games in the early morning and late afternoon, and during practice. A proposed sound system (see sheet L-8 of plan set) includes two speakers on each of the four proposed light poles, and another two outside the pressbox. A control system that allows for certain speakers to be activated will be housed in the pressbox. The applicant has stated that no complaints have been made regarding the existing sound system at the high school, and that the new system will be similar in amperage. Relocating the track from its present location will reduce the noise impact to the Deer Run neighborhood to the west.

3.11 **Traffic:** The site is accessed primarily from Edgartown-Vineyard Haven Road, which connects to Sanderson Road, which traverses the high school property and continues through part of the state forest before connecting to Barnes Road to the south. The intersection with Sanderson Road is opposite the driveway to Martha's Vineyard Community Services on Edgartown-Vineyard Haven Road. The sight lines are adequate from Sanderson Road at the intersection.

A turning movement count incorporating the school's three driveways along Edgartown-Vineyard Haven Road was conducted during the weekday morning peak hour in February 2017. The count included staff and student arrivals prior to the opening bell. Just over 300 cars entered the site, and 55% either parked or exited using the Sanderson Avenue-Barnes Road connection. The number of vehicles passing the site totaled 511.

Traffic between the high school and Barnes Road during the last full week of school in 2017 (June 19–23) averaged about 10,860 daily trips (including north-south and south-north), with peak hours typically around 8AM and 4PM. Traffic also increased around noon. The average number of peak-hour trips were 818 (AM) and 820 (PM).

Use of the stadium field when school is in session typically occurs between the hours of 2:30PM and 8:30PM. About 320 high school athletes currently use the fields, along with their off-Island counterparts during competitions. Several youth programs—lacrosse, baseball, softball, soccer, and football— also use the campus for practice and competition. In addition, the Martha's Vineyard Sharks baseball team hosts all home games on the high school campus as part of the Futures Collegiate Baseball League. All of the 20–22 annual Sharks games are held when school is out of session.

MVRHS does not expect phase one of the athletic fields project to increase vehicle trips to and from the school, and the seating capacity at the primary game field will decrease from about 800 to 704 seats. The applicant has requested a waiver to the requirement for a traffic impact analysis, since the project is designed only for current and future students, and community groups that already use the campus.

3.12 **Parking:** The plans reorganize the parking area off Sanderson Ave. to allow busses to pull in and out, although the total number of spots for that parking lot will remain at 101 (see sheet L-1 of plan set). Farther south, parking spots along Sanderson Road will be replaced with a pedestrian corridor, and a new 82-car lot will be constructed near the existing track and practice field. The high school property as a whole currently has 423 spots.

3.13 **Accessibility:** The new fields and facilities will comply with the Americans with Disabilities Act (ADA). A pedestrian corridor is planned for the southern part of Sanderson Road, between the existing practice field and the proposed football field. A 10' sidewalk will run along the edge of the proposed 82-car lot near the practice field, on the western side of Sanderson Road, then cross over to the eastern side. An 8' sidewalk from there will run north to the football field, separated from the roadway by a low stone wall. Crosswalks will be located at various points along the road.

3.14 **Housing:** The proposed project is exempt from the MVC's housing policy because the applicant is a public entity.

3.15 **School Athletic Field Case Study:** Horsley Witten Group completed a series of case studies to answer 1) What additional insight can be gained in the decision making process, implementation, and operations of athletic fields from other schools that decided for (or against) synthetic turf, 2) Can a school with similar field usage requirements meet those needs with natural grass, and 3) If the request for a synthetic field is approved, how can MVRHS responsibly ensure the health and safety of users and limit environmental impacts. The case studies include four schools that currently have or plan to have at least one synthetic field, and are supplemented by two case studies by the UMass Toxics Use Reduction Institute (TURI), which focus on school and/or community fields in Marblehead and Springfield, MA. A summary table of key findings and recommendations from the Horsley Witten case studies is available here.

The case study found that schools that pursued synthetic turf generally did so "to reduce wear and tear on natural grass fields or to expand playability (e.g., proper field dimensions, improved drainage, and extend seasonal capacity)," and that "Many communities expressed similar safety and environmental concerns (especially related to crumb rubber), plastics waste, and financial costs." The report covers issues related to the decision-making process, installation, end-of-life options, synthetic and natural grass maintenance, and health and safety. It also offers 11 recommendations on how best to evaluate and implement the MVRHS project.

Huntress provided a formal response to the TURI case study on Marblehead, MA, commenting on why the field usage numbers in Marblehead are so much higher than the numbers for MVRHS. Huntress points out among other things that high school sports including PE classes account for about 70% of the uses at MVRHS, compared to about 13% for Marblehead; and although Hopkins Field in Marblehead has a similar mix of sports, the Marblehead High School only uses it for JV and freshman games.

4 ENVIRONMENT

4.1 **Forest:** The high school property includes state-classified Prime Forest and BioMap2 Core Habitat at its southern end, and abuts the Manuel F. Correllus State Forest to the south.

4.2 **Habitat:** The area abuts NHESP habitat with some in the project area. The wooded area east of the Sharks field is considered significant habitat.

4.3 **Landscaping:** The applicant has submitted a landscape plan that proposes a wide variety of native trees, shrubs, perennials, and grasses. The landscape plan includes metal benches, shade structures, bike racks, and trash receptacles. Annual maintenance costs for the new landscaped areas is expected to range from $6,500 to $7,500.

4.4 **Open Space:** The addition of the new buildings and synthetic field will reduce the total amount of natural open space.

4.5 **Lighting:** The new track and field will include sports lighting (two poles on each side), and the four existing poles will be removed. The new poles closest to Edgartown-Vineyard Haven Road will be 51 feet from the property line. An illumination summary by Musco Lighting shows that the proposed sports lighting will not spill onto neighboring properties, and the effect on Edgartown Vineyard-Haven Road would be minimal. Huntress has stated that the plan is in compliance with International Dark Sky Association (IDA) and Community Friendly Sports Lighting Program guidelines, and has offered to pursue IDA certification.

4.6 **Energy/Sustainability:** The proposed buildings will be all-electric. Huntress has also stated that the more efficient lighting system for the track and field will reduce CO_2 emissions by 98 tons and save the high school about $119,760 over 25 years. The applicant has provided a 25-year cost comparison by Musco Sports Lighting.

A life-cycle carbon footprint analysis of the project and alternatives has not been conducted, but synthetic turf generally has a larger carbon footprint than natural grass. Carbon emissions associated with a synthetic field come mostly from the manufacturing, transport, installation, and disposal of turf products. Recycling the synthetic field overseas, as currently proposed, would add to the carbon footprint in this case. Carbon emissions associated with a natural field come mostly from installation and maintenance. A study by Colorado State University found that undisturbed natural sports turf also sequesters about 0.44 tons of carbon per acre annually, which would translate to about 1.1 tons/year for an area the size of the proposed synthetic field at the high school. However, a playing field would not be considered undisturbed. North Carolina State University also offers and online carbon calculator for turfgrass. Additional resources are available on the MVC website.

4.7 **Waste Management:** The high school property is connected to the town sewer, but the Oak Bluffs Wastewater Facility is at capacity. A septic system is also not allowed since the project lies within the Sengekontacket Pond watershed. In light of those constraints, the fieldhouse would only be constructed once it can be serviced by an approved wastewater connection.

4.8 **Water Resources:** Concerns about groundwater and runoff have focused on the potential effects of synthetic products on drinking water and coastal pond ecosystems, including the effect of microplastics on aquatic organisms.

Available information about microplastics and synthetic fields is limited mostly to crumb rubber products, which are not being proposed for the high school. Horsley Witten has stated that additional testing of the proposed carpet would be needed in order to evaluate fraying and the rate of deterioration, but deterioration would likely increase over time. Stormwater on the synthetic field will pass through two layers of geotextile woven fabric before entering the soil. Huntress has noted an opening size of 0.212mm in the fabric, which is smaller than the grass blades, and has also agreed to add a finer 0.45-micron filter sock around the perimeter of the track to help capture microfibers that are shed from the field, as recommended by Horsley Witten. (Microplastics in general can range in size from 0.1 micron to 5mm.) Huntress has stated that the force required to pull a single fiber from the woven backing is more than 18 pounds, as covered under the turf warranty. According to the manufacturer, the proposed Iron Turf product

withstood 300,000 cycles in a studded roll test (known as the Lisport Test) that simulates the wear caused by athletic use. For reference, 20,000 cycles is considered equal to about eight years of use. Testing by FIFA shows the effects of the Lisport test after 3,000 and 6,000 cycles. Testing by FIFA and Labosport shows that UV light causes the synthetic fibers to degrade slightly over time. The Labosport testing showed that UV exposure weakened the fibers by 2–4% in terms of breaking force, but did not affect their thickness. Huntress has provided photos of 16 synthetic fields at various ages, but their overall condition is not known.

Some synthetic fields in Massachusetts have tested positive for PFAS (per- and polyfluoroalkyl substances), which raises concerns about whether the proposed products for the high school field also contain PFAS, although the manufacturer has stated that the product does not contain PFOS, a type of PFAS that has been found in other synthetic fields. BrockUSA has stated that the proposed infill and shockpad do not contain any PFAS compounds.

California's Proposition 65 establishes response levels of 10 parts per trillion (ppt) for PFOA, and 40 ppt for PFOS, above which a water source should be taken out of service; the MA Dept. of Environmental Protection sets a Maximum Contaminant Level (MCL) of 20 ppt for six PFAS compounds, including PFOA and PFOS. Only a small fraction of the PFAS compounds in existence are currently regulated.

The MVC has engaged the engineering firm Tetra Tech to arrange laboratory testing of the synthetic field products and determine if they contain PFAS and other potentially harmful substances. Additional testing, which may indicate whether substances in the products could turn into PFAS over time (known as Total Oxidizable Precursor Assay and Total Organofluorine Analysis), will be done if the initial PFAS tests return negative. The results of the lab testing will be further reviewed by Horsley Witten.

4.9 **Soils and Groundwater:** The soil type is Riverhead sandy loam with 0–3% slopes. This type of soil is very deep and well drained. The water table on the property is likely perched at an elevation of 18–25 feet. Groundwater flow on the site is toward the east-southeast.

Soil testing results by Turf and Soil Diagnostics in 2019 show sandy loam with 3.63% organic matter, and potentially poor drainage. As proposed, Field #2 will be crowned, with a 1.5% slope to each sideline, to ensure adequate drainage. The existing topsoil will be stripped, screened, and amended to increase infiltration and porosity. The field will also include a new subsurface drainage system and irrigation system. The specifications for topsoil, compost, and grass seed have been provided.

The applicant has offered to install two groundwater monitoring wells just north of the synthetic field, along with initial background testing of the groundwater. The well locations were reviewed by the project's geotechnical and civil engineers. Sampling and analysis, along with annual inspections, would be done by a third-party environmental engineering firm or Licensed Site Professional selected by the high school, and would follow MA Dept. of Environmental Protection standards. Annual reports would be submitted to the MVC and Oak Bluffs Board of Health.

4.10 **Nitrogen:** The site is in the Lagoon and Sengekontacket pond watersheds. The MVC considers both ponds to be ecologically impaired. The current nitrogen loads exceed the critical nitrogen-loading limits, and eelgrass coverage in both ponds is decreasing. The site is also in a DEP Zone II area of contribution. The property is connected to the Oak Bluffs Wastewater Facility, but unable to immediately tie in (see section 4.7). According to the high school, the amount of nitrogen per square foot currently applied to the fields is about equal to that in the proposed grass maintenance program. The applicant has also stated that the synthetic field would reduce the nitrogen load at the site by 264 lbs and save about 1.18 million gallons of water per year. This does not account for potential nitrogen loading from the wood infill. (The presence of wood chips is known to reduce nitrogen in surrounding soil as bacteria decompose the wood chips, but it's unclear what the overall effect would be in the absence of soil.) The applicant has provided additional information about how maintenance and usage practices can reduce nitrogen entering the groundwater. The manufacturer has stated that nitrogen has never been a concern, so they have not done that type of testing.

4.11 **Storm water:** Stormwater currently flows from the parking area to catch basins that connect to infiltration drywells, and from the football field south toward the other fields. The project will result in about 79,500 square feet of new impervious surfaces, and include a series of stone trenches, catch basins and underground filtration chambers to manage additional stormwater. The applicant has submitted a revised stormwater report by Marchionda and Associates that includes peak flow calculations, along with plans for pre- and post-development, and operations and maintenance. The new grass field will also include a drainage system (see sheet L-13 here).

Environmental performance review: Horsley Witten conducted an Environmental Performance Review of the MVRHS proposal on behalf of the MVC and Oak Bluffs Planning Board, in order to evaluate the following:

a) *Compliance of the proposed stormwater and wastewater management approach with local and state standards*
b) *The application of the latest principles and strategies of low impact development/green infrastructure*
c) *Whether potential impacts to groundwater and other natural resources have been minimized*
d) *If opportunities for improved environmental stewardship have been achieved*

The Environmental Performance Review resulted in the following comments, submitted to the MVC and Oak Bluffs planning board on August 13, 2020. A fuller discussion of each point is available in the report. In response, Huntress Associates submitted a revised plan set (parts 1 and 2), stormwater analysis and report, and landscape plan, along with various clarifications and offers, which are available here.

1. *The proposed stormwater management plan generally meets state stormwater standards; however, there are several deficiencies in the drainage report and missed opportunities for innovation (e.g. nitrogen reduction, water reuse, and education).*

2. *Insufficient data exists to definitively conclude that there are/are not impacts to human health or the environment from the Greenfields MX Elite Woven Synthetic Turf Carpet [this has been updated to the Iron Turf Ultra Green product, which is potentially easier to recycle], Brock YSR Shock Pad and Brock BrockFill Organic Infill.*
3. *The maintenance practices recommended by the manufacturer for the synthetic field are more extensive than the maintenance program proposed in the Huntress Q&A dated April 3, 2020. Neither maintenance plan includes specific disinfection procedures to prevent COVID-19.*
4. *There is currently no facility that can provide a practical alternative for end-of-life recycling.*
5. *The proposed fertilization plan for the renovated soccer field (and other natural turf fields) will likely result in an increase in nutrients applied to the grass fields but meets criteria of the local regulations.*
6. *Additional information is needed to confirm that noise and lighting meeting the environmental performance standards of the Town of Oak Bluffs Zoning By-Laws.*
7. *The proposed short-term wastewater management is feasible, but not an ideal or sustainable long-term solution.*
8. *Even though proposed landscaping is not integrated with stormwater management, it does showcase native species and offers an opportunity for replanting of species that may be cleared from the site in the future.*
9. *Several options in the master plan require clearing of mature forest in the southeast corner of the site, which is within BioMap 2 Core Habitat.*

6 ECONOMIC IMPACT

6.1 There are currently _____ full time/ part time employees. With the proposal there will be _____ full time/part time employees.

6.2 The potential impact on schools is likely to be significant.

6.3 The potential impact on police and fire departments is _____.

7 SCENIC VALUES

7.1 **Streetscape:** The project site is visible from Edgartown-Vineyard Haven Road, but partly obscured by trees. The closest proposed sports lighting would stand 51 feet from the property line along Edgartown-Vineyard Haven Road. An illumination summary by Musco Lighting shows that a minor amount of sports lighting will spill onto the road.

7.2 **Building Massing:** The proposed fieldhouse is 4,800 ft^2 with lower and ground levels, and a height of 24' at the ridge (see sheets A100 and A200 here). The ground floor dimensions are 30' by 117'. The proposed storage building has floor dimensions of 16' by 36' (see sheet L-7 here). The proposed electrical utility building has floor dimensions of 12' by 16' with a height of about 15' at the ridge (see sheet L-8 here). The proposed grandstand will have a footprint of about 129' by 36' not including wheelchair ramps at either end, and will have a pressbox at the top. The grandstand will be 22'2" high, including the 9'6" pressbox. A 3'6" chain link fence will likely be added to the top of the pressbox to allow for filming. (See sheet L-10 here.) The grandstand could potentially be expanded in the future.

7.3 **Architectural Detailing:** See plan set part 2.

8 LOCAL IMPACT/ABUTTERS

See sections on noise, lighting, and traffic above.

9 CORRESPONDENCE

9.1 **Town Officials:** West Tisbury Conservation Commission, Ewell Hopkins (Oak Bluffs Planning Board), Sue Hruby (West Tisbury Energy Committee and Climate Advisory Committee and West Tisbury representative to Cape Light Compact)

9.2 **Island Organizations:** The Field Fund, Fire Emergency Coalition, Mass Audubon, Vineyard Conservation Society, Island Grown Initiative, Vineyard Community Sports Complex

9.3 **Public:** 133 emails and letters have been received as of Dec. 29, 2020, including from town officials and Island organizations. Among the submissions, a coaches' petition in support of the project (dated June 8, 2020) includes 24 names, a petition by the group Vineyard Community Sports Complex (dated October 18, 2020) in support of the project includes 746 names, and a petition opposing the project (dated August 2020) includes 138 names.

Common themes and concerns among supporters include student success, current conditions of the fields, increased safety for field users, recyclability of the synthetic carpet, challenges with maintaining natural grass in the past, availability of funds through a donor, reliability of synthetic turf, the stated absence of PFAS in the synthetic turf products, ability to rest the grass fields, and the opportunity for field usage by the wider community.

Common themes and concerns among opponents include school finances, cost of installing, maintaining and replacing the synthetic field, incremental development in light of the Athletic Fields Master Plan, environmental and health concerns (including the effect on groundwater and wells, potential for PFAS in the synthetic products, and microplastic pollution), climate change (including the carbon footprint of synthetic turf), the importance of waste reduction, how to dispose of synthetic materials, feasibility of recycling the synthetic carpet, potential for injuries on synthetic turf, fire risk associated with the synthetic field, hygiene and sanitation during the Covid-19 pandemic, student success, opportunity for school leadership, and Island values in light of recent waste reduction initiatives.