

Applicant

Notre Dame High School

Appl. No.

SP-3/21

REFERRALS

	Date		Comments	Date		Additional Reports
	Referred	Dated		Referred	Dated	
a. Municipal Engineer	8/12/21	9/2/21				
b. Professional Planner	8/12/21	9/10/21				
c. Traffic Consultant						
d. Construction Official	8/12/21					
e. Shade Tree Advisory Comm.	8/12/21					
f. Health Officer	8/12/21					
g. Tax Collector	8/9/21	8/9/21				
h. Public Safety	8/12/21	9/9/21				
i. Environ. Res. Committee	8/12/21	9/10/21				
j. Mercer County Planning Bd.						
k. Ewing-Law. Sewer Auth.						
l. _____ Water Co.						
m. D & R Canal Commission						
n. U.S. Post Office						
o. NJDOT						
p. PSE&G Co.						
q. Board of Education						
r. Historic Preserv. Comm.						
s. NJDEPE/Wetlands						
t. NJDEPE/Stream Encroach.						
u. _____						
v. _____						
w. _____						
x. _____						
y. _____						
z. _____						

TOWNSHIP OF LAWRENCE
Division of Planning and Redevelopment

TO: File

FROM: James F. Parvesse, Municipal Engineer

SUBJECT: Major Site Plan – Preliminary & Final Approval Application No. SP-3/21
Notre Dame High School (Turf Field), 601 Lawrence Road
Tax Map Page 13, Block 1301, Lot 34.02

DATE: September 2, 2021

General:

Notre Dame High School has requested preliminary and final site plan approval to construct a synthetic turf field on the east side of the existing tennis courts. The area is currently used as a grass sports field.

Additional information is needed to address stormwater management design (see Section 2.00). The remainder of the detailed report consists of minor technical items.

Detailed Report:

1.00 Site Layout

1.01 The plans do not show team benches or spectator bleachers. The applicant shall clarify the intent for use of the field.

1.02 Overall field dimensions shall be added to the layout plan.

2.00 Stormwater Management

2.01 Soils testing was performed and witnessed as required; however, the final report has not been submitted. The field notes indicated high mottling over the entire field area and the impact on the perforated pipe system shall be determined. Typically, there should be 1 – 2' of separation between the elevation of mottling and the piping system.

2.02 Maximum length of sheet flow in the time of concentration calculations cannot exceed 100' per the April 2021 Best Management Practices manual. The calculations also show that the existing condition runoff is greater than the post construction runoff which is not common.

2.03 The Operations and Maintenance Manual shall be a separate document. It shall be in compliance with the format provided on the New Jersey Department of Environmental Protection website. Upon approval, it shall be recorded with the Mercer County Clerk's Office with a deed declaration.

Notre Dame has several stormwater facilities on-site and it is recommended that a campus Operations and Maintenance manual be developed. The maintenance records for 2020 shall be submitted prior to issuance of a Soil Disturbance Permit. Note all records are required annually.

2.04 The Outlet Structure Detail shall be added.

3.00 Miscellaneous

- 3.01 The narrative submitted with the application states that lighting will be controlled by breakers in a locked enclosure. A timing device is recommended. The plans shall contain a note stating that all field lighting must be turned off no later than one-hour after events.
- 3.02 The Soil Disturbance Permit will be issued through Lawrence Township, not Mercer County.
- 3.03 An engineer's estimate is required for determination of inspection fees.
- 3.04 Other permits / approvals:
- a. Delaware & Raritan Canal Commission

JFP/sjs

g:engineering/notre dame sp 3 21/review #1.doc

Documents Reviewed:

- Letter from Troutman Pepper Hamilton Sanders, dated July 29, 2021
- Application No. SP-3/21 with Project Narrative
- Cover Sheet, Sheet 1 of 11, dated July 26, 2021
- Legend, Zoning and General Notes, Sheet 2 of 11, dated July 26, 2021
- Existing Conditions and Demolition Plan, Sheet 3 of 11, dated July 26, 2021
- Site Layout Plan, sheet 4 of 11, dated July 26, 2021
- Site Grading and Drainage Plan, Sheet 5 of 11, dated July 26, 2021
- Site Electric Plan, Sheet 6 of 11, dated July 26, 2021
- Construction Details I, Sheet 7 of 11, dated July 26, 2021
- Construction Details II, Sheet 8 of 11, dated July 26, 2021
- Construction Details III. Sheet 9 of 11, dated July 26, 2021
- Plan of Survey, Sheet C-2, revision dated April 6, 2015
- Partial Topographic Survey, Sheet 1 of 1, dated February 25, 2021
- Stormwater Management Report, dated July 2021
- Sports Lighting Structures, Sheet 1 of 1, revision dated April 30, 2021
- Light & Traffic Structure Proposal, dated June 7, 2021
- Lighting Report, dated November 6, 2021



P.O. Box 236
2 East Broad Street, 2nd Floor
Hopewell, NJ 08525
609-257-6705 (v)
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info@kylemcmanus.com

To: Lawrence Township Planning Board

From: Elizabeth McManus, PP, AICP, LEED AP *EMM*
Brett Harris, AICP *BH*

Re: **Notre Dame High School – Synthetic Turf Field Improvements
Preliminary and Final Major Site Plan Approval**
Block 1301 Lot 34.02
601 Lawrence Road
EGI Education, Government, Institutions Zoning District
Application SP-3/21

Date: September 10, 2021

1.0 Project Overview

- 1.1** The Applicant is requesting preliminary and final site plan approval to upgrade an existing grass athletic field into a multi-sport synthetic turf field with associated lighting for night use. No new parking is proposed. The associated lighting proposed includes four (4) 50-foot-high light poles with 15 LED lights per pole.
- 1.2** The Applicant indicates the hours of operation will be between 2:30pm – 9:30pm on weekdays and 7am – 7pm on weekends.

2.0 Site & Surrounding Area

- 2.1** This 90+ acre property is located on S.H. Route 206, also known as Lawrenceville Road, between Fairfield Avenue and Meadow Woods Lane. The subject property contains the Catholic Diocese of Trenton and the Notre Dame Highschool. The site improvements associated with the school include, associated surface parking lots, several athletic fields including baseball/softball, football, soccer, and tennis courts.
- 2.2** There are a mix of land uses in the surrounding neighborhood, with significant community assets in the area. The Lawrence Nature Center and Drexel Woods Park are located to the north. Further north is Meadowbrook Park. Across US-206, to the east, is a mix of single-family homes and commercial uses. The closest residence is approximately 850 feet to the northeast from the proposed field. Directly adjacent to the south is the Shabakunk Creek. Further south, approximately 1,200 feet from the proposed field are multifamily residential uses further south. A portion of the Heritage Trail, also known as the Johnson



Trolley Line, is to the west of the subject property. The site and surrounding areas can be seen on the following Aerial Map.



601 LAWRENCE ROAD - NOTRE DAME TURF FIELD
BLOCK 1301 LOT 34.02
TOWNSHIP OF LAWRENCE, MERCER COUNTY NJ

DATA SOURCE: Aerial Imagery, Google Earth 2021; NJGIN Mercer County Parcels 2021



3.0 Variances and Exceptions

- 4.1 The subject site is located within the EGI Education, Government, Institutions Zoning District. The EGI District is intended for governmental, educational, charitable, health care and religious uses presently existing within the municipality. The existing use and proposed uses are permitted in the district.
- 4.2 The Applicant does not require bulk variance relief from the EGI District standards. Please see the following table for additional detail.

EGI District Standards (§426)				
	Required	Existing	Proposed	Variance?
Min. Lot Area	5-acres	90-acres	No Change	No
Min. Lot Width	300 ft.	456 ft.	No Change	No
Min. Lot Depth	600 ft.	2,410 ft.	No Change	No
Min. Lot Frontage	300 ft.	615 ft.	No Change	No
Min. Front Yard	100 ft.	242 ft.	No Change	No
Min. Side Yard	100 ft.	7 ft.	No Change	No
Min. Rear Yard	100 ft.	1,665 ft.	No Change	No
Min. Setback for Accessory Uses	75 ft.	N/A	No Change	No
Max. Impervious Surface Ratio	.6	.12	No Change	No
Max. Floor Area Ratio	.2	.08	No Change	No
Max. Wall Height	6 ft.	N/A	5 ft.	No

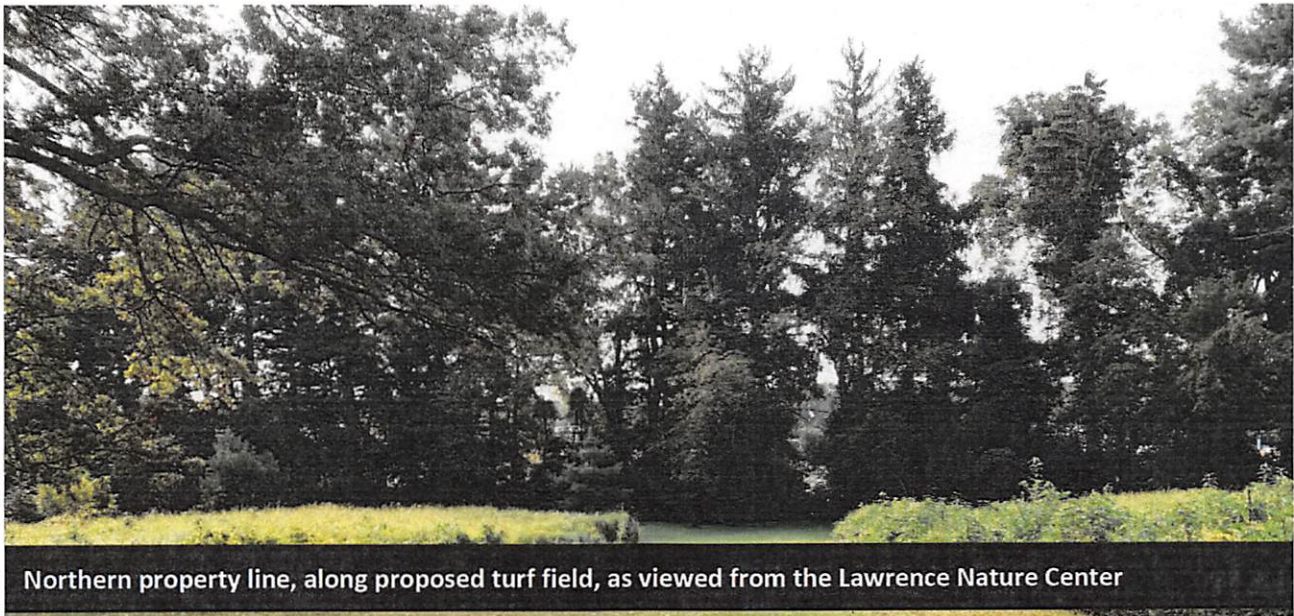
- 4.3 The Applicant indicates the Impervious Surface Ratio will not change. Testimony should be provided regarding the impervious nature of the proposed turf field. We defer to the Board Engineer regarding stormwater management and drainage issues.
- 4.4 The applicant cites relief from §527.C.1., which requires light fixtures to have a mounting height of not more than 25 feet. However, this section is applicable to surface parking lots, rather than athletic fields. While the standard is informative in that the Board has a comparison of the proposed fixture height of 50 feet to a more typical fixture height, it is not applicable.



5.0 Site Plan Comments

- 5.1** An updated Lighting Plan should be provided to identify the lighting levels along the northern property line.
- 5.2** The Applicant should provide testimony regarding any potential impact of the proposed light fixtures on the nearby residences. Testimony should minimally include the following:

 - a. What strategies are proposed to reduce or eliminate potential impacts to the site, adjacent open space, and residents in the surrounding area? This should address direction of light, light spill, glare, and any use of fixture shields. Pursuant to §520B, any glare shall not extend beyond a property’s lot lines. We note for the Board, approximately 850 feet to the northeast from the proposed field, separated by school campus buildings and woodlands, are single-family residences. The proposed lighting fixtures face this general direction. Approximately 1,200 feet to the south, separated by existing sports fields and woodlands, are multifamily residences. The proposed lighting fixtures do not face this general direction.
 - b. What is the color temperature of the proposed LED lighting?
- 5.3** The Applicant is proposing to remove 51 trees, with no new plantings proposed. The applicant should indicate if the area of disturbance can be reduced in order to retain a portion of the trees proposed for removal. Alternatively, the applicant should consider the tree preservation techniques in §541G.2. A tree protection zone, pursuant to §541E., should be depicted on the plan, along with any associated tree protection fencing.
- 5.4** The buffer along the northern property line should be supplemented with evergreen trees. There are gaps, and most of the trees appear to be deciduous, as depicted in the following image.



Northern property line, along proposed turf field, as viewed from the Lawrence Nature Center



6.0 Materials Reviewed

6.1 Application SP-3/21

6.2 *Site Plan*, consisting of 11 sheets, prepared by Robert Gregoria PE and Daren J. Phil, PE of Suburban Consulting Engineers, Inc dated July 26, 2021.

6.3 *Partial Topographic Survey*, consisting of 1 sheet, prepared by Joseph D. Phil PLS of Suburban Consulting Engineers, Inc. dated February 25, 2021.

6.4 *Plan of Survey*, consisting of 1 sheet, prepared by Americo Lucchi PLS, of Lanning Engineering CO. Inc dated June 28, 2005.

6.5 *Sports Lighting Structures Plan*, consisting of 1 sheet, prepared by NAFCO International, dated April May 4, 2021.

6.6 *Lighting Renderings and Details*, consisting of 15 sheets, prepared by IKIO LED Lighting, not dated.

7.0 Applicant Team

7.1 Applicant: Notre Dame High School 601 Lawrence Road, Lawrenceville, NJ 08648 609-882-7900 x 125 jenningsk@ndnj.org


7.2 Owner: Diocese of Trenton, 701 Lawrence Road, Lawrenceville NJ 08648 609-403-7149 dscinfo@diocesestrenton.org

7.3 Attorney: Thomas M. Letizia, Esq. 301 Carnegie Center, Suite 400 Princeton NJ 08540 609-951-4136 thomas.letizia@troutman.com

7.4 Engineer: Suburban Consulting Engineering Inc, 2430 Highway 34 Building A, Suite 1R Wall NJ 08736 732-282-1776 x 3305 rgregoria@suburbanconsulting.com

TOWNSHIP OF LAWRENCE
Division of Planning and Redevelopment

TO: Brenda Kraemer, Assistant Municipal Engineer
Elizabeth McManus, Planning Consultant
Edwin W. Schmierer, Planning Board Attorney
Michael Rodgers, Construction Official
Edward Tencza, Public Safety Coordinating Committee
Environmental Resources Committee
Shade Tree Advisory Committee
Keith Levine, Health Officer

FROM: James F. Parvesse, Municipal Engineer 

SUBJECT: Major Site Plan – Preliminary & Final Approval Application No. SP-3/21
Notre Dame High School (Turf Field), 601 Lawrence Road
Tax Map Page 13, Block 1301, Lot 34.02

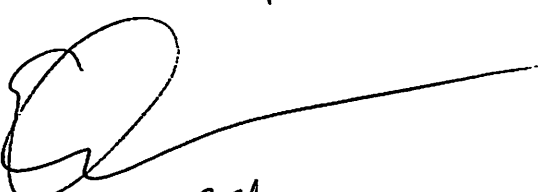
DATE: August 12, 2021

Documents for the above-referenced site plan application for the upgrade to an existing grass athletic field into a synthetic turf field with lighting were previously distributed.

Please note that this application has been re-scheduled for review by the Planning Board at the meeting to be held Monday, September 20, 2021. Therefore, please review these documents and submit your report to this office as soon as possible, but **no later than September 10, 2021** so that reports may be provided to the applicant and Board members prior to the meeting.

SJS
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Attachments

No Comments on Census

9.9.2021

Township of Lawrence
ENGINEERING DEPARTMENT

TO: Susan McCloskey, Tax Collector
FROM: Susan Snook, Administrative Secretary *AJS*
SUBJECT: Verification of Current Tax and Sewer Payment Status
DATE: August 9, 2021

Please update the status of taxes and sewer payments with regard to the following application:

Application No(s):	SP-3/21
Application Name:	Notre Dame High School
Street Address:	601 Lawrence Road
Tax Map Page(s):	13
Block:	1301
Lot(s):	34.02

Thank you for your anticipated assistance and response.

SJS
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*Taxes are current and
there is no sewer w/s
of 8/9/2021*



LAWRENCE TOWNSHIP TAX COLLECTOR
PO BOX 6006
2207 LAWRENCE ROAD
LAWRENCE TWP NJ 08648
609-844-7041



Handwritten initials or mark.

LAWRENCE TWP NJ 08648
3303 LAWRENCE ROAD
PO BOX 8008
LAWRENCE TOWNSHIP TAX COLLECTOR
608-844-3041

Lawrence Township Environmental and Green Advisory Committee

To: Lawrence Township Planning Board Members
From: Lawrence Township Environmental and Green Advisory Committee
Date: September 10, 2021
Re: Notre Dame High School Turf Field
Major Site Plan-Preliminary and Final Application No. SP-3/21
601 Lawrence Rd. Tax Map Page 13, Block 1301, Lot 34.02

In accordance with the legal authority and responsibility of the Lawrence Township Environmental and Green Advisory Committee (EGAC), we have conducted a review of the application materials provided to the Committee by the Township of Lawrence.

SUMMARY

The applicant proposes to convert a grass sports field to a synthetic turf field. A Variance to add four 50-foot light poles with 15 LED lights per pole is required. Waivers are requested for the Environmental Impact Statement and Solid Waste Management Plan.

There are four principles of the [*Green Building and Sustainability Element of the Master Plan*](#): 1) Reduce the community's dependence on substances extracted from the Earth's crust, especially fossil fuels and rare minerals. 2) Reduce dependence on manufactured substances whose production and accumulation in nature may be harmful to the environment and citizens of the Township. 3) Reduce harm to the local, regional, and global ecosystems. 4) Meet all fundamental human needs fairly and efficiently. There appears to be issues with the proposed project as it relates to this element of the Master Plan. We provide specifics in the "Detailed Review" section.

Recommendations:

1. Clarification and detail regarding infill and stone base.
2. A Solid Waste Management Plan for the turf and its components (no waiver for this aspect).
3. Maintenance Plan for the turf and its components.
4. A detailed EIS (no waiver) including but not limited to: Contaminated Run Off, Leaching and Off Gassing (including maintenance inputs); Heat Island Effect; Carbon Footprint Analysis (including Maintenance Inputs and end of life impact); Watershed Impact (including flooding); Life Cycle Costing; and Human Health Impacts (including mental health). The EIS should address cumulative effect and indicate pros and cons of alternatives and/or mitigation suggestions.

To protect and inform the community we need to have comprehensive evidence-based information in order to understand the true impact and cost to the environment, human health, and economics. End users should be fully informed of risks and the diocese and municipality should be informed of resiliency and hazard mitigation costs because of the project and the contribution to the *cumulative* effect of development.

We made a few citations in the memo, and we are including a Bibliography used to inform this memo as a separate document and hope it will provide additional insight.

EGAC memo, Notre Dame Turf Field.

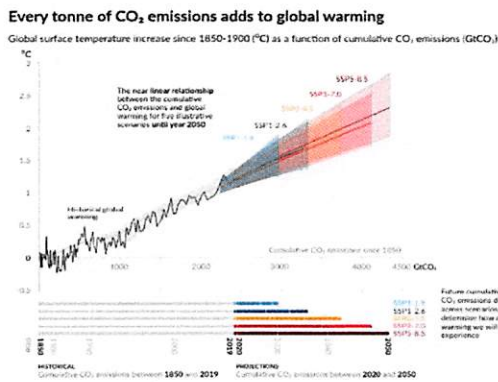
DETAILED REVIEW

CONTAMINATED RUN OFF, LEACHING AND OFF GASSING

1. The infill material is not specified and is of particular concern. Infill material, particularly crumb rubber, as well as the turf itself have been associated with the release of a carcinogens and hazardous chemicals such as polycyclic aromatic hydrocarbons (PAHs), heavy metals and other volatile organic compounds (VOCs), plasticizers, antioxidants and additives into the air, soil and water. ⁽¹⁾⁽²⁾
2. Synthetic turf has been shown to have higher concentrations of pathogenic bacteria.³
3. Bacteria, moss and algae may require the use of chemicals that drain into the soil. We recommend a review of the Turf Maintenance Plan.
4. Microplastics. Both infill particles and broken synthetic grass fibers contribute to microplastic pollution ⁴ and will impact the soil and water on campus and downstream.

CARBON FOOTPRINT

Carbon emissions come from the processing, production, transportation, installation, maintenance, and disposal stages. These material impacts over the entire lifecycle significantly increase the carbon footprint and contribute to Climate Change.⁵



CARBON SEQUESTRATION

1. There are 51 native species of trees of varying sizes greater than 8" caliper to be removed. Using the "[National Tree Benefit](#)" Modeling Calculator and inputting the species and caliper, these trees currently sequester an estimated 14,832 lbs of carbon dioxide each year. While additional trees should be planted, it may take a generation for the township to achieve this amount of capture from any new plantings (which are not included in the proposal).

2. Natural turf is a carbon sink. One estimate is that 3,400 lbs of carbon can be sequestered per acre of maintained turf. 2.28 acres (size of field disturbance) therefore sequesters 7,752 lbs. It appears the community will be losing an estimated 22,584 lbs of carbon sequestration annually from the loss of trees and natural turf. ⁶

¹ Environ Res. 2019 Feb;169:163-172. doi: 10.1016/j.envres.2018.10.018. Epub 2018 Oct 24. Evaluation of potential carcinogenicity of organic chemicals in synthetic turf crumb rubber.

Alaina N Perkins¹, Salmaan H Inayat-Hussain², Nicole C Deziel¹, Caroline H Johnson¹, Stephen S Ferguson³, Rolando Garcia-Milian⁴, David C Thompson⁵, Vasilis Vasiliou⁶

² Chemosphere. 2018 Mar;195:201-211. Determination of priority and other hazardous substances in football fields of synthetic turf by gas chromatography-mass spectrometry: A health and environmental concern. Maria Celeiro¹, Thierry Dagnac², Maria Llompart³

³ Artificial-turf surfaces for sport and recreational activities: microbiota analysis and 16S sequencing signature of synthetic vs natural soccer fields. Federica Valeriani¹, Lory Marika Margarucci¹, Gianluca Gianfranceschi¹, Antonello Ciccarelli¹, Filippo Tajani¹, Nicolina Mucci², Maurizio Ripani¹, Vincenzo Romano Spica

⁴ Received: 7 March 2019 | Revised: 18 July 2019 | Accepted: 30 July 2019 DOI: 10.1002/ppp3.10071 RESEARCH ARTICLE A microplastic used as infill material in artificial sport turfs reduces plant growth Mark van Kleunen^{1,2} | Anna Brumer² | Lisa Gutbrod² | Zhijie Zhang

⁵ IPCC, 2021: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J. B. R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu and B. Zhou (eds.)]. Cambridge University Press. In Press.

⁶ The calculations are intended to be simple and accessible and as should be considered a starting point for understanding vegetation value in the community rather than a scientific accounting of precise values.

HEAT ISLAND EFFECT

1. Heat Dissipation/Heat Absorption. Plants have pores on their leaves that take in carbon dioxide and release oxygen and water molecules. These water molecules evaporate and cool the environment. Synthetic turf is the opposite, absorbing and radiating heat, increasing the temperature of the surrounding environment. Surface temperatures of artificial grass appear to be about 20-50° F higher than natural grass and can reach the same temperature as asphalt pavement. The loss of tree canopy further increases the heat island effect.
2. Per the [2020 NJ Scientific Report on Climate Change](#), average temperatures in NJ (and globally) continue to rise. Both this and [the 2021 IPCC \(Intergovernmental Panel on Climate Change\) Report](#) indicate the need for transformative, immediate action.

STORMWATER MANAGEMENT

1. It is important to understand that the required stormwater management regulations include the peak **rate** of runoff but not overall **volume** of runoff. Notre Dame Campus is on an Ecological Floodplain.⁷ Both natural turf and trees through canopy, stems, leaves and roots, *slow down* stormwater runoff and *reduce volume* through storage and evapotranspiration. The loss of the 51 trees alone represents an estimated loss of 87,657 gallons of stormwater mitigation per year (using the “[National Tree Benefit](#)” model) which seems impactful given the increase in frequency and intensity of rain events due to climate change and flooding in this area.
2. Synthetic turf installation requires heavily compacting the soil, damaging soil structure, soil microbes and soil life, which affects aeration and drainage and results in increased run off.
2. “Water Quality 5.2” in the *Stormwater Management Report* indicates that as no driving surfaces or converting from pervious to impervious is being proposed, so TSS (Total Suspended Solids) removal is not required. Trees and natural turf reduce pollutants by taking up nutrients and other pollutants from soils and water through their roots, and by transforming pollutants into less harmful substances. Synthetic turf, while being porous, does not act as a filter. The loss of the significant number of trees and natural turf leads to an increase of TSS and pollutants into the soil and water. Additionally, the components of the synthetic turf system add additional pollutants.
3. The *SWM Report* indicates the project is in the State Planning Area 1 and that groundwater recharge measures are not required. However, natural turf and tree roots as well as leaf litter create soil conditions that promote the infiltration of rainwater into the soil, helping to store volume and replenish groundwater supply and maintain streamflow during dry periods.
4. Information regarding the 6” stone base does not seem to appear on the plans or *SWM Report*. The use of “clean” stone is imperative as different stone and particle sizes will lead to compaction creating an impervious base and ineffective design.

END OF LIFE DISPOSAL

Synthetic turf is a petrochemical product which is nearly impossible to recycle and reuse and will likely end up in the landfill. The average synthetic turf field adds 40,000 pounds of plastic carpet and 400,000 pounds of infill to landfills. Some companies claim a life expectancy of 15 to 20

⁷Using the Active River Area (ARA) conservation framework developed by The Nature Conservancy. The ARA is a holistic approach to floodplain delineation that includes the channel and the adjacent riparian lands that interact with the river as part of a dynamic system. The framework provides a spatially explicit manner for accommodating the natural ranges of variability to system hydrology, sediment transport, processing and transport of organic materials, and key biotic interactions. Data sets are more current than FEMA data sets. THE ACTIVE RIVER AREA A Conservation Framework for Protecting Rivers and Streams April 2008 This report was jointly prepared by Mark P. Smith (TNC), Roy Schiff (MMI), Arlene Olivero (TNC), and James MacBroom (MMI)

years, while studies *actually* suggest 7 to 10 years. The design, installation, and quality of the product, as well as maintenance, use, and weather conditions all affect longevity. We suggest a Solid Waste Management Plan specifically for the turf. Life Cycle carbon emissions should be factored into municipal emissions reporting.

BIODIVERSITY

1. Synthetic turf, as well as the compacted soil, does not support a whole host of living organic organisms: insects, worms, beneficial bacteria, and fungi in the soil. The insects and grass seeds are part of a food chain for higher species. Replacing grass with synthetic turf impairs soil biota and has a particular impact on local birdlife.
2. The loss of 51 native trees and ecological service, including habitat and food for insects and birds, is significant.

LIGHTING

The Electrical Plan nor the *Ikio Lighting* document appear to indicate the color temperature of the lights. Per the International Dark Sky Association, use “warm-white” or filtered LEDs (CCT ≤ 3000 K; S/P ratio ≤ 1.2) to minimize blue light emission which can harm human health and wildlife, including insects.

PROTECTING VULNERABLE POPULATION

Our most immediate concern is for the students and how this land use affects them. The literature indicates artificial turf problems of heat, injuries⁸, and toxic exposures (including PFAS) to humans. Young students with rapidly developing systems are not fully ready to fend off toxic substances. They breathe more air per unit of body weight than adults and they are more likely than adults to contact turf with hands and then into their mouths. The cumulative impact of ever-increasing toxicity and carcinogen exposure is of great concern. End users and guardians should be fully informed of risk.

CONCLUSION

We believe a detailed Environmental Impact Statement is appropriate. There is risk to the Notre Dame community, as well as the larger community. Risk analysis and decision making should be based on comprehensive and current evidence-based information. Consider alternative solutions and/or mitigation measures. Natural turf grasses have advanced in performance in heavy-duty applications due to new research and breeding approaches. Advances in turf types, technologies (including drainage), and maintenance practices have improved natural turf fields.

The Massachusetts Toxics Use Reduction Institute (TURI) concludes in 2019: “From an environmental and health standpoint, organically managed natural grass is a safer choice for sports fields. When the full product life cycle is considered, organically managed natural grass also offers lower costs over time.”

⁸ Am J Sports Med. 2019 Jan;47(1):189-196. doi: 10.1177/0363546518808499. Epub 2018 Nov 19. Higher Rates of Lower Extremity Injury on Synthetic Turf Compared With Natural Turf Among National Football League Athletes: Epidemiologic Confirmation of a Biomechanical Hypothesis
Christina D Mack¹, Elliott B Hershman², Robert B Anderson³, Michael J Coughlin^{4,5}, Andrew S McNitt⁶, Rachel R Sendor¹, Richard W Kent¹

Bibliography

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There was an earlier testing report from 2010 done at Università IUAV di Venezia which backed Limonta’s claim that the corkonut infill was running substantially cooler than rubber infill. The Synturf alternative infill page (<http://www.synturf.org/alternativeinfill.html>) contains the report: http://www.synturf.org/images/Limonta_Sport_Temperature_Comparison_Test_GEO_vs_Natural_vs_SBR.PDF

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Comment: Water conservation is seen as an important justification for the transition from natural grass to synthetic. The ISA Sports test results on comparing the Limonta Sports synthetic turf with organic Infill with a synthetic field with rubber infill and Natural grass has implications for water use of synthetic fields. “Even under the most intense heat and with no naturally occurring precipitation we feel that the field will require no more than 12,000 gallons of water applied twice a week for the field to perform optimally.” That translates as 1,200 kgals per year. A Natural grass field will use about 1,290 kgals per year, according to Alm (2016). Kanaan et al (2020) argue that synthetic field water use for managing field temperatures is comparable to the water requirements of a natural grass field. If Organic infill is used for a new sporting field, increased water use needs to be also part of the equation. Original source of the infill fibres need consideration to ensure this isn’t causing emissions associated with landclearing and biodiversity impacts at source.

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