REPORT TO MAYOR PETER HUGHES

By: THE HURRELL ADVISORY COMMITTEE

Date: May 27, 2014

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Executive Summary

The Hurrell Advisory Committee is composed of 12 voting and 2 non-voting members and was formed in November 2013 for the purpose of advising the Mayor and Town Council of Glen Ridge regarding surface coverage for Hurrell Field. The following three stipulations were set by Mayor Hughes and were considered throughout Committee deliberations: 1. No maintenance of status quo; 2. No surface that contained crumb rubber; and 3. No reduction of sports played in town.

The Committee studied the demands of GRHS, GRAA and the Borough's residents at large for use of the Borough's five fields and also evaluated the use by GRHS and GRAA of those fields that are *not* owned by the Borough, both outside the Borough and at GRHS. It obtained relevant data regarding the ages (and sizes) of the student athletes, the sports to be played, the number and timing of practices and competitive games and the fields available for use. The Committee considered the major types of field surfaces used for competitive field sports, including the feasibility and cost of installation and maintenance of each, the potential risks attendant thereto, including environmental and health and safety risks to the users, and warranty information as provided by the manufacturers.

After much deliberation, the Committee has provided two recommendations for the Borough Council to consider for Hurrell, and other (secondary) recommendations related to athletics and field space for Glen Ridge residents.

The Committee chose these field surfaces based on an extensive evaluation of the surface itself, the playing hours and sports, and size of the athletes who will use Hurrell. With education of the community at large, the leadership of GRAA, and the Director of Student Activities and staff at GRHS, the final field's use should be such that it reaches and potentially surpasses the years of warranty.

Primary Recommendations:

RECOMMENDATION 1: HYBRID GRASS

One surface that would provide benefit to the Borough by satisfying the increased demand for field space, maintaining Hurrell Field for use by the community in the Historic District, minimizing known risks, and considering cost issues, is **hybrid grass.**

Hybrid grass surfaces use a combination of natural grass and synthetic blades. Synthetic blades are anchored in (injected into) a porous, sand soil mix, one-half inch apart from one another, eight inches beneath the ground surface, and protrude .75 inches above. Natural grass is planted between the synthetic blades. The ratio of natural grass blades to synthetic blades is approximately 97 to 3. Grass roots intertwine with the anchored synthetic blades to provide stability for the root system. The manufacturer states that the synthetic blades also provide

improved drainage by wicking the water from the surface. Other than co-existing with the anchored synthetic blades, the natural grass in a hybrid surface is grown and maintained in all ways like natural grass.

The benefits of a hybrid grass field are:

- The manufacturer's warranty for the surface is 5 years.
- There is no scheduled 'end of life' to this product. The manufacturer has fields that are up to 20 years in service.
- It is a composition which has the community advantage of being a natural living surface.
- It is ecologically consistent with natural grass
- It is less costly than the artificial turf options
- Any increase in surface temperature due to the existence of synthetic blades is minimal compared to all-synthetic blade surfaces
- The ability to play on the surface while simultaneously reseeding where needed
- There is no rain-related lack of play and no divots to contend with, as would be seen in an all-grass surface
- The ability to take advantage of better grass seeds in the future
- Glen Ridge can be a leader and innovator in the U.S. with this surface
- It has proven durability in high-impact sports, as it is the surface of choice for FIFA soccer teams, and is used on at least 3 NFL teams' practice and playing fields
- Disposal: when the time comes, the hybrid surface and topsoil/sand are removed and replaced with the best available surface at that juncture.

The potential disadvantages of a hybrid grass surface are:

- It has not been installed at any publicly-maintained and available field so the Committee has not had a chance to see a hybrid field or draw upon the experience of another municipality
- There is a potential disadvantage to being 'the first' in this geographical area and in a community (not professional) field
- There is specific maintenance equipment for which the grounds staff must have proper training
- This surface meets the current needs for play at Hurrell; however, it does not significantly increase playing time, so that it will not contribute to off-loading of the other fields without a meaningful change to the usage schedule for all fields/sports
- Due to the surface being primarily natural grass, it is possible that after a heavy snow winter, the town will not gain the 'early' season playing time when our fields are in high demand (March & early April)
- The synthetic blades are sewn in using a machine that is not housed in the US.

RECOMMENDATION 2: SYNTHETIC TURF WITH CORK INFILL

Another surface that would provide benefit to the Borough by satisfying the increased demand for field space, minimizing known risks, and considering cost issues, is **synthetic turf with cork infill**.

Synthetic blade surfaces with infill consist of a base layer for structural integrity and drainage, which is typically crushed stone, plus a membrane and synthetic grass matrix. A base layer of washed silica is used as a weight to hold the grass matrix in place. The top surface(s) comprise an elastic material to simulate natural grass, which offers both traction and softness. There are many options offered by a variety of vendors. Most options are either a two-layer surface (silica base layer plus a top elastic infill) or a three-layer surface (middle layer is a mixture). The top layer consists of natural cork particulates interspersed between synthetic blades.

The benefits of a cork infill artificial turf field are:

- The warranty for any synthetic surface is 8 years
- One of the companies that produces it is part of the Keystone Cooperative, which may extend favorable pricing to Glen Ridge.
- There is precedent for its use in other towns in the U.S. with comparable levels of play
- It simulates natural turf with blades of nylon 'grass'
- The infill can be replaced by the vendor, in the event of an untoward result
- The Committee strongly recommends that, if this option is chosen, the Borough Council stipulate in the contract that any replacement infill must be completely free of crumb rubber (SBR)
- If this surface fails, it can be discarded and recycled
- There are fewer heat issues with a cork infill than with other artificial turf surfaces
- There is no rain related lack of play
- This surface meets the current needs for play at Hurrell and can exceed those hours, potentially increasing playing time, and contributing to off-loading of the other fields
- Usage may commence earlier in the playing season than with natural grass (eg. March & early April) when the fields are in high demand.

The potential disadvantages of a cork infill artificial turf field are:

- It is more costly than hybrid grass
- Committee members have not toured a cork infill field
- The surface temperature of and ambient heat generated by a cork infill surface is significantly higher than by a grass or hybrid grass field
- Dogs cannot be permitted on artificial turf surfaces
- Cork particulates may become airborne
- Cork particulates are heterogeneous in size and shape

- In describing the optimal playing surface for their respective sports, professional field hockey and baseball organizations specify non-infill surfaces.
- It is a composition which has the community disadvantage of being an artificial surface.

Secondary Recommendations:

In addition to the primary recommendations detailed above, the members of the Committee view the following information and recommendations as valuable and worthy of inclusion in this report.

- The Borough should provide adequate training to the maintenance staff, no matter what surface is selected. Since there is a Councilperson on the Hurrell Advisory Committee, he can provide continuity on the subject at the Borough Council.
- Repair divots in Hurrell's current field surface in a timely fashion, on an ongoing basis, with reseeding as needed throughout the year.
- Remediate the GRHS Field to maximize its use.
- Build upon the work performed by the Usage Subcommittee of this Committee by generating a superior scheduling strategy, including enabling software programs and updates.
- Consider designating the portion of Hurrell Field that is not lined as a baseball diamond to be a "games-only" venue to preserve the condition and longevity of whatever surface is installed.
- When George Washington Field decides on its already planned synthetic surface, the Borough should recommend a cork infill turf, for all reasons mentioned herein.

Introduction

The Borough of Glen Ridge owns and maintains five athletic fields of varying sizes and utilities for use by its 7,594 residents. An additional sports field at Glen Ridge High School (GRHS) is also available for use but is owned by the Glen Ridge Board of Education. The Borough's athletic fields are primarily used by three groups: GRHS student athletes, participants in the Borough's organized recreational sports program, the Glen Ridge Athletic Association (GRAA), and the Borough's residents at large. Over time, demand by GRHS and GRAA has come to exceed field availability. To accommodate the increased need, GRHS and GRAA travel to four fields outside the Borough, in addition to using the fields of Glen Ridge.

On November 25, 2013, Mayor Peter Hughes, on behalf of the Borough Council, convened a committee of volunteers and requested that they study the subject, and recommend a solution for the modernization of Hurrell Field.

The Committee was instructed to follow these guidelines: (i) to not consider synthetic surfaces that use recycled crumb rubber infill (comprised of styrene butadiene rubber or "SBR"); (ii) to not consider recommending that the Borough reduce usage by eliminating activities; and (iii) to not consider maintaining the status quo. The Mayor reiterated that there would not be lights placed at Hurrell, therefore limiting playing time to daylight hours. The Mayor informed the committee that Glen Ridge and Montclair will be working with grants to install an artificial turf surface at George Washington Field, which would likely result in Glen Ridge having to split access to Washington field in the Fall and Spring seasons, thereby reducing access in the Fall but increasing access in the Spring.

This report contains the recommendations of the Committee, and the information upon which they are based.

Background of Hurrell Field

Since its acquisition of the parcel of land now known as Hurrell Field, the goal of the Borough Council historically has been to maintain it as "a first class athletic facility" for senior school sports events. On several occasions through the last century, the Borough has wrestled with issues that have arisen from the wear and tear associated with increased use at Hurrell. Since 1956, the Board of Education has paid the Borough a fee to perform custodial and landscaping work between practices, games and meets played by the schools' teams and use during gymnasium sessions by GRHS students. At that time, the Board of Education was the exclusive user of Hurrell, and the maintenance agreement prohibited the Borough from making any other use of the facility when student athletic use was taking place.

On November 13, 2002 in order to obtain a grant of state aid, the Borough executed a declaration of encumbrance with the State of New Jersey Department of Environmental Protection that prohibited use of Hurrell for purposes other than recreation and conservation.

In October 2006, Ordinances 1457 and 1458 were proposed, for $5.6 million and $1.1 million respectively, to include installation of a synthetic playing surface at Hurrell as well as many other public works improvements (1457) and improvements to Carteret Park (1458). On November 3, 2006 the Borough received and certified petitions opposing both ordinances. 1144 signatures against Ordinance 1457 and 1457 signatures against Ordinance 1458, although only 418 signatures were needed to invalidate said ordinances. On February 6, 2007 a special election was held asking the same two questions in a binding referendum. The result of the referendum on February 6, 2007 was no to both questions, as follows: Question 1: NO – 1309 and YES - 392; Question 2: NO – 1036 and YES – 664.

On April 15, 2007 Glen Ridge commissioned a written report from Richard J. Buckley, the Director of the Plant Diagnostic Laboratory at Rutgers, The State

University of New Jersey. The report stated, among other things, that Hurrell Field was in exceptionally poor condition, and was largely unplayable due to overuse. It advised a level of reasonable use and made a variety of recommendations regarding the care of the field, including soil and grass maintenance practices, allocation of adequate resources and staff training, reduction of use, and community education on proper use of the field. The Borough adopted some but not all of the recommendations. In particular, it did not reduce usage of Hurrell Field and did not engage in community education.

On July 16, 2007 the Borough Council approved a Bond Ordinance, which included improvements to Hurrell. Between June and August 2009, the gravel running track was replaced with a composite track and a third party vendor installed a new drainage system under the grass on the football field. The drainage was not properly installed and failed, so the Borough contracted with a second vendor to perform remediation on the drainage system. In November 2010 the original vendor that performed the work on the football field compensated the Borough for expenses the Borough paid the second vendor to correct the drainage issues.

In 2012 the Borough was approached by a group of citizens seeking to donate funds to replace the natural grass surface of the field with artificial turf. The Borough Council determined that the issue of a non-grass field surface would be put to a referendum on the November 2012 ballot. Accordingly it set a deadline by which the donating citizens had to confirm pledges representing a specified portion of the funds to resurface the field in order to get the question on the 2012 ballot. When the donating citizens failed to obtain the requisite amount of pledges by that deadline, the question was not put on the ballot in 2012.

A press conference was held on July 31, 2013 to announce the Mayor's intention to request that the town council permit a referendum question be put to the citizens asking for permission to install an artificial turf field at Hurrell Field. At the next meeting of the town council in August 2013, several citizens requested that a second question be offered allowing voters to approve a non-crumb rubber synthetic surface. Subsequently, the Borough Council amended the questions, and authorized a revised nonbinding referendum for the following questions:

PUBLIC QUESTION #1

> *SHOULD THE BOROUGH OF GLEN RIDGE INSTALL AT HURRELL FIELD AN ARTIFICIAL TURF FIELD REGARDLESS OF ITS COMPOSITION AT AN ESTIMATED COST OF BETWEEN $900,000 AND $1,000,000 (WITH THE POSSIBILITY THAT ACTUAL COSTS MAY BE MORE OR MAY BE LESS), FUNDING A SUBSTANTIAL PORTION OF SAID COSTS FROM CONTRIBUTIONS, AND PAYING THE BALANCE BY USING THE CAPITAL IMPROVEMENT FUND OR THROUGH THE ISSUANCE OF BONDS OR BOND ANTICIPATION NOTES?*

PUBLIC QUESTION #2

> *SHOULD THE BOROUGH OF GLEN RIDGE INSTALL AT HURRELL FIELD AN ARTIFICIAL TURF FIELD WITH OTHER THAN HISTORICALLY CONVENTIONAL*

CRUMB OR CRUSHED RUBBER COMPOSITION AT AN ESTIMATED COST OF BETWEEN $900,000 AND $1,000,000 (WITH THE POSSIBILITY THAT ACTUAL COSTS MAY BE MORE OR MAY BE LESS), FUNDING A SUBSTANTIAL PORTION OF SAID COSTS FROM CONTRIBUTIONS, AND PAYING THE BALANCE BY USING THE CAPITAL IMPROVEMENT FUND OR THROUGH THE ISSUANCE OF BONDS OR BOND ANTICIPATION NOTES?

The result of the referendum on November 5, 2013 was no to both questions, as follows:

Question 1
- Yes – 1069
- No - 1332

Question 2
- Yes – 1047
- No - 1317

On November 25, 2013, Glen Ridge Mayor Peter Hughes convened a committee comprised of a cross-section of citizens and assigned it the task of recommending to the Borough Council a surface for Hurrell Field.

The Committee

The Committee was assembled by Mayor Peter Hughes. As Co-Chairs of the Committee, Mayor Hughes selected Joseph Auborn and Sujana Chandrasekhar. In consultation with the chairs, he chose David Campbell, Alexia de Fays, Christine Heinicke, Kathy Kogut, Beth Larkin, David Lefkovits, RoseAnn Murray, Bob Salvatelli, Michael Sherman, and Lorraine Torralva. Mayor Hughes assigned Michael Rohal, the Glen Ridge Borough Administrator, to be the liaison of the Borough to the Committee. Mayor Hughes and Mr. Rohal were non-voting participants in the Committee's meetings.

All of the Committee members are residents of the Borough. Mr. Auborn is Treasurer of GRAA. Ms. Chandrasekhar and Mr. Sherman are members of the Board of Health for the Borough. Mr. Lefkovits is a member of the Borough Council. Mr. Campbell is a member of the Board of Education. By design, three of the members of the Committee own and reside in homes that abut Hurrell Field and they and other Committee members have been actively participating in the Borough's consideration of the issue of Hurrell Field for years. None of the members of the Committee would be candidates to provide a service in connection with the installation or maintenance of any surface or otherwise have a pecuniary interest in any possible recommendation of the Committee.

On January 10, 2014 the Borough issued a press release announcing the formation of the Committee and welcoming input from other concerned citizens by email to

hurrell@glenridgenj.org. Since the press release, 8 communications were received at that email address and reviewed by the Committee.

Methodology

The mission of the Hurrell Advisory Committee was to craft an actionable recommendation for the surface of Hurrell Field which maximizes its use while accounting for many factors, including the impact on other fields currently in use.

In order to achieve that mission, four subcommittees were created, as follows:

- **Cost** This group provided a comparative analysis of the up-front costs of the suitable options that are available. An in depth analysis of current maintenance costs versus costs of the other surface options was performed.
- **Options** This group was responsible for analyzing suitable options that are available, including vendors, products, strengths/weaknesses, maintenance protocols, warranty issues, etc.
- **Risk** This group analyzed environmental, health, and other risks of the available options.
- **Usage** This group analyzed the field usage by the citizens of Glen Ridge, including Hurrell and other in-town and out-of-town fields, current and future. It also analyzed the impact that resurfacing Hurrell will have on the conditions at Carteret and Forest Ave Fields.

The subcommittees worked to gather information, and the entire Committee met approximately once every two weeks to evaluate the information on an ongoing basis.

1. Demand for Field Use

A. Fields in Use

The fields currently in use by the field sports teams of GRHS and GRAA are:

- Brookdale Park, in Montclair and Bloomfield,
- Carteret Park,
- Forest Avenue Field,
- George Washington Field (Fall use only),
- Glenfield Park,
- Glen Ridge High School's Field,
- Hurrell Field, and
- Watsessing Park, in Bloomfield.

Sherman Avenue Field and Clay Field are also owned by the Borough but are limited to GRAA youth sports, and are not in use or recommended for use by GRHS field sports, and are not big enough for goal sports. Currently, the only sports that are played at Hurrell Field are football and baseball, with the GRHS Marching Band performing at Hurrell Field during GRHS Varsity Football home games.

Hurrell Field is located between Bloomfield Avenue and Belleville Avenue, within 0.2 miles of GRHS. Student athletes generally walk from GRHS to Hurrell Field for practices and games. No use of buses or other transportation is needed to move students from GRHS to Hurrell Field.

George Washington Field is located at 98 Baldwin Street in Montclair, 0.87 miles from GRHS. Carteret Field is located on Carteret Street in Glen Ridge, 1.1 miles from GRHS. Forest Avenue School is located on Forest Avenue in Glen Ridge, 1.7 miles from GRHS. Brookdale Park is located in Montclair, 3.7 miles from GRHS. Students are required to arrange their own transportation to these venues for practices and games. Currently all of these fields have natural grass as their surface.

> Note: Washington Field is currently used exclusively by Glen Ridge in the Fall and exclusively by Montclair in the Spring. Monies have been received by Glen Ridge and Montclair to resurface Washington Field with a synthetic playing surface. Once resurfaced, it is anticipated that Washington Field will be shared equally by both towns during both seasons, thereby reducing its availability to Glen Ridge by half in the fall, but adding that many available usage hours in the spring.

Watsessing Park is located in Bloomfield, 1.5 miles from GRHS. It is an artificial surface manufactured using a crumb rubber infill. GRHS provides bus transportation for its student athletes participating in practices and events held at Watsessing Park.

Glen Ridge's fields are for the exclusive use of Glen Ridge residents and students. Washington Field is shared between Glen Ridge and Montclair. Brookdale and Watsessing Parks are county fields and shared amongst several towns in Essex County.

Table 1

Field	Distance from GRHS	Transportation (GRHS)
Brookdale Park	3.7 miles	Student responsibility
Carteret Park	1.1 miles	Student responsibility
Forest Avenue Field	1.7 miles	Student responsibility
George Washington Field	.87 mile	Student responsibility
Glenfield Park	.70 mile	Student responsibility
GRHS	n/a	n/a
Hurrell Field	.20 mile	Student responsibility
Watsessing Park	1.5 miles	BOE Bus

B. Field Sports

The field sports are divided into Fall Sports and Spring Sports, based on when the respective sport's regular season is played. Fall includes the time period between August and December. Spring includes the time period between February and June.[1]

The Fall Sports for both GRHS and GRAA are football, soccer and field hockey. The GRHS Marching Band is active in the Fall. The Spring Sports for both GRHS and GRAA are softball, baseball and lacrosse. GRAA also plays soccer in the Spring. The information set forth below is based on scheduled usage during the 2011-2013 field sports' seasons. The average field usage during each of those years represents usage during an average year.

In reviewing field usage, the Committee considered the relative age of the participants, since older players will create greater impact onto a field surface. The degree of impact per sport on surface, and the disparity between the impacts on field surfaces of practices versus games, were also taken into consideration.

Football

GRHS Football includes a Varsity team and a Junior Varsity team comprised of a total of approximately 45 boys in grades 9 through 12. GRHS Football uses Hurrell Field for 40 hours for games during its season and 77 hours for practices. The teams hold practices totaling 54 hours at George Washington Field during the season.

GRAA Football includes teams comprised of approximately 120 children in grades 1 through 8. Those teams use Hurrell Field for 27 hours for games during their seasons and another 5 for games at Carteret Park. GRAA football practices totaling 130 hours are held at George Washington Field during the season.

In the aggregate, GRHS and GRAA football combine for a total field usage of 72 hours for games and 207 hours for practices.

Soccer

GRHS Soccer includes Varsity teams and Junior Varsity teams comprised of approximately 35 boys and 35 girls in grades 9 through 12. Junior Varsity soccer uses George Washington Field for practices totaling 108 hours during their season. Varsity soccer uses Carteret Park for 102 hours for its practices, and JV

[1] Hurrell Field is also used in the summer for GRAA and League Baseball.

Soccer uses Carteret Park for 46 hours for its games. GRHS Varsity Soccer practices for 12 hours and hosts home games totaling 50 hours hosted at Watsessing Park.

GRAA Soccer includes teams comprised of approximately 540 boys and girls between pre-kindergarten and eighth grade. GRAA Soccer uses George Washington Field for 120 hours, including 70 for practices and 50 for games. GRAA Soccer uses Carteret Park for 64 hours for games. GRAA Soccer uses Brookdale Park for 150 hours for practices, and it uses Forest Avenue School for 54 hours of games.

In the Spring season, GRAA Soccer uses Forest Avenue School for game sessions totaling 32 hours and 40 for practice sessions. It uses Brookdale Park for 150 hours of practices in the Spring. Approximately 350 boys and girls usually participate in Spring Soccer.

In the aggregate, GRHS and GRAA soccer combine for a total field usage of 410 hours for practices and 200 hours for games in the Spring and Fall. Neither GRHS Soccer nor GRAA soccer uses Hurrell Field.

Field Hockey

GRHS Field Hockey includes a Varsity team and a Junior Varsity team comprised of approximately 35 girls in grades 9 through 12. Practice sessions totaling 80 hours and games using 68 hours are held at Forest Avenue Field.

GRAA Field Hockey includes teams comprised of approximately 120 girls between grades 3 and 8. GRAA Field Hockey practice sessions consisting of 50 hours of use, and games consisting of 40 hours of use, are held at Forest Avenue Field. GRAA Field Hockey holds another 16 hours of practice at Glenfield Park in Montclair.

In the aggregate, GRHS and GRAA field hockey use 146 hours of field time for practices and 108 for games.

Marching Band

Glen Ridge High School Marching Band is comprised of approximately 60 students in grades 7 through 12. GRHS Marching Band uses GRHS Field for practices totaling 268 hours during their season. GRHS Marching Band plays during the four home varsity games at Hurrell Field and GRAA football pep rally.

Baseball

GRHS Baseball includes a Varsity team and a Junior Varsity team comprised of approximately 30 boys. GRHS Varsity baseball holds all practices and home games at Hurrell Field, and JV baseball holds all practices at Hurrell Field. Practices use 95 hours of field time at Hurrell. GRHS Varsity home games use 38 hours of field time at Hurrell. GRHS JV Baseball hosts all of its home games at Brookdale Park. The total number of hours required to play those games is approximately 30.

GRAA Baseball includes teams comprised of 315 boys between pre-kindergarten and 8th grade. Many of the younger boys practice and play home games at Clay Field, Sherman Avenue Field, Brookdale Park, and other smaller fields in Glen Ridge. This report will only consider the 7th and 8th grade travel teams. GRAA baseball games require 48 hours of field time at Hurrell and practices require another 24 there. GRAA baseball also uses 24 hours of field time at Glenfield Park in Montclair for practices and another 58 hours for games.

In the aggregate, at the higher grade levels, GRHS and GRAA baseball combine for a total field usage of 143 hours of practices and 126 hours for games.

Lacrosse

GRHS Lacrosse includes Varsity and Junior Varsity teams comprised of approximately 50 boys and 35 girls. The GRHS Boys Lacrosse teams (Varsity and JV) use Carteret Park for practice sessions totaling 65 hours. GRHS Girls Lacrosse (Varsity and JV) uses Forest Avenue Field for practice sessions totaling 42 hours. GRHS Girls and Boys Lacrosse also use Watsessing Park for games totaling 70 hours and practices totaling 149 hours.

GRAA Lacrosse includes teams comprised of approximately 345 boys and girls between grades 1 and 8. GRAA Lacrosse uses Carteret Park for practices totaling 95 and games totaling 65 hours, and Forest Avenue Field for 60 hours of practice and 40 hours of games.

In the aggregate, GRHS and GRAA lacrosse combine for a total field usage of 316 hours for practices and 175 hours for games.

Softball

GRHS Softball includes a Varsity team and a Junior Varsity team comprised of approximately 32 girls. GRHS JV Softball holds 80 hours of practices and 25 hours of games on its own field at GRHS. The Varsity Softball team holds 84 hours of practices and another 40 hours of games at Glenfield Park in Montclair, New Jersey.

GRAA Softball includes teams comprised of approximately 80 girls between pre-kindergarten and 8th grade. Many of the younger girls practice and play home games at Clay Field, Sherman Avenue Field and other local fields. This report will only consider the older travel teams. Those teams hold total of 80 hours of practices and 30 hours of games at Glen Ridge High School's softball field, and 32 hours of practice at Carteret.

In the aggregate, GRHS and GRAA softball combine for a total field usage of 276 hours for practices and 95 for games.

In addition to youth and high school softball, there are local recreational softball leagues that use Carteret Park for 135 hours and Forest Avenue School for 15 hours in June and July.

Weekly Field Use

The usage figures listed above and in Table 2, below are annual figures. However, the annual number of hours shown for each field are not spread evenly over the course of a calendar year. For example, a field that shows annual use for a sport of 52 hours is not used one hour per week by that sport. Daily and weekly use of the fields shown increases and decreases based on which sport is in season. Obviously, at their least-used (in Winter, for example), most fields are scheduled for zero hours of play by GRHS and GRAA.

At their most-used, the following fields are used for the following number of hours:

In the peak of the Fall season, Forest Avenue Field, George Washington Field, and Hurrell Field are each used at least 22 hours per week (with aggregate usage in excess of 75 hours in the busiest week), and Carteret Park over 35 hours per week.

In the peak of the Spring season, Forest Avenue Field is used over 27 hours per week, Carteret Park is used approximately 30 hours per week, and Hurrell Field is used approximately 20 hours per week. As in the Fall, in the busiest week of the Spring season, GRHS and GRAA use the combination of those four fields over 75 hours per week. Washington Field is not used by GRHS or GRAA in the spring season.

Summary of Field Usage

The total amount of hours required by the field sports is 2,859, with 1,505 during the Fall and 1,354 during the Spring. The total number of hours required for games is 1,099, with 556 during the Fall and 543 during the Spring. The number of hours required by GRHS field sports teams is 1,355. The number of hours required by GRAA field sports teams is 1,504.

Table 2 – Games and Practices by Sport and Field, GRHS and GRAA

GRHS GAMES	Brookdale	Carteret	Forest	Washington	Glenfield	GRHS	Hurrell	Watsessing
Football							40	
Soccer		46						50
Field Hockey			68					
Baseball	30						38	
Lacrosse								70
Softball					84	80		
Marching Band						4	4	
	30	46	68		84	84	82	120

GRHS GAMES TOTAL: 514

GRHS PRAX	Brookdale	Carteret	Forest	Washington	Glenfield	GRHS	Hurrell	Watsessing
Football				54			77	
Soccer		102		108				12
Field Hockey			80					
Baseball							95	
Lacrosse		65	42					149
Softball					40	25		
Marching Band						268		
		167	122	162	40	293	172	161

GRHS PRACTICES TOTAL: 1117

GRAA GAMES	Brookdale	Carteret	Forest	Washington	Glenfield	GRHS	Hurrell	Watsessing
Football		5					22	
Soccer		64	86	50				50
Field Hockey			70					
Baseball					58		48	
Lacrosse		65	40					
Softball						30		
		134	196	50	58	30	70	50

GRAA GAMES TOTAL: 593

GRAA PRAX	Brookdale	Carteret	Forest	Washington	Glenfield	GRHS	Hurrell	Watsessing
Football				130			6	
Soccer	300		40	70				
Field Hockey			40		16			
Baseball					24		24	
Lacrosse		95	60					
Softball		32				80		
	300	127	140	200	40	80	30	

GRAA PRACTICES TOTAL: 911

ALL GAMES TOTAL: 1,107
ALL PRACTICES TOTAL: 2028
CURRENT USAGE AT HURRELL FIELD: 329
TOTAL USAGE: 3,135

2. Surface Options

Elimination of Crumb-Rubber Infill

Based on the result of the referendum on November 5, 2013, Mayor Hughes determined that while a Committee comprised of a collection of citizens assigned the task of recommending a surface for Hurrell was appropriate, enough residents are opposed to the installation of an artificial grass surface that is manufactured using an infill containing crumb rubber recycled from auto tires (or SBR) that the Committee was instructed not to consider that as a possible surface solution. As such, information regarding that type of surface is not included in this report.

Surface Options

The Committee reviewed the remaining options available for the playing surface at Hurrell Field. Broadly, they include compositions of natural grass, synthetic turf containing various infills, synthetic non-infill turf, and a hybrid synthetic-natural grass surface. The major synthetic turf vendors that were contacted and evaluated were: Field Turf, AstroTurf, Shaw Sports Turf, ACT Global, Desso Sports, Geoturf, and A-Turf, Inc. In examining the various surface options, the Committee reviewed a number of research reports authored by individuals and entities both financially interested and uninterested in the outcome, and did so in an unbiased fashion.

Natural Grass

Review of a completely natural grass playing surface, whether similar to the one presently used or not, began with an examination of whether any 100% natural grass surface could handle the increased demands of the community.

In its report to the Borough of Glen Ridge in 2007 (Buckley Report), Rutgers, The State University of New Jersey, informed the Borough of Glen Ridge that, generally, "a natural grass sport field can tolerate up to 200 hours of use per year before turf quality begins to degrade. At 400 to 600 hours of play per year the turf quality will be severely eroded."

In 2014 the Borough contracted with Rutgers NJ Agricultural Experiment Station for providing advice with respect to the maintenance and treatment of the Town fields. With regard to Hurrell field, a number of drainage and maintenance issues were identified and a comprehensive set of recommendations was laid out. Details can be found in Appendix __.

Desso Sports, an athletic surface vendor estimates that average sports use of an all-natural grass field should not exceed 300 hours per year. The European Grass Seed Consortium, a trade group, sets the maximum usage number at 375 to 500 hours per year. As indicated above, the current annual hourly usage of Hurrell Field by GRHS and GRAA, not to mention the resident population at large, approaches, or exceeds

these various limits. Given these limitations, the Committee could not identify a natural grass option for Hurrell Field.

Synthetic Surfaces

The three main synthetic surface types below were each carefully examined and are described. There are several manufacturers and service providers that produce, install, and maintain these three general surface types. They are listed below each surface type.

The synthetic blades used in all three surface types fall into three categories: nylon, polyethylene, and a blend of nylon and polyethylene, and into four types of blade construction: monofilament, fibrillated, slit film, or a mix of these three types.

- Synthetic Surface with Infill

  Infill turf is the most widely used option. It comprises a base layer for structural integrity and drainage, which is typically crushed stone, plus a membrane and synthetic grass matrix. A base layer of washed silica is used as a weight to hold the grass matrix in place. The top surface(s) comprise an elastic material to simulate natural grass which offers both traction and softness. There are many options offered by a variety of vendors. Most options are either a two-layer surface (silica base layer plus a top elastic infill) or a three-layer surface (middle layer is a mixture).

  Among the synthetic blades is spread an infill. Infill can be comprised of synthetic or natural materials. Different types of infill include: (i) a combination of cork and coconut husk, (ii) complete cork, (iii) thermoplastic elastomer, or "TPE", (iv) silicone-coated sand, and (v) newly-manufactured rubber (as opposed to granules from recycled rubber tires) or "EPDM".

  The vendors selected by this Committee for consideration that provide synthetic turf with infill turf are Field Turf, AstroTurf, Shaw Sports Turf, ACT Global, Desso Sports, Geoturf, and A-Turf, Inc. Geoturf does not offer a product using nylon turf or a blend using nylon, but does offer products using the other three blade types. All others will provide synthetic infill turf using any of the four blade types. In addition, ACT Global will use a fibrillated blade, AstroTurf, Field Turf, and Geoturf will all use a slit film or mix of slit film and monofilament blade, and Aturf, Inc. will use parallel long slit fiber blades.

  As to infill options, only Field Turf (cork only), Geoturf (cork/coconut blend) and Shaw Sports Turf (pellets containing a mix of vegetable and mineral components including coconut and cork) offer infills that include cork, coconut, or a combination thereof. All of the vendors offer a TPE infill

product. Desso, Field Turf, and Geoturf do not offer a product that uses silicone-coated sand or EPDM.

- Synthetic Surface Non-Infill

  The original Astro Turf is a synthetic carpet without particulate matter spread among the artificial blades. The current technology is much thicker than when originally invented. The blades are .75 inches tall, with a pad beneath those blades that is 1.25 inches thick. Like an infill surface, non-infill turf comprises a membrane beneath an impact pad beneath the synthetic grass surface. All three layers are fused together and rest atop a crushed stone layer.

  Of the vendors evaluated, Desso, AstroTurf, and Aturf, Inc. currently make available a non-infill product.

- Hybrid Natural Grass-Synthetic

  Hybrid surfaces use a combination of natural grass and synthetic blades. Synthetic blades are anchored (injected) in a porous, sand soil mix, one-half inch apart from one another, eight inches beneath the ground surface, and protrude .75 inches above. Natural grass is planted between the synthetic blades. The ratio of natural grass blades to synthetic blades is approximately 97 to 3. Grass roots intertwine with the anchored synthetic blades to provide stability for the root system. The manufacturer states that the synthetic blades 8 inches down also provide improved drainage. Other than co-existing with the anchored synthetic blades, the natural grass in a hybrid surface is grown and maintained in all ways like natural grass.

  Of the vendors examined, Desso makes available an affordable hybrid surface called Grassmaster.

Table 3 – Vendors and Product Scope

Infills→ **Blades↓**	Cork and Coconut Mix	Cork	Thermoplastic Elastomer	Silicone-coated sand	Virgin Rubber
Nylon	Fieldturf Shaw	Fieldturf Shaw	Astroturf Desso Fieldturf Shaw	Astroturf Shaw	Astroturf Shaw
Polyethylene	Fieldturf Geoturf Shaw	Fieldturf Geoturf Shaw	Astroturf Desso Fieldturf Geoturf Shaw	Astroturf Shaw	Astroturf Shaw
Monofilament	Fieldturf Geoturf Shaw	Fieldturf Geoturf Shaw	Astroturf Desso Fieldturf Geoturf Shaw	Astroturf Shaw	Astroturf Shaw

Blend of 2 of above	Fieldturf Geoturf Shaw	Fieldturf Geoturf Shaw	Astroturf Desso Fieldturf Geoturf Shaw	Astroturf Shaw	Astroturf Shaw

When considering the information the Committee received concerning field usage against the backdrop of the information it received concerning the various surface options, it drew the following conclusions, based on a variety of hypothetical situations. Since those original deliberations, Mayor Hughes has announced that Glen Ridge has been awarded a $150,000 grant for the installation of artificial turf at Washington Field and the Town Council has read ordinance 1612 for the $300,000 balance of the cost to Glen Ridge to resurface Washington Field in partnership with Montclair and Essex County.

Other Considerations

The Borough's plan to resurface Washington Field and enter into a revised field sharing agreement with the Township of Montclair will create availability to our athletes in the spring but decrease availability to them in the fall. The Committee studied the effect of rain on the various surfaces and calculated the hours lost under several scenarios based on the advertised impact of the different surfaces after an average winter and an average summer, as applicable. Its findings are below.

Hypothetical #1: George Washington Field is resurfaced using a synthetic turf infill or non-infill surface but Hurrell Field is left in its current state.

Hypothetical #2: Both George Washington Field and Hurrell Field are resurfaced using a synthetic turf infill or non-infill surface.

Hypothetical #3: George Washington Field is resurfaced using a synthetic turf infill or non-infill surface but Hurrell Field is resurfaced using a hybrid surface.

Hypothetical #4: Both George Washington Field and Hurrell Field are resurfaced using a hybrid surface. (no longer an option due to artificial turf at Washington field)

Hypothetical #5: Both George Washington Field and the GRHS softball field are resurfaced using a synthetic infill or non-infill turf but Hurrell Field left in its current state.

In all hypotheticals, based on advertised estimates, the fields that are refurbished with synthetic based and bladed surfaces avoided the loss of 25% of field usage per season to rain. The fields that remained all-natural grass suffered those losses. The fields that are refurbished with hybrid, despite the manufacturer's claim of no loss

of weather-related playing time, were assumed by the Usage subcommittee to lose the actual day of rain, or 12% of field usage per season to rain.[2]

	HURRELL	WASHINGTON	CARTERET	FOREST	BROOKDALE	WATSESSING	MARCHING BAND	TOTALS
TOTALS	**292**	**270**	**461**	**572**	**300***	**369**	**272**	**2236**
Totals with Rain (-25% on grass)	**219**	**203**	**346**	**429**	**225**	**362**	**201**	**1784**
SCENARIOS								
A (fescue-type grass H and turf W)	-25%		-25%	-25%	-25%			
	219	**270**	**346**	**429**	**225**	**362**	**201**	**2052**
B (turf H and turf W)			-25%	-25%	-25%			
	292	**270**	**346**	**429**	**225**	**362**	**201**	**2125**
C (Desso H and turf W)	-12%		-25%	-25%	-25%			
	257	**270**	**346**	**429**	**225**	**362**	**201**	**2090**
D (Desso H and Desso W	-12%	-12%	-25%	-25%	-25%			
	257	**238**	**346**	**429**	**225**	**362**	**201**	**2058**
E (turf W & GRHS)	-25%		-25%	-25%	-25%			
	219	**270**	**346**	**429**	**225**	**362**	**268**	**2119**

3. Risks

The Committee researched and analyzed the available data regarding three types of risk associated with the various playing surface options available for use. They are the risk of injury to participants, the risk of damage to the local and global environment and health risks associated with toxicology. Once again, for reasons set forth elsewhere in this report, the only available surface type that was not evaluated was synthetic infill using recycled crumb rubber.

The Committee reviewed over fifty studies regarding the risks associated with athletic fields. In particular it sought out objective presentations in medical journals, studies issued by state and local governmental agencies, trade publications, school districts and universities as opposed to representations from manufacturers.

The Committee was faced with challenges in conducting its research and drawing conclusions regarding risks associated with the various surface options. Simply put, the Committee faced a dearth of independent, unbiased information, studies and analyses regarding the surfaces under consideration. Specifically:

[2] http://climate.rutgers.edu/stateclim_v1/data/njhistprecip.html

- Outdated information

  First, the surfaces available for installation at Hurrell Field in 2014 are different from those involved in many, if not most, of the studies identified by the Committee. Many of the studies review data regarding artificial turf playing fields with crumb rubber infill. But the variety of surfaces available to us today has grown.

- Information regarding Synthetic Non-Infill

  Many of the studies reviewed compared environmental and health risks associated with synthetic surfaces to those associated with natural grass. However, there was a dearth of comparisons between and among the different synthetic surface types being considered by the Committee.

- Information regarding hybrid surfaces

  The Committee did not discover an independent study available regarding a hybrid synthetic/natural grass surface, whether by comparison to other synthetic surfaces or natural grass. This surface type was first installed in the United States in Denver, Colorado in 1999 at a professional football stadium. It has not yet been installed on a field sport surface used by high school athletes in the United States.

Findings Regarding Injury and Health Risks to Participants

In general, in the aggregate, the studies comparing the risk of injury for athletes playing on natural grass to those playing on artificial turf did not lead the Committee to conclude that either is significantly safer than the other. Independently, the studies suggest increased or decreased risk of injury (10-35% in either direction) depending upon the sport being played. For example, among independent studies regarding leg injuries such as those to the anterior cruciate ligament, there were somewhat higher incidences of injuries during football games played on synthetic surfaces than on natural grass surfaces, but somewhat lower incidences during soccer games under the same circumstances.

Despite claims from synthetic field surface manufacturers, evidence supports the view that artificial turf fields have higher surface temperatures than natural grass fields. However, heat released by synthetic surfaces appears to dissipate rapidly above the field surface. Therefore, the temperature of respired air for all but the younger (short) athletes would not be expected to be much higher on artificial turf fields than on natural grass fields. Nevertheless, it is a widely observed practice not to play on synthetic surface fields on very hot days.

The Committee did not identify any reliable evidence that any of the synthetic field surfaces under consideration: (i) harbor dangerous bacteria that would carry an increased risk of infection to participants or spectators; (ii) contain or emit amounts

of known volatile or semi-volatile chemicals that exceed federal safety standards, including lead. The Committee did not identify any reliable reports that establish a relationship between the synthetic field surfaces under consideration and serious diseases that have an environmental etiological component (e.g., cancer).

Findings Regarding Environmental Risks

- Synthetic Based and Bladed Field Surfaces

  The field surfaces under consideration that contain a synthetic base and blades, regardless of infill, do not appear to pose a risk that known pollutants could leach into the underlying soil or nearby water supply. It is still possible, however, that as-yet-unidentified components are being leached and accumulation of these components or reaction with other elements could be detrimental to the environment. The synthetic field surfaces under consideration avoid the need for fertilizers and require reduced use of herbicides and pesticides. And many, if not most, components of the synthetic field surfaces under consideration (blades and infills) can be recycled.

  However, the synthetic field surfaces under consideration do not maintain the natural ecosystem sustained by natural grass, and do not provide the natural water filtration provided by natural grass.

- Hybrid Surface

  A hybrid surface may carry the same neutral and positive environmental effects as the two surfaces of which it is comprised. Specifically, because it is comprised of 97% natural grass, it would likely provide close to 97% of the water filtration that an all-grass surface provides and could sustain the natural ecosystem with close to the same effectiveness as sustained by natural grass. And we can also assume that the synthetic elements of the surface would not pose the risk that known pollutants could leach into the underlying soil or nearby water supply. In addition, the small percent of synthetic elements reduces any yet-unknown environmental risks.

  By the same logic, the hybrid field surface would likely pose some of the same environmental risks as the surfaces of which it is comprised. For example: (i) because it is comprised of 97% natural grass, it would not avoid the need for fertilizers, and would require herbicides and pesticides; and (ii) if the subsoil is not removed and only sod is placed over the field, the 20,000,000 synthetic nylon blades remain in the subsoil after surface replacement and are not biodegradable.

We must note that, as with all synthetic materials, it is still possible that as-yet-unidentified components contained in the synthetic elements of the hybrid surface are being leached into the underlying soil or nearby water supply and accumulation

of these components or reaction with other elements could be detrimental to the environment.

4. Cost

Overview

Because the Products Sub-Committee recognized that the number and type of different products resulted in great complexity in making comparisons, some vendors who offered more than one category of product (i.e., an infill product and a hybrid product), had only one of the product types considered for the purpose of comparing their costs. The assumption is that once the product type is recommended and selected, the cost from all vendors offering that product type will be revealed during the Open Bid process.

Vendors were provided with a description of the field and existing surface and a Hurrell Field Site Plan. Vendors were not provided formal bid specifications and as a result some factors of the initial installation had to be assumed. When the assumptions resulted in large cost differences, the options were separated resulting in two options for grass and one for the grass hybrid product.

As previously mentioned, a decision was made to include representative products from each of the four non-crumb rubber product types identified below:

- Grass
- Grass Hybrid
- Artificial turf with infill
- Artificial turf without infill

The two surfaces recommended by the Committee are highlighted in the following text, tables and graphs, and are Option 1: Hybrid Grass and Option II-F: Synthetic with Cork Infill.

Maintenance Costs

With respect to ongoing costs, efforts were made to obtain actual estimates for ongoing maintenance when available. In some cases estimates were created which were consistent within an option. The goal with respect to this data was to capture all possible expenses, evaluating each on its own merit. In some cases it was necessary to insert an estimated placeholder value for any expense, which could not precisely be established. The Committee added a 10% increase in annual maintenance assumptions for all surfaces (natural, synthetic, and hybrid) to cover unforeseen expenses.

These expenses include but are not limited to:

- Mowing/Lining Field

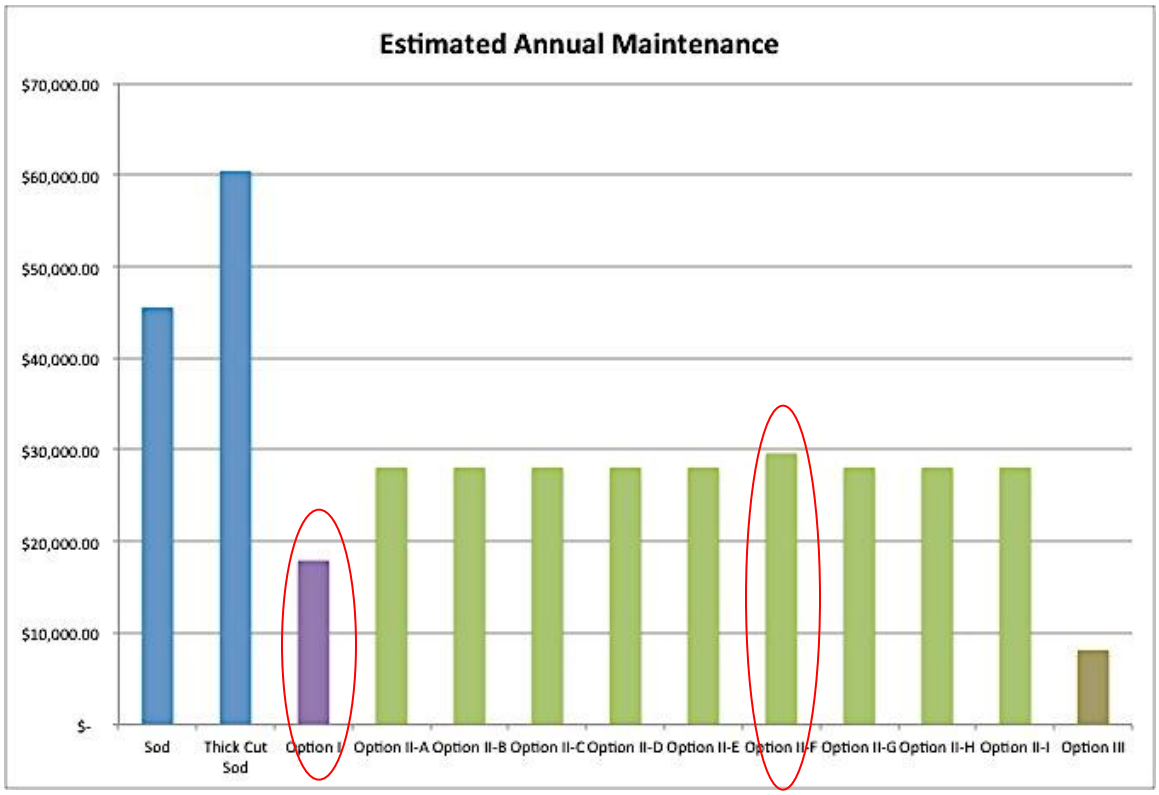
- Irrigation/Sprinkler Maintenance
- Water Consumption
- Infill Replacement
- Turf Repairs
- Equipment
- Additional Materials
- Contingency

Manpower Not Included. The annual maintenance expenses shown for each surface option below are expenses for *materials only*. Labor was not included in those calculations, as it was assumed that these expenses would be incurred irrespective of the playing surface at Hurrell Field. Glen Ridge expects to maintain its resources and any change in time allocated to Hurrell Field would re-allocated to other responsibilities of the Borough. Labor costs were also omitted from the Cost comparison of the different options because the estimated reduction in labor was nominal when compared to the installation, maintenance, and replacement costs for each option.

The Committee did not account for any increase in the number of hours when calculating the above labor expenses for natural grass-based surfaces (sod, hybrid). It could be assumed that the synthetic surface options reviewed would require approximately 66% less man hours on an annual basis. Because downsizing is not planned based on this decision, no cost saving was estimated and was excluded for the purpose of comparing the costs.

The table and graph below have the estimated annual maintenance costs by field type.

Table 4: Estimated Annual Maintenance				
Sod	$ 45,534.31		Option II-E	$ 28,081.50
Thick Cut Sod	$ 60,455.48		Option II-F	$ 29,636.69
Option I	$ 17,912.98		Option II-G	$ 28,081.50
Option II-A	$ 28,081.50		Option II-H	$ 28,081.50
Option II-B	$ 28,081.50		Option II-I	$ 28,081.50
Option II-C	$ 28,081.50		Option III	$ 8,115.75
Option II-D	$ 28,081.50			



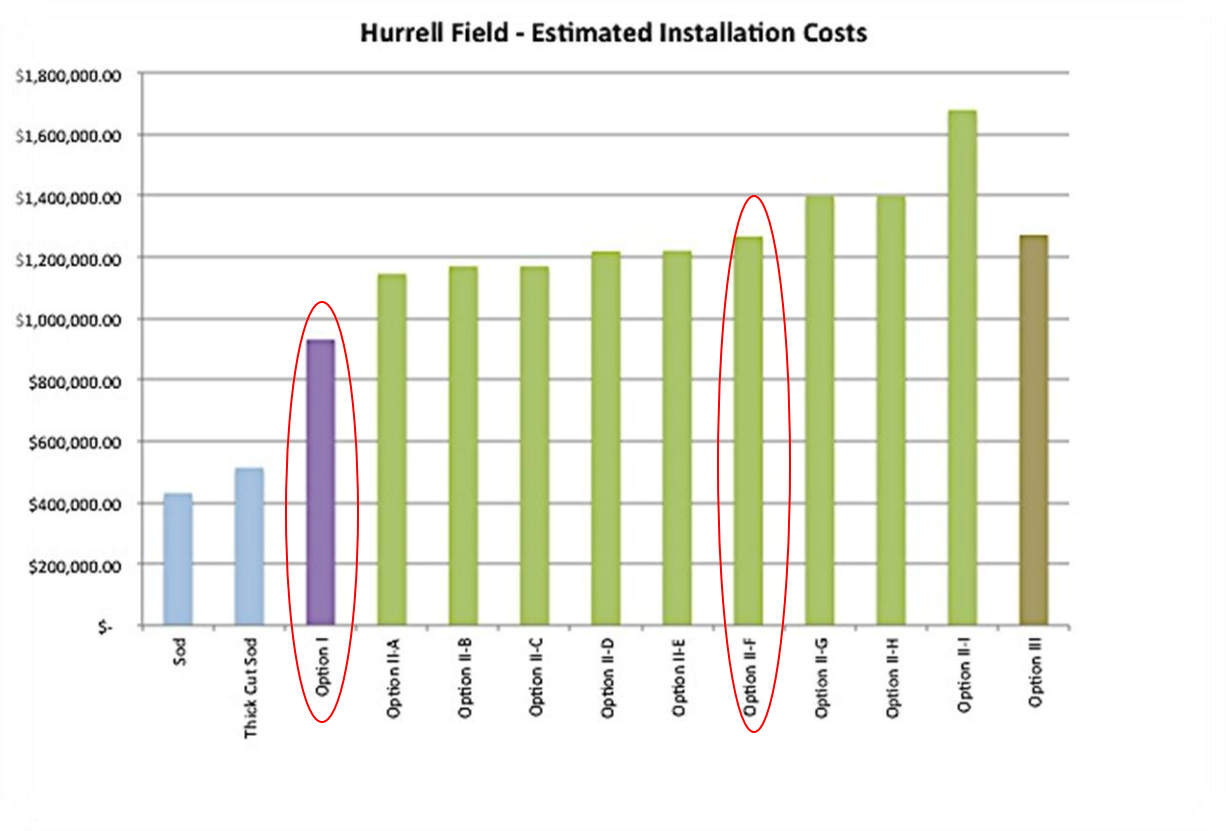
Evaluation of Installation Costs among Surfaces

Vendors were solicited to provide initial installation costs based on information provided by the Borough of Glen Ridge and a Field Site Plan provided by Pennoni Associates Inc. Dated 2/20/2009.

Estimates were valid for a specified period of time and do not replace information obtained during the formal bid process. Therefore, these estimates must be treated as such and will vary based on additional information obtained during a formal bid process.

The table and graph below have the estimated installation costs sorted by amount.

Table 5: Estimated Installation Cost				
Sod	$ 431,078.20		Option II-E	$ 1,220,498.00
Thick Cut Sod	$ 513,578.20		Option II-F	$ 1,267,426.37
Option I	$ 931,250.00		Option II-G	$ 1,400,000.00
Option II-A	$ 1,145,013.00		Option II-H	$ 1,400,000.00
Option II-B	$ 1,169,385.00		Option II-I	$ 1,678,750.00
Option II-C	$ 1,169,385.00		Option III	$ 1,271,750.00
Option II-D	$ 1,218,425.00			



Estimated Life and Net Present Value of Estimated Cost

The Committee used a life-cycle analysis to determine the most cost effective option among the ground surface options for Hurrell Field. This cost analysis included initial installation cost, and the annual cost of maintenance over a lifespan of the years covered by the product warranty. All the costs were discounted and totaled to the net present value of the estimated cost. The estimated life of all synthetic surface options was estimated to be 10 years, this analysis assumed two life cycles. . However, although the publicly available warranty information for the hybrid surface shown below (Option I) is only 5 years, the Committee assumed it to have a 15-year estimated life based on history of other installations.

Replacement / Disposal Costs

Vendors were unable to provide an estimate for both disposal of the existing artificial surface and replacement of the surface options at the end of its life cycle. The Cost Sub-Committee requested additional information to the original estimates that had been provided. Responses regarding disposal and replacement costs were inconsistent across vendors and surface types making an analysis difficult. Some of the estimates included a removal estimate, some included re-grading, and others attempted to estimate the entire job including removal, disposal, and replacement.

Since the responses were inconsistent, the Cost Sub-Committee used a disposal/ replacement estimate from the Sports Turf Managers Association (STMA). This is the national agency of the Sports Field Managers Association of New Jersey (SFMANJ) that is committed to enhancing the professionalism of athletic field managers.

The publication titled "A Guide to Synthetic and Natural Turfgrass for Sports Fields Selection, Construction and Maintenance Considerations"[3] says managers should "Plan on an approximate range of $6.50 to $7.80 per sq. ft. for the disposal and resurfacing of a synthetic field." Therefore the mid-point value of $7.10 per square foot was used to estimate the disposal and replacement cost of the artificial surface options for Hurrell Field provided in this report

Since the grass options including the grass hybrid does not have a disposal cost associated with it, the replacement value equaled has been estimated to be $328,125 which assumes the cost of replacing the natural grass elements.

Details of Estimated Cost in Net Present Value by Option

Grass - Reconditioning of Hurrell Field (Turface) – The basic cost to recondition Hurrell Field is $261,000. Ongoing maintenance of reconditioning the field in this manner has an anticipated annual expense of $45,534. Replacement Costs at the end of the life cycle are estimated at $130,500. Assumptions have been made that this ongoing expense includes such items as would be customary in maintaining an all grass field.

Grass - Replacement of Hurrell Field – Sod – This option will cost approximately $431,078 and includes the replacement of the entire surface of Hurrell Field with new sod. Assumptions include the possibility of replacement of drainage and sprinkler systems in the event of damage or deterioration. It is possible that this expense might not be realized. Ongoing maintenance expense of $45,534 includes the cost of water consumption, sprinkler maintenance, ongoing sodding and upkeep. Replacement of this option at the end of its life cycle is estimated at $215,539.

Grass - Replacement of Hurrell Field – "Thick Cut" Sod - This option will cost approximately $513,578 and includes the replacement of the entire surface of Hurrell field with new "Thick Cut" sod. Assumptions include the possibility of replacement of drainage and sprinkler systems in the event of damage or deterioration. It is possible that this expense might not be realized. Ongoing

[3] A Guide to Synthetic and Natural Turfgrass for Sports Fields Selection, Construction and Maintenance Considerations, The Sports Turf Managers Association (STMA) (2008)

maintenance expense of $60,455 includes the cost of water consumption, sprinkler maintenance, ongoing "thick cut" sodding and upkeep. Replacement is estimated at $256,789 at the end of its life cycle.

Significant variance in annual maintenance costs occurred when comparing an infill option to a non-infill option. Fundamentally, the difference is the cost of the replacement infill necessary to maintain the integrity of the field over its life, water consumption, and a 10% contingency assumption for unforeseen expenses.

Hybrid Surface – Option I – Review of this option includes the installation of the hybrid grass product and ongoing maintenance of Hurrell Field with natural grass. The estimated cost of installation is $931,250. Special attention was taken to ensure that after the installation cost, the annual maintenance fee incorporates the synthetic maintenance and the natural maintenance expense related to this product. This product requires annual reseeding and a special routine. Training of our field personnel would also be required. It is estimated that annual maintenance for this option would be $17,913. Replacement of this option at the end of its life cycle is estimated at $656,250.

The installation cost assumes: 1) that the soil composition is unsatisfactory for this type of installation, and 2) that the depth of the current irrigation system and drainage is insufficient and will interfere with the installation of the synthetic grass fibers. This information is based upon an initial review by the vendor. The price of installation of the hybrid product is $656,250 plus $275,000 estimated for soil and irrigation replacement.

Option II-A - Synthetic with Infill – Pad Infill – Geo-fill - This option includes the installation of synthetic turf with Geo-fill. The installation costs associated with this product are $1,145,013. Ongoing maintenance is in line with costs for the synthetic options evaluated in this analysis using infill. Anticipated annual maintenance cost is $28,081. Anticipated replacement costs are estimated at $887,500, in line with the STMA median estimate of $7.10/sq. ft.

Option II-B - Synthetic with Infill – Rubber/Sand Titan - This option includes the installation of synthetic turf with ambient rubber and sand. The installation costs associated with this product are $1,169,385. On-going maintenance is in line with costs for the synthetic options evaluated in this analysis utilizing infill. Anticipated annual maintenance cost is $28,081. Replacement costs at the end of its lifecycle are estimated at $887,500.

Option II-C - Synthetic with Infill – Rubber/Sand Premier - This option includes the installation of synthetic turf with ambient rubber and sand. The installation costs associated with this product are $1,169,385. On-going maintenance is in line with costs for the synthetic options evaluated in this analysis utilizing infill. Anticipated annual maintenance cost is $28,081. At the end of its life cycle it is estimated that the cost to replace this option will be approximately $887,500.

Option II-D - Synthetic with Infill - TPE - This option includes the installation of synthetic turf with Infill TPE. The installation costs associated with this product are $1,218,425. On-going maintenance is in line with costs for the synthetic options evaluated in this analysis, which utilize infill. Anticipated annual maintenance cost is $28,081. Replacement costs at the end of its life cycle are estimated at $887,500.

Option II-E - Synthetic with Infill - TPE - This option includes the installation of synthetic turf with Infill TPE. The installation costs associated with this product are $1,220,498. Ongoing maintenance is in line with costs for the synthetic options evaluated in this analysis. Anticipated annual maintenance cost is $28,081. Replacement of this option is estimated at $887,500.

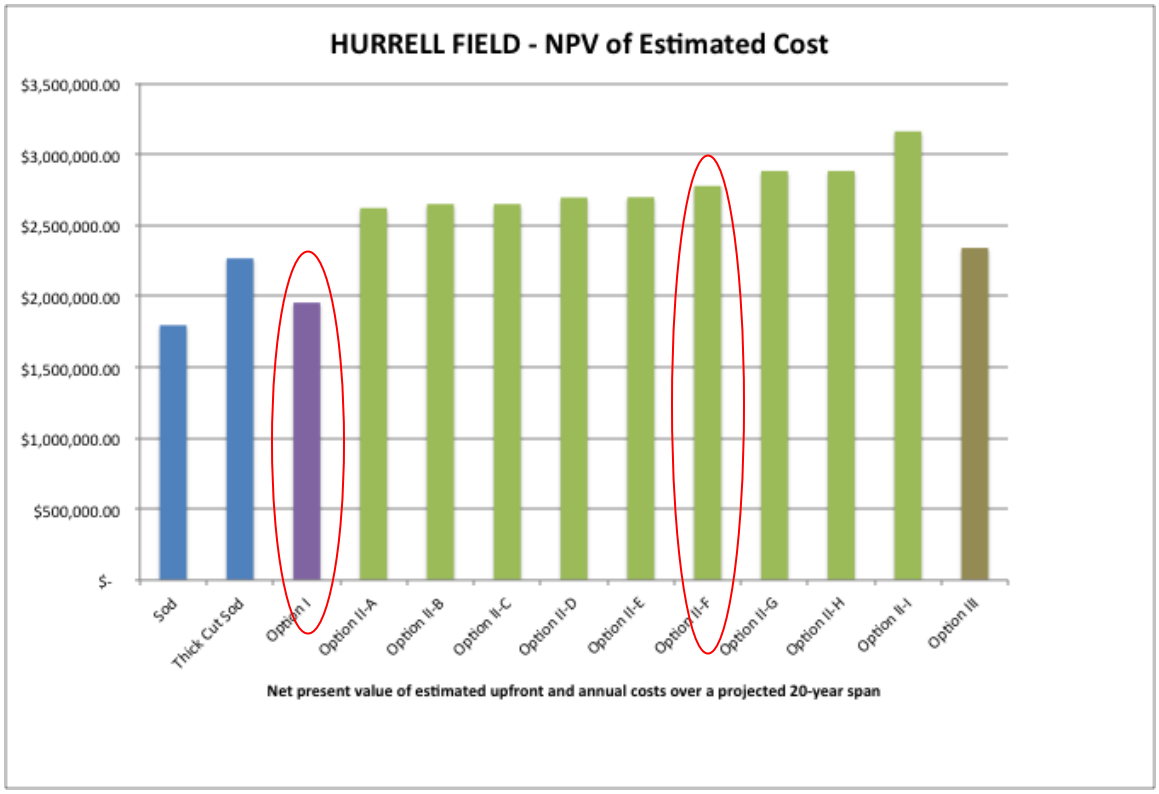
Option II-F - Synthetic with Infill - 100% Cork – This option includes the installation of synthetic turf with a 100% cork infill. The installation costs associated with this product are $1,267,426. Ongoing maintenance is in line with costs for the synthetic options evaluated in this analysis. Current annual estimate for maintenance is $29,636. Replacement costs are estimated to be $887,500.

Option II-G - Synthetic with Infill - Cork/Coconut - This option includes the installation of synthetic turf with Cork/Coconut infill. The installation costs associated with this product is $1,400,000. Ongoing maintenance is in line with costs for the synthetic options evaluated in this analysis with infill. Anticipated annual maintenance cost is $28,081. Replacement of this option is estimated at $887,500.

Option II-H - Synthetic with Infill - TPE - This option includes the installation of synthetic turf with TPE. The installation costs associated with this product are $1,400,000. Ongoing maintenance is in line with costs for the synthetic options evaluated in this analysis with infill. Anticipated annual maintenance cost is $28,081. Replacement is estimated at $887,500 at the end of its life cycle.

Option II-I - Synthetic with Infill – Coated Sand/Shock Pad - This option includes the installation of synthetic turf with 3d coated sand. The installation costs associated with this product are $1,678,750. On-going maintenance is in line with costs for the synthetic options evaluated in this analysis. Anticipated annual maintenance cost is $28,081. Replacement of this option is estimated at $887,500.

Option III - Synthetic non-Infill – This option includes the installation of synthetic turf "without" infill. The installation costs associated with this product are $1,271,750. On-going maintenance is in line with costs for the synthetic options without infill evaluated in this analysis. Anticipated annual maintenance cost is $8,115. Replacement of this option at the end of its life cycle is estimated at $887,500.



Cost Sub-Committee Conclusions

The Cost Sub-Committee NPV of Estimated Cost accounts for all factors over the lifespan of the product including the installation cost, the annual cost of maintenance minus labor, and the estimated for disposal and replacement of the surface option chosen. The NPV of Estimated Cost shows the cost estimates for the options. Net present value method (also known as discounted cash flow method) is a popular capital budgeting technique that takes into account the time value of money. It uses NPV of the investment project as the base to accept or reject a proposed investment in projects like the purchase of new surface option for Hurrell.

The estimates provided by each vendor are general estimates of the anticipated cost to refurbish and/or resurface Hurrell Field. The Borough would be responsible for obtaining actual pricing through a Request for Bid to vendors. Ongoing maintenance costs have been estimated to assume, at a minimum, a sufficient dollar placeholder for every expense. In a number of cases, it may be possible that there is no expense for that maintenance year. Variances in estimates for Performance and Payment bonds are estimated to be between $13,000 and $19,000, based on the standard assumption of 1.125% of installation cost. Not all vendors provided this

information, but the Committee has assumed this requirement will apply across vendors and is a requirement of the Borough in all bid processes.

The Cost Sub-Committee ranked the surface options evaluated in the table below from least expensive to most expensive. The NPV of estimated costs combines the following factors over a lifecycle of 20 years: (1) Installation cost, (2) Maintenance costs without labor, and (3) Disposal/ Replacement cost.

Due to the cost of all these factors, artificial turf products with infill are more expensive using the NPV of 20 years than grass, grass hybrid, and infill free artificial turf. Due to the low initial maintenance costs of grass and hybrid grass products, they had the lowest estimated cost. Again, the two final recommendations of the Committee are highlighted in the NPV table below.

Table 6: NPV of Estimated Cost over 20 years			
Thin Cut Sod	$ 1,795,609.76	Infill Turf II-D	$ 2,695,303.03
Thick Cut Sod	$ 2,266,493.64	Infill Turf II-E	$ 2,697,399.35
Hybrid	$ 1,954,716.09	Infill Turf II-F	$ 2,776,737.06
Infill Free III	$ 2,339,930.06	Infill Turf II-G	$ 2,882,520.75
Infill Turf II-A	$ 2,621,065.15	Infill Turf II-H	$ 2,882,520.75
Infill Turf II-B	$ 2,649,311.33	Infill Turf II-I	$ 3,160,806.69
Infill Turf II-C	$ 2,649,311.33		

Conclusions

The mission of the Committee was to craft an actionable recommendation for the surface of Hurrell Field which maximizes its use while accounting for many factors, including the impact on other fields currently in use. The Committee agrees that such a field surface should not only satisfy the residents' demands, but must also provide added benefits to Glen Ridge generally.

The health and emotional benefits of outdoor play for people of all ages are well-understood. Given that, the Borough Council has tasked the Hurrell Committee to come up with a solution for coverage of Hurrell Field that would enable continued extensive usage of the field by the entire town. After detailed research and discussions, the Committee has come up with two recommendations.

The two surfaces that would provide the greatest benefit to the Borough by satisfying the increased demand for field space and minimizing known risks, at the most reasonable cost are (1) hybrid grass and (2) cork infill artificial turf.

In arriving at its decision, the Committee took care to choose a surface that would not reduce use by GRHS and GRAA. In addition, the Committee considered personal

health and environmental risks, the manufacturers' warranties, and the cost of installation, maintenance and replacement.

The benefits and risks of each of the recommended options are detailed in the Executive Summary. The choice between the two surfaces depends on the Borough's desired goals and priorities for use of Hurrell Field and its strategic planning for the Borough and its fields, in whole.

Secondary recommendations that were reached as part of the extensive information-gathering and –analysis include training to the maintenance staff, timely current maintenance with reseeding as needed, remediation of the GRHS field, development of a comprehensive scheduling strategy, designation of Hurrell for games only, and usage of cork in George Washington field's upcoming synthetic surface.

It is the hope of the Hurrell Advisory Committee that education of the residents of Glen Ridge regarding the committee's deliberations, and regarding the ongoing use and maintenance of Hurrell Field will enable our Borough to achieve maximal usability from this centerpiece of the Town.

The contents of this report represent the information gathered by individuals and groups of individuals who volunteered to participate in this Committee. While we believe we have presented all information fairly and took pains to present facts accurately, there is always the potential for errors, mistakes and omissions. We apologize in advance if those are present in the document, but assure the reader that they were unintentional. The Committee Co-Chairs, Joe Auborn and Sujana Chandrasekhar, accept ultimate responsibility for the contents of the Report.

Appendix:

This appendix contains a report issued from Rutgers NJ Agricultural Experiment Station to the Borough of Glen Ridge in May 2014 after visiting and testing soils at our town fields the prior month. The report is included in its entirety.

RUTGERS
New Jersey Agricultural Experiment Station

Department of Plant Biology and Pathology
http://njaes.rutgers.edu
Center for Turfgrass Science
park@aesop.rutgers.edu
Foran Hall, Room 178
Rutgers, The State University of New Jersey (o) 848.932.6327
59 Dudley Road (c) 732.921.2288
New Brunswick, NJ 08901-8520

To: Mr. Michael Rohal, Administrator, Borough of Glen Ridge
From: Brad Park, Sports Turf Research & Education Coordinator, Rutgers University;
Amy Rowe, Environmental and Resource Management Agent, Rutgers-NJAES
Re: Report on site visit to Glen Ridge, NJ on April 8, 2014
Date: May 8, 2014

It was a pleasure meeting with Glen Ridge personnel on April 8, 2014 to assess turfgrass conditions, retrieve soil samples, and propose strategies to improve the sports fields in the Borough of Glen Ridge.

Key observations and recommendations:

- Hurrell, Forest Avenue, and Carteret Fields exhibited fair to excellent turfgrass cover in minimally trafficked areas; however, these fields had poor turfgrass cover in the highest trafficked locations. An aggressive, in-season, routine perennial ryegrass overseeding program should be initiated in field centers and goal creases. Strong consideration should be given to adopting routine overseeding as an in-house maintenance function. **The long-term presence of turfgrass cover in high traffic locations will largely be a function of the frequency of perennial ryegrass overseeding and the quantity of seed applied.**
- Maintaining adequate nitrogen (N) fertility and regular mowing should be the management emphasis at Clay and Sherman Fields.
- Soil test results indicated mid-to-high soil pH values for all fields tested; there is no need for lime applications on any field we examined.
- Under the Technical Specification section of the Borough of Glen Ridge Project Manual: 2014 Maintenance of Athletic Fields, the quantity of N fertilizer scheduled for application (5.75 lbs N per 1000 sq ft) exceeds the maximum allowable quantity per the 2011 NJ Fertilizer Law (4.25 lbs N per 1000 sq ft). Hurrell, Forest Avenue, and Carteret Fields should receive 4.0 lbs N per 1000 sq ft annually; Clay and Sherman Field should receive no more than 3.0 lbs N per 1000 sq ft per year.

Traffic management

Regulating field activity (permitting) allows scheduling of field maintenance activities and can prevent rapid field deterioration from overuse. Field use permitting also provides a potential structure to collect user fees, which in turn, can be used to offset field maintenance costs.

A common approach to traffic management involves the designation of game and practice fields. Game fields are obviously the most important fields and are provided the most protection and greatest use restrictions compared to practice fields. Accordingly, practice fields may actually have the greatest need for maintenance inputs and repair.

Scheduling of events (particularly practices) on nearby synthetic fields (Essex County or adjacent Municipalities) should continue. Synthetic fields are durable over a wide range of weather conditions and are often better capable of withstanding intense use. Natural turf fields can be protected by scheduling sporting events that require frequent day and night (lighted fields) play onto a synthetic field. This type of field rotation is especially helpful during early

spring and late fall when natural turf fields have low vigor (growth) during cold weather.

Consideration of a synthetic field installation in the Borough of Glen Ridge should take into account the high installation costs and requirements for routine maintenance associated with synthetic turf fields. Long-term budgeting needs to include costs for removal, disposal (or perhaps recycling) and surface replacement of a worn-out synthetic surface.

Overseeding strategies

Overseeding. Turf cover in goal creases, field centers, and penalty kick areas will inevitably thin out during an intense playing season. It is essential to preemptively overseed those areas of fields that will thin out from play and potentially lose turf cover. Initiate overseeding at the beginning of the playing season and repeat overseeding wherever thinning of the turf is observed during the playing season. It is far more difficult to recover or repair natural turf fields with overseeding if high-wear areas have completely lost turf cover.

Overseeding is easily done with a rotary spreader before and during the playing season (before games and practices). Seed-to-soil contact is achieved by athletes' shoes "cleating-in" the seed during play.

Repeated scattering of seed with a rotary spreader is preferred over a slit-seeder. The vertical blades on a slit-seeder will cause too much injury to the existing turf as well as the new seedlings from previous overseeding.

Choosing the appropriate seed for an overseeding program is critical. Perennial ryegrass seed is the best choice for routine overseeding of the high traffic zones of sports fields. Perennial ryegrass seed will germinate faster and at cooler soil temperatures than Kentucky bluegrass and tall fescue making it the best ideal choice for overseeding during fall and early spring. Seed blends (that is, two or more varieties) of perennial ryegrass that have good tolerance to gray leaf spot disease are recommended (see list below).

Applying a sufficient quantity of seed is important for overseeding to be successful. As an example, apply a perennial ryegrass blend at 6 pounds per 1,000 square feet to the area between the hash marks of a football field before every home game. The area between the hash marks on a football field is 16,000 square feet, which will require 96 pounds (two 50-lb bags) of seed. Take notice of the high play areas after several games, if new seedlings are not keeping up with damage and turf cover is diminishing, increase the overseeding rate by one or more 50-lb bags of seed.

The following Gray Leaf Spot resistant perennial ryegrass blends are suggested for seeding:

Grand Prix Perennial Ryegrass (Revenge GLX, Paragon GLR, Palmer V GLR, Manhattan V GLR)
New Jersey Distributor: National Seed, New Brunswick, NJ; 732.247.3100

Trifecta II GLSR (Exacta II GLSR, Charismatic II GLSR, and Secretariat GLSR). See: http://www.lebanonturf.com/products/items/2854664/index.aspx.
New Jersey distributor: Grass Roots, Randolph, NJ; 973.252.5455

Professional Select Ryegrass Blend (Applaud II, Soprano, 1G Squared)
See: http://www.penningtonseed.com/psc-_97-pd-_208
New Jersey distributor: Pennington Seed, Laurel, MD 800.732.3332

Perennial Ryegrass Blend GLSR (Overdrive, Buena Vista, Fusion)
See: http://www.burlinghamseeds.com/userfiles/products/docs/Par-5-flyer.pdf
New Jersey distributor: The Turf Trade, Mullica Hill, NJ; 856.478.6704

Diamond Quality Tri-Rye Blend (Grand Slam 2, Stellar GL, Apple GL)
See: http://www.reedandperrine.com/grassseed.html
New Jersey distributor: Reed and Perrine, Tennent, NJ; 732.446.6363

Fertilization

Nitrogen is the nutrient that has the greatest impact on turf vigor and growth. Unfortunately, N recommendations cannot be developed solely from soil test results. Other important factors need to be considered including the age and vigor (health) of the turf, soil organic matter content, mowing (clipping removal), and availability of irrigation. For example, older turfs growing on high-quality soil will not require

as much N fertilization as a new field constructed of poor soil. Additionally, more N is needed as the playing intensity (damage) increases on a field.

For sports fields that have intense traffic events and receive regular overseeding, up to 4.25 pounds N per 1,000 square feet can legally be applied per the 2011 New Jersey Law. Nitrogen can be applied to fields used for spring sports such as baseball and softball according to the schedule shown in the table below.

Field	Approximate Timing of N for high traffic fields				Annual
	March-April	May-June	August-September	October-November	
	pounds of N per 1000 square feet				
Hurrell/Forest Avenue/Carteret	1.0	1.0		1.0	3.0
Clay/Sherman	1.0	1.0	1.0	1.0	4.0

Cultivation/Aerification

Regular cultivation of the turf and soil is necessary on sports fields subjected to intense traffic, especially when the soil is very susceptible to compaction. Spring and fall are typically the best time for cultivation. At minimum, the high traffic areas of a sports field should be cultivated (aerated) at the end of each playing season.

Core cultivation or coring refers to equipment capable of extracting 0.5 to 1 inch diameter cores of soil to a depth of 2 or more inches (hollow tine). Objections to the soil cores brought to the turf surface after coring can be avoided by either removing the soil cores or working the cores back into the turf. Soil cores can be broken-up and returned to the turf through verti-cutting or drag-matting the cores. Soil cores dried to the proper water content will be easier to breakup and work back into the turf.

Cultivation can also be performed using a machine that creates similar sized holes with a solid tine (does not remove a core), which enables cultivation during the playing season. Some machines use solid tines to horizontally shatter the soil and can be equipped with a seeding box so that cultivation and seeding can be done simultaneously.

Soil that is deeply compacted should be first cultivated with a deep (up to 16 inches) tine and/or rotary de-compacter machines. Treatment with deep cultivation equipment has sufficiently improved many older sports turfs and, as a result, helped avoid the high costs of reconstruction. It should be noted that deep cultivation will not solve compaction problems associated with improper construction practices (that is, severely compacted subgrades that limit subsurface drainage of water).

There are numerous contractors capable of providing these services if the cost of purchasing cultivation equipment is deemed too expensive.

Frequency of cultivation is determined by the intensity of field use and severity of compaction. High-priority fields that receive intensive play will benefit from two or more cultivation treatments per season. Targeting cultivation to only the high-traffic zones of a field(s) rather than treating the entire field will allow you to treat problem areas more frequently (focuses your time and resources where they are needed most).

Core cultivation can be used in conjunction with overseeding and fertilization to repair badly damaged turf on fields or areas of a field using the following steps:

1. Core cultivate to a 2-inch depth or more in late summer;
2. Break-up and re-incorporate the cores using a tow-behind drag mat;

3. Seed with a blend of two-to-five perennial ryegrass varieties using a slit-seeder in two directions at a minimum of 5 pounds of seed per 1,000 square feet per direction (10 pounds total);
4. Apply a starter fertilizer; and
5. Irrigate to maintain a moist seedbed.

Periodic re-sodding

Periodic re-sodding is another strategy to re-establish turfgrass cover. Sodding can be very effective if performed in mid-to-late November. The irrigation requirement is generally very low at this time and late fall temperatures permit good rooting and a playable surface the following spring. The Koro Field Topmaker (Photo 1) can be used to remove existing turf and some soil prior to re-sodding.

Sod consisting of Kentucky bluegrass can be utilized. Non-netted sod should be specified. It would be advantageous to install sod grown on naturally sand soils on Hurrell field to help preserve the integrity of the sand slit drainage system.

Photo 1. The Koro Field Topmaker

Contractors that can perform this work include:

The Viersma Companies
Allamuchy, NJ
(p) 908.852.0552
www.viersma.com
Contact: Mike Viersma

Hummer Turfgrass Systems,
Inc. Manheim, PA
(p) 717.898.5000
www.usaturf.com/hummersportsturf/
Contact: Matt Wimer

Investment in sports field and grounds staff

It is strongly recommended that the Borough of Glen Ridge invest in practical sports turf education for its sports field and grounds staff. High traffic public sports fields are among the most challenging turf management scenarios. To maintain turf cover on these fields, strict attention must be paid to mowing, irrigation, fertilization, cultivation, and overseeding. The following courses and field days address practical sports field management.

Rutgers NJAES Office of Continuing Professional Education (OCPE)
www.cpe.rutgers.edu/landscape/athletic_field_park_management.html
Anticipated January-February 2015 Courses:

- Athletic Field Construction and Maintenance
- Baseball and Softball Skin Surface Selection and Management
- Natural and Integrated Pest Management Strategies for Sports Turf
- Park Management and Liability Issues

New Jersey Turfgrass Assocation (NJTA) www.njturfgrass.org
Rutgers Lawn, Landscape and Sports Turf Field Day; Rutgers University, North Brunswick, NJ July 30, 2014

New Jersey Turfgrass Assocation (NJTA) www.njturfgrass.org
New Jersey Green Expo; Atlantic City, NJ December 9-11, 2014

Field conditions on April 8, 2014

Hurrell Field

This large multipurpose field exhibited good to excellent turfgrass cover in the least trafficked locations of field (i.e. right field) and poor to fair cover in the highest trafficked sections. A sand slit drain system was installed in the field several years ago. Evidence of drain lines were visible at the turf surface; a soil probe verified that the trench lines, spaced approximately every 15 feet, were filled with a very coarse sand.

The mid-football field/center field location exhibited poor drainage compared to other locations of the field, despite the existence of the sand slit drainage system; this area was lower compared to surrounding areas resulting in a 'bird bath' that accumulates surface draining water. Re-establishing surface grades the best solution to eliminating this low area. Employing a surveyor and determining existing elevations, quantifying needed topsoil to eliminate the 'bird bath', and using laser-guided grading equipment to properly grade the field are necessary to solve this problem. Do not simply add 'fill' that is riddled with small stones and other debris to this and other low spots. In areas where re-grading is preformed, localized re-establishment of the sand-slit drain system will be necessary (i.e. excavate material and back-fill with coarse sand consistent with the sand that is in the current slit-drains).

Soil test results from March 2013 indicated a higher than ideal soil pH (7.1) higher-than-desired quantities of soil phosphates (P_2O_5), calcium (Ca), and magnesium (Mg). The quantity of soil potassium (K) was slightly less than desired. There is no need to apply lime to this field.

The overseeding strategies outlined above and must be implemented in the field center to maintain turfgrass cover in this high traffic location. Re-sodding (every fall, every other fall, or every third fall) should be considered (see re-sodding section above).

Clay and Sherman Field

Clay and Sherman Field are two sports fields that are used primarily by athletes middle school age and younger. Turfgrass cover on these fields ranged from good to very good; the size of the athletes and nature Little League-type activity on these fields has allowed turf conditions to remain in good condition.

Soil test results generated by the Rutgers Soil Testing Laboratory for these two fields indicated that both had optimum or above optimum quantities of soil P, K, Mg, and Ca and the soil pH was 6.86 and 7.02 for Sherman and Clay Fields, respectively.

Cultural practices should focus on regular mowing and periodic fertilization. The 3.0 lbs N per 1000 sq ft fertilization scheduled outlined above can be adopted for these lower-use fields. The attached Rutgers-NJAES Cooperative Extension document titled, *Skin Surface Selection and Management for Baseball and Softball Infields* can be used as an aid in the management of the skin surface at Sherman Field.

Forest Avenue Field

This field was lined for numerous sports on April 8, 2014 – an indication of the highly trafficked nature of this field. Goal creases were nearly 100% bare soil; minimally trafficked locations of the field were 100% turf cover. The Borough of Glen Ridge should be applauded for installing sod in several locations on this field in an effort to repair damaged turf. Soil test results (March 2013) indicated a soil pH of 6.7 and higher than desired quantities of soil P_2O_5, and Ca.

The overseeding and fertilization strategies outlined above should be prioritized. Consideration should be given to expanding the re-sodding efforts on this field to include the entire field center from goal-to-goal if/when conditions severely deteriorate. The width of the re-sodding could be the approximate distance between high school football hash marks (Photo 2). The Koro Field Topmaker can be used to strip existing turf prior to sod installation. Removing 0.5 to 0.75 inches of soil using the Topmaker will also provide the benefit to harvesting summer annual weed seed in the soil. To ensure consistent grades, the installed sod should be harvested (at the sod farm) with an equivalent quantity of soil compared to that which is being removed from the field.

Photo 2. A New Jersey municipal football field where sod was used to replace the highly trafficked field center from goal line-to-goal line.

Carteret Field

This field was described as the highest trafficked field in the Borough of Glen Ridge. Similar to other fields, goal creases and other highly trafficked locations had very little turf cover. Minimally trafficked sections of the field had excellent turf cover. The soil test report dated March 2013 indicated that the soil had a pH of 6.8 and quantities of soil P_2O_5, Ca, and Mg were above desired values.

Nitrogen, overseeding, and periodic re-sodding recommendations outlined above should be followed for this field.

Grading inconsistencies were apparent throughout the field. Absent field reconstruction or significant localized re-grading efforts, there is no means to easily correct these problems. The general surface grading plan directs water towards the lower skin surface – rendering the skin surface unplayable

following rain events. The installation of a sand-slit drain along the margin of the infield skin and outfield turfgrass would catch surface moving water and prevent it from moving onto the skin. While this will not prevent rain water falling on the skin from moving towards home plate, it will likely allow the skin to be playable in a shorter period of time following a rain event. Hummer Turfgrass Systems, Inc. (Manheim, PA; [p] 800.872.8873) is capable of performing this installation.

Comments on Project Manual: 2014 Maintenance of Sports Fields

The Technical Specifications on pages TS-1-2 outline a cultivation, seeding, fertilization, and pesticide program for the fields. The total quantity of N proposed in the tasks section (5.75 lbs N per 1000 sq ft) exceeds the maximum allowable quantity per the 2011 NJ Fertilizer Law (New Jersey Act, P.L. 2010, c. 112; see: www.ProFACT.rutgers.edu). The N schedule outlined the Fertilization section of this document can be followed by applying 1.0 lb N per 1000 sq ft per application in Steps 1, 3, 5 and 6. Per New Jersey regulations, nitrogen applications of 1.0 lb N per 1000 sq ft must contain at minimum 30% slowly available N.

Contractor-performed seeding tasks outlined in the document can be continued. High traffic field centers and goal creases should be prioritized over entire fields. At this time, there is no reason to overseed minimally trafficked locations with good existing turf cover. If the field is in-use at the time of the seeding task, a rotary spreader should be used to apply seed. In addition to the contractor-applied seeding tasks, the Borough of Glen Ridge should adopt its own in-season overseeding program as described above.

Extreme care should be taken where pesticide applications are made and new turf seedlings have emerged (resulting from overseeding). As part of Step 3, Millenium Ultra 2 is specified. This is a broadleaf herbicide that contains 2,4-D, clopyralid, and dicamba and should only be applied if broadleaf weeds are present in the fields scheduled for treatment. Turfgrass should be ‘well established’ prior to the application of this material; thus, newly seeded field centers and goal creases may need to be avoided during this application.

Prior pesticide application records should be reviewed. If fields have not received a preventative white grub application in several years (particularly Hurrell, Forest, and Carteret), an application of imidacloprid (Alternate #1) is justifiable.

The applications of Drive (a.i. quniclorac) and Acclaim (a.i. fenoxaprop) are somewhat redundant as both applications are intended for postemergence crabgrass control. Retain the Acclaim application in mid-July at 20.0 oz/Acre. Be advised of the following regarding an application of Acclaim:

1) Per label recommendations, Acclaim should be applied no sooner that 21 days after the application of 2,4-D or MCPP (e.g. Millenium Ultra).
2) New seedlings should be at least 21 days old before an application of Acclaim is made; hence, newly seeded goal creases and field centers may need to be avoided during this application

We trust these recommendations are helpful. Please do not hesitate to contact us if you have any questions.

Sincerely,

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