JOHN H. ALLGAIR, PE, PP, LS (1983-2001)
DAVID J. SAMUEL, PE, PP, CME
JOHN J. STEFANI, PE, LS, PP, CME
JAY B. CORNELL, PE, PP, CME
MICHAEL J. McCLELLAND, PE, PP, CME
GREGORY R. VALESI, PE, PP, CME

TIM W. GILLEN, PE, PP, CME (1991-2019)
BRUCE M. KOCH, PE, PP, CME
LOUIS J. PLOSKONKA, PE, CME
TREVOR J. TAYLOR, PE, PP, CME
BEHRAM TURAN, PE, LSRP
LAURA J. NEUMANN, PE, PP
DOUGLAS ROHMEYER, PE, CFM, CME
ROBERT J. RUSSO, PE, PP, CME
JOHN J. HESS, PE, PP, CME

September 23, 2022

James H. Gildea | Town of Westfield
Town Administrator
425 East Broad Street
Westfield, NJ 07090

Dear Mr. Gildea:

CME Associates was authorized by the Town of Westfield as an independent sports field management company to evaluate the Edison School Fields Plan and assist the Town to determine the optimal way to upgrade the field area at Edison School as part of the Town's overall plan to address its significant fields deficit. Specifically, we were tasked with performing the following assessments of the existing plan:

1. Assess and verify up-front costs, maintenance and upkeep costs over time, incremental capacity achieved, and other key assumptions used for both synthetic turf and natural grass field options with and without lights;
2. Calculate cost per playing hour for all options;
3. Provide pros/cons of options including comparison of incremental benefits of each solution relative to expense and capacity, such as reliability and expected maintenance downtime; and,
4. Make a recommendation on the best path forward for the Edison Fields project.

In preparation of this report, our office has performed the following:

1. Performed a field visit of the Edison School site and the surrounding community;
2. Reviewed information provided by the Town including the following documents:
    a. Edison School fields Presentation prepared by Spiezle dated June 15, 2021;
    b. Initial Edison Fields Project Proposal dated June 15, 2021;
    c. Edison Multi-Purpose Field Update Presentation by the Westfield Recreation Commission dated September 20, 2021;
    d. Edison Multi-Purpose Fields Update dated January 2022;
    e. Edison School Field Proposal dated February 2022;
    f. CRAFD Zoom meeting with Scott Bills dated February 2022;
    g. Edison School Field Use 30 Year Projections and Cost Analysis;

h. Edison Field Use Allocation;

i. Edison Field 10 Year Cost Scenarios;

j. Narrative and Parking Impact Assessment prepared by Spiezle dated February 2022;

k. David Contract Input, Powerpoint – Ward 3 and 4 resident feedback dated October 2021;

l. Summary comments from Ward 3 Residents Regarding Edison fields Plan by Councilman David Contract, undated; and,

m. Jerome Feder, PhD, letter to David Samuel, CME Associates, dated May 14, 2022.

3. Conducted Interviews with the following parties:

   a. Matt Bolton – Edison School Principal

   b. Sean MacArthur – Board of Education Facility Manager

   c. CRAFD Advisory Group

      i. Jim Blake

      ii. Jenn Crawford

      iii. Jim Heston

      iv. Erin Skurdal

      v. Bianca Wright

      vi. Gregg Lehmberg

      vii. Chris Zanelli

   d. Recreation Commission

      i. Russ Howell, Vice Chair

      ii. Jenn Gilman, Chair

      iii. Don Bogardus, Director

   e. Recreation Group Volunteers

      i. Rich Pardo - Westfield Soccer Club

      ii. Lew Kimble – Westfield Soccer Club

iii. Sean Smith – Westfield Lacrosse

iv. Erik Elfstrum – Westfield Lacrosse

f. Sandy Mamary – Athletic Director

g. Westfield Board of Education Members

i. Brendan Galligan

ii. Mike Bielen

iii. Mary Wickens

iv. Rob Bennachio

Project Understanding

The Edison School Field is currently a natural grass field located between the school and the Robinson's Branch of the Rahway River. The grade of the field slopes from north to south from the school towards the stream and the runoff is un-detained. The field includes a full-size baseball field with a grass infield which is utilized primarily by the Westfield High School varsity baseball team. The remainder of the field is to the east of the baseball field and includes a full-size baseball field with a clay infield and a large grass area between the two baseball fields which measures approximately 350' by 400'. The overall field area east of the baseball field is approximately 625'x400' (250,000± SF) and is the area that is the subject of our assessment.

The project proposes the construction of two rectangular multi-purpose fields and one full size baseball field. The two rectangular fields will be lines for several sports including:

- Two (2) Full Size Soccer Fields
- Two (2) Short Sided Soccer Fields
- Two (2) Lacrosse Fields
- One (1) Field Hockey Field
- One (1) football field that will also be utilized for band practice

It is noted that when the baseball field is being played on, the eastern rectangular multipurpose field will not be able to be utilized and vice versa. This rectangular field includes the following:

- One (1) Full Size Soccer

- One (1) Lacrosse Field
- One (1) Field Hockey Field
- One (1) Football Field

Sports lighting is proposed through the installation of new sports lighting poles throughout the facility. The lighting of the varsity baseball field is not proposed as part of this project.

Based on our review of the material provided and through the interviews conducted by our office, we understand that the Edison School Field within the project scope is currently utilized by the following groups:

1. Edison School for recess and Physical Education (PE) classes during school day hours
2. Westfield High School
    a. Junior Varsity Baseball
    b. Football Practice
    c. Track Team Practice
    d. Marching Band Practice
    e. Cheerleading Practice
3. PAL football
4. Ultimate Frisbee

In review of the existing field usage table provided by the Town, the Edison School Field is typically divided in to two fields that can be used concurrently by either the Westfield High School band/teams and/or Town recreation teams. The table indicates that each field is currently utilized approximately 973 hours per year, or 1,836 hours total taking into consideration assumptions for utilizing only one field for Edison School recess and PE time. The Edison School Field is presently entirely unlit, so all current usage hours occur mostly during daylight hours. This field time is primarily utilized by the Westfield High School (1,236 hours total) with the remaining time dedicated to the Edison school for recess and PE, and the Town recreation leagues.

It is clear in our review of the information provided by the Town and through the feedback provided in our interviews with both the Recreation/BOE personnel and the CRAFD advisory group that there is a significant need for additional field time in Westfield. Through the interviews with the Recreation Commission and the Recreation League representatives, it was indicated that the soccer and lacrosse recreation programs would have an immediate benefit in the construction of new fields as they currently don't use the Edison School Field and are reliant on fields outside of

Westfield to schedule their practices and games. Also, it was indicated that flag football is among the groups that are seeking additional playing time. Lastly, it was conveyed that girls field hockey is a sport intended to be played on artificial turf and that the Westfield High School field hockey teams use the grass field behind the high school for their practices. The field hockey team is the only high school team in Union County that does not practice on an artificial turf field. While home games are scheduled to be played on the artificial turf field at Kehler Stadium, scheduling conflicts with football, soccer and lacrosse often force the field hockey team to make alternative plans.

Cost Evaluation

Town Projected Project Costs Provided to CME

The total project cost provided in the presentation for the synthetic turf field project as developed by Spiezle Architecture is $8,594,698.00 and is broken down as follows:

1.	Fields:	$5,855,750
2.	Facility Upgrades:	$92,900
3.	Sports Lighting:	$1,252,000
4.	Restroom Facility:	$300,000
5.	Construction Contingency (15%):	$1,121,048
	Total Project Cost:	**$8,594,698**

In our assessment of the project costs, we have excluded the restroom facility cost of $345,000 ($300,000 plus 15% contingency) as this is a stand-alone project and can be constructed regardless of whether the field is constructed with grass or synthetic turf. This brings the total cost of the synthetic turf project, with lights, to $8,249,698.

The total project cost provided in the presentation for the natural grass project is $1,564,850 which is indicated to be “Natural Turfgrass with Sand Cap and Drainage” which does not include lighting. With lighting, the project cost of the natural grass field is $3,004,650.

We have reviewed these costs based on similar projects completed by our office to ensure that they are in line with current industry standards. Provided below is a summary of our review of the project costs.

Synthetic Turf Field Cost

It is our opinion that the $8,249,698 total project cost for the synthetic turf project is a realistic conservative number for budgeting purposes and will provide the required funding necessary to complete the project. In review of the Edison School Field project and based on input included in the various reports provided to our office, there are considerations that need to be included with the design of the project which need to be budgeted as follows:

- Field Grading and Stormwater Management

  The conversion of the grass field to a synthetic turf field will require grading modifications in conjunction with stormwater management improvements to meet NJDEP stormwater management standards. In construction of the synthetic turf field, the NJDEP will view the synthetic turf as an impervious surface and the design will need to ensure that peak runoff quantity reductions are met from the field discharge. This will likely be accomplished through the installation of a stone layer with subbase drains under the field which will retain the stormwater runoff prior to its ultimate discharge.

- Synthetic Turf Material and Infill

  Based on the input received regarding the type of infill material, it is anticipated that the selected alternative material will be an increase in installation cost from traditional rubber infill.

It is our opinion that the provided construction cost estimate for the synthetic turf project is sufficient to cover these items. We have rounded the construction cost up to $6,800,000 ($8,300,000 with lights) for the field assessment report.

Natural Grass Field Cost

The estimate provided by the Town proposes a base construction cost of $5 per square foot for the field. Our office has designed numerous grass fields over the last several years with construction in the $5.00 to $7.00 per square foot price range. The fields at the higher end of the scale are projects that include earthwork, field drainage and irrigation systems. Considering these improvements will be necessary at the Edison School Field, we have prepared an estimate that utilizes the $7.00 per square foot base price and adds the anticipated site costs that would typically not be included in a square foot cost estimate. We have also included the cost of the facility upgrades and the 15% contingency as included in the synthetic turf cost estimate. This provides an estimated project cost for the natural grass field project of $2,400,000 ($3,900,000 with lights).

Based on these assumptions, we have utilized the following project costs within our assessment as outlined in Table 1:

- **Natural Grass Field: $2,400,000**
- **Natural Grass Field with Lights: $3,900,000**
- **Synthetic Turf Field: $6,800,000**
- **Synthetic Turf Field with Lights: $8,300,000**

Table 1					
Field Construction Costs					
		CME COST ESTIMATE			**SPIEZLE COST ESTIMATE**
		Natural Grass Field			Synthetic Turf Field
Item:	Cost				
Field Construction(250,000 SF)	Variable	$1,750,000.00			$5,855,570.00
Additional Grass Field Costs*	$280,750.00	$280,750.00			$0.00
Facility Upgrades	$92,900.00	$92,900.00			$92,900.00
Subtotal		$2,123,650.00			$5,948,470.00
Contingency (15%)		$318,547.50			$892,270.50
Total Cost:		$2,442,197.50			$6,840,740.50
SAY:		**$2,400,000.00**			**$6,800,000.00**
With Lights:					
Lighting	$1,252,000.00	$1,252,000.00			$1,252,000.00
Contingency (15%)		$187,800.00			$187,800.00
Total Cost:		$3,881,997.50			$8,280,540.50
SAY:		**$3,900,000.00**			**$8,300,000.00**
*Cost from Synthetic turf Estimate not included in the Field Construction Cost					
Concrete Sidewalks	$80,000.00				
Fencing	$108,750.00				
Poles and Netting	$35,000.00				
Backstop	$15,000.00				
Dugouts	$15,000.00				
Bleachers	$27,000.00				
Total	**$280,750.00**				

Maintenance Costs

The costs for the maintenance of fields is more subjective than the construction of fields. Review of annual maintenance costs suggests that the labor and material spent on field maintenance varies greatly with the level of athletic teams being supported. Our office performed research to gather information on the costs for both natural grass and synthetic turf maintenance costs. Table 2 includes the yearly maintenance costs for both field types.

For the maintenance of natural grass fields, based on our research and experience, we have provided expected annual maintenance costs for a single rectangular field, which is typically 85,000 square feet in size. The final costs are multiplied by three (3) to cover the full area of the Edison School Field project. Included in the expected costs are budgets for irrigation of the fields and one full time field maintenance manager who will be integral in ensuring the proper field maintenance is implemented. Lastly, the annual cost includes a budget for the replacement of sod within the full field area every five years. This cost is averaged over the 30-year project life cycle.

Yearly maintenance costs for synthetic turf fields are significantly less than natural grass fields. The more significant cost when looking at the average yearly costs is the need to replace the synthetic turf field at the end of its useful life. Based on our experience with synthetic turf fields, we anticipate the need to replace the turf every twelve (12) years. With this being said, we have assumed the cost for two and a half (2.5) replacements over the 30-year project life cycle.

In summary, the average yearly maintenance costs are as follows as shown in Table 2:

- **Natural Grass Field: $210,000**
- **Natural Grass Field with Lights: $212,000**
- **Synthetic Turf Field: $140,000**
- **Synthetic Turf Field with Lights: $142,000**

It should be noted that these maintenance costs assume that the natural grass field is used year after year with no rest. In ideal situations, fields are rotated year after year to provide a chance for the field to re-establish after heavy use. A typical scenario for grass field use is game, practice, rest, repeat. Due to the current usage of the Edison School Fields, it is evident that this field resting does not occur. Also, typically fields are re-seeded or re-sodded in either the early spring or fall and allowed to rest while the grass is given time to germinate. This practice currently does not occur due to the demand for the field.

The anticipated total costs for each scenario over the 30-year evaluation period is as follows:

- **Natural Grass Field: $8,700,000**
- **Natural Grass Field with Lights: $10,260,000**
- **Synthetic Turf Field: $11,000,000**
- **Synthetic Turf Field with Lights: $12,560,000**

When comparing the costs developed by our office for the fields and the information provided by the Town, the overall costs are relatively similar. The summary is shown below:

	Cost	Maintenance	Total	(CME)
Natural Grass Field:	**$1,564,850**	**$221,710**	**$8,216,150**	**($8,700,000)**
Natural Grass Field w/ Lights:	**$3,064,850**	**$221,710**	**$9,716,150**	**($10,260,000)**
Synthetic Turf Field:	**$5,885,750**	**$149,999**	**$10,385,720**	**($11,000,000)**
Synthetic Turf Field w/ Lights:	**$7,110,750**	**$149,999**	**$11,610,720**	**($12,650,000)**

Table 2		
Field Maintenance Costs		
Natural Grass Field Without Lights		
Line Painting	$5,000.00	
Seeding/Overseeding	$2,000.00	
Fertilizer	$3,000.00	
Pesticides	$1,000.00	
Aeration	$2,500.00	
Sod Repair	$2,500.00	
Irrigation	$9,000.00	16in/yr
Sod Replacement*	$28,500.00	average yearly cost
Field Personnel	$16,500.00	$50,000/3
Total:	$70,000.00	
Total for 3 Fields:	**$210,000.00**	
*Sod replacement assumed to take place every 5 years. A total of 5 sod replacements on 100% of the field is anticipated spaced out over 30 years at $2.00/SF.		
Synthetic Turf Field Without Lights		
Yearly Grooming	$5,000.00	
In House Cleaning	$10,000.00	
Turf Replacement**	$125,000.00	
Total for 3 Fields:	**$140,000.00**	
**Turf replacement assumed to take place every 12 years. A total of 2.5 turf replacements is anticipated spaced out over 30 years at $6/SF.		
Add $2,000 per year for light maintenance		

Field Capacity

It is reported in the information provided to our office that the Edison School Field is utilized a total of approximately 1,836 hours per year when reviewing the usage by the Middle School, High School and recreation leagues, or an average of 918 hours per field. This field use is during daylight hours since the fields are not currently lit.

In order to determine the expected field capacity, we have reviewed the field usage in two scenarios.

The first scenario that we have reviewed, based on our research and experience, is the absolute maximum capacity based on the field surface type. These maximum field capacities are independent of whether the fields are installed with lights. On a natural grass field, a municipal user can expect "good" field conditions on a field that is used between 600 and 800 hours per year and "fair" field conditions on a field that is used between 800 and 1,000 hours per year. For our analysis, we have utilized 800 hours as an anticipated maximum yearly field use for natural grass fields. Based on our research and experience, the maximum yearly field use of synthetic turf fields is recommended to be anywhere from 3,000 to 3,500 hours.

In the second scenario, we reviewed the projected use data provided to us by the Town. Based on this information, it is anticipated that the Edison School Field will be utilized for a total of 4,356 hours per year, or 2,178 hours per field. These projected hours were established utilizing realistic constraints and adjustments for known variables, including seasonality of the various sports and the availability of the coaches and players. Also, these projections were made assuming that lights will be installed as part of the project. In discussion of the field use with the recreation leagues group, they indicated that lighting the fields is imperative for their practice schedules as they require holding practices at night due to the fact that many of the volunteer coaches work during the day and cannot start practice until 6:00 pm or later. With the inclusion of lighting with the project, it allows the recreation teams to utilize the fields for practice after the high school groups are done using the fields and when the coaches are available.

The main reason to consider the installation of lights is for the additional field capacity that lighted fields will provide to the community in meeting the anticipated 4,356 hours of field usage. Without the installation of lights, we have determined through our review of the provided information that the projected field usage will decrease by approximately 30%. This provides an anticipated usage without lights of approximately 3,000 hours per year, or 1,500 hours per field.

In review of this data, the installation of lighting with a natural grass field does not provide any additional field usage hours since the current use (918 Hours) already exceeds the maximum yearly field use (800 Hours). With this being said, it is not recommended that lighting be installed should the fields remain grass fields.

On the other hand, in order to achieve the anticipated field usage of 2,178 hours per field, it is necessary for the lighting to be installed with the synthetic turf project. The combination of synthetic turf surface and lights provides the most flexible field time and meets the demands of both the middle school and high school after school and the recreation teams after the school teams have used the fields.

Utilizing the assumptions above, we estimate the following maximum yearly hours per field:

- **Natural Grass Field: 800 Hours**
- **Synthetic Turf Field without Lights: 1,500 Hours**
- **Synthetic Turf Field with Lights: 2,178 Hours**

Field Cost per Playable Hour

We have reviewed the cost per playable hour for each of the options over the 30-year project life cycle. In this analysis, we have utilized two fields at the hours projected above. This is summarized in Table 3.

- **Natural Grass Field: $181.25 per playable hour**
- **Natural Grass Field with Lights: $213.75 per playable hour**
- **Synthetic Turf Field: $122.22 per playable hour**
- **Synthetic Turf Field with Lights: $96.11 per playable hour**

Table 3
Cost Comparison Per Field hour

	Project Cost	Annual Maintenance Cost	Analysis Period (years)	Total Cost over Analysis Period	Anticipated Use Hours (2 Fields Assumed)	Cost per Field Hour
Natural Grass:	$2,400,000	$210,000	30	$8,700,000.00	1600	$181.25
Natural Grass With Lights:	$3,900,000	$212,000	30	$10,260,000.00	1600	$213.75
Synthetic Turf:	$6,800,000	$140,000	30	$11,000,000.00	3000	$122.22
Synthetic Turf With Lights:	$8,300,000	$142,000	30	$12,560,000.00	4356	$96.11

Recommendation

Based on the information reviewed by our office in preparation of this assessment as well as our own experience in the construction of natural grass and synthetic turf fields, we recommend that the Town of Westfield move forward with a synthetic turf project at the Edison School Field. Based on the demand for fields within the Town and the fact that recreation teams, especially soccer and lacrosse, are currently using fields out of Town for practices and in some cases home games, a synthetic turf project is the best way to maximize field usage for both the Board of Education and Recreation Leagues.

The inclusion of sports lighting with the project, which increases the field use hours by approximately 30%, provides coaches time to schedule practices in the spring and fall months after the High School uses the field and during a time period when volunteer coaches are able to schedule practice. Provided below are additional benefits of the construction of the synthetic turf fields. We also have provided discussion on several of the topics that were brought up by participants that were interviewed during our evaluation.

Discussion Topics

Expense

The construction cost of synthetic turf fields is higher than grass fields, however maintenance of synthetic turf fields is very low compared to the maintenance of grass fields. Overall when looking at the cost per playable hour, synthetic turf is the cheaper alternative due to the increased number of hours that can be played on a synthetic turf field.

In order for fields to be in an acceptable condition to use for games, demand for resources to properly perform the maintenance can be costly for the owner, especially in cases where the fields are overused. The costs established for maintenance of the grass fields include additional personnel to manage the maintenance and equipment to perform the work which is not required for synthetic turf fields.

Capacity

The Town has spent much time preparing an accurate estimate of current use and projected utilization to predict the programming and annual hours of use. A synthetic turf field is the best way to maximize field use for a community. With the increased capacity, the synthetic turf field will reduce the time that parents have to drive to other communities for practice as the recreation teams often utilize fields in other municipalities due to the limited field use.

Synthetic turf fields can benefit the community by letting several different teams utilize the field at once without the need to restripe field markings for an individual sport. Also, since there is no down time for inclement weather, field schedules can be maintained without the need to juggle schedules for rained out games, practices etc.

The lining of the multi-purpose synthetic turf field for field hockey will provide the field hockey team with a field that is up to par with other high schools in the district. Currently the field hockey team is the only team in Union County that does not practice on a synthetic turf field.

Reliability

Synthetic turf fields can be played on during or after wet weather where even well-maintained grass can stay saturated for extended periods after notable precipitation.

Currently, after inclement weather prevents the use of the grass field, students from the Edison Middle School walk across the street to Kehler Stadium for recess and PE class. The conversion of the fields to synthetic turf will permit the students to have recess and PE at the school after rain events.

Field use can be expanded for synthetic turf fields during inclement weather. It has been explained during the interviews that after a rain event, the fields often have several days of downtime while the fields dry out. This is due to the heavy silt content in the underlying soil that was observed during our field investigation. This is not uncommon and can be due to a variety of factors including grading issues and soil conditions.

Field use can start earlier with synthetic turf as typically inclement weather in March can delay use of the fields. With synthetic turf, you can play on the fields in any weather. Quite often natural grass fields in the northeast are not in acceptable condition until April to have steady play forcing game postponement and extension of the season.

Extended periods of drought conditions can also be detrimental to fields. In irrigated fields, additional watering is necessary to ensure the fields maintain the proper moisture level for sustainability of the grass. This leads to additional watering costs. In non-irrigated fields or during water use restrictions, the ground can become hard and can potentially cause impact injuries to players.

Maintenance

Typically, when repairing natural grass fields, the work is performed either in early Spring or early Fall. Once the repair work is complete, the fields needs time to rest for the grass to establish. This results in the shutdown of the fields for several weeks, or use of the fields prematurely which

negates that work performed on the field. Ideally the fields should be rotated every three seasons for game, practice, rest, repeat, which provides the necessary time for a field to recover from the heavy use of the 'game" season. With the current field demand, there is no time for the field to rest between seasons.

Overuse of grass fields during dry periods causes the fields to become hard. Poor grass establishment during the season can also cause the field surface to become uneven. These conditions can lead to players becoming more susceptible to injuries. Similarly, concussions are more likely in cold weather when fields harden due to frozen soil.

For natural grass fields, manual restriping of the fields is required for different sports. The synthetic turf fields will be lined for several different sports with no maintenance required when shifting from one sport to the next.

Natural grass requires downtime for mowing, irrigation, and rest to lessen compaction and improve the turf grass.

Proper maintenance of natural grass fields requires a significant demand of pest and weed control, as well as fertilization and irrigation.

Proper maintenance should include the resting of fields for repair and for a full season for replacement

Synthetic Turf Concerns

Infill

There is concern from the residents interviewed as part of our study that traditional synthetic turf fibers and rubber infill may be carcinogenic or toxic. The fibers used in the turf systems are typically made of polyethylene which is a common polymer used in commercial and residential carpets and flooring. The turf industry also eliminated the use of lead chromate in turf fibers in 2009 when there was a concern that elevated levels of lead were found on synthetic turf fields. While there are many studies available on both sides of this subject, there are no studies to our knowledge that show that playing on synthetic turf fields poses a direct human health risk. The USEPA, in conjunction with the Centers for Disease Control and Prevention/Agency for Toxic Substances and Consumer Product Safety Commission, prepared a study to review the potential health impacts of playing on synthetic turf fields with crumb rubber infill. This report indicated that while chemicals are present in the crumb rubber, they are similar to components found in other everyday consumer products and that exposure to the chemicals is limited.

Should the use of rubber infill continue to be a concern, there are alternative infills that can be evaluated during the design process if so desired. These alternative infills include organic materials such as cork, coconut fibers and walnut shells and alternate rubber material such as coated SBR crumb rubber, EPDM rubber, and thermoplastic elastomer. Lastly, turf companies are developing proprietary synthetic infill materials that can be utilized.

The alternate rubber materials or synthetic infills are a good alternative to traditional rubber infill. It should be noted that these alternate infill materials can add anywhere from $25,000 to $150,000 in construction cost per field depending on the chosen alternative. The maintenance costs are similar to the traditional rubber infill. It is anticipated that the added construction costs would be covered in the preliminary project cost estimates.

Stormwater Management

The conversion of grass fields to synthetic turf fields will trigger stormwater management regulations which will result in the requirement that the peak runoff rate from the site be reduced in the post developed condition prior to being discharged to Robinson's Creek. Reconstruction of grass fields will not provide any benefit through the reduction of stormwater runoff. Overall, the drainage area of the fields is minimal compared to the overall drainage area that flows to the creek. Any impact from any reconstruction project at the school will be minimal based on the small area that contributes runoff to the stream. Depending on the final project design, the NJDEP will likely have jurisdiction over the project and the design of the stormwater management system will have to meet the NJDEP and Town of Westfield stormwater management regulations.

The conversion of the grass field to a synthetic turf field will require grading modifications in conjunction with stormwater management improvements to meet NJDEP stormwater management standards. In construction of the synthetic turf field, the NJDEP will view the synthetic turf as an impervious surface and the design will need to ensure that peak runoff quantity reductions are met from the field discharge. This will likely be accomplished through the installation of a stone layer with subbase drains under the field which will retain the stormwater runoff prior to its ultimate discharge to the adjacent creek. It is anticipated that due to these regulations that the construction of a synthetic turf field will have a net benefit over natural grass fields in regards to stormwater runoff quantity reduction.

Surface Temperature

Synthetic turf fields can have a hotter surface than grass fields. The NJSIAA has developed a *Heat Participation Policy*, which applies to both practice and games. This policy requires that Wet Bulb Globe Temperature (WBGT) readings be taken at specified times before and during practice and games. The policy establishes WBGT levels that indicate the risk for heat

illness. Based on this risk, the policy includes time limitations on practice and games, or, at very high readings, practice and games are required to be canceled until a lower level is reached. This policy must be followed by coaches and trainers for all NJSIAA sanctioned games and practices and shall be followed regardless of the field type.

In speaking with Sandy Mamary, Athletic Director for the Board of Education, she indicated that she is aware of the NJSIAA Policy and did not recall any time that practice or a game had to be canceled at Kehler field due to excessive heat.

Field Scheduling

Scheduling of the field usage will be an important issue for any field improvement project at Edison School. Things to consider during the scheduling based on our analysis are as follows:

- Coordinating the schedule at Kehler Field with the Edison Field to ensure use of Edison Field is limited and/or restricted when there is a large event at Kehler.
- Limit and/or restrict field use when there is an event at Edison School such as back to school night, school play, band concert, etc. It is our understanding that the Board of Education in partnership with the Town's Recreation Department will manage the schedule to ensure that the policies put in to place are followed once the fields are improved.

Field Lighting

As previously indicated, it is recommended that sports lighting be installed with synthetic turf to gain the maximum return on investment in terms of playable field hours. The sports lighting industry has made significant strides in improving the light fixtures to direct the lighting on to the fields and not on to the surrounding properties. In addition, conversion of sports lighting from traditional bulbs to LED fixtures has further eliminated many of the issues associated with the installation of sports lighting in residential neighborhoods. Based on our research and experience with lighting sports fields, the benefits of LED sports lighting are as follows:

- The controls of the LED fixtures allow the lights to be turned on and off instantaneously reducing the transition period between the end of field use and the shutdown of the lights.
- The LED fixtures can be set to light individual fields and be programmed with various illumination levels depending on what activity is being played and if the field is being utilized for practice or games.

- The LED fixtures will reduce light pollution with the virtual elimination of glare and light spillage outside of the field area. LED bulbs have precision focus which allows the illumination to be directed on the fields and not the surrounding areas.
- The LED fixtures reduce the visibility of the light source further reducing glare.
- The LED lighting is much more energy efficient than traditional sports lighting providing a savings in electric bills.

I trust the above is as required at this time. However, should you have any questions or require additional information, please do not hesitate to contact me at this office.

Very Truly Yours,

CME Associates

Trevor J. Taylor, PE, PP, CME, CFM
Principal