

LEGAL NOTICE

**TOWN OF WESTON, CONNECTICUT
REQUEST FOR PROPOSALS
PARKS AND RECREATION DEPARTMENT
LANDSCAPING AND GROUNDSKEEPING –
MOREHOUSE FARM PARK & BISCEGLIE-SCRIBNER PARK**

The Town of Weston, Connecticut is seeking bids for the landscaping and grounds keeping of the Morehouse Farm Park & Bisceglie-Scribner Park for the following period of July 1, 2019 through June 30, 2022. Bid Specifications can be obtained online at www.westonct.gov/rfps.

Sealed bids shall be received by the Town Administrator, 56 Norfield Road, Weston, CT 06883, until 2 pm on 12/28/18, at which time the bids shall be publicly opened in the Town Hall meeting room. Any questions about the bid shall also be directed to David Ungar, Director of Parks and Recreation, at 203-222-2655.

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REQUEST FOR PROPOSALS
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OVERVIEW: The Town of Weston, Connecticut is seeking bids for the landscaping and grounds keeping of the Morehouse Farm Park (MFP) & Bisceglie-Scribner Park (BSP) for the following three fiscal years: 1) July 1, 2019 thru June 30, 2020; 2) July 1, 2020 thru June 30, 2021; and 3) July 1, 2021 thru June 30, 2022. Sealed bids shall be received by the Town Administrator, 56 Norfield Road, Weston, CT 06883, until 2pm on 12/28/18, at which time the bids shall be publicly opened at the Town Hall meeting room. Any questions about the bid shall be directed to David Ungar, Director of Parks and Recreation, at 203-222-2655. All bids must be submitted on the forms provided and shall include all company names, signatures, addresses, and other information required. Each bid must be signed by an authorized representative of the company. Work references for similar type projects may be included with your bid.

RESERVATION OF RIGHTS: The Town of Weston reserves the right to reject any and all bids, and reject any part of any bid. The Town reserves the right to waive any informality in any and all bids deemed in the best interest of the Town. The Town reserves the right to negotiate with the selected bidder any amendments to the contract. The Town shall be under no obligation to accept the lowest financial bid. The Town may make such investigations as it deems necessary to determine the ability of a bidder to perform the work.

EXCLUSIONS: The Town of Weston shall not provide space to the Contractor within the Town's buildings and grounds for the storage of supplies, equipment, and materials. The Contractor shall not be required to provide trash removal, watering, and safety checks on facilities, unless this contract is amended by listing such additional items and the prices to be paid for such.

TERM: The contract shall be effective when signed by both parties. The contract shall be for a one (1) year period, effective July 1, 2019 and extending annually at the option of the Town through June 30, 2022. The Town may terminate the contract on thirty (30) days written notice to the other if the other materially fails to perform any of the obligations, provided that upon receipt of such notice of early termination, the party so notified shall have three (3) business days from that date of notice to correct such failure.

PRICE AND PAYMENT: The total price for services is shown on Schedule A, and shall be paid to the Contractor on a pro-rated basis over the service period. If work is performed for less than a calendar month, the Contractor shall be entitled to receive payment for the prorated portion of such month. The Contractor shall invoice the Town as of the last day of the month.

TAXES: The Town of Weston is exempt from the payment of taxes imposed by the federal and state governments. Such taxes should not be included in any price.

LEGAL COMPLIANCE: The Contractor shall abide by all federal, state, and local laws, ordinances, and regulations.

Material Safety Data Sheets: The Contractor shall supply the Town with copies of Material Safety Data Sheets for all products used on the job site.

INSURANCE: The Contractor shall carry Worker's Compensation insurance in accordance with the laws of the State of Connecticut, and all other applicable laws and regulations, for all of his employees engaged in work under the contract. If any work is sublet, the Contractor shall require the subcontractors to provide Worker's Compensation insurance for all of the latter's employees engaged in such work unless such employees are covered by the protection afforded by the Contractor's Worker's Compensation insurance and the certificate of insurance furnished by the Contractor so stipulates. Prior to commencing work, the Contractor shall furnish the Town with proof of coverage.

The Contractor shall carry comprehensive General Liability and Automobile Liability insurance limits in amounts not less than \$1,000,000 per occurrence as a Combined Single Limit for Bodily Injury, Personal Injury, and Property Damage. Prior to commencing work, the Contractor shall furnish the Town with proof of such coverage and shall include the Town of Weston as additional insured with regard to this work. If any work is sublet, the Contractor shall require the subcontractors to provide comprehensive General Liability and Automobile coverage in the same limits as for the Contractor, and shall furnish the Town with proof of coverage.

PERSONNEL: The Contractor shall designate a member of its management team who is very knowledgeable about the terms and conditions of the contract, to make weekly inspections of the athletic fields which are part of this contract. The Contractor shall interview, screen, and check references of employees assigned to perform the work in this contract. A police check shall be provided if requested by the Town. The Town has the right at all times to require that the Contractor remove and/or replace any personnel working on Town property.

NON-ASSIGNABILITY: The Contractor shall neither assign the contract nor any payments due hereunder in whole or in part without prior written approval of the Town of Weston.

AUTHORITY TO EXECUTE: The individual executing the bid proposal represents and warrants that he or she is duly authorized to execute and deliver this proposal on behalf of the corporation or entity for which he or she is signing, in accordance with its terms. All the terms and conditions are hereby ratified and confirmed in all respects, inclusive of the attached Schedule A and Specifications.

SCOPE OF SERVICES: During the term of the contract and any extensions, the Contractor shall furnish the services set forth in this section. The Contractor shall furnish all labor, materials, equipment, and supervision necessary to perform such services. The Town may request and the Contractor may perform extra services at such prices and at such times as the parties agree in writing. The Town may decide not to have landscaping and grounds keeping performed on all the areas listed in the specification; if that happens, the Town and Contractor shall negotiate a mutually agreed upon price reduction in the contract. All lawncare and maintenance work

performed shall be done in accordance with the attached Integrated Turfgrass Pest Management and Best Practice Plan for Athletic Fields (The Integrated Plan)

- I. The following work is to be performed at both Morehouse Farm Park (MFP) & Bisceglie-Scribner Park (BSP). MFP is located at 154 Newtown Turnpike in Weston. BSP is located at 478 Newtown Turnpike in Weston.
 - A) Pre-season spring clean-up of leaves sticks and debris to be completed soon after the winter season. This will be performed on the grass, trails and shrub beds.
 - B) Post-season fall clean-up of leaves sticks and debris: this will be conducted once the majority of leaves have fallen. This will be performed on the grass, trails and shrub beds.
 - C) Weeding of baseball and Softball fields on an as needed basis during the season.
 - 1) Initial infield Preparation for Recreation Programs, Little League and Babe Ruth Softball
 - 2) Initial setting of home plates and pitching rubbers
 - 3) Initial set up of foul lines, base marks and coaching boxes
 - 4) Initial set up of base marks for recreation programs, Little League and softball programs.
 - 5) Complete initial clay preparation for each season including adding clay if needed, edging of the infield grass, tilling and weeding.
 - D) Minor landscape projects (Top dressing of scar marks and filling holes or depressions when needed).
 - E) Preparation of Baseball / Softball infields prior to each season.
 - F) Major landscape projects, including complete refurbishment of baseball and softball infields as needed. This includes top dressing & over seeding.
 - G) Soil testing: to be performed each spring. The town of Weston will receive a copy of the results. Fertilizer applications will be based on these results.
 - H) Major lawn care projects (applications of appropriate fertilizers and weed control to all athletic field surfaces.) Soil tests to be taken on all areas and analysis studied.
 - I) Lawn Care and Maintenance
 1. Core Aeration and seeding of all grass areas to be performed each spring and fall. Proper seed mixtures to be utilized to ensure strong athletic field turf growth. Rate of seed is 3-5 pounds for every 1000 square feet. The grass seed to be used is a mixture of Perennial Rye and Kentucky Bluegrass, based on consultation with the Director of Parks and Recreation.
 2. Pre-emergent crabgrass control application (spring)
 3. Herbicide (spring & fall), but only as required per The Integrated Plan
 4. Fertilization (spring, summer & fall) organic
 5. Soil Test (spring)
 6. Two Annual Seeding's (Spring & Fall)
 7. Lawn Mowing and trimming: All lawn areas as both parks will be cut as needed throughout the season on an as-needed basis. The estimated minimum number of cuts is 28. This trimming shall maintain the grass areas in a neat condition and at approximately the same length as adjacent mowed areas.
 - i) With each mowing and trimming, the contractor will pick up any litter

on lawns and trail areas and place in supplied trash cans.

- ii) All edges will be trimmed, such as around tree wells, buildings, etc.
- iii) All grass clippings will be removed from the sidewalks after each cutting.

8. Trail Maintenance

- i) Contractor will walk the trails at each park weekly to remove litter, leaves and branches that may have fallen on the path. All fitness trail signs will be checked and repaired when necessary. Any and all depressions in the trail material will be raked out and leveled for safe passage.

II. The following work is to be performed at Morehouse Farm Park (MFP) and Bisceglie – Scribner Park (BSP)

A) Lawn Care and Maintenance

- i) Pre-emergent: One application shall be applied in the spring to all lawn areas for the prevention of crabgrass and certain other annual grasses and broadleaf weeds.
- ii) Herbicide: Applications shall be applied in the spring and the fall. None shall be applied if so directed by The Integrated Plan,
- iii) Fertilization: Organic fertilizer applications shall be applied in a uniform fashion so as to produce a uniformly green condition. All organic fertilizer used will have at least 50% slow release nitrogen of the highest quality, as well as low salt content. Organic fertilizers shall be applied to all lawn areas in accordance with the following timeline:
 - a) April 20th or close use ratio 31-0-0
 - b) June 1st or close use ratio 5-2-4
 - c) August 1st or close use ratio 5-2-4
 - d) September 15th or close use ratio 31-0-0

III. The following work is to be performed only at Bisceglie-Scribner Park (BSP)

A) Backstop windscreens installation in the spring and post season removal and storage.

B) Trail maintenance

C) Pre-Season Cleanup

- i) Power sweep and clean-out the swimming pond
- ii) Edge the lawn near the swimming pond
- iii) Seed the lawn near the swimming pond
- iv) York rake the stone in the park driveway
- v) Leaves will be removed from the area around the Old Post Office

IV. The following work is to be performed only at the High School's Revson Field and Middle School fields early the next day after the town 4th of July celebration.

V. Clean-up of firework debris and trash from both of the above fields and place refuse in dumpsters provided. * Bid this amount separately in appropriate bid section.

VI. Clean-up of firework debris that lands on adjacent private property along Lords Highway.
* Bid this amount separately in appropriate bid section.

**TOWN OF WESTON, CONNECTICUT
 PARKS AND RECREATION DEPARTMENT
 MOREHOUSE FARM & BISCEGLIE-SCRIBNER PARKS
 SCHEDULE A
 TOTAL BID PRICE**

Dates	Bisceglie- Scribner Park	Morehouse Farm Park	School Campus Fields Fireworks clean up 5th of July	Total
July 1, 2019 through June 30 2020				
July 1, 2020 through June 30, 2021				
July 1, 2021 through June 30, 2022				

Standard Hourly rate for labor and equipment for additional services if requested.

Labor \$ _____ Equipment \$ _____

Company Name: _____

Address: _____

Contact person _____

Telephone/ Fax _____

Email: _____

Signature of Signing Authority _____

 Printed Name of Signing Authority

 Date

Prepared for:
Milone & MacBroom
Engineering, Landscape Architecture and Environmental Science
Cheshire, Connecticut

Integrated Turfgrass Pest Management
and Best Management Practice Plan
for Athletic Fields
Morehouse Farm Park
Town of Weston
Weston, Connecticut

Prepared by:

William M. Dest, Ph.D.
Agronomist/Soil Scientist
July 9, 2002

INTRODUCTION

The integrated turfgrass pest management plan is designed using best management practices to 1) reduce risk of nitrogen movement to groundwater and nitrogen and phosphorus movement to the surrounding wetlands and the Saugatuck Reservoir and 2) minimize the need for pesticides, although some pesticides will be required if pest populations should cause permanent damage to the fields or could thin the turf enough to cause soil erosion. This is to be achieved by 1) identifying the major anticipated pest problems, 2) selecting the pesticides to control the anticipated pest problems using an environmental risk assessment model for pesticide leaching and runoff, 3) using biological control that has proven successful, 4) employing best management practices for nitrogen and phosphorus fertilization, 5) grass species selection, 6) mowing practices that will recycle nutrients and suppress diseases and 7) controlling thatch to reduce disease incidence and insect damage from occurring. The report also presents site specific soil properties of the A horizon from the present site that were used in the environmental risk assessment model and for preparing limestone and phosphorus recommendations for the construction phase of the project, Appendix A.

FERTILIZER PROGRAM

Best management practices for nitrogen fertilization for the proposed playing fields will include 1) applying nitrogen fertilizer only when the grass is actively growing, 2) returning grass clippings to the turf to recycle plant nutrients which will reduce the amount of nitrogen fertilizer and other fertilizer nutrients required, and 3) by applying most of the nitrogen required each year from a slow release nitrogen source such as coated urea, IBDU, or a natural organic form.

The amount of fertilizer nitrogen applied to the playing surfaces will not exceed 132 pounds of nitrogen per acre per year and will be divided into several applications with no single application to exceed 44 pounds of nitrogen per acre. This combined with using most of the nitrogen in slow release forms will reduce the risk of nitrogen runoff, leaching to groundwater and excessive plant growth from occurring. Plants that produce excessive growth are more prone to disease compared to plants in which excess growth is controlled.

Table 1
Fertilizer Programs

Fertilizer Program for Playing Fields Containing Maximum Yearly Amount of Nitrogen

Month	Fertilizer Grade	Lbs. of nutrients/acre		
		N	P ₂ O ₅	K ₂ O
April/May	¹ 31-0-0	22	-	-
June	² 6-1-3	44	7.3	22
August	6-1-3	44	7.3	22
September	31-0-0	<u>22</u>	<u>-</u>	<u>-</u>
Total yearly amount		132	14.6	44

¹ IBDU - a slow release fertilizer source of nitrogen

² Ringer - composted natural organic fertilizer source

Fertilizer Program for Playing Fields Using Minimum Yearly Amount of Nitrogen

Month	Fertilizer Grade	Lbs. of nutrients/acre		
		N	P ₂ O ₅	K ₂ O
May	6-1-3	44	7.3	22
August	6-1-3	<u>44</u>	<u>7.3</u>	<u>22</u>
Total yearly amount		88	14.6	44

Other slow release nitrogen sources may be substituted for the 31-0-0 and 6-1-3 fertilizer above. These may include sources such as sulfur or polymer coated urea and other composted natural organic fertilizers such as Sustane (5-2-4) and Nature Safe (8-3-5). Composted materials have been shown to suppress certain diseases such as pythium blight, brown patch and dollar spot and are included in the list of sources for this purpose (Nelson, 1992; Nelson et al., 1992).

There may be occasions when additional nitrogen will be required to sustain adequate growth and vegetative cover given the sporting events, level of participation, and intensity of use at the proposed Morehouse Farm Park. Ammonium nitrate (34-0-0) may be used as a supplement to the sources above depending upon the season, rate of growth, periods when the fields are renovated, and the nitrogen supplied by the clippings. The rate of nitrogen from ammonium nitrate can be between 10 to 20 lbs. N per acre at each application but not to exceed 20 lbs. N per acre in any single treatment.

Four hundred thirty five pounds (435 lbs.) of P₂O₅ per acre and 4.5 tons per acre of Dolomitic limestone will be applied to the fields during seedbed preparation and incorporated into the top 6 to 7 inches of topsoil. Applying fertilizer phosphorus during seedbed preparation will increase the soil levels of available phosphorus so that large surface applications of phosphorus will not have to be made to the turf in future years, thus reducing the risk of phosphorus runoff to the adjacent wetlands and the Saugatuck Reservoir although the phosphorus runoff from turfgrasses seldom occurs or has been shown to be in very small amounts when it does occur (Watschke et al., 1989; Harrison et al., 1993).

Nutrient loading rates from surface flow of nitrogen and phosphorus are shown for the present condition and the proposed fields, table 2. Estimates were derived using the Simple Method Equation from Schueler (1987) which utilizes average flow weighted values. The average flow weighted values for woodlands are from Haith et al. (1987), values for underfertilized grassland from McLeod (1984) and values for turf are from Kelling, et al. (1975), Watschke, et al. (1989) and Gross et al. (1990).

The equation used in determining loading rates is:

$$L = [(P)(P_j)(R_v)/12](C)(A)(2.72)$$

in which

- L = loading rate lbs. N and P per acre
- P = rainfall depth (47.1"/yr.)
- Pj = factor that corrects for storms with no runoff (0.9)
- Rv = runoff coefficient (0.05) - fraction of rainfall that is converted into runoff
- C = flow weighted mean concentration of N and P (mg/l)
- A = area of land use type
- 12 and 2.72 are conversion constants

Table 2

		Total Nitrogen and Phosphorus Loading Rates				
		Mean Runoff conc (mg/l)			Loading Rates Lbs/year	
	Land use	acres	N	P	N	P
present condition	woodland	18.9	0.19	0.006	1.73	0.05
	¹ grassland	12.6	0.11	0.28	<u>0.67</u>	<u>1.69</u>
				Total	2.40	1.74
² post condition	woodland	14.4	0.19	0.006	1.31	0.04
	¹ grassland	8.4	0.11	0.28	0.44	1.13
	turfgrass	7.8	2.00	0.33	<u>7.49</u>	<u>1.24</u>
				Total	9.24	2.41

¹unfertilized grassland

²0.9 acres are comprised of skinned infields and do not contribute to nitrogen and phosphorus runoff.

The loading rate for nitrogen and phosphorus to the adjacent wetland and Saugatuck Reservoir is 0.9 and 4.8% of the maximum yearly amount of nitrogen and phosphorus respectively to be applied to the fields. Further the loading rates represent a small increase from the present condition, therefore should not adversely impact the adjacent wetland. Also, it is likely that some of the nitrogen if it does reach the wetland will be lost to the atmosphere through denitrification, a common function of wetland soils.

The yearly concentration of nitrogen and phosphorus in runoff from the planned Morehouse Farm Park to adjacent wetlands based upon the loading rates in Table 2 will be 0.13 mg/l (milligram per liter) and 0.028 mg/l of nitrogen and phosphorus respectively. Yearly runoff volume is 12 acre inches and is from Mr. Ted Hart, Milone & MacBroom.

SOIL TESTS

Soil samples to determine soil pH and soil available nutrients, particularly phosphorus and potassium, should be taken once every 3 to 4 years from the field. This will determine if additional phosphorus and/or potassium is required above that which is applied in the fertilizer programs outlined above. Also, requirements for a limestone treatment should be based on the results from measuring soil pH to reduce the risk of overliming or not applying sufficient lime to maintain the pH between 6.0 to 6.7. Correct sampling technique is critical for interpreting soil test results.

PESTICIDES AND PEST CONTROL

The anticipated major pest problems for the fields are restricted to just a few insects. These are the Japanese beetle grub and chinch bug. The major anticipated weed problems are the weeds crabgrass and the broadleaf weeds such as clover, dandelion and plantains. Parasitic diseases are not anticipated to be a major problem for the field areas, therefore fungicides will not be required. Even if a disease does occur with the possible exception of pythium, the turf will usually recover with a change in weather conditions.

A monitoring protocol for pest problems will be implemented. The frequency that monitoring is carried out will depend on weather conditions, periods in which the grass is under stress and when individual pest problems are expected to occur. Threshold levels for pests will be used where they have been established, such as for insects. However, threshold levels for weeds in turfgrasses have not been determined nor are they as easily defined as for insects so that a decision to take action using herbicides still remains subjective. There are also other insect problems such as the bluegrass billbug and grubs of the European chafer and Oriental beetle that will be monitored for and controlled should they be sighted. However, they do not occur with the same frequency on turfgrasses in Connecticut as the above-mentioned insects.

Insects

Japanese Beetle Grubs

Japanese beetle grubs are a soil inhabiting insect and do most of their feeding in September and October on the roots of grasses. Monitoring for Japanese beetle grubs will begin in mid-July to early August after the adults have laid their eggs. A garden spade or other suitable means can be used in which square foot samples are taken from the top 2 to 3 inches of the surface and the soil just below the turf examined for the number of grubs in each sample. A 4" cup cutter as used on golf courses can also be used as a sampling tool in place of a garden spade. Samples should be taken at approximately 20 foot intervals over the fields. Suggested threshold populations for grubs have been placed at 6 to 20 larvae per square foot before an insecticide treatment is required. However, plant vigor and soil moisture content are factors that can affect threshold populations and will enter into the decision to undertake an insecticide treatment. It takes a greater number of grubs to affect a healthy and vigorous growing turf.

The nematode Heterorhabditis bacteriophora will be used first to control grubs before an insecticide treatment if they exceed the threshold level and are in the early stages of development. Soil moisture must be adequate for its application. Close monitoring for its control will follow. If the grub population still continues to be above the threshold level, then an insecticide treatment will be applied.

Chinch Bug

Chinch bug is a surface feeding insect. Damage is caused by the insect extracting juices from the stems and leaves often killing the entire plant. Damage is in the summer months, June through August, and often gives the appearance of drought injury. There are two generations produced during this time. Monitoring is done at this time by parting the grass between damaged and healthy grass to examine the presence of the insect. Also, a coffee can with both ends removed can be inserted into the turf and filled with water. The chinch bugs, if present, will float to the surface. Threshold levels have been placed between 30 to 50 nymphs per square foot. The selection of endophyte perennial ryegrass cultivars for the field and fine leaf fescues for the surrounding areas will reduce the risk of chinch bug injury. See Grass Species Selection.

Weeds

Crabgrass

Crabgrass is an annual weed that begins to germinate in mid May/early June. Maintaining a dense stand of grass will help in restricting crabgrass populations. Also, crabgrass infestation into the fields can be somewhat reduced if the fields are maintained at a 2 ½ inch mowing height. This reduces light penetration below the canopy and moderates soil temperatures which affects crabgrass seed germination and subsequent seedling development. Further, using a combination of pre and post emergence herbicides to control crabgrass if it becomes a problem reduces the total overall amount of active ingredient of herbicide needed per acre should chemical control be required. A preemergence herbicide spring treatment will only be used if there was a large infestation of crabgrass the previous year. Crabgrass population will be monitored and recorded at the end of each summer to identify areas requiring treatment the following spring. A preemergence treatment the next spring will only be used if crabgrass populations exceed 5% of the field areas.

Broadleaf Weeds

Broadleaf weeds will eventually encroach into the fields. However, monitoring will help in the decision to treat with a herbicide. A means for monitoring weeds can be accomplished by using a simple rating system of 1 through 3 in which 1 = weeds found occasionally in the turfgrass population of less than 10%, 2 = weeds found frequently, or between 10 to 30%, and 3 = weeds abundant in the plant population or greater than 30%. Although the rating is subjective, it will assist in making decisions to 1) chemically treat for weeds, 2) evaluate the success of past herbicide treatments, and 3) make changes in the cultural program to better

provide the turfgrass community with a competitive advantage over the weeds. A weed population rated 1 may not require a herbicide treatment while a rating of 2 or 3 which may seriously affect the surface of the fields resulting in the risk of soil erosion or an unsafe surface to play on would require a herbicide treatment because of the abundant weed population. Broadleaf weed populations will be scouted for in late April/early May and again in August and September. The location of weed populations and species names will be recorded. Spot treatment of weeds that are found only in a few locations in the fields should be employed in place of blanket treatments whenever feasible.

INSECTICIDE AND HERBICIDE SELECTION

A risk assessment model was used for selecting the insecticides and herbicides that can be used on the fields by determining their potential runoff and leaching to groundwater. Pesticides that have a low potential were selected and are shown in table 3. The National Pesticide Soil Data Base and User Decision Support System for Risk Assessment of Ground and Surface Water Contamination (NPURG) was used. It is a computerized system developed by the USDA, SCS based on the GLEAMS model (Leonard et al., 1987) for use in agricultural row crops.

The conditions of the model are:

1. There is a 4% slope.
2. The pesticide is applied to a fallow (bare surface) field 2, 4, 8 and 15 days before a major rainfall event.
3. A rainfall event of 3.5 inches takes place every second day for five events for a total of 17.5 inches of rainfall followed by a 1 inch event every other day for at least 4 times giving a total of 21.5 inches of rainfall over an 18 day period. This far exceeds normal rainfall. However, the model is designed to err on the conservative side for protecting ground and surface water.

A summary of the pesticide fate as a result of the NPURG analysis is shown in Appendix B of the report.

Table 3 - Pesticides with Low Leaching and Runoff Potential

<u>Herbicides</u>	<u>Insecticides</u>
2,4-D amine (many names) ¹	acephate (Orthene)
bensulide (Betasan)	bendiocarb (Turcan)
benefin (Balan)	bifenthrin (Talstar)
dicamba (Banvel)	carbaryl (Sevin)
2,4-DP	chlorpyrifos (Dursban)
dithiopyr (Dimension)	cyfluthrin (Tempo)
fenoxaprop-ethyl (Acclaim)	fluvalinate (Mavrik)
glyphosate (Roundup)	Lambda-cyhalothrin (Scimitar)
MCPP (mecoprop)	
oxadiazon (Ronstar)	
pendimethalin (Pendulum)	
siduron (Tupersan)	
triclopyr (Turflon)	
trifluralin (Treflan)	

¹ Common name (trade name)

GUIDELINES FOR SAFE USE AND HANDLING PESTICIDES

Guidelines for safe use and handling pesticides will be followed to include but not limited to:

1. Pesticides will be selected based on target species. No other pesticides will be applied.
2. The use of pesticides are to be spatially restricted. For example, if white grubs inhabit or are damaging only a single location on a field, then only the location in which they are found or are at the threshold level will be treated (spot treatment). This will substantially reduce the use of pesticides.
3. Pesticides will only be applied during periods when the grass is growing actively.
4. Higher than recommended rates of pesticides will be avoided. Research is showing that present label rates for pesticide may even be reduced. As an example, a strategy of using pre/post herbicide treatments for annual grassy weeds such as crabgrass is shown to reduce overall herbicide use on this annual species.
5. Pesticides should be applied uniformly to the area to be treated by careful equipment calibration and using correct spacing and nozzle heights on boom sprayers if used to apply the materials. Equipment should be calibrated on a periodic basis to maintain correct application rates.
6. Pesticide treatments will be avoided during windy conditions and/or prior to a period a heavy rainfall event is predicted.
7. Application equipment will be maintained and cleaned so that the equipment operates efficiently.
8. Label directions for mixing pesticides will be followed to ensure efficient and safe use. Guidelines for proper disposal of pesticide containers will be followed.
9. Persons using the pesticides will be properly licensed. This is required by state and federal law. Persons have to go through training programs and take examinations to obtain their licenses.
10. Up to date records will be kept on pesticide use to include:
 - a) date of pesticide application
 - b) common name of pesticide and amount of active ingredient
 - c) amount of pesticide applied
 - d) location in which pesticide was applied to the field or fields if a spot treatment
 - e) size of area treated
 - f) type of application method (spray, granular, etc.)

- g) weather conditions at the time of treatment and 24 hours following treatment
- h) applicator's name and affiliation

Insects and weeds will be controlled using multiple techniques that include 1) accurate pest identification 2) good monitoring techniques, 3) using pest threshold levels where they have been determined, 4) using biological control where it has been found to be successful, 5) grass species selection, and 6) employing sound cultural practices such as careful fertilization, cultivation, mowing and thatch control. This management strategy will reduce pest problems and pesticide use.

GRASS SPECIES SELECTION

Kentucky bluegrass cultivars were selected for the playing surfaces of the baseball fields for their good rating under low maintenance in the National Kentucky Bluegrass Tests, National Turfgrass Evaluation Program. The perennial ryegrass cultivars were selected for high endophyte. Grass varieties with high endophyte have shown to display good resistance to leaf feeding insects such as chinch bug.

The fine leaf fescue cultivars (chewings and creeping red fescue) for seeding in areas outside the playing surfaces such as outside fences and slopes were chosen for their high endophyte. Also fine leaf fescues have a low fertility requirement and have continually shown to persist with minimal or no fertilization whether mowed or left unmowed once established. The fine leaf fescues outside the playing surfaces will additionally serve as sinks for any nitrogen, phosphorus or pesticide that might move in overland flow.

Seed Mixtures

Athletic Field Playing Surfaces (percent seed by weight)

- 35% Ram I Kentucky bluegrass
 - 35% North Star Kentucky bluegrass
 - *15% Cutter perennial ryegrass
 - *15% Elf perennial ryegrass
 - *high endophyte
- Seeding rate = 130 pounds per acre

Areas outside the playing surfaces (percent by weight)

- *40% Victory II chewings fescue
 - *30% Fenway creeping red fescue
 - 30% Discovery hard fescue
 - *high endophyte
- Seeding rate - 260 pounds per acre

The varieties selected for the proposed project should become part of the specifications for building the fields. The varieties selected above may be substituted by other varieties with similar characteristics but the species ratio and seeding rates are to remain the same in each seed mixture. Final cultivar selection will be based on local availability.

The best time to seed cool season grasses is between August 15 and September 30. Soil temperatures are ideal for germination to occur and weeds such as crabgrass (highly competitive in spring to mid-summer seedings if not chemically controlled) is not a problem with seedling development of the cool season grasses seeded at this time of year. The construction schedule should be planned to meet this time period for seeding.

MOWING MANAGEMENT

1. The mowing height for the fields will be maintained at 2 to 2 ½ inches. Grass areas outside the field once established will be mowed at a cutting height of 3 inches. Keeping the fields and areas outside the field at these mowing heights will reduce the ingress of weedy grasses such as crabgrass provided a dense stand of grass is maintained. However it should be recognized that the mowing height will affect the ball to surface properties. High mowing heights reduce the velocity of the ball as it moves across the playing surface.

2. The field will be mowed at 5 to 7 day intervals depending upon the growth rate of the grass. Mowing off an excessive amount of leaf area at a single mowing is to be avoided. Also, mower blades should be kept sharp to avoid injury to the leaf blade. Infrequent mowing and dull mowing blades weaken the plant causing the turf to thin and make it more susceptible to disease and encroachment of weeds.

3. Clippings on the field and surrounds will be returned to recycle nutrients thus substantially reducing the amount of nutrients needed to be applied through fertilization. Returning clippings can reduce the nitrogen requirement by 25 to 30 percent over a growing season. Further, research at the Storrs Experiment Station, University of Connecticut (Dest, 1992) has shown disease suppression of pink snow mold, red thread and drechslera leaf spot diseases on a perennial ryegrass/Kentucky bluegrass sward from returning grass clippings compared to clippings removed (a common practice on many home grounds).

THATCH, SOIL COMPACTION, CULTIVATION, AND FIELD RENOVATION

A field renovation section is added for the multipurpose fields because of intensive use leading to subsequent wear. Periodic renovation in this case is important to maintaining a sustainable grass cover. A lack of grass cover with a subsequent loss of root mass increases the risk of nitrogen leaching due to the mineralization of nitrogen from soil organic matter and applied organic nitrogen sources. Further, the risk of soil erosion is increased.

Excessive accumulation of thatch often occurs with rhizomatous grass species such as Kentucky

bluegrass which provides an ideal habitat for insects and fungal pathogens. The following measures will be employed to control thatch from building up excessive accumulations.

1. The field will be core aerified thoroughly toward the latter part of May to early June and again in late August/early September for the purpose of bringing soil to the surface. The soil cores will be pulverized for topdressing. This practice assists in controlling thatch accumulation. Also core aerification helps in reducing soil compaction which can reduce turf vigor and root development resulting in predisposing the turf to disease. Therefore core aerification performs a dual role. An aerifier with tines spaced on at least 3 to 3 ½ inch centers and with a coring depth of no less than 3 inches or greater should be used. If tines are spaced further apart than this, then several passes over the fields will be required.

2. Dethatching along with core aerification may occasionally be required if thatch accumulation proceeds at a faster rate than decomposition. No more than ¾ inches of thatch should be allowed to accumulate. A dethatching machine should be employed if greater than ¾ inches of thatch is beginning to accumulate.

3. Field renovation - Renovate the multipurpose fields on a periodic basis using the following method:

1. Sow 100 pounds per acre of the perennial ryegrass-Kentucky bluegrass seed mixture. The seed mixture should contain 70% perennial ryegrass cultivars and 30% Kentucky bluegrass cultivars. Use cultivars that are rated good under low maintenance. See seed specified in Grass Species Selection, Athletic Field Playing Surfaces.

2. Core aerify 2 times over the fields with the core aerifier specified above.

3. Sow another 100 pounds of the perennial ryegrass-Kentucky bluegrass seed mixture per acre.

4. Pulverize the soil cores and work the pulverized soil cores into the turf using a steel mat.

5. Sow 60 pounds of the perennial ryegrass-Kentucky bluegrass seed mixture using a slit seeder.

6. If renovation takes place in the spring or early summer, treat the fields with siduron if a crabgrass infestation is predicted - see reference to Pesticides and Pest Control.

MAINTENANCE FOR ESTABLISHMENT PHASE (GROW-IN PERIOD)

The use of pesticides during the grow-in period can be avoided if seeding is done in accordance with the recommended seeding rates and the seeding schedule is met. See Grass Species Section. Also it is important to achieve a stand of grass quickly to reduce the risk of soil erosion. The following program is designed to do this.

1. Apply a 1-2-1 ratio fertilizer to the surface of the field prior to seeding to supply 88 lbs. P_2O_5 per acre.
2. Periodic fertilizer treatments should be made during grass establishment with a soluble nitrogen source such as ammonium nitrate or urea applied at a rate to supply 20 Lbs. N per acre at each treatment until the grass is well established and a dense stand of grass is achieved. The period between fertilizer treatments will be between 2 to 4 weeks depending on the rate of growth and development of the grass obtained after each fertilizer treatment. It is important that a grass stand be achieved in a short period of time to reduce soil erosion. Fertilizer treatments at this stage of growth, particularly with nitrogen, are important in achieving this goal. Once the stand of grass is mature, then the fertilizer sources and rates outlined in the fertilizer program should be followed.
3. Mowing - Mowing will begin when the seedlings reach a height of 2 inches on the fields. The grass should be mowed at 4 to 5 day intervals using a reel mower set at 1 ½ inches cutting height (bench setting). Mowing frequency and cutting height are extremely important to shoot development in grasses and result in achieving a good grass cover quickly. The mowing height will be raised once a good grass cover is obtained. Using a reel mower at this stage is extremely important if the goal is to have the fields ready to use within 3 to 4 months of growing weather from seeding.
4. Irrigation - The seeded field should be irrigated with quantities of water each day to replace amounts lost from the surface by evaporation and by transpiration from the plant. This should be done for 3 to 5 weeks following seeding. Adequate moisture is important to reduce seedling loss and achieve a dense grass cover quickly. Water quantities used should be recorded on a daily basis and the amounts adjusted to meet the evapotranspiration demand.

SUMMARY

The Management Plan for the proposed fields and adjacent areas reduces the risk of nitrogen, phosphorus and pesticide movement to groundwater and to the adjacent wetland and the Saugatuck Reservoir by implementation of best management practices and therefore should have no adverse impact on water quality or the adjacent wetland. The components of the plan include 1) grass species and cultivar selection for pest resistance and for those species and cultivars having a minimum nitrogen requirement where feasible 2) seeding rates and schedule, 3) a biological control strategy that is showing promise for disease suppression and controlling white grubs, 4) guidelines for handling and using pesticides, 5) major pest complex of the most often encountered pests found on playing fields and 6) selection of pesticides with a low leaching and runoff potential for use on the proposed fields. However, other maintenance practices are also important to maintaining an acceptable grass cover and safe playing surface such as aeration, proper mowing heights and frequency, careful water use and periodic field renovation to restore the turf cover from either wear or unforeseen injury.

Maintenance of Skinned Area

Skinned Infields

The following work is to be done before each game.

1. Scarify the infields with a scarifier drag (example: nail drag) to relieve surface compaction and decrease hardness.
2. Drag or float the infields to smooth and level the surfaces. Change directions with each pass over the skinned infields. Also rotate starting and stopping points each time the fields are dragged.
3. Water the infields lightly to firm the surface. Hand watering with hose and spray nozzle is the preferred method.
4. Apply soil material to the pitcher's mounds and batter's boxes to fill depressions. Bring to grade with surrounding areas and tamp material until the surfaces are adequately firmed. Remove any loose soil material.

The following work is to be done between game events.

1. Fill depressions and holes in the infields with soil material to bring to grade with surrounding areas. Tamp or roll these areas to adequately firm the fill materials.
2. Maintain the edge at the skin and turf areas level and with a clean and sharp edge. Prevent buildup of a lip by removing infield material accumulated on the grass with a rake or wash off the material using a high pressure nozzle attached to a hose.

Work to be done once per year

1. Cultivate the top three inches of infield material if the surface becomes too compact or if additional materials are to be added.
2. Laser grade the infields and groom.
3. Remove soil material at the edge of the skinned infields and turf if a substantial lip builds up. This may require stripping the sod, removing soil material, regrading and sodding. Soil may also be removed from beneath the sod with a garden spade or fork and the edges tamped. This will depend upon the amount of soil material that has accumulated at the edge between the skinned infield and sod.

Literature Cited

Dest, W.M., S.C. Albin, and K. Guillard, 1992. Turfgrass clipping management. Rutgers Turfgrass Proceedings. 23:28-38.

Gross, C.M., J.S. Angle and M.S. Welterlen, 1990. Nutrient and sediment losses from turfgrass. J. Environ. Qual. 19: 663-668.

Haith, D.A. and L.L. Shoemaker. 1987. Generalized watershed loading functions for stream flow nutrients. Water Resour. Bul. 28:421-428.

Harrison, S.A., T.L. Watschke, R.O. Mumma, A.J. Jarrett and G.W. Hamilton, Jr. 1993. Nutrient and pesticide concentrations in water from chemically treated turfgrass. In A. Leslie (ed). Pesticides in Urban Environments. Am. Chem. Soc.

Kelling, K.K. and A.E. Peterson, 1975. Urban lawn infiltration rates and fertilizer runoff losses under simulated rainfall. J. Soil Sci. Soc. Amer. Proc. 39: 348-352.

McLeod, R.V. and R.O. Hegg, 1984. Pasture runoff water quality from application of inorganic and organic nitrogen sources. J. Env. Qual. 13:122-126.

Nelson, E.B. and C.M. Craft, 1992. Suppression of dollar spot on creeping bentgrass and annual bluegrass turf with composted-amended topdressing. Plant Disease. 76:954-958.

Nelson, E.B., 1992. Biological control of diseases on golf course turf. GSGA Green Sect. Rec. 30:11-14.

Schueller, T.F., 1987. Controlling urban runoff: a practical manual for planning and designing urban BMPs. Metro. Wash. Council of govts.

Watschke, T.L. and R.O. Mumma, 1989. The effect of nutrients and pesticides applied to turf on the quality of runoff and percolating water. A Final Report to the U.S. Dept. Int., U.S. Geol. Sur. ER 8904, Env. Res. Res. Inst. Penn. State Univ. 64 pp.

APPENDIX A

July 9, 2002

Soil Test Results
 Proposed Athletic Field Complex
 Morehouse Farm Park
 Town of Weston

Sample ID soil type	vegetation	sand ---	silt %	clay ---	particle size ¹	textural class	organic ² matter %	soil pH	P/acre	soil available nutrient ³ lb. K/acre	soil available lb. K/acre	Depth of A horizon - inches -
Charlton/ ⁴ Hollis, Sutton	grassland	51.1	33.7	15.2		sandy loam	6.7	4.8	1	87		7.3"
Charlton/	woodland	46.9	38.1	15.0		loam	8.8	4.7	2	82		7.7"

¹ Silt and clay determined by hydrometer method.

² Determined by loss of weight on ignition.

³ Determined by modified Morgan method.

⁴ Sample submitted to the laboratory was a composite of the Charlton/Hollis and Sutton soils.

⁵ Dept of A horizons are means of 84 samples. Depth ranged from 4 to 12 inches.