Recreation Master Plan Report Hamilton-Wenham Regional High School

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enclosures

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HAMILTON-WENHAM REGIONAL HIGH SCHOOL

NEEDS ASSESSMENT AND ATHLETIC CAMPUS

MASTER PLAN REPORT

SECTION 1.0 – INTRODUCTION, BACKGROUND, AND PURPOSE

Gale Associates, Inc. (Gale) was engaged by the Hamilton-Wenham Regional School District and the Hamilton-Wenham Recreation Department to assist with the development of a Needs Assessment and Athletic Campus Master Plan. The goals of this study were:

1. *To evaluate the Hamilton-Wenham Regional High School's (HWRHS') requirements for athletic fields currently, as well as in the future, at the high school site.*

2. *To review and update the evaluation of the HWRHS' existing athletic field facilities at the high school, as necessary, based on the previous Town-Wide Master Plan. The evaluation will consider adequacy, serviceability, safety, accessibility and utility of the facilities.*

3. *To provide master planning, resulting in a well-integrated repair and/or redevelopment plan for the athletic campus property that best meets the needs of the HWRHS and the Hamilton-Wenham Regional School District (HWRSD).*

4. *To develop a phasing plan, over a ten (10) year period, including a recommendation for a Phase 1 project, based on repair/development costs, scope, the needs of HWRHS and HWRSD, as well as community buy-in.*

5. *To analyze the impact of the proposed Master Plan Redevelopment on the existing athletic facilities within the Towns of Hamilton and Wenham.*

6. *To develop a 2-D, colored rendering and imagery of the recommended Phase 1 project, for use by HWRSD and HWRHS for project related fundraising.*

In the initial stages of the planning effort, Gale completed an inventory and evaluation of the HWRHS's recreational assets, and assisted in preparing calculated annual field use demands. Subsequently, Gale facilitated a user group meeting to discuss demands, understand needs, determine maintenance

issues, and obtain feedback related to the adequacy of the existing athletic campus.

The intent of this report is to first summarize and interpret the data collected during the Master Plan, and describe the resulting Planning Program. The Planning Program is an articulation of the HWRHS athletic campus requirements, needs and priorities as determined from the facilities evaluation, needs assessment, demand matrix, and user group meetings, as described above. Secondly, this report will offer recommendations regarding a series of facilities redevelopments, repairs, or enhancements intended to accomplish the Planning Program. Finally, this report will provide recommendations regarding a possible phasing of the proposed enhancements along with a schematic budget estimate associated with their implementation. These recommended facility enhancements form the basis of the Hamilton-Wenham Regional High School Needs Assessment and Athletic Campus Master Plan.

SECTION 2.0 - SYNOPSIS OF RECREATION FACILITY EVALUATIONS AND DEMAND CONCLUSIONS

As an initial step in the master planning effort, Gale completed an inventory and evaluation of the HWRHS athletic campus. As part of the Town-Wide Recreation Master Plan completed by Gale in 2010, a demand assessment was completed to quantify the use of the existing facilities and to assess their serviceability, compliance with applicable standards, and most importantly, their adequacy. As part of this Master Plan, Gale assisted the School and Towns with updating the demand quantification to obtain a more current snapshot of the annual athletic campus uses.

The facility inventory, evaluation, and demand quantification addresses the following questions:

- *What is the inventory and general condition of the HWRHS athletic fields included as part of this project?*
- *What record information or base plans are available for each?*
- *What are some of the immediate repair or renovation needs for each site (as opposed to redevelopment)?*
- *How many scheduled uses, by type, does each field sustain in a given year?*
- *What are the projected annual field uses for the planning period?*

The assessment was performed using accepted industry standards and guidelines where available, such as The National Federation of State High

School Associations (NFHS) and the Massachusetts Interscholastic Athletic Association (MIAA) guidelines as it relates to field dimensions, support equipment, orientation, and setbacks. The Architectural Access Board (AAB) and Americans with Disabilities Act (ADA) Guidelines were used to assess site accessibility.

The fields were also evaluated for serviceability (i.e. are systems and equipment in good condition and meeting the intended purpose?) and safety. The findings are categorized as they relate to the safety, serviceability, and accessibility of the components. The findings of the evaluation and condition assessment led to recommendations for each individual site. The following is an outline of the background investigation and condition assessment performed for the athletic campus.

Section 2.1 - Base Plan Development

An essential task of the Master Planning effort is the creation of a suitable base plan in AutoCAD to use as a starting point for the schematic planning effort to follow. The key function of the base map is to provide a site map of adjacencies and potential site and project impacts. Gale used Massachusetts Geographical Information Systems (GIS) to determine approximate locations of property lines, topographic contours, floodplains, and wetlands. Gale obtained a record drawing for portions of the athletic campus from HWRHS files as available. Gale compiled all available information to develop a suitable base plan for the campus. The base plan is provided as Enclosure 1.

It should be noted that Gale used the location of the previously flagged wetland limits from a plan provided by HWRHS to approximate the wetland limits. The plan is dated February 18, 2005 by Hugh J. Collins, Jr., Landscape Designer, Inc. Approved wetland delineations expire after three (3) years from their date of acceptance. Future redevelopment of the athletic campus will likely require a Notice of Intent (NOI) and re-flagging of the existing wetlands. The actual wetland limits therefore may vary from what is depicted on the base plans contained herein.

The base plans reflect approximate locations and are considered sufficient for the Master Planning effort; however, these plans are not suitable for detailed design, and any projects completed as a result of this Master Plan in the future will require a full property line and topographic survey. The results of these more detailed updated surveys may require modifications to the assumptions made during the Master Planning process.

Gale concluded that the athletic campus is very constrained and has extremely low expansion potential beyond the existing developed footprint. For those undeveloped areas that exist within the Town-Owned parcel, the majority of

them are constrained by jurisdictional wetlands. Opportunities for expansion of the athletic campus on site are very limited.

Section 2.2 - Facility Inventory and Evaluation

Gale documented the condition assessment of each athletic field on the HWRHS campus on a Gale standard Field Evaluation Form. The individual forms, provided as Enclosure 2, detail the general condition of each athletic field on the campus. Gale compiled a summary of the individual field assessments, as well as several recommended maintenance/repair tasks for each. These repairs are recommended to provide safe, serviceable, and accessible facilities, and are not related to the renovation strategies to be presented in this report. The inventory, condition assessment, and recommended short-term repairs or maintenance tasks, where appropriate, are summarized below.

Hamilton-Wenham Regional High School

The outdoor athletic facilities at Hamilton-Wenham Regional High School and Middle School consist of the following athletic facilities:

- *Four (4) multipurpose rectangular grass fields.*
- *One (1) 90' grass/clay baseball field.*
- *One (1) 400-meter running track and associated field events.*
- *One (1) 60' grass/clay softball field (Middle School).*

Figure 1
HWRHS Athletic Campus Aerial Image

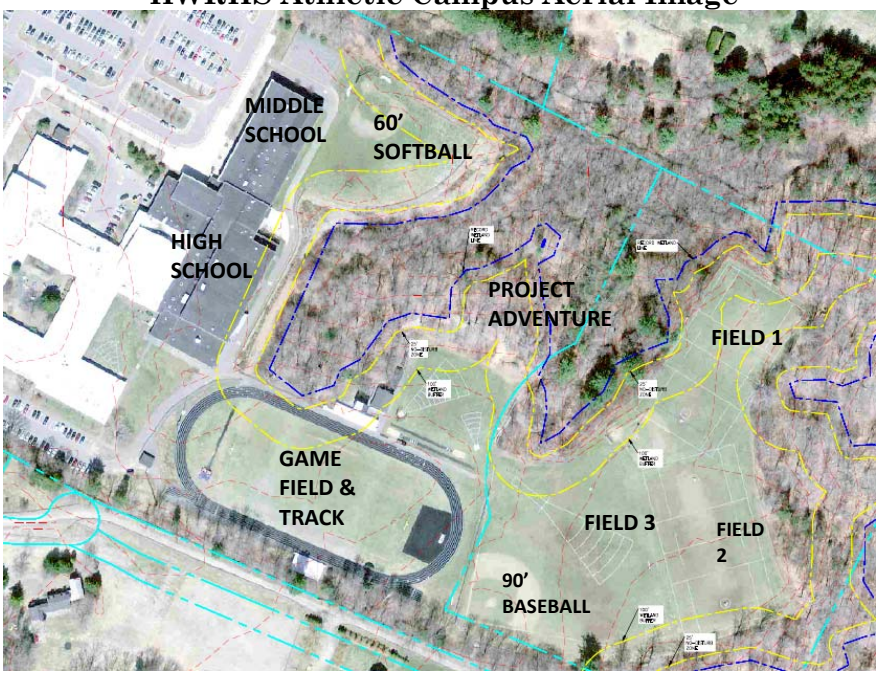


Figure 1 Notes:

1. Dark blue dashed line represents the approximate location of the bordering vegetated wetlands.

2. The dashed yellow lines represent the 25-foot No-Build Zone and the 100' Wetland Buffer Zones.

3. The teal dashed lines represent parcels according to the Tax Assessors Maps.

The following is a summary of the condition assessments performed at each athletic field:

Game Field – 190' x 360'

- The existing natural grass field on the inside of the running track is generally in good condition with decent growth density and minor repairs needed. Some depressions/ruts in the field affecting planarity could be repaired by topdressing, leveling, and over-seeding.

- Irrigation to the field is provided by a well system. However, water bans in the Town often prevent use of irrigation system.

- A concrete trench drain system is installed between the natural grass field and the track. The trench drain appears to be in poor condition based on visible debris build-up and Gale understands that the drainage system backs up in rain events. Exposed concrete along the edges of the drain system may be a safety hazard for field and/or track use. The trench drain has also created heaves and depressions in the adjacent track pavement in several areas. In any design efforts moving forward, the drainage system should be re-evaluated.

- The game field is under-sized based on MIAA recommended sizes to accommodate high school multi-purpose uses. The field size is approximated to be 190'x360' and is adequate for football and field hockey only. A safety run-out is estimated to be provided at 8' – 10' in distance between the edge of field striping and edge of track. The width meets the very minimal requirements, and does not meet recommended or desired widths for lacrosse and soccer. MIAA recommends a minimum of 180'x330' for Men's Lacrosse, 195'x360' for Women's Lacrosse, 195'x330' for Soccer, and 180'x300' for Field Hockey.

- The field is oriented in a Northwest-Southeast direction, which is not optimal solar orientation for rectangular athletic fields. Optimal solar orientation is North-South direction to limit glare by the sun.

- Spectator seating on the home side is in good condition and appears to provide ADA accessibility to seating. The pressbox is in fair to poor condition and does not provide ADA access, which is required by Massachusetts Building Code. Visitor seating is in poor/failing condition and does not appear to meet building, life safety, or ADA codes.

- Slow-draining surface materials and subsoils, likely resulting from over-compacted soils, often prevents scheduling of events or use of the field after significant rain events. This condition is a constraint on the athletics scheduling.

- Spectator/access control appears to be accomplished through use of rope and stanchions around the field perimeter. Fencing is not provided along the perimeter of the track. A security/perimeter fence is not provided to separate the facility from other athletic facilities on site and provide gated access to individual facilities.

- Scoreboard, goal posts, flagpole, and player benches are provided, although most appear to be old in age and require upkeep to improve aesthetics and serviceability.

- No athletic lighting is present.

Track and Field Event Venues

- The running track appears to be a 400-meter track with six (6) lanes on the oval and six (6) lanes on the straightaway. The radius of the track is estimated to be 104-feet, which provides a long narrow infield, limiting field width. The straightaway is located on the visitors' side of the track. Typically, the straightaway is located on the home side of the track for better visibility of events by spectators. Optimum track configuration includes eight (8) lanes on both the straightaway and oval, but most commonly high school tracks have six (6) lanes on the oval and eight (8) lanes on the straightaway, if possible.

- Track surfacing is in generally fair condition. While the acrylic coating has exceeded its useful life and has worn down to an unserviceable thickness, it does not appear that there are significant structural issues with the pavement or reflective

cracking. Given the age of the track at over 20 years, the asphalt condition appears to be good. It is apparent that some areas of standing water, UV degradation, and use has affected the surface condition. The synthetic surface was not observed to be delaminating, peeling, or cracking.

- Field Events provided include long/triple jump runways and sand pits, pole vault, high jump, shot put, discus, and javelin. The field event venues are generally in fair condition, with short-term repairs and maintenance recommended for each.

Field 1 – 170' x 330' Multipurpose Rectangular Field

- Field 1 is the northernmost rectangular field on the athletic campus and is surrounded on three (3) sides by undeveloped woodlands containing vegetated wetlands. The field in its current configuration and location is within several jurisdictional wetland buffers, including the 50-foot no-build zone and the 100' bordering vegetated wetland buffer.

- Field 1 is estimated to be approximately 170'x330' in size. This width does not meet minimum widths recommended by MIAA for Men's/Women's Lacrosse, Soccer, or Field Hockey. The length does not meet the requirements for Football. The field is undersized.

- Field 1 was noted to have planarity issues, with varying slopes across the field, several depressions, and sinking areas. The field slopes towards the edges significantly at the field corners and sidelines.

- The general turf condition is fair, with moderate growth density noted and limited areas of worn/bare turf. The field appears to be used less than other fields on the campus due to its size constraints.

- Irrigation is not provided at the field.

- The solar orientation of the field is good, in a generally North-South direction.

- Field 1 is at the highest elevation on the campus, and it appears that there are no significant drainage issues beyond localized ponding.

- There were no spectator seating areas visible, and no code-accessible route provided to the field. The field does not appear to have a scoreboard or player seating areas.

- No athletic lighting is present.

Field 2 – 180' x 330' Multi-Purpose Rectangular Field

- Field 2 is the easternmost rectangular grass field on the athletic campus. The field is estimated to be approximately 180'x330' in size. At this dimension, the field does not meet minimum recommended widths for soccer or Women's Lacrosse. The dimensions meet the minimum recommendations for Men's' lacrosse and Field Hockey only.

- Field 2 is located at the point of lowest elevation at the athletic campus and is bordered on its eastern, low-lying side by a bordering vegetated wetland within the undeveloped wooded area of the property. Due to this, the field is most often wet after rain events and receives the runoff from the remainder of the site. There is no formalized drainage system for the athletic field beyond surface runoff.

- Field 2 has significant bare spots and low turf growth density. The field appears to see the most use and is in failing condition. The field is likely severely over-compacted, limiting drainage capabilities of the topsoil and sub-soils which is likely a contributing factor to the poor drainage condition.

- Aeration to relieve compaction, top-dressing and over-seeding are recommended to provide a serviceable stand of turf. A substantial maintenance/reconstruction effort is required to provide an adequate field for competition play.

- There were no spectator seating areas visible, and no code-accessible route to the field provided. The field does not appear to have a scoreboard or player seating areas.

- No athletic lighting is present.

Field 3 – 200' x 330' Multi-Purpose Rectangular Field (Baseball Outfield)

- Field 3 is located in the outfield of the existing J.V. baseball field. The field is estimated to be approximately 200'x330', but has use constraints relative to its position in the outfield of baseball.

- At 200'x300', the field meets minimum recommended widths for all multipurpose uses, but is constrained in its length and does not meet minimum lengths recommended for Women's Lacrosse and Soccer.

- The planarity of the field is generally poor, with ruts and heaves throughout. The turf is worn at high-use areas around mid-field and at the goalmouths. Overall, it has generally sparse turf growth and is likely over-compacted. Aeration to relieve compaction, top-dressing and over-seeding are recommended to provide a serviceable stand of turf.

- The field appears to drain relatively well, and is at a higher elevation than the adjacent Field 2.

- There were no spectator seating areas visible, and no code-accessible route to the field provided. The field does not appear to have a scoreboard or player seating areas.

- No athletic lighting is present.

90' Baseball Diamond

- The baseball field has a 90' diamond, and the following approximate outfield distances: Left Field: 293', Center Field: 400'+, Right Field: 300'. The left field dimension does not meet the MIAA minimum recommended outfield dimension (300') for High School play.

- The solar orientation of the baseball field is optimal, with home plate and second base facing a Northeast direction.

- The baseball field is in generally fair to poor condition, with dimensional constraints, poor supporting amenities, and potential safety hazards related to proximity of player areas.

- The infield is in generally poor condition and requires weeding, raking, removal of lip buildup, reconstruction of mound, and supplemental infield mix proportioned to promote drainage.

- The distance from foul lines to player areas and between the backstop to home plate are severely constrained due to adjacent property lines and athletic facilities.

- There were no spectator seating areas visible, and no code-accessible route to the field provided. The field does not appear to have a scoreboard or player seating areas.

- No athletic lighting is present.

Middle School

60' Softball Diamond

- The 60' softball diamond located at the Middle School appears to have recently been renovated from a baseball field to a fully skinned infield softball field.

- The field provides a left, right, and center field distance of approximately 230-feet, with a permanent outfield fence in good condition. The outfield distance of 230 feet meets the minimum MIAA outfield dimension for softball of 200 feet.

- The field is positioned in a southeasterly direction and is located adjacent to jurisdictional wetlands. Its location and topography result in a generally wet outfield and there is believed to be no subsurface drainage system in place.

- The solar orientation of the field is poor (southeast) and likely results in some solar glare during evening play on the field.

- The skinned infield appeared to be in good condition, but was saturated during the site visit. The School may consider testing and supplementing the ratio of sand/clay/silt to provide an optimum infield mix ratio.

- Turf condition is generally good, with good growth density and few bare/worn areas.

- Player seating areas are in generally good condition, and consist of concrete pads with benches and perimeter fencing. Enclosed dugouts are not provided.

- There were no spectator seating areas visible, and no code-accessible route to the field provided. The field does not appear to have a scoreboard or player seating areas.

Section 2.3 - Soil Tests and Recommended Improvements (Short Term)

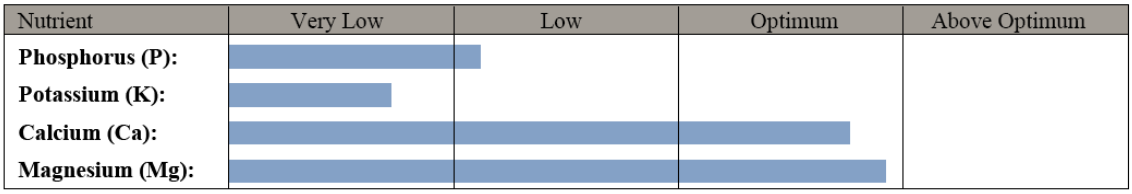
During the field evaluations, Gale obtained a series of soil samples from several of the natural grass athletic fields for analysis of the topsoil. The samples were submitted to the UMass Extension Center for Agriculture for the following tests:

- *Macro/Micronutrients Analysis*
- *Particle Size Analysis*
- *Organic Content*

The results of the testing indicate what deficiencies there may be in the soil medium for the existing grass fields, as well as recommendations on how to correct the deficiencies for best management of the turf. These test results and recommendations are provided for short-term maintenance opportunities, in the event that the Master Plan redevelopments and improvements will not be implemented in the short-term. The following is a summary of the test results and recommendations. The complete test reports are included as Enclosure 3.

Game Field

Soil Test Interpretation:



Recommendations:

Limestone:	None (based on target pH of 6.5)
Nitrogen (N):	3-5 lbs per 1,000 sq. feet
Phosphorus (P_2O_5):	1.5 lbs. per 1,000 sq. feet
Potassium (K_2O):	6 lbs. per 1,000 sq. feet

For best results, split the N, P_2O_5, and K_2O recommendations above into three to four applications over the course of the growing season at six to eight week intervals, beginning in mid- to late April.

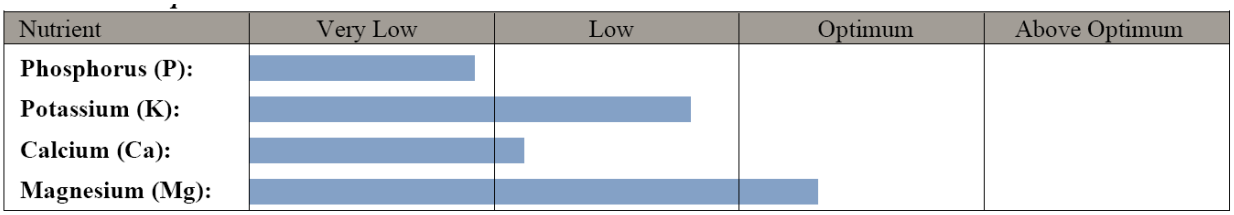
Particle Size Analysis:

	Results	*Desired Ranges*	*Summary*
Sand:	57%	40%-60%	Acceptable
Silt:	33.1%	30%-40%	Acceptable
Clay:	9.9%	5%-15%	Acceptable

Results of the particle size analysis indicate that the existing topsoil has appropriate fractions of sand, silt, and clay.

Field 1

Soil Test Interpretation:



Recommendations:

Limestone: 75 lbs. per 1,000 sq. feet (based on target pH of 6.5)
Nitrogen (N): 3-5 lbs per 1,000 sq. feet
Phosphorus (P_2O_5): 2 lbs. per 1,000 sq. feet
Potassium (K_2O): 2 lbs. per 1,000 sq. feet

Do not topdress turf with more than 50 lb. limestone per 1,000 square feet at one time. Split the above application between early spring and mid-autumn.

For best results, split the N, P_2O_5, and K_2O recommendations above into three to four applications over the course of the growing season at six to eight week intervals, beginning in mid- to late April.

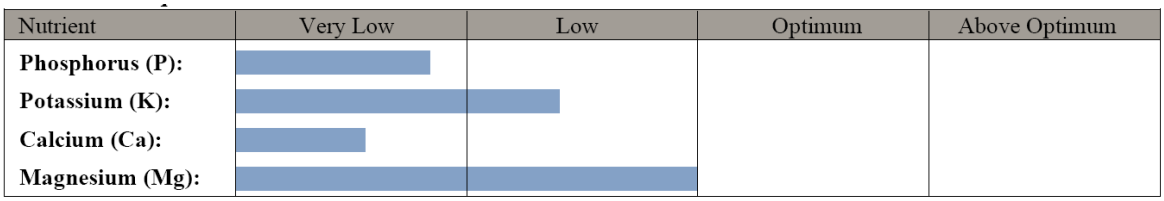
Particle Size Analysis:

	Results	*Desired Ranges*	*Summary*
Sand:	68.5	40%-60%	High
Silt:	22.2	30%-40%	Low
Clay:	9.3	5%-15%	Acceptable

Results of the particle size analysis indicate that the existing topsoil has a high fraction of sand, low fraction of silt, and an appropriate fraction of clay.

Fields 2 & 3

Soil Test Interpretation:



Recommendations:

Limestone: 100 lbs. per 1,000 sq. feet (based on target pH of 6.5)
Nitrogen (N): 3-5 lbs per 1,000 sq. feet
Phosphorus (P_2O_5): 2 lbs. per 1,000 sq. feet
Potassium (K_2O): 4 lbs. per 1,000 sq. feet

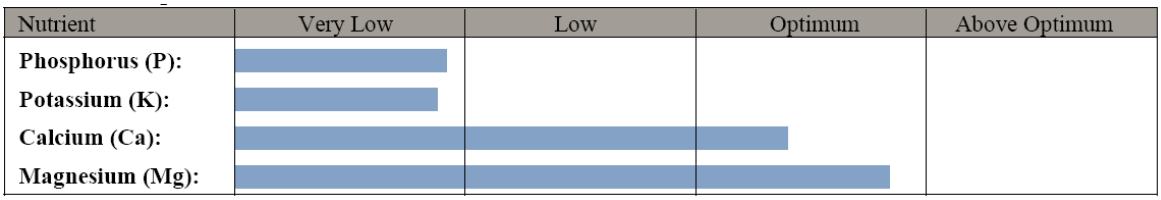
Do not topdress turf with more than 50 lb. limestone per 1,000 square feet at one time. Split the above application between early spring and mid-autumn.

For best results, split the N, P_2O_5, and K_2O recommendations above into three to four applications over the course of the growing season at six to eight week intervals, beginning in mid- to late April.

Particle Size Analysis was not performed on the soil located within Fields 2 & 3.

Softball Field

Soil Test Interpretation:



Recommendations:

Limestone: None (based on target pH of 6.5)
Nitrogen (N): 3-5 lbs per 1,000 sq. feet
Phosphorus (P_2O_5): 2 lbs. per 1,000 sq. feet
Potassium (K_2O): 5 lbs. per 1,000 sq. feet

For best results, split the N, P_2O_5, and K_2O recommendations above into three to four applications over the course of the growing season at six to eight week intervals, beginning in mid- to late April.

Particle Size Analysis:

	Results	*Desired Ranges*	*Summary*
Sand:	60.5	40%-60%	High
Silt:	31.0	30%-40%	Acceptable
Clay:	8.5	5%-15%	Acceptable

Results of the particle size analysis indicate that the existing topsoil has appropriate fractions of sand, silt, and clay.

Section 2.4 - Annual Field Use and Equivalent Uses (Demand)

An aggressively maintained, irrigated field that is rested for up to a third of the fall or spring growing season can theoretically sustain up to 200 - 250 team-uses per year, depending on how well-built and how well-maintained it is, and can still maintain a high quality and safe athletic turf. A scheduled team use is a two 2-hour game or practice involving 15-20 athletes. For most municipal fields which are often times poorly built, are rarely well-maintained, seldom rested, and often poorly watered, a more realistic level of use for a planning basis is 200 scheduled team uses per year.

As part of the master planning process for the Town-Wide Master Plan completed for the Towns of Hamilton and Wenham in 2010, Gale developed questionnaires, hosted user-group meetings, and assisted the Recreation Department in identifying all formal uses made of each athletic facility in the Towns. This quantification was refined and then finalized throughout the previous master plan. The final quantification of demand was used as a starting point for this HWRHS Master Plan, and was updated in 2014.

Since 2010, there have been very few modifications to the schedules, quantity of uses, and team events effecting the overall use of the athletic facilities at HWRHS. Gale met with athletic facility staff, users, coaches, the Rec. Dept., and school administration to review and update the 2010 demand quantification. As a result, the following updates were identified:

Added Team Events / Athletic Programs

- Girls' softball is anticipated to be added to the HWRHS athletics program. The demand quantification projected uses related to softball to provide an accurate future use quantification.

- Hamilton-Wenham Babe Ruth Baseball was added as there is a quantifiable use of the High School baseball field for the spring and summer Babe Ruth program.

Modification to Quantity of Uses and/or Location of Uses

Several programs were re-evaluated to determine the projected quantity of uses on the athletic fields. The following teams/programs were determined to have seen changes in schedules or field uses since 2010:

- Hamilton-Wenham Youth Football – increase in uses
- Hamilton-Wenham Youth Boys Lacrosse – increase in uses
- HWRHS Football – increase in uses and change in location of uses
- HWRHS JV Girls Lacrosse – increase in uses and change in location of uses
- HWRHS Varsity Girls Lacrosse – increase in uses and change in location of uses
- HWRHS Varsity Boys Lacrosse – increase in uses and change in location of uses
- HWRHS JV Boys Soccer – increase in uses and change to locations
- HWRHS Varsity Boys Soccer – decrease in uses
- HWRHS JV Girls Soccer – decrease in uses and change to locations
- HWRHS Varsity Baseball – decrease in uses and changed to indicate 100% off-site use
- H-W Senior Babe Ruth (summer) – increase in uses

The revisions to the demand quantification were reviewed through user group meetings and determined to be final prior to proceeding with the development of the planning program. Refer to Enclosure 4 for the annual field use demand matrix.

Based on the results of the demand quantification, it is apparent that a shortage of field space is likely compromising the quality of the athletic fields at HWRHS. Three (3) of the six (6) athletic fields currently experience more than 250 scheduled team uses per year. Based on these uses it is unlikely that these fields can sustain an acceptable stand of turf even if properly well maintained and rested. It appears that the 60' softball diamond at the Middle School is most heavily used in terms of quantity of uses. The softball field is used by Little League, girls' softball, physical education (Middle School) and Middle School intramurals. The field totals approximately 360 scheduled team uses on an annual basis.

The second most heavily used athletic field at HWRHS appears to be Field 2. Field 2 is scheduled for use by HWRHS football, lacrosse, and soccer, as well as high school physical education classes. The field experiences 324 annual team uses.

The third athletic field exceeding a total of 250 annual uses is Field 1. Field 1 provides approximately 277 team uses each year. These uses consist of Girls and Boys Lacrosse, Girls Soccer, and field event uses. Refer to Enclosure 4 for the complete demand quantification.

The results of the demand quantification indicate that the fields at HWRHS are being used to accommodate over 1,480 team events per year. This number is based on scheduled events only and does not include informal or undocumented uses. Refer to Figure 2 for the summary of Annual Team Uses. The summary is also included in Enclosure 5.

Figure 2
Annual Team Uses ("Field Demand")

HAMIILTON-WENHAM MASTER PLAN ACTUAL SCHEDULED USES (DEMAND)

FIELD USE ANNUAL SUMMARY - ACTUAL TEAM USES			
Field Location	**Field Type**	**Total Annual Uses**	**Comments**
Game Field Inside Track	MPR	**130**	Varsity games (football,soccer,lax)
Field 1 (Upper Field)	MPR	**277**	Soccer and Lax
Field 2 (Lower Field)	MPR	**324**	Football practice/lax/PE
Field 3 (Baseball Outfield)	MPR	**205**	Soccer/Lax
Project Adventure Field	MP	**65**	Football/track and field
Baseball Field	90'D	**124**	JV and Babe Ruth
Softball Field	60'D	**356**	MS PE, Little League, new softball team
	Total	1481	

Green: <200 uses
Yellow: 200-250 uses
Red: >250 uses

With a population of four (4) multi-purpose rectangular fields, one (1) baseball field, and one (1) softball field, the facility theoretically has the ability to adequately sustain approximately 1,200 uses per year. Without consideration of the relationship between type of use and type of field, it is quickly apparent that there may be a facility deficit of over 250 annual uses, or a 1-2 field equivalent. This is a gross estimate and does not take into consideration the type of fields (ball fields or rectangular) most required, nor does it distinguish between youth sports and school sports; however, it is a valuable data point as we begin to formalize the Planning Program below. The relationship between field type and quantity of uses is analyzed in Section 4.0.

Section 2.5 - Field Demand Impact – Equivalent Team Uses

It was concluded in the previous section that the High School Multi-Purpose Field No. 2 and the Middle School Softball Field receives the highest amount of annual team uses. In comparing the uses at these athletic fields, it is obvious that the types of uses are noticeably different, and likely result in different levels of stress and wear on the field. The softball field is primarily used for low-contact sports for which athletes are of youth age, such as little league, middle school physical education, and middle school intramurals. High School Field No. 2 is primarily used for high school level sports, where contact is increased, play is more aggressive, and athletes are generally larger, increasing the stress loads on the field and the rate of field deterioration and wear resulting from its use. Therefore, it can be stated that there is a relationship between type/level of use and amount of deterioration that can be expected. While the "Actual Team Uses" (Enclosures 4 and 5) is a good indication of scheduled team uses, the "Equivalent Team Uses" is a better indicator of the anticipated quality of the field relative to the amount of uses seen by the field. As a result, we must account not only for the number of uses, but for the type of use and age of the participants, by applying an impact factor to the raw scheduled use data.

Based on our experience, we have developed an impact factor of 1.0 to women's soccer as the average activity in terms of field impact and deterioration. We believe that high school football is twice as damaging to the turf and assign it a 2.0 impact factor accordingly. Other impact factors for various sports were assigned based on assumed turf impact and multiplied by the number of scheduled uses for each type activity to yield the equivalent team uses in terms of turf damage and impact.

While this approach is arguably somewhat imprecise, it is a definite improvement over the consideration of raw scheduled use data alone, as it accounts for differences in the impact on turf condition of the various uses of the athletic fields. Refer to Enclosure 6 for the Equivalent Demand quantification.

The equivalent scheduled team use data for fields which routinely sustain use for sports such as men's lacrosse or football obviously tend to be higher than actual scheduled uses, while those for fields which are routinely used for Little League baseball tend to be less. While this calculation allows us to validate the quantified uses and relative condition of the fields, the "Actual Team Uses" is used for planning purposes in the development of the Planning Program.

Section 2.5.1 - Rest Period

All heavily used athletic fields require a 30-45 day rest period during an active growth period in the fall or the spring. The rest period allows the predominately blue grass field to repair itself by rhizome propagation and "re-knit" the root-zone. This process does not take place during the summer when cool weather

grasses like Kentucky blue grass are dormant. This is understandably a significant challenge for virtually all public school and municipal organizations.

It is apparent that the athletic fields at HWRHS are not afforded a rest period due to the schedule and use by athletic program needs throughout the school year. The master plan should consider provisions for a rest period for natural turf fields to improve the School's ability to provide realistic and beneficial maintenance of the athletic facility.

SECTION 3.0 – NEEDS ASSESSMENT

One of the keys to the development of a comprehensive athletic facility Master Plan is to assess the needs of the facility's end users. While Gale made several site visits, sampled soils, evaluated the facilities, and documented quantity of users, we are unable to make first-hand observations regarding how the facilities are used season to season. We must rely on the facility's users to provide their perceptions of the facilities. As a basis for the discussion of needs assessments, we facilitated a discussion surrounding a variety of topics, including the following:

- *Specific season-dependent field conditions*
- *Maintenance concerns – routine and past due*
- *Scheduling constraints*
- *Geometric and use-related constraints*
- *Field accessibility issues*
- *Spectator-related concerns (quantity of seating, accessibility)*
- *Fencing/security concerns*
- *Storage adequacy*
- *Fixed and non-fixed equipment*
- *Transportation / location concerns*

While the 2010 Hamilton-Wenham Master Plan included a Town-Wide survey, questionnaire, and user group discussions, the current smaller and more focused Master Plan utilized several user-group meetings to obtain an understanding of the needs.

The findings and conclusions are summarized below.

Section 3.1 - Needs Assessment Conclusions and Recommendations

While each facility user had varying degrees of participation, interest, goals, suggestions, requests, complaints, and recommendations, the discussions resulted in a comprehensive list of generally common and decided goals for the Master Plan. While the demand quantification provides a basis for determining field deficits, the needs assessment provides the goals and objectives that should

be considered in moving forward with the Master Plan. The following conclusions, in no particular order, were generated based on the user-group needs assessments:

1. Keep HWRHS Athletic Programs On-Site

   It is apparent that there is a need to increase the accommodations for the variety of athletic programs offered at HWRHS and minimize the amount of off-site events. Currently, several programs are required to hold events at an off-site location. Specifically, the tennis and varsity baseball programs are not accommodated by facilities located at the High School campus. Additionally, several freshmen programs, field hockey, and cross country utilize off-campus venues for events. Transportation, safety, and "coach ability" are two main concerns related to off-campus events. An objective of the Master Plan is to consider accommodating more High School events on the campus, with emphasis on including tennis facilities at the High School to accommodate the tennis program.

2. Site Drainage Conditions

   It became apparent upon evaluating the athletic facilities that there are several drainage concerns that often impacts their schedule and use. During wet weather, the Game Field and Field No. 2 often become impacted, resulting in a shifting of events to other fields on site. Slow-draining, over-compacted subsoils, outdated drain systems, lack of subsurface drainage, and adjacent wetland resource areas all contribute to drainage concerns throughout the site. An objective of the Master Plan is to consider improved drainage, all-weather facilities, and both track and field improvements to avoid delayed field use, safety, and schedule impacts related to drainage.

3. Storage

   A common concern of facility users is related to the storage provisions at the High School. Two (2) existing storage areas are currently provided, both of which are in poor condition and do not provide the appropriate capacity, accessibility, or utility infrastructure to be effective. Generally, the facilities are outdated and have not been updated or renovated to sustain the ever-growing and expanding athletic programs. An objective of the Master Plan is to consider providing storage to meet the needs of all athletic programs.

4. Track Renovation

The synthetic surface of the existing running track has generally reached the end of its serviceable life and should be reconstructed. The rubber and acrylic latex components of the surface have worn and have experienced ultraviolet degradation and loss of rubber. The asphalt base appears to be in good structural condition based on the lack of visible heaves, cracks, or depressions. The useful life of an asphalt pavemat can be estimated at twenty (20) years. Given the age of the track, it has exceeded its useful life. However, further investigation of the asphalt mat would be required to determine the extent of asphalt reuse for a potential reconstruction effort.

5. Dimensional Constraints

Several dimensional constraints were noted in Gale's facility evaluation and were verified throughout the needs assessment. The baseball field has inadequate left field dimensions, foul line setbacks, and backstop distance. The game field is constrained by the short radius track facility, which limits the width of the multipurpose field on its interior. Field 1 has limited dimensions based on the adjacent undeveloped areas and wetland resource areas. An objective of the Master Plan is to address dimensional constraints bearing on the adequacy of many of the athletic facilities at HWRHS.

6. Spectator Seating and Pressbox

Spectator seating at the HWRHS athletic facility is provided only at the track and game field. The "home side" grandstand is in generally good condition and appears to meet accessibility requirements. However, the press-box does not meet building or accessibility codes and should be replaced. Furthermore, the "Visitors" seating area does not appear to meet building or life safety codes and should be replaced. Spectator seating is not provided at any of the other athletic facilities. An objective of the Master Plan is to address spectator seating and press areas to provide more adequate and code compliant facilities.

7. Site Fencing and Safety

The athletic campus at HWRHS does not currently contain perimeter safety fencing to control access to areas outside of main events. There is a safety and security concern related to unsecured areas during ticketed events at the game field. An objective of the Master Plan is enhance site safety and security, specifically related to controlled access outside of main event areas.

8. All-Weather Field Surfaces and Lights

   A common perception of the user groups is that the campus does not have the capacity to expand and develop the amount of fields required to sustain their uses. Therefore, the general consensus was in support of synthetic turf and lights as a way to extend playing hours, increase field use, and limit maintenance required to provide an adequate playing surface.

SECTION 4.0 – ATHLETIC FIELD PLANNING PROGRAM REQUIREMENTS

Based upon Gale's evaluation of the athletic facility, the quantification of demands, and the needs assessment, it is readily apparent that HWRHS is experiencing a deficit related to quantity of fields. Currently, in order to limit the amount of play on each field to approximately 200 scheduled team uses per year, and in order to afford spring or fall rest periods to key fields, it appears that the Town requires an additional two (2) multipurpose rectangular athletic fields. The following is the calculation related to field deficits.

Section 4.1 - Field Demand

- Hamilton-Wenham Regional High School Athletic Field Inventory:
  - Three (3) Multipurpose Rectangular Athletic Fields
  - One (1) 90' Baseball Diamond (Partially skinned infield)
  - One (1) 60' Softball Diamond (Fully skinned infield)
  - One (1) 400-meter running track

- Hamilton-Wenham Regional High School Athletic Programs:
  - 1,481 Annual Events

Section 4.2 - Use Analysis by Type

It is important to gain an understanding of the type of use scheduled on each field, in order to maintain accurate field deficit calculations. Figure 3 presents the total number of uses, by type, and summarizes the calculation for field deficit. The field deficit is calculated as follows:

Fields Provided: = Actual number of fields provided for specific type of use

Fields Required: = Demand / 200 uses per year

Field Deficit: = Fields Required - Fields Provided

Refer to Figure 3, below for a summary of total uses and resulting field deficit calculations. The results indicate that HWRHS has a deficit of two (2) multi-purpose rectangular fields and six (6) tennis courts.

Figure 3
Field Use by Type

TYPES OF USES	DEMAND	FIELDS/COURTS PROVIDED	FIELDS/COURTS REQUIRED	DEFICIT
MULTIPURPOSE USES (includes all Phys. Ed. And field event uses)	1,211	4	6	**2**
90' BASEBALL USES	124	1	1	NONE
60' SOFTBALL/YOUTH BASEBALL USES	146	1	1	NONE
TENNIS	N/A	0	6	**6**
TOTAL	1,481			

Section 4.3 - Planning Program

In Section 3.1, a list of goals and objectives of the Master Plan were summarized. These should be considered in any proposed redevelopment, if possible. In addition to these goals, the field use analysis documented above, results in the following planning program:

- *Two (2) Multi-Purpose Rectangular Athletic Fields*
- *New 400-Meter Running Track and Field Events*
- *Tennis Courts Six (6)*

The planning program assumes that all existing facilities can be maintained and have the ability to withstand 200-225 annual uses. The planning program is used as the basis to develop the proposed athletic facilities improvements.

SECTION 5.0 - PROPOSED ATHLETIC FACILITIES IMPROVEMENTS

Beyond the immediate field maintenance and short-term recommendations summarized in Sections 2.2 and 2.3 of this report, the main goal in the Master Plan is to develop an Athletic Campus Redevelopment Plan, comprised of renovations, redevelopments, and/or new construction projects with the goal of accomplishing the planning program and as many of the goals and objectives as possible.

During the Master Planning process, Gale provided two (2) campus-wide redevelopment schemes intended to meet the previously outlined goals and objectives and accomplish the planning program. The working group and facility users reviewed and provided input on the two (2) proposed redevelopments for incorporation into one (1) Final Redevelopment Plan. The final HWRHS Facility Redevelopment plan is described in this section.

The HWRHS Master Plan Redevelopment proposes to reconstruct and/or redevelop several of the facilities at HWRHS over a period of ten (10) years to provide a facility that better meets the needs of the School and the Town. The schematic redevelopment includes the following:

- *Reconstruct the running track to provide a 118' radius track with eight (8) lanes on the straightaway and six (6) lanes on the oval, with a urethane pave mat, fully surfaced D-Areas, and reconstructed field event venues.*

- *Reconstruct the existing game field to provide a full-sized synthetic turf field at 210' x 360' to accommodate all multi-purpose uses. Install athletic lighting in conjunction to maximize uses of the field.*

- *Construct a storage complex to provide four (4) – 600 square foot storage units, accessible through a paved access route from all facilities and readily accessible from the track and game field area.*

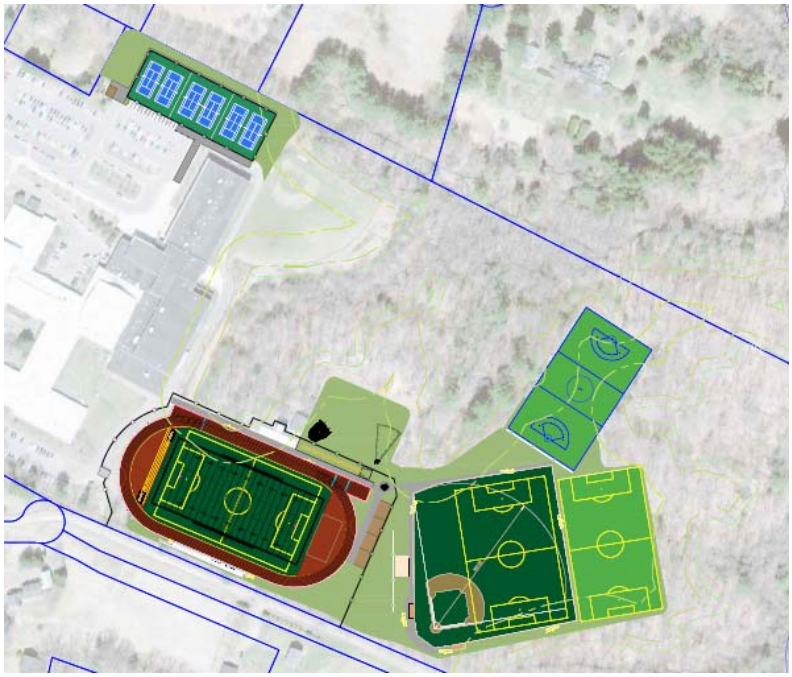
- *Install six (6) tennis courts in the location of the existing northwest section of parking, adjacent to the Middle School. The renovation would result in a loss of approximately thirty (30) parking spaces.*

- *Redevelop the current baseball field and multi-purpose outfield (Field No. 3) to provide a combination baseball/multipurpose synthetic turf facility with athletic field lighting. As part of the renovation, provide new dugouts, fencing and protective safety netting.*

- *Expand Field No. 2 (natural grass field) to accommodate the baseball/multipurpose combination field complex. The construction requires clearing of approximately an acre of undeveloped/wooded land on the property.*

The proposed schematic redevelopment plan generally meets all goals and objectives identified in the Master Plan, as well as the planning program field needs. Refer to Figure 4 below for an overview of the layout plan. The plan is attached herein under Enclosure 7.

Figure 4
Proposed Master Plan Redevelopment



Section 5.1 - Track & Game Field Reconstruction

The reconstruction of the current track and game field will provide HWRHS with a more adequate track facility – with an expanded radius from 104-feet to 118-feet to provide a full-width multi-purpose game field on its interior. Currently, the small radius track limits the width of the natural grass multi-purpose field. The increase in track radius will result in an athletic field sized at 210' x 360', appropriate for football, soccer, lacrosse, and field hockey uses at MIAA standards. The multi-purpose field is proposed to be synthetic turf, to provide a durable, all-weather surface, maximizing the quantifiable amount of uses afforded by the field. The following are the key elements proposed to be incorporated into the facility:

- 400-meter, 118' radius track with ½" urethane pave mat surface.
- Fully surfaced "D-Areas", including long/triple jump venues and high jump venue.
- Reconstructed pole-vault, discus, and shot put venues.
- Six (6)-lanes on the oval and 8-lanes on the straightaway for improved meet management.

- 210'x360' infilled synthetic turf field, to be marked/striped as desired by the High School.

- Four (4)-pole athletic lighting system, to provide 50-footcandles of illumination over the field.

- Renovated pressbox on the home spectator seating side. Spectator seating on the home side proposed to remain.

- New visitors seating for approximately 400 spectators.

- 30' safety netting between the end zones and surfaced D-Areas, for safety during concurrent field/track use.

- 6' height fencing around the facility for security/access control.

- Storage area, including four (4) – 1,200 square foot modular storage units, accessed by a 12' paved access drive and pedestrian walkways.

The track and field redevelopment project accomplishes several of the goals and objectives, as well as the planning program requirements. The transition from a natural grass playing field to a synthetic turf playing field will allow the High School to double or triple the amount of uses on the field, without affecting the field's quality. In order to gain full advantage of the field, an athletic lighting system is proposed. Athletic lighting extends the hours of play so that the high school can place more demand on the field. Conversion to the synthetic turf field, plus installation of athletic lighting, can presumably take demand off from the other natural grass athletic fields and allow them to have a rest period. The field will be capable of holding over 500 annual team uses without detriment to the quality of the field, compared to the 130 annual team uses placed on the field currently.

The track and field redevelopment proposes that the home-side spectator seating remain, and that a new accessible pressbox be constructed. The visitor side seating is proposed as portable seating on a concrete slab with a capacity of 400 spectators. As proposed, the design encroaches on the side-yard setback required by zoning by-laws. However, the Schools may be exempt from this setback requirement through the Dover Amendment (Refer to Section 5.3 below).

Section 5.2 – Track and Field Redevelopment Schematic Costs

The track and field redevelopment, including design and construction, is estimated to cost $2,693,621.87. Note that all cost estimates provided in this report are based on schematic plans and are for initial planning purposes. Cost estimates are subject to change upon completion of a detailed site investigation and final design. Additionally, the Town/School should plan for a contingency

fund estimated at 10% of the total construction cost for each project. The following is a breakdown of the cost estimate:

Section 5.3 - Track and Field Redevelopment Cost Breakdown

HAMILTON-WENHAM REGIONAL HIGH SCHOOL MASTER PLAN		
Schematic Pre-Design Estimate		
TRACK AND FIELD REDEVELOPMENT PROJECT		
ITEM	DESCRIPTION	TOTAL COST
1	General Conditions	$ 78,772.62
2	Erosion Control	$ 3,150.00
3	Site Preparation / Demolition	$ 15,000.00
4	Track Reconstruction	$ 409,380.00
5	Track D-Area Construction	$ 170,840.00
6	Discus / Hammer and Shot Put Venues	$ 35,600.00
7	Pole Vault and Long Jump	$ 52,000.00
8	Synthetic Turf Game Field Construction (inside track)	$ 1,166,466.00
9	Athletic Lighting	$ 310,000.00
10	Spectator Seating	$ 145,000.00
11	Walkways / Access Drives	$ 31,195.00
12	Utilities	$ 100,000.00
	Subtotal	$ 2,517,403.62
	Soft Costs (7%)	$ 176,218.25
	TOTAL	$ 2,693,621.87

The cost estimate includes standard SBR crumb rubber infill for the synthetic turf carpet. Alternative infill would result in a $200k to $400k premium.

It is important to note that an infilled synthetic turf carpet has a useful life of approximately 12-14 years, at which time the carpet is required to be replaced. However, the remainder of the infrastructure, including the stone base and drainage system, does not require replacement. This recurring cost for carpet replacement should be considered upon development of synthetic turf fields, and is estimated at $400,000 - $450,000.

Section 5.4 – Track and Field Redevelopment Permitting Implications

The track and field redevelopment is currently within the buffers of a jurisdictional wetland. During design of the facility, the Schools will need to have the wetland boundaries delineated with flags to confirm boundaries of jurisdictional wetlands. The Hamilton Conservation Commission (ConCom) will likely require that a Request for Determination of Applicability (RDA) and/or a Notice of Intent (NOI) be filed for the project. Additionally, the track and field redevelopment project will may require a Variance or Special Permit through the Zoning Board of Appeals and/or Planning Board for installation of athletic lighting as well as the spectator seating within side yard property line setbacks. While the Schools may elect to obtain these permits as required by the local Zoning Bylaws, the Dover Amendment allows educational facilities to be exempt from certain zoning restrictions. The Schools should have the Dover Amendment (MGL Chapter 40A Section 3) reviewed by legal counsel, prior to making decisions related to permitting and potential zoning bylaw exemptions.

Additionally, it should be noted that construction of spectator seating may require review of the plans by the local Building/Plumbing Inspector. The inspector may requires that a restroom facility be constructed to support the permanent seating, which is often required by State Plumbing Codes. A plan or feasibility study for a restroom facility located on the campus was not included in this Master Plan and is not included in the cost estimate.

Section 5.5 - Baseball / Multi-Purpose Combination Field

The Master Plan Redevelopment includes redevelopment of the existing baseball field and multi-purpose outfield (Field No. 3) to provide a combination baseball/ multi-purpose synthetic turf facility. As part of the renovation, we recommend that new dugouts, fencing, seating, and protective safety netting be included. The reconstruction will provide HWRHS with the following improvements:

- *Synthetic turf baseball field with portable pitcher's mound to allow full multi-purpose use of the baseball infield during the off-season.*
- *Baseball field dimensions of 315' to left field, 350' to center field, and 300' to right field.*
- *Portable outfield fencing for use during baseball season.*
- *Modular enclosed dugouts two (2).*
- *New backstop, safety netting along left field, and perimeter fencing.*
- *Baseball safety setbacks of over 35' from foul lines to sidelines/player seating areas.*
- *Portable spectator seating (150+/- seats).*
- *Multi-purpose infilled synthetic turf outfield (210' x 330') appropriate for MIAA soccer, lacrosse, and field hockey.*

- *4' chain link perimeter fencing around the synthetic turf multipurpose outfield.*
- *Athletic field lighting, to be installed in phases, as a way to extend the amount of uses on the facility.*

Section 5.6 – Baseball/Multi-Purpose Field Schematic Costs

The baseball/multi-purpose combination field development, including design and construction, is estimated to cost $2,511,198.00

Section 5.7- Baseball/Multi-Purpose Field Redevelopment Cost Breakdown

HAMILTON-WENHAM REGIONAL HIGH SCHOOL MASTER PLAN		
Schematic Pre-Design Estimate		
BASEBALL/MULTIPURPOSE FIELD REDEVELOPMENT		
1	General Conditions	$ 171,407.89
2	Erosion Control	$ 4,950.00
3	Site Preparation / Demolition	$ 13,000.00
4	Synthetic Turf Combination Field (Baseball & Multipurpose)	$ 1,492,996.00
5	Athletic Lighting	$ 460,000.00
6	Spectator Seating	$ 28,000.00
7	Walkways / Access Drives	$ 26,560.00
8	Utilities	$ 70,000.00
9	Landscaping	$ 80,000.00
		$ 2,346,913.89
		$ 164,283.97
		$ 2,511,197.86

It is important to note that an infilled synthetic turf carpet has a useful life of approximately 12-14 years, at which time the carpet is required to be replaced. However, the remainder of the infrastructure, including the stone base and drainage system, does not require replacement. This recurring cost for carpet replacement should be considered upon development of synthetic turf fields.

Section 5.8 – Baseball/Multi-purpose Field Permitting Implications

The combination baseball/multi-purpose synthetic turf field is located within the buffers of a jurisdictional wetland, specifically the 50' and 100' buffers. During design of the facility, the Schools will need to have the wetland boundaries delineated with flags to confirm boundaries of jurisdictional wetlands. The Hamilton Conservation Commission (ConCom) will likely require that a Request for Determination of Applicability (RDA) and/or a Notice of Intent (NOI) be filed for the project. Additionally, the project well may require a Variance or Special Permit through the Zoning Board of Appeals and/or Planning Board for installation of athletic lighting. While the Schools may elect to obtain these permits as required by the local Zoning Bylaws, the Dover Amendment allows educational facilities to be exempt from certain zoning restrictions. The Schools should have the Dover Amendment (MGL Chapter 40A Section 3) reviewed by counsel prior to making decisions related to permitting and potential zoning bylaw exemptions.

Section 5.9 - Tennis Development

It is apparent that there is a common desire to keep the athletic programs offered by HWRHS on the HWRHS campus. Currently, several athletic programs use off-campus facilities as their home venue. While varsity baseball, field hockey, and tennis are among these, the tennis venues located off-campus are in very poor condition. Additionally, the off-campus venue creates transportation and coaching issues. The Master Plan proposes to incorporate a tennis facility into the High School campus in the location of the existing parking lot to the north of the Middle School. The development results in a loss of approximately thirty (30) parking spaces, and maintains the structure and access to the existing plant control building. One of the three two-court batteries is proposed at the location of the existing Middle School playground area, and would likely be used as such. The tennis facility is proposed with the following elements:

- *Six (6) full-size (78' x 36') tennis courts aligned in a North-South direction.*
- *10' perimeter fencing surrounding each of three (3) two-court batteries.*
- *Athletic lighting.*
- *Walkways and parking improvements.*

Section 5.10 – Tennis Development Schematic Costs

The tennis court development, including design and construction, is estimated to cost $660,032.00. The following is a breakdown of the cost estimate:

Section 5.11 - Tennis Development Cost Breakdown

HAMILTON-WENHAM REGIONAL HIGH SCHOOL MASTER PLAN		
Schematic Pre-Design Estimate		
TENNIS COURT DEVELOPMENT		
ITEM	DESCRIPTION	TOTAL COST
1	General Conditions	$ 61,122.45
2	Erosion Control	$ 2,900.00
3	Site Preparation / Demolition	$ 12,500.00
4	Tennis Construction	$ 288,070.00
5	Athletic Lighting	$ 216,800.00
6	Site Walkways / Parking Improvements	$ 18,810.00
7	Landscaping / Site Elements	$ 16,650.00
		$ 616,852.45
		$ 43,179.67
		$ 660,032.12

Section 5.12 - Tennis Development Permitting Implications

A small portion of the proposed tennis development is located within the buffers of a jurisdictional wetland, specifically the 50' and 100' buffers. During design of the facility, the Schools will need to have the wetland boundaries delineated with flags to confirm boundaries of jurisdictional wetlands. The Hamilton Conservation Commission (ConCom) will likely require that a Request for Determination of Applicability (RDA) be filed for the project. Additionally, the project will may require a Variance or Special Permit through the Zoning Board of Appeals and/or Planning Board for installation of athletic lighting. While the Schools may elect to obtain these permits as required by the local Zoning Bylaws, the Dover Amendment allows educational facilities to be exempt from certain zoning restrictions. The Schools should have the Dover Amendment (MGL Chapter 40A Section 3) reviewed by counsel prior to making decisions related to permitting and potential zoning bylaw exemptions.

Section 5.13 – Field No. 2 Expansion

Construction of the baseball/multipurpose combination field requires that Field #2 be expanded and shifted eastward to maintain adequate dimensions. The minimum scope of the reconstruction effort requires the following:

- Clearing of the currently undeveloped/wooded portion of the High School lot to the East of existing Field No. 2 (approximately one acre).

- Construction of an amended root zone athletic field, including subsurface drainage, athletic field topsoil and seed mix, and an irrigation system (if appropriate).

Section 5.14 – Field No. 2 Expansion Schematic Costs

The Field No. 2 Expansion, including design and construction, is estimated to cost $329,886.00. The following is a breakdown of the cost estimate:

HAMILTON-WENHAM REGIONAL HIGH SCHOOL MASTER PLAN		
Schematic Pre-Design Estimate		
FIELD #2 EXPANSION AND Field #1 SAFETY NETTING		
ITEM	DESCRIPTION	TOTAL COST
1	General Conditions	$ 38,969.28
2	Erosion Control	$ 4,500.00
3	Site Preparation / Demolition	$ 10,000.00
4	Field 2 Expansion	$ 254,835.00
	Subtotal	$ 308,304.28
	Soft Costs - 7%	$ 21,581.30
	Total	$ 329,885.57

Section 5.15 – Field No. 2 Expansion Permitting Implications

The Field No. 2 expansion project is located within the buffers of a jurisdictional wetland, specifically the 50' and 100' buffers. During design, the Schools will need to have the wetland boundaries delineated with flags to confirm boundaries of jurisdictional wetlands. The Hamilton Conservation Commission (ConCom) will likely require that a Request for Determination of Applicability (RDA) and/or a Notice of Intent (NOI) be filed for the project.

Section 5.16 - Modular Storage Buildings

The Master Plan redevelopment proposes to provide a series of modular storage units to increase storage space for the athletic programs at HWRHS. The four (4) buildings are intended to be clear span, pre-fabricated, 600sf buildings installed on a concrete pad. The buildings are intended to be accessed by a paved access road for ease of transporting and removing stored equipment.

Section 5.17 – Modular Storage Buildings Schematic Costs

The modular buildings, including design and construction, is estimated to cost $459,580.00. The following is a breakdown of the cost estimate:

HAMILTON-WENHAM REGIONAL HIGH SCHOOL MASTER PLAN		
Schematic Pre-Design Estimate		
Modular Storage Buildings		
ITEM	DESCRIPTION	TOTAL COST
1	Modular Storage Buildings and Foundations	$ 395,874.00
2	Walkways / Access Drives	$ 7,640.00
3	Utilities	$ 26,000.00
	Subtotal	$ 429,514.00
	Soft Costs - 7%	$ 30,065.98
	Total	$ 459,579.98

As a result of the Master Plan Redevelopment, the new HWRHS athletic campus will have eliminated the field deficit calculated from the field use data, and addressed the goals and objectives resulting from the needs assessment. A summary of the improvements and a tally of the net field/court quantity change is in Figure 5, below.

Figure 5
Summary of Improvements

Improvement	*Elements*	*Field Quantity Change*	*Cost*
Track and Field Redevelopment			
	Synthetic Turf Field conversion	+1 Field	
	New 118' Radius Track	N/A	
Baseball/Multipurpose Combination Field			
	Synthetic Turf conversion	+1 Field	
Tennis Complex			
	Six (6) new Tennis Courts	+6 Courts	
Site Improvements / Field Repairs			
	Netting/Fencing/Walkways	N/A	
	Repairs to Fields #1, #2, and Softball	N/A	
	Total:	+2 MPR Fields +6 Tennis Courts	

While the data shows that the Master Plan Redevelopment layout addresses the current and projected unmet needs of the athletic programs, Gale was requested by the School to consider additional improvements beyond the calculated and assessed needs. The data does not support a current need for these improvements, however they would likely provide additional benefits to the athletic campus.

1) Convert Field No. 1 to Synthetic Turf

Field No. 1, located at the Northeast corner of the HWRHS athletic campus, is undersized at 170' x 330'. The field size does not meet minimum MIAA dimensional requirements for any High School level sports. This includes soccer, lacrosse, field hockey, and football. Therefore, any full-scale redevelopment of this field likely does not provide a large benefit to cost ratio. The dimensional constraint is a result of the existing location within jurisdictional wetland buffers. Almost exactly 50% of the field area is within

the 50' and/or 100' wetland buffers. This means that any redevelopment work at the location of the field would require a significant permitting effort, with the risk that permits may not be obtained. Between the permitting effort, and dimensional constraints, we do not recommend this redevelopment as a high priority. The cost of the redevelopment, including design, permitting, and construction, is estimated at $850,000. At this cost, there are likely other improvements that would be of higher benefit for the price. That being said, synthetic turf at the location of Field No. 1 would provide drainage improvements and a durable, all-weather surface requiring low maintenance in comparison to a natural grass surface.

2) Convert the Softball Field to Synthetic Turf

Similarly to the previous discussion on turf conversion at Field No. 1, the softball field is a generally small playing area of which more than 65% of the field is within jurisdictional wetland buffers. Installation of synthetic turf at the softball field would likely require high cost resulting in low benefit. Gale would not recommend a synthetic turf conversion at the softball field as a high priority, unless the need is justified. The current demand calculation and needs assessment does not necessarily justify the need for synthetic turf at the softball field. That being said, synthetic turf at the location of the softball field would provide drainage improvements and a durable, all-weather surface requiring low maintenance in comparison to a natural grass surface. The cost of the field renovation, including design, permitting, and construction, is estimated at $650,000.

SECTION 6.0 – ATHLETIC FIELD DEMAND AND REST FOLLOWING MASTER PLAN IMPLEMENTATION

Section 6.1 – Master Plan Impact on High School Athletic Campus

An objective of the Master Plan is to reconstruct existing fields and/or develop sufficient new fields to better meet the demands placed on them by the existing athletic programs at HWRHS. A goal is to provide sufficient fields by type such that the demand on any individual field does not exceed 200 to 250 scheduled team uses. As previously noted, 200 team uses is the maximum number that a properly irrigated and maintained field with a 30-45 day rest period during the active growth season can sustain and still maintain good quality athletic turf.

For purposes of this analysis, we believe that Master Plan Redevelopment will be implemented as a result of this Master Plan study, in a series of phases. The implementation of the Master Plan will result in the natural turf fields seeing a significant reduction in uses and allow enough rest between seasons for re-growth and maintenance of the turf. This reduction is based on our assumption

that the game field uses increase from 130 to 425 uses per year, and the baseball/multi-purpose combination field uses increase from 329 (205 at Field No. 3 and 124 at the Baseball Field), to 479 annual uses.

As shown in Figure 6, the implementation of the proposed strategy allows for a redistribution of demand with an overall reduction of demand on all fields.

Figure 6
Field Use upon Implementation of the Master Plan
– Redistribution of Demand

FIELD USE ANNUAL SUMMARY - ACTUAL & PROPOSED TEAM USES				
Field Location	**Field Type**	**Total Annual Uses**	**Total Annual Uses**	**Comments**
Game Field Inside Track	MPR	**130**	--	
NEW GAME FIELD	SYN	--	**425**	
Field 1 (Upper Field)	MPR	**277**	**162**	
Field 2 (Lower Field)	MPR	**324**	**150**	
Field 3 (Baseball Outfield)	MPR	**205**	--	
NEW COMBO SYNTURF	BB/MPR	--	**479**	
Project Adventure Field	MP	**65**	**65**	
Baseball Field	90'D	**124**	--	On Combo Field
Softball Field	60'D	**356**	**200**	Move MS P.E. to turf
	Total	1481	1481	

Implementation of the Master Plan will result in a reduction of uses on Field No.1 by 115, Field No. 2 by 174, and the Softball Field by 156 uses. All fields are proposed to experience less than their maximum sustainable uses (200-250 for natural grass). Maximum use on a turf field is constrained only by schedule, as increases in demand do not impact the quality of the field within its useful life.

Other assumptions were made in providing this redistributed demand, including the following:

1) Middle School Physical Education classes relocate to one (1) of the synthetic turf fields to reduce the impact to natural grass fields from Physical Education use.

2) High School Physical Education classes relocate to one (1) of the synthetic turf fields to reduce the impact to natural grass fields from Physical Education use.

3) Soccer, lacrosse, and field hockey games can be held on a rotation between the Game Field (turf) or the Combination Field (turf).

4) Due to the fact that there is only one (1) baseball field located on campus, either JV or Varsity baseball continue to use an off-campus facility, unless scheduling permits use of one (1) field for both.

5) Soccer, lacrosse, and field hockey practices can be held on the combination field, which can be used in either North-South orientation (1 field) or an East-West orientation (2 shortened fields). Practices can also be held on Field No. 1, or Field No. 2.

Section 6.2 – Master Plan Impact on Town-wide Athletic Field Inventory

An important objective of the Master Plan is to provide a redevelopment or repair strategy that will not only improve the High School athletic campus, but will provide benefits to a significant portion of the inventory of existing athletic fields throughout the towns of Hamilton and Wenham. Section 6.1 discussed the redistribution of demand over the high school athletic campus. This section will discuss a potential redistribution strategy that considers events currently occurring on fields in Hamilton and Wenham, outside of the high school athletic campus.

The redistribution strategy in Section 6.1 resulted in a total of 425 uses on the proposed synthetic turf game field inside the track, and a total of 479 uses on the combination baseball and multipurpose turf field. The redistribution considers uses only proposed at the high school. However, lighted turf fields can typically accommodate over 700 uses, given typical high school hours and uses on weekdays and weekends. To summarize the maximum scheduled uses on a lighted turf athletic field, we have provided a calculation in Figure 7, below.

Figure 7 – Calculated Uses on a Lighted Synthetic Turf Field

CALCULATED USES ON A LIGHTED SYNTHETIC TURF FIELD				
TIMEFRAME	2-HOUR USES BETWEEN 8:30AM AND 8:30PM	# OF DAYS IN TIMEFRAME	# OF WEEKS IN TIMEFRAME	TOTAL USES
FALL & SPRING WEEKDAY	3	5	20	300
FALL & SPRING SATURDAY	6	1	20	120
FALL & SPRING SUNDAY	3	1	20	60
SUMMER WEEKDAY	6	5	8	240
SUMMER SATURDAY	6	1	8	48
SUMMER SUNDAY	3	1	8	24

Definitions & Assumptions
Fall = September thru Mid November (20 weeks)
Spring = April - mid June (20 weeks)
Summer = July & August (8 weeks)
Fall & Spring Weekday use = 2:30pm - 8:30pm
Saturday Use = 8:30AM - 8:30PM
Sunday use = After 12:00PM

TOTAL USES	**792**

As can be seen in Figure 7, a synthetic turf used to its full scheduling potential at a high school can accommodate up to 792 estimated uses. This does not assume concurrent uses, which may often occur with youth athletic programs or after-school practices on the combination turf field proposed at the baseball field, resulting in additional uses. In the previous redistribution of the athletic programs currently held at the high school (Section 6.1), we have estimated that the two (2) turf fields will be used for less than 500 events each. Through strategic scheduling, the field could be used to accommodate both Town and School programs currently held off campus, up to 792 uses. The following is a potential strategy for distributing some of these uses over the turf fields. This strategy utilizes the demand quantities calculated as part of the 2010 Town-wide Mater Plan.

1) Varsity Girls Lacrosse and Youth Lacrosse programs currently using the athletic fields at Fairhaven Field can be scheduled to use the synthetic turf game field at the high school. Based on the demand matrix

completed for the Town-wide Master Plan, this results in a total of 142 uses shifting from Fairhaven to the high school

2) Freshmen soccer currently held at Donovan can be scheduled to use the synthetic turf game field at the high school. Based on the demand matrix completed for the Town-wide Master Plan, this results in a total of 92 uses shifting from the Donovan fields to the high school game field.

3) Youth football programs currently held at the outfield of the baseball field at Patton Park can be scheduled to be held on the combination baseball and multipurpose turf field at the high school. This results in a total of 55 annual two-hour uses shifting from Patton Park to the high school.

4) Babe Ruth baseball currently held at Wildes Field in Pingree Park can be scheduled to be held on the combination baseball and multipurpose turf field at the high school. This results in a total of 55 annual two-hour uses shifting from Pingree Park to the high school.

Although this potential scheduling/redistribution strategy provides an estimated number of events that may be relocated to the high school turf fields, the athletic program and recreation program director will need to verify any scheduling constraints and conflicts. Based on these assumed scheduling revisions, we have updated the demand summary for the inventory of athletic fields in the Towns of Hamilton and Wenham. Refer to Figure 8, below.

Figure 8 – Town-Wide Demand Summary Upon Implementation of Master Plan and Program Scheduling Revisions

FIELD USE ANNUAL SUMMARY - CURRENT AND PROPOSED TEAM USES				
Field Location	**Field**	**Field Type**	**Total Annual Uses**	**Total Annual Uses**
Patton Park	60' Diamond & MPR	60' B / MPR	510	455
	90' Diamond	90' B	144	144
Pingree Park	Cheeseman	60' B	228	228
	Wildes	90' B & MPR	233	153
	Black	60' B	208	208
Donovan Field	Field 1	60' B	152	152
	Field 2	MPR	267	175
Fairhaven Field	Fairhaven Field	MPR	358	216
DPW Field	DPW Field	MPR	130	130
Iron Rail Fields	Field 7	MPR	275	275
	Field 8	MPR	287	287
	Field 9	MPR	287	287
West Wenham Park	Field 1	MPR	10	10
H-W Regional High School	Turf Game Field	MPR	425	659
	Combo Turf Field	90'B/MPR	479	614
	Field 1	MPR	162	162
	Field 2	MPR	150	150
	Proj Adventure	MP	65	65
Middle School	Field 1	60' B	200	200
Winthrop School	Field 1	60' B	276	276
Cutler School	Field 1	60' B	318	318
Buker Elementary	Field 1	60' B	388	388
	Field 2	60' B	166	166
		Total	5718	5718

Upon implementation of the master plan and revisions to schedule and location of several athletic programs, it can be concluded that implementation of the HWRHS Master Plan will result in a reduction of uses at four (4) existing natural grass athletic fields in the Town, including Patton Park (510 uses to 455 uses), Wildes Field at Pingree Park (233 uses to 153 uses), Donovan Field (267 uses to 175 uses), and Fairhaven Field (358 uses to 216 uses). This reduction in use will result in improved overall field conditions and a manageable, more realistic maintenance program to accommodate the field demands.

SECTION 7.0 – ATHLETIC FIELD REDEVELOPMENTS PHASING

It is apparent that the implementation of the entire Master Plan is not feasible in a single project due to Town's fiscal constraints and the impacts on users, who must have field space during the redevelopment process. The Master Plan is therefore broken into discrete projects based on reasonable annual budget expenditures, priority of need, and minimization of user impacts. In general, the principles behind the formulation of the Master Plan phasing are to:

- *Accomplish the projects, which result in the biggest impact first, to set the conditions for the project;*
- *Accomplish the remaining Master Plan elements in order of relative importance based on projected use;*
- *Attempt to accomplish all elements of the Master Plan in ten (10) years.*
- *Attempt to balance the Town's expenditure on field renovation throughout the Master Plan implementation period;*
- *Schedule Master Plan elements that only provide for the renovation of an existing field in place, with no change in layout or use, late in the phasing plan.*

Phasing Plan Summary

Phase 1. Phase 1 should include the track and field redevelopment at HWRHS. This project can be completed during summer, between June and September, and will provide the highest return in terms of use transition to the field beginning once the project is complete. The redevelopment will result in nearly instant relief on the natural grass fields on the campus. The cost of the improvements under Phase 1 includes the following:

Phase 1 Total	**$2,694,000**

Phase 2. Phase 2 consists of the combination baseball and multipurpose synthetic turf field with athletic field lighting. This phase should include the fencing, netting, dugouts, walkways, and related amenities at the baseball field complex, as well as the safety netting proposed at the south end of Field #1. The preliminary cost estimate for the Phase 3 work includes the following:

Phase 2 Total:	**$ 2,511,198**

Phase 3. Phase 3 should include the development of the six (6) tennis courts and associated lighting, walkways, and site improvements. Phase 3 should also include construction of the storage complex adjacent to the track and field facility. The preliminary cost estimate for the improvements under Phase 3 includes the following:

Tennis Court Development:	$ 660,032
Storage Complex:	$ 460,000
Phase 3 Total:	**$1,120,032**

Phase 4. Phase 4 consists of the expansion and reconstruction of Field No. 2 as necessary due to construction of the combination baseball/multi-purpose turf field. The preliminary cost for the improvements in Phase 4 includes the following:

Phase 4 Total:	**$ 330,000**

Phase 5. Phase 5 includes reconstruction of the softball field at the Middle School, as well as replacement of the synthetic turf field carpet at the track and field complex.

Softball Field Reconstruction:	$ 300,000
Synthetic Turf Carpet Replacement:	$ 425,000
Phase 5 Total:	**$ 725,000**

Figure 7
Phasing Plan

HAMILTON-WENHAM MASTER PLAN PHASING PLAN (10-YEAR)					
PROJECT ELEMENTS	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
TRACK AND FIELD COMPLEX					
Track and Field Redevelopment	2,694,000				
BASEBALL/MP COMBO FIELD					
Baseball/MP Combination Field		2,511,198			
TENNIS COMPLEX					
Six (6) Tennis Courts and Lights			660,032		
STORAGE COMPLEX					
Foundation and 4 precast storage units			460,000		
FIELD #2 EXPANSION					
Field #2 Expansion				330,000	
SOFTBALL FIELD RECONSTRUCTION					
Reconstruct softball field					300,000
TURF CARPET REPLACEMENT					
Turf replacement at track and field					425,000
SUBTOTALS	**2,694,000**	**2,511,198**	**1,120,032**	**330,000**	**725,000**
MASTER PLAN REDEVELOPMENT TOTAL	**7,380,230**				

*Cost estimates do not include inflation/price escalation.

SECTION 8.0 – OVERALL CONCLUSIONS

The HWRHS Athletic Facility Master Plan has identified the athletic campus shortfalls, assessed needs, and provided data to support a calculated field deficit of two (2) multi-purpose rectangular athletic fields and six (6) tennis courts. Additionally, in support of the field deficit, the needs assessment identified a list of unmet needs as perceived by the facility staff, users, and coaches.

The Master Plan provides a redevelopment strategy to be implemented over a period of ten (10) years to accomplish the unmet needs and calculated facility deficits. Costs estimates have been provided which approximate that the

redevelopment costs, prioritized into separate, discrete projects, total nearly 7.4 million dollars. Gale has provided a phasing plan which recommends separation of the project into more feasible smaller projects, which may be more financially feasible for the Town/Schools to implement. Data presented here in indicates that implementation of the master plan will result in a facility that can accommodate the athletic program at HWRHS. The plan reduces the amount of annual team uses placed on each field by redistributing the demand, and incorporates use of synthetic turf fields and lights to further increase the amount of use each field can sustain. The plan also addresses unmet needs related to dimensional constraints, storage requirements, seating, track facility, and fencing and security. In addition to the positive impacts of the redevelopment scheme for the facilities at the High School, the Master Plan provides an analysis of the impact to the Town-wide athletic facility demands upon implementation of the Master Plan. The analysis includes a strategy for demand redistribution of athletic programs in the Town, to best make use of the proposed redevelopments at the High School. This analysis results in a substantial reduction of field uses at four (4) town athletic facilities, including Patton Park, Donovan Field, Fairhaven Field, and Pingree Park. The reduction of uses placed on these facilities is anticipated to improve the overall condition and quality of the existing natural grass athletic fields.