Gale Associates, Inc.

Engineers Architects Planners

Athletic and Recreation Facilities Design Group

HWRHS – Master Plan and Field Assessment

Presented to:
Hamilton-Wenham Regional HS

Date: October 8, 2015

Presented by:
William J. Seymour, P.E.

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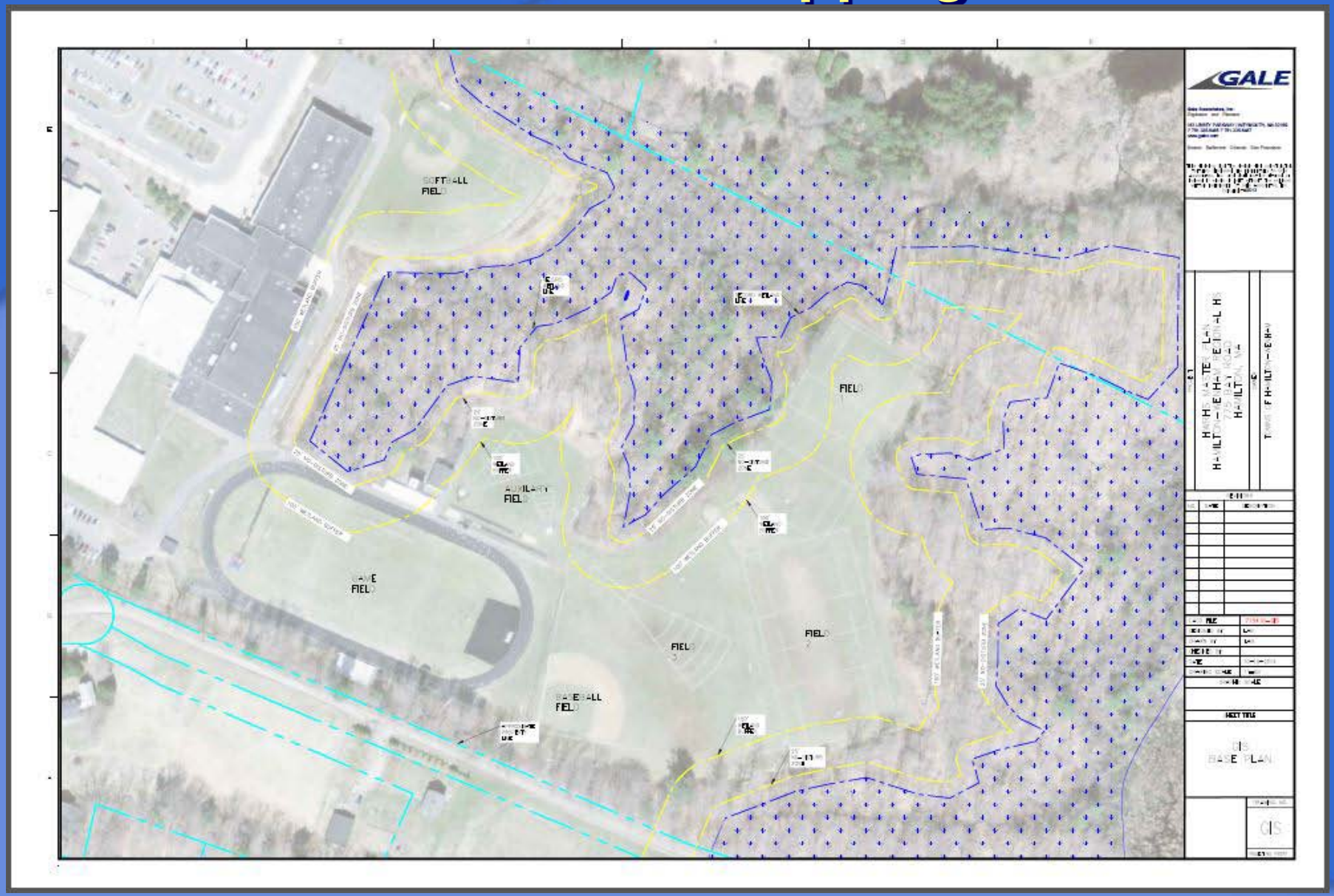
Existing Conditions

Existing Conditions
Constraints Mapping



Field Assessment Results

Game Field

- Good turf condition.
- Water bans affect irrigation.
- Field unaligned.
- Concrete trench drain in disrepair.
- Press Box / Seating are in poor condition.
- Non-ADA compliant.
- Heavy, compact soils; poor drainage.

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Field Assessment Results

400 Meter Track

- Six (6) lane straightaway on visitor side.
- Short radius; r = 104 feet.
- Heavily worn surface – ¼” latex surfacing.
- Structurally sound - > 20 years.
- All field events are in generally fair condition.

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Field Assessment Results

Field #1 – MPR (North)

- **Located within BVW buffer.**
- **Dimensions: 170’ x 330’.**
- **Poor planarity, dips, heaves.**
- **Fair turf stand.**
- **No irrigation.**
- **Some localized ponding, but generally well drained.**
- **No seating or accessible routes.**

Field Assessment Results

Field #2 – MPR (East)

- **Dimensions: 180’ x 330’ … limiting.**
- **Lowest elevation; poorly drained.**
- **Within buffer of BBV on eastern edge.**
- **Heavily used.**
- **Have clay soils / requires heavy aeration.**
- **No amenities, no seating or accessible routes.**
- **No athletic lighting.**

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Field Assessment Results

Field #3 – MPR (JV Baseball Outfield)

- **Dimensions: 200’ x 300’ … limiting.**
- **Poor rectangular geometry.**
- **Poor turf quality; poor planarity w/ ruts.**
- **Grass seems choked out.**
- **Worn in high traffic areas.**
- **No athletic lighting.**

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Field Assessment Results

90’ Baseball Diamond

- **Dimensions: 293’ x 400’ x 300’.**
- **Good solar orientation.**
- **Infield weeding; remove lip; additional mix.**
- **Rebuild mound.**
- **In-play setbacks all less than optimal.**
- **No seating, lighting or ADA accessible routes.**

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Field Assessment Results

60’ Softball Diamond (Middle School)

- Recent renovation.
- New full skin infield.
- Good geometry.
- Adjacent wetlands, poorly drained.
- Poor solar orientation.
- Turf condition good, few worn spots.
- Players dugouts minimal w/ benches and fencing.
- No amenities, seating or ADA accessible routes.

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Soil Test Report

Prepared For:

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Gale Associates, Inc
163 Libbey Pkwy
Weymouth, MA 02189

lab@gainc.com
781-335-6465

Sample Information:

Sample ID: S3
FIELD #2/3
Order Number: 11152
Lab Number: S141114-104
Area Sampled: 60000 sqft
Received: 11/14/2014
Reported: 11/20/2014

Results

Analysis	*Value Found*	*Optimum Range*
Soil pH (1:1, H2O)	5.5	
Modified Morgan extractable, ppm		
Macronutrients		
Phosphorus (P)	1.7	4-14
Potassium (K)	70	100-160
Calcium (Ca)	274	1000-1500
Magnesium (Mg)	51	50-120
Sulfur (S)	16.6	>10
Micronutrients *		
Boron (B)	0.1	0.1-0.5
Manganese (Mn)	6.0	1.1-6.3
Zinc (Zn)	1.7	1.0-7.6
Copper (Cu)	0.4	0.3-0.6
Iron (Fe)	20.4	2.7-9.4
Aluminum (Al)	287	<75
Lead (Pb)	7.1	<22

Analysis	*Value Found*	*Optimum Range*
Cation Exch. Capacity, meq/100g	8.1	
Exch. Acidity, meq/100g	6.1	
Base Saturation, %		
Calcium Base Saturation	17	50-80
Magnesium Base Saturation	5	10-30
Potassium Base Saturation	2	2.0-7.0
Scoop Density, g/cc	1.01	
Optional tests		
Soil Organic Matter (LOI), %	5.1	

* *Micronutrient deficiencies rarely occur in New England soils; therefore, an Optimum Range has never been defined. Values provided represent the normal range found in soils and are for reference only.*

Soil Test Interpretation

Nutrient	Very Low	Low	Optimum	Above Optimum
Phosphorus (P):				
Potassium (K):				
Calcium (Ca):				
Magnesium (Mg):				

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Soil Testing – Summaries

- Generally low P, K and Ca.
- Generally good Mg.
- Generally acidic.
- Varied 0 – 100 lbs. limestone per 1000 sf.

Demand Summary – Current Uses

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	

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Needs Assessment / Planning Program Summary

- Keep HWRHS programs on site.
- Enhance field drainage / availability.
- Provide site storage.
- Renovate / improve track.
- Enhance field dimensional constraints.
- Improve spectator seating / press box.
- Develop six (6) tennis courts on site.
- Improve site fencing / security.
- Develop durable, near all-weather fields and lights.
- Create additional field capacity. (2 MPR fields)

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Schematic Layout Plan (Sheet 2)

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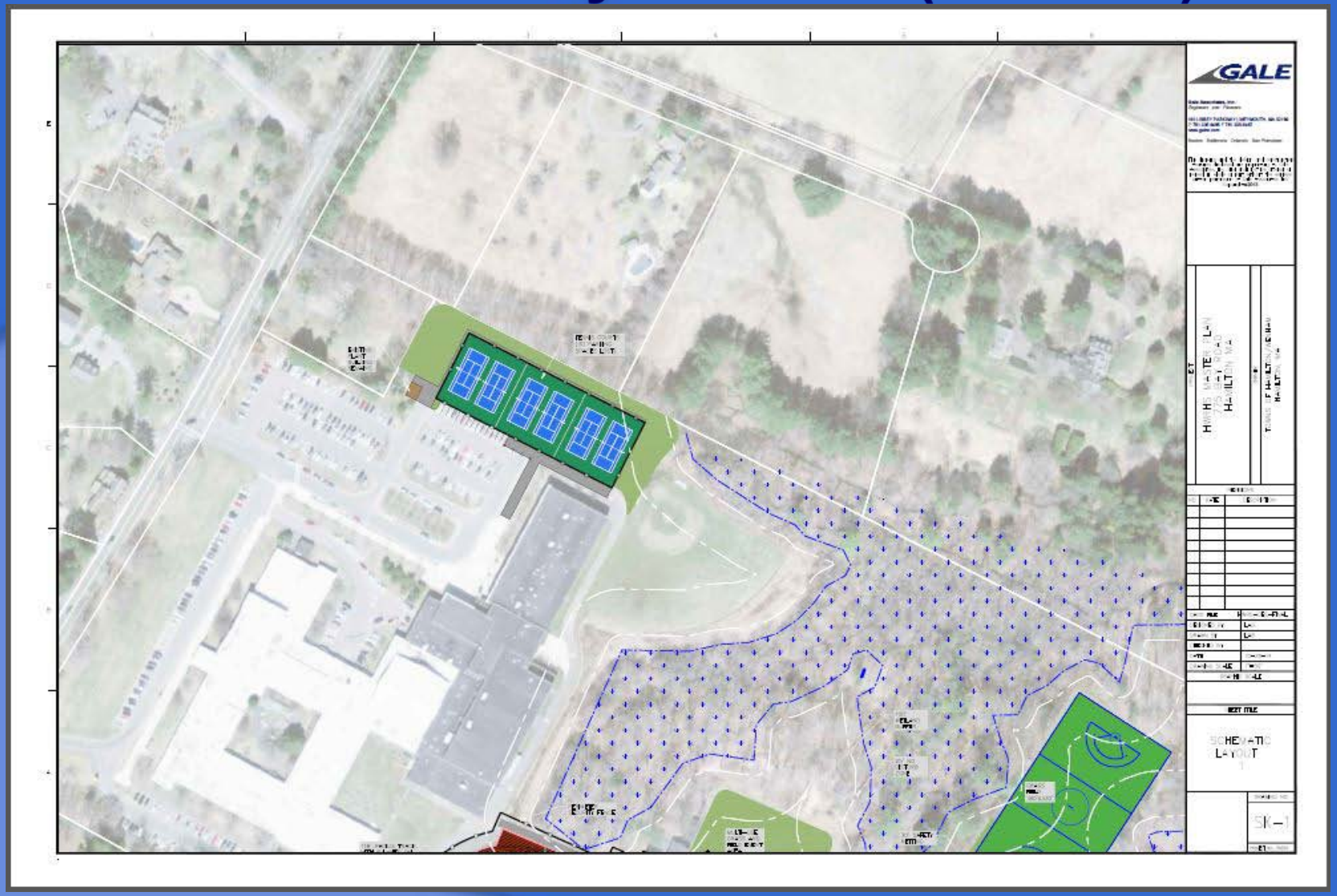
LaSalle Academy, Providence, RI

Norwell High School, Norwell, MA

Schematic Layout Plan (Sheet 1)



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Springfield College Tennis Complex
USTA Facility of the Year - 2014

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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	

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Demand Summary – Current & Proposed Uses (HWRHS)

HAMILTON-WENHAM MASTER PLAN PROPOSED REDISTRUBION 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	

Demand Summary – Current & Proposed Uses (Town Wide)

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

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Track & Field – Cost Estimate

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

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Baseball / MPR– Cost Estimate

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

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Tennis Court – Cost Estimate

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

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Softball Field Reconstruction– Cost Estimate

HAMILTON-WENHAM REGIONAL HIGH SCHOOL MASTER PLAN		
Schematic Pre-Design Estimate		
SOFTBALL FIELD RECONSTRUCTION		
ITEM	DESCRIPTION	TOTAL COST
1	General Conditions	$ 37,060.88
2	Erosion Control	$ 4,500.00
3	Field Reconstruction	$ 235,475.00
	Subtotal	$ 277,035.88
	Soft Costs - 7%	$ 19,392.51
	Total	$ 296,428.39

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Modular Storage Building – 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

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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
SUBTOTALS	**2,694,000**	**2,511,198**	**1,120,032**	**330,000**	**300,000**
MASTER PLAN REDEVELOPMENT TOTAL	**$ 6,595,860**				

*Cost estimates do not include inflation/price escalation.

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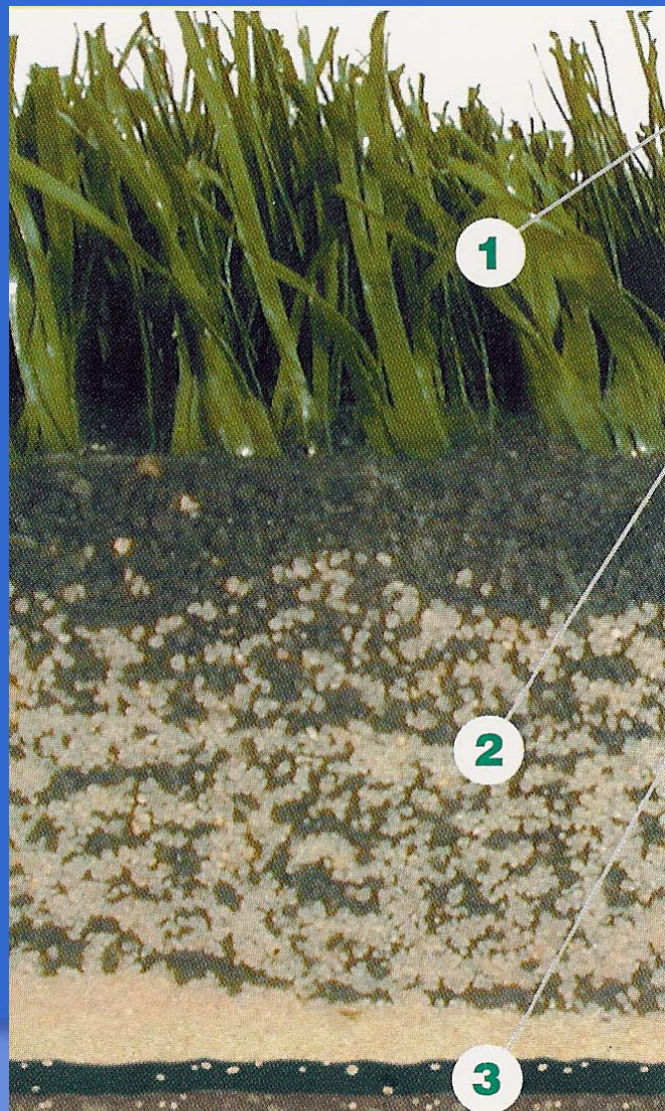
Miscellaneous Improvements – Cost Estimate

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

Filled Turf Since 1996
How Infilled Turf Has Been Marketed

"Filled" Synthetic Turf Advantages:

- Dramatically increased use (2-3 X)
- **Allows full use of athletic lighting**
- **Very low maintenance**
- **Grass-like look and performance**
- **All-weather availability**
- **Environmentally Sensitive**
- **Permanent lines and markings**
- **Enhanced player safety**
- **Pay-to-play opportunities**
- **Image/Branding**
- **Immediate availability**



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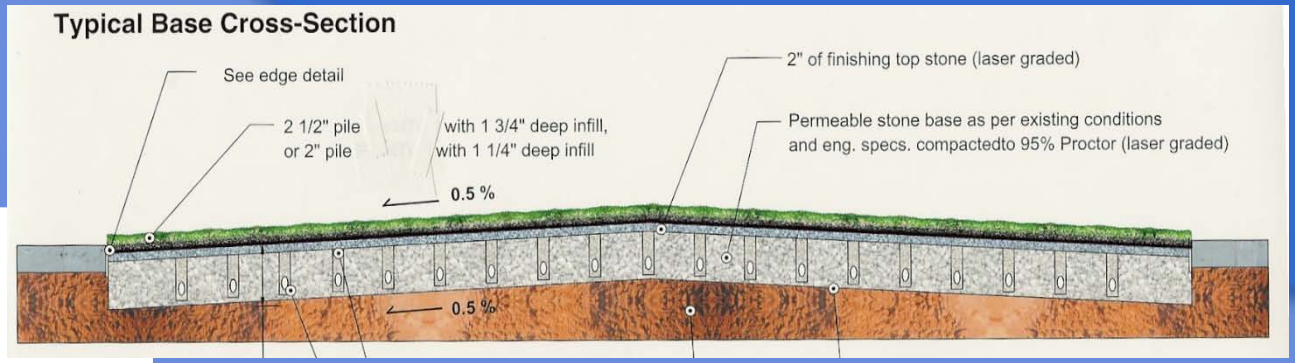
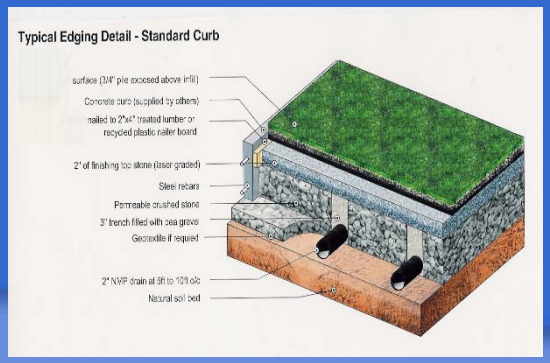
How are filled turf fields constructed? What are the field's main characteristics?

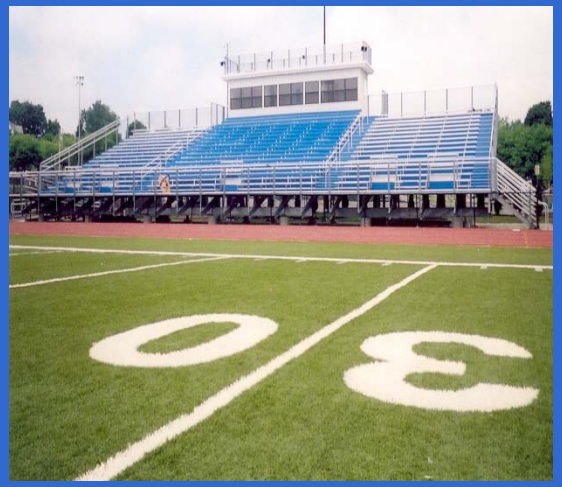
- Top soil is removed to a depth of about 12 inches
- A concrete anchor curb is constructed around the perimeter
- Drainage pipe is installed every 20-25 feet
- A free-draining stone base is installed and laser graded
- A crown of 0.5% is maintained across the field
- The carpet is installed on top of the stone
- Field lines and markings are permanently installed
- The carpet is "infilled" with silica sand & ground rubber crumb





How Long Will the Carpet Last? How Durable Is the Turf?

- **Today's infilled carpets expected to last 10-14 years**
- **UMASS Lowell (the oldest infilled field in New England) used a less durable technology carpet and still lasted 11 seasons of constant use**



UMASS Lowell - 1999

UMASS Lowell Users:

- Football (2 Seasons)
- Field Hockey – Varsity & JV
- Soccer – Men & Women
- Lacrosse – Men & Women
- Intramurals
- Club Sports
- Community/Youth Sports
- Summer Camps/Clinics
- Baseball
- Softball

Actual Use Statistics:

- 7 Hours/Day (Mon.-Fri.)
- 12 Hours/Day (Sat.-Sun.)
- 30 weeks per year (May-Nov.)
- 1800 direct use hours per year
- **720 events/year @ 2.5 Hours/Event**
- 18,000 hours over the 10-year life

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Staph Infection Risk In Synthetic Turf

Penn State Conclusions

- Staph survives on both natural grass and synthetic turf indoors multiple days
- Commercially available anti microbial treatments significantly decrease survival rate
- Outdoor survival rate much lower (temp/UV)
- Survival rate on natural grass comparable to synthetic turf outdoors

Survival of Staphylococcus on Synthetic Turf,

Andrew S. McNitt, The Pennsylvania State University,

Diane Petrunak, The Pennsylvania State University

Are “In-filled” turf fields as safe as natural grass?

A 5-year study by Dr. Bill Barnhill assessed high school athletes in Texas, comparing FieldTurf to natural grass, concluded:

- **A 66% reduction in neural injuries**
- **50% reduction in cranial/cervical injuries**
- **A 33% reduction in third degree injuries**

A 3-year study by Dr. Michael C. Meyers, PhD, FACSM, which assessed 704 Div. 1 NCAA football games comparing FieldTurf to natural grass concluded:

In regards to incidence of injury:

- 7% Fewer total injuries
- 3% Fewer minor injuries
- 19% Fewer substantial injuries
- 22% Fewer severe injuries

In regards to head, knee, and shoulder trauma:

- 12% Fewer concussions
- 42% Lower anterior cruciate ligament trauma
- 16 % Lower ACL and associated tissue trauma
- 10% Fewer AC separations
- 64% Fewer rotator cuff tears
- 46% Lower incidence of shoulder lesions

GMAX Testing, ASTM 355-95

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Are there health or environmental risks with infilled turf versus natural grass?

US CONSUMER PRODUCT SAFETY COMMISSION:

"There is no indication that exposure to the turf could pose any harm. We are not recommending that communities shut down their playing fields."

THE CENTER OF DISEASE CONTROL (CDC):

"Testing on FieldTurf fields have consistently shown 10-20 ppm or less then 5% of the lead level regarded as problematic."

NEW YORK DEPARTMENT OF HEALTH AND MENTAL HYGIENE:

"Based on existing HUD Guidelines and EPA standards, lead hazard risk assessments at these four DPR synthetic turf fields did not identify lead hazards."

NEW JERSEY DEPARTMENT OF HEALTH:

"Based on the state's recommendation, the committee voted in favor of re-opening the fields without restrictions."

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION:

"MassDEP believes that this use of tire crumb rubber in synthetic turf athletic field to be an acceptable recycling/reuse of tire rubber that does not warrant further review by MassDEP."

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