Synthetic Turf

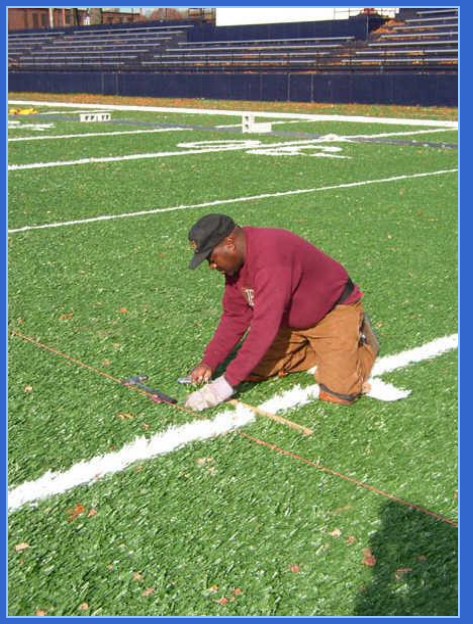
Typical life cycle
cost considerations for Infilled Turf

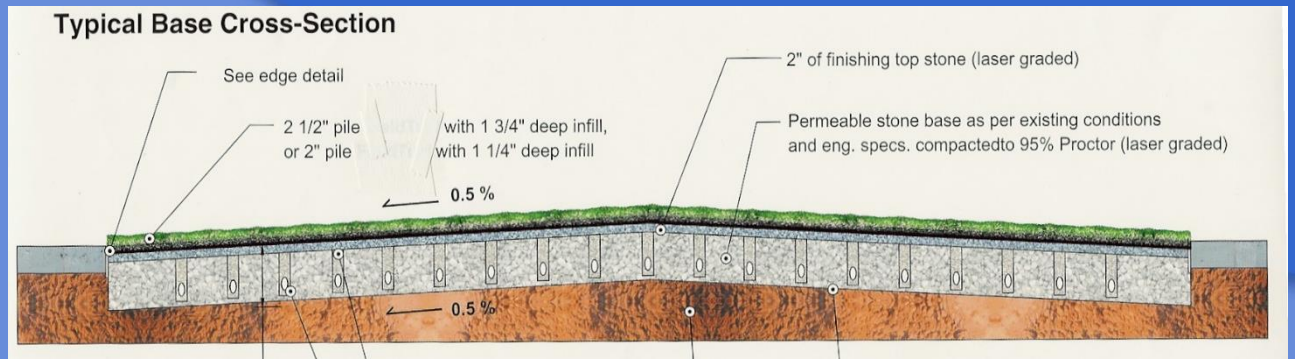
GALE

How would a synthetic turf field be constructed?

What are the new field's main characteristics?

- Top soil is removed to a depth of about 18 inches
- A concrete anchor curb is constructed around the field perimeter
- Drainage pipe is installed every 15-20 feet
- A free-draining stone base is installed and laser graded
- A crown of ½% 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 & cryogenically ground rubber crumb





Why Install Synthetic Turf Multi-Purpose Game Field?

“Filled” Synthetic Turf Advantages:

- **Dramatically increased use (2-3 X)**
- **Allows full use of proposed 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**

GALE

How Long Will the Carpet Last?

How Durable Is the Turf?

- **Today's infilled carpets expected to last 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

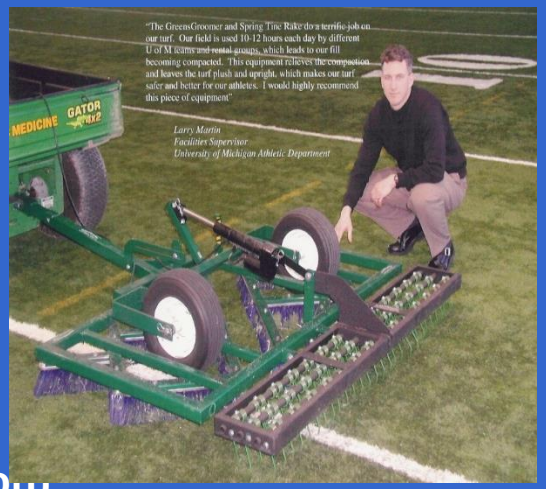
Actual Use Statistics:

- 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

GALE

Are there maintenance savings associated with the new field?

YES: Maintenance costs decrease by $26,000/year and the number of uses increases by 300%



Natural Turf Field Maintenance Cost (labor, material, depreciation):

▪ Mowing, 30 cuttings	$5,500
▪ Watering – ½-1 in./week @ 20 weeks	$5,000
▪ Irrigation Winterize/De-winterize	$3,000
▪ Fertilizer x 3, lime, pesticides	$5,000
▪ Aeration, topdressing, overseeding	$6,000
▪ Line markings (weekly @ 24 weeks)	$3,500
	$28,000/year

The Infilled Synthetic Turf Field is groomed with a towed groomer provided with the field, approximately 4-5 Times/Year: $5,000 / Year

GALE

Gale Associates, Inc.

Engineers and Planners

Maintenance Activity Resource and Cost Summary

Activity: **Fertilizer Spreading** **Symbol:** F

Typical Athletic Field at 100,000 S.F.

RESOURCE	UNIT	UNIT COST	QUANTITY	COST	COMMENTS
LABOR					
MAINT. SUPERVISOR	MH	$ 60.00	3	$ 180.00	incl. direct labor and overhead
MAINT. WORKER	MH	$ 40.00	3	$ 120.00	incl. direct labor and overhead
EQUIPMENT					
PULL SPREADER	EH	$ 0.48	3	$ 1.44	incl. operation cost and depreciation
MANUAL SPREADER	EH	$ 0.15	1	$ 0.15	incl. operation cost and depreciation
TRACTOR	EH	$ 2.48	3	$ 7.44	incl. operation cost and depreciation
UTILITY TRUCK	EH	$ 3.22	4	$ 12.88	incl. operation cost and depreciation
TRAILER	EH	$ 0.45	4	$ 1.80	incl. operation cost and depreciation
MATERIALS					
FERTILIZER	LB	$ 4.00	300	$ 1,200.00	at rate of 3 lb of N/ 1,000 s.f.
COST PER FIELD				**$ 1,523.71**	

Gale Associates, Inc.

Engineers and Planners

Maintenance Activity Resource and Cost Summary

Activity: **Cut Grass, Empty trash, Re-Stripe (Rectangular)**

Typical Athletic Field at 100,000 S.F. **Symbol: MR**

RESOURCE	UNIT	UNIT COST	QUANTITY	COST	COMMENTS
LABOR					
MAINT. SUPERVISOR	MH	$ 60.00	4.5	$ 270.00	incl. direct labor and overhead
MAINT. WORKER	MH	$ 40.00	4.5	$ 180.00	incl. direct labor and overhead
EQUIPMENT					
CHALK STRIPER	EH	$ 0.30	3	$ 0.90	incl. operation cost and depreciation
UTILITY TRUCK	EH	$ 3.22	4.5	$ 14.49	incl. operation cost and depreciation
TRAILER	EH	$ 0.45	4.5	$ 2.03	incl. operation cost and depreciation
MOWER (DECK)	EH	$ 0.88	2	$ 1.76	incl. operation cost and depreciation
MOWER (RIDER)	EH	$ 1.76	4	$ 7.04	incl. operation cost and depreciation
BLOWERS / TRIMMERS	EH	$ 0.30	3	$ 0.90	incl. operation cost and depreciation
MATERIALS					
CHALK	LS	$ 15.00	1	$ 15.00	per field
TRASH BAGS	DOZ	$ 10.00	1	$ 10.00	
COST PER FIELD				**$ 502.12**	

Gale Associates, Inc.

Engineers and Planners

July					August				September			
WK 26	WK 27	WK 28	WK 29	WK 30	WK 31	WK 32	WK 33	WK 34	WK 35	WK 36	WK 37	WK 38
MR,IR	MR,IR	MR,IR	MR,IR	MR,IR	MR,IR	MR,IR	A,MR,IR	MR,P,IR	MR,LT	F , MR,LT	MR,LT	MR,LT
1	1	1	1	1	1	1	1	1	1	1	1	1
							1					
1	1	1	1	1	1	1	1	1	1	1	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0
										1		
								1				
0	0	0	0	0								

Gale Associates, Inc.

Engineers and Planners

MAINTENANCE ACTIVITIES					
EQUIP. MAINT., INVENTY, TRAIN.- E	1	$	4,360	$	4,360
INSPECTION, SOIL SAMPLING - I	1	$	201	$	201
MOWING, STRIPING, TRASH, (BASEBALL) - MB	0	$	444	$	-
MOWING, STRIPING, TRASH, (RECTANGULAR) - MR	27	$	502	$	13,557
AERATE AND DRAG - A	2	$	348	$	696
IRRIGATION - IR	17	$	101	$	1,717
TOPDRESS AND DRAG - T	1	$	1,716	$	1,716
OVERSEED AND DRAG - O	1	$	1,101	$	1,101
LIGHTING - LT	0	$	70	$	-
FERTILIZE - F	2	$	1,524	$	3,047
PESTICIDE / WEED TREATMENT - P	2	$	402	$	805
LIME Ph ADJUSTMENT - L	1	$	774	$	774
SPRING CLEAN UP, IRRIGAT. SERV. - S	1	$	1,476	$	1,476
ROUTINE IN-SEASON REPAIRS - B	1	$	695	$	695
WINTERIZE IRRIG. / FALL CLEAN-UP- W	1	$	1,608	$	1,608
				$	31,753

GALE

Course of Action 1:

Construction of a New Natural Turf Field

Assume: Insitu-Material
Topsoil Supplementation
(Sand; Micro-Nutrients)
New Irrigation
Formal Under-drainage
Premium Seed Mix/Sod

Cost: $350,000* Loss of Use x 2 years ($20,000)

Renovation: Every 6 years at $40,000

Includes design, permitting, bidding and construction costs

GALE

Course of Action 2:

Construct a Replacement Synthetic "Filled-Turf"

Assume: **Standard Installation by Industry Leader**
Formal Under-drainage
Standard curb/no track
8 year warranty/14 year life

Cost: $800,000* **No loss of use**

Renovation: Replace carpet at year 15
Repaint selected lines every 4 years

Includes design, permitting, bidding and construction costs

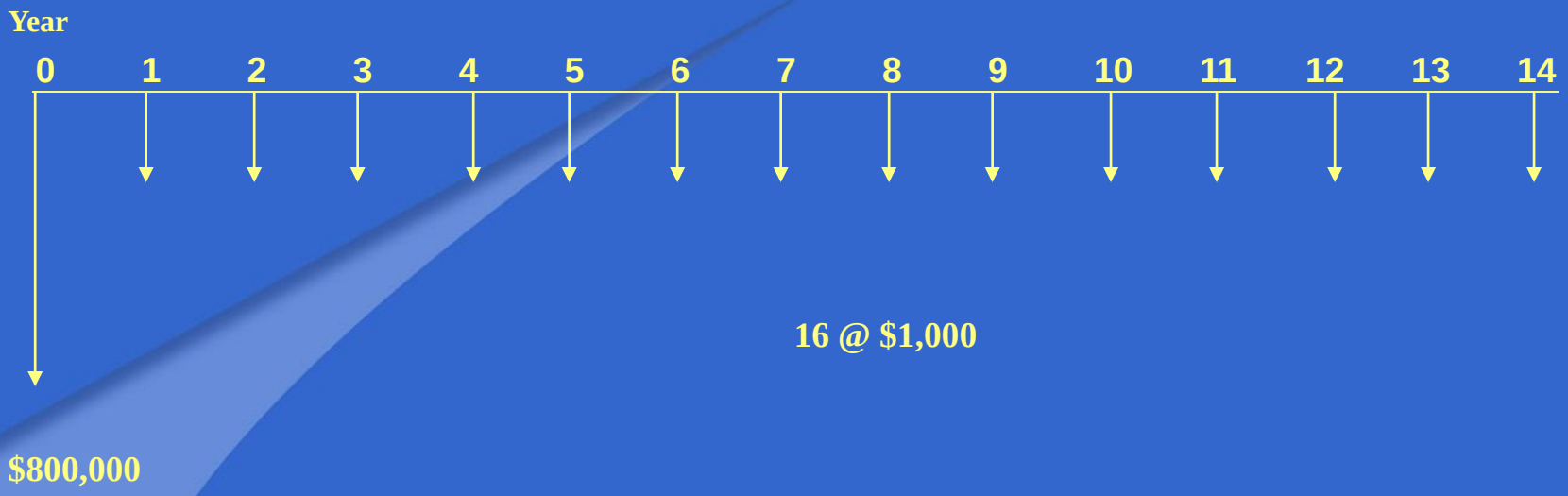
GALE

Course of Action 1 – Existing Field Reconstruction

$$NPV_{(I=3\%)} = 350{,}000 + 31{,}750\,(11.296) + 20{,}000\,(1.913) + 40{,}000\,(.837) + 40{,}000\,(.7014)$$

$$= \$808{,}428$$

Course of Action 2 – “Filled Turf” Field



$$NPV_{(I=3\%)} = 800{,}000 + 1{,}000\ (11.296)$$

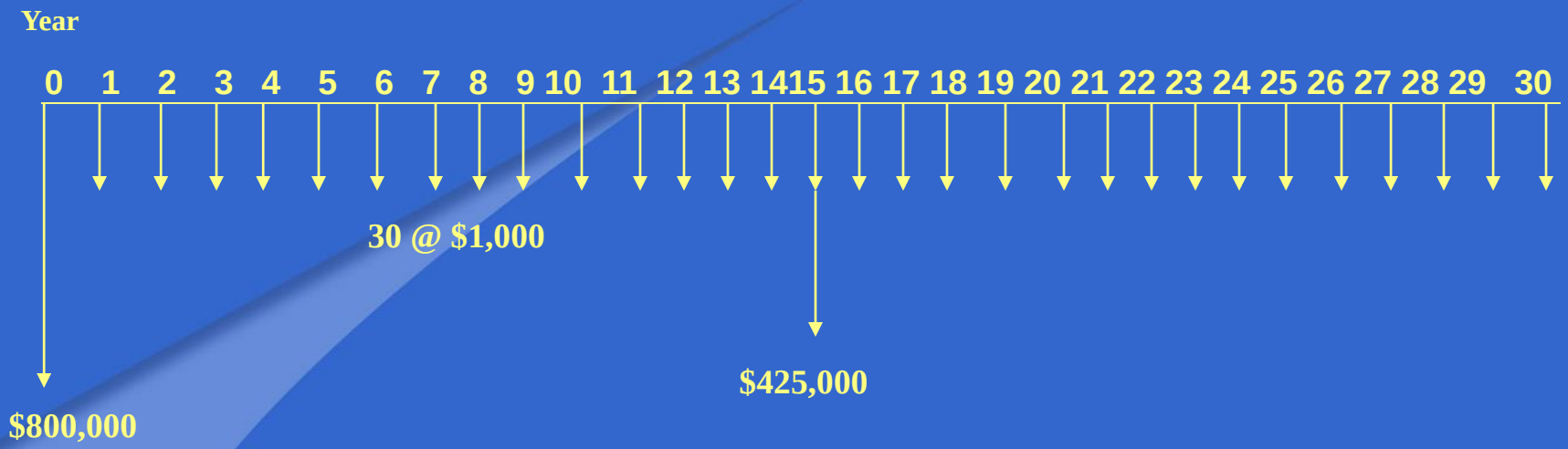
$$= \$812{,}134$$

Course of Action 1 – Existing Field Reconstruction

$$NPV_{(I=3\%)} = 350{,}000 + 31{,}750\,(19.6) + 20{,}000\,(1.913) + 40{,}000\,(.837+.701+.588+.492+.412)$$

$$= \$1.1312M$$

Course of Action 2 – Infilled Synthetic Turf Field



$$NPV_{(I=3\%)} = 800{,}000 + 1{,}000\,(19.6) + .641\,(425{,}000)$$

$$= \$1.092\ M$$

Cost Conclusions: Assume interest rate = 3%

14 year analysis:

NPV COA 1 = $808,400 **cost/use = $808,400/200 (14) = $288/use**
NPV COA 2 = $812,134 **cost/use = $812,134/400 (14) = $145/use**

30 year analysis:

NPV COA 1 = $1.13M **cost/use = $1.13M/200 (30) = $188/use**
NPV COA 2 = $1.09 **cost/use = $1.09M/400 (30) = $91/use**

***Initial costs of synthetic ≈ 2x as much**

***Life cycle costs essentially the same over 14 years**
Life Cycle Costs slightly favor synthetic over 30 years

***Cost per use greatly favors synthetic, 2 : 1 over 14 or 30 years**
(more favorable if field is lighted)

***Does not consider maintenance savings on other fields due to demand shift**

***Other savings (safety, pay to play, all weather, and community value are not considered and favor synthetic)**

GALE