



Prevention Beats Intervention in Sports Field Management

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Prevention Beats Intervention in Sports Field Management

Mike Goatley

Jim Puhalla



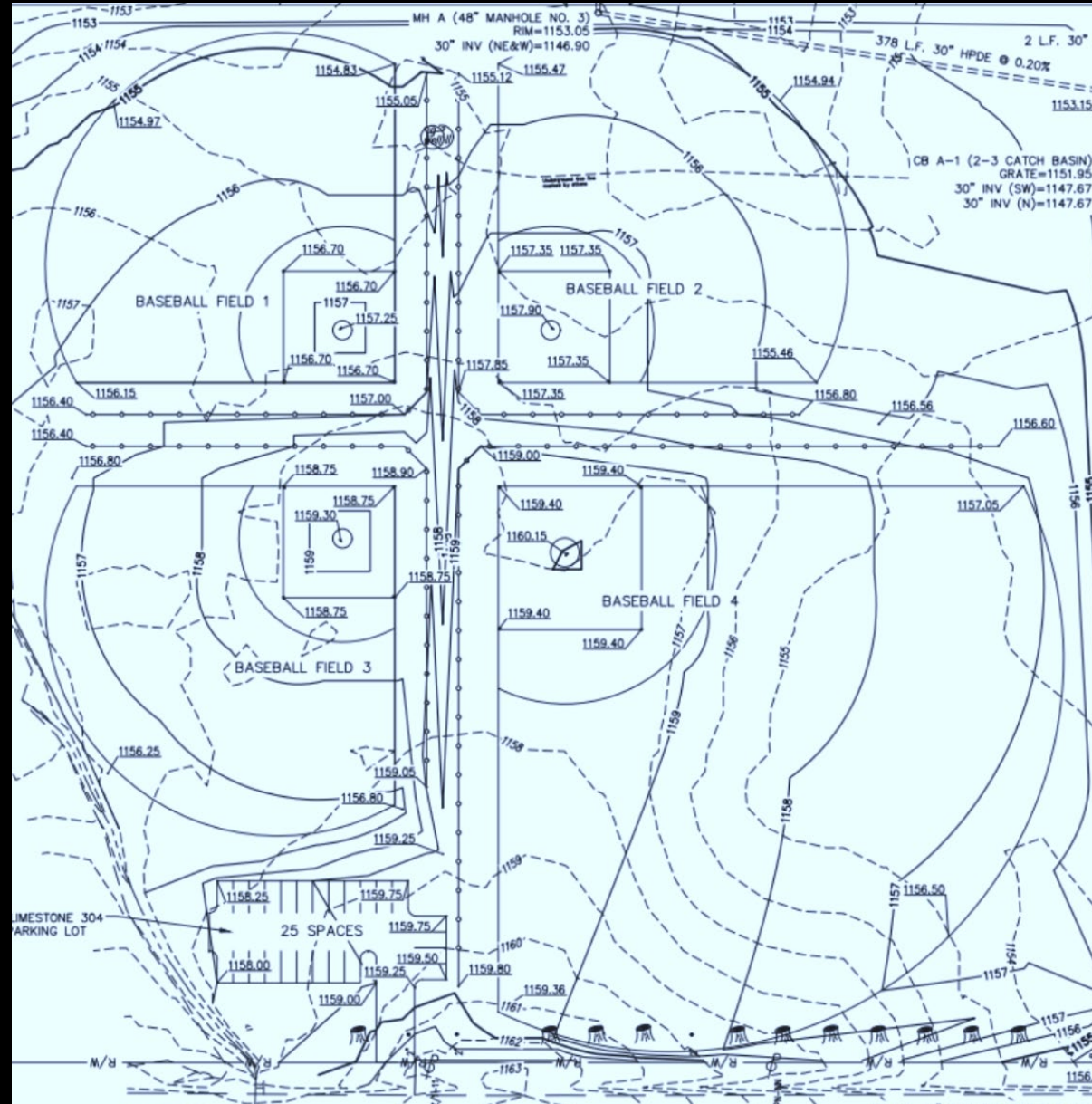
“Prevention is worth a pound of cure”.

Our goals today

- Engage in conversations WITH YOU about:
 - From a Design and Construction viewpoint, how to prevent some of the most common (and repeated) mistakes observed over the years during the planning and construction phase.
 - Ways to correct those mistakes if they *exist*.
 - From an agronomic standpoint, what are the most cost-effective preventive (and curative) strategies.

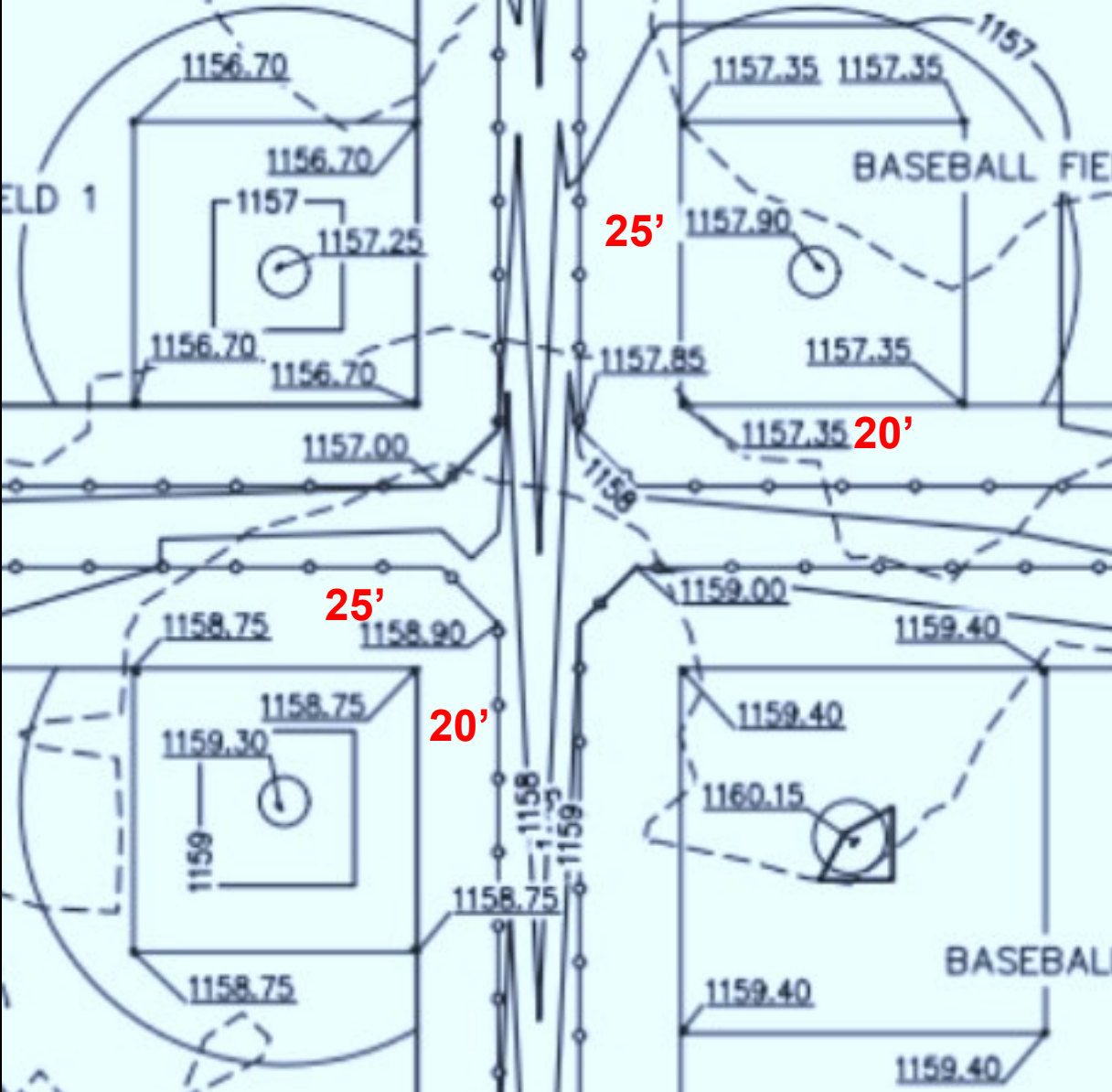
Follow Rule Book (or User)
Requirements and Recommendations

WHAT'S WRONG WITH THIS PICTURE



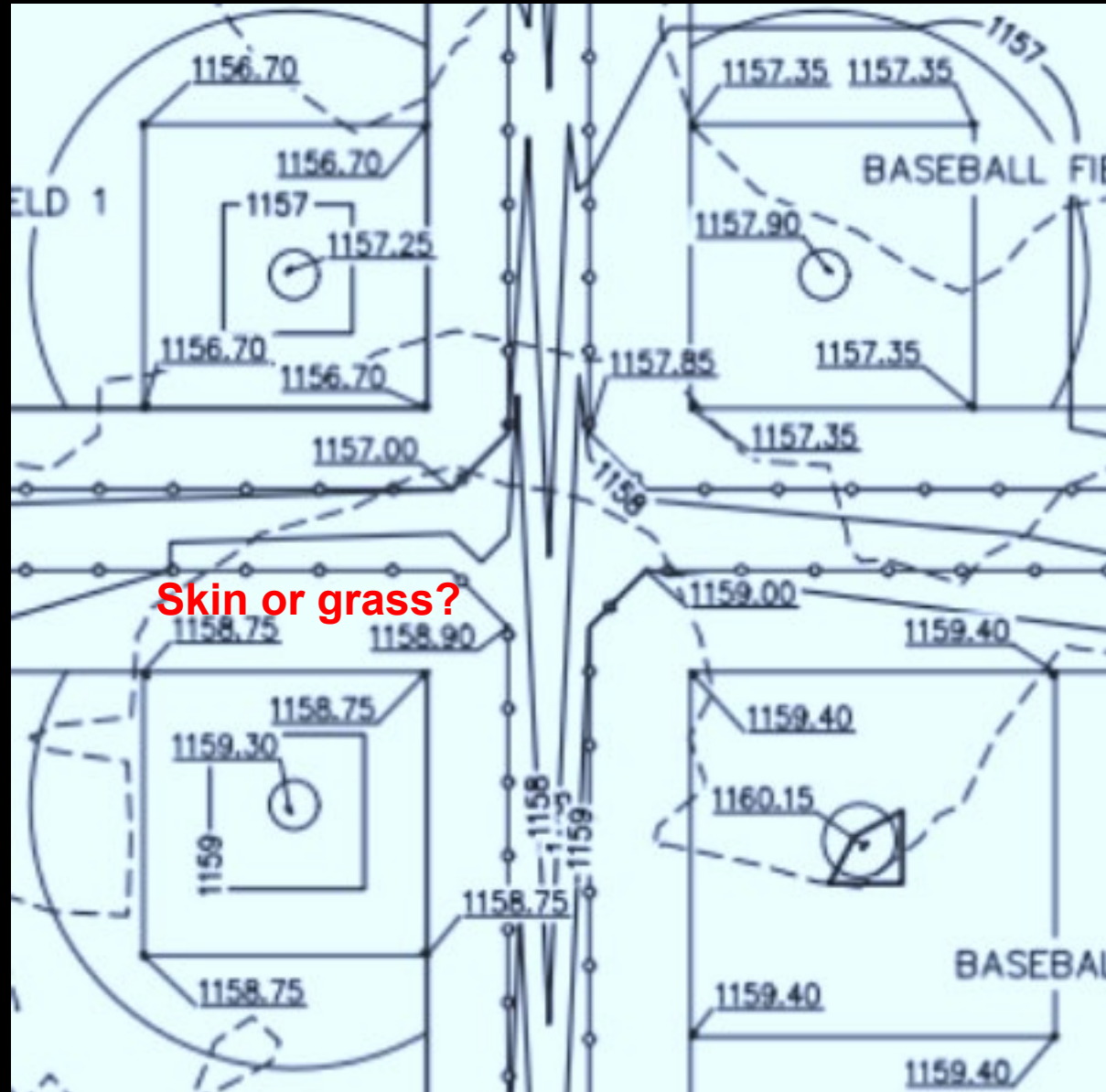
LAYOUT

Foul Territory Different

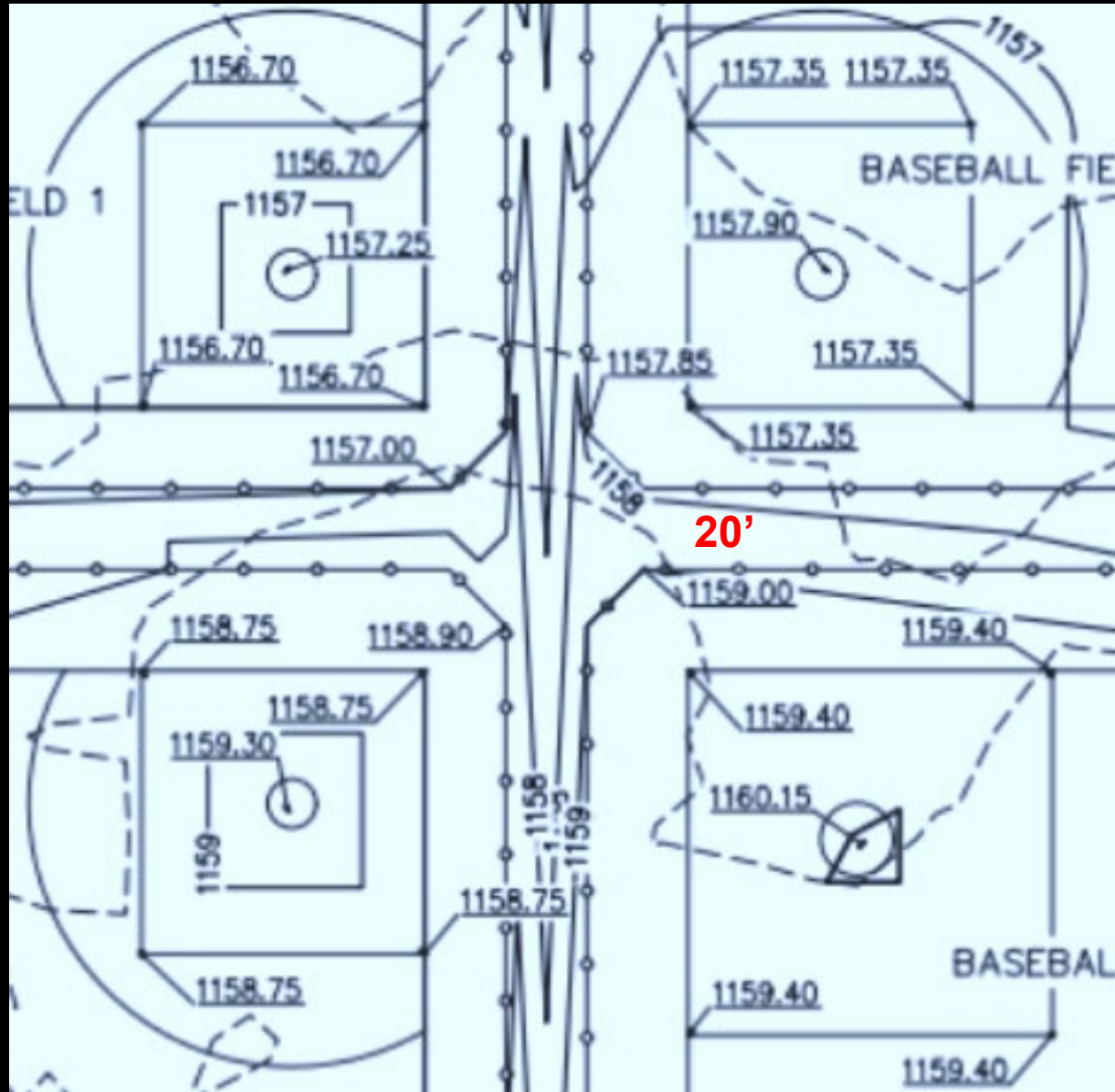




Skinned Area Not Defined in Foul Territory



No Room for Dugouts



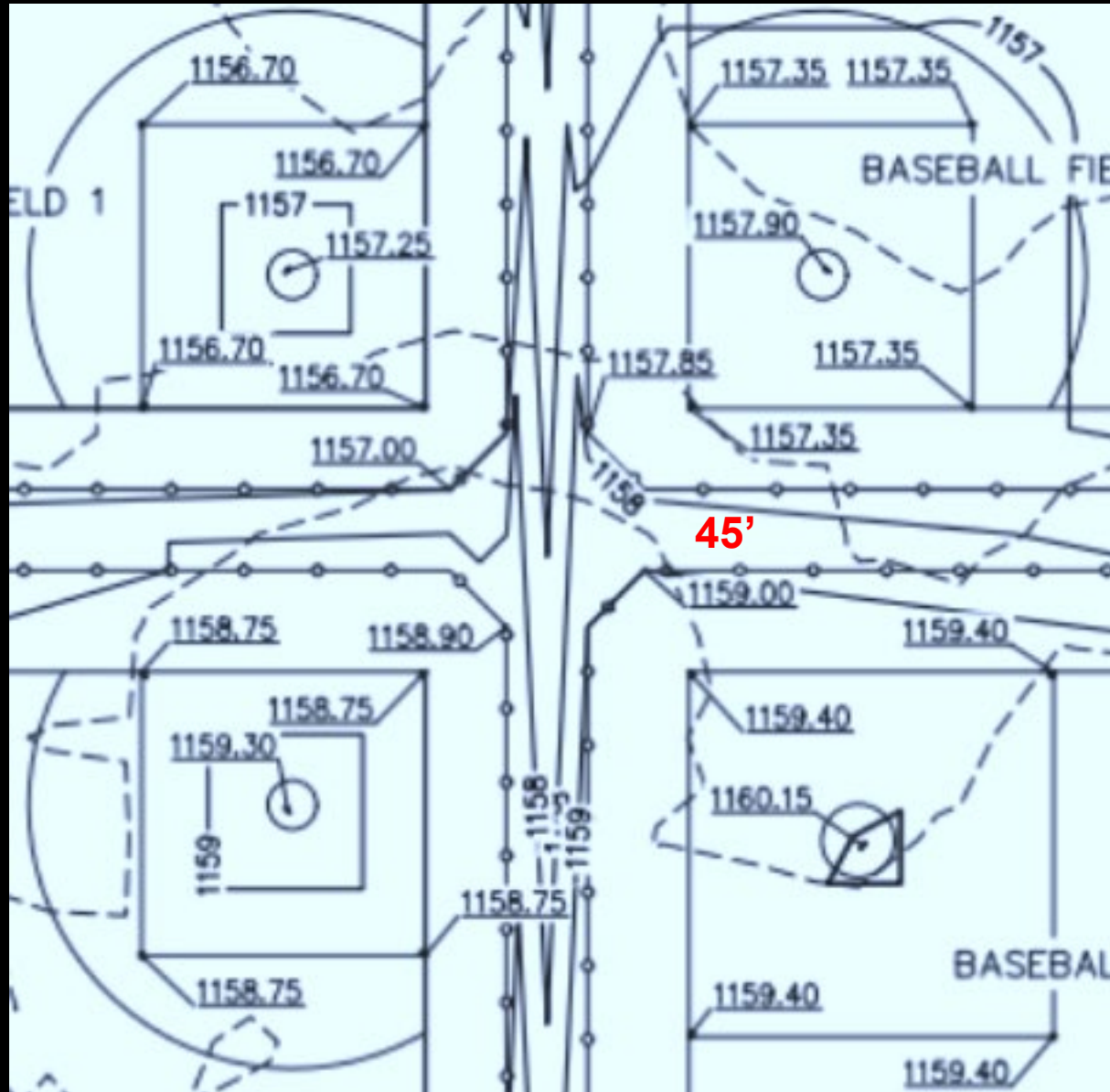


High school baseball dugout too small – only 22' wide

Table 12.4 Dugout sizes for different levels of competition

<u>Age or Organization</u>	<u>Size of Dugout</u>
6 and under	8 feet wide by 20 feet long
7 to 12	8 feet wide by 25 feet long
13 to 16	8 feet wide by 35 feet long
High School Baseball	8 feet wide by 45 feet long
High School Softball	8 feet wide by 35 feet long
College Baseball	10 feet wide by 60 feet long
College Softball	10 feet wide by 50 feet long

No Room for Dugouts



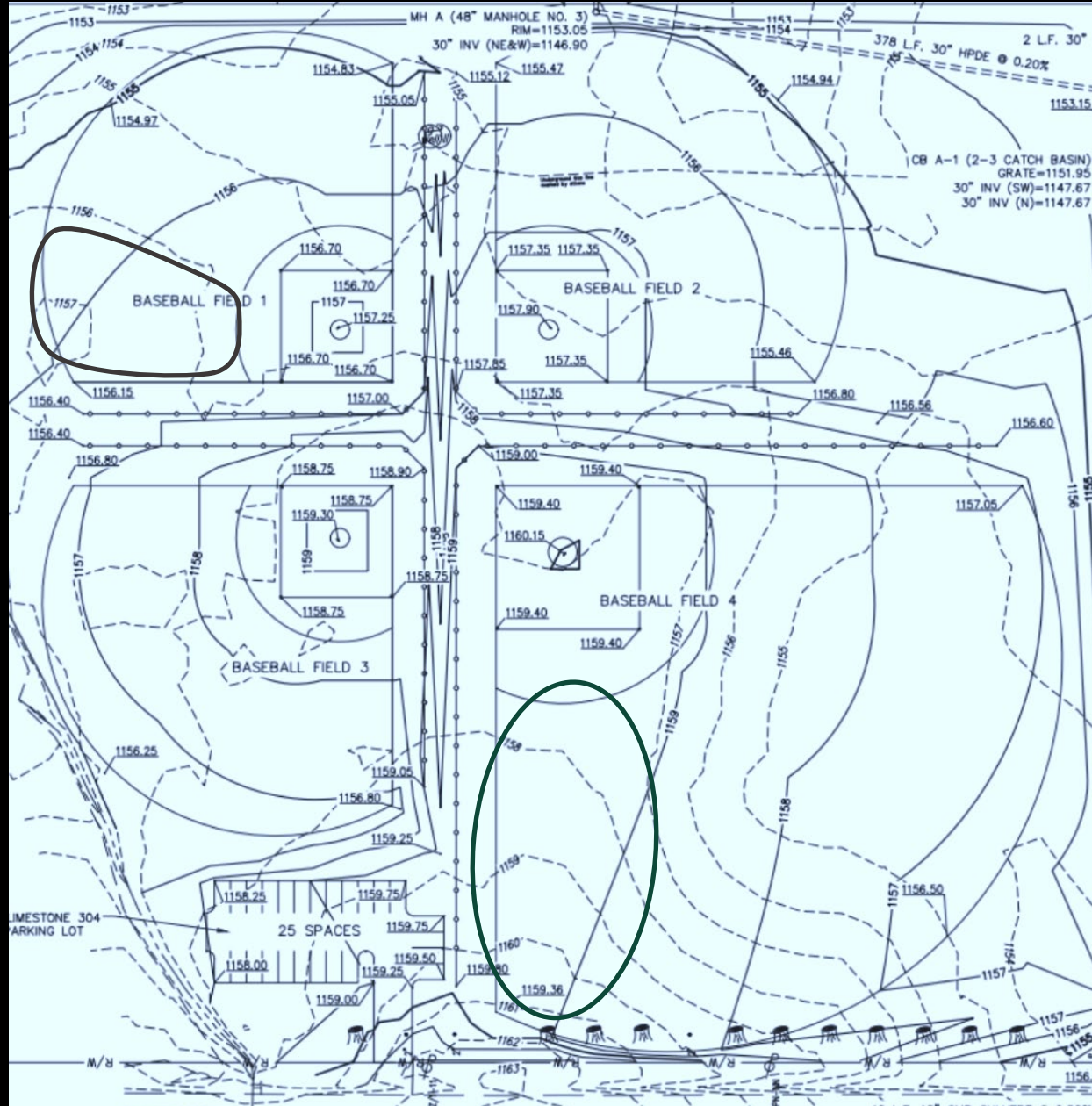
GRADE

The IDEAL sports field would be flat, but ideal is also not realistic for natural OR synthetic systems. A properly designed sports field is going to keep water moving across and away from the area.



This field has a 1% slope for surface drainage AND it also has French drains around its perimeter to move the water away from the site.

Grade Inconsistent



Isolate Each Field as
an Individual Drainage Unit

**Use an
Interceptor drain
and a catch
basin for the
drain to empty
into.**



IRRIGATION

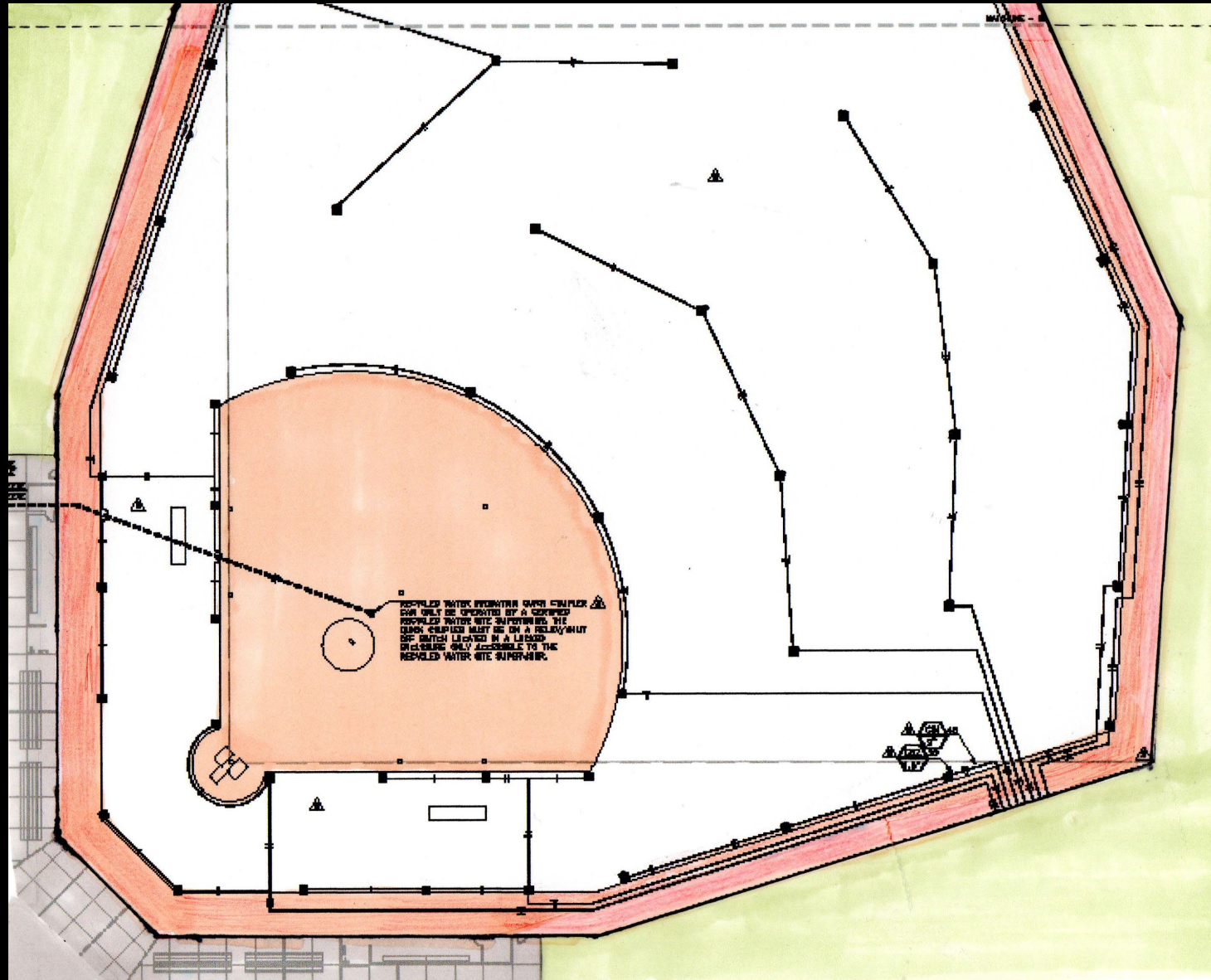
Provide Matched Precipitation

What is Matched Precipitation?

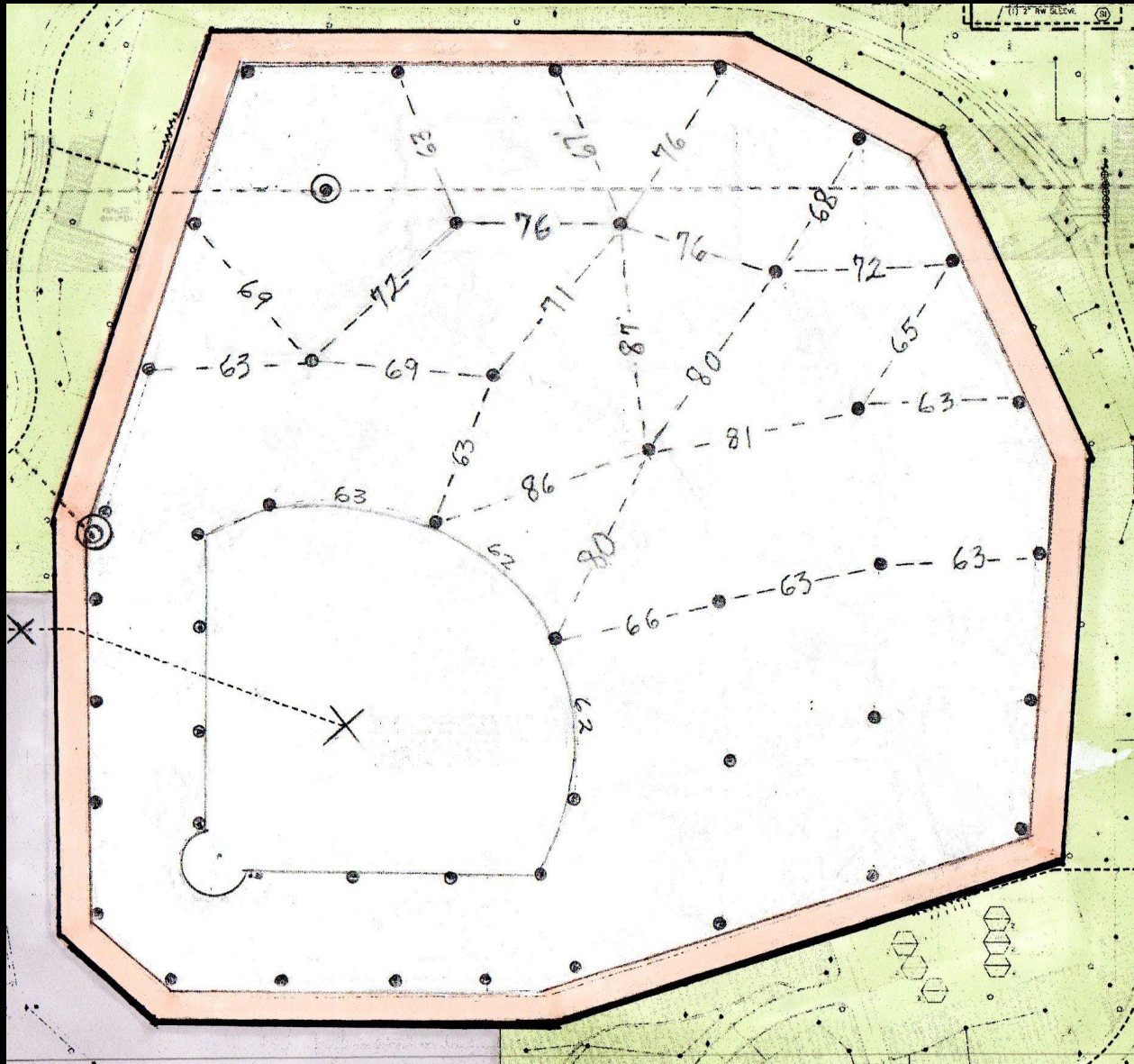
The irrigation system distributes about the same amount of water over the entire field.

Provide equal spacing from side-to-side AND end-to-end.

Spacing Not Equal in All Directions



Actual Dimensions



While we're on the subject of irrigation
Dr. Goatley and I would like to ask a
Question.

How many rely on the irrigation
controller to deliver the right
amount of water?

Tools to check soil moisture: moisture sensor or a screw driver



Grassing and Material Selection

Utilize the latest genetics when possible in selecting grasses

- Use resources like NTEP, TWCA, university lists, consulting with your peers etc., and look for 'trends over time'.
- Don't expect 'immediate grassification' even when interseeding improved genetic material.

TABLE 26.

MEAN TURFGRASS QUALITY AND OTHER RATINGS OF KENTUCKY BLUEGRASS CULTIVARS
GROWN UNDER TRAFFIC STRESS AT BLACKSBURG, VA 1/
2018 DATA

TURFGRASS QUALITY AND OTHER RATINGS 1-9; 9=BEST 2/

NAME	% GREEN COVER PRE TRAFFIC	% GREEN COVER POST TRAFFIC	% BARE GROUND POST TRAFFIC	% COVER 2 WEEKS POST TRAFFIC	% BARE 2 WEEKS POST TRAFFIC	QUALITY PRE TRAFFIC	QUALITY MIDTRAFFIC	QUALITY TRAFFIC
BOMBAY (GO-22B23)	99.0	95.0	5.0	97.7	1.7	9.0	9.0	9.0
PIVOT	99.0	97.7	1.7	97.7	1.7	9.0	9.0	9.0
SYRAH (LTP-11-41)	99.0	97.7	1.7	99.0	0.0	9.0	9.0	9.0
BAR PP 7236V	99.0	93.3	6.7	97.7	1.7	9.0	8.7	8.7
DLFPS-340/3455	99.0	97.7	1.7	99.0	0.0	9.0	8.7	8.7
J-1138	99.0	91.7	8.3	95.0	5.0	9.0	8.0	8.7
KENBLUE	99.0	95.0	5.0	97.7	1.7	9.0	8.7	8.7
PPG-KB 1304	99.0	95.0	5.0	97.7	1.7	9.0	8.3	8.7
RAD-1776	99.0	95.0	5.0	95.0	5.0	9.0	8.3	8.7
A11-40	99.0	95.0	5.0	95.0	5.0	8.7	8.0	8.3
BAR PP 71213	99.0	93.3	6.7	93.3	6.7	8.7	7.7	8.3
BAR PP 7K426	99.0	91.7	8.3	96.3	3.3	9.0	8.0	8.3
BARVETTE HGT?	99.0	95.0	5.0	99.0	0.0	8.3	8.3	8.3
DLFPS-340/3438	99.0	94.7	5.0	97.7	1.7	8.7	8.0	8.3
ORTON (PST-K13-143)	99.0	93.3	6.7	96.0	3.3	8.7	8.3	8.3
STARR (GO-2628)	99.0	93.3	6.7	97.7	1.7	8.7	8.0	8.3
A13-1	99.0	91.7	8.3	95.0	5.0	8.7	7.7	8.0
ACOUSTIC (PPG-KB 1131)	99.0	91.7	8.3	95.0	5.0	8.7	7.7	8.0
BAR PP 7309V	99.0	93.3	6.7	97.7	1.7	8.3	7.7	8.0
BARSERATI (BAR PP 110358)	99.0	91.7	8.3	94.7	5.0	8.7	8.0	8.0
DLFPS-340/3444	99.0	96.3	3.3	97.7	1.7	8.3	8.0	8.0
PST-11-7	99.0	93.3	6.7	96.3	3.3	8.3	7.7	8.0
SEIWAY	99.0	95.0	5.0	96.3	3.3	8.7	8.0	8.0
SHAMROCK	99.0	94.7	5.0	94.7	5.0	8.3	8.0	8.0
SKYE	99.0	95.0	5.0	97.7	1.7	8.3	8.0	8.0
YELLOWSTONE (A12-7)	99.0	93.3	6.7	95.0	5.0	8.7	8.0	8.0
A11-26	99.0	93.3	6.7	96.3	3.3	8.0	7.3	7.7
A11-38	99.0	93.3	6.7	96.3	3.3	8.0	7.7	7.7
CLOUD (GO-2425)	99.0	91.7	8.3	93.3	6.7	8.0	7.3	7.7
DLFPS-340/3494	99.0	91.7	8.3	93.3	6.7	8.3	7.3	7.7
DLFPS-340/3548	99.0	91.7	8.3	93.3	6.7	8.3	7.3	7.7
DLFPS-340/3549	99.0	91.7	8.3	93.3	6.7	8.3	7.3	7.7
ELECTRIC (PST-K11-118)	99.0	90.0	10.0	91.7	8.3	8.3	7.7	7.7
JERSEY (NAI-A16-3)	99.0	93.3	6.7	95.0	5.0	8.3	7.7	7.7
PALOMA (PST-K13-139)	99.0	93.3	6.7	95.0	5.0	8.3	7.3	7.7
PPG-KB 1320	99.0	91.7	8.3	91.7	8.3	8.3	7.3	7.7
RAD 553	99.0	94.7	5.0	96.3	3.3	8.0	7.7	7.7
A10-280	99.0	91.7	8.3	95.0	5.0	8.3	7.3	7.3
A16-1	99.0	91.7	8.3	93.3	6.7	7.7	7.3	7.3
A16-17	99.0	93.3	6.7	95.0	5.0	8.0	7.3	7.3
A16-2	99.0	90.0	10.0	93.3	6.7	8.0	7.3	7.3
AFTER MIDNIGHT	99.0	91.7	8.3	95.0	5.0	8.3	7.3	7.3
AKB3128	99.0	91.7	8.3	94.7	5.0	8.3	7.3	7.3
BLUE DEVIL	99.0	93.3	6.7	93.3	6.7	8.3	7.3	7.3
BLUE GEM (NAI-13-9)	99.0	91.7	8.3	93.3	6.7	8.0	7.0	7.3
BLUE MAGIC (A99-2897)	99.0	91.7	8.3	95.0	5.0	8.3	7.3	7.3
DLFPS-340/3500	99.0	93.3	6.7	93.3	6.7	8.0	7.0	7.3

TABLE 26.
(CONT'D)

MEAN TURFGRASS QUALITY AND OTHER RATINGS OF KENTUCKY BLUEGRASS CULTIVARS
GROWN UNDER TRAFFIC STRESS AT BLACKSBURG, VA 1/
2020 DATA

TURFGRASS QUALITY AND OTHER RATINGS 1-9; 9=BEST 2/

NAME	QUALITY RATINGS					QUALITY PRE-TRAF	%GREEN COV PRE-TRAF	%BARE PRE-TRAF	QUALITY MID-TRAFF	%GREEN COV POST TRAF	%BARE POST TRAF	QUALITY POST TRAF	%GREEN COV 2 WEEKS POST TRAFFIC	%BARE POST TRAFFIC	QUALITY
	MAY	JUN	JUL	AUG	MEAN										
STARR (GO-2628)	7.3	9.0	8.7	7.7	8.1	7.7	83.3	16.7	5.0	83.3	16.7	8.3	88.3	11.7	9.0
A11-26	7.3	9.0	5.7	6.3	7.1	6.3	83.3	16.7	5.3	83.3	16.7	8.3	88.0	11.7	8.7
PPG-KB 1304	7.0	9.0	9.0	8.0	8.4	8.0	93.0	6.7	4.7	93.0	6.7	9.0	91.3	8.3	8.7
SKYE	7.7	8.7	6.3	7.3	7.5	7.3	89.7	10.0	4.3	89.7	10.0	8.7	88.3	11.7	8.7
BARSERATI (BAR PP 110358)	7.3	9.0	7.7	6.3	7.5	6.3	86.7	13.3	6.0	86.7	13.3	8.7	85.0	15.0	8.3
BARVETTE HGT?	7.0	8.7	5.7	8.3	7.7	8.3	96.0	3.3	5.0	96.0	3.3	9.0	89.3	10.0	8.3
BOMBAY (GO-22B23)	7.3	9.0	7.0	8.0	7.9	8.0	76.7	23.3	5.0	76.7	23.3	7.7	88.3	11.7	8.3
DLFPS-340/3455	7.3	8.7	8.3	7.3	7.7	7.3	73.3	26.7	4.0	73.3	26.7	7.3	80.0	20.0	8.3
SHAMROCK	7.7	8.3	7.3	6.3	7.2	6.3	73.3	26.7	5.3	66.7	33.3	6.7	83.3	16.7	8.3
SYRAH (LTP-11-41)	7.0	8.3	7.0	6.3	6.9	6.3	86.7	13.3	5.0	86.7	13.3	8.7	85.0	15.0	8.3
A13-1	8.3	8.7	5.0	5.3	6.6	5.3	70.0	30.0	5.0	76.7	23.3	7.7	78.3	21.7	8.0
A15-6	7.3	9.0	5.7	5.3	6.9	5.3	71.7	28.3	4.0	70.0	30.0	7.0	81.7	18.3	8.0
A16-1	7.3	8.3	7.7	6.0	6.9	6.0	80.0	20.0	4.7	73.3	26.7	7.3	80.0	20.0	8.0
BAR PP 79366	6.3	7.3	3.3	4.0	5.2	4.0	58.3	41.7	5.0	43.3	56.7	4.3	78.3	21.7	8.0
A16-2	7.3	8.7	6.3	6.3	7.2	6.3	83.3	16.7	4.3	73.3	26.7	7.3	84.7	15.0	7.7
AKB3128	8.3	8.0	5.7	5.0	6.7	5.0	70.0	30.0	5.0	66.7	33.3	6.7	75.0	25.0	7.7
BAR PP 79494	7.0	8.3	6.3	5.0	6.6	5.0	65.0	35.0	5.3	53.3	46.7	5.3	76.7	23.3	7.7
BLUE GEM (NAI-13-9)	7.7	8.7	5.7	4.3	6.1	4.3	66.7	33.3	5.0	66.7	33.3	6.7	78.3	21.7	7.7
J-1138	8.0	9.0	6.0	6.3	7.1	6.3	66.7	33.3	5.7	70.0	30.0	7.0	81.7	18.3	7.7
RAD-1776	7.7	9.0	8.0	6.7	7.5	6.7	80.0	20.0	5.7	80.0	20.0	8.0	76.7	23.3	7.7
BAR PP 7K426	6.7	8.0	5.7	5.3	6.3	5.3	66.7	33.3	4.7	60.0	40.0	6.0	73.3	26.7	7.3
DLFPS-340/3549	6.7	8.7	6.3	4.3	6.1	4.3	75.0	25.0	5.0	73.3	26.7	7.3	73.3	26.7	7.3
DLFPS-340/3552	7.7	7.7	3.7	4.0	5.5	4.0	66.7	33.3	4.3	66.7	33.3	6.7	75.0	25.0	7.3
KH3492	6.7	8.3	5.7	6.7	7.0	6.7	76.7	23.3	6.0	76.7	23.3	7.7	75.0	25.0	7.3
ACOUSTIC (PPG-KB 1131)	6.0	8.3	6.0	5.7	6.5	5.7	73.3	26.7	4.3	73.3	26.7	7.3	79.7	20.0	7.3
TWILIGHT (NAI-13-132)	7.7	8.7	6.3	6.3	7.0	6.3	65.0	35.0	5.0	63.3	36.7	6.3	71.7	28.3	7.3
AKB3179	6.7	7.7	4.0	4.7	5.5	4.7	55.0	45.0	5.7	46.7	53.3	4.7	70.0	30.0	7.0
BABE	7.0	8.3	6.0	5.3	6.3	5.3	71.7	28.3	5.3	70.0	30.0	7.0	70.0	30.0	7.0
BAR PP 7309V	7.0	7.7	5.3	5.3	6.1	5.3	66.7	33.3	5.0	66.7	33.3	6.7	70.0	30.0	7.0
ELECTRIC (PST-K11-118)	7.0	9.0	8.0	6.3	7.1	6.3	66.7	33.3	4.0	70.0	30.0	7.0	71.7	28.3	7.0
KENBLUE	6.7	7.0	7.0	6.0	6.5	6.0	60.0	40.0	5.7	66.7	33.3	6.7	70.0	30.0	7.0
NURUSH (J-3510)	6.7	7.3	4.3	4.3	5.3	4.3	58.3	41.7	4.3	53.3	46.7	5.3	70.0	30.0	7.0
UNITED (NAI-13-14)	7.3	8.3	5.0	5.0	6.0	5.0	63.3	36.7	4.3	66.7	33.3	6.7	68.3	31.7	7.0
A10-280	8.7	8.3	5.0	5.7	6.8	5.7	66.7	33.3	5.0	56.7	63.3	5.7	68.3	31.7	6.7
A16-17	8.0	8.7	7.7	4.0	6.7	4.0	58.3	41.7	5.0	56.7	43.3	5.7	63.3	36.7	6.7
AVIATOR II (NAI-15-84)	7.3	7.7	5.3	5.0	5.9	5.0	53.3	46.7	5.0	36.7	63.3	3.7	65.0	35.0	6.7
MIDNIGHT	7.7	8.7	6.7	6.0	6.6	6.0	56.7	43.3	4.3	43.3	56.7	4.3	63.3	36.7	6.7
ORION (PST-K13-143)	6.7	8.0	6.7	6.3	6.5	6.3	60.0	40.0	4.3	66.7	23.3	6.7	65.0	35.0	6.7
PROSPERITY	6.7	8.0	4.7	4.7	5.9	4.7	71.7	28.3	5.0	63.3	36.7	6.3	66.7	33.3	6.7
SELWAY	7.7	8.0	7.3	4.7	6.3	4.7	71.7	28.3	4.7	63.3	36.7	6.3	65.0	35.0	6.7
A06-8	7.3	8.0	5.7	5.3	6.5	5.3	71.7	28.3	5.3	70.0	30.0	7.0	63.3	36.7	6.3
BAR PP 7236V	7.7	8.3	7.0	6.7	7.3	6.7	68.3	31.7	5.3	63.3	36.7	6.3	66.3	33.3	6.3
DLFPS-340/3550	7.7	8.3	6.0	5.3	6.3	5.3	60.0	40.0	4.3	56.7	43.3	5.7	68.3	31.7	6.3
NAI-15-80	8.0	7.3	4.3	3.3	5.3	3.3	43.3	56.7	4.7	36.7	63.3	3.7	63.3	36.7	6.3
PALOMA (PST-K13-139)	7.3	7.7	6.0	4.3	5.8	4.3	56.7	43.3	5.0	53.3	36.7	5.3	63.3	36.7	6.3
A11-40	7.0	8.3	8.3	7.0	7.5	7.0	66.7	33.3	5.0	56.7	43.3	5.7	60.0	40.0	6.0
BLUE MAGIC (A99-2897)	8.0	8.0	5.0	4.3	6.5	4.3	66.7	33.3	4.7	76.7	23.3	7.7	60.0	40.0	6.0
BLUE KNIGHT	6.3	6.3	3.3	3.7	4.7	3.7	46.7	53.3	4.7	53.3	46.7	5.3	56.7	43.3	6.0
DLFPS-340/3438	6.3	8.0	5.7	3.7	5.5	3.7	51.7	48.3	4.3	43.3	56.7	4.3	63.0	36.7	6.0
DLFPS-340/3444	6.3	8.3	6.0	5.3	6.3	5.3	63.3	36.7	5.0	53.3	46.7	5.3	58.3	41.7	6.0

What was going on here?

- The situation:
 - Glyphosate tolerant bentgrass, the early 2000s.
 - Seed used to produce new plants that were confirmed glyphosate tolerant in the greenhouse.
 - In late summer, introduced the seed into an existing Penncross putting green accompanied by aerating and topdressing for site preparation and new cultivar establishment.
 - Sprayed the green with a labeled glyphosate rate next fall to get rid of the Poa and the old bentgrass...
- And 90% of the green was killed by the spray.



The mix selected for both these sites:

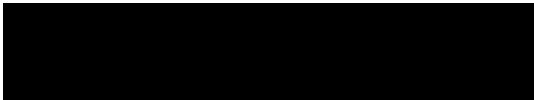
-62% sand

-19% silt

-19% clay

The rationale for the high school field: *“We want only the best for our student athletes so we gave them an infield mix that the pros use in Baltimore...”*

Sample:



Date Received:	3-Jan-20
Testing Dates:	1/4-1/6
Report Date:	6-Jan-20

Particle Size Analysis

		<u>Pro Mix</u>	<u>Int. Mix</u>	<u>Rec. Mix</u>
% Gravel	3.1%	≤ 5%	≤ 5%	≤ 5%
% Sand	63.1%	58% - 62%	65% - 69%	70% - 75%
% Silt	17.3%	38% - 42%	31% - 35%	25% - 30%
% Clay	16.5%			

Sand Sieve Size Analysis (ASTM D7928-17)

		<u>Pro Mix</u>	<u>Int. Mix</u>	<u>Rec. Mix</u>
(No. 5) Gravel (> 4.0 mm)	0.4%	0%	0%	0%
(No. 10) Fine Gravel (4.0 - 2.0 mm)	2.7%	≤ 5%	≤ 5%	≤ 5%
(No. 18) Very Coarse Sand (2.0 - 1.0 mm)	3.0%			
(No. 35) Coarse Sand (1.0 - 0.5 mm)	4.2%	38% - 45%	45% - 50%	> 50%
(No. 60) Medium Sand (0.5 - 0.25 mm)	22.3%			
(No. 100) Fine Sand (0.25 - 0.15 mm)	14.1%			
(No. 140) Fine Sand (0.15 - 0.10 mm)	8.0%			
(No. 270) Very Fine Sand (0.15 - 0.05 mm)	11.5%			
Silt (0.05 - 0.002 mm)	17.3%	38% - 42%	31% - 35%	25% - 30%
Clay (< 0.002 mm)	16.5%			

Angularity / Sphericity	Acid Reaction	D15	D85
Sub-Rounded / Medium Sphericity	None	0.0018 mm	0.43 mm

Soil Textural Class	Silt / Clay Ratio	Color* - Dry	Color* - Wet
Sandy Loam	1.1	2.5YR 4/4 reddish brown	2.5YR 3/4 dark reddish brown

*Munsell Soil Color Chart



Q: Is thatch “good or bad”?

A: Yes.



This material was not designed for warning tracks



DIY Skinned Area / Warning Track Material Test



Chain-link Fence

One more rail near the bottom will help prevent this



Use two bottom rails from dugout to dugout



“Bottom tension wire” will provide support



Preventative Pest Control

Preventative pest control has many positives but...

- Budget... what is the ROI?
- Environmental impact?
- Time (consider both the Preventative AND Curative perspectives)... what's time worth to you?
- Particular situation? Consider needs, wants, and expectations (yours and your clientele).

A “failed preventative treatment” for weed control.

PRE crabgrass herbicide applied at ideal time in spring for crabgrass control on a cool-season sports field in central Virginia.

But later that summer, the SFM determined the PRE herbicide had failed in doing its job based on weed pressure.

What could have happened?





Wormageddon 2021 in the mid-Atlantic! Fall armyworm feeding was devastating to cool-season grasses (fescue sod image on left) and significant damage even on bermudagrass sports fields (on right).

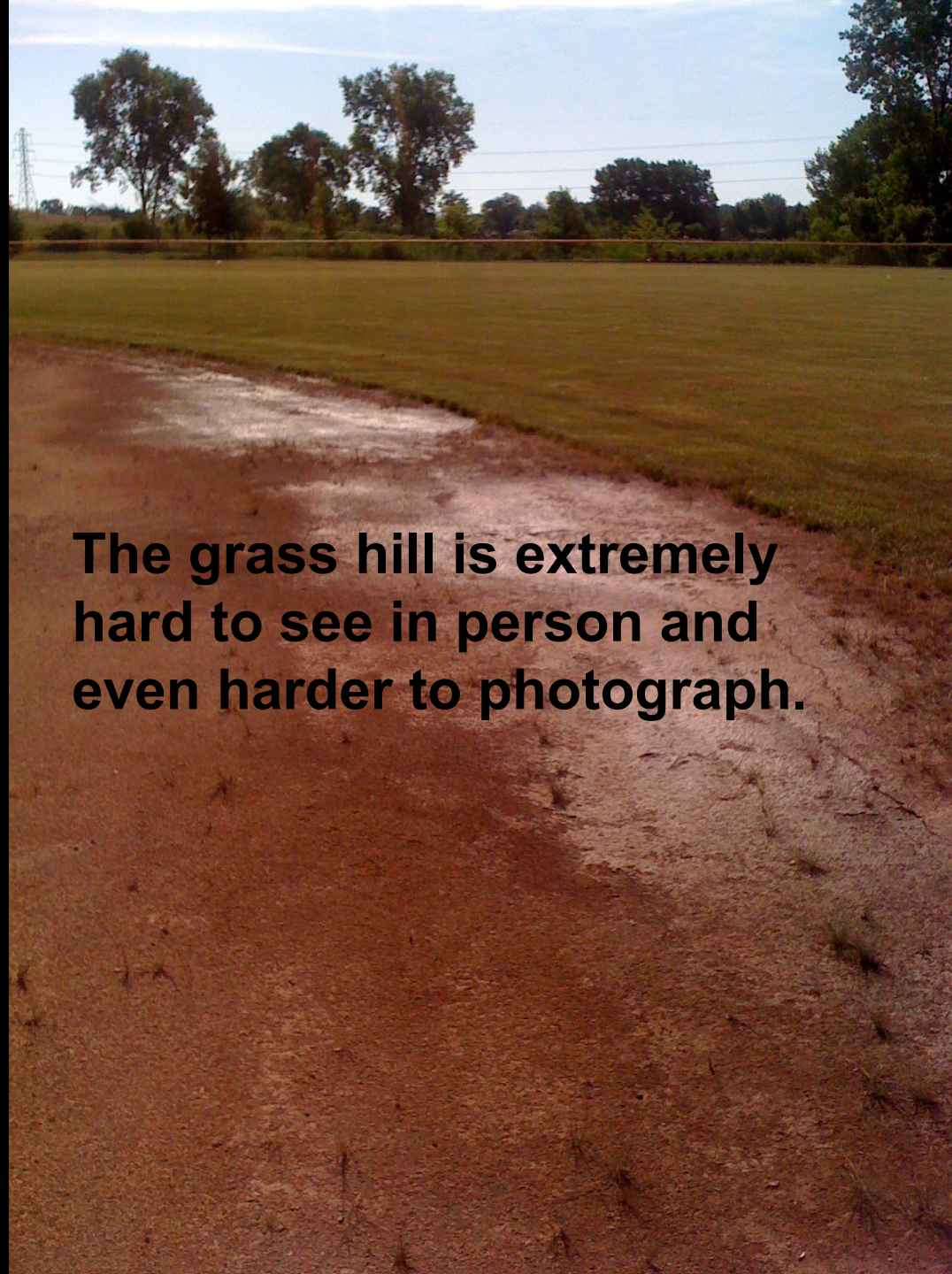
It is generally unheard of to treat preventatively for FAW as a pest, but should people change their perspectives on this given unprecedented FAW pressure of 2021?

Infield Renovation

**How would you
fix these wet
spots?**



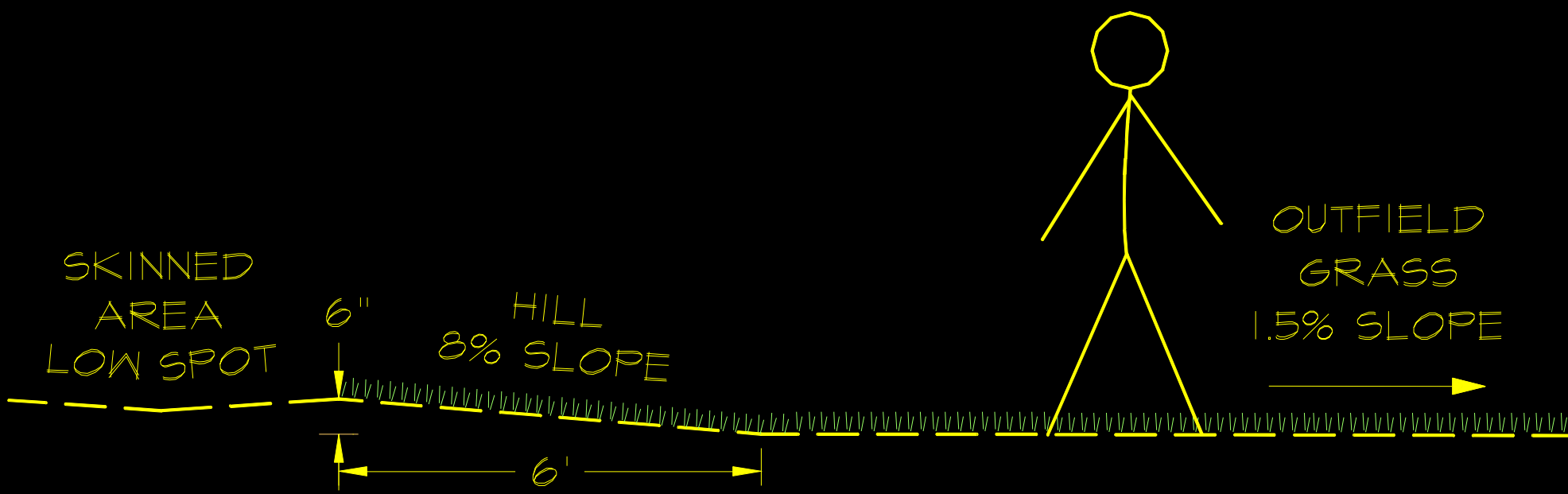
This problem is caused by a grass hill at the edge of the skinned area.

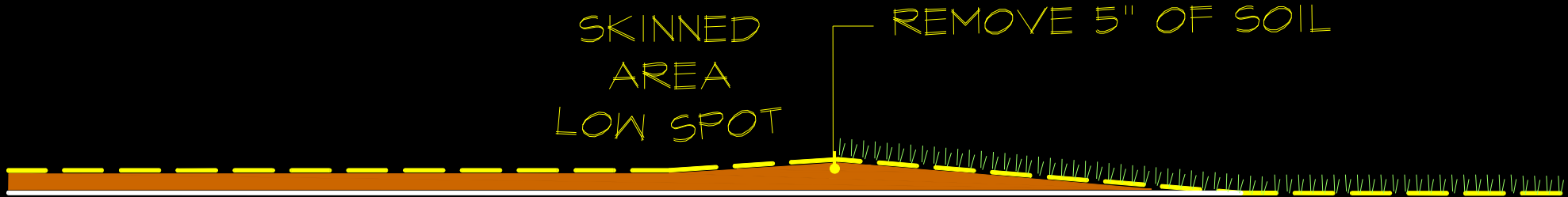


The grass hill is extremely hard to see in person and even harder to photograph.

That's because the hill is very well camouflaged by the grass.







- EXISTING GRADE
- PROPOSED GRADE
- SOIL REMOVAL





200 tons of skin material was removed from this field to reestablish positive surface drainage



Prevention Beats Intervention in Sports Field Management

Thank you for joining us today!

