Sports Turf Solutions
Athletic Field Testing and Consulting Services

October 22, 2011

Erin Anderson, Field Operations Analyst
City of San Francisco, Recreation and Parks Dept.
501 Stanyon Street
San Francisco, CA 94132

Re: Impact Test Results – Mission Recreation Center

Dear Erin,

On October 19th I conducted impact attenuation tests on the synthetic turf athletic field at Mission Recreation Center, in San Francisco, CA. The tests were conducted in substantial compliance with ASTM test method F355-A and test specification F1936-10. Section 8.3 of test specification F1936-10 was modified for use on a micro-field lined for soccer; and, due to the limited size of the playing surface, only six test points were evaluated. Detailed test results are attached.

The test results reported herein reflect the performance of the points tested, at the time of testing and at the temperatures reported. As recorded in the attached results, **test points #1, #2, #3, and #5 failed to meet ASTM's requirement of <200 average *g*-max**, when tested in accordance with the above listed method and specification. (It should be noted that these results do not imply that an impact-related injury cannot occur if the surface system complies with ASTM's *g*-max requirement.)

Thank you for the opportunity to be of service. Please call if you have questions or would like additional copies of the report.

Sincerely,

Parker Wood
Sports Turf Solutions

Encl: Impact Test Data
Test Site Diagram

29001 Falcon Ridge Rd.
www.turftest.com Salinas, CA 93908 pwood@turftest.com
Phone: (831) 484-2138 *Assessing and Improving Safety and Playability* Fax: (831) 484-2139

Impact Test Data

Field Location: **Mission Recreation Center**
Date(s) of Test: **10/19/2011**

Field Description and Condition:

Field Layout:	Soccer
Surface Type:	Infilled Synthetic Turf
Manufacturer:	FieldTurf USA
Date Installed:	n/a
Condition:	Clean and dry
Orientation:	End A is North

Test Method/Specification: ASTM F1936-10
Standard Specification for Impact Attenuation of Turf Playing Systems as Measured in the Field

Weather Conditions

General:	Mostly cloudy; lt breeze
Temp. (F):	64 °F (avg.)
Humidity:	64% Relative

Primary Contact:

Name	Erin Anderson
Phone #	(415) 831-6840

Test Performed By:
Parker Wood, Sports Turf Solutions

Summary of Test Results

Location	Vo (m/s)	h (m)	Avg *g*-max	SI	HIC	Temperatures				Depths		
						Air (°C)	Air (°F)	Surf (°C)	Surf (°F)	Pile (mm)	Infill (mm)	Turf (mm)
Test Point 1	3.59	0.66	**295**	1406.3	1223.5	18	64	23	73	29	24	5
Test Point 2	3.58	0.65	**227**	965.1	836.0	18	64	22	72	34	29	5
Test Point 3	3.58	0.66	**297**	1428.5	1236.0	18	64	21	70	23	19	4
Test Point 4	3.58	0.65	**189**	745.6	649.4	17	63	16	61	49	43	6
Test Point 5	3.58	0.65	**287**	1371.8	1192.7	17	63	17	63	32	28	4
Test Point 6	3.55	0.64	**168**	644.7	561.5	18	64	19	66	51	46	5

Range of *g*-max averages:	
Highest average reading	297
Lowest average reading	168
Average of the averages	244

Exceptions / Comments:

Section 8.3 of ASTM Standard Specification F1936-10 was modified for use on a micro-field lined for soccer. Due to the very limited size of the playing area, only six points were selected for testing. All tests met data integrity requirements. The turf exhibited signs of heavy fibrillation and there was infill material showing on the surface in many areas. A minor seam problem was noted at the end of the restraining arc closest to side C, at end B of the field. Some seam lines are being exposed due to turf wear.

Impact Test Data

Field Location: **Mission Recreation Center**
Date(s) of Test: **10/19/2011**

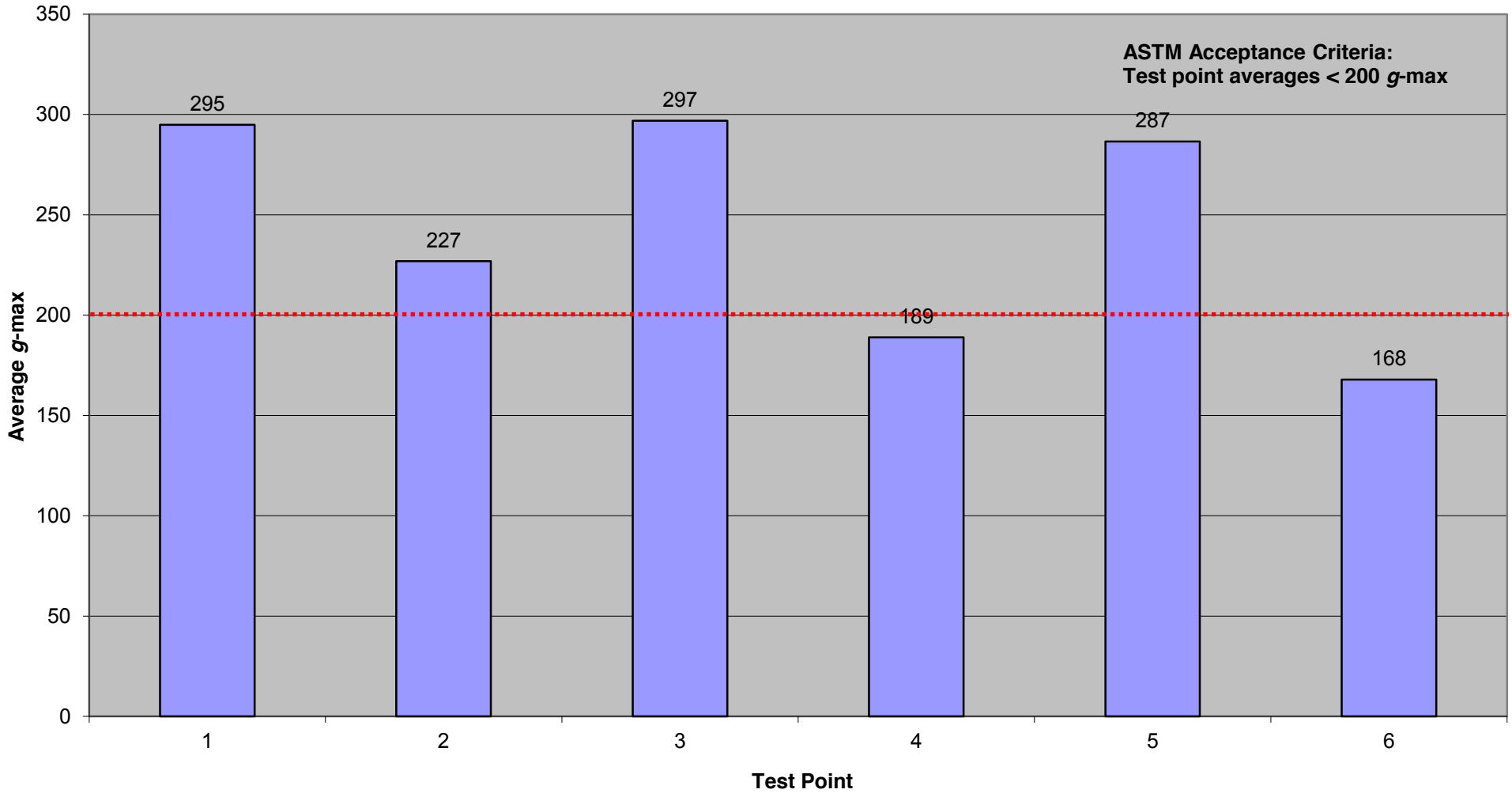
Detailed Test Results

Location	Drop #	Vo (m/s)	h (m)	***g*-max**	SI	HIC	Temperatures				Depths		
							Air (°C)	Air (°F)	Surf (°C)	Surf (°F)	Pile (mm)	Infill (mm)	Turf (mm)
Test Point 1	1	3.53	0.64	257.8	1134.6	985.1							
Goal line, End A,	2	3.60	0.66	290.9	1381.0	1201.7							
center of field	3	3.58	0.65	298.8	1431.6	1245.2							
	Avg 2&3	3.59	0.66	**294.9**	1406.3	1223.5	18	64	23	73	29	24	5
Test Point 2	1	3.52	0.63	202.4	808.7	700.8							
Corner of penalty	2	3.58	0.65	221.7	936.9	812.3							
box, End A,	3	3.58	0.65	232.0	993.3	859.7							
Side C	Avg 2&3	3.58	0.65	**226.9**	965.1	836.0	18	64	22	72	34	29	5
Test Point 3	1	3.59	0.66	265.6	1199.8	1034.7							
Center of the field	2	3.56	0.65	292.6	1398.1	1209.4							
	3	3.60	0.66	301.3	1458.9	1262.5							
	Avg 2&3	3.58	0.66	**297.0**	1428.5	1236.0	18	64	21	70	23	19	4
Test Point 4	1	3.56	0.65	169.2	628.0	547.3							
Corner of the	2	3.59	0.66	186.7	735.9	641.1							
field, End B,	3	3.58	0.65	191.2	755.3	657.7							
Side D	Avg 2&3	3.58	0.65	**189.0**	745.6	649.4	17	63	16	61	49	43	6
Test Point 5	1	3.59	0.66	248.0	1081.5	939.9							
Penalty kick spot,	2	3.58	0.65	278.7	1317.3	1145.4							
End B, center of	3	3.58	0.65	294.5	1426.3	1239.9							
field	Avg 2&3	3.58	0.65	**286.6**	1371.8	1192.7	17	63	17	63	32	28	4
Test Point 6	1	3.57	0.65	151.0	551.7	482.0							
Half way from mid-	2	3.54	0.64	167.2	642.5	559.7							
field to End B, 2'	3	3.56	0.65	168.7	646.9	563.2							
outside Side C	Avg 2&3	3.55	0.64	**167.9**	644.7	561.5	18	64	19	66	51	46	5

Note: The equipment used to determine *g*-max values was last calibrated 9/06/11. The calibration certificate is on file at Sports Turf Solutions. Copies are available upon request.

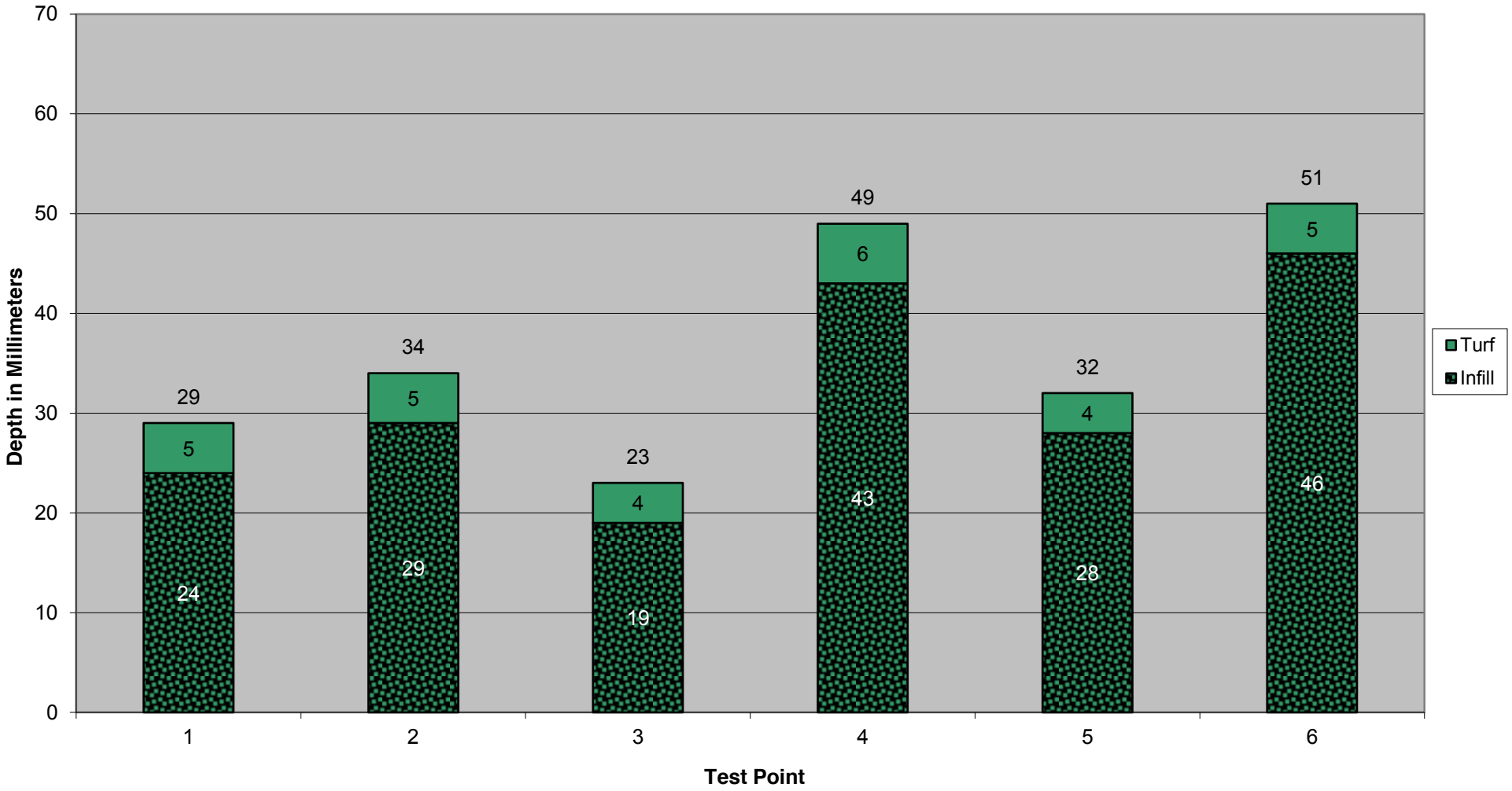
Mission Recreation Center - Soccer Field

Average *g*-max Levels



Mission Recreation Center - Soccer Field

Test Point Profiles



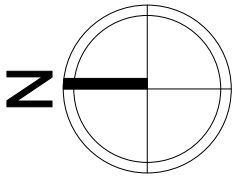
Test Point Reference Guide

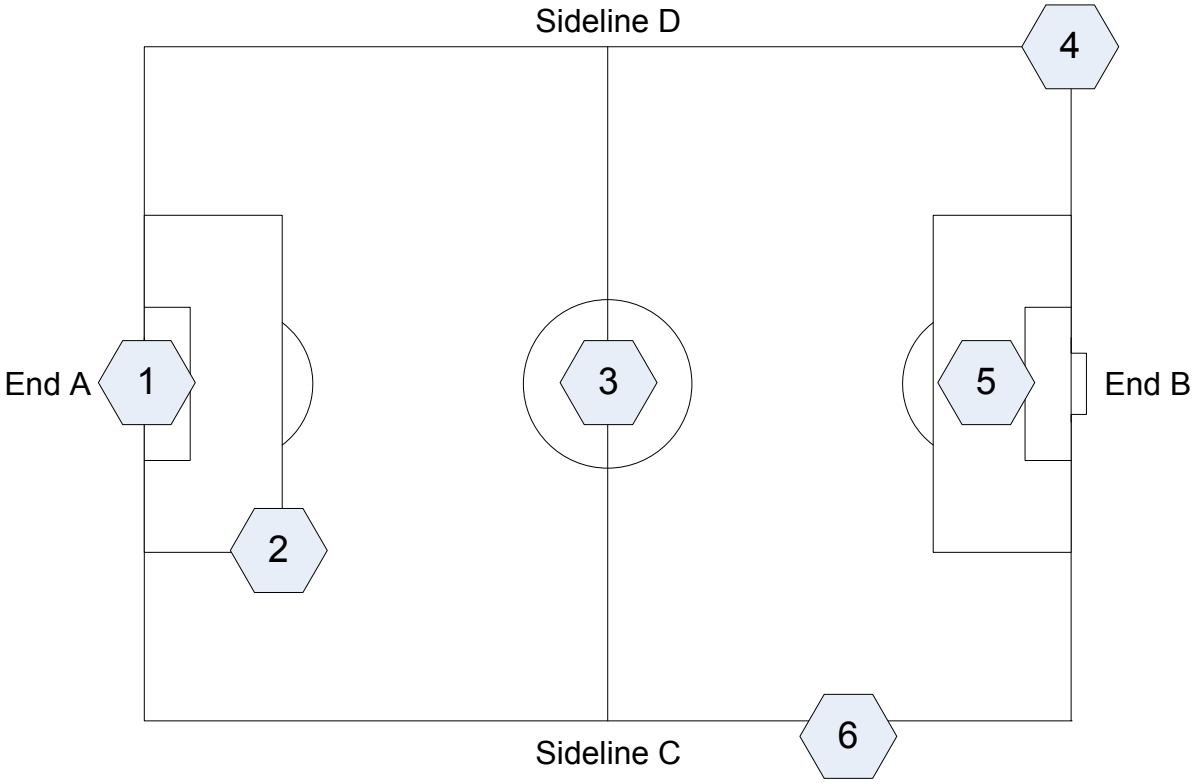
Job Number: 11-087

Client: City of San Francisco

Field: Mission Recreation Center

Date Tested: 10/19/2011





Test Points:

Point 1 – Goal line, end A, center of field
Point 2 – Corner of penalty box between end A and mid-field line, closest to sideline C
Point 3 – Mid-field line, center of field
Point 4 – Corner of the field at end B and sideline D
Point 5 – Penalty kick spot, end B, center of field
Point 6 – Half way from mid-field line to end B, 2' outside sideline D

Note: Not to scale.

© 2011 – Sports Turf Solutions