



TESTING SERVICES, INC.
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TEST REPORT

CLIENT:	X-Grass	REPORT NUMBER:	51660
	PO Box 579	LAB TEST NUMBER:	2316-7890
	Rocky Face, GA 30740	DATE:	April 30, 2011
		PAGE:	1 of 2

Test Material: 70 oz Turf

Infill: 2.0 lbs/ft² EnviroFill

Pad: 4" Playground Pad (total of 4, 1" pads)

Tested Dimension: 18" x 18"

Sub Base: 3" Crushed Rock

Impact Location: Center of Test Material

Date of Receipt: April 18, 2011

Testing Period: April 26--28, 2011

Authorization: Lynette Ogle

Test Procedure: The submitted sample was evaluated for Shock Absorbing Properties in Accordance with the procedures outlined in ASTM F 1292-09; Standard Specification for Impact Attenuation of Surface Systems Under and Around Playground Equipment. A deviation to this standard was made at the request of the client who instructed Tsi to substitute the above listed sub-base in place of concrete to comply with the client's installation protocol.

Missile: Hemispherical (Triaxial Accelerometer): Total Drop Assembly Weight (46g) 10 lbs

Test Equipment: Triax 2000 Surface Impactor
 Date of Last Calibration: 3/21/2011 by Alpha Automation

Sample Pre-Condition: 50±10 RH, 70F±5F for a minimum of 24 hrs prior to testing

Sample Conditioning: 8 hrs @ each reference temperatures prior to testing

Temperature: Maximum Drop Height That Gives a Gmax of 200 or Less and A HIC of 1000 or less

Ambient, 72°F (23°C) 14'

Hot, 120°F (49°C) 13'

Cold, 25°F (-6°C) 14'

Critical Fall Height (CFH):	13'
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Reference Gmax Curves Included

Prepared and signed by:

Erle Miles, Jr. VP
 Testing Services Inc.



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AMBIENT Sample Condition: Dry Temperature: 70°F (23°C)	Drop #	Velocity ft/sec	Angle	Drop Ht/Actual	Drop Ht/Theoretical	Gmax	HIC
	1	27.7	5	12'	11.92	87	560
	2	27.8	6	12'	12.01	93	621
	3	27.7	7	12'	11.92	95	626
	Average			Drops 2, 3		94	624
	Drop #	Velocity ft/sec	Angle	Drop Ht/Actual	Drop Ht/Theoretical	Gmax	HIC
	1	28.8	9	13'	12.89	96	647
	2	28.8	8	13'	12.89	104	720
	3	28.8	9	13'	12.89	105	726
	Average			Drops 2, 3		105	723
	Drop #	Velocity ft/sec	Angle	Drop Ht/Actual	Drop Ht/Theoretical	Gmax	HIC
	1	29.8	10	14'	13.80	108	821
2	30.0	4	14'	13.99	113	872	
3	29.9	5	14'	13.89	111	844	
Average			Drops 2, 3		112	858	

HOT Sample Condition: Dry Temperature: 120°F (49°C)	Drop #	Velocity ft/sec	Angle	Drop Ht/Actual	Drop Ht/Theoretical	Gmax	HIC
	1	27.8	6	12'	12.01	79	474
	2	27.8	1	12'	12.01	86	547
	3	27.8	4	12'	12.01	85	522
	Average			Drops 2, 3		86	535
	Drop #	Velocity ft/sec	Angle	Drop Ht/Actual	Drop Ht/Theoretical	Gmax	HIC
	1	28.8	0	13'	12.89	95	641
	2	28.8	4	13'	12.89	96	662
	3	28.8	7	13'	12.89	98	680
	Average			Drops 2, 3		97	671
	Drop #	Velocity ft/sec	Angle	Drop Ht/Actual	Drop Ht/Theoretical	Gmax	HIC
	1	29.9	6	14'	13.89	98	716
2	30.0	8	14'	13.99	99	697	
3	29.8	5	14'	13.80	106	786	
Average			Drops 2, 3		103	742	

COLD Sample Condition: Dry Temperature: 25°F (-6°C)	Drop #	Velocity ft/sec	Angle	Drop Ht/Actual	Drop Ht/Theoretical	Gmax	HIC
	1	27.8	2	12'	12.01	102	704
	2	27.8	10	12'	12.01	114	816
	3	27.8	2	12'	12.01	113	807
	Average			Drops 2, 3		114	812
	Drop #	Velocity ft/sec	Angle	Drop Ht/Actual	Drop Ht/Theoretical	Gmax	HIC
	1	28.8	6	13'	12.89	112	834
	2	28.8	5	13'	12.89	116	864
	3	28.9	3	13'	12.98	120	929
	Average			Drops 2, 3		118	897
	Drop #	Velocity ft/sec	Angle	Drop Ht/Actual	Drop Ht/Theoretical	Gmax	HIC
	1	30.0	4	14'	13.99	121	972
2	30.0	5	14'	13.99	126	1024	
3	29.9	2	14'	13.89	125	1005	
Average			Drops 2, 3		126	1015	