



**TESTING SERVICES, INC.**  
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## TEST REPORT

|         |                      |                  |                   |
|---------|----------------------|------------------|-------------------|
| CLIENT: | X-Grass              | REPORT NUMBER:   | 54350             |
|         | PO Box 579           | LAB TEST NUMBER: | 2418-1455         |
|         | Rocky Face, GA 30740 | DATE:            | February 22, 2012 |
|         |                      | PAGE:            | 1 of 2            |

**Test Material:** 2.0" Poured-In-Place (0.50" Top Cap + 1.5" Buffings)

**Tested Dimension:** 18" x 18"

**Sub Base:** Concrete

**Impact Location:** Center of Test Material

**Date of Receipt:** February 8, 2012

**Testing Period:** February 10--21, 2012

**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.

**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) 5'

Hot, 120°F (49°C) 4'

Cold, 25°F (-6°C) 4'

|                                    |           |
|------------------------------------|-----------|
| <b>Critical Fall Height (CFH):</b> | <b>4'</b> |
|------------------------------------|-----------|

Reference Gmax Curves Included

Prepared and signed by:

\_\_\_\_\_  
 Erle Miles, Jr. VP  
 Testing Services Inc.



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|   |         |                 |       |                |                     |      |      |     |
|---|---------|-----------------|-------|----------------|---------------------|------|------|-----|
| AMBIENT Sample Condition: Dry<br>Temperature: 70°F (23°C) | Drop #  | Velocity ft/sec | Angle | Drop Ht/Actual | Drop Ht/Theoretical | Gmax | HIC  |     |
|   | 1       | 16.2            | 8     | 4'             | 4.08                | 133  | 634  |     |
|   | 2       | 16.2            | 4     | 4'             | 4.08                | 134  | 654  |     |
|   | 3       | 16.3            | 8     | 4'             | 4.13                | 134  | 647  |     |
|   | Average |                 |       |                | Drops 2, 3          |      | 134  | 651 |
|   | Drop #  | Velocity ft/sec | Angle | Drop Ht/Actual | Drop Ht/Theoretical | Gmax | HIC  |     |
|   | 1       | 18.1            | 9     | 5'             | 5.09                | 167  | 992  |     |
|   | 2       | 18.1            | 7     | 5'             | 5.09                | 167  | 986  |     |
|   | 3       | 18.1            | 7     | 5'             | 5.09                | 164  | 945  |     |
|   | Average |                 |       |                | Drops 2, 3          |      | 166  | 966 |
|   | Drop #  | Velocity ft/sec | Angle | Drop Ht/Actual | Drop Ht/Theoretical | Gmax | HIC  |     |
|   | 1       | 19.7            | 6     | 6'             | 6.03                | 183  | 1229 |     |
| 2   | 19.8    | 5               | 6'    | 6.09           | 184                 | 1218 |      |     |
| 3   | 19.8    | 7               | 6'    | 6.09           | 181                 | 1195 |      |     |
| Average   |         |                 |       | Drops 2, 3     |                     | 183  | 1207 |     |

|  |         |                 |       |                |                     |      |      |     |
|--|---------|-----------------|-------|----------------|---------------------|------|------|-----|
| HOT Sample Condition: Dry<br>Temperature: 120°F (49°C) | Drop #  | Velocity ft/sec | Angle | Drop Ht/Actual | Drop Ht/Theoretical | Gmax | HIC  |     |
|  | 1       | 14.2            | 8     | 3'             | 3.13                | 114  | 453  |     |
|  | 2       | 14.1            | 7     | 3'             | 3.09                | 113  | 459  |     |
|  | 3       | 14.2            | 9     | 3'             | 3.13                | 117  | 474  |     |
|  | Average |                 |       |                | Drops 2, 3          |      | 115  | 467 |
|  | Drop #  | Velocity ft/sec | Angle | Drop Ht/Actual | Drop Ht/Theoretical | Gmax | HIC  |     |
|  | 1       | 16.2            | 8     | 4'             | 4.08                | 131  | 640  |     |
|  | 2       | 16.3            | 6     | 4'             | 4.13                | 137  | 693  |     |
|  | 3       | 16.2            | 9     | 4'             | 4.08                | 135  | 678  |     |
|  | Average |                 |       |                | Drops 2, 3          |      | 136  | 686 |
|  | Drop #  | Velocity ft/sec | Angle | Drop Ht/Actual | Drop Ht/Theoretical | Gmax | HIC  |     |
|  | 1       | 18.1            | 8     | 5'             | 5.09                | 176  | 1092 |     |
| 2  | 18.1    | 6               | 5'    | 5.09           | 182                 | 1171 |      |     |
| 3  | 18.1    | 8               | 5'    | 5.09           | 184                 | 1175 |      |     |
| Average  |         |                 |       | Drops 2, 3     |                     | 183  | 1173 |     |

|  |         |                 |       |                |                     |      |      |     |
|--|---------|-----------------|-------|----------------|---------------------|------|------|-----|
| COLD Sample Condition: Dry<br>Temperature: 25°F (-6°C) | Drop #  | Velocity ft/sec | Angle | Drop Ht/Actual | Drop Ht/Theoretical | Gmax | HIC  |     |
|  | 1       | 14.1            | 4     | 3'             | 3.09                | 117  | 449  |     |
|  | 2       | 14.1            | 5     | 3'             | 3.09                | 117  | 456  |     |
|  | 3       | 14.1            | 3     | 3'             | 3.09                | 118  | 461  |     |
|  | Average |                 |       |                | Drops 2, 3          |      | 118  | 459 |
|  | Drop #  | Velocity ft/sec | Angle | Drop Ht/Actual | Drop Ht/Theoretical | Gmax | HIC  |     |
|  | 1       | 16.2            | 6     | 4'             | 4.08                | 143  | 691  |     |
|  | 2       | 16.2            | 3     | 4'             | 4.08                | 141  | 682  |     |
|  | 3       | 16.2            | 8     | 4'             | 4.08                | 148  | 728  |     |
|  | Average |                 |       |                | Drops 2, 3          |      | 145  | 705 |
|  | Drop #  | Velocity ft/sec | Angle | Drop Ht/Actual | Drop Ht/Theoretical | Gmax | HIC  |     |
|  | 1       | 18.1            | 8     | 5'             | 5.09                | 173  | 1008 |     |
| 2  | 18.1    | 4               | 5'    | 5.09           | 175                 | 1028 |      |     |
| 3  | 18.1    | 7               | 5'    | 5.09           | 177                 | 1045 |      |     |
| Average  |         |                 |       | Drops 2, 3     |                     | 176  | 1037 |     |