SUMMARY OF RESULTS

Beneficial Designs, Inc. received a surfacing sample from Invisible Structures, Inc. classified as a subsurface structure with the brand name Grasspave$^2$. This sample of Grasspave$^2$ met the maneuverability performance requirements of ASTM F 1951-08.

Report prepared by: Seanna Kringen, Research Associate  
30 October 2008

TEST SPECIMEN

Manufacturer: Invisible Structures, Inc.  
Name: Grasspave$^2$

Type: subsurface structure  
Source: Invisible Structures, Inc.

Mfr’s lot no.: H303977  
Date of manufacture: 05/27/2008  
Thickness: 9 in

INSTALLATION, LEVELING & COMPACTION

A 6-inch layer of base course (#2 road base) was installed and compacted. One pound of Hydrogrow polymer-fertilizer mixture was sprinkled onto the base course and spread evenly by hand. The 1-inch Grasspave$^2$ ring and grid structure was then placed over the base course and Hydrogrow mix, ring side up. The Grasspave$^2$ was cut to fit the form, filled with sand and leveled. The sod was sprayed on the back side with water until about 0.25 inch of soil was left. A 2-inch layer of sod was laid over the base course, root side down and cut to fit the form. This layer was wetted and compacted using a hand tamper until the roots were pressed into the sand and then wetted again. The total depth of the installation was 9 inches. This was watered every day and mowed as needed. The grass was cut to a length of 1.25 inches above the soil.

TEST DATE

2 October 2008

TESTING CONDITIONS

Surface water content: N/A  
Surface temperature: 68 deg F  
Atmospheric temperature: 73 deg F  
Relative humidity: 34 %

TEST WHEELCHAIR & RIDER

Manufacturer: Sunrise Medical/Quickie  
ID no.: none  
Model: Quickie II  
Weight: 31.5 lb.

Weight of test wheelchair rider: 168 lb.  
Front-to-rear weight distribution of wheelchair-rider system: 40% - 60%

Beneficial Designs Inc.  
2240 Meridian Blvd, Suite C  
Minden NV 89423  
775.783.8822 voice  
775.783.8823 fax

ASTM F 1951-08 Surface Testing Report  
## WHEELCHAIR WORK MEASUREMENT METHOD RESULTS

<table>
<thead>
<tr>
<th>Straight Propulsion on Grasspave&lt;sup&gt;2&lt;/sup&gt;</th>
<th>Turning on Grasspave&lt;sup&gt;2&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work per meter (N*m)</td>
<td>Trial Time (sec)</td>
</tr>
<tr>
<td>---------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Trial 1: 83.0</td>
<td>6.8</td>
</tr>
<tr>
<td>Trial 2: 76.2</td>
<td>7.2</td>
</tr>
<tr>
<td>Trial 3: 71.6</td>
<td>7.8</td>
</tr>
<tr>
<td>Trial 4: 62.5</td>
<td>6.8</td>
</tr>
<tr>
<td>Trial 5: 66.4</td>
<td>7.4</td>
</tr>
</tbody>
</table>

Average work per meter (n=3) 71.4 N*m

<table>
<thead>
<tr>
<th>Straight Propulsion on 7.1% Ramp&lt;sup&gt;*&lt;/sup&gt;</th>
<th>Turning on 7.1% Ramp&lt;sup&gt;*&lt;/sup&gt;</th>
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</tr>
<tr>
<td>Trial 1: 73.3</td>
<td>7.9</td>
</tr>
<tr>
<td>Trial 2: 73.4</td>
<td>7.4</td>
</tr>
<tr>
<td>Trial 3: 71.7</td>
<td>7.8</td>
</tr>
<tr>
<td>Trial 4: 72.4</td>
<td>6.9</td>
</tr>
<tr>
<td>Trial 5: 74.8</td>
<td>7.3</td>
</tr>
</tbody>
</table>

Average work per meter (n=3) 73.0 N*m

Average work per meter (n=3) 48.9 N*m

Average work per meter (n=3) 55.4 N*m

* Hard smooth surface with grade of 7.1+/-0.2% (1:14)

Straight Propulsion Work Ratio 0.978

Turning Work Ratio 0.882

Work ratio = Avg work on surface/Avg work on 7.1% ramp. If both the straight propulsion and turning work ratios are less than 1.00, the surface system meets the performance requirements of F 1951-08.
Invisible Structures, Inc. – Grasspave\textsuperscript{2}
Hard, smooth surface with a grade of 7.1 ± 0.2% (1:14)
Hard, smooth surface with a grade of 7.1 ± 0.2% (1:14)