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ASTM F 1951-08 Surface Testing Report

Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment

SUMMARY OF RESULTS

Beneficial Designs, Inc. received a surfacing sample from **Boddingtons Limited** classified as surface stabilizer with the brand name **GrassProtecta® Standard**. This sample of **GrassProtecta® Standard met** the maneuverability performance requirements of ASTM F 1951-08.

Report prepared by: Seanna L. Kringen — 17 December 2010

Seanna Kringen, Research Associate — Date

TEST SPECIMEN

Manufacturer	**Boddingtons Limited**
Name	**GrassProtecta® Standard**
Type	surface stabilizer
Source	Essex, England
Mfr's lot no.	N/A
Date of manufacture	04/2010
Thickness	0.5 in.

TEST DATE

7 December 2010

TESTING CONDITIONS

Surface water content	N/A
Surface temperature	40 deg F
Atmospheric temperature	40 deg F
Relative humidity	62 %

INSTALLATION, LEVELING & COMPACTION

The GrassProtecta® Standard mesh was unrolled and allowed to sit for one hour. A 4 foot by 12 foot level portion of existing lawn that was free from bumps and dips was mowed. GrassProtecta® Standard mesh was placed over the installation area. Edges of the mesh were pinned to the lawn using supplied "U" pins every 24 inches.

GrassProtecta® Standard was installed on 16 October, 2010. Grass was mowed prior to testing.

TEST WHEELCHAIR & RIDER

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

Weight of test wheelchair rider	159 lb.
Front-to-rear weight distribution of wheelchair-rider system	40% - 60%

WHEELCHAIR WORK MEASUREMENT METHOD RESULTS

Straight Propulsion on GrassProtecta® Standard

	Work per meter (N*m)	Trial Time (sec)
Trial 1	26.5	7.7
Trial 2	31.7	7.8
Trial 3	28.7	7.4
Trial 4	27.7	7.4
Trial 5	31.8	7.7

Average work per meter (n=3) 29.4 N*m

Turning on GrassProtecta® Standard

	Work per meter (N*m)	Trial Time (sec)
Trial 1	49.4	6.6
Trial 2	41.7	7.3
Trial 3	46.3	6.5
Trial 4	47.1	6.5
Trial 5	44.6	7.4

Average work per meter (n=3) 46.0 N*m

Straight Propulsion on 7.1% Ramp*

	Work per meter (N*m)	Trial Time (sec)
Trial 1	73.6	6.7
Trial 2	72.0	7.5
Trial 3	60.3	8.0
Trial 4	73.2	7.3
Trial 5	75.3	7.1

Average work per meter (n=3) 72.9 N*m

Turning on 7.1% Ramp*

	Work per meter (N*m)	Trial Time (sec)
Trial 1	65.2	7.0
Trial 2	61.6	7.6
Trial 3	62.1	7.2
Trial 4	60.4	7.9
Trial 5	60.4	7.8

Average work per meter (n=3) 61.4 N*m

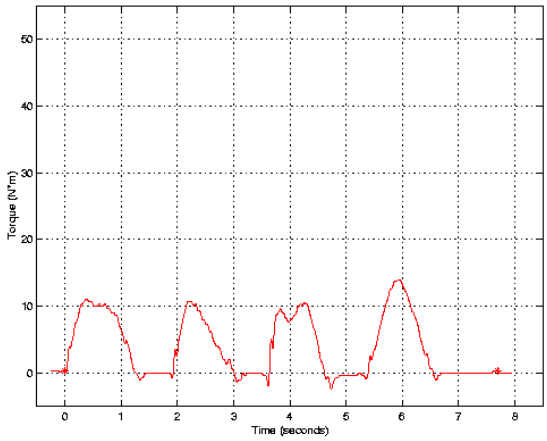
* Hard smooth surface with grade of 7.1+/-0.2% (1:14)

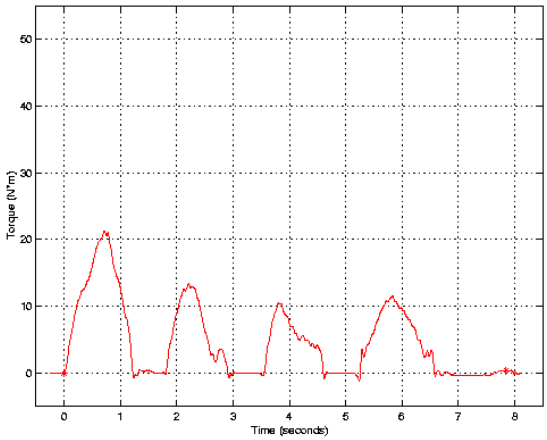
Straight Propulsion Work Ratio 0.403

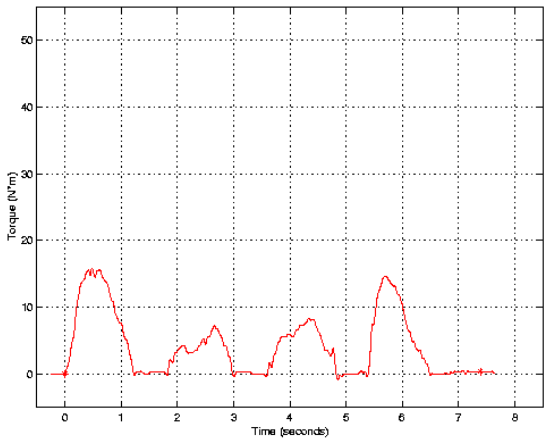
Turning Work Ratio 0.750

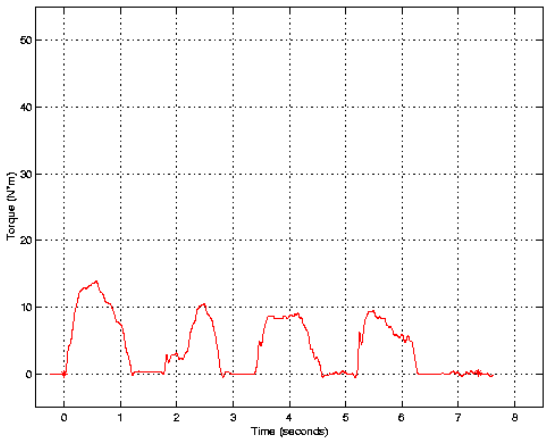
Work ratio = Avg work on surface/Avg work on 7.1% ramp. If both the straight propulsion and turning work ratios are less than 1.00, the surface system meets the performance requirements of F 1951-08.

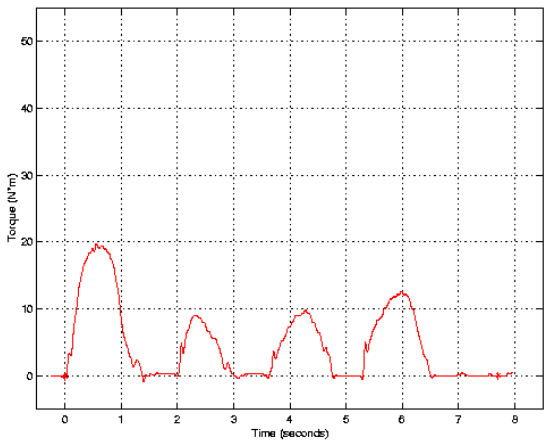
ASTM F1951 – 08 Part 6: Wheelchair Work Measurement Method – Straight Propulsion
Boddingtons Limited – GrassProtecta® Standard



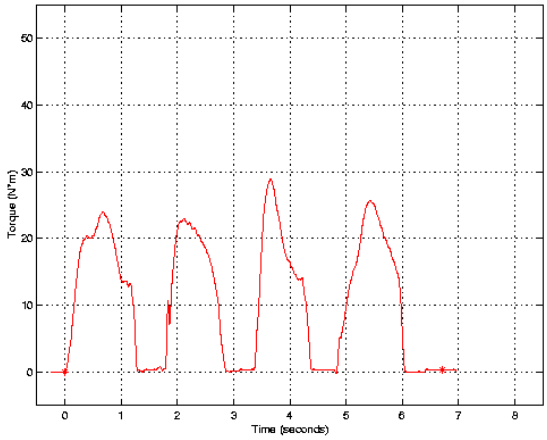


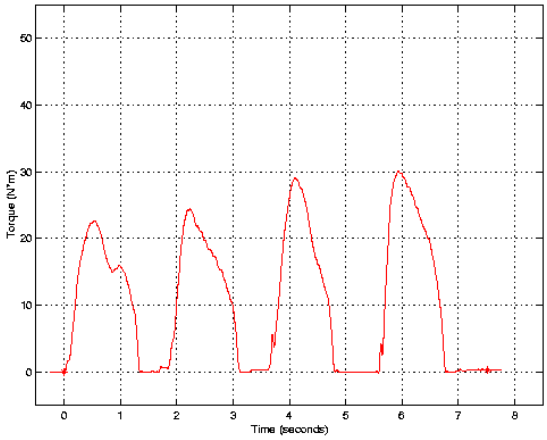


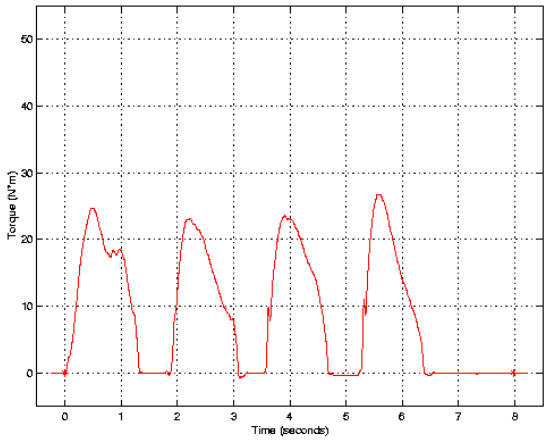


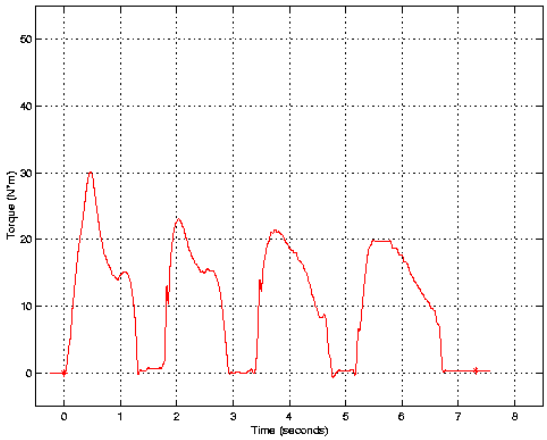


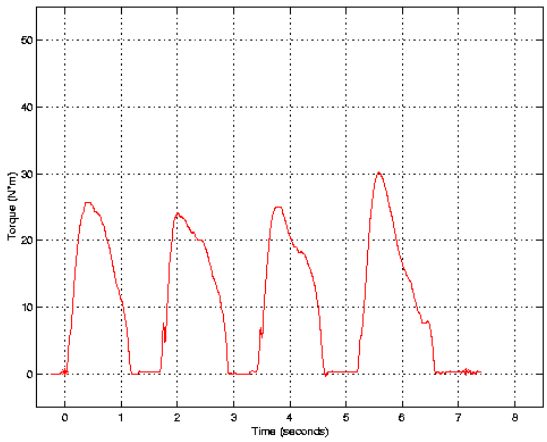
ASTM F1951 – 08 Part 6: Wheelchair Work Measurement Method – Straight Propulsion Hard, smooth surface with a grade of 7.1 ± 0.2% (1:14)



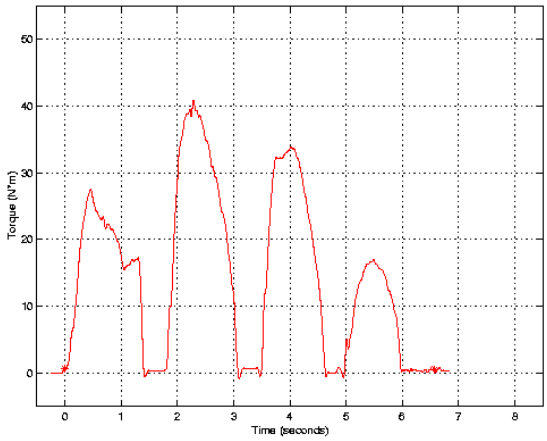


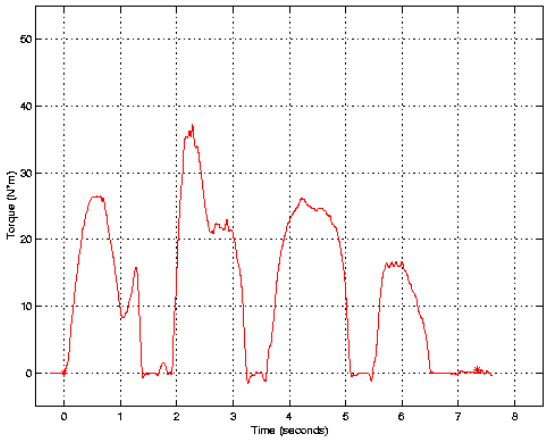


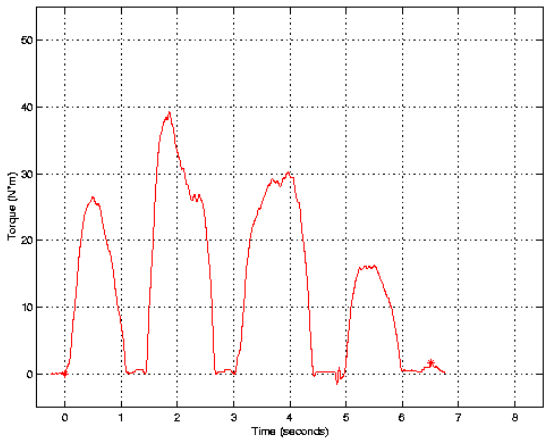


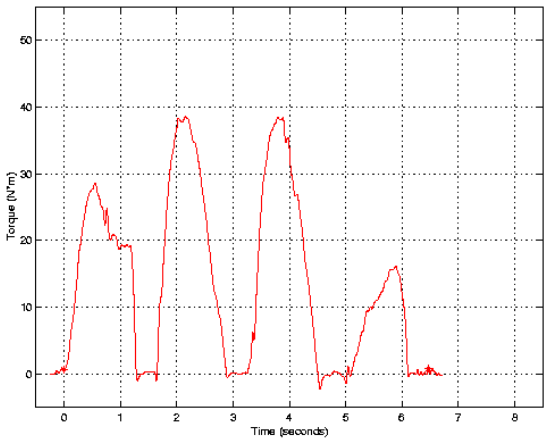


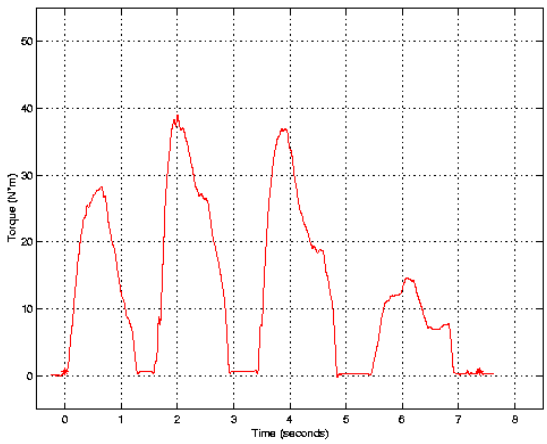
ASTM F1951 – 08 Part 7: Wheelchair Work Measurement Method – Turning
Boddingtons Limited – GrassProtecta® Standard











ASTM F1951 – 08 Part 7: Wheelchair Work Measurement Method – Turning
Hard, smooth surface with a grade of 7.1 ± 0.2% (1:14)