

ASTM F 1951-14 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 **TRUEGRID Permeable Pavers** classified as subsurface structure with the brand name **TrueGrid Pro Plus**. This sample of TrueGrid Pro Plus **met** the maneuverability performance requirements of ASTM F 1951-14.

Report prepared by:
Peter Axelson, Testing Supervisor

7 June 2019
Date

TEST SPECIMEN

Manufacturer **TRUEGRID Permeable Pavers**
Name **TrueGrid Pro Plus**

Type subsurface structure
Source
Mfr's lot no. 011902080
Date of manufacture
Thickness 2

TEST DATE

30 May 2019

TESTING CONDITIONS

Surface temperature 70 deg F
Atmospheric temperature 63 deg F
Relative humidity 35 %

INSTALLATION, LEVELING & COMPACTION

Excavate test bed area to 10 inches below grade, Fill excavated area with 5 to 6 inches of #2 road base, Rake until level, Compact to a depth of 4 inches, add 5 to 6 inches of #2 road base, compact to a total road base depth of 8 inches, Place Truegrid product on top of compacted #2 road base, Fill grid with 3/4 crushed washed angular stone, Rake to fill evenly to top of grid, Rake excess stone off of grid.

TEST WHEELCHAIR & RIDER

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

Weight of test wheelchair rider 165 lb.
Front-to-rear weight distribution
of wheelchair-rider system 40% - 60 %

WHEELCHAIR WORK MEASUREMENT METHOD RESULTS

Straight Propulsion on TrueGrid Pro Plus

	Work per meter (N*m)	Trial Time (sec)
Trial 1	29.4	6.2
Trial 2	36.7	6.8
Trial 3	29.1	6.4
Trial 4	24.3	6.4
Trial 5	26.6	6.4

Average work per meter (n=3) 28.4 N*m

Turning on TrueGrid Pro Plus

	Work per meter (N*m)	Trial Time (sec)
Trial 1	17.7	6.0
Trial 2	22.7	6.4
Trial 3	27.4	6.1
Trial 4	22.5	6.0
Trial 5	22.8	6.7

Average work per meter (n=3) 22.7 N*m

Straight Propulsion on 7.1% Ramp*

	Work per meter (N*m)	Trial Time (sec)
Trial 1	75.8	7.5
Trial 2	77.0	7.7
Trial 3	74.5	7.5
Trial 4	75.6	8.0
Trial 5	69.9	7.9

Average work per meter (n=3) 75.3 N*m

Turning on 7.1% Ramp*

	Work per meter (N*m)	Trial Time (sec)
Trial 1	53.3	6.5
Trial 2	53.3	7.1
Trial 3	55.7	6.9
Trial 4	50.2	7.6
Trial 5	53.8	7.2

Average work per meter (n=3) 53.5 N*m

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

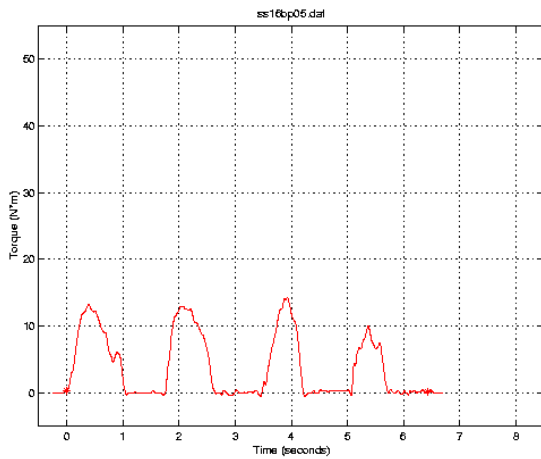
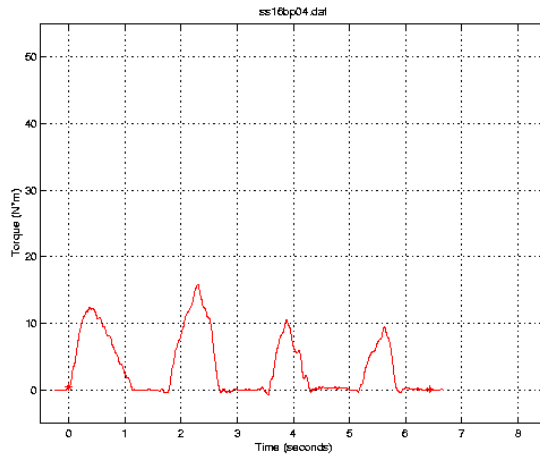
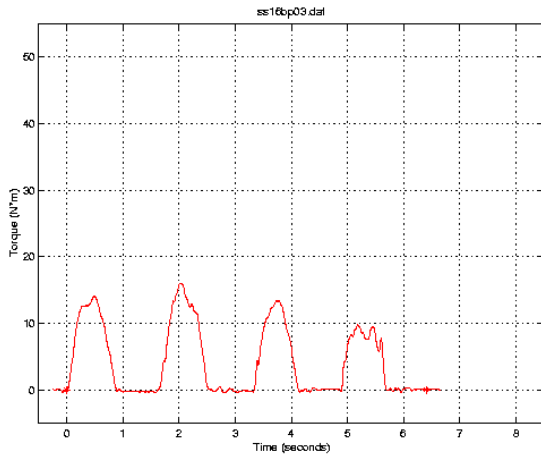
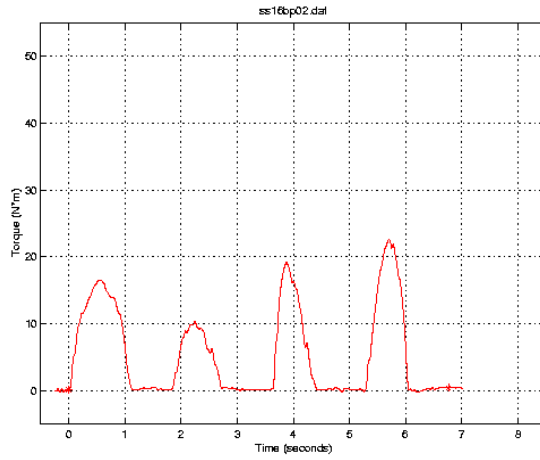
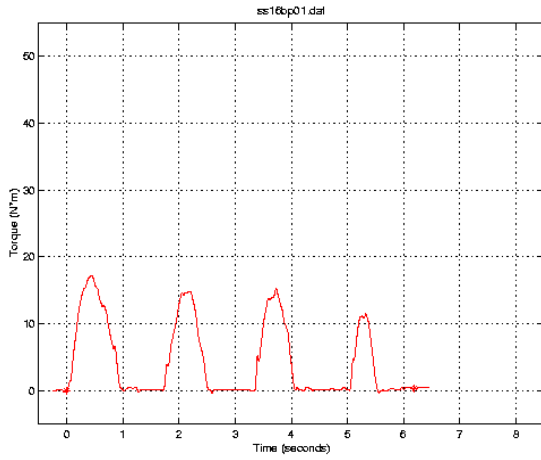
Straight Propulsion Work Ratio 0.377

Turning Work Ratio 0.424

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.

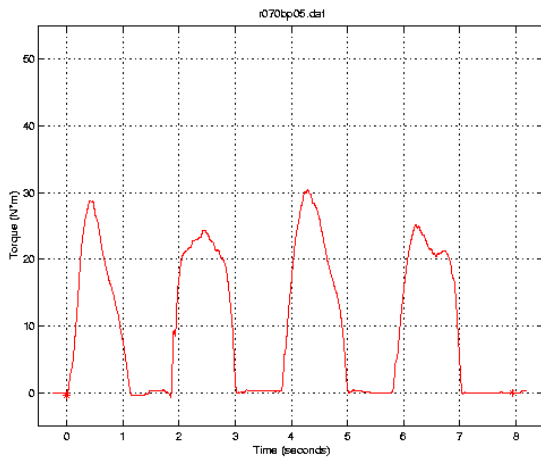
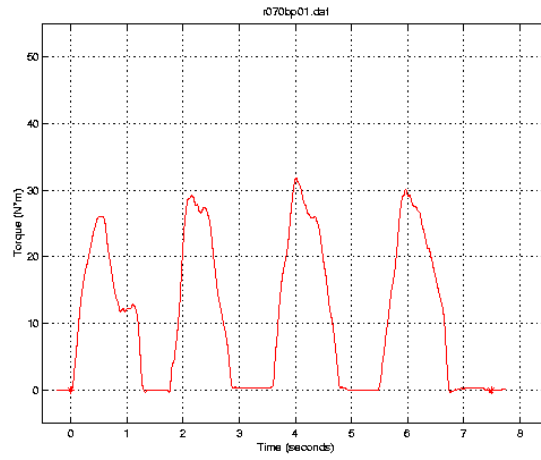
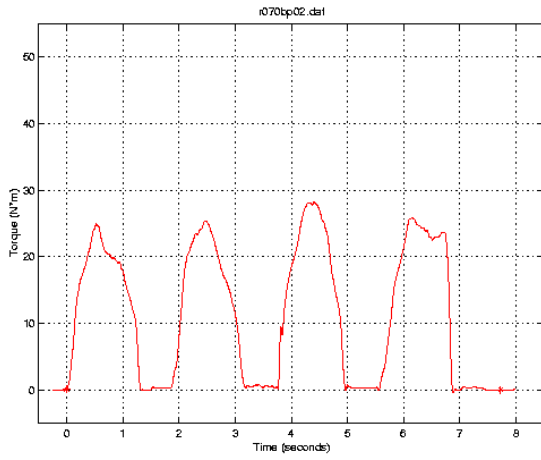
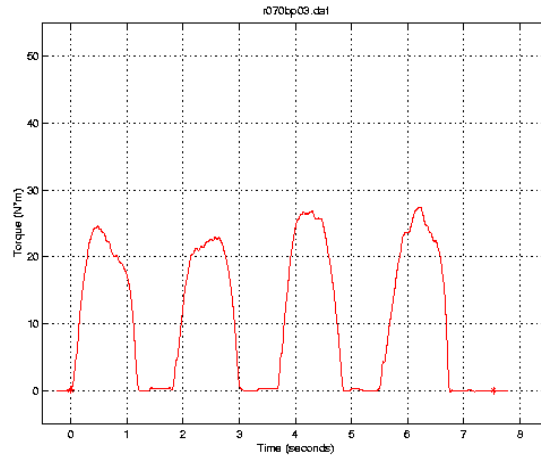
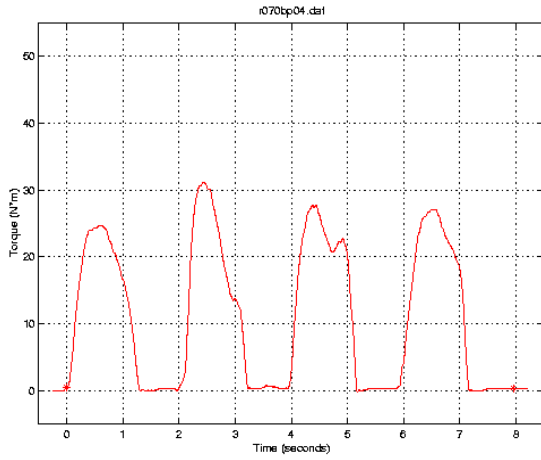
ASTM F1951 – 08 Part 6: Wheelchair Work Measurement Method – Straight Propulsion

TrueGrid – TrueGrid Pro Plus

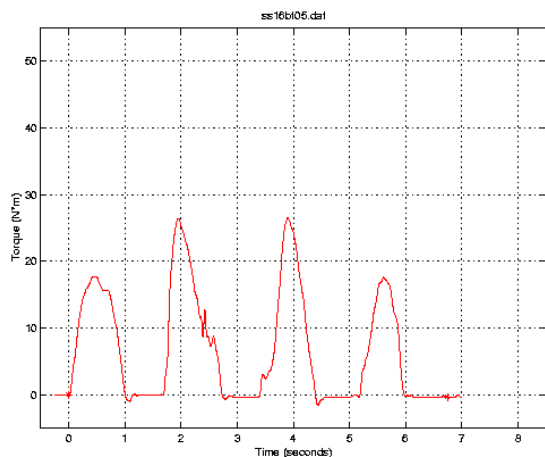
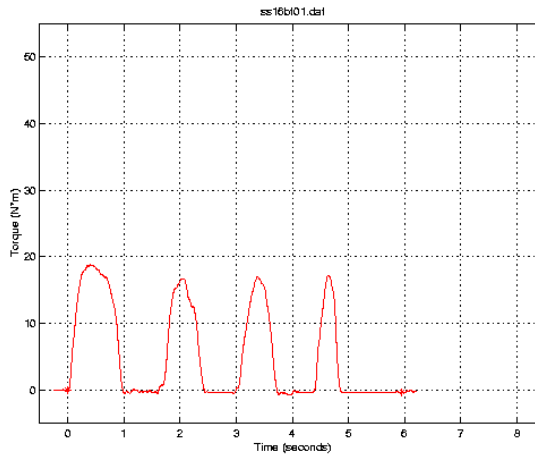
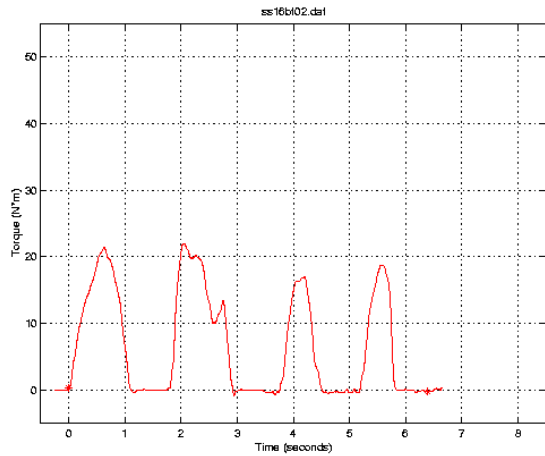
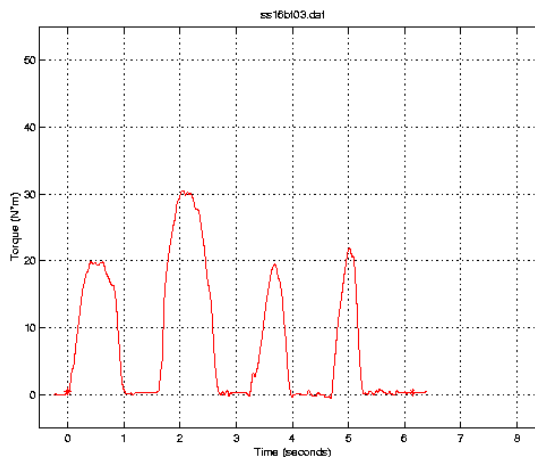
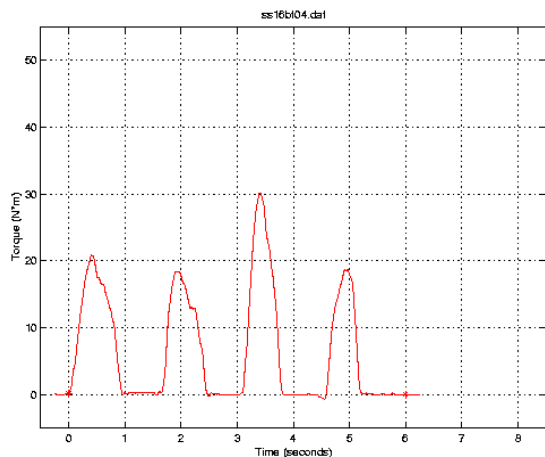


ASTM F1951 – 08 Part 6: Wheelchair Work Measurement Method – Straight Propulsion

Hard, smooth surface with a grade of $7.1 \pm 0.2\%$ (1:14)



ASTM F1951 – 08 Part 7: Wheelchair Work Measurement Method – Turning TrueGrid – TrueGrid Pro Plus



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

