Racing Surfaces Testing Laboratory

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ThorTurf
Track in a Box Results
Arena Depths

Prepared by:

Racing Surfaces
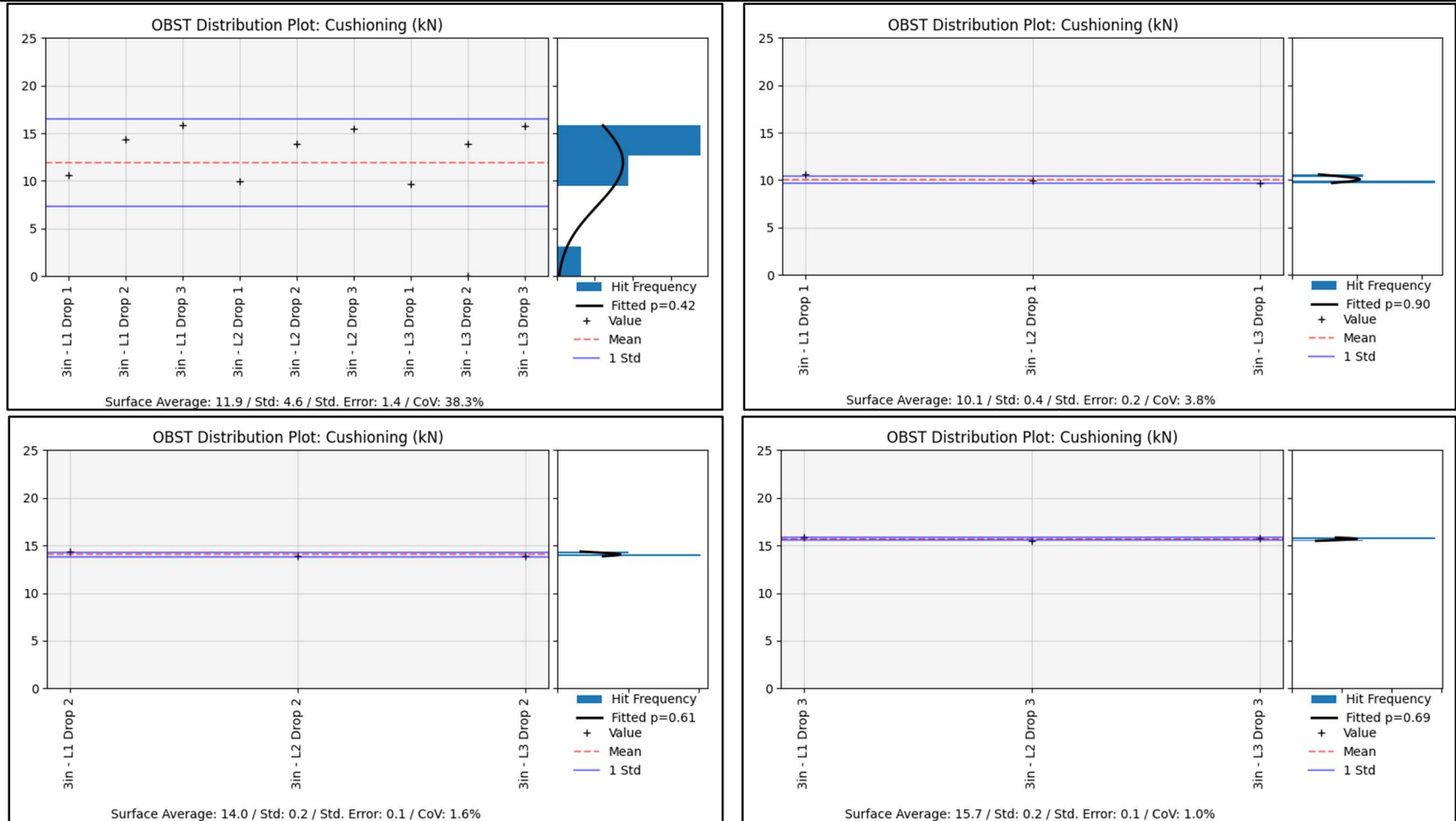Testing Laboratory

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Orono Biomechanical Surface Tester (OBST) – Arena – 3in Depth

The Orono Biomechanical Surface Tester (OBST) was developed to provide a functional comparison of racing surfaces. The OBST machine duplicates the speed, directions and loads of the leading foreleg of a Thoroughbred horse at a gallop. The machine which was initially funded by the AQHA Racing has now been used on more than 60 racing and training surfaces in the US and Canada. For testing Arena surface applications, the OBST is dropped from 36.5in height, three times in succession (Drop1, Drop2 and Drop3). See ASTM F3400: *Standard Test Method for In-situ Testing of Functional Properties of Equine Surfaces: Artificial Surfaces* for more information.
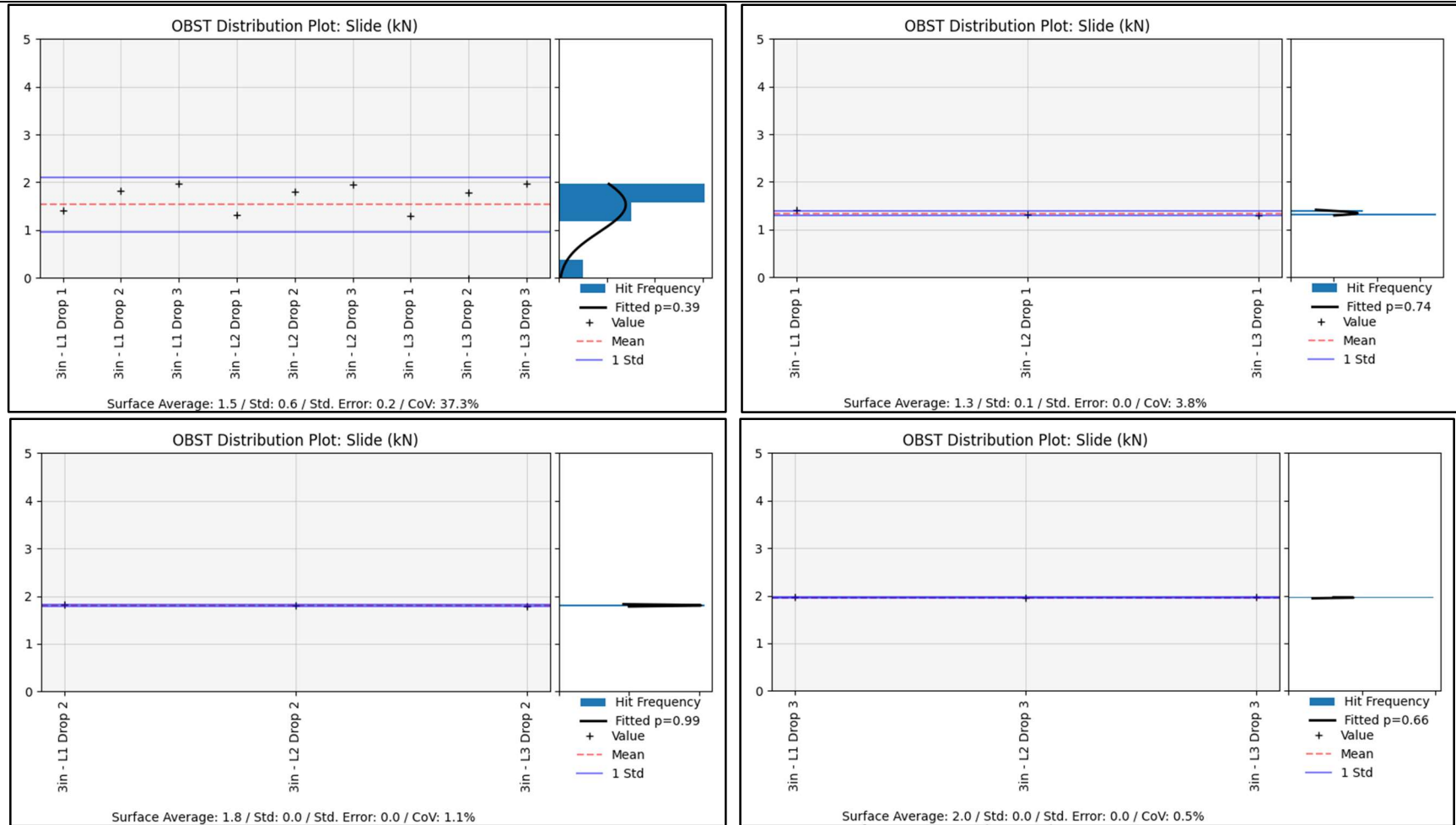
OBST "Cushioning": Arena – 3in Depth

OBST Figure 1: The (Top-Left) figure shows the peak Cushioning (peak vertical load) recorded by the OBST for all Drops on a 3in surface. The OBST data is further broken down by "Drop#" in the other three figures. **Drop1's (Top-Right), Drop2's (Bottom-Left) and Drop3's (Bottom-Right).**

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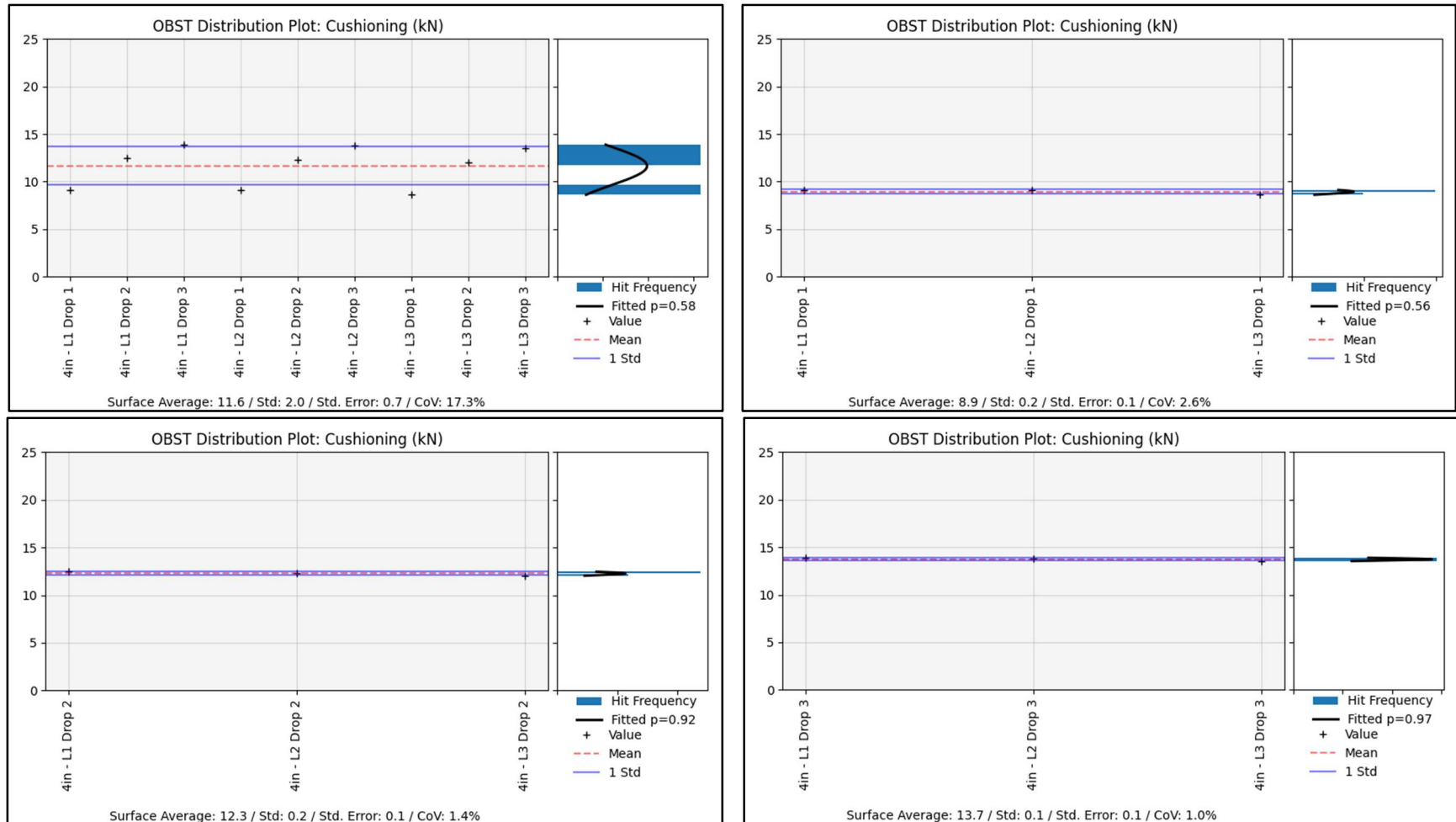
OBST "Impact Firmness": Arena – 3in Depth
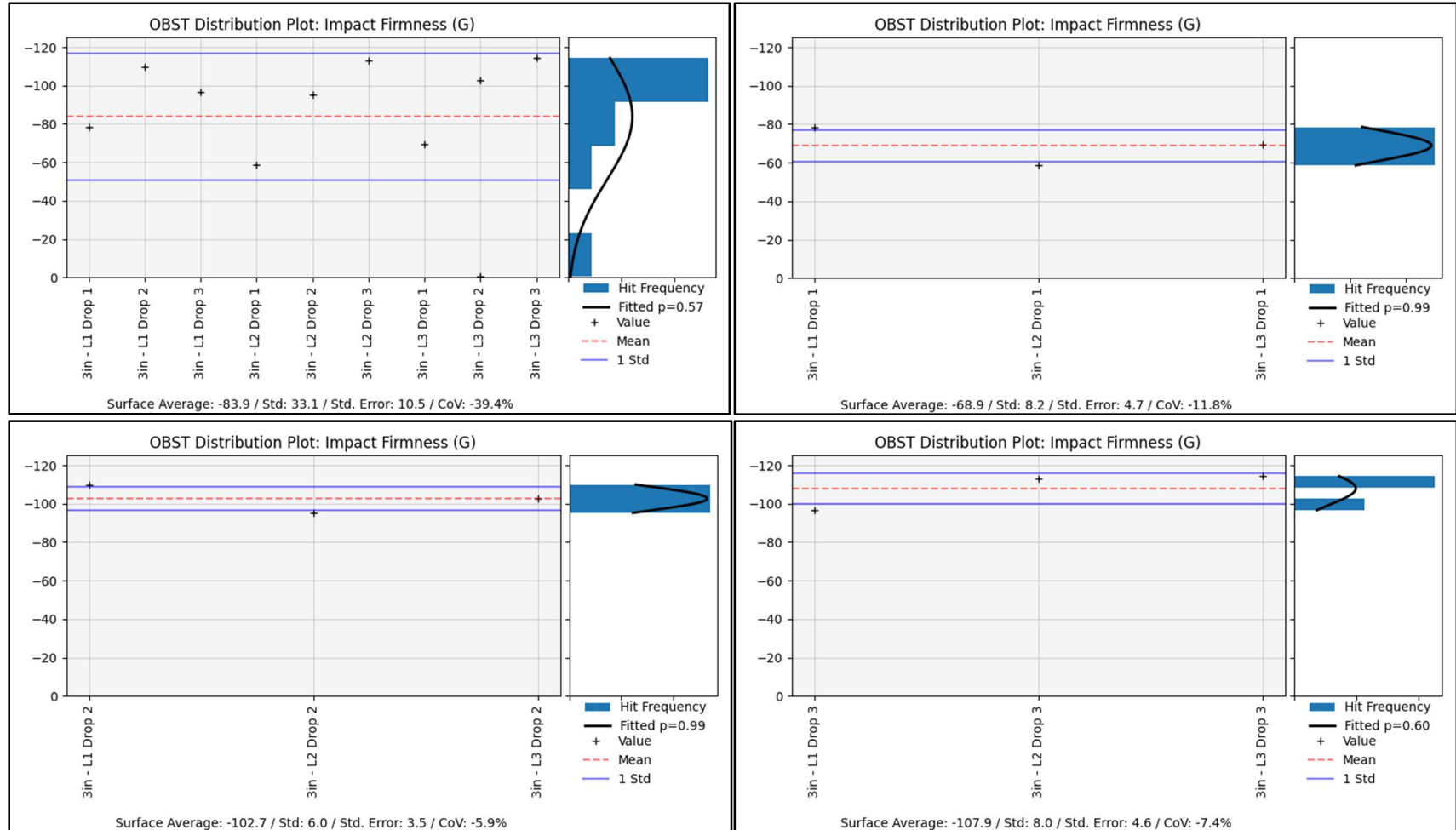
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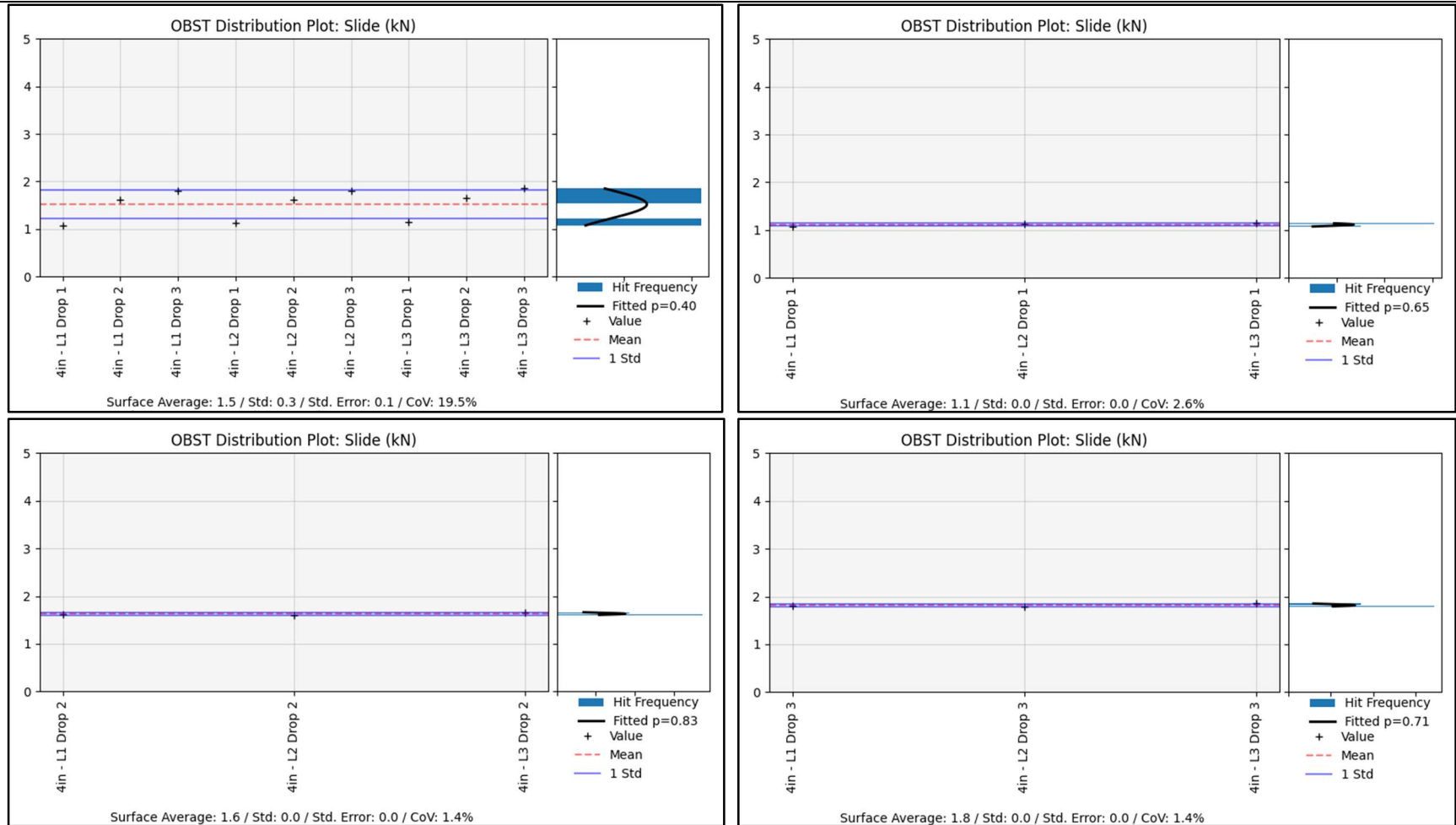
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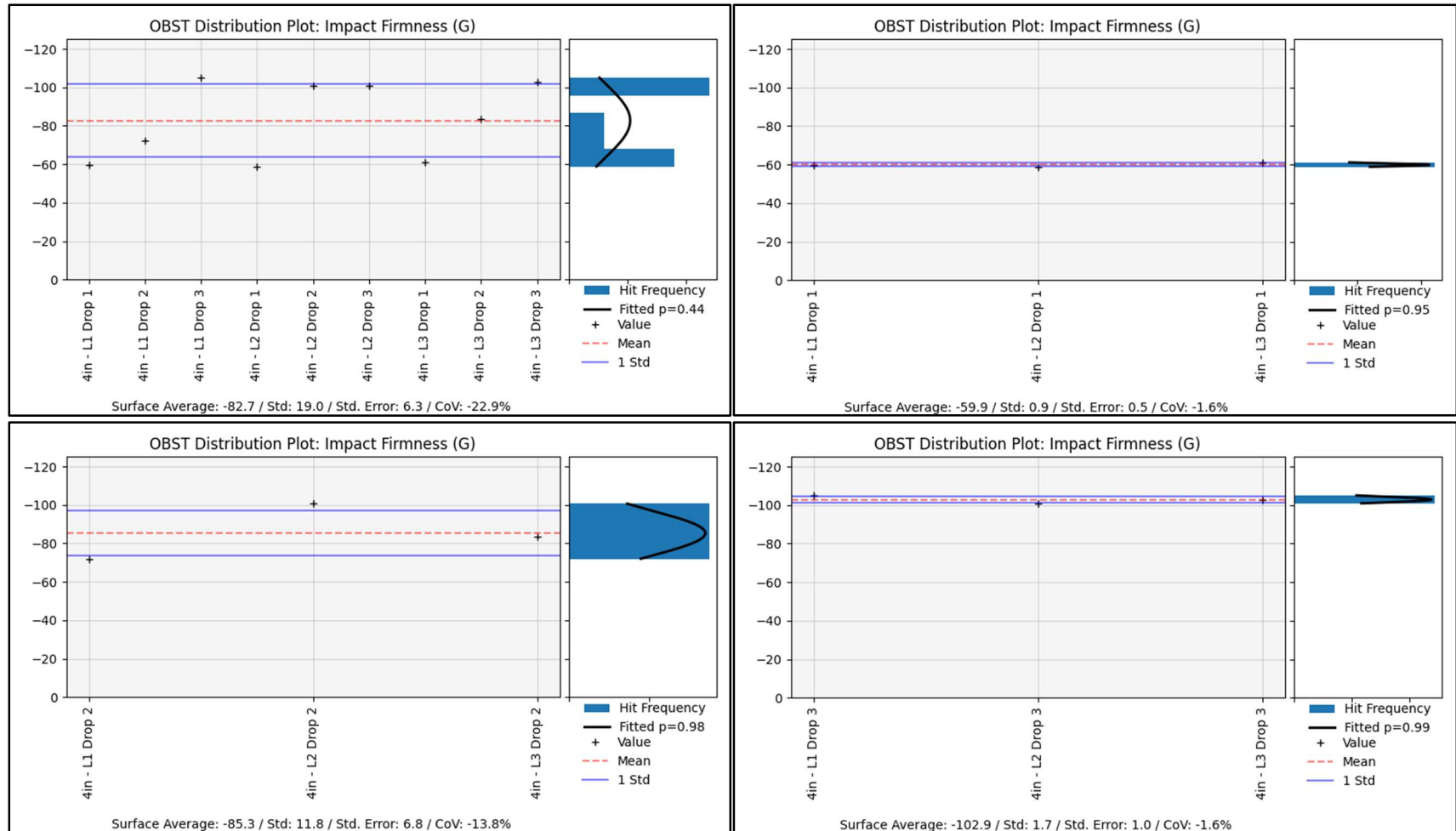
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Measurement Comparisons – Arena – All Depths (3in and 4in)

The OBST data is compared to Temperature data collected with a Resistance Temperature Detector (RTD).

OBST vs RTD Probe: Arena – All Depths (3in and 4in)

"Location"	Cushioning (kN)	Slide (kN)	Impact Firmness (G)	Surface Temp. (F)
COMBINED – Overall – Average	12.5 +/- 2.3	1.6 +/- 0.3	-87.9 +/- 19.6	75.0 +/- 0.8
3in – Overall – Average	13.3 +/- 2.4	1.7 +/- 0.3	-93.2 +/- 18.8	74.4 +/- 0.4
3in – Drop 1 - Average	10.1 +/- 0.4	1.3 +/- 0.1	-68.9 +/- 8.2	74.4 +/- 0.4
3in – Drop 2 - Average	14.0 +/- 0.2	1.8 +/- 0.0	-102.7 +/- 6.0	74.4 +/- 0.4
3in – Drop 3 - Average	15.7 +/- 0.2	2.0 +/- 0.0	-107.9 +/- 8.0	74.4 +/- 0.4
4in – Overall – Average	11.6 +/- 2.0	1.5 +/- 0.3	-82.7 +/- 19.0	75.7 +/- 0.3
4in – Drop 1 - Average	8.9 +/- 0.2	1.1 +/- 0.0	-59.9 +/- 0.9	75.7 +/- 0.3
4in – Drop 2 - Average	12.3 +/- 0.2	1.6 +/- 0.0	-85.3 +/- 11.8	75.7 +/- 0.3
4in – Drop 3 - Average	13.7 +/- 0.1	1.8 +/- 0.0	-102.9 +/- 1.7	75.7 +/- 0.3

MC Table 1: This table shows the average and standard deviation values recorded by the OBST and Rainier Penetrometer or hand depth measurements paired with TDR.

"Location"	Cushioning (kN)	Slide (kN)	Impact Firmness (G)	Surface Temp. (F)
3in – L1 Drop 1	10.6	1.4	-78.5	75
3in – L1 Drop 2	14.4	1.8	-109.9	75
3in – L1 Drop 3	15.8	2.0	-96.6	75
3in – L2 Drop 1	10.0	1.3	-58.6	74
3in – L2 Drop 2	13.9	1.8	-95.2	74
3in – L2 Drop 3	15.5	1.9	-112.9	74
3in – L3 Drop 1	9.7	1.3	-69.6	74.1
3in – L3 Drop 2	13.9	1.8	-102.9	74.1
3in – L3 Drop 3	15.8	2.0	-114.3	74.1
4in – L1 Drop 1	9.1	1.1	-59.6	76
4in – L1 Drop 2	12.5	1.6	-72.0	76
4in – L1 Drop 3	13.9	1.8	-105.0	76
4in – L2 Drop 1	9.1	1.1	-58.8	75.8
4In – L2 Drop 2	12.3	1.6	-100.7	75.8
4in – L2 Drop 3	13.8	1.8	-100.9	75.8
4in – L3 Drop 1	8.6	1.1	-61.1	75.2
4in – L3 Drop 2	12.0	1.7	-83.3	75.2
4in – L3 Drop 3	13.5	1.9	-102.8	75.2

MC Table 2: This table shows the values recorded by the OBST and the Temperature values recorded with a RTD for each location tested.

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