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No. 70767-1

COURT OF APPEALS, DIVISION I
OF THE STATE OF WASHINGTON

TWYLA KILL and TERRY KILL,

Appellants,

vs.

CITY OF SEATTLE,

Respondent.

BRIEF OF APPELLANTS

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I. ASSIGNMENTS OF ERROR

A. Assignments of Error

1. The trial court erred in granting the City of Seattle's (the "City") motion for summary judgment and dismissing Ms. Kill's claims.

2. The trial court erred in excluding the opinions of Ms. Kill's expert Joellen Gill under ER 702 and ER 403.

3. The trial court erred in denying reconsideration of its summary judgment order.

4. The trial court erred by not holding a *Frye* hearing regarding the admissibility of Ms. Gill's opinions.

B. Issues Pertaining to Assignments of Error

1. Was whether the smooth metal rim of an in-sidewalk utility cover that Ms. Kill slipped on was reasonably safe for pedestrians an issue of fact precluding summary judgment?

2. Were Ms. Gill's methodology and opinions regarding slip-resistance testing helpful and reliable and did they satisfy ER 702 and ER 403?

3. Were Ms. Gill's opinions other than those based on her slip resistance testing admissible and did they create an issue of fact about the rim's safety?

4. Did the evidence that the rim did not comply with the City's standards and practices for in-sidewalk utility covers create an issue of fact?

5. Did the evidence and newly-discovered evidence that Ms. Gill's test methods were reliable justify reconsideration of the trial court's summary judgment order?

6. Should the trial court have conducted a *Frye* hearing before excluding Ms. Gill's opinions about slip-resistance testing under ER 702 and ER 403?

II. STATEMENT OF THE CASE

A. Overview

Ms. Kill slipped on the rim of a utility vault (commonly referred to as a "handhole"). The handhole was embedded in a City sidewalk at 5th and Pike in downtown Seattle. The rim was wet due to rain. The handhole's cover was made of diamond plate. However, the rim of the handhole was not diamond plate, but smooth metal and was not treated with a nonskid application. Ms. Kill slipped on the wet smooth metal and sustained injuries. The incident happened on November 13, 2009.

Ms. Kill contended the rim was not adequately slip-resistant and was unreasonably dangerous for pedestrians.

Ms. Kill retained Joellen Gill as an expert to test the rim and offer opinions about its safety. Ms. Gill is an engineer employed by Applied Cognitive Sciences (ACS) with expertise in human factors and slip-resistance testing.

Ms. Gill explained .0.5 was generally accepted as the minimum coefficient of friction (COF) for reasonable safety.[1] She inspected the cover and rim and conducted slip-resistance testing with a tribometer (a device that measures the COF between two surfaces). The test showed the rim's COF when wet fell considerably below 0.5.

Discovery revealed that the rim did not comply with the City's own standards and practices (calling for a diamond plate rim or otherwise slip-resistant rim) for handholes when the rim was installed and before and after Ms. Kill's slip and fall.

The parties filed summary judgment motions. The City argued that Ms. Gill's tribometer was not properly calibrated according to ASTM F2508 (a consensus standard which became effective after Ms. Gill's initial testing), her testing methodology and opinions did not satisfy the *Frye* standard or ER 702 and there was no other evidence that the rim was not reasonably safe. The City never tested the rim.

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[1] Generally speaking COF ranges from 0.0 to 1.0. COF for typical rubber soled shoes on rough ice generally ranges from 0.2 to 0.25; on concrete sidewalks (wet or dry) the COF is typically above 0.75. CP 62 (10.21.11 Gill report, p. 3, Ex. 2 to First Gill Decl., Sub No. 22).

Ms. Gill conducted ASTM F2508 testing for her tribometer and tested the rim again. Again it tested well below 0.5 when wet, though her second measurement differed slightly from the first. By contrast, the diamond plate cover tested above 0.5 even when wet.

The trial court found Ms. Gill was qualified as an expert and *Frye* did not bar her testimony but that her testing methodology and conclusions regarding (i) calibration of her tribometer and (ii) the difference in her test results did not satisfy ER 702's reliability test and therefore excluded her opinions. The trial court reasoned the case rose or fell on Ms. Gill's testing and that without her opinions there was no issue of fact whether the rim was unreasonably dangerous. Accordingly the trial court granted summary judgment in favor of the City.

Ms. Kill sought reconsideration and a *Frye* hearing. She submitted, *inter alia*, newly-discovered evidence from the manufacturer of Mrs. Gill's tribomter which conducted testing confirming it was in calibration. The trial court denied reconsideration, expanded upon its reasoning for excluding Ms. Gill's testimony and declined to conduct a *Frye* hearing.

B. The Utility Vault Cover and Rim

A photo of the handhole on which Ms. Kill slipped appears on the following page. It shows the 2" rim surrounding the cover is smooth

metal (*i.e.*, the diamond plate of which the cover is constructed does not extend to the perimeter and there is no slip-resistant surface on the rim).[2]

The City owns the utility cover and it is located within a City right-of-way.[3] In discovery the City stated it "[i]t appears the Cover was likely installed in 1989 (when the Bank Centre building was completed) or before."[4] The City also represented "[i]t is likely that the installed cover complied with any existing standard at the time of installation".[5]

C. The City's Standards for Utility Covers and Rims

The illustration on the following page is from the City's 1986 Standard Plans for handholes and shows a cover and rim treated to provide slip-resistance (diamond plate)[6]

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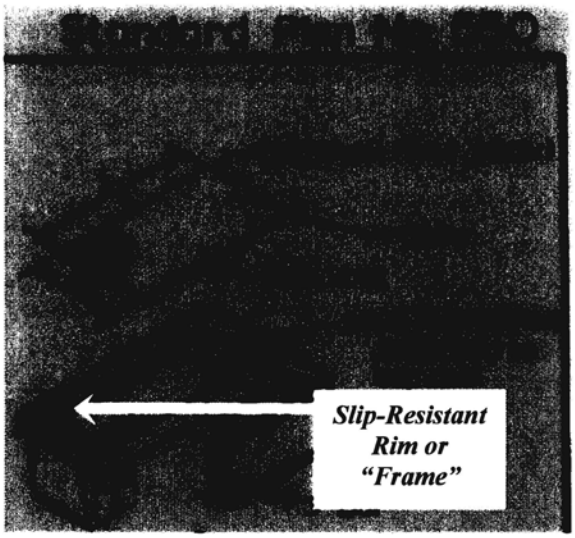
[2] Appx. 1; CP 66 (Ex. 3 to First Gill Decl., Sub No. 22).
[3] CP 81 (response to Interrogatory No. 19, Ex. 2 to 1.18.13 Myers Decl., Sub No. 24).
[4] CP 82 (*id.;* response to Interrogatory No. 20).
[5] *Id.*
[6] CP 492-493 (Ex. 1 to 5.28.13 Myers Decl., Sub No. 51).



Since at least 2000 the City's plans and specifications have called for handholes to be "slip-resistant" and to have a "nonskid surface".[7] Specifically, the City began requiring surfaces like SlipNOT Grade 3 coarse for handholes.[8] The following image illustrates the texture of this surface:[9]

[7] CP 501-530 (Ex. 1-13 to 5.28.13 Myers Decl., Sub No. 51) (excerpts from City of Seattle's Standard Plans and Standard Specifications).
[8] CP 505 (Ex. 5 to 5.28.13 Myers Decl., Sub No. 51) (excerpt from City of Seattle 2000 Standard Specifications).
[9] CP 532-534 (Ex. 14 to 5.28.13 Myers Decl., Sub No. 51) (excerpt from SlipNOT Specifications). "Grade 3 coarse" is the most slip-resistant surface made by SlipNOT and has a minimum COF of 0.8. *Id.*

In 2003 the City's plans required "lids and frames" of handholes to have a nonskid surface.[10] The City's 2008 standards (in effect at the time of Ms. Kill's fall) provided that handhole covers and frames were supposed to have a nonskid surface such as SlipNOT Grade 3 coarse.[11]

D. The City's Testimony Regarding Utility Covers and Rims

Steven Read (a supervising civil engineer with the Seattle Public Utilities materials laboratory) testified as the City's CR 30(b) representative. He explained "[y]ou definitely want a nonskid surface" for in-sidewalk utility vault covers or anything else put in a sidewalk.[12] He did not know why the rim here was smooth metal.[13] He testified diamond plate rims (as well as covers) were available when the handhole was installed.[14] He agreed that Standard Plan 550 was the standard associated with selecting or installing the handhole.[15] Diamond plate was used because it fits the definition of nonskid according to the standard of the day; that was usually what was specified.[16] He agreed the diamond plate

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[10] CP 508 (Ex. 6 to 5.28.13 Myers Decl., Sub No. 51) (excerpt from City of Seattle 2000 Standard Specifications).
[11] CP 521, 524 (Ex. 10-11 to 5.28.13 Myers Decl., Sub No. 51) (excerpts from City of Seattle 2008 Standard Plans and Standard Specifications).
[12] CP 116-117 (Read dep. at p. 23, lines 4-6; Ex. 6 to 1.18.13 Myers Decl., Sub No. 24).
[13] CP 109 (Read dep. at p. 16, lines 11-16).
[14] CP 124 (Read dep. at p. 31, lines 20-24).
[15] CP 123-124 (Read dep. at p. 30, line 24 through p. 31, line 15).
[16] CP 103, 105-106 (Read dep. at p. 10, lines 10-15; p. 12, lines 1 through p. 13, line 1; p. 25, lines 10-15).

was supposed to provide a nonskid surface and provides better traction than smooth metal.[17]

In 2011 the City officially acknowledged that in-sidewalk utility vault covers must have a COF of at least 0.5.[18] Mr. Read testified this did not "raise the bar" for the City in terms of past practice.[19] He agreed that the level of traction needs to be at least 0.5.[20]

Mr. Read said there are "lots of ways" to go about giving the rim a nonskid quality[21]; "the easiest way" is to paint covers and rims with a nonskid coating and he explained the City had done this to increase the coefficient of friction on in-sidewalk covers.[22] The City also uses "SlipNOT" products and Mr. Read agreed they typically have a higher degree of traction than smooth metal.[23]

E. Ms. Gill's First Field Test of the Rim

Ms. Gill conducted slip-resistance testing of the rim in February 2011 using an English XL variable incidence tribometer (VIT) manufactured by Excel Tribometers (Excel).[24]

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[17] CP 102, 110 (Read dep. at p. 9, lines 1-23; p. 17, lines 10-12).
[18] CP 103-104 (Read dep. at p. 10, line 5 through p. 11, line 4).
[19] CP 127-128 (Read dep. at p. 34, lines 20-23, p. 35, lines 8-11).
[20] CP 107 (Read dep. at p. 14, lines 11-21).
[21] CP 121 (Read dep. at p. 28, lines 3-4).
[22] CP 119-120, 122 (Read dep. at p. 26, line 21 through p. 27, line 18, p. 29, lines 2-9).
[23] CP 108-109 (Read dep. at p. 15 lines 2-5, p. 16, lines 2-6; *id.*). *See also* CP 134-138 (SlipNOT articles re: City Light) (Ex. 7 and 8 to 1.18.13 Myers Decl., Sub No. 24).
[24] CP 52 *et seq.* (First Gill Decl., Sub No. 22).

To ensure it was accurate Ms. Gill's tribometer was annually calibrated by Excel and had been calibrated by Excel about a month before her field testing.[25] Ms. Gill also successfully performed pre-test calibration with a reference surface tile with a known COF as specified by the English XL VIT User's Guide with a result within ±.03.[26]

Ms. Gill's field testing showed the rim's COF was 0.35 (± 0.02) when wet.[27] Ms. Gill explained a value of 0.5 for the coefficient of friction is generally accepted as the minimum threshold for a safe walking surface.[28] Based on her measurement the rim's slip resistance would have to be increased almost fifty percent to comply with the 0.5 minimum threshold for reasonable safety.[29]

F. Motions for Summary Judgment

The parties filed summary judgment motions.[30] The City argued Ms. Gill's opinions should be excluded under *Frye* (it requested a *Frye* hearing) and ER 702 because (i) 0.5 was not generally accepted as setting

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[25] CP 262 (Second Gill Decl., ¶6, Sub No. 38); CP 268 (Gill report, p. 2, Ex. 2 to Second Gill Decl., Sub No. 38); CP 563 (Fourth Gill Decl., ¶7, Sub No. 56).
[26] CP 268 (Gill report, p. 2, Ex. 2 to Second Gill Decl., Sub No. 38); CP 563 (Fourth Gill Decl., ¶8, Sub No. 56); CP 572 (English XL VIT User's Guide, p. 5, Ex. 1 to Gill Decl., Sub No. 56); CP 203 (Gill deposition at 80:18-24, Ex. 1 to 2.11.13 Myers Decl., Sub No. 29); CP 389 (Gill dep. at p. 81, lines 1-14, Ex. 1 to Groshong Decl., Sub No. 45).
[27] CP 53 (First Gill Decl., ¶7, Sub No. 22); CP 64 (10.21.11 Gill report, p. 4, Ex. 2 to First Gill Decl., Sub No. 22).
[28] CP 53 (First Gill Decl., ¶6, Sub No. 22); CP 64 (10.21.11 Gill report, p. 4, Ex. 2 to First Gill Decl., Sub No. 22); CP 485 (Third Gill Decl., ¶4, Sub No. 50).
[29] CP 63 (10.21.11 Gill report, p. 4, Ex. 2 to First Gill Decl., Sub No. 22).
[30] CP 216 *et seq.* (Plaintiffs' Renewed Motion for Partial Summary Judgment, Sub No. 36); CP 372 *et seq.* (City's Motion for Summary Judgment, Sub No. 44).

a standard for minimum safety and (ii) she had not followed the ASTM standard applicable to slip resistance testing with walkway tribometers (F2508). The City relied on testimony from its expert James E. Flynn, P.E.[31] Mr. Flynn specifically criticized Ms. Gill because she had not "validated" her tribometer under ASTM F2508.[32] Neither Mr. Flynn nor anyone else on behalf of the City conducted slip-resistance testing of the rim.

G. ASTM F2508

ASTM F2508 took effect soon after Ms. Gill's initial testing.[33] ASTM F2508 established protocols for improving the precision of tribometers. Generally speaking classes of tribometers (for example, the English XL VIT) are "validated" by manufacturers and individual tribometers are "calibrated" by users/tribometrists.[34] Validation involves a set of 40 tests measuring and ranking four sets of reference tiles (supplied

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[31] CP 407 *et seq.* (First Flynn Decl., Sub No. 46); CP 454 *et seq.* (Second Flynn Decl., Sub No. 48); CP 234 *et seq.* (3.12.13 Flynn report, Ex. 1 to 5.10.13 Myers Decl., Sub No. 37).
[32] CP 235, 236 (3.12.13 Flynn report, p. 2-3, Ex. 1 to 5.10.13 Myers Decl., Sub No. 37).
[33] App. 4 (ASTM F2508); CP 278-282 (Ex. B to Second Gill Decl., Sub No. 38); CP 431-435 (Ex. 4 to First Flynn Decl., Sub No. 46).
[34] Appx. 4, p. 1. As defined in Section 3.2.3: "Validation" is "the set of operations that establishes, under specified conditions, the proper ranking and differentiation of reference surfaces by a walkway tribometer. As defined in Section 3.2.1: "Calibration" is "the set of operations that establishes, under specified conditions, the relationship between the values obtained by a walkway tribometer and the corresponding supplier reference values".

by ASTM) made of polished granite, porcelain, vinyl and ceramic.[35] (ASTM does not provide reference slip resistance values for the tiles.[36]) Calibration involves a set of 16 tests and comparison of those results to validation results.[37]

H. Ms. Gill's ASTM F2508 Validation Testing

Excel has validated the class of Ms. Gill's tribometer according to ASTM F2508.[38] Excel's Validation Reports for the English XL VIT provide values based on the testing of Excel's four reference tiles (acquired from ASTM) with Excel's tribometer.[39] Excel establishes a 95th percentile confidence interval[40] for the English XL VIT.[41] Because the measurements from which the confidence interval is defined are so precise (more precise than can accurately be read[42]), Excel as the manufacturer

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[35] *Id.*, p. 2, Section 7 (Reference Surfaces); Section 8 (Procedure); Section 9 (Analysis of Results and Walkway Tribometer Validation).
[36] CP 649 (6.6.13 Gill report, p. 2, ¶8, Ex. C to Fifth Gill Decl., Sub No. 62C).
[37] Appx. 4, p. 3-4, Sections 12-13.
[38] After Ms. Gill's initial field testing Excel produced an ASTM F2508 Validation Report in 2011 for the class of English XL VIT she had used (base model). CP 284-291 (base model Validation Report; Ex. C to Second Gill Decl., Sub No. 38). At the time of her second field test she used an updated English XL VIT model (with sequencer), for which Excel has published a separate Validation Report. Appx. 5; CP 634-631 (Validation Report, Ex. A to Fifth Gill Decl., Sub No. 62C).
[39] Appx. 5, p. 3 (CP 636).
[40] A confidence interval indicates a measurement's precision. With a 95% confidence interval there is a 95% chance that the mean is between a range of two values.
[41] Appx. 5, p. 3 (CP 636). The confidence interval is based on the measurements taken during validation testing. The degree of precision of the English XL VIT was "less than ± .006 for all reference surfaces". This is "substantially more accurate than required for statistical differentiation of the reference surfaces, and/or substantially more accurate than required for ranking of the reference surfaces." *Id.*
[42] Appx. 7, pp. 1-2, ¶4 (CP 648-649) (Ex. C to Fifth Gill Decl., Sub No. 62C).

provides a margin of error of ± 0.03 for surfaces with slip resistance values of less than 0.50 and ± 0.05 for surfaces with slip resistance values greater than 0.50.[43]

Ms. Gill addressed Mr. Flynn's criticism by validating her tribometer according to ASTM F2508.[44] She (i) conducted four successful initial calibration tests (using a certified test tile with a known reference slip resistance) and then (ii) tested each of the four ASTM reference tiles[45] (which do not have reference slip resistance values).[46] Ms. Gill's testing confirmed her tribometer correctly ranked the tiles in order of slip-resistance and provided a statistically unique slip-resistance measure for each surface, thus satisfying ASTM F2508 validation.[47]

Ms. Gill's results (using her tiles and her tribometer) were consistent with Excel's (using its tiles and its tribometer) and within the requisite confidence intervals and margins of error for the values in Excel's Validation Report except her ceramic tile tested "rougher" than

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[43] The margin of error established by Excel as the manufacturer refers to the accuracy of the equipment based on Excel's testing in a wide variety of applications. It is "[b]ased on the practical range of accuracy required for a walkway tribometer to meaningfully measure slip resistance to assess the relative risk for human slip and fall injury, and based [sic] other testing and analyses…" Appx. 5, p.3 (CP 636).

[44] Appx. 6 (CP 643-646) (ACS Validation Report, Ex. B to Fifth Gill Decl., Sub No. 62C); CP 564 (Fourth Gill Decl., ¶12, Sub No. 62C).

[45] Appx. 6.

[46] Appx. 7, p. 2, ¶8 (CP 649) (6.6.13 Gill report, p. 2, Ex. C to Fifth Gill Decl., Sub No. 62C).

[47] Appx. 6, p. 2 (CP 644) (ACS Validation Report, Ex. B to Fifth Gill Decl., Sub No. 62C).

Excel's tile (and exceeded the 95th percentile confidence interval and ± 0.05 margin of error).[48] The following table compares the mean values of Ms. Gill's ASTM F2508 validation testing of her tiles with Excel's validation testing of its tiles:[49]

Reference Surface	***Mean Value (Excel Validation Report—Excel Tiles)***	***Mean Value (Gill Validation Report—Gill Tiles)***	***Difference in Mean Values***
RS-A (granite)	0.08	0.07	-.01
RS-B (porcelain)	0.13	0.10	-.03
RS-C (vinyl)	0.18	0.17	-.01
RS-D (ceramic)	0.61	0.85	+0.24

I. The ASTM F2508 Reference Tiles are Variable—But Ms. Gill's Tribometer Was in Calibration Because She Had Validated It

Ms. Gill consulted with Excel about the results and particular the "rougher" testing of her ceramic tile (which was outside the 95th percentile confidence interval and margin of error). Excel confirmed there was inherent variability within and between the ASTM reference tiles due to manufacturing tolerances.[50] This was especially apparent for the ceramic tile (which Excel found produced results from 0.50 to 1.0).[51]

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[48] Appx. 6, p. 3 (CP 645) (ACS Validation Report, Ex. B to Fifth Gill Decl., Sub No. 62C).
[49] Appx. 5, p. 3 (CP 636); Appx. 6, p. 3 (CP 645); Appx. 7, p. 1-2 (CP 648-649).
[50] Appx. 7, p. 2, ¶7 (CP 649) (Ex. C to Fifth Gill Decl., Sub No. 62C).
[51] *Id.*

More importantly, Ms. Gill confirmed (again, after consulting with Excel) that based on her successful validation testing that her tribometer was considered in "calibration" under ASTM F2508.[52]

J. Ms. Gill's Second Field Test of the Rim

After validating her tribometer Ms. Gill field-tested the rim a second time. The test results showed the average COF of the rim when wet was 0.21 (± 0.02) (*i.e.,* the surface was more slippery during this test than at the time of the first test and still well below 0.5).[53] By contrast the diamond plate cover tested 0.59 (± 0.01) when wet.[54]

Ms. Gill's field test results differed from the first field test by 0.14. She explained that while the rim was in the same or substantially similar condition, the lower coefficient of friction reflected in the second test was likely due to the presence of contaminants on the rim surface that she tested it in its existing condition (as pedestrians would encounter it).[55]

K. Summary Judgment Hearing[56] and Ruling

The trial court ruled from the bench at the hearing.[57] It held that while Ms. Gill qualified as an expert (1) her tribometer was not properly

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[52] *Id.*, ¶10.
[53] CP 564 (Fourth Gill Decl., ¶13, Sub No. 56); CP 585 (Ex. 3 to Fourth Gill Decl., Sub No. 56).
[54] CP 582.
[55] CP 631-632 (Fifth Gill Decl., ¶ 7, Sub No. 62C).
[56] *See* VRP pp. 1-68.
[57] VRP, pp. 60-63.

calibrated during either field test and (2) Ms. Gill did not adequately explain the difference in her field test results. As a result, her testimony was excluded under ER 702. The trial court explained that without admissible expert testimony there were no genuine issues of material fact and the City was entitled to judgment as a matter of law.

Counsel for Ms. Kill requested a *Frye* hearing and the trial court indicated it would entertain briefing.[58] The trial court subsequently entered a written order granting the City's motion.[59]

L. Subsequent Testing by Excel

After the summary judgment hearing Excel conducted testing of Ms. Gill's tribometer using both its own reference tiles and Ms. Gill's.[60]

The following table compares the mean values for Excel's validation testing (its tiles, its tribometer) with its calibration testing (its tiles, Ms. Gill's tribometer):[61]

Reference Surface	***Mean Value (Excel Validation Report—Excel Tiles)***	***Mean Value (Excel Calibration Testing—Excel Tiles)***	***Difference in Mean Values***
RS-A (granite)	0.08	0.07	-.01
RS-B (porcelain)	0.13	0.12	-.01
RS-C (vinyl)	0.18	0.17	-.01
RS-D (ceramic)	0.61	0.58	-0.03

[58] VRP, p. 64, line 9 through p. 66, line 3.
[59] Appx. 10 (CP 652 *et seq.*) (6.24.13 order granting summary judgment, Sub No. 65).
[60] Appx. 8-9 (CP 668 *et seq.*) (Ex. A and B to Widas Decl., Sub No. 67).
[61] Appx. 5, p. 3; Appx. 8, p. 3.

Based on these results Excel found that Ms. Gill's tribometer satisfied ASTM F2508 calibration and issued a Calibration Report specifically for her tribometer.[62]

Excel also confirmed Ms. Gill's tribometer had accurately measured her reference tiles.[63] The following table compares Ms. Gill's results to Excel's for her tiles (with Excel measuring the center of her tiles):

Reference Surface	***Mean Value (Gill Validation Report—Gill Tiles)***	***Mean Value (Excel Testing—Gill Tiles)***	***Difference in Mean Values***
RS-A (granite)	0.07	0.08	+.01
RS-B (porcelain)	0.10	0.10	.00
RS-C (vinyl)	0.17	0.15	-.02
RS-D (ceramic)	0.85	0.64	-0.21

The results (except the ceramic tile) fell within the 95th percentile confidence interval and margin of error.

The challenge lay in ascertaining the difference between Ms. Gill's and Excel's test results for the same ceramic tile. When Excel tested Ms. Gill's ceramic tile with her tribometer it found the surface of the tile was not uniform—the center produced a lower measurement (0.64) than the tile's quadrants.[64] However, Excel's testing of the tile's southwest

[62] Appx. 8.
[63] Appx. 6; Appx. 9.
[64] Appx. 9.

quadrant (0.84) was consistent with Ms. Gill's testing which had been performed on that quadrant (0.85).[65] That solved the mystery.

The testing ultimately showed the different tiles' test results were comparable under ASTM F2508 (based on testing the center of Ms. Gill's ceramic tile) within the 95th percentile confidence interval and margin of error:

Reference Surface	***Mean Value (Excel Validation Report—Excel Tiles)***	***Mean Value (Excel Testing—Gill Tiles)***	***Difference in Mean Values***
RS-A (granite)	0.08	0.08	0.00
RS-B (porcelain)	0.13	0.10	-.03
RS-C (vinyl)	0.18	0.15	-.03
RS-D (ceramic)	0.61	0.64	+.03

M. Ms. Kill's Motions for Reconsideration and for a *Frye* Hearing

Ms. Kill sought reconsideration and a *Frye* hearing and submitted declarations from Excel, Ms. Gill and Dr. Richard T. Gill (the chief scientist of ACS),[66] which confirmed (i) her tribometer was properly calibrated and (ii) it was not a generally accepted practice to clean or decontaminate a field surface prior to testing. The City did not offer any testimony from Mr. Flynn in response.

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[65] Appx. 9; CP 925-926 (Sixth Gill Decl., ¶¶3-8, Sub No. 75).
[66] CP 924-926 (Sixth Gill Decl., Sub No. 75); CP 930-964 (Decl. of Dr. Richard T. Gill, Sub No. 77); CP 668-679 (Widas Decl., Sub No. 67).

While the trial court stated it had considered the evidence presented upon reconsideration, it denied reconsideration and Ms. Kill's motion for a *Frye* hearing, expanding on the reasoning contained in its summary judgment order. In sum, the trial court reasoned:

> In conclusion, the Court exercises its discretion to exclude Ms. Gill's testimony under ER 702 and ER 403. Tribometer readings seem most appropriate to determine a ranking of how slippery various surfaces are in relation to each other. With that said, this Court is not ruling they are inherently unreliable. If Ms. Gill had demonstrated that the tribometer was accurately validated and calibrated, and had accounted for the margin of error due to variations within the same or among different reference tiles of the same type and variations in surface contaminants of the subject area, her testimony may well have been admissible to prove the *relative* slipperiness of the metal rim. But in this case, where the [sic] Ms. Gill attempted to use the tribometer readings to show objective slipperiness compared against a supposed objective standard of safety, despite the evidence showing that tribometers are inaccurate for such purposes, and without explaining or addressing the margins of error resulting from surface contaminants and variable reference tiles, the Court exercises its discretion to exclude that evidence.[67]

III. SUMMARY OF ARGUMENT

The trial court erred in granting summary judgment because whether the rim was reasonably safe is a question of fact.

The trial court exceeded the scope of its gatekeeping function and assumed a scientist's mantle when it excluded Ms. Gill's opinions under ER 702 and ER 403. Ms. Gill's opinions were helpful and reliable:

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[67] Appx. 11, pp. 16-17 (CP 1214-1215) (order denying reconsideration and motion for *Frye* hearing, Sub No. 94).

1. Ms. Gill's tribometer was determined to be both validated and calibrated.

2. Ms. Gill's tribometer accurately tested two sets of variable reference tiles (as well as a reference tile with a known COF). Therefore it could accurately test the rim.

3. Any theoretical "relativity" of tribometer readings is not incompatible with the 0.5 standard for reasonable safety.

4. The rim has different surface contaminants at different times, which explained the slightly different field test results. The generally accepted practice in tribometry is to test a field surface in its "as found" condition (as experienced by pedestrians), not to decontaminate or clean it before testing for a "baseline" reading.

Any alleged errors or deficiencies in Ms. Gill's methodology went to weight rather than admissibility and if there was any doubt about the validity of Ms. Gill's opinions they should have been tested at trial or in a *Frye* hearing.

It's also helpful to consider what evidence the trial court did not have when it made its rulings:

1. There was no evidence from the City regarding the rim's slip-resistance—the City never measured it.

2. Mr. Flynn never testified the rim was slip resistant, reasonably safe or could test close to 0.5 when wet.

3. Mr. Flynn never offered an opinion that wet smooth metal is slip resistant or reasonably safe.

4. There was no testimony from Mr. Flynn about Ms. Gill's ASTM F2508 testing, Excel's testing of Ms. Gill's

tribometer, the difference in Ms. Gill's test results and her explanations of those results.

Ms. Gill also expressed admissible opinions relating to the rim's safety that were not based on her slip-resistance testing. These opinions created a genuine issue of fact.

The evidence showed that the rim did not comply with the City's own standards and practices at the time of installation and thereafter. This also raised a genuine issue of fact.

The trial court should also have (i) granted reconsideration of its summary judgment order in light of the evidence it considered and (ii) held a *Frye* hearing before assessing Ms. Gill's opinions under ER 702.

The Court should hold Ms. Gill's opinions are admissible under ER 702 and reverse and remand the case for trial. In the alternative, the case should be remanded for a *Frye* hearing.

IV. ARGUMENT

A. The Trial Court Erred in Granting the City's Motion for Summary Judgment—Whether the Rim was Reasonably Safe is an Issue of Fact

1. *Summary Judgment Standard*

Summary judgment is inappropriate if there is a genuine issue as to any material fact or if the moving party is not entitled to a judgment as a

matter of law. CR 56. The moving party bears the initial burden of showing the absence of an issue of material fact.[68]

All facts and reasonable inferences are viewed in the light most favorable to the non-moving party.[69] When reasonable minds could differ, the motion should be denied and the case should go to trial.[70] "The evidence of the non-movant is to be believed, and all justifiable inferences are to be drawn in his favor."[71]

A declaration containing admissible expert opinion on an ultimate issue of fact is sufficient to create a genuine issue as to that fact and precluding summary judgment, where the expert has considered the available data and formed his opinion based on it rather than speculation.[72]

2. *Standard of Review*

'The de novo standard of review is used by an appellate court when reviewing all trial court rulings made in conjunction with a summary

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[68] *Young v. Key Pharm., Inc.*, 112 Wn.2d 216, 225, 770 P.2d 182 (1989). Only after the moving party has met its burden of producing factual evidence showing that it is entitled to judgment as a matter of law does the burden shift to the nonmoving party to set forth facts showing that there is a genuine issue of material fact. *Hash by Hash v. Children's Orthopedic Hosp. and Medical Center*, 110 Wn.2d 912, 915, 757 P.2d 507 (1988); *Weatherbee v. Gustafson*, 64 Wn. App. 128, 133, fn. 1, 822 P.2d 1257 (1992).

[69] *Kahn v. Salerno*, 90 Wn. App. 110, 117, 951 P.2d 321 (1998), *rev. denied*, 136 Wn.2d 1016.

[70] *Klinke v. Famous Recipe Fried Chicken, Inc.*, 94 Wn.2d 255, 256-257, 616 P.2d (1980).

[71] *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 255, 106 S.Ct. 2505, 2513, 91 L.Ed.2d 202 (1986).

[72] *J.N. v. Bellingham Sch. Dist. No. 501*, 74 Wn. App. 49, 60-61, 871 P.2d 1106 (1994); *Pagnotta v. Beall Trailers of Oregon, Inc.*, 99 Wn. App. 28, 34, 991 P.2d 728 (2000); *Coggle v. Snow,* 56 Wn. App. 499, 511, 784 P.2d 554 (1990).

judgment motion.'[73] This means the appellate court performs the same inquiry as the trial court.[74]

The appellate court considers all of the evidence before the trial court, including evidence considered in a motion for reconsideration.[75] In the context of summary judgment, unlike in a trial, there is no prejudice if the trial court considers additional facts on a motion for reconsideration.[76]

3. *The Rim's Safety is an Issue of Fact*

A municipality is "obligated to exercise ordinary care to keep its public ways in a reasonably safe condition for persons using them in a proper manner and exercising due care for their own safety."[77]

"In tort actions, issues of negligence and causation are questions of fact not usually susceptible to summary judgment."[78] Specifically, "[w]hether or not a roadway is reasonably safe is generally a question of fact."[79] There are at least two published Washington appellate cases

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[73] *Cornish College of the Arts v. 1000 Virginia Ltd. P'ship*, 158 Wn. App. 203, 215-216, 242 P.3d 1 (2010) (quoting *Folsom v. Burger King*, 135 Wn.2d 658, 663, 958 P.2d 301 (1998).

[74] *Washburn v. City of Federal Way*, 310 P.3d 1275, 1287 (2013).

[75] RAP 9.12; *Weatherbee,*, 64 Wn. App. at 133, fn. 1, 822 P.2d 1257 (1992), ("According to the trial court's order dismissing the motion for reconsideration, it was considered by the trial court, and this court considers all of the evidence before the trial court."); *accord, Jacob's Meadow Owners Ass'n v. Plateau 44 II, LLC*, 139 Wn. App. 743, 754-755, 162 P.3d 1153 (2007).

[76] *August v. U.S. Bancorp*, 146 Wn. App. 328, 347, 190 P.3d 86 (2008).

[77] WPI 140.01; *Keller v. City of Spokane*, 146 Wn.2d 237, 249, 44 P.3d 845 (2002).

[78] *Miller v. Likins*, 109 Wn. App. 140, 144, 34 P.3d 835 (2001).

[79] DeWolf and Allen, 16A Wash. Prac., Tort Law And Practice § 18:17 (3d ed.) (emphasis added), citing *Owen v. Burlington Northern and Santa Fe R.R. Co.*, 153 Wn.

specifically addressing smooth utility covers and holding there was a factual issue for the jury.[80]

The ultimate issue before the trial court was if there was a genuine issue of fact whether the smooth metal rim reasonably safe. As the cases and commentary indicate, this is generally an issue for trial and this case was no exception.

B. Ms. Gill's Opinions and Methodology Regarding Slip-Resistance Testing are Helpful and Reliable—the Court Erred in Excluding Her Opinions Under ER 702 and ER 403

The key inquiry under ER 702 is if the expert's methodology and resulting conclusions are helpful and reliable. Ms. Gill's testimony satisfies both requirements. The trial court made factual and logical errors in evaluating the evidence and improperly made judgments about the underlying science. All of the trial court's remaining criticisms go to the

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2d 780, 108 P.3d 1220 (2005). *See also Xiao Ping Chen v. City of Seattle*, 153 Wn. App. 890, 909, 223 P.3d 1230 (2009) (whether a roadway was safe for ordinary travel and whether a municipality took adequate corrective action "are questions of fact" and generally not susceptible to summary judgment; emphasis added).

[80] In *Smith v. City of Spokane*, 103 Wn. 314, 174 P. 2 Wn. 1918 (1918) the court held the plaintiff's case properly went to the jury because the evidence showed a manhole cover in a pedestrian crossing had worn smooth, causing the plaintiff to slip and fall on it. Similarly, in *Smith v. City of Tacoma*, 51 Wn. 101, 98 P. 91 (1908) the court held the evidence that the plaintiff slipped on a worn smooth metal cover over a coal hole was sufficient to deny a motion for a nonsuit.

weight of Ms. Gill's testimony and her credibility, not threshold admissibility.[81]

1. *ER 702 Requires Expert Testimony to be "Helpful" and "Reliable"—In Doubtful Cases the Testimony Should be Admitted*

ER 702 provides:

> If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise.

"*Frye* excludes testimony based on novel scientific methodology until a scientific consensus decides the methodology is reliable; ER 702 excludes testimony where the expert fails to adhere to that reliable methodology."[82] Helpfulness to the trier of fact is construed broadly.[83] Courts will favor admissibility in doubtful cases.[84] Testimony about generally accepted methodology will be allowed even when the conclusions the testifying expert reaches are not themselves yet generally accepted.[85] "Whether a given scientific technique has been performed

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[81] *Cf. Lakey v. Puget Sound Energy, Inc.*, 176 Wn.2d 909, 920-921, 96 P.3d 860 (2013) (plaintiffs' expert excluded as he did not follow proper methodology supported by defense expert testimony; conclusions were unreliable because he performed no original research, did not consider all relevant data and selectively sampled data).
[82] *Id.*
[83] *Philippides v. Bernard,* 151 Wn.2d 376, 393, 88 P.3d 939 (2004).
[84] *Miller*, 109 Wn. App. at 148.
[85] *Moore v. Harley-Davidson Motor Co. Group, Inc.*, 158 Wn. App. 407, 418, 241 P.3d 808 (2010).

correctly in a particular instance… goes to its weight, not admissibility."[86] ''[R]elatively minor allegations of error create a basis for cross-examination, not exclusion."[87]

The trial court is a gatekeeper, but this does not substitute for the adversary system. "Vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence."[88]

Two federal cases involving competing expert opinions about slip resistance testing are instructive. In *Phelps v. Stein Mart, Inc.*, Not Reported in F. Supp.2d, 2011 WL 1337362 (W.D. La. 2011) the court declined to exclude testimony due to an insufficiently reliable methodology, holding that the experts' competing methodologies (even though both had not fully complied with the applicable ASTM standard) were relevant and reliable and any questions about the experts' testing was for the trier of fact.[89] In *Rosenfeld v. Oceania Cruises, Inc.,* 654 F.3d 1190, 1194 (11th Cir. 2011), the court reversed and granted a new trial, holding the trial court erred in excluding expert testimony about

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[86] *State v. Gregory*, 158 Wn.2d 759, 830, 147 P.3d 1201 (2006).
[87] *Moore*, 158 Wn. App. at 423, citing *State v. Copeland,* 130 Wn.2d 244, 270-271, 922 P.2d 1304 (1996); *State v. King County Dist. Court West Div.*,175 Wn. App. 630, 641, 307 P.3d 765 (2013) ("…unless errors rates are so serious as to be unhelpful to the trier of fact, error rates go to weight, not admissibility.").
[88] *Anderson v. Akzo Nobel Coatings, Inc.*, 172 Wn. 2d 593, 607. 260 P.3d 857 (2011), citing *Daubert v. Merrell Dow Pharm, Inc.*, 509 U.S. 579, 596, 113 S.Ct. 2786, 125 L.Ed.2d 469 (1993).
[89] Appx. 13.

coefficient of friction testing and that criticism of the expert's methods went to the weight and the persuasiveness of his testimony, not its admissibility.[90]

2. *Standard of Review*

Customarily the appellate court reviews a trial court's decision concerning the admissibility of expert testimony for an abuse of discretion (where the court issues manifestly unreasonable rulings or rulings based on untenable grounds).[91] However, "[o]n appeal from summary judgment, trial court rulings on the admissibility of evidence are reviewed de novo, even though the same rulings might be reviewed only for abuse of discretion in an appeal following a trial."[92] The de novo standard of review also applies to evidentiary rulings on expert testimony on summary judgment.[93]

3. *Ms. Gill's Testimony is "Helpful"*

The trial court stated that Ms. Gill's testimony "essentially amounts to the statement that smooth metal is slippery when wet," which the court stated was not beyond the common knowledge of a layperson and therefore not helpful to the trier of fact.

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[90] Appx. 14.
[91] *Lakey*, 176 Wn.2d at 918.
[92] Tegland, 14A Wash. Prac., Civil Procedure § 25:29, fn. 5, (2d ed.) (internal citations omitted). *See also Momah v. Bharti*, 144 Wn. App. 731, 749, 182 P.3d 455 (2008).
[93] *See, e.g., Moore v. Hagge*, 158 Wn. App. 137, 147, 241 P.3d 787 (2010) (reviewing de novo the trial court's rulings excluding portions of expert declaration).

While courts should not admit expert opinions on commonly understood topics, the inquiry is whether the expert testimony would assist even the knowledgeable juror.[94]

If the slipperiness of wet smooth metal is common knowledge summary judgment should not have been granted because the jury could find the rim was dangerously slippery. More importantly, this was not an accurate description of Ms. Gill's testimony, which addressed how slippery the rim was when wet, why it was slippery, why it was unsafe and what could and should have been done about it. This testimony would be helpful to the jury.[95]

4. *Ms. Gill's Tribometer was Calibrated at the Time of Her First Field Test*

The trial court agreed (i) ASTM F2508 did not preclude Ms. Gill's methodology for her first test since ASTM F2508 was not in effect then and (ii) her methodology for her first test was not novel or unreliable under *Frye*. However, the trial court stated that it was not convinced that Ms. Gill's tribometer was correctly calibrated at the time of her initial test.

There was no evidence from the City, Mr. Flynn or otherwise that (i) Ms. Gill improperly applied the methodology existing at the time of her

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[94] *In re Detention of Coe*, 160 Wn. App. 809, 824, 250 P.3d 1056 (2011), review granted 172 Wn.2d 1001, 258 P.3d 685, affirmed on other grounds 175 Wn.2d 482, 286 P.3d 29.
[95] *See, e.g., Rosenfeld,* 654 F.3d at 1193-1194 (error in excluding expert testimony because jury was not allowed to consider evidence about whether the slip resistance of the flooring posed a danger to passengers).

first test for determining calibration or (ii) her tribometer was out of calibration (which therefore did not shift the City's initial burden on summary judgment). Instead the trial court held that Ms. Gill's "conclusory statements" about calibration were insufficient.

Ms. Gill's testimony was not conclusory. She did not simply state her tribometer was calibrated, but explained how it was calibrated at the time in accordance with accepted protocols. She explained that if the tribometer satisfies the criteria for the test tile with a known COF (which it did) it is in calibration.[96]

The trial court remarked that Ms. Gill's original report did not contain her calibration results. However, she testified it was successfully calibrated and explained how, which is all that matters on summary judgment.[97] The absence of recorded calibration results goes solely to the weight and credibility of her testimony, not threshold admissibility.

5. *Ms. Gill's Individual Tribometer was "Validated" at the Time of Her Second Field Test—Therefore it Was "Calibrated"*

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[96] Dr. Richard T. Gill's testimony also addressed the applicable calibration procedures and confirms that Ms. Gill's tribometer was calibrated. CP 931-934 (Dr. Richard T. Gill Decl., ¶¶6-14, Sub No. 77).

[97] There was no evidence that recording the calibration results was a generally accepted practice. Ms. Gill explained the results would only be noted if the tribometer failed, which it never had; in which case it would be sent the manufacturer for calibration instead of being used in the field, as it was. CP 563 (Fourth Gill Decl., ¶8, Sub No. 56); CP 389 (Gill dep. at p. 81, lines 1-14, Ex. 1 to Groshong Decl., Sub No. 45).

The trial court explained it did not find Ms. Gill's tribometer was calibrated according to ASTM F2508 at the time of her second field test. There was no testimony from Mr. Flynn to that effect.

Validation is a more complex set of testing that generates a more statistically robust result and demonstrates a particular tribometer is valid independent of any other tests by any other tribometers. Calibration compares the values obtained by an individual tribometer to the values established in validation.

Because Ms. Gill's tribometer was successfully validated (*i.e.*, it correctly ranked and differentiated her slip resistance tiles), there was no need for the additional ASTM F2508 calibration protocol, which simply compares calibration results to those obtained through validation. This comparison is problematic due to reference tile variability. Excel confirmed that her tribometer was calibrated because it had successfully been validated.

The trial court stated that ASTM F2508 does not provide for validation by a "user" (the individual tribometrist). ASTM F2508 does not expressly preclude a "user" from conducting "validation" tests.[98] Mr.

[98] The trial court incompletely quoted Section 11.1 of ASTM F2508 ("Validation Schedule"), which describes when a "supplier" or "independent testing facility" shall perform validation. Appx. 5, p. 4. The standard simply provides that a "user" is permitted to perform the less complex tests for "calibration". Further, the standard does not define "independent testing facility" or state that a "user" cannot also be an

Flynn (who chaired the ASTM F-13 committee that wrote the standard) specifically criticized Ms. Gill for not conducting validation testing, suggesting "users" may do so.[99]

Regardless, the trial court did not dispute that the results of Ms. Gill's validation testing were what was important, that they were internally correct (*i.e.*, the tiles were properly ranked and differentiated) or that the validation protocol itself was properly followed.

6. *The Trial Court Overlooked the Margin of Error in Comparing Ms. Gill's and Excel's Results*

The trial court's more significant concern was with how Ms. Gill's results compared to Excel's. Even though Excel and Ms. Gill were each testing different tiles, Ms. Gill's results were still within the 95th percentile confidence interval and the applicable margin of error for each reference tile except the RS-D ceramic tile (when the quadrant was tested). However, subsequent testing of the center of Ms. Gill's tile showed her tribometer measured both sets of tiles within the confidence interval and margin of error.

With respect to the upper and lower 95th percentile confidence intervals for the four reference surfaces contained in Excel's Validation

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"independent testing facility". Ms. Gill explained the standard was not clear and whether a "user" was expressly allowed to conduct validation was being considered by the ASTM Committee. CP 924 (Sixth Gill Decl., ¶2, Sub No. 75).

[99] CP 235, 236 (3.12.13 Flynn report, Ex. 1 to 5.10.13 Myers Decl., Sub No. 37).

Report, the trial court noted: "Critically, none of the calibration results by Ms. Gill fall within these intervals." (Emphasis original.) While that is true, the trial court overlooked the fact that (because the confidence interval results in values are more precise than can be accurately read) Excel's Validation Reports expressly provide for a margin of error—a difference of ± .03 for slip resistance values equal to or less than 0.5 and ± .05 for slip resistance values equal to or greater than 0.5.

There was no testimony from Mr. Flynn that Excel's Validation Report providing for these margins of error was erroneous or contrary to F2508.[100] In fact, he cited Excel's Validation Report.[101]

The City argued F2508 doesn't provide for this margin of error and the trial court suggested at oral argument this was a "fudge factor". But in the absence of testimony from Mr. Flynn this argument alone was insufficient to prevail on summary judgment. Clearly Excel is in a much better position than the City or the trial court to know about the interplay between the standard and the precision and calibration of its machine.

7. *ASTM F2508 Reference Tiles are Variable —Different Tiles Cannot Necessarily be Compared to Determine if a Tribometer is Calibrated*

Comparing the results of a tribometrist's testing (whether it's called "validation" or "calibration") using her tiles with the

[100] VRP p. 38, line 5 through p. 39, line 6.
[101] CP 457-458 (Second Flynn Decl., ¶5, Sub No. 48).

manufacturer's "validation" with its tiles produces meaningful results only if the tiles are virtually identical. However, a fundamental problem with ASTM F2508 and the way the trial court applied it is that it does not (at present) account for the tile variability that's been shown to exist after the standard was adopted. Dr. Richard T. Gill noted this issue had been raised at a recent ASTM meeting, that these and other issues are being continually addressed by ASTM and that there was confusion in the tribometry community regarding application of the standard.[102] Mr. Flynn offered no testimony about tile variability generally or how it relates to ASTM F2508.

Because the reference tiles are variable, Ms. Kill pointed out it was not appropriate to conclude that Ms. Gill's results were unreliable simply by comparing them to Excel's—Excel tested apples and she tested oranges. Ultimately what's important is that (i) Ms. Gill's tribometer was validated by testing her tiles; (ii) Excel demonstrated her tribometer was calibrated with its tiles; and (iii) when the variations in the ceramic tile were ascertained and controlled for Ms. Gill's tribometer accurately measured both sets of tiles under the ASTM F2508 protocol.

8. *Excel's Testing of Ms. Gill's Tribometer Confirmed it was Calibrated*

[102] CP 935-937 (Dr. Richard T. Gill Decl., ¶¶18-22, Sub No. 77).

Excel's testing put to rest any doubts that Ms. Gill's tribometer satisfied both ASTM F2508 validation and calibration. There was no testimony from Mr. Flynn regarding Excel's testing.

In using Ms. Gill's tribometer to test Excel's own reference tiles—*i.e.*, the same tiles used to prepare its Validation Report—Excel confirmed that its tribometer and Ms. Gill's reached the same results (*i.e.*, within the 95th percentile confidence interval and margin of error) and was in calibration. Excel's testing of Ms. Gill's tiles also showed her tribometer's results for both tiles when compared fell within the confidence interval and margin of error.

The trial court erroneously stated that "as with Ms. Gill's prior results" these values were outside those from the Excel Validation Report. Again, the trial court overlooked the margin of error for the machine.

9. *Tile Variability Does Not Establish Ms. Gill's Results Are Unreliable*

The trial court appeared to reason that assuming tile variability existed tribometer results could not be reliable because two machines each calibrated with different tiles could produce different results when measuring the same surface.

Mr. Widas of Excel expressly stated:

> The observed statistical variations between different sets of reference surface tiles have not yet been shown to be consequential

> with respect to measurement of slip resistance of real-world walkway surfaces by a calibrated English XL VIT walkway tribometer, used according to the current User Guide. Further, the variations in reference surface tiles have not yet been shown to negate the usefulness of ASTM F2508 as a means to validate walkway tribometers.[103]

Further, the court's comparison of calibration results and field test results didn't make sense because the former can be different and the latter the same. (If two tribometers are calibrated with different tiles that does not necessarily mean that they are going to produce different results when measuring the same surface in the field.)[104]

The trial court stated Ms. Gill had not shown what margin of error tile variability adds to her calculation or how it is accounted for, dismissing it as a "fudge factor". But there is no "fudge factor" in the sense of making an artificial adjustment to Ms. Gill's measurements to compare with Excel's. Both her tiles and Excel's tiles were measured with the same tribometer and satisfied validation and calibration.

10. *The Difference in Ms. Gill's Test Results Does Not Make the Results Unreliable*

Ms. Gill's tribometer was validated and calibrated, but her field test results differed. The trial court held (without testimony from Mr.

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[103] Appx. 9, p. 2.

[104] The difference in calibration results (when measuring the slip resistance of different tiles) only shows that each tribometer accurately measured the particular tile it was calibrated against. Properly calibrated tribometers can still arrive at the same result when testing a surface in the field, even if they were calibrated with different tiles.

Flynn) the 0.14 difference in Ms. Gill's field test results meant her tribometer readings were too unreliable to establish how slippery the rim was at the time of Ms. Kill's fall.

Tests are relevant, and therefore generally admissible, if they are performed under conditions similar to those with which the court is concerned.[105] Any dissimilarity or variance in conditions between what is being tested goes to the weight of the testimony rather than to its admissibility.[106] Sufficient similarity is all that is required, not identical conditions.[107]

The difference in readings does not mean Ms. Gill's methodology is unreliable. As an initial matter, the court gave insufficient consideration to the fact that both tests showed the rim's slip resistance was well below the 0.5 threshold. The differences in testing simply mean that on some days the rim is slipperier than others—but it's never reasonably slip-resistant when wet. There was no evidence the smooth rim could ever measure anywhere close to 0.5 when wet.

Ms. Gill and Dr. Gill explained the difference in test results is due to the presence of different surface contaminants on different days

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[105] *Quinn v. MacPerson*, 73 Wn.2d 194, 201, 437 P.2d 393 (1968).
[106] *Nordstrom v. White Metal Rolling & Stamping Corp.*, 75 Wn.2d 629, 642, 453 P.2d 619 (1969): *Bichl v. Poinier*, 71 Wn.2d 492, 497, 429 P.2d 228 (1967).
[107] *Breimon v. General Motors Corp.*, 8 Wn. App. 747, 756, 509 P.2d 398 (1973).

affecting the measured slip resistance, which do not affect the accuracy of the instrument itself.

The trial court stated it wasn't sure what the tribometer was measuring if testing on different days produced different results, suggesting the variable (surface contaminants) was not adequately controlled. However, Ms. Kill submitted testimony that it is not a generally accepted practice to "decontaminate" or clean the surface being tested in the field (because cleaning the surface before testing to removing all surface contaminants does not measure the surface as pedestrians encounter it).[108]

The trial court relied heavily on the *Michaels v. Taco Bell* case, which ultimately excluded a tribometrist's methodology under ER 702.[109] This case is not like *Michaels*. In this case both of Ms. Gill's tests results are entirely consistent with expected results (wet smooth metal is less than 0.5 as a general principle and has a higher COF when dry than when wet), not "counterintuitive". The two known factors that affected slip resistance were the same: smooth metal that was wet with water. Ms. Gill tested the

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[108] CP 938-940 (Dr. Richard T. Gill Decl., ¶¶27-32, Sub No. 77); CP 815 (Scher dep. at p. 29, line 19 through p. 30, line 25, Ex. C to Nute Decl., Sub No. 73).

[109] Appx. 12. *Michaels* explained the challenges with the expert's methodology was that the expert did not know the kind of tile that was present at the time of the plaintiff's fall and his testing did not duplicate or attempt to duplicate the conditions present when the plaintiff fell (there was evidence of a soda spill prior to the plaintiff's fall but the expert did not test the floor with soda). Further, the expert's results in *Michaels* indicated a damp floor exceeding the 0.5 standard but a dry floor did not, which the court observed was counterintuitive and the expert could not explain the result.

rim when wet. The difference in test results is readily explainable by the presence of contaminants commonly found on outdoor, in-city sidewalks—it does not mean the measurement is wrong. In *Michaels* there was no testimony that the expert's testing methodology was generally accepted.

11. *ER 403 Does Not Preclude Ms. Gill's Testimony*

On reconsideration the trial court held Ms. Gill's "statements that the tribometer is capable of providing objectively correct measurements, and her statement that .5 is an absolute threshold for safety would 'mislead the jury' contrary to ER 403." This was not part of the basis for the court's original summary judgment ruling, which was only addressed calibration and the difference in test results.

"Rule 403 is considered an extraordinary remedy, and the burden is on the party seeking to exclude the evidence to show that the probative value is substantially outweighed by the undesirable characteristics. When the balance is even, the evidence should be admitted."[110]

As an initial matter, according to the trial court's reasoning that tribometers are capable of producing reliable results and based on the evidence her tribometer was validated and calibrated, Ms. Gill should be able to testify about her field test results if not necessarily their

[110] Tegland 5D Wash. Prac., Handbook Wash. Evid. ER 403 (2013-14 ed.) (citations omitted).

"objectivity" or comparison to an "objective" 0.5 standard (as the trial court suggested when it said her testimony "may well have been admissible to prove the *relative* slipperiness of the metal rim").

That said the jury would not be confused or misled by Ms. Gill's testimony that the rim was unreasonably slippery because her testing with a calibrated and ASTM F2508-tested tribometer showed the rim tested well below a 0.5 COF which is generally accepted as the minimum threshold for a reasonably safe walking surface (particularly where the City would be free to conduct its own testing, cross-examine Ms. Gill and call Mr. Flynn). The trial court engaged in an analysis more appropriate under *Frye*, as the City acknowledged in asking for a *Frye* hearing on whether the 0.5 standard was generally accepted.

The problem predating ASTM F2508 (as Mr. Flynn explained it) was that different tribometers were producing different results when testing identical surfaces. ASTM F2508 does not merely "support" the limits of tribometer relativity as the trial court noted—it <u>controls</u> for them.[111]

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[111] Mr. Flynn expressly opined that once a tribometer met the criteria in ASTM F2508 subsequent field measurements could be compared to determine the relative slip resistance of the field surface, which in turn could be compared to reference values employed in human ambulation studies. CP 410 (Flynn decl., ¶7, Sub No. 46). For example, Mr. Flynn explained "If Ms. Gill's machine had been calibrated pursuant to ASTM F2508, we would have some basis for saying that the tested surface is roughly equivalent to Vinyl Composition tile, or much more slip resistant than such tile…" CP 459 (Flynn decl., ¶9, Sub No. 46).

Ms. Gill did not state that her tribometer produced an "absolute" or "objective" value. Rather, she explained that because her tribometer was in calibration it was capable of measuring a field surface like the rim in order to produce a scientifically valid result.[112] That said, it seems difficult to characterize her results as "relative"—the fact that her tribometer satisified ASTM F2508 and was determined to accurately measure two sets of reference tiles (and a reference tile with a known slip resistance) with significant precision indicates it could "objectively" measure the rim, at least with sufficient accuracy to be reliable. In any event, certainly the City could cross-examine Ms. Gill and call Mr. Flynn about the "relativity" of tribometer measurements.

The trial court's other concern appeared to be that it would be misleading for Ms. Gill to compare her test results against an "objective" and "absolute" standard for reasonable safety if tribometers measure "relative" slipperiness. Essentially the trial court rejected the 0.5 standard without conducting the *Frye* hearing the City itself had requested.

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[112] The trial court also stated tribometer readings could not be "objective measurements" if test results from different tiles cannot be compared. If tiles are different a tribometer cannot be said to be in calibration by comparing different tile measurements—different tiles can't be compared for that purpose. But if a given tribometer has been determined to be validated—*i.e.*, provide a statistically unique slip resistance measure for each tile, accurately rank reference tiles in the correct order and adequately differentiate them—both that tribometer and a tribometer calibrated (a) against the same tiles or (b) with virtually identical yet different tiles are equally capable of taking consistent and scientifically meaningful field surface measurements.

The 0.5 standard is not an "absolute" value. It's a threshold value based on research that has been adopted as indicative of the point at which an unacceptable number of slips are likely to occur, taking into account a margin of safety (not merely the point at which slips occur on various surfaces, as measured in the studies cited by Mr. Flynn). It's both accepted by the City and generally accepted according to numerous sources.[113] It's not absolutist in its application.[114] Here, because the rim tested so far below 0.5, based on the strength of her results with a calibrated tribometer Ms. Gill explained the rim was more likely than not unreasonably slippery, not merely because it tested under 0.5.[115]

Any tribometer relativity is not incompatible with a particular COF being indicative of reasonable safety. ASTM F2508 acknowledges but does not purport to speak to the issue.[116] Both Ms. Gill and Mr. Flynn agree tribometer results ultimately have to be compared to something to be useful in evaluating safety—they only differ as to what that should be (0.5 vs. ambulation studies).

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[113] CP 53 (First Gill Decl., ¶6, Sub No. 22); CP 64 (10.21.11 Gill report, p. 4, Ex. 2 to First Gill Decl., Sub No. 22); CP 263-264 (Second Gill Decl., ¶¶9-13, Sub No. 38); CP 270 (3.30.13 Gill report, pp. 4-5, Ex. A to Third Gill Decl., Sub No. 38); CP 610-622 (Ex. A through C to 6.6.13 Myers Decl., Sub No. 62B); CP 401-403 (W. English article, Ex. 3 to Groshong Decl., Sub No. 45).

[114] Ms. Gill explained at her deposition that she couldn't say a surface that tested 0.49 was problematic. CP 204-205 (Gill dep. at p. 19 through p. 88, line 8) (Ex. 1 to 2.11.13 Myers Decl., Sub No. 29).

[115] *Id.*

[116] 5.3.4.

Any issues about the interplay between tribometer science, ASTM F2508 and the 0.5 standard should have been resolved at trial or at least a *Frye* hearing. (And at most the trial court's semantic concerns would warrant delimiting Ms. Gill's testimony, not excluding it wholesale.)

C. Ms. Gill's Opinions Independent of Her Slip-Resistance Testing Were Admissible and Raised a Genuine Issue of Fact

A trial court abuses its discretion in summary judgment proceedings if it strikes entire affidavits containing both admissible and inadmissible statements, and the admissible statements show that there are disputed issues of material fact.[117]

Ms. Gill offered the following opinions in addition to her opinions based on her slip-resistance testing of the rim: (i) smooth metal usually has a coefficient of friction of less than 0.5[118]; she tested a smooth rim in another case and the COF was less than 0.5[119]; it is generally accepted in that the inclusion of smooth metal in a pedestrian walkway does not afford adequate traction when wet, is not reasonably safe when wet and should not be part of a pedestrian walkway where wet conditions are reasonably foreseeable[120]; the rim could have been made of diamond plate like the

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[117] *Sun Mountain Productions, Inc. v. Pierre*, 84 Wn. App. 608, 617, 929 P.2d 494 (1997).
[118] CP 564 (Fourth Gill Decl., ¶14, Sub No. 56).
[119] *Id.*
[120] CP 565 (Fourth Gill Decl., ¶17, Sub No. 56).

cover.[121]; treatment with a nonskid material is frequently employed to increase the slip resistance of smooth metal surfaces[122]; slip-resistant vault covers have been available since the early 1990s[123]; and the risk of a slip is greatly enhanced upon encountering a much more slippery surface— the diamond plate cover and the concrete surrounding the rim were much rougher than the rim.[124]

The trial court did not specifically exclude these opinions under ER 702 or on any other basis, only Ms. Gill's opinions regarding slip resistance testing. Her other opinions were admissible and created an issue of fact.

D. The Rim Did Not Comply with the City's Own Standards and Practices—This was Admissible to Show the Rim Wasn't Reasonably Safe

"…[W]hat is usually done pursuant to an industry custom or standard is evidence of what ought to be done by a person exercising reasonable care."[125] A statute, regulation, or other positive enactment may help define the scope of a duty or the standard of care.[126] A jury may

[121] CP 53 (First Gill Decl., ¶9, Sub No. 22). *See also* CP 627-629 (photos of diamond plate rims) (Ex. E to 6.6.13 Myers Decl., Sub No. 62B).
[122] CP 53 (First Gill Decl., ¶11, Sub No. 22).
[123] CP 54 (First Gill Decl., ¶12, Sub No. 22).
[124] CP 264 (Second Gill Decl., ¶13, Sub No. 38).
[125] DeWolf and Allen, 16 Wash. Prac., Tort Law And Practice § 2:41 (3d ed.)
[126] *Owen,* 153 Wn. 2d at 787.

consider industry standards in determining whether a party acted reasonably.[127]

During oral argument counsel for Ms. Kill pointed out that the City's 1986 standard required a slip-resistant rim.[128] The City conceded "…if there were evidence in the record that showed that the hand hole wasn't in compliance, that might well give rise to a jury question…."[129] Counsel for Ms. Kill noted the City represented in its discovery responses that the handhold was installed in 1989.[130] The City then said it would have to amend its discovery responses.[131]

The trial court did not actually analyze whether the rim complied with the referenced standard, instead stating Ms. Kill had not introduced evidence about when the rim was installed other than the City's response in written discovery that it was likely installed in 1989 "or before". This disregarded the reasonable inferences from the evidence. Plaintiffs specifically asked the City this question in discovery and the City indicated 1989 was the likely year. The City's 1986 standard required a

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[127] *Van Hout v. Celotex Corp.*, 121 Wn.2d 697, 705, 853 P.2d 908 (1993); *Broten v. May*, 49 Wn. App. 564, 744 P.2d 1085 (1987) ("Industry standards are generally admissible as evidence of standard of care").
[128] VRP, p. 17, lines 3-20.
[129] VRP, p. 43, lines 7-25.
[130] VRP, p. 53, line 6 through p. 54, line 11.
[131] VRP, p. 59, line 17 through p. 60, line 5.

diamond plate rim. Further, Mr. Read testified diamond plate rims were available when the rim was installed and that was the standard at the time.

There was also evidence the rim did not comply with the City's standards and practices after 1989, at the time of Ms. Kill's fall and since (which included not just using new products such as SlipNOT, but simply applying a nonskid treatment to existing covers and rims). The trial court stated that "[f]ailure to meet current standards does not by itself establish that the metal rim was unreasonably dangerous," correctly observing there was no duty to "retrofit" the handhole to comply with current standards.[132] Plaintiffs did not argue there was such a duty, but there was a duty to keep the rim reasonably safe. The City's standards and practices and the City's deviation from them were evidence that the smooth metal rim was not reasonably safe.

E. The Trial Court Should Have Granted Reconsideration

While the trial court held that the additional evidence of Excel's testing was not "newly discovered" with "reasonable diligence" the court nevertheless expressly stated it considered that evidence. Therefore this Court may also consider it in determining whether summary judgment should have been granted. That said, the Court should also hold that the

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[132] As the trial court held there is generally not a municipal duty to retrofit streets or sidewalks to bring them up to current standards. *Ruff v. County of King*, 125 Wn.2d 697, 705, 887 P.2d 886 (1995).

trial court abused its discretion in denying reconsideration in light of the evidence it considered (particularly in the context of summary judgment vs. trial).

1. *Standard of Review*

A trial court's ruling on a motion for reconsideration is reviewed for an abuse of discretion (when its decision is manifestly unreasonable or based upon untenable grounds or untenable reasons), except errors of law are reviewed de novo.[133]

2. *Reconsideration Was Appropriate*

The additional evidence Plaintiffs' presented upon reconsideration was "newly discovered" with "reasonable diligence" under CR 59(a)(4) and justified reconsideration (particularly in the summary judgment vs. trial context). Ms. Kill could not with "reasonable diligence" have obtained Excel's testing before the hearing. It would not have been reasonable (or feasible)[134] for Ms. Kill to have asked Ms. Gill to send her tribometer to Excel for additional testing before the hearing to determine it was ASTM F2508-compliant when her own expert's testing had already

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[133] *Go2Net, Inc. v. C I Host, Inc.*, 115 Wn. App. 73, 88, 60 P.3d 1245 (2003); Tegland, 15 Wash. Prac., Civil Procedure § 38:30 (2d ed.).

[134] Ms. Gill's ASTM F2508 testing and field test were performed on June 1 and 2, 2013. The summary judgment hearing was on June 7, 2013. Ms. Gill's office is in Spokane, Washington. Exel's office was located in Greer, South Carolina (now in Chesapeake, Virginia).

confirmed that (and Excel had confirmed in consultation with Ms. Gill that her methods were appropriate and her tribometer was calibrated).

The trial court relied on the principle that a party may not supplement an expert's testimony on reconsideration simply because the party failed to realize the expert's testimony was insufficient. This did not accurately characterize the situation and the case cited by the court is distinguishable.[135] Here, the additional evidence did not fill prior gaps in Ms. Gill's analysis—it confirmed she'd been right all along that her tribometer was calibrated. Further, Excel's testing was not "cumulative" as the trial court indicated (it only would have been cumulative if the court had agreed Ms. Gill's tribometer was calibrated).

Reconsideration under CR 59(a)(7) was also appropriate. Based on all of the evidence the trial court reviewed and the inferences from the evidence the orders excluding all of Ms. Gill's opinions and granting summary judgment were unsupported and contrary to law for the reasons previously set forth (*viz.*, whether a condition is reasonably safe is a question of fact, Ms. Gill's opinions satisfied both *Frye* and ER 702 and the evidence showed there was an issue of fact).

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[135] In *Adams v. Western Host, Inc.*, 55 Wn. App. 601, 608, 779 P.2d 281 (1989) the plaintiff's expert wholly failed to discuss the specific facts of the case in his first declaration and this was not corrected until the plaintiff sought reconsideration.

Reconsideration was also appropriate under CR 59(a)(9)'s "substantial justice" standard.[136]

F. The Trial Court Should Have Conducted a *Frye* Hearing

While the trial court correctly held *Frye* did not preclude Ms. Gill's opinions, a *Frye* hearing should have been held to evaluate the underlying science forming the basis for the trial court's ER 702 and 403 rulings.

1. *The Frye Test*

The "*Frye* test" is based on *Frye v. U.S.*, 293 F. 1013 (App. D.C. 1923). A recent decision from the Court summarizes *Frye*:[137]

> 1. Expert testimony is admissible where (1) the scientific theory or principle upon which the evidence is based has gained general acceptance in the relevant scientific community of which it is a part; and (2) there are generally accepted methods of applying the theory or principle in a manner capable of producing reliable results.
>
> 2. Both the theory underlying the evidence and the methodology used to implement the theory must be generally accepted in the scientific community for evidence to be admissible under *Frye*.
>
> 3. Courts do not determine if the scientific theory underlying the proposed testimony is correct; rather, courts "must look to see whether the theory has achieved general acceptance in the appropriate scientific community."

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[136] *See, e.g., Barth v. Rock*, 36 Wn. App. 400, 674 P.2d 1265 (1984).

[137] *Lake Chelan Shores Homeowners Ass'n v. St. Paul Fire & Marine Ins. Co.*, --- P.3d ---, *2, 2013 WL 4432162 (2013); *see also Lakey,* 176 Wn.2d at 915, 918-920 (trial court ordered *Frye* hearing); *Anderson,* 172 Wn.2d 593 at 603.

4. It is not necessary that the relevant scientific community be unanimous in its acceptance of a particular theory or methodology.

The *Frye* standard recognizes that "judges do not have the expertise required to decide whether a challenged scientific theory is correct" and therefore courts "defer this judgment to scientists."[138]

As the trial court recognized, a *Frye* determination must be made before considering ER 702:

> [T]rial courts should initially make a *Frye* determination as to the general acceptance of the scientific principle underlying the expert's proposed testimony. Once the court is satisfied that there exists general acceptance in the appropriate scientific community, the court should look to ER 702 to determine the admissibility of the expert's testimony.[139]

While a separate hearing is not mandatory, when the *Frye* issue is complex and clearly debatable, the court will often conduct a separate hearing to resolve the issue.[140]

2. *Standard of Review*

The standard of review for whether scientific evidence satisfies the *Frye* requirement of general acceptance in the scientific community is *de*

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[138] *Copeland*, 130 Wn.2d 244 at 255, citing *State v. Cauthron*, 120 Wn.2d 879, 887, 846 P.2d 502 (1993) (emphasis added).
[139] *Cauthron*, 120 Wn.2d at 890, fn. 4.
[140] 5B Wash. Prac., Evidence Law and Practice § 702.21 (5th ed.)

novo.[141] This standard also applies to the trial court's decision not to hold a *Frye* hearing.[142]

3. *The Trial Court Should Have Conducted a Frye Hearing Before Excluding Ms. Gill's Opinions*

Frye is implicated by the evidence and the trial court's reasoning. If there are unresolved issues about the underlying scientific/technical methodology there is no benchmark against which to measure the expert's application of the methodology under ER 702.

The City's motions were predicated upon the calibration protocol of ASTM F2508. The principal basis for the trial court's exclusion of Ms. Gill's testimony and resulting summary judgment order was that her tribometer was not calibrated according to ASTM F2508. To the extent there remains any question that her tribometer was calibrated according to the standard, the problem is not that Ms. Gill erred in applying it but that her test results and Excel's call into question whether ASTM F2508's calibration protocol is both "a generally accepted" method and "capable of producing reliable results". There was no rebuttal from Mr. Flynn. Dr. Gill testified that there was confusion in the tribometry community about application of the standard. A *Frye* hearing would be appropriate to assess whether ASTM F2508's calibration method is generally accepted and

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[141] *Eakins v. Huber,* 154 Wn. App. 592, 599-600; 225 P.3d 1041 (2010).
[142] *Gregory*, 158 Wn.2d 759 at 830; *Copeland*, 130 Wn.2d at 255-56.

reliable in the first instance before deciding whether Ms. Gill properly adhered to the ASTM F2508 calibration methodology.

As discussed above *Frye* also applies to the extent the trial court was concerned about how tile variability affected field test measurements, the "relativity" of tribometer measurements and the application of the 0.5 standard. A *Frye* hearing would also be appropriate to address the Court's criticism of the methodology underlying Ms. Gill's differing field test results; instead of considering generally accepted methodology the trial court simply disagreed, which exceeded the scope of its gatekeeping role.

V. CONCLUSION

There was considerable evidence that the rim was not reasonably safe. The trial court erred in excluding Ms. Gill's opinions and in granting summary judgment. Ms. Kill requests that the Court reverse the trial court's order dismissing her claims on summary judgment and remand the case for trial (or alternatively for a *Frye* hearing).

DATED this 26th day of November, 2013.

Attorneys for Appellants Kill

By:_____
Michael David Myers, WSBA No. 22486
Ryan C. Nute, WSBA No. 32530

VI. APPENDIX

APPENDIX – 1


ONE
WAY

APPENDIX – 2

Lori M

City Of Seattle

STANDARD

PLANS

for

Municipal Public Works

Construction

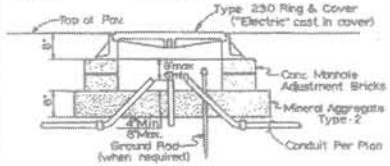
1986

Eleventh Edition

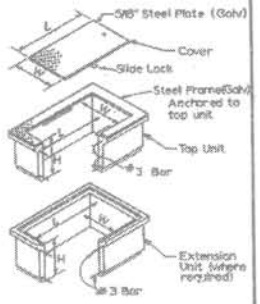
Standard Plan No. 550

Handhole Schedule

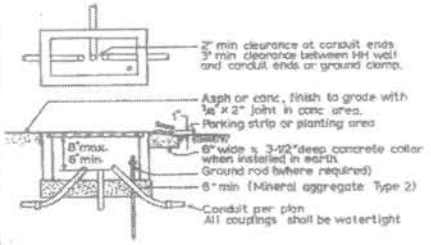
HANDHOLE Type	TOP UNIT Inside Dimensions L	W	H	EXTENSION UNIT (E) H	LID Dimensions L	W
1	19"	14"	12"	12"	17 3/4"	13"
2	28"	17"	12"	12"	25 5/8"	17 1/8"
3	38"	24"	30"	NA	36 1/2"	26"
4	24" Diameter			NA		
GRHH	8" Diameter			NA		



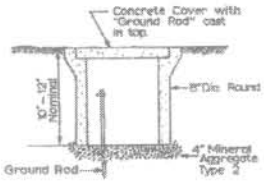
Type 4 Handhole
Traffic Bearing
No Scale



Type 1 & 2 Handhole
with Extension
No Scale



Handhole Installation Detail



Ground Rod Handhole
(GRHH)

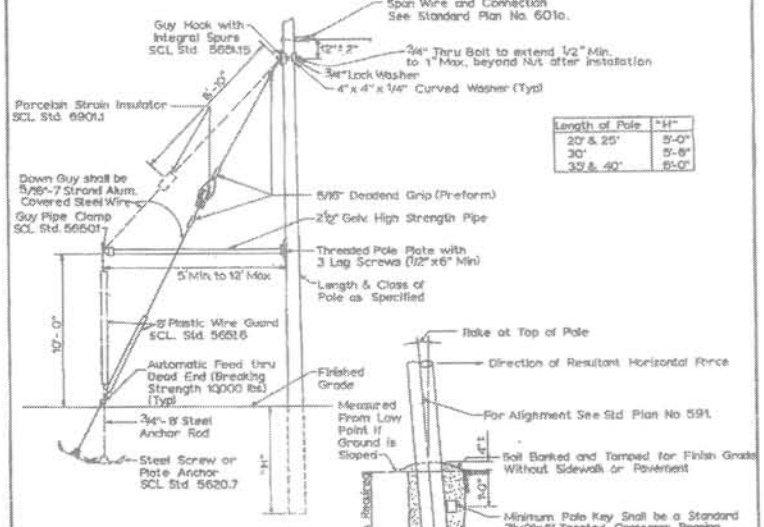
Notes:

1. The cover shall have 1/16" to 1/8" clearance on each edge within the frame after galvanizing.
2. The ground rod shall extend a minimum of 3" above the bottom of the handhole a maximum of 8".
3. Type 1, 2, and 3 handhole covers shall have "TC" or "SL" on them, as appropriate.
4. Type 4 handhole shall be installed in roadways, parking lots, etc.

Ref. Std. Spec. Sec. 8-33

APPROVED BY THE BOARD OF PUBLIC WORKS 10/31 19 CHAIRMAN ATTEST: SECRETARY	CITY OF SEATTLE DEPARTMENT OF ENGINEERING	Handholes

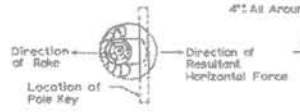
Standard Plan No. 560



Length of Pole	"H"
20' & 25'	5'-0"
30'	5'-6"
35' & 40'	6'-0"

Wood Pole
Down and Sidewalk Guy

Elevation



Plan

Wood Pole Keying
Standard

Rake and Embedment Schedule		
Length Ft.	Embedment Ft.	Rake in Inches
30	5'-6"	18
35	6'-0"	20
40	6'-0"	22

Ref. Std. Spec. Sec. 8-32

Do Not Scale

APPROVED BY THE BOARD OF PUBLIC WORKS 10/31 19 CHAIRMAN ATTEST: SECRETARY	CITY OF SEATTLE DEPARTMENT OF ENGINEERING	Wood Strain Poles

APPENDIX – 3

English XL VIT
User Guide

July 4, 2012

Priorities for Slip Resistance Measurement –

1. Assure the annual Instrument Calibration is current and your slipmeter is in good operating condition.

2. Test foot calibration must be performed as described herein before each metering episode and during extensive testing or testing that may otherwise alter the test foot.

3. When performing wet testing, spray or otherwise apply water to create an "unbroken film." Some surface materials do not permit an unbroken film of water to form regardless of the amount of water applied. Remember, the intent is to simulate a water spill on the walking surface. You have applied sufficient water when you are assured the test foot and walking surface are wetted.

4. You must be completely familiar with the entire English XL VIT User Guide before you use the English XL VIT for slip resistance metering.

5. You must follow the protocols in the English XL VIT User Guide when performing slip resistance metering with the English XL VIT.

Required Items -

To use your English XL VIT, you will need -

- Calibration tile and shim
- Clean dry paper towels or soft cloth towels
- Squeeze bottle with clean tap water
- Test foot sanding system, "The Sander" preferred, or the XL Sanding Pad
- Clean filings brush
- An ankle spring retaining device (blank test foot, thin flat golf divot repair tool, or similar item)

How to Charge the System -

1. Loosen the thumb screw on the regulator at least one (1) full turn so that when the system is charged there is a low reading on the pressure gauge (10-20 psi).

2. Loosen the thumb screw on the CO_2 cylinder holder.

3. If you have an XL VIT with Sequencer, ensure your actuation button is in the UP position before charging the CO_2.

4. Lay the cylinder in the CO_2 holder so the round end of the cylinder is toward the thumb screw, and insert the narrow flat cap end of the cylinder into the puncture pin sleeve.

5. Tighten the CO_2 thumb screw until the pin punctures the cylinder cap, and continue to tighten just enough to seal. Do not over-tighten the thumb screw.

6. Turn the regulator thumb screw in to set the pressure to 25 psi ± 2 psi on the gauge. Test fire the machine to verify the pressure setting after each adjustment.

7. If the instrument has not been used for an extended time, and the piston does not extend when you actuate the button, set the pressure regulator to 0 psi, press the actuation button to depressurize the pneumatic cylinder, grasp the foot and gently pull until the piston moves.

How to Prepare the Standard Neolite Test Foot

1. Have an ankle spring retaining device available (blank test foot, golf divot repair tool, or similar item)

2. Without straining the low pressure plastic tubing, raise the pneumatic cylinder about 20 degrees, grasp the edges of the test foot, pull back the ankle joint spring.

3. If using an ankle spring retaining tool, insert the tool between the bottom of the spring and the back of the white plastic ankle nut, grasp the round white plastic ankle nut, and remove the test foot.

4. If using a blank test foot as a retainer, grasp the round white plastic ankle nut, unscrew and remove the test foot, and replace with the blank foot to retain the nut.

5. The test foot must be dry before sanding – if wet, wipe thoroughly with a clean dry paper towel, allow to air dry for about 1 minute until no visible moisture remains, then sand.

6. Perform 5 to 10 clockwise circles with a standardized test foot preparation device "The Sander", or 180 grit hard-backed sandpaper on the XL Sanding Pad. Use light pressure until a sanding dust "bagel" is produced on the sandpaper.

7. Replace the test foot on the round white plastic ankle nut without touching the Neolite face of the test foot.

8. Adjust the tightness of the test foot on the ankle by pulling back the ankle joint spring then grasp the round white plastic nut. Thread the test foot clockwise into the nut gently until you feel the end of the threads, then loosen ¼ turn. Only grasp the test foot by the edges. Never touch the face of the test foot with your fingers or other source of contamination.

How to Fire the XL VIT –

1. Wrap your fingers around the horizontal handle at the top of the mast, with your hand positioned so that the thumb of that hand presses on the top of the actuating button.

2. Put the thumb of your other hand on the top of the adjusting wheel while putting your fingers of that hand on the frame side rail.

3. Exert just enough pressure on the handle to stabilize the machine, and just enough pressure with your thumbs to actuate the button or turn the wheel. There is no need to use a death grip on the machine, or to jab or pound the button. Think gentle and graceful.

4. Firing with the XL Sequencer model is a smooth, positive press to the bottom, and immediate release of the button of the self-timed actuator.

5. Firing with a standard XL model (without Sequencer) is a firm, continuous actuation of the button to produce a "choo-choo" action and sound. Both the down sound (from your actuation) and the up sound (from the automatic return) should be the same. When it's right, the firing thumb

pressure should bottom-out the actuating button for about ½ second, and you should sense the test foot push on the test surface before releasing the actuator button.

6. When testing, always turn the adjusting wheel ¼ turn between strokes, and always go from a more vertical mast to a more inclined mast. Always go from lower to higher readings on the slip index.

How to Clean your Test Foot Calibration Tile (Your Test Foot Calibration Tile should be cleaned before each test foot calibration series)

1. Rub the test surface of the tile with a clean soft cloth with a few drops of liquid dish detergent soap and plenty of clean warm water.

2. Rinse thoroughly with a strong flow of clean warm water for sufficient time to assure complete removal of the soap.

3. You may either dry the tile with a clean, dry, untreated, lint-free cloth or paper towel, or proceed with the test foot calibration procedure.

4. Never allow the test surface of the Test Foot Calibration Tile to come in contact with your fingers or any other source of potential contamination.

5. Always store your Test Foot Calibration Tile in the packaging originally provided with the tile.

How to Calibrate your Test Foot (You may want to calibrate your test foot at your base of operations if your testing does not involve more than 2 or 3 three test runs, or if there will not be contaminants that would affect the test foot. Otherwise, take your calibration tile with you to verify the continued calibration of your test foot.)

1. Position the test foot calibration tile on a solid stable surface.

2. Prepare the dry test foot as described and properly mount on the XL VIT.

3. Position the slipmeter so the test foot is over the testing location on the test foot calibration tile. Support the rear of the slipmeter with a piece of solid, stable material of thickness equal to the test foot calibration tile thickness.

4. To clean any residual sanding dust from the test foot, initially set the mast to approximately 0.40 slip index, wet the calibration tile under the test foot with clean tap water to provide an unbroken film of water, fire the slipmeter - the foot should slip. Rewet the tile and repeat the slip 3 more times.

5. Set the mast to a slip index of 0.05 *less than* the anticipated value of your tile.

6. Rewet the tile and fire – the test foot should NOT slip.

7. Decline the mast ¼ turn, rewet the tile and repeat until the test foot slips. Read and record the slip index from the protractor.

8. Rotate the calibration tile 90 degrees (or move the slipmeter to another part of the test tile depending on your purpose). Again, starting at 0.05 *less than* the value of your tile, rewet the tile, fire, decline the mast ¼ turn, rewet the tile and repeat until the test foot slips. Read and record the slip index from the protractor at each slip.

9. Repeat for at least 4 slips. If the readings are not ± 0.03, re-prepare the test foot.

10. Your reading should be the Certified Test Foot Calibration Tile value ± 0.03, or a value of 0.20 ± 0.03 on a non-certified test foot calibration tile.

    a. If the reading is consistently low, the test foot is either contaminated or sanded too flat. After assuring the test foot is not contaminated, sand with "The Sander", or alter your manual sanding technique by grasping higher on the test foot while sanding. Be sure the test foot is dry before sanding.

    b. If the reading is consistently high, the test foot may be excessively rounded, oxidized, gouged by a rough testing surface, or contaminated, and will need to be re-prepared. After assuring the test foot is not contaminated, sand with "The Sander", or alter your manual sanding technique by grasping lower on the test foot while sanding. Be sure the test foot is dry before sanding.

    c. If you suspect your test foot is contaminated, wash the Neolite with a warm soap and water solution, rinse until you are certain all soap is removed, wipe thoroughly with a clean dry towel, and air dry until there is no visible moisture, then sand according to normal test foot preparation procedures until your calibration value is achieved.

Perform Dry Testing (test foot and test surface are both dry) -

1. Prepare the test foot as described.

2. Position the slipmeter so the test foot is over the testing location on the test surface. Values may differ within close proximity of each other on some surfaces.

3. Set the mast to a slip index approximately 20 percent less than the anticipated slip value. Start at about 0.60 for smooth, hard surfaces (most clean, dry surfaces measure significantly higher than 0.50). Make sure you always start at a low enough slip index to increment the adjustment wheel ¼ turn and fire at least 3 or 4 times before slip occurs.

4. Fire the machine– the test foot should NOT slip.

5. Decline the mast by incrementing the adjustment wheel ¼ turn, fire, and repeat until the test foot slips. Read and record the slip index from the protractor.

6. Re-prepare the test foot off the machine as described after each dry slip.

7. Rotate the slipmeter or the test surface 90 degrees. Reset the mast so that you will fire at least 3 or 4 times before slip occurs, fire, decline the mast ¼ turn, and repeat until the test foot slips. Read and record the slip index from the protractor at each slip.

8. Re-prepare the test foot as described after each slip.

9. Normally, 4 orthogonal (N, E, S, W) readings on the same spot are sufficient to assess slip resistance. Taking a total of 6-8 readings makes the measurement more statistically significant, if necessary.

10. Note any directional properties of the surface (grain, surface anomalies, etc).

11. If there is no apparent directionality to the test surface and the readings are not within the tolerances specified in the Advisories at the end of this User Guide, and if a trend in the readings is evident, continue testing until the trend stabilizes. If the trend does not stabilize by 10 slips, stop and evaluate the possibility of contamination, surface variations, or other potential variables then re-prepare the test foot and begin again. Surfaces with prominent, sharp asperities may drastically change the test foot when slip occurs. Additional sanding may be required to restore the test foot.

Check your calibration is you suspect the test foot has been altered in any way.

Perform Wet Testing (perform after all anticipated dry testing) –

1. Be extra careful when doing wet testing and the mast is near vertical; make sure to wait longer between firings for the test foot assembly to come to rest against its seat before firing again.

2. Prepare the dry test foot as described.

3. Position the slipmeter so the test foot is over the testing location on the test surface.

4. Wet the surface under the test foot with clean tap water, enough to provide an unbroken film of water.

5. To clean any residual sanding dust from the test foot, initially set the mast to approximately 0.40 slip index, wet the test surface under the test foot with clean tap water to provide an unbroken film of water, fire the slipmeter.

    a. If the foot slips at 0.40 slip index, rewet the surface and repeat the cleaning slip 3 more times. Set the mast to a slip index approximately 20 percent less than the anticipated slip value (start at about 0.05 for smooth, hard surfaces). Make sure you always start at a low enough slip index to increment the adjustment wheel ¼ turn and fire at least 3 or 4 times before slip occurs.

    b. If the foot does not slip at 0.40 slip index, the test surface asperities are sufficiently prominent to make any trace sanding dust irrelevant. Continue wet testing as described below. Make sure you always start at a low enough slip index to increment the adjustment wheel ¼ turn and fire at least 3 or 4 times before slip occurs.

6. Wet the test surface under the test foot.

7. Fire the machine– the test foot should NOT slip.

8. Wet the surface under the test foot.

9. Decline the mast ¼ turn, fire, wet the surface, and repeat until the test foot slips. Read and record the slip index from the protractor.

10. Rotate the slipmeter or test surface 90 degrees. Reset the mast so that you will fire at least 3 or 4 times before slip occurs, wet the surface under the test foot, fire, decline the mast ¼ turn, and repeat until the test foot slips. Read and record the slip index from the protractor at each slip.

11. Normally, 4 orthogonal (N, E, S, W) readings on the same spot are sufficient to assess slip resistance. Taking a total of 6-8 readings makes the measurement more statistically significant, if necessary.

12. Note any directional properties of the surface (grain, surface anomalies, etc).

13. If there is no apparent directionality to the test surface and the readings are not within the tolerances specified in the Advisories at the end of this User Guide, and if a trend in the readings is evident, continue wet testing until the trend stabilizes. For wet testing with slip resistance values below 0.20, re-sand if and when a declining trend appears. For slip resistance values above 0.20, dry the test foot completely and re-sand after 8 slips unless a definitive declining trend appears before then.

Advisories - General

- Acceptable tolerances for homogeneous materials are ±0.03 for slip resistance readings less than 0.50, and ±0.05 for slip resistance readings equal to or greater than 0.50.

- If, for some reason, you know that the reading you took was not a valid reading (e.g. you sneezed, and the machine moved when the foot slipped, or similar known inappropriate displacement of the machine) do not record the value.

- A slip during a test with the English XL VIT is defined as when the first full extension of the pneumatic cylinder occurs. Creeps are not a slip.

- If the lower tube pops off under normal operating conditions, simply use scissors to cut ¼" from the end and reattach the tube to the nipple. The tubing is long enough to perform the cut several times before requiring a new tube. When you raise the pneumatic cylinder, make sure you don't strain the tube – this should eliminate the issue.

- Yellowing of the polymer tubes is a result of the lubrication in the CO_2. If your tubing becomes noticeably yellowed in less than one year from

Instrument Calibration, you are classified as a heavy user, and it is recommended that you have your Instrument Calibration performed more often.

- Always loosen the pressure regulator thumb screw and remove the CO_2 cylinder when finished testing to protect the pressure gauge.
- Rarely, when the pressure is not able to be controlled, the regulator has blown and your machine needs service.
- Rarely, grease may be expelled from the exhaust port of the actuation valve. If this is an issue, clean the exhaust ports with a cotton swab periodically to avoid build-up.
- Rarely, the rubber cushion "dot" under the pneumatic cylinder is lost. Your machine will need service.
- Do not pull on the test foot or connecting shaft while the system is pressurized.
- If the instrument has not been used for an extended time, and the piston does not extend when you actuate the button, set the pressure regulator to 0 psi, press the actuation button to depressurize the pneumatic cylinder, grasp the foot and gently pull until the piston moves.
- If you can get a clean strike on a surface, you can take a measurement. If the test foot physically impinges on the side of a projection, the slip resistance is mechanical obstruction, as opposed to the interaction of surfaces in relative motion to each other and the reading is not valid.

Advisories - Test Foot

- The condition of the test foot is the only significant variable in the accuracy and reliability of your testing results, if your machine is in sound condition and is current with its annual Instrument Calibration, and if you use your slipmeter properly according to this User Guide. Use extra care when you calibrate your test foot.
- If you suspect that the Neolite has become contaminated, wash the Neolite with a warm soap and water solution, rinse until you are certain all soap is removed, wipe thoroughly with a clean dry towel, air dry until there is no visible moisture, sand according to normal test foot preparation procedures, and perform a test foot calibration.

- Calibration of the test foot on the standard XL calibration tile to 0.20 is the method of standardizing the test foot surface. If you are unable to repeatedly manually achieve the calibration value on your calibration tile, you must practice your sanding technique until your value is consistent, or preferable use the standardized test foot preparation device "The Sander."

- Neither age nor thickness affects the usefulness of Neolite; as long as there is an even thickness of uncontaminated Neolite, it is usable. Replacement is recommended when the thickness is 0.02 inches or less.

- The cleanliness of the sandpaper is critical for preparing the Neolite test foot. The presence of sanding dust on the test foot may significantly affect results. As a general rule, the sandpaper is no longer clean enough if there is any visible Neolite ® sanding dust after vigorous brushing with the filings brush provided with your English XL VIT.

- If not using "The Sander", which is the preferred method, use the XL Sanding Pad. If you are highly confident in your manual sandig technique, you may use sheet 180 grit Silicon Carbide sandpaper, held securely flat on a hard smooth surface, such as a countertop or smooth hard floor. If not using "The Sander", be certain of your sanding technique by calibrating the test foot before, during and after testing to assure that your manual sanding technique consistently produces the correct calibration value each time.

- A gouged, significantly contaminated or improperly prepared test foot may require 50 to several hundred sanding circles with "The Sander" or the proper manual technique to correct the defective condition. See the extended discussions in the Newsletters on www.exceltribometers.com.

- The test foot must be dry before sanding. If the test foot is wet, the sandpaper will be clogged with sanding mud and be ruined. Always wipe a wet test foot thoroughly with a clean dry paper towel, allow to air dry for about 1 minute until all visible moisture is gone, then sand.

- To avoid contamination of the test foot face, only grasp the test foot by the edges. Never touch the face of the test foot.

- It is advisable to calibrate the test foot at your base of operations if testing does not involve more than 2 or 3 three test runs, or if there will not be contaminants that would affect the test foot. Otherwise, take your calibration tile with you to verify the continued calibration of your test foot.

Advisories – Packing, Storage, and Shipping your Machine

- When not using your slipmeter, stretch a thin rubber band around the ankle spring and attach the other end of the rubber band to the bolt under the pressure gauge to prevent damage to the test foot assembly.

- Do not ship the tribometer unless it is in its carrying case. Remove all books, parts, and accessories from the carrying case pockets.

- When shipping, put the slipmeter in the soft case, with the mast set to about 0.05 (nearly vertical) slip resistance. Fill the space in the soft case over the regulator with bubble wrap or 'air bags' to keep the meter seated at the bottom of the case. Snap the case closed, and put it in a box with enough packing that it will not move when shaken.

- Do not ship CO_2 to when you send your machine for Instrument Calibration.

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APPENDIX – 4

Designation: F2508 – 11

Standard Practice for Validation and Calibration of Walkway Tribometers Using Reference Surfaces[1]

This standard is issued under the fixed designation F2508; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice is intended to establish the parameters for validation and calibration of walkway tribometers.

1.2 This practice provides a walkway tribometer supplier with a procedure and suite of reference surfaces to validate his walkway tribometer by properly ranking and differentiating the surfaces.

1.3 This practice provides the user of a walkway tribometer with a procedure and suite of reference surfaces to test calibration of his instrument.

1.4 This practice describes the necessary materials, specifications, and the cleaning process for reference materials, as well as the requirements for the validation of a supplier's walkway tribometer and calibration of a user's walkway tribometer.

1.5 This practice applies to walkway tribometers without reference to the nature of the scale of the readings produced by them. The scale used in the reports of validation and calibration must be the same, and are to be those of the instrument or defined for the instrument.

1.6 The values stated in SI units are to be regarded as standard. The values given in parentheses are for information only and are not considered standard.

1.7 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D1349 Practice for Rubber—Standard Temperatures for Testing

D3244 Practice for Utilization of Test Data to Determine Conformance with Specifications

F1646 Terminology Relating to Safety and Traction for Footwear

3. Terminology

3.1 *Definitions*—For terms used in this practice not identified herein, refer to Terminology F1646.

3.1.1 *paired t-test, n*—a test of statistical significance based on the use of student's *t*-distribution and used to compare two sample means (see Appendix X2).

3.1.2 *supplier, n*—any individual, agent, company, manufacturer, or organization responsible for the walkway tribometer prior to receipt by the user. **D3244**

3.1.3 *test foot, n*—shoe bottom material or surrogate mounted on the walkway tribometer that comes into contact with the surface being tested.

3.1.4 *walkway tribometer, n*—any apparatus used to measure the frictional forces acting at an interface between a walkway surface and shoe material.

3.1.4.1 *Discussion*—A judgement of the adequacy of these frictional forces acting on a walkway surface/shoe surface interface is the basis for an assessment of slip properties relative to human locomotion.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *calibration, n*—the set of operations that establishes, under specified conditions, the relationship between the values obtained by a walkway tribometer and the corresponding supplier reference values.

3.2.2 *reference surfaces (RS's), n*—specified materials, identified in Section 7, that have an experimentally demonstrated slip properties for a select population of pedestrians and serve as references for walkway tribometer measurements.

3.2.3 *validation, n*—the set of operations that establishes, under specified conditions, the proper ranking and differentiation of reference surfaces by a walkway tribometer.

[1] This practice is under the jurisdiction of ASTM Committee F13 on Pedestrian/Walkway Safety and Footwear and is the direct responsibility of Subcommittee F13.10 on Traction.

Current edition approved March 15, 2011. Published March 2011. DOI: 10.1520/F2508-11.

[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

4. Summary of Practice

4.1 This practice establishes a procedure to: *(1)* validate walkway tribometer models against a human gait-based reference system, and *(2)* calibrate each individual walkway tribometers of a validated model against published suppliers' reference values (as defined in 9.1, Eq 4).

4.2 This practice provides for validation and calibration of walkway tribometers as a means of verifying their relationship to reference surfaces and verifying a particular device continues to produce consistent results.

4.3 The method of ranking walkway surface slip properties using a limited population of ambulating human subjects is supported by a peer-reviewed study.[3]

4.4 Validation consists of a series of 40 tests on each reference surface from this practice. A walkway tribometer model is considered valid if it ranks the four reference surfaces from this practice in the proper order with statistically significant differentiation between results obtained for each surface. Validation is intended to be accomplished for each walkway tribometer model when it is initially introduced and is to be accomplished by or on behalf of the supplier and made available to each user.

4.5 Calibration for a specific walkway tribometer requires a series of 16 tests on each of the reference surfaces from this practice. A specific walkway tribometer is considered within calibration if the bias of the mean test values for each surface falls within the 95 % confidence interval for the walkway tribometer model as established by the validation tests (as defined in 9.1, Eq 4).

5. Significance and Use

5.1 To be meaningful, walkway tribometer results must correlate the slip characteristics of a surface or contaminant, or both, to the actual propensity for human slips. To achieve this goal, walkway tribometer models must be validated against a standard with relevance to human ambulation.

5.2 This practice prescribes a series of reference surfaces with known relative slip potential ranging from very high to low (as defined by laboratory conditions only) upon which walkway tribometer models can be validated. The relative slip potential of each reference surface was established from human subject walking trials.[3]

5.3 The following should be considered in applying the validation and calibration obtained by this practice:

5.3.1 The scientific study upon which the validation process is based was conducted with a select population of young adults (mean age 26 years) who were free from gait deviations while walking in a straight path on a level surface with a mean walking velocity of 2.18 m/s. This walking velocity is faster than the average walking velocity for the general population which includes a much wider age range with greater variability; thus, the study sample population of pedestrians and conditions is not representative of the larger general population of pedestrians.

5.3.2 All subjects walked in Oxford-style shoes whose soles were constructed of smooth styrene butadiene rubber (SBR) with 75A Shore hardness. The shoe style and sole material is not representative of all combinations available in the marketplace.

5.3.3 The reference surfaces defined in this practice are not representative of all walkway surfaces. The outcome of the validation practice reflects performance on the type of reference surfaces and surface conditions defined in this practice only. Validation and calibration of a walkway tribometer as defined by this practice does not imply validation and calibration under all combinations of test foot materials and walkway surfaces.

5.3.4 The validation and calibration procedure defined by this practice is not intended to establish a "safe threshold" value for any walkway surface.

6. Apparatus

6.1 The walkway tribometer shall be free of defects and operational throughout its range. Refer to the walkway tribometer instruction manual to ensure proper operation and instrument condition before the validation and calibration process.

6.2 *Test Foot Designation and Condition*:

6.2.1 The supplier must provide test foot material, dimension, storage, and service life specifications. The specifications shall be sufficient to permit procurement of an exemplar test foot.

6.2.2 A uniquely numbered test foot, meeting the supplier's material and dimensional specifications shall be provided with the walkway tribometer being tested.

6.2.2.1 The calibration results shall apply only to the walkway tribometer/test foot combination tested.

6.2.3 Prepare the test foot as prescribed by the walkway tribometer supplier or by a fully documented procedure included in the validation or calibration report.

7. Reference Surfaces (RS's)[4]

7.1 *Reference Surfaces*:

7.1.1 *RS A*—Polished black granite whose surface beneath the test foot is covered with a continuous film of 0.04 % by volume solution of Triton X-100[5] (nonionic surfactant) in distilled water (that is, 200 µL of Triton X-100 per 500 mL of distilled water).

7.1.2 *RS B*—Porcelain whose surface beneath the test foot is covered with a continuous film of distilled water.

7.1.3 *RS C*—Vinyl composition tile whose surface beneath the test foot is covered with a continuous film of distilled water.

7.1.4 *RS D*—Ceramic whose surface beneath the test foot is covered with a continuous film of distilled water.

7.2 Each RS shall be permanently marked to designate its reference class (that is, "A", "B", "C", "D").

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[3] Powers, C. M., Blanchette, M. G., Brault, J. R., Flynn, J., and Siegmund, G. P., "Validation of Walkway Tribometers: Establishing a Reference Standard," *Journal of Forensic Sciences*, Vol. 55, No. 2, March 2010, pp. 366–370.

[4] Available from ASTM International Headquarters. Order Adjunct No. ADJF2508. Original adjunct produced in 2011.

[5] The sole source of supply of the apparatus known to the committee at this time is Gallade Chemical, Santa Ana, CA. If you are aware of alternative suppliers, please provide this information to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee,[1] which you may attend.

7.3 Reference surfaces shall be stored in a manner that prevents deformation and contamination.

7.4 Reference surfaces should not be used for validation or calibration testing after 5 years from date of purchase.

8. Procedure

8.1 *Environment*—The validation and calibration test shall be performed at a humidity level of 50 ± 5 % and a temperature range of 23 ± 2°C (73.4 ± 3.6°F) (derived from Practice D1349).

8.2 *Reference Surface Preparation*—The reference surface shall be free from visible dents, cracks, voids, or other significant blemishes.

8.2.1 *Cleaning*:

8.2.1.1 No surface treatment except as specified in this section is permitted.

8.2.1.2 Prepare a 0.05 % by volume solution of liquid sodium lauryl sulfate in distilled water (that is, 250 µL of sodium lauryl sulfate per 500 mL of distilled water).

8.2.1.3 Dip a clean soft-bristled nylon brush in the cleaning solution and gently scrub in a circular pattern the entire reference surface for a minimum of 10 s. Reapply the cleaning solution and repeat the minimum 10-s scrubbing two times.

8.2.1.4 Rinse the surface thoroughly with distilled water, ensuring that no visible suds or soap residues remain.

8.2.1.5 Dry the surface with dry and oil-free compressed air or air dry if compressed air is not available. The reference surface shall exhibit no visible moisture film or droplets.

8.2.1.6 Prepare an ethanol solution containing equal parts denatured ethanol in distilled water.

8.2.1.7 Dip a clean soft-bristled nylon brush, different from that used in 8.2.1.3, in the ethanol solution and gently scrub the reference surface for 10 s.

8.2.1.8 Dry the reference surface with dry and oil-free compressed air or air dry if compressed air is not available. Any visible contamination remaining after this step will disqualify the reference surface for use.

8.2.1.9 Ensure that handling of the reference surface does not introduce contaminants to the surfaces, including exposing the surfaces to contact of human skin.

8.2.1.10 The cleaning procedure should be performed before each testing session.

8.3 *Reference Surface Mounting*—Mount the reference surface onto a flat and rigid substrate that prevents movement of the reference surface parallel to the test plane of the walkway tribometer during testing. Select a substrate that will not deform during wet testing.

8.4 *Walkway Tribometer Validation Testing*—Using the walkway tribometer being validated and the test foot prepared in 6.2.3, perform 40 tests in accordance with a uniquely identifiable version of the walkway tribometer supplier's operating instructions or any other formal procedure in the test area of each of the four reference surfaces that have been prepared in accordance with 8.2. Of the 40 tests, perform 10 in each of 4 orthogonal directions, that is, at 0, 90, 180, and 270° relative to an arbitrarily defined direction on the reference surface. Record the results of all tests as specified in Section 10.

9. Analysis of Results and Walkway Tribometer Validation

9.1 For the 40 tests on each reference surface, calculate the mean ($\bar{X}$), standard deviation (*SD*), standard error (*SE*) of the mean, and 95th percentile confidence interval (*CI*) for the walkway tribometer test results for each reference surface using Eq 1 through Eq 4, respectively:

$$\bar{X} = \frac{1}{n}\sum_{i=1}^{n}(x_i) \tag{1}$$

where:

n = number of measurements (40), and

x_i = test result

$$SD = \sqrt{\frac{1}{n-1}\cdot\sum_{i=1}^{n}(x_i-\bar{x})^2} \tag{2}$$

$$SE = \frac{SD}{\sqrt{n}} \tag{3}$$

$$\text{95th percentile } CI = \bar{X} \pm (1.96 \times SE)$$
$$= \bar{X} - (1.96 \times SE) \text{ to } \bar{X} + (1.96 \times SE) \tag{4}$$

9.2 A valid walkway tribometer must properly rank the friction between the test foot and reference surfaces and provide a statistically unique slip resistance measure for each surface. A valid walkway tribometer model shall satisfy the following two compliance criteria:

9.2.1 *Rank Order*—The rank order of the mean walkway tribometer results for each reference surface shall be the same as shown in Appendix X1.

9.2.2 *Differentiation*—Using the mean and standard deviation, paired *t*-tests as described in Appendix X2 shall produce significantly different results ($p < 0.05$) for all adjacently ranked reference surfaces (that is, between RS A and RS B, RS B and RS C, and RS C and RS D).

9.3 Failure to meet the two validation criteria shall be considered an unsatisfactory result. The supplier's guidelines for troubleshooting shall be followed, and the walkway tribometer validation repeated. If the results are still not satisfactory, the walkway tribometer fails the validation.

10. Walkway Tribometer Validation Report

10.1 The report shall include information about the walkway tribometer, test foot, reference surfaces, test procedure, and analysis method to allow the validation testing to be reproduced. The report shall include the following minimum information:

10.1.1 Operator, test address, company, and contact information;

10.1.2 Source of reference surfaces and date acquired;

10.1.3 Validation test date;

10.1.4 Validation temperature and humidity;

10.1.5 Walkway tribometer supplier, model number, and serial number;

10.1.6 Test foot number, material, age, preparation procedure, and dimensions;

10.1.7 The supplier's published version of the walkway tribometer operating instructions, test foot preparation, and test procedure. If a different procedure is used, attach a full description to the report;

10.1.8 *Test Results*—Mean, standard deviation, standard error of the mean, and 95th percentile confidence intervals for each reference surface (see Section 9);

10.1.9 Results of the rank order of reference surfaces and a statement of whether the walkway tribometer complies (see 9.3);

10.1.10 Results of the differentiation of reference surfaces and a statement of whether the walkway tribometer complies (see 9.3);

10.1.11 Comments on any aspect of the validation process that the operator judged to be noteworthy or that may have affected the test results; and

10.1.12 Statement that validation has been performed in accordance with this practice.

11. Validation Schedule

11.1 Validation shall be performed by walkway tribometer suppliers or independent testing facility:

11.1.1 When the walkway tribometer model is first certified to comply with this practice; and

11.1.2 Whenever the design of a walkway tribometer model is changed.

12. Walkway Tribometer Calibration Testing

12.1 Using the walkway tribometer being calibrated and the test foot prepared in 6.2.3, use supplier's instructions or any other formal procedure to perform 16 tests on each reference surface (defined in Section 7) in the test area that has been prepared by 8.2. Of the 16 tests, perform four in each of four orthogonal directions, that is, at 0, 90, 180, and 270° relative to an arbitrarily defined direction on the reference surface. Record the results for all tests as specified in Section 10.

13. Analysis of Results and Walkway Tribometer Calibration

13.1 Compute the mean for each reference surface using Eq 1 (see 9.1).

13.2 To be considered a calibrated walkway tribometer, the mean for each reference surface shall lie within the supplier's reported 95th percentile confidence interval.

13.3 Failure to meet this calibration criterion shall be considered an unsatisfactory result. The walkway tribometer shall be recalibrated or adjusted, or both, in accordance with the supplier's instructions and the walkway tribometer calibration repeated. If the result is still not satisfactory, the walkway tribometer fails calibration.

14. Walkway Tribometer Calibration Report

14.1 The report shall include sufficient information about the walkway tribometer, test foot, test foot preparation, reference surfaces, test procedure, and analysis method to allow the calibration testing to be reproduced. The report shall include the following minimum information:

14.1.1 Operator, test address, company, and contact information;

14.1.2 Source of reference surfaces and date acquired;

14.1.3 Calibration test date;

14.1.4 Calibration temperature and humidity;

14.1.5 Walkway tribometer supplier, model type, and serial number;

14.1.6 Test foot number, material, age, preparation procedure, and dimensions;

14.1.6.1 The calibration results shall apply only to the unique walkway tribometer/test foot combination tested.

14.1.7 The supplier's published version of walkway tribometer operating instructions, test foot preparation, and test procedure. If a different procedure is used, attach a complete description to the report;

14.1.8 *Test Results*—Mean of each reference surface;

14.1.9 Comparison of mean to supplier's reported 95th percentile confidence interval;

14.1.10 Statement addressing walkway tribometer's compliance or noncompliance with criterion;

14.1.11 Comments on any aspect of the calibration process that the operator judged to be noteworthy or that may have affected the test results; and

14.1.12 Statement that the calibration has been performed in accordance with this practice.

15. Calibration Schedule

15.1 Calibration shall be performed:

15.1.1 Following initial manufacture and before delivery to the initial end user;

15.1.2 Following introduction of a new test foot;

15.1.3 After any repair of the walkway tribometer; and

15.1.4 At intervals not to exceed one year.

16. Keywords

16.1 slip properties; walkway tribometer

APPENDIXES

(Nonmandatory Information)

X1. RANK ORDER OF REFERENCE SURFACES

X1.1 Reference surfaces from left to right ranked from least to most slip resistant in Table X1.1.

TABLE X1.1 Rank Order of Reference Surfaces

Least Slip Resistant → Most Slip Resistant			
RS – A	RS – B	RS – C	RS – D

X2. PAIRED *t* TEST

X2.1 *Formula for Calculation of t:*

$$t = \frac{d_m}{SD/\sqrt{N}} \quad \text{(X2.1)}$$

where:

d_m = the mean difference, that is, the sum of the differences of all the data points (RS A measurement 1 – RS B measurement 1, ...) divided by the number of pairs (40),

SD = the standard deviation of the differences between all the pairs (calculate using Eq 2, see 9.1), and

N = the number of pairs (40).

NOTE X2.1—Use the absolute value of t (that is, assume that t is positive).

X2.2 *Calculation of Statistical Significance between Reference Surfaces:*

X2.2.1 If the calculated t value is greater than 1.694 (critical value), then a statistically significant difference exists between reference surfaces.

X2.2.2 If the calculated t value is less than 1.694 (see Note X2.2), then no statistically significant difference exists between reference surfaces.

NOTE X2.2—The selection of this critical value assumes: *(1)* one-tailed t test (used when there is an expectation of a significant difference between groups), *(2)* 39 degrees of freedom (number of pairs – 1), and *(3)* 0.05 level of significance.

APPENDIX – 5

REPORT OF ASTM F2508 VALIDATION OF THE ENGLISH XL VIT WITH SEQUENCER VARIABLE INCIDENCE/ARTICULATED STRUT TRIBOMETER WITH STANDARD XL VIT NON-TREADED TEST FOOT AND STANDARDIZED TEST FOOT PREPARATION DEVICE

January 16, 2012

Excel Tribometers LLC proffers this Report of ASTM F2508 Validation of the XL VIT as the patent owner, manufacturer and sole authorized supplier and servicer of the English XL VIT Variable Incidence/Articulated Strut Tribometer, hereinafter referred to as the XL VIT.

Excel Tribometers LLC certifies and affirms that the XL VIT with sequencer-model conforms to all requirements of ASTM F2508-11 Standard Practice for Validation and Calibration of Walkway Tribometers Using Reference Surfaces, which conformance validates the XL VIT with sequencer-model properly and adequately correlates the slip characteristics of a surface or contaminant, or both, to the actual propensity for human slips against a human gait-based reference system and standard practice with relevance to human ambulation.

The XL VIT with sequencer-model performed all operations under the specified F2508 standard practice validation conditions. The XL VIT with sequencer-model performed a series of 40 tests on each of the requisite reference surfaces and ranked the four reference surfaces in the proper order with statistically significant differentiation between the results obtained for each surface. The test results are appended hereto.

All testing was conducted in accordance with the July 4, 2012 version of the XL VIT User Guide, available on the ExcelTribometers.com website, and using the XL VIT standardized test foot preparation device, "The Sander." Peter Widas, Vice President and Chief Operations Officer of Excel Tribometers, LLC, performed the testing on January 16, 2013, at the home office of Excel Tribometers, LLC, 160 Tymberbrook Drive, Lyman, SC, 29365, where the air temperature was 73.4 degrees ± 3.6 degrees Fahrenheit, and relative humidity was 50 percent ± 5 percent.

The test instrument was the XL VIT with sequencer-model, serial number 1011724, manufactured and supplied by Excel Tribometers LLC.

The test foot was standard XL VIT non-treaded test foot, serial number 2006, 1.25 inches ± 0.03 inches diameter true circle.

XL VIT Base-Model ASTM F2508 Validation Report

The XL VIT standardized test foot preparation device, "The Sander," was serial number 101.

The test foot used in this validation was surfaced with Neolite® on October 19, 2012, by Excel Tribometers LLC. The Neolite® was manufactured on June 19, 2012, by Smithers Scientific Services, Inc., 425 W. Market St. Akron, OH 44303. USA. Tel: 330-762-7441. The Neolite® is stored in ambient open interior conditions. The service life of the Neolite® surface of the test foot is unlimited as long as there is an even, minimum 0.020 inches thickness of uncontaminated Neolite.

Test foot preparation was in accordance with the July 4, 2012 version of the XL VIT User Guide, available on the ExcelTribometers.com website, using the XL VIT standardized test foot preparation device, "The Sander."

Testing was conducted on the specified reference surfaces acquired from ASTM International Headquarters on March 23, 2011. The reference surfaces are stored in a flat, secure, enclosed, clean containment to prevent deformation and contamination.

Each reference surface was permanently and respectively marked *RS-A* for the polished black granite, *RS-B* for the porcelain, *RS-C* for the vinyl composite tile, and *RS-D* for the ceramic.

The reference surfaces were supported during testing on a flat and rigid substrate, which was impervious to the liquids used, and that prevented movement of the reference surface parallel to the test plane of the XL VIT base-model.

The cleaning procedure performed before each testing session was: 1.) Prepare a 0.05% by volume solution of liquid sodium lauryl sulfate in distilled water (that is, 250 µL of sodium lauryl sulfate per 500 mL of distilled water). 2.) Dip a clean soft-bristled nylon brush in the cleaning solution and gently scrub in a circular pattern the entire reference surface for a minimum of 10 seconds. Reapply the cleaning solution and repeat the minimum 10-seconds scrubbing two times. 3.) Rinse the surface thoroughly with distilled water, ensuring that no visible suds or soap residues remain. 4.) Dry the surface with dry and oil-free compressed air or air dry if compressed air is not available. The reference surface shall exhibit no visible moisture film or droplets. 5.) Prepare an ethanol solution containing equal parts denatured ethanol in distilled water. 6.) Dip a clean soft-bristled nylon brush, different from that used in step 2 above, in the ethanol solution and gently scrub the reference surface for 10 seconds. 7.) Dry the reference surface with dry and oil-free compressed air or air dry if compressed air is not available. Any visible contamination remaining after this step would disqualify the reference surface for use. Handling of the reference surface was so as to not introduce contaminants to the surfaces, including prohibiting exposing the surfaces to contact of human skin.

XL VIT Base-Model ASTM F2508 Validation Report

Using the identified XL VIT with sequencer-model, the identified standard XL VIT non-treaded test foot prepared as specified, and the identified XL VIT standardized test foot preparation device, "The Sander," 40 tests were performed in accordance with the identified version of the XL VIT User Guide, in the test area of each of the four reference surfaces that were prepared as specified, ten (10) tests in each of four (4) orthogonal directions, that is, at 0, 90, 180, and 270 degrees relative to an arbitrarily defined direction on the reference surface, and the results of the tests were recorded and are appended hereto.

The *RS A* reference surface beneath the test foot was covered during testing with a continuous film of 0.04% by volume solution of Triton X-100 (nonionic surfactant, currently available from Gallade Chemical, Santa Ana, CA.) in distilled water (that is, 200 µL of Triton X-100 per 500 mL of distilled water). The *RS B*, *RS C*, and *RS D* reference surfaces beneath the test foot were covered with a continuous film of distilled water.

As detailed in the XL VIT with sequencer-model F2508 Validation Testing Form appended hereto, the following results were achieved:

	RS-A Granite	**RS-B Porcelain**	**RS-C Vinyl**	**RS-D Ceramic**
Mean	0.080	0.134	0.177	0.611
Standard Deviation	0.007	0.008	0.011	0.019
Standard Error	0.001	0.001	0.002	0.003
95th Confidence Lower	0.078	0.132	0.173	0.605
95th Confidence Higher	0.082	0.137	0.180	0.616
Rank (1 = least slip resistant)	1	2	3	4

Note that the 95th percentile confidence interval for Peter Widas performing the testing was less than ± 0.006 for all reference surfaces, which is substantially more accurate than required for statistical differentiation of the reference surfaces, and/or substantially more accurate than required for ranking of the references surfaces.

Based on the practical range of accuracy required for a walkway tribometer to meaningfully measure slip resistance to assess the relative risk for human slip and fall injury, and based other testing and analyses, Excel Tribometers LLC, as the manufacturer and supplier of the XL VIT with sequencer-model, has established a 95th percentile confidence interval for the XL VIT with sequencer-model of ± 0.03 for slip resistance values equal to or less than 0.50, and ± 0.05 for slip resistance values greater than 0.50.

The values of ***t*** for the paired ***t*** test for adjacently ranked surfaces are as follows:

Paired *t* Test		
A-B	40.657	>1.694
B-C	19.272	>1.694
C-D	116.742	>1.694

XL VIT Base-Model ASTM F2508 Validation Report

The XL VIT with sequencer-model and the standard XL VIT non-treaded test foot, using the XL VIT standardized test foot preparation device, "The Sander," clearly achieved statistical differentiation and complied with the rank order of reference surfaces as established in ASTM F2508-11 Standard Practice for Validation and Calibration of Walkway Tribometers Using Reference Surfaces.

Validation of the XL VIT base-model will be performed again whenever the design of the XL VIT base-model is changed.

An F2508 Calibration procedure shall be performed following initial manufacture and before delivery to the initial end user of each XL VIT base-model who so requests.

Verification of the F2508 Validation of the XL VIT with sequencer-model shall otherwise be accomplished through an F2508 Calibration procedure following introduction of a new test foot; after any repair of the walkway tribometer that could affect the performance of the tribometer; and at intervals not to exceed one year.

The F2508 Calibration procedure consists of a series of 16 tests on each of the reference surfaces, four (4) tests in each of four (4) orthogonal directions, that is, at 0, 90, 180, and 270 degrees relative to an arbitrarily defined direction on the reference surface, all in accordance with specifications and procedures defined herein and defined in the ASTM F2508-11 Standard Practice for Validation and Calibration of Walkway Tribometers Using Reference Surfaces.

The XL VIT base-model is considered within calibration if the bias of the mean test values for each surface falls within the 95th percentile confidence interval herein defined for the XL VIT base-model, as established by the validation tests, and as established by Excel Tribometers LLC. Failure to meet this calibration criterion shall be considered an unsatisfactory result, and shall require the XL VIT base-model be recalibrated or adjusted, or both, by Excel Tribometers LLC, and the F2508 Calibration procedure repeated.

An F2508 Calibration Report shall be prepared and include sufficient information about the XL VIT base-model, test foot, test foot preparation, reference surfaces, test procedure, and analysis method to allow the calibration testing to be reproduced. The F2508 Calibration Report shall include at the minimum: 1.) Operator, test address, company, and contact information; 2.) Source of reference surfaces and date acquired; 3.) Calibration test date; 4.) Calibration temperature and humidity; 5.) Walkway tribometer supplier, model type, and serial number; 6.) Test foot number, material, age, preparation procedure, and dimensions; 7.) The Excel Tribometers LLC version of the XL VIT User Guide, test foot preparation, and test procedure used; 8.) Test Results: Mean of each reference surface; 9.) Comparison of mean to Excel Tribometers LLC reported 95th percentile confidence interval; 10.) Statement addressing compliance or noncompliance with criterion; 11.) Comments on any aspect of the calibration process

that the operator judged to be noteworthy or that may have affected the test results; and 12.) Statement that the calibration has been performed in accordance with ASTM F2508-11 Standard Practice for Validation and Calibration of Walkway Tribometers Using Reference Surfaces.

The calibration results shall apply only to the unique XL VIT with sequencer-model/XL VIT, standard XL VIT non-treaded test foot, and XL VIT standardized test foot preparation device, "The Sander" combination tested.

In summary, the XL VIT with sequencer-model is fully ASTM F2508 validated and fully ASTM F2508 compliant.

Respectfully submitted,

Peter Widas, BSMSE, CXLT, Vice President, Chief Operating Officer, for

EXCEL TRIBOMETERS, LLC
1361-F W. Wade Hampton Blvd., PMB 213
Greer, SC 29650

757 897-2853
888 804-3727 fax

pwidas@EXCELTRIBOMETERS.com

www.EXCELTRIBOMETERS.com

XL VIT Base-Model ASTM F2508 Validation Report

XL VIT Base-Model F2508 Validation Testing Form

Operator	Peter Widas
Test Address	160 Tymberbrook Dr, Lyman, SC 29365
Company	Excel Tribometers, LLC
Contact Info	pwidas@exceltribometers.com, 757-897-2853
Source of Ref Surfaces	ASTM
Date Acquired	3/23/11
Validation Test Date	1/16/13
Validation Temperature	71.8
Validation Humidity	49
Walkway Tribometer Supplier	Excel Tribometers, LLC
Walkway Tribometer Model	XL VIT with sequencer-model
Walkway Tribometer Serial Number	1011724
Test Foot Number	2006
Test Foot Material	Neolite
Test Foot Age	Manuf 6/19/12 (Smithers), Mounted 10/19/12
Test Foot Preparation Procedure	Calibrate standard XL VIT test foot using Sander #101 to 0.20 ± 0.03 on a standard XL calibration tile prior to testing each reference surface
Test Foot Dimensions	1.25" Diameter Disc
Operating Instructions Version	4-Jul-12

XL VIT Base-Model ASTM F2508 Validation Report

Test Readings - Highlighted cells follow test foot sanding.

Calibration	N	0.23	0.23	0.23	0.24
	E	0.24	0.22	0.24	0.23
	S	0.23	0.21	0.22	0.22
	W	0.22	0.21	0.23	0.21
Measurement	**Direction**	**RS-A Granite**	**RS-B Porcelain**	**RS-C Vinyl**	**RS-D Ceramic**
1	N	0.08	0.15	0.17	0.63
2	E	0.09	0.14	0.18	0.63
3	S	0.08	0.14	0.17	0.63
4	W	0.08	0.14	0.18	0.63
5	N	0.09	0.14	0.21	0.61
6	E	0.08	0.13	0.18	0.62
7	S	0.09	0.13	0.17	0.62
8	W	0.08	0.14	0.17	0.60
9	N	0.09	0.12	0.18	0.61
10	E	0.08	0.13	0.17	0.61
11	S	0.08	0.13	0.19	0.61
12	W	0.09	0.14	0.17	0.59
13	N	0.10	0.15	0.19	0.59
14	E	0.09	0.15	0.17	0.60
15	S	0.08	0.14	0.18	0.60
16	W	0.07	0.14	0.17	0.58
17	N	0.08	0.14	0.19	0.63
18	E	0.07	0.14	0.16	0.64
19	S	0.08	0.14	0.17	0.62
20	W	0.08	0.14	0.17	0.60
21	N	0.08	0.13	0.19	0.59
22	E	0.08	0.13	0.18	0.61
23	S	0.07	0.13	0.17	0.60
24	W	0.08	0.14	0.19	0.58
25	N	0.07	0.13	0.19	0.63
26	E	0.08	0.13	0.18	0.63
27	S	0.08	0.13	0.17	0.62
28	W	0.08	0.13	0.18	0.60
29	N	0.08	0.12	0.19	0.59
30	E	0.07	0.13	0.18	0.61
31	S	0.08	0.13	0.16	0.60
32	W	0.08	0.13	0.16	0.59
33	N	0.09	0.13	0.17	0.64
34	E	0.08	0.13	0.17	0.65
35	S	0.07	0.13	0.17	0.64
36	W	0.08	0.14	0.16	0.63
37	N	0.07	0.12	0.19	0.60
38	E	0.07	0.12	0.17	0.60
39	S	0.07	0.13	0.18	0.58
40	W	0.08	0.14	0.17	0.58

XL VIT Base-Model ASTM F2508 Validation Report

Statistical Analysis

	RS-A Granite	diff A-B	RS-B Porcelain	diff B-C	RS-C Vinyl	diff C-D	RS-D Ceramic
Mean	0.080	-0.054	0.134	-0.042	0.177	-0.434	0.611
Standard Deviation	0.007	0.008	0.008	0.014	0.011	0.024	0.019
Standard Error	0.001		0.001		0.002		0.003
95th Confidence Lower	0.078		0.132		0.173		0.605
95th Confidence Higher	0.082		0.137		0.180		0.616
Rank (1 = least slip resistant)	1		2		3		4
Paired t test		40.657		19.272		116.742	

APPENDIX – 6

Applied Cognitive Sciences

REPORT OF ASTM F2508 VALIDATION
OF THE
ENGLISH XL VIT WITH SEQUENCER
VARIABLE INCIDENCE/ARTICULATED STRUT TRIBOMETER
WITH STANDARD XL VIT NON-TREADED TEST FOOT

Introduction

Applied Cognitive Sciences' Senior Engineer Joellen Gill and Research Associate Dr. Angela Colcombe conducted testing on our English XL VIT Variable Incidence/Articulated Strut Tribometer (XL VIT).

Our testing confirms that our XL VIT with sequencer-model, serial number 1102108 conforms to all requirements of ASTM F2508-11 Standard Practice for Validation and Calibration of Walkway Tribometers Using Reference Surfaces. Our results demonstrate that our XL VIT correlates with the slip characteristics of a surface and/or contaminant, to the actual propensity for human slips relative to a human gait-based reference system and standard practice with relevance to human ambulation.

Procedure

We performed a series of 40 tests on each of the reference surfaces obtained through ASTM. We then ranked the four reference surfaces in the proper order based on statistical differentiation (See Appendix 1).

All testing was conducted in accordance with the July 4, 2012 version of the XL VIT User Guide, available on the ExcelTribometers.com website and the ASTM F2508 – 11 Procedures. Tests were conducted on June 1, 2013, at our offices in Spokane Washington, 99201, 509-624-3714. The air temperature was 73.4 degrees ± 3.6 degrees Fahrenheit, and relative humidity was 50 percent ± 5 percent.

Apparatus
The test instrument was the XL VIT with sequencer-model, serial number 1102103, manufactured and supplied by Excel Tribometers LLC. The test foot was standard OEM neoprene rubber, XL VIT non-treaded test foot, 1.25 inches ± 0.03 inches diameter true circle prepared according to the July 4, 2012 XL VIT Users Guide.

Preparation of Reference surfaces
The reference surfaces RS-A granite, RS-B porcelain, RS-C vinyl, and RS-D Ceramic, were obtained directly from ASTM on May 10, 2013.

Each of the reference surfaces was prepared according to the ASTM F2508-11 section 8. Procedure. Specifically after ensuring the reference surfaces were free from visible dents, cracks, voids or other blemishes, we cleaned each surface with a soft-bristled nylon brush in the following manner:

1.) Gently scrubbed the surface with a solution of 250uL of sodium lauryl sulfate per 500 mL of distilled water in a circular manner for at least 10 seconds two times.
2.) We then rinsed each surface with distilled water thoroughly.
3.) We then allowed each surface to air dry until there was no visible moisture or water droplets.
4.) Next we gently scrubbed each surface with a clean soft bristled nylon brush with a solution of equal parts ethanol and distilled water for 10 seconds.
5.) Finally, we allowed each reference surface to air dry until there was no visible moisture or water droplets.

Mounting of Reference Surfaces
We mounted each surface to prevent movement on a flat surface impervious to the contaminants used.

Walkway Tribometer Validation Testing
Our tribometer was first calibrated using a certified testing tile with a value of .15 +/-.03. Results of calibration are shown in Appendix 1.

Forty tests were performed on each reference surface in accordance with the July 4, 2012 version of the XL VIT User Guide, available on the ExcelTribometers.com website. Ten tests were performed in each of the four orthogonal directions, at 0, 90, 180, and 270 degrees relative to an arbitrarily defined direction on the reference surface (labeled as N, W, S, and E in the table in Appendix 1). RS-A polished black granite was contaminated with a continuous film of a solution comprised of 200uL of Triton X-500[5] (nonionic surfactant) in 500mL of distilled water. RS-B porcelain, RS-C vinyl, and RS-D ceramic were each contaminated with a continuous film of distilled water alone.

Analysis

Raw data and summary statistics can be found in Appendix 1. Analyses were conducted as per F2508-11 Section 9, Analysis of Results and Walkway Tribometer Validation. For each of the 40 tests on each reference surface, the mean, standard deviation, standard error of the mean, and 95th percentile confidence intervals were computed. Each surface was then rank ordered from the least slip-resistant to the most slip-resistant. Paired t-tests were calculated for all adjacently ranked reference surfaces (between RS-A and RS-B, RS-B and RS-C, and RS-C and RS-D). Results can be seen in Appendix 1.

Appendix 1

Calibration on certified test tile with value of .15 +/- .03

N	.16	.16	.16	.16
W	.17	.16	.17	.16
S	.17	.18	.15	.17
E	.18	.16	.17	.17

Results Summary

	RS-A Granite	RS-B Porcelain	A-B diff	RS C Vinyl	B-C diff	RS – D Ceramic	C-D diff
Mean	0.0700	0.1013	-0.0312	0.1727	-0.0715	0.8505	-0.6778
ST DEV	0.0064	0.0082	-0.0018	0.0137	-0.0055	0.0110	0.0026
ST ERROR	0.0010	1.0013		0.0021		0.0017	
95th Confidence Low	0.62	0.09		0.16		0.84	
95th Confidence High	0.78	0.11		0.19		0.87	
Rank	1	2		3		4	
Paired t test			22.39		63.59		258.81

Results – Raw Data

Measurement	Direction	RS-A Granite	RS-B Porcelain	RS-C Vinyl	RS-D Ceramic
1	N	0.07	0.09	0.21	0.85
2	W	0.08	0.11	0.19	0.85
3	S	0.07	0.11	0.18	0.85
4	E	0.08	0.11	0.17	0.85
5	N	0.07	0.1	0.19	0.84
6	W	0.08	0.11	0.18	0.87
7	S	0.07	0.1	0.19	0.85
8	E	0.08	0.09	0.17	0.85
9	N	0.07	0.09	0.19	0.83
10	W	0.07	0.1	0.18	0.87
11	S	0.06	0.1	0.18	0.85
12	E	0.07	0.11	0.17	0.85
13	N	0.06	0.09	0.19	0.84
14	W	0.08	0.11	0.18	0.86
15	S	0.07	0.1	0.18	0.85
16	E	0.06	0.11	0.17	0.85
17	N	0.07	0.08	0.19	0.84
18	W	0.08	0.11	0.17	0.86
19	S	0.06	0.1	0.19	0.86
20	E	0.07	0.11	0.17	0.84
21	N	0.06	0.11	0.16	0.84
22	W	0.08	0.11	0.17	0.87
23	S	0.07	0.1	0.18	0.86
24	E	0.07	0.1	0.17	0.84
25	N	0.07	0.1	0.15	0.84
26	W	0.07	0.11	0.15	0.85
27	S	0.07	0.09	0.17	0.86
28	E	0.06	0.09	0.15	0.84
29	N	0.07	0.09	0.15	0.85
30	W	0.07	0.11	0.16	0.83
31	S	0.06	0.1	0.18	0.87
32	E	0.06	0.1	0.17	0.85
33	N	0.07	0.1	0.17	0.86
34	W	0.08	0.11	0.16	0.83
35	S	0.07	0.1	0.17	0.87
36	E	0.07	0.1	0.16	0.84
37	N	0.07	0.09	0.15	0.86
38	W	0.07	0.11	0.17	0.85
39	S	0.07	0.1	0.17	0.85
40	E	0.07	0.1	0.16	0.85

APPENDIX – 7

Applied Cognitive Sciences
Human Factors Engineering
A CONSULTING GROUP

June 6, 2013

Mike Myers
Myers & Company, P.L.L.C.
1809 Seventh Avenue, Suite 700
Seattle, Washington 98101

Re: Kill v. City of Seattle

Dear Mr. Myers:

I have reviewed the City of Seattle's Motion to Strike in the above referenced matter. The purpose of this supplemental report is to provide a rebuttal to this motion and to establish a basis for the conclusion that the tribometer used to test the subject handhole rim which induced Ms. Kill's slip and fall has successfully demonstrated validation and calibration as required by ASTM F 2508.

Validation/Calibration of XL VIT Tribometer Serial Number 1102103

1. We have successfully demonstrated validation in accordance with the requirements of ASTM F 2508 by correctly rank ordering the reference tiles and by providing a statistically unique slip resistance measure for each surface (Section 9.2 of ASTM F 2508).
2. The Excel Tribometers Validation Report that was referenced by Mr. Flynn was the correct reference report as of the date of my second declaration which appended this Validation Report as Exhibit C. Note that this Validation Report is for a "base model". When I initially tested the surface of the handhole rim on which Ms. Kill slipped and fell, the tribometer I used was a base model but it has since been upgraded to a sequencer model for more consistent (i.e. less variability) testing. The correct report for comparison is the Validation Report for the English XL with Sequencer with Standard XL VIT Non-Treaded Test Foot (attached). It is also important to note that as of the date of my initial testing ASTM F 2508 had not yet been released, thus it would have been unreasonable for me to have demonstrated compliance with this standard at that time.
3. The correct Validation Report from EXCEL Tribometers for the XL VIT with Sequencer and Non-Treaded Test Foot establishes the following means for each of the reference tiles (rounded) as measured by Peter Widas of EXCEL Tribometers:
   RS-A 0.08
   RS-B 0.13
   RS-C 0.18
   RS-D 0.61
4. The Validation Report for the XL VIT with Sequencer and Non-Treaded Test Foot goes on to say: Excel Tribometers LLC, as the manufacturer and supplier of the XL VIT with

sequencer-model, has established a 95th percentile confidence interval for the XL VIT with sequencer-model of ± 0.03 for slip resistance values equal to or less than 0.50". Although this confidence interval of ± 0.03 is larger than the statistically calculated confidence interval as reported by EXCEL Tribometers in the attached Validation Report, in my conversation with Peter Widas, the individual who performed the ASTM F 2508 testing for this report, he noted that as the manufacturer and supplier of the XL VIT, he is confident in the ± 0.03 confidence interval as the calculated confidence intervals result in values that are more precise than can be accurately read.

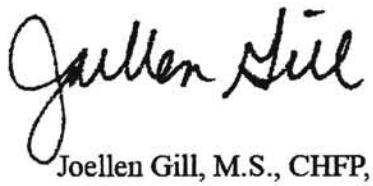
5. In comparing the means we obtained with our testing as seen below we are within the 95th percentile confidence interval as reported by the manufacturer and supplier for slip resistance values equal to or less than 0.50.
   RS-A 0.07 (-.01)
   RS-B 0.10 (-.03)
   RS-C 0.17 (-.01)
6. Clearly we have demonstrated calibration according to ASTM 2508 for these 3 reference tiles.
7. Furthermore, in my conversation with Pete Widas he noted that the proper procedure to demonstrate calibration under ASTM F 2508 does not require one to compare the data from the certification testing to the data obtained by the manufacturer/supplier **unless the same reference tiles are used**. That is, there is inherent variability in the reference tiles due to manufacturing tolerances. This is especially apparent for RS-D, the ceramic tile with the grit surface. Mr. Widas commented he has had users who have measured 0.50 on the RS-D they obtained from ASTM and other users who have measured 1.0 on a different RS-D tile they obtained from ASTM.
8. There is no reference slip resistance provided by ASTM with the purchase of these reference tiles.
9. There is, however, a reference slip resistance provided on the certified test tile on which we initially calibrated the subject tribometer; this slip resistance is 0.15 ± 0.03. We obtained the following results for this calibration that was performed immediately prior to testing each of the 4 reference tiles:
   Before RS-A 0.17 ±.01
   Before RS-B 0.17 ±.01
   Before RS-C 0.16 ±.01
   Before RS-D 0.17 ±.01
10. Peter Widas confirmed that because we successfully tested our tribometer according to the procedure required by ASTM, just as Excel Tribometers did (i.e. completing the 40 tests on each reference tile under controlled conditions) with results that demonstrate a confidence interval of less than or equal to ± .015 our specific walkway tribometer is considered within calibration. There is no need for us to either test our tribometer using the reference tiles used by Peter Widas or for Peter Widas to test his tribometer using the

reference tiles used by us. Obviously such a requirement is unmanageable given the literally thousands of XL tribometers currently in use around the world.

11. Lastly, I believe it is important to take just a moment to step back from these tedious technical details to gain some perspective:
    a. Variable incident strut tribometers, of which there are two (i.e. the Brungraber Mark II and III and the English XL) were initially developed, tested, and widely adopted for use by the tribometry community in the early 1990's.
    b. For over 20 years tribometrists have used these two scientific instruments, the most technologically advanced tribometers even to this date, to measure slip resistance for innumerable surfaces; experts have relied on the data provided by these devices as foundation for their testimony countless times in state and federal courts around the country, even internationally.
    c. During the past 20 years, as with all scientific instruments, efforts have been made to increase confidence in their precision and to reduce the statistical standard deviation of their measurements.
    d. The latest advancement in this area, which just became available in March 2011, is the ASTM-F 2508; a methodology intended to assist tribometrists in verifying their scientific equipment is valid and calibrated. The creation of ASTM F 2508 does not invalidate past measurements or past testimony. Rather, it only means that tribometrists (i.e. at least those that invest the time and resources necessary to ensure their equipment is compliant) can now measure the slip resistance of various surfaces with greater confidence in their precision.
    e. Lastly, consider the values for the slip resistance that I measured. It is not the case that the values I measured are ever so slightly less than the minimum safety standards required, while the Defense experts values exceed the minimum safety standards; it is noteworthy that the Defense has not attempted to measure the slip resistance of the handhole. Rather their entire defense has been to criticize my measurements; measurements that could be increased by 35% and still the handhole would fail to meet the minimum safety standards. This is like a radar gun that clocks a vehicle in excess of 80 MPH in a 60 MPH speed limit zone and debating the precision of the radar gun because it does not include the latest technology.
    f. The point to be made is that the exact value of the slip resistance of the subject handhole is not what is important. What is important is whether or not the handhole is reasonably safe (i.e. provides a slip resistance of 0.50 or more). My measurements (i.e. $0.35 \pm .02$ and $0.21 \pm .02$) unequivocally demonstrate that the slip resistance of the subject handhold is significantly less than the minimum safe value.

Please let me know if I can be of further assistance in this matter.

Sincerely,



Joellen Gill, M.S., CHFP, CXLT, ASP
Senior Engineer

APPENDIX – 8

REPORT OF ASTM F2508 CALIBRATION OF THE ENGLISH XL VIT WITH SEQUENCER VARIABLE INCIDENCE/ARTICULATED STRUT TRIBOMETER

Excel Tribometers LLC proffers this Report of ASTM F2508 Calibration of the XL VIT as the patent owner, manufacturer and sole authorized supplier and servicer of the English XL VIT Variable Incidence/Articulated Strut Tribometer, hereinafter referred to as the XL VIT.

Excel Tribometers LLC certifies and affirms that the XL VIT with Sequencer conforms to all requirements of ASTM F2508-11 Standard Practice for Validation and Calibration of Walkway Tribometers Using Reference Surfaces, which conformance validates the XL VIT with Sequencer properly and adequately correlates the slip characteristics of a surface or contaminant, or both, to the actual propensity for human slips against a human gait-based reference system and standard practice with relevance to human ambulation.

All testing of the XL VIT with Sequencer which is the subject of this Tribometer Calibration Report was conducted in accordance with the July 4, 2012 version of the XL VIT User Guide, available on the ExcelTribomters.com website. Peter Widas, Vice President and Chief Operations Officer of Excel Tribometers, LLC, performed the testing on June 13, 2013, at the home office of Excel Tribometers LLC, 160 Tymberbrook Drive, Lyman, SC, 29365, where the air temperature was 73.4 degrees ± 3.6 degrees Fahrenheit, and relative humidity was 50 percent ± 5 percent.

The instrument which is the subject of this Tribometer Calibration Report is the XL VIT with Sequencer model, serial number 1102108, manufactured by Excel Tribometers LLC, and currently owned by Joellen Gill, of Applied Cognitive Sciences.

The test foot was standard XL VIT non-treaded test foot, 1.25 inches ± 0.03 inches diameter true circle.

The test foot used in this Calibration was supplied by the customer.

Test foot preparation was in accordance with the July 4, 2012 version of the XL VIT User Guide, available on the ExcelTribometers.com website.

Testing was conducted on the specified reference surfaces acquired from ASTM International Headquarters on March 23, 2011. The reference surfaces are stored in a flat, secure, enclosed, clean containment to prevent deformation and contamination.

XL VIT with Sequencer ASTM F2508 Calibration Report

Each reference surface was permanently and respectively marked *RS-A* for the polished black granite, *RS-B* for the porcelain, *RS-C* for the vinyl composite tile, and *RS-D* for the ceramic.

The reference surfaces were supported during testing on a flat and rigid substrate, which was impervious to the liquids used, and that prevented movement of the reference surface parallel to the test plane of the XL VIT with Sequencer.

The cleaning procedure performed before each testing session was: 1.) Prepare a 0.05% by volume solution of liquid sodium lauryl sulfate in distilled water (that is, 250 µL of sodium lauryl sulfate per 500 mL of distilled water). 2.) Dip a clean soft-bristled nylon brush in the cleaning solution and gently scrub in a circular pattern the entire reference surface for a minimum of 10 seconds. Reapply the cleaning solution and repeat the minimum 10-seconds scrubbing two times. 3.) Rinse the surface thoroughly with distilled water, ensuring that no visible suds or soap residues remain. 4.) Dry the surface with dry and oil-free compressed air or air dry if compressed air is not available. The reference surface shall exhibit no visible moisture film or droplets. 5.) Prepare an ethanol solution containing equal parts denatured ethanol in distilled water. 6.) Dip a clean soft-bristled nylon brush, different from that used in step 2 above, in the ethanol solution and gently scrub the reference surface for 10 seconds. 7.) Dry the reference surface with dry and oil-free compressed air or air dry if compressed air is not available. Any visible contamination remaining after this step would disqualify the reference surface for use. Handling of the reference surface was so as to not introduce contaminants to the surfaces, including prohibiting exposing the surfaces to contact of human skin.

Using the identified XL VIT with Sequencer and the identified XL VIT non-treaded test foot prepared as specified, 16 tests were performed in accordance with the identified version of the XL VIT User Guide, in the test area of each of the four reference surfaces that were prepared as specified, four (4) tests in each of four (4) orthogonal directions, that is, at 0, 90, 180, and 270 degrees relative to an arbitrarily defined direction on the reference surface, and the results of the tests were recorded and are appended hereto.

The *RS A* reference surface beneath the test foot was covered during testing with a continuous film of 0.04% by volume solution of Triton X-100 (nonionic surfactant, currently only available from Gallade Chemical, Santa Ana, CA.) in distilled water (that is, 200 µL of Triton X-100 per 500 mL of distilled water). The *RS B*, *RS C*, and *RS D* reference surfaces beneath the test foot were covered with a continuous film of distilled water.

XL VIT with Sequencer ASTM F2508 Calibration Report

As detailed in the XL VIT with Sequencer F2508 Calibration Testing Form appended hereto, the following results were achieved:

	RS-A Granite	RS-B Porcelain	RS-C Vinyl	RS-D Ceramic
Mean	0.066	0.116	0.165	0.576
Standard Deviation	0.005	0.010	0.010	0.018
Standard Error	0.001	0.002	0.002	0.003
Validation Confidence Lower*	0.050	0.104	0.138	0.561
Validation Confidence Upper*	0.110	0.164	0.198	0.661
Rank (1 = least slip resistant)	1	2	3	4

*Based on the XL VIT ASTM F2508 Validation Testing, and based on the practical range of accuracy required for a walkway tribometer to meaningfully measure slip resistance to assess the relative risk for human slip and fall injury, and based on other testing and analyses, Excel Tribometers LLC, as the manufacturer and supplier of the XL VIT with Sequencer, has established a validation confidence interval for the XL VIT with Sequencer of ± 0.03 for slip resistance values equal to or less than 0.50, and ± 0.05 for slip resistance values greater than 0.50. Based on the XL VIT with Sequencer ASTM F2058 Validation testing, these specified validation confidence intervals clearly satisfy the requirements of ASTM F2508 with respect to statistical differentiation and proper rank ordering of the reference surfaces.

The values of ***t*** for the paired ***t*** test for adjacently ranked surfaces are as follows:

Paired *t* Test		
A-B	19.365	>1.694
B-C	13.846	>1.694
C-D	92.199	>1.694

The XL VIT with Sequencer is considered within calibration if the bias of the mean test values for each surface falls within the validation confidence interval herein defined for the XL VIT with Sequencer, as established by the validation tests, and as established by Excel Tribometers LLC. Failure to meet this calibration criterion shall be considered an unsatisfactory result, and shall require the XL VIT with Sequencer be recalibrated or adjusted, or both, by Excel Tribometers LLC, and the F2508 Calibration procedure repeated.

The XL VIT with Sequencer which is the subject of this Tribometer Calibration Report clearly achieved statistical differentiation and complied with the rank order of reference surfaces as established in ASTM F2508-11 Standard Practice for Validation and Calibration of Walkway Tribometers Using Reference Surfaces.

F2508 Calibration procedures shall be performed again on the XL VIT with Sequencer which is the subject of this Tribometer Calibration Report following introduction of a new

test foot; after any repair of the walkway tribometer that could affect the performance of the tribometer; and at intervals not to exceed one year.

These calibration results apply only to the XL VIT with Sequencer/XL VIT and standard XL VIT non-treaded test foot combination tested.

Respectfully submitted,

Peter Widas, BSMSE, CXLT, Vice President, Chief Operating Officer, for

EXCEL TRIBOMETERS, LLC
1361-F W. Wade Hampton Blvd., PMB 213
Greer, SC 29650

757 897-2853
888 804-3727 fax

pwidas@EXCELTRIBOMETERS.com

www.EXCELTRIBOMETERS.com

XL VIT with Sequencer ASTM F2508 Calibration Report

XL VIT With Sequencer F2508 Calibration Testing Form

Operator	Peter Widas
Test Address	160 Tymberbrook Dr, Lyman, SC 29365
Company	Excel Tribometers, LLC
Contact Info	pwidas@exceltribometers.com, 757-897-2853
Source of Ref Surfaces	ASTM
Date Acquired	3/23/11
Validation Test Date	6/13/13
Validation Temperature	75.2°F
Validation Humidity	49%
Walkway Tribometer Supplier	Excel Tribometers, LLC
Walkway Tribometer Model	English XL VIT with Sequencer
Walkway Tribometer Serial Number	1102108
Test Foot Number	Unknown (Customer Supplied)
Test Foot Material	Neolite
Test Foot Age	Unknown (Customer Supplied)
Test Foot Preparation Procedure	Calibrate standard XL VIT test foot per the XL User Guide
Test Foot Dimensions	1.25" Diameter Disc
Operating Instructions Version	July 4, 2012

XL VIT with Sequencer ASTM F2508 Calibration Report

Test Readings - Highlighted cells follow test foot sanding.

Calibration	N	0.21	0.20	0.20	0.19
	E	0.18	0.17	0.20	0.20
	S	0.18	0.17	0.18	0.17
	W	0.18	0.20	0.19	0.19
Measurement	**Direction**	**RS-A Granite**	**RS-B Porcelain**	**RS-C Vinyl**	**RS-D Ceramic**
1	N	0.07	0.12	0.17	0.57
2	E	0.07	0.12	0.17	0.60
3	S	0.06	0.14	0.16	0.57
4	W	0.07	0.12	0.18	0.56
5	N	0.07	0.11	0.18	0.58
6	E	0.07	0.11	0.16	0.59
7	S	0.06	0.12	0.15	0.57
8	W	0.07	0.12	0.16	0.56
9	N	0.07	0.11	0.17	0.60
10	E	0.07	0.12	0.18	0.60
11	S	0.07	0.12	0.16	0.60
12	W	0.06	0.12	0.17	0.58
13	N	0.06	0.10	0.15	0.55
14	E	0.06	0.10	0.17	0.56
15	S	0.07	0.12	0.15	0.58
16	W	0.06	0.11	0.16	0.55

Statistical Analysis

	RS-A Granite	diff A-B	RS-B Porcelain	diff B-C	RS-C Vinyl	diff C-D	RS-D Ceramic
Mean	0.066	-0.050	0.116	-0.049	0.165	-0.411	0.576
Standard Deviation	0.005	0.010	0.010	0.014	0.010	0.018	0.018
Standard Error	0.001		0.002		0.002		0.003
95th Confidence Lower	0.065		0.113		0.162		0.571
95th Confidence Higher	0.068		0.119		0.168		0.582
Rank (1 = least slip resistant)	1		2		3		4
Paired t test		19.365		13.846		92.199	

APPENDIX – 9

EXCEL TRIBOMETERS, LLC SLIPMETER SCIENCE, TECHNOLOGY, MANUFACTURE, SERVICE

June 14, 2013

Joellen Gill, M.S., CHFP, CXLT, ASP
Senior Engineer
Applied Cognitive Sciences
2104 W. Riverside Avenue
Spokane, WA 99201

Please find attached a PDF copy of the ASTM F2508 Calibration Report of the testing performed as you requested with your supplied English XL VIT walkway tribometer, using your supplied test foot, conducted on our set of reference surface tiles, the same reference surface tiles used for the manufacturer's F2508 Validation Testing.

Your instrument and test foot successfully satisfied the requirements of the ASTM F2508 Calibration protocol on our reference surface tiles.

As a matter of interest, additional slip resistance measurements were taken of your set of reference surface tiles with your English XL VIT and your test foot, which measured values conformed to the Validation Confidence Intervals for all four surfaces, except that testing at various locations on Reference Surface D showed the value varied from a mean value of 0.641 in the center (which falls within the Validation Confidence interval of the values established on our set of reference surface tiles), to 0.755 in the northeast quadrant, 0.645 in the southeast quadrant, 0.803 in the northwest quadrant, and 0.840 in the southwest quadrant. The measured variations were verified and supported by readily visible differences in the surface characteristics of your Reference Surface D tile.

The readings on the center of your tiles are as follows:

Measurement	Direction	RS-A Granite	RS-B Porcelain	RS-C Vinyl	RS-D Ceramic
1	N	0.08	0.10	0.14	0.66
2	E	0.08	0.10	0.15	0.67
3	S	0.09	0.11	0.15	0.65
4	W	0.08	0.10	0.15	0.62
5	N	0.08	0.10	0.15	0.68
6	E	0.07	0.10	0.16	0.65
7	S	0.08	0.09	0.15	0.60
8	W	0.08	0.10	0.14	0.60
	Average	0.080	0.100	0.149	0.641
	Stdev	0.005	0.005	0.006	0.031

The readings on Reference Surface D by quadrant are as follows:

		NE Quad	SE Quad	SW Quad	NW Quad
Measurement	**Direction**	**RS-D Ceramic**	**RS-D Ceramic**	**RS-D Ceramic**	**RS-D Ceramic**
1	N	0.77	0.68	0.80	0.82
2	E	0.77	0.64	0.85	0.80
3	S	0.74	0.64	0.86	0.80
4	W	0.74	0.62	0.85	0.79
	Average	0.755	0.645	0.840	0.803
	Stdev	0.017	0.025	0.027	0.013

Testing of different sets of ASTM F2508 reference surfaces by different independent entities has disclosed similar variations in other sets of reference surface tiles. The observed statistical variations between different sets of reference surface tiles have not yet been shown to be consequential with respect to measurement of slip resistance of real-world walkway surfaces by a calibrated English XL VIT walkway tribometer, used according to the current User Guide. Further, the variations in reference surface tiles have not yet been shown to negate the usefulness of ASTM F2508 as a means to validate walkway tribometers.

Please let us know if we can be of further assistance. We look forward to providing our services and resources to satisfy your slip meter needs.

Thank you,
Peter Widas, BSMSE, CXLT
Vice President, COO
EXCEL TRIBOMETERS, LLC

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www.EXCELTRIBOMETERS.com

APPENDIX – 10

The Honorable Kenneth Schubert
Responding Party: Twyla and Terry Kill
Hearing Date: June 7, 2013 at 10:00 a.m.

IN THE SUPERIOR COURT OF THE STATE OF WASHINGTON
FOR KING COUNTY

TWYLA KILL, and TERRY KILL, individually and the marital community comprised thereof, Plaintiffs, vs. CITY OF SEATTLE, a Washington municipal corporation, Defendant.	No. 12-2-07790-8SEA ORDER GRANTING DEFENDANT CITY OF SEATTLE'S MOTION FOR SUMMARY JUDGMENT AND DENYING PLAINTIFFS' MOTION FOR PARTIAL SUMMARY JUDGMENT [CLERK'S ACTION REQUIRED]

THIS MATTER came on regularly for hearing on Plaintiffs' Motion for Partial Summary Judgment, Defendant City of Seattle's Motion for Summary Judgment and the Plaintiffs' Renewed Motion for Partial Summary Judgment, and the Court having read and considered the records and files herein, including:

1. Plaintiffs' Motion for Partial Summary Judgment;
2. Declaration of Michael David Myers and the exhibits attached thereto;
3. Declaration of Joellen Gill;
4. Declaration of Twyla Kill;

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5. Defendant City of Seattle's Response to Motion for Summary Judgment and Request for Continuance;

6. Declaration of Joseph Groshong and exhibits attached thereto;

7. Declaration of Jeffrey R. Baker;

8. Declaration of Steven Read and exhibits attached thereto;

9. Plaintiff's Reply in Support of Motion for Partial Summary Judgment;

10. Second Declaration of Michael David Myers in Support of Plaintiffs' Motion for Partial Summary Judgment and the exhibits attached thereto;

11. Defendant City of Seattle's Motion for Summary Judgment;

12. Declaration of Joseph Groshong and exhibits attached thereto;

13. Declaration of James E. Flynn, P.E., In Support of the City of Seattle's Motion for Summary Judgment and exhibits attached thereto;

14. Declaration of Jeffrey R. Baker;

15. Declaration of Steven Read and exhibits attached thereto;

16. Declaration of Rajeev Kelkar, Ph.D., in Support of the City of Seattle's Motion for Summary Judgment and exhibits attached thereto;

17. Plaintiffs' Renewed Motion for Partial Summary Judgment;

18. Declaration of Michael David Myers in Support of Plaintiffs' Renewed Motion for Partial Summary Judgment and exhibits attached thereto;

19. Second Declaration of Joellen Gill, M.S., CHFP, CXLT, ASP and exhibits attached thereto;

20. Plaintiffs' Response to Defendant's Motion for Summary Judgment;

21. Third Declaration of Joellen Gill, M.S., CHFP, CSLT, ASP;

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22. Declaration of Michael David Myers in Support of Plaintiffs' Response to Defendant's Motion for Summary Judgment and exhibits attached thereto;

23. City's Response to Plaintiffs' Motion for Summary Judgment;

24. Second Declaration of James E. Flynn, P.E., in Support of the City of Seattle's Motion for Summary Judgment;

25. Plaintiff's Reply in Support of Renewed Motion for Partial Summary Judgment;

26. Fourth Declaration of Joellen Gill, M.S., CHFP, CXLT, ASP and exhibits attached thereto;

27. Reply in Support of City's Motion for Summary Judgment;

28. City's Motion to Strike;

29. Declaration of Joseph G. Groshong in support of Motion to Strike;

30. Plaintiffs' Response to Motion to Strike;

31. Declaration of Michael David Myers in support of Plaintiffs' response to Seattle's Motion to Strike and exhibits attached thereto;

32. Fifth Declaration of Joellen Gill, M.S., CHFP, CXLT, ASP and exhibits attached thereto;

and the Court, being fully advised in the premises, finds as follows:

1. A transcript of the Court's oral ruling (pp. 65-73 of the transcript of the hearing on the parties' motions for summary judgment) on the parties' summary judgment motions is appended to this order as ***Exhibit "A"*** and details the reasoning behind the Court's ruling. The general basis for the Court's ruling and the details of that ruling are set forth as follows.

2. Plaintiffs submitted the testimony of Joellen Gill, M.S., CHFP, CXLT, ASP in support of their Motion for Summary Judgment and Renewed Motion for Partial Summary Judgment and in

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Opposition to the City's Motion for Summary Judgment and the City's Motion to Strike.

3. Ms. Gill offered testimony as an expert based on scientific, technical or otherwise specialized knowledge. Ms. Gill qualifies as an expert.

4. The City objected to the admission of aspects of Ms. Gill's testimony, including Ms. Gill's ultimate conclusion that the utility cover rim that Ms. Kill alleges she slipped on was unreasonably dangerous.

5. The Court finds Ms. Gill's methodology regarding slip-resistance testing in this case is unreliable and therefore unhelpful to the jury under ER 702 for the following reasons:

a. Ms. Gill's English XL tribometer was not properly calibrated when testing of the rim at issue was performed.

b. Any assertion by Ms. Gill that despite a standard range for calibration that an additional "fudge factor" applies to calibrating her machine is not supported.

c. The two tests of the rim at issue that Ms. Gill performed produced different results.

d. Ms. Gill has not provided an adequate explanation for the difference in test results. Either Ms. Gill's tribometer is inherently unreliable or the way she used it was inherently unreliable.

e. Ms. Gill failed to account for how the presence or absence of surface contaminants may have affected her test results.

6. Based on the foregoing, the Court exercises its discretion to exclude Ms. Gill's testing and consequently her opinion that the rim was unreasonably slippery from consideration on summary judgment.

7. Plaintiffs' case relies on Ms. Gill's opinion. With her opinion excluded, Plaintiffs fail to

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demonstrate an issue of fact as to whether the rim was unreasonably slippery.

8. Following the Court's oral ruling Plaintiff requested a *Frye* hearing before the Court excluded Ms. Gill's opinions. The Court advised Plaintiff it would consider briefing on that issue but would not stay its order in the meantime.

NOW THEREFORE, IT IS HEREBY ORDERED:

1. Defendant City of Seattle's Motion for Summary Judgment is hereby **GRANTED**;
2. Plaintiffs' Motion for Partial Summary Judgment is hereby **DENIED**;
3. Plaintiff is given leave to submit briefing in support of her request for a *Frye* hearing;
4. All claims against Defendant City of Seattle are dismissed with prejudice; and
5. Each party shall bear its own costs.

DATED this 26th day of June, 2013.

The Honorable Kenneth Schubert

Presented by:

PETER S. HOLMES
Seattle City Attorney

By: _____
JOSEPH G. GROSHONG, WSBA #41593
Assistant City Attorney

Attorneys for Defendant City of Seattle

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Seattle City Attorney
600 Fourth Avenue, 4th Floor
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Seattle, WA 98124-4769
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Copy Received; Notice of Presentation Waived:

MYERS & COMPANY PLLC

By: _____

MICHAEL DAVID MYERS, WSBA #22486

Attorneys for Plaintiffs

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Exhibit "A"

THE COURT: The way I see this, and this, I think, should make for a decently narrow issue on appeal, is that this case rises or falls on Ms. Gill and her testimony. And it seems to me that she's clearly offering testimony as an expert that what she is saying is scientific, technical, or other specialized knowledge, and I do believe that she has the expert qualifications to provide that opinion. The problem that I have is with her opinion and the reliability, or more to the point, the lack thereof, of her methodology used in gathering and analyzing the data in this case.

And what I find particularly compelling in that regard is that, number one, it seems that Mr. Flynn is, in my view, accurate in calling into question the calibration of her -- the device she used to create these test results. So as a preliminary matter it seems like the device was not properly calibrated at any point in time, both during the time when there were not specific calibration requirements or standards that applied to this machine, and it seemed like there was kind of this gray area when -- in February 2011 when she did her first test results, and then when we got the more specific results that since February 2011 have become the industry standard her calibration test results as shown on that report, the means she ended up with were outside of that 95th percent confidence low and 95th percent confidence high.

And I simply don't find reliable her assertion that despite there being a range that she should be permitted an additional fudge factor. And to the extent that a range that is a standard calibration range as provided in her report would receive an additional fudge factor, in my opinion actually calls into question the entire reliability of the device and whether or not a jury would be allowed to either rely on it or would not find it so confusing as to make it simply unreliable.

The other factor that I considered is just the test results in themselves. Her February test result came up with a .35. Her most recent result came in with a .2. She didn't really have a good explanation for it, in my view. Her fifth declaration simply said, "In my opinion, the rim I tested on February 24th, 2011, and on June 2nd, 2013, was in the same or substantially condition as it was at the time of Mr. Kill's fall." If that's the case, then -- and this machine was either being operated properly, or if operated properly can result in reliable data, should have come up with the same or substantially similar test results. And I think that these results are significantly and substantially different in that the .15 difference between them would be a sufficient difference if it went the other way to completely refute plaintiffs' entire case in that it would have resulted with a .5 test result. And so a .1 -- if we really

have a machine that ends up with a .15 range in what it produces, and at the outer limits of that range it actually falls within .5 and at the other range it falls within .2, then either the machine is inherently unreliable or the way she used it is inherently unreliable.

And what she also goes on to say is, "I did not clean the rim before either testing, but tested it in its existing condition," in parentheses, "As pedestrians would encounter," end parentheses, "when wet and when dry. I'm not aware of any evidence that the rim had been cleaned prior to Ms. Kill's fall. The presence or absence of contaminants has no impact on my opinions in this case since both readings were below .4."

But the idea that the presence or absence of contaminants has no impact on how slippery something is I think was addressed pretty effectively by that Michael's v. Taco Bell case, where it seems clear that if this methodology is going to be reliable such that it should go to the jury, that it needs to be able to address the presence or absence of contaminants. The idea that there could have been oil on this or any number of things that could have been on it on one day versus the other that could have also potentially explained this significant difference of .15 between the test results, it seems inherently unreliable to the Court that if it's true that it wouldn't make any difference what

was on the surface of that in terms of those contaminants, then I'm not sure what this machine is actually testing.

So, again, on that basis I do not find her expert opinion as to the slip resistance or lack thereof of the rim surrounding this frame to be admissible. I'm exercising my discretion accordingly by not considering that and finding it as inadmissible. Without that testimony, the Court does not believe that plaintiff has any evidence to support her contention that that rim, that two-inch rim, was so inherently dangerous that the City does not need to be on notice of its dangerous condition, and because there's no other evidence that the City was on notice of its dangerous condition, the Court is going to deny plaintiffs' motion for summary judgment and grant defendant's motion for summary judgment.

So I don't know -- since in all respects except for this Court's evidentiary ruling de novo review, and that review is based on the -- the evidentiary ruling is based on a use of discretion, if you folks want to prepare a written order that sets forth the evidentiary ruling, we can certainly do that. You can also just simply prepare a copy of the transcript and have that be the basis for your appeal. I'm assuming there's going to be an appeal. It doesn't matter to me. Whatever is going to make it easier for, in my view, the appellate court to review this decision is what I would

favor. But I can simply sign an order that says "Plaintiffs' motion denied, defendant's motion granted," and then you guys can prepare a transcript.

MR. NUTE: And that would be my preference, Your Honor.

THE COURT: Sure. That's fine.

MR. NUTE: Your Honor, if I could make one request?

THE COURT: Sure.

MR. NUTE: Earlier the defense mentioned a Frye hearing. I'd like to know if the Court would entertain a request for a Frye hearing before deciding to exclude Ms. Gill's opinions wholesale.

THE COURT: I appreciate the request, I just don't think it's necessary. I think based on what I've seen of her report with the test results that we have here, I don't know what would be gained from a Frye hearing. If you want to tell me what could be, but I've got five declarations from one expert, and I've read all of them, and she has not explained to my satisfaction the differences in her test results. She hasn't explained to my satisfaction why test results that are on a machine that when calibrated created results that were outside of the calibration range that's allowed by that manufacturer, why those results would be even admissible. I don't know what she could say in open court that would change those results.

MR. NUTE: And I can't make a proffer to you right now --

THE COURT: Sure.

MR. NUTE: -- saying what --

THE COURT: I know you're --

MR. NUTE: -- she would say.

THE COURT: You're in a tough spot.

MR. NUTE: All I'm saying is that I think that when Ms. Gill is confronted with the way the Court has viewed the evidence, I think she'll be able to provide an explanation that would make her testimony at least admissible, if not necessarily persuasive to the Court in the sense of granting plaintiffs' summary judgment motion. But in terms of --

THE COURT: Surviving the --

MR. NUTE: Correct.

THE COURT: Yeah. And, you know, because that's a request that you didn't make yet in writing to the Court, if you want to submit briefing on that, I'm happy to consider it. I'm not going to stay this order pending that. I'm happy to give you the opportunity, if you want, to tell the Court why it should do that simply because it was the City's request that we do a Frye hearing. And I'm not holding it against you that you didn't make the request. I'm happy to have you make that suggestion now. And for heaven's sakes, if it's something that's going to change my mind, I'd rather it change it now than waiting a year and a half for the appeal to come around, so I invite that. Now, that doesn't mean

that I invite motions for reconsideration necessarily.

MR. NUTE: Understood.

THE COURT: You're welcome to file those however you want, but I am telling you that I would have no problem if you wanted to -- well, I don't have a problem either way. You file whatever you want, but -- let's leave it at that.

MR. NUTE: Thank you.

THE COURT: Okay.

MR. GROSHONG: Your Honor, the City would actually prefer a written order. We'd be fine taking your transcript and putting it in the order in terms of your reasoning, but we have reason to suspect we may be litigating in a case against Ms. Gill sometime in the future, and we'd like a clear order that says you're excluding her testimony, if you're willing to sign such an order.

THE COURT: If you're willing to draft it and run it by Mr. Myers, whether or not he agrees with it -- he can take a look at it and make changes that he wants and then sign it with you and saying -- you know, not obviously that he's admitting the truth of it. If he doesn't agree with it but I do, I'll still sign it.

MR. GROSHONG: Okay.

THE COURT: But if I don't agree with it, then I'll just sign an order that says "Granted" and "Denied" like I just did. So if you want to do that -- I've got two other orders

that I'm getting out this afternoon; otherwise, I would probably take that on myself. But I just -- I don't have time, and I'm in the middle of a two-week trial.

MR. GROSHONG: Okay.

THE COURT: So don't take it personally, but that's why I went through the trouble of trying to make what was hopefully a clear record for appeal --

MR. GROSHONG: Yeah.

THE COURT: -- on why I didn't find this evidence -- so -- and as long as the State doesn't see this as an opportunity to pack in information that I -- or reasons that I didn't --

MR. GROSHONG: We're going to get --

THE COURT: -- express.

MR. GROSHONG: We're going to get your transcript, Your Honor, and really just go from that.

THE COURT: Okay.

MR. GROSHONG: So it may take a week to get you the order. If that's acceptable, that's what we'd like to do.

THE COURT: I don't have a problem with it. I don't know of any timeline that's impacting anything in terms of the signing of the actual order. In fact, it may actually just give Mr. Myers more time to prepare his Frye request.

MR. NUTE: No objection.

THE COURT: Or not. So that's fine. We don't --

MR. GROSHONG: Right.

THE COURT: I don't feel a compelling need to get something signed today. You know what my ruling is.

MR. GROSHONG: Right.

THE COURT: And I'm happy to have you folks submit something jointly or not for me to sign, okay.

MR. GROSHONG: Okay.

THE COURT: But excellent briefing. I really -- I enjoyed -- I never thought I would know this much about slip resistance, and so -- but I appreciate it. I thought it was very good on both sides. And thanks for your time today.

MR. NUTE: Thank you, Your Honor.

MR. GROSHONG: Thank you, Your Honor.

THE COURT: All right.

THE CLERK: All rise.

(Proceedings concluded.)

APPENDIX – 11

THE HONORABLE KEN SCHUBERT

IN THE SUPERIOR COURT OF THE STATE OF WASHINGTON
IN AND FOR THE COUNTY OF KING

TWYLA KILL, and TERRY KILL, individually and the marital community comprised thereof, Plaintiffs, v. CITY OF SEATTLE, a Washington municipal corporation Defendants.	NO. 12-2-07790-8 SEA ORDER DENYING PLAINTIFFS' MOTION FOR RECONSIDERATION AND MOTION FOR A FRYE HEARING

I. INTRODUCTION

Plaintiffs Twyla Kill ("Ms. Kill") and the marital community comprised of Ms. Kill and her husband Terry Kill (collectively "plaintiffs") ask this Court to reconsider its decision to exclude the testimony of their expert, Ms. Joellen Gill ("Ms. Gill"), as unreliable under ER 702. Without Ms. Gill's expert testimony, the Court held that plaintiffs could not create an issue of fact as to whether the rim of a metal utility cover upon which Ms. Kill contends she slipped and

JUDGE KEN SCHUBERT
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fell was unreasonably dangerous. As a result, the Court granted defendant City of Seattle's (the "City") motion for summary judgment.

Plaintiffs now request a *Frye* hearing on the admissibility of Ms. Gill's testimony. This Court denies plaintiffs' request because the tests conducted by a tribometer to show how slippery surfaces are in relation to each other does not involve a novel scientific theory. Because the Court finds that using a tribometer for that purpose is generally accepted in the relevant scientific community and capable of producing reliable results, a *Frye* test is unnecessary.

Plaintiffs also submit new evidence to support their claim that Ms. Gill's test results and her opinion based on those results are reliable. Plaintiffs fail to meet their burden of showing under CR 59(a)(4) that they could not with reasonable diligence have discovered and produced that evidence before the summary judgment hearing. Regardless, consideration of that evidence and reconsideration of plaintiffs' prior briefing does not change this Court's discretionary ruling to exclude Ms. Gill's testimony and test results pursuant to ER 403 and 702. Accordingly, the Court denies both motions and affirms its previous rulings excluding Ms. Gill's testimony and granting the defendant's motion for summary judgment.

II. SUMMARY OF FACTS

A. Ms. Kill's Fall on the Smooth, Two-Inch Metal Rim of a Utility Cover.

On November 13, 2009, Ms. Kill walked through downtown Seattle while she contends it was raining.[1] She fell on a wet metal utility cover.[2] The utility cover was diamond plated. A

[1] Declaration of Twyla Kill (Kill Decl.), ¶¶ 2 and 3. Plaintiffs submitted what they contended was a "true and correct copy of Weather Underground's weather report for November 13, 2009." *See* Declaration of Michael David Myers (Myers Decl.), 05/10/2013, Ex. 4. The first page of that report indicates that there was .33 inches of precipitation measured at Boeing Field, in Seattle that day. The second and third pages of that report contain "hourly observations" that show a number of columns. The last full column is "Gust Speed." The next column is cut-off after the letter "P." That same weather report, which the missing columns, can be found on-line at: http://www.wunderground.com/history/airport/KBFI/2009/11/13/DailyHistory.html?req_city=Boeing+Field-King+County+International&req_state=WA&req_statename=Washington. In addition to the missing "Precip" (precipitation) column, the webpage shows two additional columns that are missing from plaintiffs' "true and

smooth, two-inch metal rim surrounded the utility cover.[3] Although she concedes her shoe was wider than the metal rim,[4] Ms. Kill contends her foot only slipped on the cover's rim, rather than on either the cement or the diamond plated cover on either side of it, because "[a]s I began to fall I looked down to see what I was slipping on. My foot slipped along the rim."[5] For purposes of this motion, the Court accepts as true that Ms. Kill slipped only on the wet, smooth, two-inch metal rim of the utility cover. Plaintiffs sued the City of Seattle, alleging that the smooth metal rim was unreasonably dangerous.

B. ASTM's standards F1679 and F2508.

Plaintiffs hired Ms. Gill as an expert to conduct tests and testify about the condition of the metal rim. Ms. Gill used an English XL VIT tribometer, a machine that measures the coefficient of friction or "slip-resistance" of a surface. She used that tribometer to conduct two tests of the metal rim upon which Ms. Kill slipped. Different standards for the validation and calibration of tribometers were in effect at the time of the each test.

Prior to March 2011, the American Society for Testing and Materials's ("ASTM") F1679 standard provided instructions for how to use a tribometer. The ASTM withdrew the F1679 standard in September 2006, but did not adopt a new standard to replace it during the next five years. Accordingly, Ms. Gill stated that the English XL VIT User Guide applicable to the tribometer she used specifies a method of calibration for users to employ before testing.[6]

In March 2011, ASTM F2508, the current standard for validation and calibration of

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correct" copy: "Events" and "Conditions." The columns of "Precip", "Events", and "Conditions" show that the last measurable rain occurred at 11:53 am (.06 of an inch) and that no rain fell for the rest of the day. Despite the apparent contradiction of plaintiffs' own evidence, the Court accepts for purposes of summary judgment Ms. Kill's contention that it was raining when she slipped.

[2] Kill Decl., ¶6.

[3] Declaration of Joellen Gill (First Gill Decl.), 01/17/13, Ex. 2 (Applied Cognitive Sciences' Report), 1.

[4] Myers Decl. in Supp. of Pls.' Mot. for Partial Summ. J., 01/18/2013, Ex. 1 (Dep. of Twyla Kill), 34:19-20.

[5] *Id.*, 34:2-3.

[6] Fourth Declaration of Joellen Gill (Fourth Gill Decl.), 06/03/13, Ex. 1, 4-5.

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tribometers, went into effect. Although Ms. Gill states that it is ambiguous whether the standard allows both manufacturers and individual tribometrists to validate tribometers,[7] ASTM F2508 unambiguously states "validation shall be performed by walkway tribometer suppliers or an independent testing facility."[8] Additionally, it defines "supplier" as "any individual, agent, company, manufacturer, or organization responsible for the walkway tribometer *prior to receipt by the user*."[9] Accordingly, it is clear that under ASTM F2508, only manufacturers or independent testing facilities, not individual tribometrists, may *validate* a tribometer.

Under ASTM F2508, a validated tribometer must have satisfied two criteria: (1) it must rank the coefficient of friction of each of four reference surface tiles in the correct order; and (2) it must produce statistically significant results, using the mean and standard deviation, for all adjacently ranked surface tiles.[10] If the tribometer does not satisfy these criteria, then it fails validation.[11]

In contrast to the manufacturer-performed validation, tribometrists must perform calibration of their machine in order to ensure their test results are valid. To calibrate a tribometer, the user measures each reference surface tile, and compares the results to the "95 percentile confidence interval" supplied by the manufacturer's validation report.[12] If the results for each tile do not fall within the confidence interval, then the tribometer fails calibration.[13]

Therefore, ASTM F2508 ensures tribometer reliability with two safeguards. First, manufacturers or independent testers must validate tribometers. And secondly, users must calibrate tribometers to ensure the measurements fall within the confidence interval set forth in

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[7] Sixth Declaration of Joellen Gill (Sixth Gill Decl.), 07/02/13, ¶2.
[8] Second Declaration of Joellen Gill (Second Gill Decl.), 05/10/13, Ex. B, ¶11.1.
[9] *Id.*, ¶3.1.2.
[10] *Id.*, ¶9.2.
[11] *Id.*, ¶9.3.
[12] *Id.*, ¶¶13.1-2.
[13] *Id.*, ¶13.3.

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the manufacturer's validation report. If a tribometer fails either calibration or validation, it fails to comply with ASTM F2508.

C. Ms. Gill's Two Tests Produced Varying Results.

On February 24, 2011 – just a week or so before the adoption of F2508, Ms. Gill first tested the metal rim, and found it had a coefficient of friction (or slip-resistance) of .35 (±.02).[14] Ms. Gill's declaration contains the bare conclusion with no explanation that she calibrated the tribometer according to the English XL VIT User Guide.[15]

On June 1, 2013 – the day before her second test, Ms. Gill calibrated her tribometer and produced what she called a "validation" report (because Ms. Gill is not a manufacturer, she cannot validate her tribometer; she can only calibrate it to determine if it falls into the ranges the manufacturer's validation report outlines).[16] Her test results showed that the granite reference tile measured .070; the porcelain tile measured .101, the vinyl tile measured .172; and the ceramic tile measured .850.[17]

Ms. Gill's fifth declaration lays out the correct *validation* report by Excel Tribometers, LLC, the manufacturers of the tribometer, against which to compare her June 1, 2013 calibration results.[18] That report provides 95th percent confidence intervals of .078-.082 for the granite reference tile; .132-.137 for the porcelain reference tile; .173-.180 for the vinyl reference tile; and .605-.616 for the ceramic reference tile.[19] Critically, none of the calibration results produced by Ms. Gill fall within these intervals.

[14] First Gill Decl., 01/17/13, ¶7.
[15] Fourth Gill Decl., 06/03/13, ¶8.
[16] *Id.*, ¶12.
[17] *Id.*, Ex. 2, (Applied Cognitive Sciences ASTM F2508 Validation Report).
[18] Fifth Declaration of Joellen Gill (Fifth Gill Decl.), 06/06/13, ¶3.
[19] *Id.*, Ex. A, (Excel Tribometers LLC Validation Report).

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On June 2, 2013, five days before the hearing on the parties' cross-motions for summary judgment, Ms. Gill again tested the rim, and found a coefficient of friction of .21 (±.02).[20] In an effort to re-create the wet conditions present when Ms. Kill slipped, Ms. Gill poured water on the rim in order to test it while wet.[21] To explain the different results (.35 vs. .21), Ms. Gill stated that "there must be some surface contaminant of some kind that was on the rim as tested that resulted in the lower figure the second time around."[22]

Regardless, as explained above, Ms. Gill did not conduct that test with a properly calibrated tribometer because her calibration results did not fall within the 95th percentile confidence interval of the validation report for her tribometer. Ms. Gill explained that these results outside of that interval were not significant. She claimed the manufacturer gave her an additional "margin of error" or "fudge factor" that meant that her tribometer was adequately calibrated so long as the calibration results were some unspecified amount close enough to the 95th percentile confidence interval.[23]

D. The Court Excluded Plaintiffs' Expert's Testimony and Test Results.

The parties filed cross motions for summary judgment, which the Court heard on June 7, 2013. The City of Seattle moved to exclude Ms. Gill's last declaration, both on the grounds that plaintiffs filed that evidence for the first time in their reply brief, and on the basis that her results did not comply with ASTM 2508. At the summary judgment hearing, the Court excluded Ms. Gill's testimony as unreliable under ER 702, and granted defendant's motion for summary judgment.[24] During oral argument, plaintiffs requested a *Frye* hearing on the admissibility of

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[20] Fourth Gill Decl., 03/6/13, ¶13.
[21] Declaration of Ryan C. Nute (Nute Decl.) in Supp. of Pls.' Mot. for *Frye* Hr'g, 07/02/13, Ex. 1 (June 7, 2013 Summary Judgment Transcript), 24:6-24.
[22] *Id.*, 25:1-4.
[23] *Id.*, 39:8-42:13.
[24] Order Granting Def. City of Seattle's Mot. for Summ. J., 4.

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Ms. Gill's testimony.[25] The Court did not grant the hearing, but invited plaintiffs to submit briefing on the issue.[26]

E. Plaintiffs Sought a *Frye* Hearing and Move for Reconsideration.

Within ten days of the summary judgment hearing, plaintiffs filed a motion for a *Frye* hearing and a motion for reconsideration. In support of those motions, plaintiffs filed a sixth declaration from Ms. Gill, who had asked Excel Tribometers to test her tribometer using Excel's reference tiles. The results of this testing were: .066 for the granite tile; .116 for the porcelain; .165 for the vinyl tiles; and .576 for the ceramic tile.[27] As with her prior results, these results are outside the validation report provided by plaintiff.

Excel also tested Ms. Gill's reference tiles with its tribometer. It found measurements of .080 for the granite tile; .100 for the porcelain; .149 for the vinyl tiles; and .641 for the ceramic tile.[28] Except for the granite tile, these measurements are outside of the validation report's 95th percent confidence interval. Additionally, the measurements for the vinyl and ceramic tiles are substantially different than Ms. Gill's calibration results using those tiles (.172 and .850 respectively). Excel also determined that the coefficient of friction of Ms. Gill's ceramic reference tile varied widely from quadrant to quadrant, ranging from .645 in the Southeast quadrant to .840 in the Southwest quadrant.[29]

III. LEGAL ANALYSIS

Plaintiffs argue that their motion for reconsideration is proper under three subsections of CR 59(a). First, plaintiffs argue that the new evidence they submitted is "newly discovered evidence" that they could not "with reasonable diligence have discovered and produced at the

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[25] Nute Decl. in Support of Pls.' Mot. for Recons., Ex. A, 69.
[26] *Id.*, at 69-71.
[27] Declaration of Peter Widas (Widas Decl.), Ex. 1.
[28] *Id.*, Ex. 2.
[29] *Id.*

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trial."[30] Secondly, plaintiffs argue that "there is no evidence or reasonable inference from the evidence to justify the verdict or the decision, or [the decision] is contrary to law."[31] Finally, plaintiffs argue "that substantial justice has not been done."[32] After careful consideration of each argument discussed in turn below, the Court does not find any of those grounds warrant reversing its decision to deny plaintiffs' motion for summary judgment, exclude their expert's test results and testimony, and grant defendant's motion for summary judgment as a result.

A. Plaintiffs Failed to Show that their Newly Presented Evidence Could Not Have Been Produced Prior to the June 7, 2013 Hearing.

The Court can grant the motion on this basis of newly discovered evidence only if the evidence "(1) will probably change the result of the trial; (2) was discovered since the trial; (3) could not have been discovered before trial by the exercise of due diligence; (4) is material; and (5) is not merely cumulative or impeaching."[33] Washington case law also establishes that a party's realization that it presented insufficient evidence is not grounds for a motion for reconsideration.[34]

Plaintiffs argue that it was "unreasonable to expect that Plaintiff and Ms. Gill should have anticipated all of the issues that came to light."[35] However, plaintiffs had the burden of proving the reliability of the expert testimony they wished to present. A party may not supplement an expert's testimony on a motion for reconsideration simply because the party failed to realize the expert's testimony was insufficient.[36] Plaintiffs argue that Ms. Gill could not have been expected

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[30] CR 59(a)(4).
[31] CR 59(a)(7).
[32] CR 59(a)(9).
[33] *Go2Net, Inc. v. C I Host, Inc.*, 115 Wn. App. 73, 88, 60 P.3d 1245 (2003) (citing *Holaday v. Merceri*, 49 Wn. App. 321, 329, 742 P.2d 127 (1987)).
[34] *Id.* at 91; *Adams v. Western Host, Inc.*, 55 Wn. App. 601, 608, 779 P.2d 281 (1989): *Schoening v. Young*, 55 Wash. 90, 92-93, 104 P. 132 (1909).
[35] Reply in Supp. of Pls.' Mot. for Recons., 2.
[36] *Adams*, 55 Wn. App. at 608.

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to send her tribometer to be tested by the manufacturer prior to the summary judgment hearing. The issues that led Ms. Gill to have the manufacturer test her tribometer existed before the summary judgment hearing. Accordingly, she could have obtained the manufacturer's test results before the summary judgment hearing. She did not do so presumably because she believed her opinion and her test results were sufficiently reliable to be admissible. Plaintiffs' realization that the evidence submitted by their expert was insufficient to survive summary judgment does not make the additional evidence "newly discovered."[37]

Similarly, the Court denies plaintiffs' request for a continuance in order to retain another expert witness. Plaintiffs have not shown why allowing them to retain a new expert would create "newly discovered evidence" and not be cumulative. Just as it would be inappropriate to allow a party to belatedly supplement insufficient evidence with additional declarations from an expert witness, it would be inappropriate to allow a party to belatedly supplement the record with new additional evidence from a "newly discovered" expert. Regardless and as discussed below, consideration of plaintiffs' newly presented evidence does not change the Court's view that its prior decisions were correct.

B. Substantial Evidence, Even when Viewed in the Light Most Favorable to Plaintiffs, and the Rules of Evidence Support the Court's Ruling.

Plaintiffs next argue that their motion for reconsideration is appropriate under CR 59(a)(7). That provision allows motions for reconsideration when the decision is unsupported or contrary to law. Here, the law at issue consists of the rules regarding the admissibility of scientific expert testimony. That law requires expert testimony to satisfy both *Frye* and ER 702 to be admissible. In other words, this Court "***must*** exclude expert testimony involving scientific

[37] Moreover, plaintiffs state that the new "evidence from Excel confirmed what was already in the record." Reply in Supp. of Pls.' Mot. for Recons., 2. Evidence that is merely cumulative cannot be "newly discovered." *Go2Net, Inc.*, 115 Wn. App. at 88.

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evidence unless the testimony satisfies both *Frye* and ER 702."[38]

Washington courts examine "evidence derived from a novel scientific theory or principle" under the test announced in *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923) to determine its admissibility.[39] "To admit evidence under *Frye*, the trial court must find that the underlying scientific theory and the 'techniques, experiments, or studies utilizing that theory' are generally accepted in the relevant scientific community and capable of producing reliable results."[40] If the evidence does not involve a novel scientific theory, courts do not need to conduct a *Frye* inquiry.[41]

Under *Frye*, courts look generally "at whether a theory has accepted and reliable mechanisms for implementing it," not whether an expert properly implemented those mechanisms in the present case.[42] "When a scientific theory has protocols for assuring reliability, an expert's errors in applying proper procedures go to the weight, not the admissibility, of the evidence, *unless the error renders the evidence unreliable*."[43] If the evidence is unreliable due to an expert's error, courts should exclude the evidence using other grounds, such as ER 702, rather than *Frye*.[44]

1. *Frye* Does Not Bar the Methodology Used by Ms. Gill.

As a threshold *Frye* issue, the Court must determine whether Ms. Gill's methodology is novel. Defendant argues that plaintiffs' expert's first test, which was conducted under a standard other than that set forth in ASTM F2508, is unreliable. However, defendant does not argue

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[38] *Lakey v. Puget Sound Energy, Inc.*, 176 Wn.2d 909, 918, 296 P.3d 860 (2013) (citing *State v. Copeland*, 130 Wn.2d 244, 255–56, 922 P.2d 1304 (1996)) (emphasis added).
[39] *State v. Phillips*, 123 Wn. App. 761, 766, 98 P.3d 838 (2004) (citing *Copeland*, 130 Wn.2d at 261).
[40] *Lakey*, 176 Wn.2d at 918 (quoting *Anderson v. Akzo Nobel Coatings, Inc.*, 172 Wn.2d 593, 603, 260 P.3d 857 (2011)).
[41] *Phillips*, 123 Wn. App. at 766 (citing *State v. Hayden*, 90 Wn. App. 100, 104, 950 P.2d 1024 (1998)).
[42] *Lakey*, 176 Wn.2d at 919-20.
[43] *Id.*, at 920 (citing *Copeland*, 130 Wn.2d 244, 270-71) (emphasis added).
[44] *Id.* (citing *Anderson*, 172 Wn.2d at 606; *Cauthron*, 120 Wn.2d at 890).

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either that the methodology used by Ms. Gill when she conducted her first test was novel, or that it was not generally accepted at that time. Furthermore, in a similar case involving the use of the same kind of tribometer, another court found that methods other than ASTM F2508 were generally accepted, even in May 2011, a month *after* ASTM released the F2508 standard.[45] Therefore, *Frye* permits Ms. Gill's first test results conducted a month *before* ASTM released the F2508 standard.

Frye also permits Ms. Gill's second test that she conducted using the F2508 standard. Defendant does not argue that ASTM F2508 is not generally accepted in the scientific community. Instead, defendant argues that Ms. Gill improperly followed this methodology for calibration and validation. However, *Frye* only applies to scientific methodologies in general, not to the particular application of a methodology in a given case.[46] By arguing that Ms. Gill's testimony is unreliable because she failed to correctly employ ASTM F2508, defendant essentially concedes that ASTM F2508 is an appropriate methodology. Therefore, *Frye* does not exclude the results of Ms. Gill's second test.

2. ER 702 and 403 Warrant the Exclusion of Ms. Gill's Test Results.

Evidence that is not excluded under *Frye* must still pass the two-part test under ER 702 (and, of course, be admissible under ER 403): (1) whether the witness is qualified to present expert testimony and (2) whether the expert testimony would be helpful the trier of fact."[47] "Evidence is helpful if it concerns matters beyond the common knowledge of a layperson and

[45] *Michaels v. Taco Bell Corp.*, 2012 WL 4507953 (D. Or. Sept. 27, 2012).
[46] *Lakey*, 176 Wn.2d at 919-20.
[47] *Copeland*, 130 Wn.2d at 256.

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does not mislead the jury."[48] Additionally, unreliable evidence cannot be helpful to the finder of fact.[49]

This Court is mindful that courts generally interpret possible helpfulness to the trier of fact broadly and favor admissibility in doubtful cases.[50] But this is not a doubtful case. The Court exercises its discretion to exclude both of Ms. Gill's test results under ER 702 and 403. The Court finds that Ms. Gill's testing will not be helpful to the trier of fact for several reasons. First, Ms. Gill's testimony essentially amounts to the statement that smooth metal is slippery when wet. This proposition is not "beyond the common knowledge of a layperson," and thus not helpful to the trier of fact.[51]

Second, Ms. Gill's statements that the tribometer is capable of providing objectively correct measurements, and her statement that .5 is an absolute threshold for safety would "mislead the jury" contrary to ER 403. Defendant's experts have provided copious evidence that tribometers are only effective to measure relative slipperiness, not absolute slipperiness.[52] For example, different tribometers, both across models and within models, can give significantly ***different*** readings for the ***same*** surface.[53] Thus, tribometer readings are only meaningful when used in a relative manner. For instance, a tribometer can accurately determine whether one surface is more or less slippery than other surfaces *measured by that same tribometer*, but cannot

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[48] *State v. Thomas*, 123 Wn. App. 771, 778, 98 P.3d 1258 (2004).
[49] *Anderson*, 172 Wn.2d at 600.
[50] *Miller v. Likins*, 109 Wn. App. 140, 148, 34 P.3d 835 (2001).
[51] *See Michaels*, 2012 WL 4507953, at *6 ("the concept that a tile floor is slippery when wet is not one beyond the common knowledge of the average lay person.")
[52] *See, e.g.* Declaration of James E. Flynn (First Flynn Decl.) in Supp. of the City of Seattle's Mot. for Summ. J., 05/07/2013, Ex. 1 (Validation of Walkway Tribometers: Establishing a Reference Standard), Ex. 2 (Assessment of Walkway Tribometer Readings in Evaluation Slip Resistance: A Gait-Based Approach), Ex. 3 (The Development of A Universal Approach to Testing of Walkway Slip Resistance in the U.S.); Declaration of Steven Read, 02/04/2013; Second Declaration of James E. Flynn (Second Flynn Decl.), in Supp. of the City of Seattle's Mot. for Summ. J., 05/23/2013.
[53] First Flynn Decl. ¶5.

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give an objective measurement of a surface that can be compared to readings by other tribometers, or to an objective safety standard.

ASTM F2508 supports these limits of tribometer utility. ASTM F2508 provides no ranges within which a tribometer must measure the reference tiles. A tribometer could measure all of the tiles below .5, or all of the tiles above .5, and still be valid, as long as it correctly ranked the tiles in terms of how slippery they are in relation to each other and statistically differentiated between them. By using the tribometer's measurement as an absolute value, rather than a relative value, Ms. Gill's test results and testimony would improperly mislead the jury.

Third, the Court finds that the variability of the reference tiles used to calibrate Ms. Gill's tribometer makes her results unreliable. If machines are calibrated in reference to tiles, and the coefficient of friction varies both between purportedly identical tiles, and within different areas of the same tile, then two machines calibrated with different sets of tiles would produce different results while measuring the same surface, despite both being in calibration.

Plaintiffs themselves state "validation and calibration is wholly dependent on the particular reference tiles that are being used because there is an inherent variability between reference tiles."[54] Furthermore, "[comparing] test results based on different reference tiles is comparing apples to oranges."[55] But if test results from different tiles cannot be compared, then plaintiffs' argument that the tribometer readings are objective measurements must fail.

Further, plaintiffs' expert has not shown what margin of error the variability of reference tiles adds to their calculation, or how they account for it – the addition of a "fudge factor" only compounds this issue. Therefore the variability of the reference tiles makes tribometer readings

[54] Pls.' Mot. for Recons., 6.
[55] *Id.*, 7.

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unreliable for the purpose of providing objective measurements of the friction coefficient of the metal rim.

Fourth, surface contaminants make Ms. Gill's tribometer readings unhelpful to the jury to determine that the metal rim was unreasonably dangerous at the time Ms. Kill slipped. Ms. Gill states that variation in surface contaminants explains the difference between her first and second reading.[56] If true, that means surface contaminants can have an effect of at least .14 on the friction coefficient of the rim. Plaintiffs admit there is no way of knowing what contaminants were on the surface at the time plaintiff slipped.[57] Accordingly, surface contaminants, which according to plaintiffs' expert's own test results can have an effect of at least .14, makes the tribometer readings unreliable to determine how slippery the rim was at the time Ms. Kill fell.

Last but by no means least, the Court is not convinced that Ms. Gill's tribometer was correctly calibrated during either of her tests. Plaintiffs argue that when Ms. Gill first tested the rim on February 24, 2011, her tribometer was properly calibrated according to existing standards.[58] The only support for this statement consists of Ms. Gill statement that her "tribometer was properly validated and calibrated prior to [first] testing the rim at issue" on February 24, 2011.[59] The initial report giving Ms. Gill's findings, which is dated October 21, 2011 and does not specify the date Ms. Gill tested the rim, describes in total the test procedure as follows:

> "at the time of Ms. Gill's site inspection she used an English XL Tribometer to measure the coefficient of friction or slip resistance index on the metal utility cover embedded in the sidewalk that induced Ms. Kill's slip and fall. When wet (i.e. as it was at the time of Ms. Kill's slip and fall), the coefficient of friction for the smooth

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[56] *Id.*, 4.
[57] *Id.*, 8-9.
[58] Reply in Supp. of Pls' Renewed Mot. for Partial Summ. J., 2.
[59] Second Gill Decl., 05/10/13, ¶6.

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metal perimeter band averaged 0.35 ±0.02. Such values are dangerously slippery as discussed below."[60]

The report provides no information on any validation or calibration prior to Ms. Gill's first test.

In Ms. Gill's second declaration, she states "I relied on a Validation Report... which indicates that the English XL tribometer I used conforms to all requirements of ASTM F2508."[61] This statement is problematic for two reasons. First, although plaintiffs argue that the testing conformed to the existing standards at the time of the test, Ms. Gill relies on a validation report under ASTM F2508, the very standard plaintiffs argue did not apply at the time of the first test. Secondly, the validation report relied on by Ms. Gill did not exist before March 25, 2011,[62] a whole month after Ms. Gill conducted the testing. Thus, it is impossible for Ms. Gill to have relied on this validation report on *February 24, 2011*, the date of the initial testing, because the manufacturer had yet to even create that report.

Whether the model of Ms. Gill's tribometer was validated by the manufacturer at a later date under a different standard is irrelevant to determining whether her tribometer was calibrated according to the standards in place *at the time of testing*. The only proof plaintiff offers about the calibration of Ms. Gill's tribometer on February 24, 2011, is Ms. Gill's statement in her declaration dated June 3, 2013, that she calibrated the tribometer according to the English XL VIT User Guide prior to testing on February 24, 2011.[63] Plaintiffs have not produced evidence that Ms. Gill followed the appropriate procedures, apart from statements more than two years after the testing was conducted. The original report produced by Ms. Gill's company does not mention that any calibration occurred, much less disclose the results of the calibration testing and

[60] First Gill Decl., 01/17/13, Ex. 2(Applied Cognitive Sciences' Report), 4.
[61] Second Gill Decl., 05/10/13, ¶5.
[62] *Id.*, Ex. C (Excel Tribometers Validation Report), 1.
[63] Fourth Gill Decl., 06/03/13, ¶8.

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whether they were within the requisite values. Such conclusory statements are insufficient to defeat summary judgment.[64]

In the case of Ms. Gill's second test, plaintiffs' own evidence shows the tribometer failed the standards in ASTM F2508. As described above, plaintiffs' experts have provided several calibration reports. In each report, one or more of the reference tile measurements exceeded the confidence interval in the validation report. Plaintiffs argue that variations both within the same and among different reference tiles explain these inconsistent results. This may be true, but it does not change the fact that the tribometer failed to meet the standards of ASTM F2508, which requires calibration *and* validation. The Court finds that the failure to comply with ASTM F2508, along with the myriad of different readings produced by the different reports, make Ms. Gill's testimony unreliable under ER 702 and likely to confuse the jury contrary to ER 403.

In conclusion, the Court exercises its discretion to exclude Ms. Gill's testimony under ER 702 and 403. Tribometer readings seem most appropriate to determine a ranking of how slippery various surfaces are in relation to each other. With that said, this Court is not ruling they are inherently unreliable. If Ms. Gill had demonstrated that the tribometer was accurately validated and calibrated, and had accounted for the margin of error due to variations within the same or among different reference tiles of the same type and variations in surface contaminants of the subject area, her testimony may well have been admissible to prove the *relative* slipperiness of the metal rim. But in this case, where the Ms. Gill attempted to use the tribometer readings to show objective slipperiness compared against a supposed objective standard of safety, despite the evidence showing that tribometers are inaccurate for such purposes, and without explaining

[64] *See, e.g., Gulle v. Ballard Cmty, Hosp.*, 70 Wn.App. 18, 25, 851 P.2d 689 (1993) (expert's affidavit summarizing medical malpractice plaintiff's postsurgical complications, coupled with unsupported conclusion that complications were caused by defendant's "faulty technique," was insufficient to defeat summary judgment motion).

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or addressing the margins of error resulting from surface contaminants and variable reference tiles, the Court exercises its discretion to exclude that evidence.

C. Plaintiffs Failed to Establish that Substantial Justice Has Not Been Done.

Finally, plaintiffs seek relief under CR 59(a)'s catch-all provision "that substantial justice has not been done."[65] Courts grant motions for reconsideration under CR 59(a)(9) only under rare circumstances.[66] Plaintiffs argue that the Court should grant this exceptional remedy because the Court relied on a flawed reading of ASTM F2508.

To support their argument, plaintiffs cite to a case in which the Court granted such relief because an expert witness explicitly based his conclusion on a study which he mischaracterized.[67] In that case, a CR 59(a)(9) motion was appropriate because the expert's testimony misled the jury.[68] That relief would be appropriate here if this Court had admitted Ms. Gill's test results and testimony because this Court believes those results and her testimony would misled the jury. But the import of this Court's decision is to bar evidence that would mislead the jury. Plaintiffs are correct that ASTM F2508 does not account for variations among the same kind of reference tiles, but it does not follow that the Court relied on a flawed interpretation of the standard, or that defendant mischaracterized it. Therefore, CR 59(a)(9) does not provide a basis for a motion for reconsideration.

D. Plaintiffs' Other Evidence Fails to Raise a Genuine Issue of Material Fact

Plaintiffs also argue that the metal rim failed to comply with the City's standards either when it was installed, or in subsequent years. However, plaintiffs have not introduced evidence about when the metal rim was installed (except to show it was likely installed in *or before* 1989),

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[65] CR 59(a)(9).
[66] *Sligar v. Odell*, 156 Wn. App. 720, 734, 233 P.3d 914 (2010); *Lian v. Stalick*, 106 Wn. App. 811, 825, 25 P.3d 467 (2001).
[67] *Barth v. Rock*, 36 Wn. App. 400, 403-04, 674 P.2d 1265, (1984).
[68] *Id.* at 404-05.

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and have not demonstrated that it failed to comply with City standards at that time. Furthermore, Washington case law establishes that the City has no duty to retrofit its streets or sidewalks to meet its current standards, as long as the facilities are reasonably safe.[69] Failure to meet current standards does not by itself establish that the metal rim was unreasonably dangerous. Therefore, plaintiffs have not raised a genuine issue of fact to preclude summary judgment.

IV. CONCLUSION

While the Court appreciates the parties' time, energy and resources spent on the interesting issues addressed in this order, it declines to change its discretionary ruling to exclude, pursuant to ER 702 and 403, Ms. Gill's testimony and her test results regarding the condition of the metal rim. That expert testimony and her test results represent plaintiffs' only evidence that the metal rim was unreasonably dangerous. Without that evidence, plaintiffs do not and cannot raise a genuine issue as to whether the metal rim was unreasonably dangerous. Accordingly, the Court denies plaintiffs' motion for reconsideration and motion for a *Frye* hearing and leaves in place its order granting defendant's motion.

Dated this 8th day of August, 2013.

HONORABLE KEN SCHUBERT
KING COUNTY SUPERIOR COURT JUDGE

[69] *See Ruff v. Cnty. of King*, 125 Wn.2d 697, 705, 887 P.2d 886, (1995) (citing *Tanguma v. Yakima Cnty*, 18 Wn. App. 555, 560, 569 P.2d 1225 (1977)); *see also Lucas v. Phillips*, 34 Wn.2d 591, 596, P.2d 279 (1949).

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APPENDIX – 12

Not Reported in F.Supp.2d, 2012 WL 4507953 (D.Or.)
(Cite as: 2012 WL 4507953 (D.Or.))

Only the Westlaw citation is currently available.

United States District Court, D. Oregon.
Jeanne MICHAELS, Plaintiff,
v.
TACO BELL CORPORATION, a California corporation, Defendant.

Civ. No. 10–1051–AC.
Sept. 27, 2012.

Craig A. Nichols, Nichols & Associates, Portland, OR, for Plaintiff.

Jean Ohman Back, Sharon E. Rye, Schwabe Williamson & Wyatt, PC, Portland, OR, for Defendant.

OPINION AND ORDER

ACOSTA, United States Magistrate Judge:

Introduction

***1** Plaintiff Jeanne Michaels seeks to introduce expert engineering testimony to support her negligence claims against Defendant Taco Bell Corporation for damages resulting from injuries allegedly suffered when she slipped and fell on a wet floor near the front entrance of a Taco Bell restaurant. Defendant moves to exclude Plaintiff's expert, David Karlin, because his opinions do not meet the prerequisites for expert testimony admissibility established by Federal Rule of Evidence 702 and *Daubert v. Merrett Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993). The court finds that Karlin's methods and ultimate opinion do not meet the standard for reliability established under those authorities and therefore grants Defendant's motion. [FN1]

FN1. Defendant's motion appears in the court docket as No. 54. Plaintiff filed a motion to exclude Defendant's rebuttal expert, which motion appears as No. 63 in the court docket. At hearing on the parties' respective motions, Plaintiff withdrew her motion. Thus, the court considers only Defendant's motion to exclude.

Background

The incident facts relevant to Defendant's motion are not disputed. Defendant owns and operates a Taco Bell restaurant located at 725 NE Weidler Street in Portland, Oregon. On January 8, 2010, Plaintiff dined at this Taco Bell restaurant. After eating, Plaintiff began to walk out of the store when she slipped and fell on the floor near the restaurant's entrance. The floor at that location was wet from having been recently mopped. A sandwich-style yellow warning sign was posted at the mopped area.

Allegations

Plaintiff's negligence allegations are simple, clear, and straightforward. She asserts:

> The cause of the injuries suffered by Plaintiff was the negligence of Defendant, by and through the actions and/or inactions of its employees acting within the scope and course of their employment with Defendant, in one or more of the following particulars:
>
> a. Failing to maintain the floor of the restaurant in a reasonably safe condition;
>
> b. Allowing water and/or mop water and/or a slippery substance to come into contact with and remain on the floor of the restaurant when Defendant knew, or in the exercise of reasonable care should have known, that the substance created an unreasonable risk of harm to customers in the store;

c. Failing to install a non-slip surface on the floor of the store; and

d. Failing to warn Plaintiff of the dangerous condition.

Third Amended Complaint, ¶ 8 (Docket No. 67).

Plaintiff's Expert

Plaintiff hired David Karlin ("Karlin"), a consulting engineer, to provide expert testimony regarding the slip resistance of the flooring material in the area of the Taco Bell restaurant where Plaintiff's fall occurred. Karlin is a mechanical engineer. He received his B.S. in mechanical engineering in 1984 from the Massachusetts Institute of Technology ("MIT") and his M.S. in mechanical engineering from MIT in 1986. He is a licensed professional engineer in Oregon, Washington, California, and Hawaii. Karlin's memberships in professional organizations include the Society of Automotive Engineers, the American Society of Mechanical Engineers, an arson investigators organization, and three separate accident reconstructionist organizations. His resume (Exhibit 11, Supplemental Declaration of David Karlin, Docket No. 73) also discloses an extensive list of "Special Studies," the subjects of which primarily have been accident investigation and reconstruction of vehicle collisions and their related environments. He is registered as a Traffic Accident Reconstructionist by the Accreditation Commission for Traffic Accident Reconstruction. Karlin's resume shows that on January 31, 2008, he became a certified English XL Tribometrist (CXLT). A tribometer is an instrument that measures friction between two surfaces, and Karlin used an English XL tribometer to conduct his slip-resistance testing in this case.

Plaintiff's Expert's Opinion

***2** Karlin's expert report is dated January 23, 2012, and its substantive text comprises less than three pages. Attached to his report are twenty-two pages of photographs taken from the Taco Bell restaurant's surveillance video which captured Plaintiff's fall. The report's text documents the results of Karlin's May 20, 2010, testing of the floor surface of the Taco Bell restaurant in the area of Plaintiff's fall, and sets out his conclusions from that testing. The portions of his report relevant to Defendant's motion are set out below:

CONCLUSIONS

1. The tile floor was very slippery when wet with water or soap solution.

2. The tile floor was slightly slip resistant when dampened, then dry-mopped.

3. The tile floor (on the day of our inspection) was moderately dirty with a significant residue remaining after multiple cleaning passes.

4. A Taco Bell employee wet-mopped most of the restaurant lobby in the incident video; two slip incidents occurred within a 13 second period during and just after mopping.

5. Floor tiles with measurably better slip-resistance were available for this use. This floor may also be made safer with an appropriate floor finish or etching.

METHODS AND PROCEDURES

During the course of our investigation, TAI [FN2] performed the following;

FN2. "TAI" abbreviation for the name of the engineering consulting firm that employs Karlin.

1. Reviewed a provided surveillance videotape and downloaded specific frames.

2. Measured, inspected and photographed the incident floor on May 20, 2011.

3. Tested the slip resistance of the tile floor surface using the English XL Variable Incidence Tribometer (Slip–Resistance Tester) in accordance with ASTM F1679 and all current calibration standards.

4. Reviewed excerpts from the Taco Bell employee manual regarding floor cleaning.

5. Reviewed building codes and accessibility standards.

6. Prepared this report.

DATA AND OBSERVATIONS

1. The incident Taco Bell fast food restaurant (Figure 1) had two entrances, from the east (Figure 2) and from the west. The slip occurred near the east door (Figure 3), on the way to the restroom and near the rubbish counter (Figure 4). The floor was sloped very slightly uphill to the north and downhill to the east.

2. We measured both a brown and a tan 8 inch square tile in the area of the slip (Figure 5). There was little measurable difference between them. When tested in accordance with ASTM F1679, the tiles had a wet slip index of 0.15. We also tested with the Taco Bell cleaning solution (0.14) and after an employee damp mopped the tiles (0.53 after a short drying time). The floor was found to be relatively dirty after the employee mopped (Figure 6). Wet ASTM F1679 testing was repeated after the mopping and the floor had a wet slip index of 0.13.

3. The employee manual directed the following:

a. Prevent slips and fall—"Mop small areas at a time." (TBC00142)

b. Types of Cleaners "KADET Quarry Tile Floor Cleaner ... 1 packet per 4 gallons." (TBC00169)

***3** c. Mopping Floors—During the Day—"Use the yellow-handled mop ONLY in the kitchen" and "Damp mop a 10' x 10' area." (TBC00178)

4. The Taco Bell employee in the video mopped the whole dining room lobby and some of the dining room over several minutes, without pausing for areas to dry or putting out signs to warn of the various wet floor areas. Around the time 17:07, after mopping the whole dining room lobby, the employee drags the wet mop around the dining room lobby periphery on her way back to the kitchen. The subject slipping incident occurred about 30 seconds later. We extracted 20 frames from the provided video covering just over 5 minutes of time (Figures 7–26, provided). Figure 7 shows the employee beginning mopping operations with a yellow handled mop five minutes before the accident occurred, Figure 17 shows another customer slipping but catching herself on a nearby counter, and the incident slip occurred 13 seconds later, in Figure 22.

5. Building codes and accessibility standards indicate that this restaurant floor should be "firm, stable and slip-resistant" and not sloped more than 1 part in 20 (5 percent).

ANALYSIS AND DISCUSSION

1. No regulations currently exist that define what the minimum slip index value should be for public areas. A common industry practice is to consider any surface that has a slip index of 0.5 or higher to be slip resistant.

2. The floor tiles were slippery when wet. The floor tiles were slip resistant when carefully cleaned with a damp mop, then air dried slightly.

3. Floor etching technology may be available to permanently increase the slip resistance of tile floor surfaces. Commercial floor mats may be an assist but can contaminate customer shoes and cause tripping incidents. Mats must be kept meticulously clean to be effective. Engineered floor finishes are available to modestly increase the slip resistance of a stone tile floor.

4. Incidentally, in several Kentucky Fried Chicken restaurants we found the American Olean Quarry Natural N46 Indoor/Outdoor tile. These tiles were specified by Kentucky Fried Chicken and tested by us with very high slip resistance in the similar restaurant lobby application. These American Olean tiles are good examples of slip-resistant flooring that is suitable for use in the ordering and eating areas of Kentucky Fried Chicken and Taco Bell restaurants. It is our understanding the Kentucky Fried Chicken and Taco Bell are sister companies.

5. The Taco Bell employee in this incident used a yellow handled mop, the kitchen mop, to maintain the dining room floor. Kitchen mops typically contain grease and particles of food that would likely make the dining room floor slippery, even with proper mopping techniques. Additionally, this employee did not use proper mopping techniques, as outlined in the Taco Bell employee manual. Specifically, she did not work in 10 by 10 areas and did not properly sign the wet areas, then rewetted a new slippery path as she pushed the mop back into the kitchen.[FN3]

FN3. Karlin's full report is attached as Exhibit 10 to the Supplemental Declaration of David Karlin (Docket No. 73) ("Supp.Karlin.Deck").

Defendant's Motion

***4** Defendant asserts two grounds for excluding Karlin's testimony, First, Defendant contends that the methodology Karlin used to evaluate the slip resistance of the floor was unreliable. Defendant argues that Karlin did not properly validate and calibrate his tribometer in accordance with established industry standard American Society for Testing and Materials ("ASTM") F2508–11, "Standard Practice for Validation and Calibration of Walkway Tribometers Using Reference Surfaces" ("F2508"). Defendant points out that Karlin instead used the ASTM 1679–04 Standard. Test Method for Using a Variable Incidence Tribometer ("F1679"). Defendant argues that Karlin's failure to use the new F2508 standard rendered his test results invalid, and that his lack of knowledge about the standard shows he is not qualified as a slip-resistance expert because he is not aware of current industry standards and practices.

Second, Defendant asserts that Karlin failed to reliably apply the testing methods to the facts of this case, Karlin tested the slipperiness of the floor under various conditions, including creating a small puddle of water on the floor, spraying the tiles with Taco Bell cleaning solution, and mopping the tiles with water and leaving them to dry both partially and completely. Defendant contends that Karlin's opinions about the slip resistance of the floor tiles under these tested conditions are irrelevant, because they are dissimilar to the conditions of the tiles at the time Plaintiff slipped and fell.

In her response brief, Plaintiff argues that Karlin's academic and professional background render him qualified to give his opinion regarding the slip resistance of the floor. Plaintiff contends that Karlin was following reliable industry procedures when he tested the floor on May 20, 2011, using the ASTM F1679 method. Plaintiff acknowledges that F1679 was officially withdrawn by ASTM in 2006, but contends that F1679 is still available for purchase through ASTM and is still widely used by tribometrists. Plaintiff also points out that Karlin had his tribometer calibrated by the manufacturer, Excel Tri-

bometers, on May 18, 2011, just two days prior to the testing. Plaintiff notes that the manufacturer did not use the F2508 standard for calibration, but instead followed the F1679 method. Additionally, Plaintiff contends that Karlin's report of the floor testing is relevant because the floor was wet when Plaintiff slipped, and that his wet, dry, and soap tests were proper because it is impossible to know the exact contaminants that were present on the mop and on the floor at the time of Plaintiff's accident.

Legal Standard

Federal Rule of Evidence ("Rule") 702 provides:

> If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise, if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case.

***5** FED.R.EVID. 702.

Under Rule 702, the district court is tasked with the gate-keeping function assigned by *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993) (*Daubert I*), to determine the admissibility of expert witness testimony. *Kumho Tire Co., Ltd. v. Carmichael*, 526 U.S. 137, 141, 147 (1999). "Faced with a proffer of expert scientific testimony, then, the trial judge must determine at the outset ... whether the expert is proposing to testify to (1) scientific knowledge that (2) will assist the trier of fact to understand or determine a fact in issue. This usually entails a preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue." *Daubert I*, 509 U.S. at 592–93 (footnote omitted). *Daubert* applies to the testimony of engineers and other experts who possess technical and other specialized knowledge. *Kumho Tire*, 526 U.S. at 141. An expert's "bald assurance of validity is not enough." *Daubert v. Merrell Dow Pharm., Inc.*, 43 F.3d 1311, 1316 (9th Cir.1995) (*Daubert II*).

Factors to be considered when determining if the testimony is reliable scientific knowledge are whether the theory or technique is generally accepted in the relevant scientific community, whether it has been subjected to peer review and publication, whether it can be and has been tested, whether standards exist to control the technique's operations, and whether the known or potential rate of error is acceptable. *Daubert I*, at 593–94. The inquiry, however, is a flexible one, with the focus solely on the principles and methodology used, not on the conclusions they generate. *Id.* at 594. *See also Claar v. Burlington Northern R. Co.*, 29 F.3d 499, 502 (9th Cir.1994) (the district court is "both authorized and obligated to scrutinize carefully the reasoning and methodology" underlying the expert's testimony); *Tyson v. Oregon Anesthesiology Group, P.C.*, Case No. 03–1192–HA, 2008 WL 2371420, at *15 (D. Or. June 6, 2008) (finding inadmissible expert conclusions that were "vague and inadequately supported with specific, relevant statistical analysis"). Other relevant factors may be considered, and the factors listed in *Daubert* may not be reasonable measures of the reliability of expert testimony in a particular case. *Id.* at 594; *Kumho Tire*, 526 U.S. at 147–153. As the Supreme Court observed, *Daubert's* factors "may or may not be pertinent in assessing reliability ... The conclusion, in our view, is that we can neither rule out, nor rule in, for all cases and for all time the applicability of the factors mentioned in *Daubert* .... Too much depends upon the particular circumstances of the particular case at issue." *Kumho Tire*, 526 U.S. at 150 (citations and internal quotations omitted).

A threshold question in determining the admissibility of expert testimony is whether the proffered testimony will assist the trier of fact. *Daubert I*, 509 U.S. at 592. Expert witness testimony is unnecessary unless the subject matter "is beyond the common knowledge of the average lay person." *United States v. Hanna*, 293 F.3d 1080, 1086 (9th Cir.2002) (quotation omitted). Thus, "even if [the expert] testimony may assist the trier of fact, the trial court has broad discretion to admit or exclude it." *Beech Aircraft Corp. v. United States*, 51 F.3d 834, 842 (9th Cir.1995) (per curiam) (quotation omitted).

***6** Rulings on the admissibility of expert testimony under Rule 702 are committed to the sound discretion of the trial court. *Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 141–42 (1997).

Discussion

I. Is the Proffered Testimony Expert Testimony?

The court's initial inquiry is whether Karlin's testimony consists of "scientific, technical, or other specialized knowledge" such that Rule 702's requirements must be applied. Clearly, it does. Karlin's testimony purports to measure the slip resistance of the Taco Bell restaurant's tile floor under several different test conditions. Karlin used is an English XL Tribometer, an instrument that measures friction between two surfaces, to quantify the slip resistance values for each test condition. Measuring, quantifying, and analyzing the slip resistance under various conditions of surfaces that come in contact with one another is a subject "beyond the knowledge of the common knowledge of the average lay person," Thus, the subject of the testimony involves the kind of "technical knowledge" contemplated by Rule 702.

II. Is Karlin An Expert?

Defendant does not dispute that Karlin is an expert, and the record supports the conclusion that he is an expert as contemplated by Rule 702. Karlin is a licensed mechanical engineer who holds two degrees from MIT. He has substantial experience as a consulting engineer, in particular with respect to vehicle accident reconstruction. He is certified to use the English XL Tribometer. Karlin is a qualified expert, specifically, a qualified mechanical engineer, for purposes of Rule 702 and *Daubert's* requirements.

III. Is Expert Testimony Needed to Assist the Trier of Fact?

Plaintiff's Third Amended Complaint specifies four ways in which Defendant allegedly was negligent: (1) failing to maintain the floor of the restaurant in a reasonably safe condition; (2) creating an unreasonable risk of harm when Defendant allowed mop water and/or a slippery substance to remain on the restaurant floor; (3) failing to install a non-slip surface on the floor of the store; and (4) failing to warn Plaintiff of the dangerous condition. Expert testimony is not needed to assist the jury in determining the first two specifications, and Karlin's proffered opinion address only one of the remaining two specifications.

Simple facts anchor Plaintiff's case: she suffered injuries when she slipped and fell on a wet tile floor near the entrance of a Taco Bell restaurant. Three of her four legal theories are equally simple. The first specification of negligence asserts that Taco Bell employees failed to maintain the floor in a safe condition by not keeping it dry and the second contends that they allowed it to remain wet. These allegations target acts or omissions of Defendant's employees at the particular store, whose conduct allegedly resulted in the wet floor on which Plaintiff slipped. The concept that a tile floor is slippery when wet is not one beyond the common knowledge of the average lay person. Plaintiff's counsel effectively conceded this conclusion at hearing on Defendant's motion, when he was unable to explain how Karlin's testimony was needed to help a jury understand these two theories. Thus, Karlin's expert testimony is not necessary to assist the jury in determining these two specifications of negligence.

***7** With respect to the fourth specification, fail-

ure to warn of the wet floor, Karlin offers no testimony at all, His report contains no discussion of nor opinion about Defendant's alleged failure to warn of the allegedly wet floor. Neither does Karlin present himself as a warnings expert: his report, his resume, and the background information offered during his deposition do not address this topic. Thus, Karlin's testimony is irrelevant to the jury's consideration of Plaintiff's fourth specification of negligence and, therefore, is inadmissible.

This leaves Plaintiff's third specification of negligence, Defendant's alleged failure to install a non-slip surface on the floor of the Taco Bell restaurant, as the subject on which Karlin's expert testimony might assist the jury. Summarized, on this issue Kariin's testimony includes a description of the testing and measurements he performed on the Taco Bell restaurant's floor material, his findings of the floor's slip resistance under various conditions, and his opinion about the floor tiles' slip resistance. The court now examines Karlin's expert testimony, as it relates to this issue, under the requirements of Rule 702 and *Daubert.*

IV. Is the Expert Testimony Reliable?

A. Karlin's Use of the F1679 Standard.

Defendant argues that Karlin's testimony should be excluded because the method used to calibrate his tribometer rendered the device unreliable for testing the floor tiles. On this point Defendant's argument is straight forward: Kariin used the wrong standard to calibrate his tribometer; thus, the measurements produced by his testing are not reliable under Rule 702 and *Daubert.* Kariin used the American Society for Testing and Materials's ("ASTM") F1679 standard for calibrating his tribometer, about which Defendant makes two observations. First, F1679 provides only instructions for how to use a tribometer; it is not a standard for calibrating it. Second, the ASTM withdrew the F1679 standard in September 2006, almost five years before Karlin relied on it to conduct his testing in this case, and replaced it in March 2011 with the F2508 standard. At oral argument, Defendant further pointed out that prior to ASTM's publication of F2508 there was no standard at all against which tribometers could be uniformly calibrated and that even the manufacturer of the English XL Tribometer acknowledge F2508 as the applicable standard.

Summarized, Plaintiff responds that ASTM withdrew F1679 "for a violation of form and style" by referring to "proprietary apparatus where alternatives exist," but that it continued as the recognized industry standard for using a tribometer. Plaintiff also argues that currently, and particularly at the time Karlin conducted his testing, F2508 was not generally accepted in the industry because only two months had passed between ASTM's adoption of F2508 in March 2011 and Karlin's testing in May 2011. Plaintiff further notes that Karlin had his English XL tribometer calibrated by the manufacturer just two days before he conducted his testing, thus further ensuring that his tribometer was properly calibrated and, thus, capable of making accurate, reliable measurements.

***8** The court is not persuaded by Defendant's argument that Karlin's use of the Fl 679 standard renders his test results unreliable. First, Karlin testified that the F1679 standard was the recognized yardstick for using tribometers when conducting slip-resistance testing. Defendant's evidence does not dispute this assertion but instead questions whether F679's content constitutes a proper standard at all. Whatever its shortcomings, however, Karlin's testimony establishes that at the time of his testing, F1679 was in general use to calibrate tribometers.

Second, Defendant's evidence does not establish that at the time of Karlin's testing in May 2011, F2508 was generally accepted in the industry as the standard for calibrating tribometers. Plaintiff points out that even though the two principals of Excel Tii-

bometers LLC were members of the ASTM committee that developed the F2508 standard, that company used F1679 to calibrate his tribometer two months after F2508 was adopted days and just days before Karlin conducted his testing in this case. Further, Plaintiff presented two reports to support her position that Karlin properly relied on the F1679 standard in conducting his testing. The first report is by Zurich Services Corporation, published in August 2011, and contains a detailed analysis of the accuracy of two tribometer models, one of which is the English XL. (Nichols Amended Supplemental Declaration, Ex. 1.) The Zurich report attests to the accuracy of the English XL without ever mentioning the F2508 standard. The second report discusses testing of the English XL and concludes that it is suitable and reliable for measuring the slip resistance of wet and dry surfaces, including flooring. (Nichols Amended Supplemental Declaration, Ex. 2.) The report contradicts Defendant's assertion that prior to F2508's adoption reliable and uniform calibration of tiibometers could not be accomplished.

Rule 702 requires expert testimony to be a product of reliable methods that have " 'general acceptance' in the relevant expert community." *Kumho Tire Co., Ltd. v. Carmichael,* 526 U.S. 137, 156 (1999). The court finds that the F2508 standard had not at the time of Karlin's May 2011 testing gained the general acceptance Rule 702 requires. The court thus concludes that the methodology Karlin used is reliable and that his opinion should not be excluded for failing to use the F2508 standard.

C. *Methodology and Application*

The remaining issue in determining the admissibility of Karlin's testimony is whether the testimony is "the product of reliable principles and methods" and whether Karlin "has applied the principles and methods reliably to the facts of the case." FED. R. EVID. 702. The court concludes that Karlin's execution of the slip resistance tests does not meet *Daubert's* reliability requirements. Because Karlin failed to adequately apply his methods to the facts of this case, his testimony is inadmissible.

First, Karlin's report lacks information key to supporting the reliability of his methods and testing of the floor tiles. He concludes that "[f]loor tiles with measurably better slip-resistance were available for this use," but nowhere in his report does Karlin identify the manufacturer and model of floor tile actually used in the Taco Bell restaurant where Plaintiff's fall occurred. He provides no information about the manufacturer's specifications regarding the tested tile's slip resistance or whether the tested tile, as manufactured, met government or accepted industry standards for slip resistance. Also absent is any identification of the other floor tiles he claims were better and whether these tiles were available for use at the time the subject floor tiles were purchased and installed in the Taco Bell restaurant.

***9** Equally critical on this point is Karlin's deposition admission that he did not know even what kind of tile was present in the Taco Bell restaurant when he tested it. When asked at deposition, he replied, "it's a light brown or mauve 8–by–8 tile" but did not know the kind of tile or whether it is a tile generally used in commercial facilities. (Declaration of Jean 0. in Support of Defendant's Motion to Exclude (Docket No. 56), Exhibit 3, at 5) (hereinafter "Karlin Dep."). Karlin failed to satisfactorily explain why, when he had adequate opportunity to acquire and incorporate this knowledge into his testing, he failed to do so. That the information was available to Karlin is undisputed. In its brief supporting its motion and at hearing on its motion, Defendant's counsel represented, and Plaintiff's counsel did not refute, that in February 2011, Plaintiff deposed Michael Singhose, a Taco Bell architect, who identified the type of tile used and discussed the rationale for its use at the restaurant where Plaintiff fell. Def. Memo 5.

Second, Karlin does not explain in his report the reasons he used the testing methods described in his

report and how those various methods are relevant to the conditions of the tile floor present at the time of Plaintiff's fall. In fact, the record shows that Karlin's testing assumptions are unsupported by evidence that they duplicated or attempted to duplicate the conditions present when Plaintiff fell. Karlin tested the tile floor using soap solution, but he testified in deposition that he did not know whether any soap solution was used to mop the floor on the day of Plaintiff's fall and, in fact, specifically acknowledged he was told by an employee at the restaurant that "they never used soap during the day." Karlin Dep. 7; Defendant Taco Bell Corporation's Memorandum in Support of Motion to Exclude David Karlin as an Expert and Strike His Expert Report ("Def.Mem.") 9. Karlin also tested the tiles after creating a small puddle of water on the floor, but neither the written record or the still photos taken from the surveillance CD depicting Plaintiff's fall show a puddle on the floor where Plaintiff's fall occurred. Supp. Karlin Decl., Ex. 10, at 8–27. Indeed, Plaintiff's Third Amended Complaint contains no such allegation. And, a soda spill had occurred and had been mopped up in the area of Plaintiff's fall just before it occurred, but none of Karlin's testing included the use of soda, whether before or after it had been mopped up. Def. Memo. 9, 11; Karlin Dep. 8–10. Finally, Singhose described at deposition Taco Bell's standard process for cleaning floors at the restaurant where Plaintiff fell and identified the floor cleaner solution used (Def.Memo.5), yet Karlin's report contains no mention of this information and no explanation why such information was not relevant to his testing or to the validity of his conclusions. In sum, Karlin's report lacks information directly relevant to the court's assessment of the validity of his testing methodology and whether his methodology was reliably applied to the facts of this case.

***10** Third, Karlin could not explain in his deposition why his test results showed that tiles mopped and left damp were less slippery than tiles mopped and left to dry completely. Even to a lay person this comparative result is counterintuitive, yet when asked about the result during his deposition, Karlin simply replied, "I don't know." (Karlin Dep. 18). Given Karlin's report statement that "[a] common industry practice is to consider any surface that has a slip index of 0.5 or higher to be slip resistant," his finding that the damp floor exceeded this alleged industry standard but a dry floor did not,—with no explanation for how that result could occur—further undermines the reliability and validity of his methodology.

In *Kumho Tire* the Supreme Court affirmed the trial court's exclusion of plaintiff's expert testimony based on reasoning applicable here. The trial court "did not doubt" the qualifications of plaintiff's expert mechanical engineer, but nonetheless excluded the expert's testimony because "it initially doubted, and then found unreliable, 'the methodology employed the expert in analyzing the data' " he obtained from his inspection and the scientific basis, " 'if any,' ' for his analysis. *Kumho Tire*, 526 U.S. at 153 (quoting the district court), Here, Karlin clearly is a qualified mechanical engineer but, as *Kumho* makes clear, that a witness is a qualified expert in a field or on a subject does not by itself make relevant or admissible whatever opinion he or she proposes to offer. As did the trial court in *Kumho Tire*, this court finds unreliable the expert's methodology used in gathering and then analyzing the data in this case.

On this point, the Court spoke with equal clarity that the trial court's task is to apply *Daubert's* requirements to determine the reasonableness of the expert's methodology in the case at hand, not its reasonableness generally. *Kumho Tire*, 526 U.S. at 153–54. Here, Karlin's methodology is not a reliable approach to determining whether Defendant in this case was negligent in "failing to install a non-slip surface on the floor of the store." As described above, there are serious questions about the validity of the data he used and assumptions he made, and he failed to consider material information in conducting his testing and analysis—information that either was

available to him or could have been obtained by him. The expert mechanical engineer's testimony in *Kumho* suffered similar dispositive flaws in both methodology and factual assumptions and here, as in *Kumho Tire,* the result is similarly dispositive of the proffered opinion.

In sum, the court has found that the subject of Karlin's expert testimony properly relates only to one of Plaintiff's four allegations of negligence, that Defendant "[failed] to install a non-slip surface on the floor of the store." As to that allegation, Karlin's testimony lacks the underlying reliability necessary under *Daubert* to be relevant to the jury's determination whether Defendant acted negligently in installing the floor tile material present at the time Plaintiff fell. Consequently, Karlin's testimony is inadmissible.

Order

***11** For the reasons stated above, Defendant's motion to exclude Plaintiff's expert testimony is GRANTED. Karlin's expert report is stricken and Karlin is precluded from testifying at trial.

D.Or.,2012.
Michaels v. Taco Bell Corp.
Not Reported in F.Supp.2d, 2012 WL 4507953 (D.Or.)

END OF DOCUMENT

APPENDIX – 13

Not Reported in F.Supp.2d, 2011 WL 1337362 (W.D.La.), 85 Fed. R. Evid. Serv. 83
(Cite as: 2011 WL 1337362 (W.D.La.))

H

Only the Westlaw citation is currently available.

United States District Court,
W.D. Louisiana,
Monroe Division.
Jack PHELPS, et al.
v.
STEIN MART, INC.

Civil Action No. 09–1869.
April 7, 2011.

Jeffrey D. Guerriero, Kevin D. Alexander, Guerriero & Guerriero, Monroe, LA, for Jack Phelps, et al.

Jason Michael Nash, Ungarino & Eckert, Shreveport, LA, for Stein Mart, Inc.

RULING

ROBERT G. JAMES, District Judge.

***1** Pending before the Court is a Motion in Limine [Doc. No. 17] filed by Defendant Stein Mart, Inc. ("Stein Mart") and a Motion in Limine [Doc. No. 24] filed by Plaintiffs Jack and Sherry Phelps ("the Phelps"). For the following reasons, both motions are DENIED.

I. FACTUAL AND PROCEDURAL HISTORY

This case arises out of an alleged slip and fall accident inside the Monroe, Louisiana Stein Mart store. The Phelps allege that, on October 7, 2008, Mr. Phelps went to Stein Mart to purchase two sweater vests and slipped and fell inside the entrance. On October 1, 2009, the Phelps filed suit against Stein Mart for negligence, alleging, among other things, that tiles on the floor created an unreasonable risk of harm because they were slippery and that Stein Mart had actual or constructive notice of the condition of the tiles prior to the accident.

The Phelps retained Dr. Leighton Sissom ("Dr.Sissom"), and Stein Mart retained Dr. Mike James ("Dr.James") as experts to conduct field tests on the tiles where the accident occurred. Both experts performed "drag sled" tests on the tiles. Stein Mart describes a drag sled test as follows:

> A testing material is used, with a known weight applied to the material. Thereafter, the material is attached to a weight scale or dynamometer,[FN1] and tension is applied until the material begins to move across the surface to be tested. At the moment that the material "breaks" traction and begins to move, a reading is taken from the scale. The reading is then divided by the known weight, which yields the coefficient of friction.
>
> FN1. A dynamometer is an instrument used to measure mechanical forces or torque.

[Doc. No. 17, p. 10]. The lower the coefficient of friction, the less friction there is between two surfaces. The American Society for Testing and Materials ("ASTM") requires a coefficient of friction of 0.50 or greater for flooring. The tile manufacturer's listed coefficient of friction of the tiles was 0.60 when they were installed at the Stein Mart store over ten years ago. Both experts' drag sled tests indicate that the tiles' coefficient of friction decreased over time because of wear and tear. The extent of the decrease is at issue.

Dr. Sissom used a phenolic material [FN2] from the sole of the shoe Mr. Phelps' was wearing at the time of the accident as the testing material, and a dynamometer with whole and half pound gradations. Based on his dry drag sled tests that produced an av-

erage coefficient of friction of 0.48, Dr. Sissom opined that the tiles were dangerous at the time of the accident and six months prior thereto. Dr. Sissom also performed "wet" drag sled tests by adding water to the tiles. Dr. Sissom's wet drag sled tests produced an average coefficient of friction of 0.52, notably above ASTM's 0.50 standard.

FN2. A phenolic material is a hard plastic.

Dr. James used "leather from a new dress loafer" as the testing material and a dynamometer with sixteenth of a pound gradations. [Doc. No. 31, p. 3]. Based on his dry drag sled tests that produced an average coefficient of friction of 0.52, Dr. James opined that the tiles were not defective at the time of the accident.

***2** On February 9, 2011, Stein Mart filed a Motion in Limine [Doc. No. 17] seeking to exclude or limit the opinions of the Dr. Sissom. Stein Mart asserts that Dr. Sissom's "opinions are irrelevant as they are not based on appropriate scientific study[,] are lay opinions, and have not been applied, reliably, to the facts of the case." [Doc. No. 17, p. 2].

On March 11, 2011, the Phelps filed a Motion in Limine [Doc. No. 24] seeking to exclude the opinions of Dr. James. The Phelps assert that Dr. James' opinions "are irrelevant as they are not based on appropriate [scientific] study and are lay opinions, and his methods have not been applied, reliably, to the facts of this case." [Doc. No. 24, p. 2].

II. LAW AND ANALYSIS

The admissibility of expert testimony is governed by Federal Rule of Evidence 702. Rule 702 provides:

> If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise, if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case.

The district court's role in applying Rule 702 is that of a gatekeeper. *See Daubert v. Merrell Dow Pharm., Inc.,* 509 U.S. 579, 597 (1993). In considering whether the proffered testimony should be admitted, the court first considers whether the witness is qualified as an expert by knowledge, skill, experience, training, or education. *See Moore v. Ashland Chem., Inc.,* 126 F.3d 679, 684 (5th Cir.1997). The court then determines whether the proffered testimony will assist the trier of fact in understanding the evidence or determining a factual issue in dispute (*i.e.,* the relevancy test). *See id.; see also* FED.R.EVID. 401(" 'Relevant evidence' means evidence having any tendency to make the existence of any fact that is of consequence to the determination of the action more probable or less probable than it would be without the evidence."). Rule 702 also "imposes a special obligation on a trial judge to 'ensure that any and all scientific testimony ... is not only relevant, but reliable.' " *Kumho Tire Co. v. Carmichael,* 526 U.S. 137, 147 (1999) (quoting *Daubert,* 509 U.S. at 589); *see also United States v. Rubio,* 321 F.3d 517, 525 (5th Cir.2003).

A. Dr. Sissom

The Court finds that Dr. Sissom's opinions are relevant and reliable. First, Dr. Sissom is qualified as an expert in coefficient of friction analysis. Dr. Sissom has a Ph.D. in mechanical engineering, is a licensed professional engineer, and has been an expert in cases involving coefficient of friction analysis "approximately twelve or fifteen times." [Doc. No. 23, p. 14].

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(Cite as: 2011 WL 1337362 (W.D.La.))

Second, Dr. Sissom's testimony will assist the jury in determining whether the tiles created an unreasonable risk of harm and whether Stein Mart had constructive notice of the condition of the tiles prior to the accident. Dr. Sissom's dry drag sled tests and his opinions based on those tests, that the tiles were dangerous at the time of the accident and six months prior thereto, tend to show that the tiles created an unreasonable risk of harm and Stein Mart had constructive notice of the condition of the tiles prior to the accident. [FN3]

FN3. Dr. Sissom averred that the ASTM, among other entities, defines a coefficient of friction between 0.40 and 0.49 as dangerous.

***3** Third, Dr. Sissom's dry drag sled tests were conducted in a reliable manner and in accordance with the facts of this case. As Stein Mart admits, "Dr. Sissom used a well known and accepted method of performing the examination, namely using a weighted drag sled, obtaining data, and then performing calculations in order to obtain coefficient of friction data." [Doc. No. 17, p. 6]. In fact, Dr. Sissom performed the same dry drag sled tests as Dr. James on the tiles where the accident occurred, but with a different testing material and dynamometer.

Stein Mart argues that Dr. Sissom's use of a phenolic testing material is not approved by the ASTM in coefficient of friction testing. Stein Mart notes that Dr. James used a leather testing material which is approved by "ASTM D 2047–99," a standard test method for measuring the coefficient of friction of floor surfaces promulgated by the ASTM, and use of neolite [FN4] as a testing material is approved by "ASTM C 1028." [Doc. No. 17, p. 10]. However, ASTM D 2047–99 has been superseded by ASTM D 2047–04, and ASTM D 2047–04 is inapplicable to the case at hand. ASTM D 2047–04 describes a laboratory test method using a machine called a "James Machine." Neither expert in this case performed laboratory tests or used a James Machine to calculate the coefficient of friction of the tiles. Regardless, even if ASTM D 2047–04 were applicable to this case, it states that "[o]ther shoe material may be used for individual and specific testing purposes." [Doc. No. 23–1]. Dr. Sissom's use of a phenolic testing material produced reliable data in light of this standard.

FN4. Neolite is a synthetic material typically used for soles of shoes.

Likewise, Dr. Sissom's use of a phenolic testing material produced reliable data in light of a similar ASTM standard. ASTM C 1028–07 provides a "standard test method for determining the static coefficient of friction of ceramic tile and other like surfaces by the horizontal dynamometer pull-meter method." [Doc. No. 23–3]. ASTM C 1028–07 suggests using "neolite heel assemblies" as a testing material, but states that "[n]eolite **or an equivalent** has been found satisfactory." *Id.* (emphasis added). The Court is not persuaded that using a phenolic testing material in drag sled tests produces unreliable data.[FN5]

FN5. Similarly, the Court is not persuaded that Dr. Sissom's use of a dynamometer with whole and half pound gradations rather than sixteenth of a pound gradations renders his data and opinions unreliable.

Stein Mart also argues that Dr. Sissom "has no factual or scientific bas[is] to opine that the mats were very wet" or that "adverse water conditions were a major impact in the accident." [Doc. No. 17, p. 12]. The Phelps note that "[t]his observation was derived from [Dr.] Sissom's interview with Jack Phelps, and the defendant has produced no evidence to contradict this observation." [Doc. No. 23, p. 8]. It is undisputed that it "had been raining on the day of Jack Phelps' fall, and it was reasonable for Dr. Sissom to conclude that "patrons of the Stein Mart store would track water from outside into the store...." *Id.*

at 8 & 9. Regardless, as the Phelps note, the assumption that there was water on the tiles did "not bear[ ] on [Dr. Sissom's] ultimate conclusion that the average coefficient of friction of the floor at issue is below the applicable standards" of 0.50. *Id.* at 9. Dr. Sissom's dry drag sled tests did not add water to the tiles or otherwise compensate for "adverse water conditions." *Id.*

***4** Finally, Stein Mart argues that Dr. Sissom's opinion in his affidavit that "the floor had a coefficient of friction of less than .50 at the time of the October 7, 2008, incident, and was in such a condition for the six months preceding the accident" is "in stark contrast to Dr. Sissom's deposition testimony." [Doc. No. 17, p. 13]. The Court does not agree. Dr. Sissom unequivocally testified in his deposition that it was his opinion that the tiles had an average coefficient of friction of 0.48 for some time prior to the accident. In his affidavit, based on the tile manufacturer's listed coefficient of friction of 0.60 and the length of time the tiles were in place, Dr. Sissom averred that the tiles' coefficient of friction was below 0.50 six months prior to the accident.

B. Dr. James

The Court finds that Dr. James' opinions are relevant and reliable. First, Dr. James is qualified as an expert in coefficient of friction analysis. Dr. James has a masters degree and Ph.D. in civil engineering and owns an accident reconstruction consulting business. Dr. James testified that he has performed coefficient of friction tests on several occasions.

Second, Dr. James' testimony will assist the jury in determining whether the tiles created an unreasonable risk of harm. Dr. James' dry drag sled tests that produced an average coefficient of friction of 0.52 and his opinion based on those tests that the floor was not defective tend to show that the floor did not create an unreasonable risk of harm.

Third, Dr. James' dry drag sled tests were conducted in a reliable manner and in accordance with the facts of this case. As noted in the Court's discussion of Dr. Sissom, Dr. James performed the same dry drag sled tests as Dr. Sissom on the tiles where the accident occurred, but with a different testing material and dynamometer.

The Phelps argue that Dr. James did not comply with ASTM C 1028–07 because he failed to consider "[o]ther factors that can affect slip resistance, such as the degree of wear on the shoe and flooring material; presence of foreign material, such as water, oil, and dirt; the length of the human stride at the time of the slip; type of floor finish; and the physical and mental condition of humans." [Doc. No. 24, p. 8]. ASTM C 1028–07 states that "[o]ther factors can affect slip resistance" in addition to "the measurement made by [the dynamometer]" and that the drag sled test method under ASTM C 1028–07 "should not be used under field conditions unless those conditions are fully described." [Doc. No. 23–3, p. 1]. While neither expert fully complied with ASTM C 1028–07, the Court is not persuaded that their opinions should be excluded on this basis.

In sum, although there may be factors which call into question the weight to be accorded Dr. Sissom's and Dr. James' opinions, their tests are sufficiently relevant and reliable to meet the *Daubert* standard, and any questions as to weight is decided by the trier of fact. *See* *Simpson v. James*, 903 F.2d 372, 377 (5th Cir.1990).

III. CONCLUSION

***5** For the foregoing reasons, Stein Mart's Motion in Limine [Doc. No. 17] and the Phelps' Motion in Limine [Doc. No. 24] are DENIED.

W.D.La.,2011.
Phelps v. Stein Mart, Inc.
Not Reported in F.Supp.2d, 2011 WL 1337362

(W.D.La.), 85 Fed. R. Evid. Serv. 83

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APPENDIX – 14

654 F.3d 1190, 2011 A.M.C. 2838, 86 Fed. R. Evid. Serv. 619, 23 Fla. L. Weekly Fed. C 366
(Cite as: 654 F.3d 1190)

H

United States Court of Appeals,
Eleventh Circuit.
Lydia ROSENFELD, Plaintiff–Appellant,
v.
OCEANIA CRUISES, INC., Defendant–Appellee.

No. 10–12651.
Sept. 7, 2011.

Background: Passenger of cruise ship who sustained shoulder injuries after slipping and falling on ceramic tile floor near buffet area of ship brought action against ship's operator to recover damages for her injuries. After granting defendant's motion to preclude expert testimony, the United States District Court for the Southern District of Florida, No. 1:08–cv–22174–JLK, James Lawrence King, J., entered judgment on a jury verdict for defendant, and subsequently denied plaintiff's motion for new trial. Plaintiff appealed.

Holdings: The Court of Appeals, Wilson, Circuit Judge, held that:
(1) the district court erred by granting defendant's motion to preclude the proposed testimony of plaintiff's expert concerning the safety of defendant's choice of flooring, and
(2) the district court's error was not harmless.

Reversed and remanded.

West Headnotes

[1] Federal Courts 170B 823

170B Federal Courts
170BVIII Courts of Appeals
170BVIII(K) Scope, Standards, and Extent
170BVIII(K)4 Discretion of Lower Court
170Bk823 k. Reception of evidence. Most Cited Cases

Court of Appeals reviews the district court's decision to exclude an expert's testimony for an abuse of discretion, a standard that requires the appellate court to defer to the district court's evidentiary ruling unless that ruling is manifestly erroneous.

[2] Federal Courts 170B 895.5

170B Federal Courts
170BVIII Courts of Appeals
170BVIII(K) Scope, Standards, and Extent
170BVIII(K)6 Harmless Error
170Bk895.5 k. Evidence in general. Most Cited Cases

Court of Appeals will not overturn an evidentiary ruling and order a new trial unless the objecting party has shown a substantial prejudicial effect from the ruling.

[3] Evidence 157 508

157 Evidence
157XII Opinion Evidence
157XII(B) Subjects of Expert Testimony
157k508 k. Matters involving scientific or other special knowledge in general. Most Cited Cases

Evidence 157 535

157 Evidence
157XII Opinion Evidence
157XII(C) Competency of Experts
157k535 k. Necessity of qualification. Most

654 F.3d 1190, 2011 A.M.C. 2838, 86 Fed. R. Evid. Serv. 619, 23 Fla. L. Weekly Fed. C 366
(Cite as: 654 F.3d 1190)

Cited Cases

Evidence 157 ⚿555.2

157 Evidence
157XII Opinion Evidence
157XII(D) Examination of Experts
157k555 Basis of Opinion
157k555.2 k. Necessity and sufficiency. Most Cited Cases

Trial courts determining the admissibility of expert testimony must engage in a rigorous three-part inquiry, considering whether: (1) the expert is qualified to testify competently regarding the matters he intends to address, (2) the methodology by which the expert reaches his conclusions is sufficiently reliable as determined by the sort of inquiry mandated in *Daubert*, and (3) the testimony assists the trier of fact, through the application of scientific, technical, or specialized expertise, to understand the evidence or to determine a fact in issue. Fed.Rules Evid.Rule 702, 28 U.S.C.A.

[4] Evidence 157 ⚿508

157 Evidence
157XII Opinion Evidence
157XII(B) Subjects of Expert Testimony
157k508 k. Matters involving scientific or other special knowledge in general. Most Cited Cases

Evidence 157 ⚿535

157 Evidence
157XII Opinion Evidence
157XII(C) Competency of Experts
157k535 k. Necessity of qualification. Most Cited Cases

Evidence 157 ⚿555.2

157 Evidence
157XII Opinion Evidence
157XII(D) Examination of Experts
157k555 Basis of Opinion
157k555.2 k. Necessity and sufficiency. Most Cited Cases

In determining the admissibility of expert testimony, while there is inevitably some overlap among the basic requirements, namely, qualification, reliability, and helpfulness, they remain distinct concepts, and courts must take care not to conflate them. Fed.Rules Evid.Rule 702, 28 U.S.C.A.

[5] Evidence 157 ⚿555.2

157 Evidence
157XII Opinion Evidence
157XII(D) Examination of Experts
157k555 Basis of Opinion
157k555.2 k. Necessity and sufficiency. Most Cited Cases

In determining the admissibility of expert testimony, it is not the role of the district court to make ultimate conclusions as to the persuasiveness of the proffered evidence; rather, vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence. Fed.Rules Evid.Rule 702, 28 U.S.C.A.

[6] Evidence 157 ⚿150

157 Evidence
157IV Admissibility in General
157IV(E) Competency
157k150 k. Results of experiments. Most Cited Cases

654 F.3d 1190, 2011 A.M.C. 2838, 86 Fed. R. Evid. Serv. 619, 23 Fla. L. Weekly Fed. C 366
(Cite as: 654 F.3d 1190)

In most cases, objections to the inadequacies of a study are more appropriately considered an objection going to the weight of the evidence rather than its admissibility. Fed.Rules Evid.Rule 702, 28 U.S.C.A.

[7] Evidence 157 ⚿513(2)

157 Evidence
157XII Opinion Evidence
157XII(B) Subjects of Expert Testimony
157k513 Construction and Repair of Structures, Machinery, and Appliances
157k513(2) k. Buildings in general. Most Cited Cases

Evidence 157 ⚿557

157 Evidence
157XII Opinion Evidence
157XII(D) Examination of Experts
157k557 k. Experiments and results thereof. Most Cited Cases

In personal injury action brought by passenger injured after slipping and falling on ceramic tile floor near buffet area of cruise ship, the district court erred by granting ship operator's motion to preclude the proposed testimony of passenger's expert that operator's choice of flooring posed a higher danger of slip-and-fall accidents than other surface types; passenger's principal theory of the case was that operator's choice of flooring for the cafe area was unreasonable, given operator's knowledge that the area was heavily trafficked and susceptible to spills, and a qualified expert who uses reliable testing methodology may testify as to the safety of a defendant's choice of flooring, determined by the surface's coefficient of friction, as matters of slip resistance and surface friction are beyond the understanding and experience of the average lay citizen. Fed.Rules Evid.Rule 702, 28 U.S.C.A.

[8] Evidence 157 ⚿557

157 Evidence
157XII Opinion Evidence
157XII(D) Examination of Experts
157k557 k. Experiments and results thereof. Most Cited Cases

Qualified expert who uses reliable testing methodology may testify as to the safety of a defendant's choice of flooring, determined by the surface's coefficient of friction. Fed.Rules Evid.Rule 702, 28 U.S.C.A.

[9] Federal Courts 170B ⚿901.1

170B Federal Courts
170BVIII Courts of Appeals
170BVIII(K) Scope, Standards, and Extent
170BVIII(K)6 Harmless Error
170Bk901 Exclusion of Evidence
170Bk901.1 k. In general. Most Cited Cases

In personal injury action brought by passenger injured after slip-and-fall near cruise ship's buffet area, district court's error in excluding proposed testimony of passenger's expert concerning safety of ship operator's choice of flooring was not harmless; passenger's principal theory of the case was that operator's choice of ceramic-tile flooring for cafe area was unreasonable, given its knowledge that area was heavily trafficked and susceptible to spills, because passenger was not allowed to admit evidence proving the inadequacy of operator's choice of flooring, jury could not have found that floor near buffet was necessarily unsafe when wet, and so jury was not able to consider whether operator's choice of flooring caused passenger's injuries, which was particularly problematic given negligence instruction stating that "plaintiff alleges that the injury was caused by Defendant's failure to choose an adequate flooring surface for the

area where the accident occurred." Fed.Rules Evid.Rule 702, 28 U.S.C.A.

***1191** Michael A. Winkleman, Ricardo Valdes Alsina, Lipcon Margulies Alsina & Winkleman, PA, Miami, FL, for Plaintiff–Appellant.

William F. Clair, Hill Betts & Nash, Fort Lauderdale, FL, for Defendant–Appellee.

Appeal from the United States District Court for the Southern District of Florida.

Before BARKETT and WILSON, Circuit Judges, and WALTER, District Judge.[FN*]

FN* Honorable Donald E. Walter, United States District Judge for the Western District of Louisiana, sitting by designation.

WILSON, Circuit Judge:

While a passenger aboard the *M/V Nautica,* Lydia Rosenfeld slipped and fell on a ceramic tile floor near the buffet bar of the vessel's Terrace Café. She suffered a shoulder fracture and incurred medical expenses as a result of her fall. Rosenfeld brought this diversity action against the operator of the *M/V Nautica,* Oceania Cruises, Inc. ("Oceania"), to recover damages for her injuries. She claimed, *inter* ****1192*** *alia,* that Oceania negligently caused the accident by failing to provide an adequate flooring surface for the buffet area of the Terrace Café.

To prove her case, Rosenfeld offered the expert testimony of Peter Vournechis, an Australian floor-safety specialist who performed various coefficient-of-friction tests to determine the slip resistance of the *M/V Nautica*'s flooring surfaces. Vournechis found that, under wet conditions, the ceramic-tile surface surrounding the Terrace Café had an inadequately low coefficient of friction. Thus, he proposed to testify at trial that the flooring surface was not reasonably safe for a self-serve or bistro area, because it posed a high risk for those passing through the Café to slip and fall.

Following briefing, the district court entered a pre-trial order precluding Vournechis's testimony. The court stated only one ground for its decision:

> [Rosenfeld] ... has not established that the proposed liability expert will provide helpful analysis to the Court in understanding a matter of scientific, technical or specialized expertise. Instead, the liability expert intends to testify that the floor where plaintiff fell is unreasonably safe for its intended use. Such conclusions are properly left for the Court or jury to decide.

At trial, Rosenfeld raised the issue again, asking the district court to allow her to read Vournechis's deposition to the jury. The court denied her oral motion. At the close of the evidence, the court instructed the jury, in relevant part, as follows:

> In this case the plaintiff claims that the defendant was negligent and that such negligence was the legal cause of damage sustained by the plaintiff. Specifically, the plaintiff alleges that the injury was caused by Defendant's failure to choose an adequate flooring surface for the area where the accident occurred....
>
> In order to prevail on this claim the Plaintiff must prove both of the following facts by a preponderance of the evidence:
>
> First: That the defendant was "negligent;" and
>
> Second: That such negligence was a "legal cause" of damage sustained by the plaintiff.
>
> ...

> If the evidence proves negligence on the part of the Defendant that was a legal cause of damage to the Plaintiff, you should award the Plaintiff an amount of money that will fairly and adequately compensate the Plaintiff for such damage.

Following several hours' deliberation, the jury returned a verdict for Oceania. Rosenfeld now appeals from the district court's orders granting Oceania's motion to preclude the expert testimony and denying Rosenfeld's motion for a new trial. For the following reasons, we reverse.

I. STANDARD OF REVIEW

[1][2] We review the district court's decision to exclude an expert's testimony for an abuse of discretion, *see* Kumho Tire Co., Ltd. v. Carmichael, 526 U.S. 137, 152, 119 S.Ct. 1167, 1176, 143 L.Ed.2d 238 (1999), a standard that requires us to defer to the district court's evidentiary ruling unless that ruling is "manifestly erroneous." *Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 142, 118 S.Ct. 512, 517, 139 L.Ed.2d 508 (1997) (quotation marks omitted). "We will not overturn an evidentiary ruling and order a new trial unless the objecting party has shown a substantial prejudicial effect from the ruling." *Maiz v. Virani*, 253 F.3d 641, 667 (11th Cir.2001).

II. DISCUSSION

Rosenfeld argues that the district court abused its discretion by prohibiting her ***1193** from introducing expert testimony that Oceania's choice of flooring posed a higher danger of slip-and-fall accidents than other surface types. Oceania, however, argues that the district court's exclusion of the testimony was proper under *United States v. Frazier*, 387 F.3d 1244 (11th Cir.2004) (en banc), but that if any error occurred it was harmless.

[3][4] In *Frazier*, we clarified that trial courts determining the admissibility of expert testimony under Federal Rule of Evidence 702 must "engage in a rigorous three-part inquiry," considering whether:

> (1) the expert is qualified to testify competently regarding the matters he intends to address; (2) the methodology by which the expert reaches his conclusions is sufficiently reliable as determined by the sort of inquiry mandated in *Daubert* [*v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 113 S.Ct. 2786, 125 L.Ed.2d 469 (1993)]; and (3) the testimony assists the trier of fact, through the application of scientific, technical, or specialized expertise, to understand the evidence or to determine a fact in issue.

387 F.3d at 1260 (quoting *City of Tuscaloosa v. Harcros Chems., Inc.*, 158 F.3d 548, 562 (11th Cir.1998)). "While there is inevitably some overlap among the basic requirements—qualification, reliability, and helpfulness—they remain distinct concepts and the courts must take care not to conflate them." *Id.*

[5][6] Further, "it is not the role of the district court to make ultimate conclusions as to the persuasiveness of the proffered evidence." *Quiet Tech. DC–8, Inc. v. Hurel–Dubois UK Ltd.*, 326 F.3d 1333, 1341 (11th Cir.2003); *Maiz*, 253 F.3d at 666 ("A district court's gatekeeper role under *Daubert* is not intended to supplant the adversary system or the role of the jury." (internal quotation marks omitted)). "Quite the contrary, 'vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence.' " *Quiet Tech.*, 326 F.3d at 1341 (quoting *Daubert*, 509 U.S. at 596, 113 S.Ct. at 2798). Indeed, "in most cases, objections to the inadequacies of a study are more appropriately considered an objection going to the weight of the evidence rather than its admissibility." *Hemmings v. Tidyman's Inc.*, 285 F.3d 1174, 1188 (9th Cir.2002). *See also Quiet Tech.*, 326 F.3d at 1345 (noting that, "[n]ormally, failure to include var-

iables will affect the analysis' probativeness, not its admissibility" (quoting *Bazemore v. Friday,* 478 U.S. 385, 400, 106 S.Ct. 3000, 3009, 92 L.Ed.2d 315 (1986))).

[7][8] Here, the district court excluded Vournechis's proposed testimony as unhelpful, explaining that "[s]uch conclusions are properly left for the Court or jury to decide." In this instance, we disagree. As the court instructed the jury, Rosenfeld's negligence claim arose from "Defendant's [alleged] failure to choose an adequate flooring surface for the area where the accident occurred." Rosenfeld's principal theory of the case was that Oceania's choice of ceramic tile flooring for the Terrace Café area was unreasonable, given Oceania's knowledge that the area was heavily trafficked and susceptible to spills. A qualified expert who uses reliable testing methodology may testify as to the safety of a defendant's choice of flooring, determined by the surface's coefficient of friction. *See, e.g., Great Am. Ins. Co. v. Cutrer,* 298 F.2d 79, 80–81 (5th Cir.1962) [FN1] ***1194** (noting that both the plaintiff and defendant presented expert evidence about the coefficient of friction on the steps and sidewalk where the plaintiff slipped and fell); *see also Santos v. Posadas De Puerto Rico Assocs., Inc.,* 452 F.3d 59, 63–64 (1st Cir.2006) (approving the admission of expert testimony regarding the variable friction between the pool steps and their edges on the grounds that it was crucial to the plaintiff's theory of the case).

> FN1. In *Bonner v. City of Prichard,* 661 F.2d 1206, 1209 (11th Cir.1981) (en banc), we adopted as binding precedent all decisions handed down by the Fifth Circuit before October 1, 1981.

Because the jury was not allowed to consider evidence about whether the slip resistance of the flooring posed a danger to passengers aboard the *M/V Nautica,* it could not have found in Rosenfeld's favor with regard to her main negligence theory; matters of slip resistance and surface friction are "beyond the understanding and experience of the average lay citizen." *See United States v. Rouco,* 765 F.2d 983, 995 (11th Cir.1985). Accordingly, we conclude that the district court erred by granting Oceania's motion to preclude Vournechis's proposed testimony.

Although the district court discussed only whether Vournechis's testimony would be helpful to a jury, Oceania advances a number of arguments on appeal concerning the reliability of Vournechis's methods. Specifically, Oceania argues that Vournechis's methods failed to accurately test for wet conditions, and that his conclusions were "imprecise and unspecific" and based on "incorrect assumption[s]" about the location of Rosenfeld's fall. However, based on the facts of this case, these arguments attack the weight and the persuasiveness of Vournechis's testimony, not its admissibility. Oceania can raise these arguments on retrial through " 'vigorous cross-examination' " and " 'presentation of contrary evidence.' " *Quiet Tech.,* 326 F.3d at 1346 (quoting *Daubert,* 509 U.S. at 596, 113 S.Ct. at 2798).

[9] Finally, we cannot say that the district court's error was harmless. Because Rosenfeld was not allowed to admit evidence proving the inadequacy of Oceania's choice of flooring surface, the jury could not have found that the floor near the Terrace Café's buffet was necessarily unsafe when wet. Consequently, the jury was not able to consider whether Oceania's choice of ceramic-tile flooring caused Rosenfeld's injuries. This is particularly problematic in light of the negligence instruction given to the jury that "the plaintiff alleges that the injury was caused by Defendant's failure to choose an adequate flooring surface for the area where the accident occurred."

Accordingly, we conclude that a new trial is warranted; Rosenfeld is entitled to submit expert testimony regarding the adequacy of Oceania's choice of flooring surface.

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REVERSED AND REMANDED.

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