



## FACTS

On November 13, 2009, Twyla Kill was walking along a sidewalk in downtown Seattle around 1:30 p.m. She recalled that it was raining at the time.<sup>1</sup> At the corner of Fifth Avenue and Pike Street, Kill slipped on the outer rim of a metal utility cover and fell. Kill was injured as a result. She and her husband sued the city of Seattle (City), alleging that the rim was unreasonably dangerous.

The utility cover—also known as a handhole—is diamond plated and is surrounded by a smooth, two-inch metal rim. The City owns the utility cover and it is in the City right of way. The City did not know when the utility cover was installed, but it was likely “in 1989 (when the Bank Centre building was completed) or before.” There were no prior complaints about the specific utility cover or other similar utility cover rims.

Kill hired Joellen Gill as an expert to conduct tests and testify about the condition of the metal rim. To do so, Gill used an English XL Variable Incidence Tribometer, an instrument that measures the coefficient of friction, or “slip-resistance” of a surface. Gill used the tribometer to conduct two slip-resistance tests of the utility cover rim: the first in February 2011 and the second in June 2013.

Different standards for tribometer validation and calibration were in effect at the time of each of Gill’s field tests. Prior to September 2006, the American Society for

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<sup>1</sup> Kill submitted a weather report stating that it rained 0.33 inches on November 13, 2009. However, the hourly precipitation column is cut off in the record. In its order denying Kill’s motion for reconsideration, the trial court noted that the same weather report can be found online. The online weather report showed that the last measurable rain fell at 11:53 a.m. (0.06 of an inch) and no rain fell for the rest of the day. This contradicts Kill’s statement that it was raining at the time she slipped and fell. But, for the purposes of summary judgment, the trial court accepted Kill’s contention that it was raining when she slipped.

Testing and Material (ASTM) F1679 standard provided instructions for how to use a tribometer. However, the ASTM withdrew the F1679 standard in September 2006 and did not adopt a new standard for five years.

In March 2011, the current standard for tribometer validation and calibration, ASTM F2508, went into effect. ASTM F2508 states that “[v]alidation shall be performed by walkway tribometer suppliers or independent testing facilit[ies].” It defines “supplier” as “any individual, agent, company, manufacturer, or organization responsible for the walkway tribometer prior to receipt by the user.” Thus, an individual user cannot validate a tribometer.

Under ASTM F2508, a tribometer must satisfy two criteria to be validated: (1) it must rank the coefficient of friction for 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. ASTM F2508 at § 9. If the tribometer does not satisfy these criteria, then it fails validation. Id. at § 9.3. The manufacturer must then create a validation report specifying the 95th percentile confidence interval for each reference surface tile. Id. at § 10.1.

ASTM F2508 also requires individual users to perform calibration of their tribometer to ensure valid test results. Id. at § 4.5, 13.2. The tribometrist must measure each of the four reference surface tiles and compare the results to the 95th percentile confidence interval specified in the manufacturer’s validation report. Id. at § 13.2. If the results for each tile do not fall within the confidence interval, then the tribometer fails calibration. Id. at § 13.3.

Therefore, ASTM F2508 ensures tribometer reliability with two safeguards. First, manufacturers or independent testers must validate the tribometer. Second, individual users must calibrate their tribometer to ensure their measurements fall within the confidence interval set forth in the validation report. If the tribometer fails either calibration or validation, then it fails to comply with ASTM F2508.

On February 24, 2011, just before the adoption of ASTM F2508, Gill tested the metal rim of the utility cover. She explained that the manufacturer calibrated her tribometer in January 2011. Gill found that the rim's coefficient of friction when wet was 0.35 ( $\pm 0.02$ ). Gill opined that 0.35 is very slippery and not reasonably safe for pedestrian use. She stated that the "generally accepted standard is that 0.5 is the established minimum value for the coefficient of friction for a reasonably safe horizontal walking surface."

The coefficient of friction scale ranges from 0.0 to 1.0. In 2011, the City adopted a 0.5 coefficient of friction standard for new utility covers. Prior to that, the City did not have a standard in place.

On June 2, 2013, Gill conducted a second test of the metal rim. In an effort to recreate the wet conditions when Kill slipped, Gill poured water on the rim. Gill found that the coefficient of friction was 0.21 ( $\pm 0.02$ ). Explaining the different results (0.35 versus 0.21), Kill stated that Gill explained "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."

The day before Gill's second test, she calibrated her tribometer and created what she called a "Report of ASTM F2508 Validation" of the English XL tribometer. She used the four reference tiles—granite, porcelain, vinyl, and ceramic—sent from ASTM. Her test results showed the coefficient of friction for each tile as: 0.0700 for granite, 0.1013 for porcelain, 0.1727 for vinyl, and 0.8505 for ceramic. However, the manufacturer's validation report for Gill's tribometer specifies the 95th percentile confidence intervals as: 0.078-0.082 for granite, 0.132-0.137 for porcelain, 0.173-0.180 for vinyl, and 0.605-0.616 for ceramic. None of Gill's calibration results fall within these intervals.

On the parties' cross motions for summary judgment, the trial court held Gill's methodology for slip-resistance testing to be unreliable and therefore unhelpful to the jury under ER 702. The court believed Gill was qualified as an expert. However, the court explained that Gill's tribometer was not properly calibrated when she tested the utility cover rim. Furthermore, the court reasoned, Gill's two tests of the rim produced different results. It concluded that Gill did not provide an adequate explanation for this difference. "Either Ms. Gill's tribometer is inherently unreliable or the way she used it was inherently unreliable." And, the court held that Gill failed to account for how the presence or absence of surface contaminants may have affected her test results.

As a result, the court excluded Gill's test results and her opinion that the rim was unreasonably slippery. Without Gill's testimony,

[T]he 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 therefore held that Kill failed to demonstrate an issue of fact. It granted the City's motion for summary judgment and dismissed all claims against the City with prejudice.

After the trial court's ruling, Gill sent her tribometer to the manufacturer (Excel Tribometers LLC) for additional testing. Using Gill's tribometer and its own reference tiles, Excel produced the following calibration results: 0.066 for granite, 0.116 for porcelain, 0.165 for vinyl, and 0.576 for ceramic. Like Gill's original calibration, these results are outside the 95th percentile confidence interval in the validation report.

Excel also conducted a calibration test using its own tribometer and Gill's reference tiles. These results were: 0.080 for granite, 0.100 for porcelain, 0.149 for vinyl, and 0.641 for ceramic. Except for the granite tile, these results are also outside the 95th percentile confidence interval and all substantially different than Gill's calibration results for the same tiles. Excel also determined that the coefficient of friction for Gill's ceramic reference tile varied widely from quadrant to quadrant, ranging from 0.645 in the southeast quadrant to 0.840 in the southwest quadrant. Based its testing, Excel asserted an additional margin of error of  $\pm 0.03$  for slip resistance values equal to or less than 0.50 and  $\pm 0.05$  for slip resistance values greater than 0.50. Therefore, Excel believed that Gill's tribometer satisfied the ASTM F2508 calibration requirements.

In a motion for reconsideration, Kill stated:

The differences in the results which concerned the Court are not caused by an uncalibrated tribometer, but individual and internal variations in the ceramic references tiles ASTM sells to manufacturers like Excel (and individual tribometrists) for ASTM F2508 validation/calibration and

the fact that ASTM F2508's testing protocols do not at this time account for such variations.

Kill explained that ASTM F2508 assumes the tiles' surfaces are not variable, even though different tiles are used for validation and calibration. She argued that the difference between the validation report and Gill's calibration was attributable to this variation in tiles.

Kill also requested a Frye hearing on the applicability of ASTM F2508. Frye v. United States, 293 F. 1013, 1014 (D.C. Cir. 1923). Kill asserted that based on Excel's testing, there is "a real question whether ASTM F2508 is capable of producing accurate results." She argued that there is an "apparent lack of consensus in the scientific community about how validation and calibration results are supposed to be interpreted."

The trial court denied Kill's request for a Frye hearing. The court concluded that Gill's methodology for measuring slip-resistance was not novel under Frye. The court also denied Kill's motion for reconsideration and excluded Kill's testimony under ER 702 and ER 403. The court did not believe that tribometers are inherently unreliable, only that Gill's tests results were unreliable, because her tribometer was not properly calibrated and her two test results varied greatly. The court therefore left in place its order granting the City's motion for summary judgment and dismissing with prejudice. Kill appeals.

## DISCUSSION

### I. Gill's Expert Testimony

Kill argues that the trial court erred in excluding Gill's testimony, because Gill's opinions and methodology regarding slip-resistance testing are helpful and reliable. Kill makes several related arguments. She asserts that any minor margin of error or

variance in Gill's test results goes to the weight and credibility of Gill's testimony, not its admissibility. She likewise argues that the trial court improperly overlooked the additional margin of error asserted by the tribometer manufacturer. Kill also contends that, because Gill's individual tribometer was successfully validated, there was no need for the additional ASTM F2508 calibration protocol.

A. Standard of Review

We review an order granting summary judgment de novo. Moore v. Hagge, 158 Wn. App. 137, 146, 241 P.3d 787 (2010). Summary judgment is appropriate when there is no genuine issue of material fact and the moving party is entitled to judgment as a matter of law. Id. In determining whether a genuine issue of material fact exists, we construe the facts and reasonable inferences in the light most favorable to the nonmoving party. Id. at 146-47.

We generally review evidentiary rulings for abuse of discretion. Hensrude v. Sloss, 150 Wn. App. 853, 860, 209 P.3d 543 (2009). However, the "de novo standard of review is used by an appellate court when reviewing all trial court rulings made in conjunction with a summary judgment motion." Folsom v. Burger King, 135 Wn.2d 658, 663, 958 P.2d 301 (1998). Therefore, we conduct the same inquiry as the trial court in considering Gill's testimony. Id.

The trial court must exclude expert testimony involving scientific evidence that does not satisfy both Frye and ER 702. Lakey v. Puget Sound Energy, Inc., 176 Wn.2d 909, 918, 296 P.3d 860 (2013). Under Frye, the 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 are capable of producing



reliable results. Id. (quoting Anderson v. Akzo Nobel Coatings, Inc., 172 Wn.2d 593, 603, 260 P.3d 857 (2011)).

Evidence that is admissible under Frye must still pass the two-part test under ER 702: (1) the witness must be qualified as an expert and (2) the expert's testimony must be helpful to the trier of fact. State v. King County Dist. Court W. Div., 175 Wn. App. 630, 637, 307 P.3d 765, review denied 179 Wn.2d 1006, 315 P.3d 530 (2013). Courts interpret possible helpfulness to the trier of fact broadly and favor admissibility in doubtful cases. Id. at 638. Evidence is helpful if it concerns matters beyond the common knowledge of a layperson and does not mislead the jury. Id. Unreliable testimony does not assist the trier of fact. Lakey, 176 Wn.2d at 918.

In sum, Frye and ER 702 work together to regulate expert testimony. Id. Frye excludes testimony based on novel scientific methodology until there is consensus in the relevant scientific community that the methodology is reliable. Id. at 918-19. ER 702 excludes testimony where the expert fails to adhere to that reliable methodology. Id. at 919.

**B. Gill's Methodology and Test Results Were Unreliable**

Kill is correct that "[w]hen 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." Id. at 920. For instance, this court held that an inherent margin of error of 0.01 percent in the Breathalyzer machine went to the weight of the breath test results, not their admissibility. State v. Keller, 36 Wn. App. 110, 111-14, 672 P.2d 412 (1983). However, this rule does not apply if "the error renders the evidence unreliable."

Lakey, 176 Wn.2d at 920. In such cases, the trial court may exclude the unreliable evidence under ER 702. Id.

Similarly, variance in test conditions and original conditions do not necessarily preclude admissibility, as variations may merely go to the weight of the evidence. Bichl v. Poinier, 71 Wn.2d 492, 497, 429 P.2d 228 (1967). Identical conditions are not required. Breimon v. Gen. Motors Corp., 8 Wn. App. 747, 756, 509 P.2d 398 (1973). However, there must be substantial similarity in the test conditions and the conditions at the time of the accident. Id. Furthermore, variable test results may be excluded where the original conditions are not accounted for in a subsequent test. Quinn v. McPherson, 73 Wn.2d 194, 201-02, 437 P.2d 393 (1968).

Here, Gill's test results varied so significantly as to render them unreliable. Her first test showed a coefficient of friction of 0.35 ( $\pm 0.02$ ). Her second test showed 0.21 ( $\pm 0.02$ ). This is a difference of 0.14, almost 15 percent of the entire coefficient of friction scale, which ranges from 0.0 to 1.0. This is not a minor variance.

Furthermore, there is no documentation in the record of the rim's condition on the day Kill slipped, other than it was wet. Gill poured water on the rim for her second test, but was able only to speculate that some type of surface contaminant must have caused the variation in test results. Without more evidence, Gill could not establish substantial similarity between her two tests, nor between the test conditions and the condition of the rim when Kill fell. As Gill's test results and explanation demonstrate, surface contamination can have a dramatic impact on the slipperiness of the metal rim.

Furthermore, Gill's tribometer was not properly calibrated under the ASTM F2508 standard at the time of her second field test. The following table shows the various calibration results:

	Granite	Porcelain	Vinyl	Ceramic
95th Percentile Confidence Interval	0.078-0.082	0.132-0.137	0.173-0.180	0.605-0.616
Gill's calibration using her tribometer and tiles	0.0700	0.1013	0.1727	0.8505
Excel's calibration using Gill's tribometer and its own tiles	0.066	0.116	0.165	0.576
Excel's calibration using its own tribometer and Gill's tiles	0.080	0.100	0.149	0.641

The confidence interval represents a margin of uncertainty. Every measurement is uncertain, in that no instrument is infinitely precise or accurate. King County Dist. Court, 175 Wn. App. at 638. The concept of measurement uncertainty is similar to the concept of margin of error. Id. It expresses the idea that a true value of a measurement can never be known. Id. Even the best instruments yield only an estimate of the true value. Id. Uncertainty indicates a range in which a true value of a measurement is likely to occur. Id. A confidence interval is one way of expressing uncertainty. Id. Here, for instance, the manufacturer is 95 percent confident that the true value of the coefficient of friction for granite measured by the English XL tribometer lies between 0.078 and 0.082.

The table demonstrates that Gill's tribometer measurements for each of the four surface reference tiles fell outside the manufacturer's 95th percentile confidence interval.<sup>2</sup> The same was true when Excel tested Gill's tribometer using its own reference tiles. And, with the exception of the granite tile, Excel's measurements using its own tribometer and Gill's tiles fell outside the confidence interval. Moreover, all three calibration tests for all four reference tiles vary significantly.

Both Kill and the City put forth evidence that ASTM F2508 is the industry standard. The standard specifies that if calibration results for each tile do not fall within the specified confidence interval, the tribometer fails calibration. ASTM F2508 § 13. A tribometer that fails calibration does not comply with ASTM F2508 and does not produce valid test results. Id. Gill's tribometer failed calibration. As the trial court explained, either Gill's tribometer is unreliable or the way she used it is unreliable. Expert testimony that does not adhere to reliable methodology is properly excluded under ER 702. Lakey, 176 Wn.2d at 918-19.

And, lastly, as the trial court held, Gill's statement that a 0.5 coefficient of friction is an absolute threshold for safety would mislead the jury. The City provided copious evidence that tribometers are effective to measure only relative slipperiness, not absolute slipperiness. Different tribometers, both across models and within models, can give significantly different readings for the same surface. Thus, a tribometer can

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<sup>2</sup> Excel asserted an additional margin of error of  $\pm 0.03$  for slip-resistance measurements under 0.50 and  $\pm 0.05$  for measurements above 0.50 to account for the variations in reference tiles. However, the greater the margin of error, the less precise the measurement and the less helpful the measurement is to the jury. Moreover, even with Excel's purported additional margin of error, Gill's calibration results for porcelain and ceramic still fall outside the 95th percentile confidence interval.

accurately determine whether one surface is more or less slippery than other surfaces measured by that same tribometer, but it cannot give an objective measurement of a surface.

For all these reasons, we conclude that Gill's expert testimony on slip-resistance is unreliable and misleading. It would therefore be unhelpful to the jury under ER 702. As such, we hold that the trial court properly excluded the evidence.

C. The Trial Court Did Not Need to Hold a *Frye* Hearing

In the alternative, Kill argues that the trial court should have held a Frye hearing to assess whether the ASTM F2508 calibration method is generally accepted and reliable—before deciding whether Gill properly adhered to that methodology. We review *de novo* a trial court's decision not to conduct a Frye hearing. State v. Gregory, 158 Wn.2d 759, 830, 147 P.3d 1201 (2006). Frye is implicated only where “either the theory and technique or method of arriving at the data relied upon is so novel that it is not generally accepted by the relevant scientific community.” Lakey, 176 Wn.2d at 919 (quoting Anderson, 172 Wn.2d at 611). While the admissibility of novel scientific testimony raises Frye concerns, the application of accepted techniques to reach novel conclusions does not. Id.

Gill stated in her declaration that the English XL tribometer is generally accepted in the scientific community. The manufacturer stated that this particular tribometer “conforms to all requirements of ASTM F2508-11 Standard Practice for Validation and Calibration of Walkway Tribometers Using Reference Surfaces.” The City submitted several scholarly articles explaining that slip-resistance measurements are tribometer specific. “The introduction of [ASTM F2508] . . . has produced a method which allows

validation of each type of tribometer and the values generated during testing.” This evidence demonstrates that the ASTM F2508 is generally accepted in the relevant scientific community and capable of producing reliable results. Without it, the literature indicates that tribometer results are not reliable. The fact that Gill could not conform her tribometer measurements to ASTM F2508 does not mean that ASTM F2508 is unreliable.

II. Genuine Issue of Material Fact

We must still decide whether there is a genuine issue of material fact in Kill's remaining evidence. Municipalities have a duty to exercise reasonable care to keep their sidewalks in a condition that is reasonably safe for ordinary travel. Keller v. City of Spokane, 146 Wn.2d 237, 249, 44 P.3d 845 (2002). Whether a sidewalk is reasonably safe is generally a question of fact. See Owen v. Burlington N. & Santa Fe R.R., 153 Wn.2d 780, 788, 108 P.3d 1220 (2005). Questions of fact may be determined as a matter of law when reasonable minds could reach but one conclusion. Id.

The fact that the plaintiff slipped and fell does not, by itself, mean that there is an unreasonably dangerous condition. Knopp v. Kemp & Hebert, 193 Wash. 160, 164-165, 74 P.2d 924 (1938). “It is common knowledge that people fall on the best of sidewalks and floors. A fall, therefore, does not, of itself, tend to prove that the surface over which one is walking is dangerously unfit for the purpose.” Id. Furthermore, the nonmoving party may not rely on speculation or argumentative assertions that unresolved factual issues remain. Marshall v. Bally's Pacwest, Inc., 94 Wn. App. 372, 377, 972 P.2d 475 (1999).

Taking all reasonable inferences in Kill's favor, there is evidence that the utility cover rim was (1) wet from rain, (2) smooth metal, and (3) two inches wide. Kill also stated in her declaration that she was wearing work boots at the time of her fall. It is common knowledge that smooth, wet metal is slippery. See Michaels v. Taco Bell Corp., Civ. No. 10-1051-AC, 2012 WL 4507953, at \*6 (D. Or. Sept. 27, 2012). This evidence establishes that the utility cover rim was slippery when wet. However, there is no evidence to establish that the rim was unreasonably slippery. The fact of Kill's fall is not enough. Therefore, without expert testimony establishing that the rim was unreasonably dangerous, the jury would be left to speculate. There is no genuine issue of fact to resolve.<sup>3</sup>

Kill nevertheless argues that the City did not comply with its own standards and practices, which she asserts is admissible to show the rim was not reasonably safe. In

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<sup>3</sup> Kill cites two old Washington slip and fall cases that involved wet metal on sidewalks. In Smith v. City of Tacoma, the plaintiff slipped on a wet, smooth sheet of metal covering a coal hole on an inclined sidewalk. 51 Wash. 101, 102-03, 98 P. 91 (1908). The metal sheet was worn by years of foot traffic and several people had previously slipped on it. Id. at 102-03. The court concluded that this evidence was sufficient to go to the jury on the issues of negligence and constructive notice. Id. at 103. In Smith v. City of Spokane, the plaintiff slipped on a manhole cover in the sidewalk. 103 Wash. 314, 315, 174 P. 2 (1918). The manhole was wet and partially covered with snow and ice. Id. Like in City of Tacoma, the manhole had been worn smooth and other pedestrians had fallen on it. Id. at 316. On these facts, the court refused to hold "as a matter of law, that the cover is not such a menace as to make the city liable to answer in damages to one who is injured by falling thereon." Id. at 315.

These cases are distinguishable from Kill's case. City of Tacoma involved a sheet of metal on an inclined sidewalk. 51 Wash. At 102-03. The manhole cover in City of Spokane was partially covered by snow and ice. 103 Wash. At 315. Both of these conditions increased the dangerousness of the smooth metal coverings. Furthermore, in both cases, several previous slips indicated that the metal covers were unreasonably slippery. By contrast, there were no prior complaints about the utility cover where Kill slipped and fell, nor about others like it. We therefore conclude that City of Tacoma and City of Spokane are distinguishable and do not control here.

determining whether the defendant acted with reasonable care, the trier of fact may be informed of the standard industry practice. RESTATEMENT (SECOND) OF TORTS § 295A (1965); Helling v. Carey, 83 Wn.2d 514, 518-19, 519 P.2d 981 (1974). Likewise, a statute, regulation, or other positive enactment may help define the scope of a duty or the standard of care. Owen, 153 Wn.2d at 787. However, industry custom is not conclusive on the issue of negligence. See Helling, 83 Wn.2d 514, 518-19.

Kill is correct that since at least 2003, the City has required all new utility cover frames to have a nonskid surface.<sup>4</sup> CITY OF SEATTLE, STANDARD PLANS FOR MUNICIPAL CONSTRUCTION, Standard Plan No. 550 (2003). The City's expert, Seattle Public Utilities Civil Engineer Steven Read, agreed that diamond plating or SlipNOT rims provide greater traction than smooth metal. Read explained that "[y]ou definitely want a nonskid surface" for in-sidewalk utility covers. However, the City also submitted a declaration from Jeffrey Baker, an operations manager at WS Molnar Company, the manufacturer of SlipNOT products. Baker explained that he was familiar with general industry practices. He believed that most, if not all, utilities would not require SlipNOT on a one to two inch metal frame surrounding a SlipNOT cover. He stated, "the industry standard

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<sup>4</sup> The record states that the utility cover in question "was likely installed in 1989 . . . or before." Kill argues that, based on this date, the utility cover rim violated the City's own 1986 standard requiring a slip-resistant rim. The 1986 standard included not-to-scale diagram of a utility cover. CITY OF SEATTLE, STANDARD PLANS FOR MUNICIPAL PUBLIC WORKS CONSTRUCTION, Standard Plan No. 560 (11th Ed. 1986). It shows a partially shaded utility cover and rim. Kill asserts that this required the utility cover rim to be diamond plated. However, nothing in the diagram so states. Rather, the diagram specifies only: "Steel Frame(Galv) Anchored to top unit." "Galv" presumably means galvanized, which is a coating to prevent rust. WEBSTER'S THIRD INTERNATIONAL DICTIONARY 932 (2002).

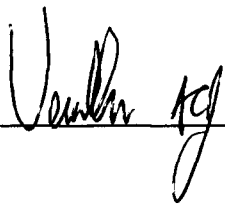


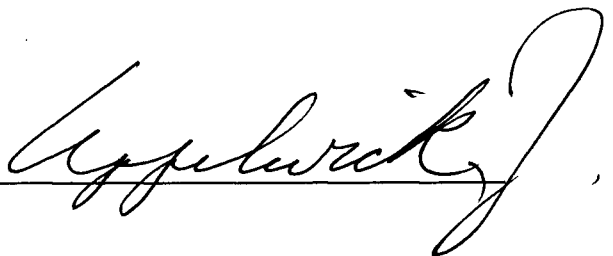
is to install flat metal frames in some installations and use SlipNOT or comparable covers.”

The City’s current requirement of nonskid utility cover rims, by itself, does not establish that smooth metal rims are unreasonably dangerous. See Ruff v. County of King, 125 Wn.2d 697, 705, 887 P.2d 886 (1995) (recognizing that municipalities are not required “to update every road and roadway structure to present-day standards”). Likewise, the existence of a safer alternative does not mean that the metal rim is unreasonably slippery. Baker’s declaration also suggests that nonskid utility cover rims are not industry custom. We therefore conclude that this evidence does not create a genuine issue of material fact.

We affirm.

WE CONCUR:

  
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