IN THE COURT OF APPEALS OF TENNESSEE
AT JACKSON
NOVEMBER 16, 2011 Session

BERNIE CHEATHAM d/b/a UNIVERSAL BUILDERS, ET AL. v. THE FEDERAL MATERIALS COMPANY, LLC, ET AL.

Direct Appeal from the Circuit Court for Weakley County
No. 4223 William B. Acree, Judge

No. W2011-01155-COA-R3-CV - Filed February 21, 2012

Builder was hired to construct a commercial building, and it purchased the concrete for the building's concrete slab from Supplier. The concrete slab developed major cracks, which led to this lawsuit between Builder and Supplier. After a two-day bench trial, the trial court found that Supplier had delivered defective concrete, and it entered judgment in favor of Builder for $60,000. We affirm.

Tenn. R. App. P. 3; Appeal as of Right; Judgment of the Circuit Court Affirmed

ALAN E. HIGHERS, P.J., W.S., delivered the opinion of the Court, in which HOLLY M. KIRBY, J., and J. STEVEN STAFFORD, J., joined.

Damon E. Campbell, Union City, Tennessee, for the appellant, Federal Materials Company, LLC

James B. Webb, Brandon L. Newman, Trenton, Tennessee, for the appellees, Bernie Cheatham and Universal Builders, LLC

OPINION

I. FACTS & PROCEDURAL HISTORY

In 2005, Bernie Cheatham d/b/a Universal Builders ("Builder") was hired by Joe Taylor d/b/a Taylor Home Works[1] to construct a commercial building in Martin, Tennessee, that was to be used as a building supply store. As part of the project, Builder was required to construct a six-inch-thick concrete slab for the building. Builder purchased the concrete for the job from Federal Materials Company, LLC ("Supplier"), and the concrete was delivered to the job site and poured on December 30, 2005. Very significant and extensive cracks developed in the concrete slab, and the owner of the building, Joe Taylor d/b/a Taylor Home Works, eventually sued Builder due to the defects in the concrete. In turn, Builder filed a third party complaint against Supplier, alleging that it had supplied defective concrete for the job.

The suit between the owner of the building and Builder was settled at mediation for $60,000. However, the suit between Builder and Supplier went to trial. The case was tried over the course of two days, with the parties' presenting testimony from numerous lay witnesses and two expert witnesses, in addition to several exhibits. At the conclusion of the trial, the judge made lengthy findings of fact and ultimately ruled in favor of Builder, finding that Supplier had delivered defective concrete. Accordingly, the trial court entered a judgment against Supplier for $60,000 plus prejudgment interest.

II. ISSUES PRESENTED

Supplier presents the following issues, as we perceive them, for review:

1. Whether the evidence supports the trial court's finding that there was something wrong with the concrete when documentary evidence and expert testimony suggested that the concrete was not defective; and
2. Whether the trial court failed to make a finding as to the most probable cause of the cracking of the concrete.

For the following reasons, we affirm the decision of the circuit court.

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[1] According to references in the record, Taylor Home Works was formerly known as Tuck's Home Works and/or Tuck's Discount Paneling and Supply Company at some times relevant to this case. However, for ease of reference, we will refer to the business simply as "Taylor Home Works."

III. STANDARD OF REVIEW

On appeal, a trial court's factual findings are presumed to be correct, and we will not overturn those factual findings unless the evidence preponderates against them. Tenn. R. App. P. 13(d) (2011); ***Bogan v. Bogan***, 60 S.W.3d 721, 727 (Tenn. 2001). For the evidence to preponderate against a trial court's finding of fact, it must support another finding of fact with greater convincing effect. ***Watson v. Watson***, 196 S.W.3d 695, 701 (Tenn. Ct. App. 2005) (citing *Walker v. Sidney Gilreath & Assocs.*, 40 S.W.3d 66, 71 (Tenn. Ct. App. 2000); *The Realty Shop, Inc. v. RR Westminster Holding, Inc.*, 7 S.W.3d 581, 596 (Tenn. Ct. App. 1999)). When the resolution of the issues in a case depends upon the truthfulness of witnesses, the fact-finder, who has the opportunity to observe the witnesses in their manner and demeanor while testifying, is in a far better position than this Court to decide those issues. ***Mach. Sales Co., Inc. v. Diamondcut Forestry Prods., LLC***, 102 S.W.3d 638, 643 (Tenn. Ct. App. 2002). "The weight, faith, and credit to be given to any witness's testimony lies in the first instance with the trier of fact, and the credibility accorded will be given great weight by the appellate court." ***Id.*** We review a trial court's conclusions of law under a *de novo* standard upon the record with no presumption of correctness. ***Union Carbide Corp. v. Huddleston***, 854 S.W.2d 87, 91 (Tenn. 1993) (citing *Estate of Adkins v. White Consol. Indus., Inc.*, 788 S.W.2d 815, 817 (Tenn. Ct. App. 1989)).

IV. DISCUSSION

First, we will address Supplier's contention that the evidence presented at trial does not support the trial court's conclusion that the concrete was defective. However, we must first recount the contradictory testimony that was presented about the events of December 30, 2005, when the concrete slab was poured. Obviously, the date of the pour occurred during the winter. The witnesses at trial agreed that it is common practice in the concrete industry to add an accelerant, such as calcium chloride, to concrete that is poured during the winter in order to speed up the setting or hardening process during cold weather. However, the parties presented conflicting testimony about whether calcium chloride was actually added to the concrete that was used for this job.

Builder had hired Mr. Robert Jackson and his concrete finishing crew to spread, smooth, and "finish" the concrete at the Taylor Home Works site. Mr. Jackson had been in the concrete finishing business for fifty-four years. He had worked with Builder on numerous jobs over the past fifteen years. Mr. Jackson testified that it was he who made the decision about whether to use an accelerant in the concrete for the Taylor Home Works job. Mr. Jackson said that he discussed the issue with Scotty Warren, the sales representative at Supplier, and told Mr. Warren that he wanted to use calcium chloride, at the level of two percent, and that he wanted the bagged form of the substance brought to the job site and

poured directly into the concrete trucks there (as opposed to adding the liquid form at the concrete plant).[2] Mr. Jackson testified that when he arrived at the job site on the day of the pour, Mr. Warren said that the calcium chloride could not be added to the trucks at the job site because it would slow the job down and "holdup the process." So, according to Mr. Jackson, he told Mr. Warren to use "High-Early," which is another accelerant that can be added to the concrete at the concrete plant, in liquid form, as a substitute for calcium chloride. Mr. Jackson said he knew that the High Early "wasn't going to set it like calcium," but he told Mr. Warren to use it because he wanted to ensure that he could finish the job on time.

Supplier delivered twenty-one truckloads of concrete to the job site that day, beginning at around 7:30 a.m. Mr. Jackson explained that it is necessary to "work" the concrete before it "sets up," but he said that this concrete set up faster than he could keep up with it. According to Mr. Jackson, each load of concrete would set up and harden to the point that a man could walk on it within twenty to thirty minutes of being poured. Mr. Jackson said that concrete with calcium chloride will normally set up within four hours, and that this concrete set up within about 45 minutes. Mr. Jackson explained that he expected to start using his machines to finish the concrete at about 11:30 or 12:00 that day, but that he had to start using them immediately because the concrete was setting up so fast. Mr. Jackson said that he had never seen concrete set up that fast before in over fifty years of finishing concrete, and that it was as if someone had added calcium chloride to concrete on a 90 degree summer day. Mr. Jackson said that the concrete started cracking as soon as his crew started working on it and that the cracks were "all over" and "going everywhere" in a manner that he had never seen.[3] Mr. Jackson testified that if Supplier had been adding calcium chloride to the concrete trucks at the job site, as he had originally requested, he could have responded to such a problem by asking them to reduce the amount of calcium chloride or discontinue its use altogether.

Mr. Robert Rowan worked as the superintendent for Builder on the Taylor Home Works job, and he similarly testified that the concrete delivered by Supplier got "harder,

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[2] An employee of Supplier later testified that the travel time involved in a concrete delivery impacts the effect of the calcium chloride because "the longer it's on there, the more heat it's going to generate." He said that calcium chloride added at the concrete plant would heat up more than it would when added at the job site. The distance from the concrete plant to the job site in this case was about seventeen miles. Mr. Jackson explained that the concrete is delivered in large trucks with rolling barrels on the back, and that in order to add calcium chloride at the job site, it is necessary to carry the forty to fifty pound bags of calcium chloride up a step ladder on the truck and pour them into the drum.

[3] Mr. Jackson explained that he knew something was wrong with the concrete after the first truckload was poured, but that he basically had no choice but to continue because he would not recommend stopping a concrete pour and then coming back later to try to pour more concrete on top of it.

quicker than what it should." Mr. Rowan testified that he had never seen concrete set up that quickly before, and that a man could stand on the concrete within fifteen to twenty minutes of it being poured when it would normally take about two hours for that to happen. Mr. Rowan said he believed that there was something wrong with the concrete and that there was nothing that anyone could have done "to save that slab."

Mr. Bernie Cheatham, the owner of Universal Contractors ("Builder"), testified that he was at his office on the day of the pour when he got a call from the job site supervisor, Mr. Rowan, about the problem with the concrete. Mr. Cheatham said he drove to the Taylor Home Works job site and arrived sometime "before lunch," and that the concrete had already begun to crack by that time. Mr. Cheatham said that he had never seen concrete set up as fast as this concrete did. Mr. Cheatham said he believed that Supplier delivered bad concrete that was improperly mixed. Mr. Cheatham explained that the cracking of this slab is not typical concrete cracking. He said that concrete will often have shrinkage cracks, into which a knife could barely fit, but these cracks now measure up to 7/8" wide and are nearly the width of a quarter.

The owner of the Taylor Home Works business, Joe Taylor, testified as well. He said that he tried to observe as much of the construction of his building as possible, so he was present at the job site on the day that the concrete slab was poured. Mr. Taylor said he was there from approximately 9:00 to 11:00 and that "the first thing [he] noticed was how fast the cracking of the concrete was taking place." Mr. Taylor explained that he had "poured driveways and stuff like that" in the past, and that he had never seen concrete crack as quickly as it did on this occasion. He said that the concrete "was setting up extremely fast." Mr. Taylor said he immediately expressed his concern to Mr. Cheatham about the fact that the concrete did not "seem right" to him. Mr. Taylor described the cracks on the day of the pour as "superficial" or "spider cracks," but he said that they had grown over time and "haven't stopped as of today."

Mr. Scotty Warren testified that he was the sales representative for Supplier who "sold the job" to Mr. Cheatham, the owner of Builder. Mr. Warren explained that he was in the office at the concrete plant in Union City on the morning of the pour when the superintendent, Mr. Rowan, called to tell Supplier exactly what to put in the concrete. Mr. Warren said that Mr. Jackson (the concrete finisher) was with Mr. Rowan when he called. Mr. Warren testified that he was not involved in the decision to add calcium chloride to the concrete. However, he said that when he heard that the order was for "straight cement mix with two percent calcium flake and hot water," he immediately told the acting plant manager who was taking the order that "they do not need to put all of that stuff in there that day, because [he] knew it was going to be up in the 50s and sunny. And that was too much, in [his] opinion, to put in it, under the weather conditions that day." Mr. Warren testified that

adding calcium chloride on such a warm day when the wind is blowing "pretty hard" will make the concrete set "excessively quick," which can cause cracking. According to Mr. Warren, the acting plant manager "tried talking them out of it," but Mr. Jackson wanted the calcium chloride, and "that was pretty much the end of the story." Mr. Warren said "we put every bag of flake calcium that we had in the [company] pickup, and it was driven to the job site."

Although Mr. Warren was employed as a sales representative at Supplier, he testified that he delivered concrete in one of the concrete trucks on the day of the pour at the Taylor Home Works site. Mr. Warren testified that calcium chloride was added at the job site to all four of the loads that he delivered that day. When asked who dumped the calcium chloride into his truckloads, he replied, "I can't exactly remember, it's been so long, but I knew it was put in on every load. I'm almost – most of the time, I'm the one who put it in." Mr. Warren said he could not remember whether he went over to the pickup truck and picked up the bags for each of his loads.

Mr. Warren testified that the best way of adding calcium chloride to concrete at the job site is to mix it with water and let it dissolve, then pour the solution into the drum. However, he explained that the "normal procedure," and the one preferred by most concrete finishers, is to "just take the bag, dump it in the drum, have your drum in full-mix and wash your hopper down and wash your blades down and let it mix, you know, about 8 to 10 minutes; 8 to 10 minutes is what I have always been told; about 8 minutes to mix it; that's what we recommend." Mr. Warren said that for the Taylor Home Works job, the calcium chloride was not mixed with water but was simply added to the trucks. The delivery tickets filled out by each of the concrete truck drivers that day listed the exact times when each truck left the plant, arrived at the job, started discharging concrete, finished discharging concrete, left the job, and arrived back at the plant.[4] According to those delivery tickets, thirteen of the twenty-one trucks were at the job site for only ten minutes or less before they started discharging concrete. Some of the delivery tickets indicated that trucks began discharging concrete within five, four, three, or zero minutes of arriving on site. Mr. Warren conceded that it would have been impossible to take the necessary steps to add the bagged calcium chloride to the trucks and let it mix for the proper duration within such short periods of time. Nevertheless, he testified that sometimes the times listed on the delivery tickets are not

[4] Mr. Warren acknowledged that his name was not listed on any of the delivery tickets under "Operator," but he said that was because he does not usually drive a concrete truck and the tickets were printed with the regular driver's name on them. Mr. Jackson, the concrete finisher, testified that he had known Mr. Warren for a long time and that he did not see him driving a concrete truck that day. Mr. Cheatham also testified that Mr. Warren did not come to the job site while he was there for an hour before lunch, even though a delivery ticket indicated that the truck Mr. Warren claimed to have driven was at the job site from 11:10 to 11:45.

accurate, and also, he said, the concrete finishers sometimes get in a hurry and insist that the drivers start pouring the concrete before the mixing process is completed. Mr. Warren testified that poor mixing could cause discoloration, lumps, or "hot spots" where one area sets up more than the other, but to his knowledge, it would not cause cracking. Mr. Warren testified that he got a phone call from Mr. Cheatham during the afternoon of the date of the pour about the cracks forming in the concrete, so he went back to the job site to look at them.

The delivery ticket from the very first truck to arrive at the job site on the day of the pour listed Scott Dennison as the operator, and he was the driver who was allegedly replaced by Mr. Warren. That first delivery ticket lists, in addition to the concrete delivery, 38 fifty-pound bags of calcium chloride. The space on the delivery ticket labeled "taken by" was signed, "Bear," who was an employee of the finishing crew. Mr. Warren testified that two bags of calcium chloride were added to each of the first nineteen trucks, and then when they ran out of bags, liquid calcium chloride was added at the concrete plant to each of the last two trucks. When asked whether it was possible that liquid calcium chloride could have been added to *all* of the trucks *in addition to* bagged calcium chloride, Mr. Warren said he did not think so, and that he assumed that someone simply called and asked for the liquid calcium chloride toward the end of the job. However, he said that he really could not say what happened because he was driving a truck and not in the office that day.

Mr. Robert Jackson, the concrete finisher, testified that he never saw any bags of calcium chloride at the job site that day, whether on a concrete truck, a palate, or a company pickup. He said he knew that no calcium chloride was added at the job site because of how fast the trucks were coming and the fact that he did not see the drivers get out of the trucks "to turn the mix around before discharging the mix." Mr. Jackson said he did not know how the drivers could have added calcium chloride without him noticing it.

Mr. Cheatham, the owner of Builder, testified that during the hour that he was at the job site before lunch, he walked around the entire job site and did not see any empty bags or unopened bags of calcium chloride. Mr. Rowan, the superintendent on the job for Builder, testified that he was the first person to arrive at the job site that morning and the last one to leave that evening, and he said that he did not see any bags of calcium chloride on the job site that day, nor did he see the drivers mixing it in the trucks.

Finally, Mr. Taylor, the owner of the Taylor Home Works business, who visited the site for two hours that day, said he did not see any fifty-pound bags at the job site. Mr. Taylor said he saw five to ten concrete trucks come and go while he was there, and he did not see anyone tearing open sacks and pouring them into the back of the concrete trucks.

Two expert witnesses testified as well. Dr. Ashraf Elsayed testified for Builder. Dr. Elsayed had a Ph.D in civil engineering and was licensed as a professional engineer in fifteen states. He was a professor of civil engineering at Arkansas State University and also the chief engineer of geotechnology at a geotechnical firm in Memphis that does soil and foundation engineering. Dr. Elsayed testified that he deals with the materials that go into making and mixing concrete on a daily basis. He was also involved in concrete evaluation and construction at his previous job in the engineering department of a company that did highway and airport construction.

Dr. Elsayed testified that he had reviewed numerous documents and tests in preparation for testifying in this case. He explained that calcium chloride is heavily used in the concrete industry, and that if used correctly, it normally will not cause any problems. He stated that the maximum recommended dosage of calcium chloride is two percent of the dry weight of the cement. He testified that an "overdose" of calcium chloride can cause problems like the ones in this case. Dr. Elsayed explained that he could not be 100% certain as to the cause of these cracks because he was not at the job site on the day of the pour, "but," he added, "what I've seen indicates an overdosage of calcium chloride." Dr. Elsayed said that the cracks at the Taylor Home Works site are indicative of drying shrinkage, and that an overdose of calcium chloride can accelerate and increase the amount of drying shrinkage and cause shrinkage cracks. Dr. Elsayed testified that an overdose of calcium chloride can cause rapid stiffening, rapid increase in drying shrinkage, and loss of strength at later ages. He also said that improper mixing of calcium chloride can lead to concentrations of calcium chloride in the mix which can also increase the chance of having cracks.

Dr. Elsayed testified that it normally takes two to four hours before a man can walk on concrete after it is poured, and if calcium chloride is added, it could, depending on the dosage, shorten that time to one hour. However, he said that if a man could walk on the concrete at the Taylor Home Works site after thirty minutes, that would not be typical of normal concrete and "[t]hat would be a case of an overdosage of calcium chloride."

Supplier presented the testimony of its own expert witness, Mr. John McCord, who held a bachelor's degree in civil engineering and was employed as Director of Engineering for the Kentucky Ready Mixed Concrete Association. Mr. McCord had previously worked for the Kentucky Department of Highways as Director of Division Materials. Mr. McCord testified that he teaches classes that allow certification for concrete testing technicians for the American Concrete Institute. Based upon his inspection of the slab and review of various exhibits, Mr. McCord opined that the excessive cracking of the Taylor Home Works floor was caused by a combination of factors that created "a perfect storm." He discussed the preparation of the ground before the slab was poured, the design of the building, the type of footers used for the foundation, the spacing and depth of the saw joints in the concrete, the

depth of the wire mesh reinforcement used in the concrete, the temperature of the concrete, and the wind speed and temperature on the day of the pour as possible contributing factors to the cracks in the concrete.

Mr. McCord said he did not believe that calcium chloride had anything to do with the cracking; however, he based that opinion upon his belief that two percent calcium chloride was added at the job site as requested, and he clarified that a two percent addition of calcium chloride would not cause the floor to crack. When asked about the possibility that a "double dose" of calcium chloride was used, Mr. McCord said that he did not see any evidence to suggest that a double dose was added here, and that if the calcium chloride was "doubled up," it would have likely caused the concrete to set up in the concrete truck before it could be poured. However, when questioned further about this testimony, Mr. McCord conceded that he did not know what would happen if calcium chloride was added twice because he had never heard of anyone adding that much accelerant to concrete. He said that concrete with a double dose of calcium chloride would have such a short set up time that no one would want to use it.[5]

Upon questioning by Builder's counsel, Mr. McCord conceded that Supplier is one of the "top ten members" of the Kentucky Ready Mixed Concrete Association, Mr. McCord's employer, "in terms of yards of production and equipment." He explained that members of the association pay annual dues based upon factors such as how many plants and trucks they have. He also testified that the first time he went to observe the cracks at the Taylor Home Works site, he did so as a favor to Supplier. He explained that he was in town that day teaching a class that Supplier's employees attended, and for which Supplier paid attendance fees to Mr. McCord's employer. Mr. McCord also acknowledged that "one of the folks from [Supplier]" is on the Board of the Kentucky Ready Mixed Concrete Association.

The trial judge made lengthy findings of fact in this case and specifically stated that he had "a problem with Mr. McCord's testimony." The trial judge noted Mr. McCord's opinion that there was a design error involved, yet Mr. McCord admitted that he had not seen the design plans, which were drawn up by a professional structural engineer and submitted in accordance with local ordinances to the City of Martin. The judge said that fact "severely impeache[d] Mr. McCord's testimony." The judge also discussed and rejected some of Mr. McCord's numerous other theories about possible causes, finding that Mr.

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[5] Mr. McCord acknowledged that when asked during his deposition about what would happen if calcium chloride was added once at the plant and then again at the job site, he simply said, "the more calcium chloride you put in, the more chance you have for . . . . probably some conditions that would be found on the job, that kind of condition being more – again, I think being something related to a cosmetic situation."

McCord failed to provide an "adequate explanation" to support the theories. The judge described Mr. McCord as "quite reluctant to answer a number of questions" and said he "seemed quite evasive." We will not belabor this discussion by explaining in detail why it was proper for the trial judge to reject each of the many theories mentioned by Mr. McCord. Suffice it to say that the trial judge was "'best situated to determine the credibility of the witnesses and to resolve factual disputes hinging on credibility determinations.'" ***ARC LifeMed, Inc. v. AMC-Tennessee, Inc.***, 183 S.W.3d 1, 25 (Tenn. Ct. App. 2005) (quoting *Mitchell v. Archibald*, 971 S.W.2d 25, 29 (Tenn. Ct. App. 1998)). We will not "'second-guess a trial court's credibility determinations unless there is concrete, clear, and convincing evidence to the contrary.'" ***Id.*** We find no such evidence to contradict the judge's credibility determination here.

The trial judge also made an express finding that calcium chloride was not added at the job site. The judge listed several reasons for his finding, including the fact that Mr. Jackson (the finisher), Mr. Cheatham (the owner of Builder), and Mr. Rowan (Builder's superintendent) all testified that they did not see any bags of calcium chloride being added to the nineteen truckloads of concrete. The judge also noted Mr. Jackson's testimony that Mr. Warren (Supplier's sales representative) told him that he could not add the calcium chloride as requested because it would take too long. Although Mr. Warren had testified that calcium chloride was added at the job site, the judge explicitly stated, "I do not believe Mr. Warren's testimony. I do not think he is credible." Because the factual dispute regarding whether calcium chloride was added at the job site hinged on credibility determinations, we will defer to the trial court's finding that calcium chloride was not added at the site as requested. The evidence certainly does not preponderate against such a finding.

Regarding the cause of the cracks in the concrete, Supplier claims that "the trial court did not make a determination as to the most probable cause for the condition[.]" Supplier also insists that "the trial court did not specifically find that [Supplier] had improperly mixed the concrete." We disagree with both of these assertions. Early in the trial court's findings, the judge did state:

> In short, The Court finds that the calcium chloride was not added at the site, which, that means no one knows exactly how it was added, whether or not it was added properly, how much was added or whether or not that mixture was proper. We do not know.

However, the Court went on to discuss the fact that it was undisputed that the concrete set up very quickly and that cracks formed in the concrete extremely quickly at numerous locations, and that the witnesses testified they had never seen that happen before. The judge noted the testimony that a man could stand on the concrete within fifteen to twenty minutes,

and that the concrete eventually developed "really significant" cracks. The judge then stated, "The Court concludes that from the testimony of the cracks appearing so quickly and so severely and the fact that the concrete setup so quickly, that there was something wrong with the concrete." After again noting that the concrete set up "way too fast" and cracked much more quickly and extensively than it should have, the judge recounted the testimony from Builder's expert witness that "an improper mixture likely caused the problem." The judge then stated his conclusion that Builder had proven by a preponderance of the evidence that "the concrete was defective," and that "it was because of the improper mixture of [the] concrete." As such, we find no merit in Supplier's contentions that the trial court "did not make a determination as to the most probable cause for the condition" and "did not specifically find that [Supplier] had improperly mixed the concrete."

Supplier argues on appeal that the trial judge should have given more weight to the "reports and documents" in the record that suggested that calcium chloride was not the cause of the cracks. Specifically, Supplier points to a report prepared by Construction Materials Laboratory, Inc., who visited the job site and inspected the cracks in the floor slab just a few days after the pour, at the request of Builder. The report states, in relevant part:

> The slab had several areas of cracking. We were not on site at the time of the placement of the concrete and can only list some possibilities causing the cracking problems.
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> 1) Windy conditions often cause these problems by allowing the concrete to dry on the surface while the underlying mix is still in a plastic condition.
> 2) Pouring the mix at a high slump.
> 3) Not getting the control joints sawn immediately after the finishing was completed.
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> Most of the cracks appeared to be of the plastic shrinkage variety. These do not usually present a problem as long as the reinforcement is embedded in the concrete slab. Special attention should be given in watching for areas where spalling of the surface of the slab might occur.

Mr. Cheatham testified that when this inspection was performed, the worst cracks were only about 1/8" wide, and there were many other smaller, superficial "plastic cracks." He said that at the time of the inspection, "they didn't dream these cracks would get as wide as they did[.]" Regarding the possible causes listed in the report, Dr. Elsayed testified that the wind speed on the day of the pour, which was five to fifteen miles per hour, was "not going to be much of a factor" and was "unlikely" to cause cracks such as these. With regard to the saw

joints, there was testimony from several witnesses that the crew started cutting saw joints *before* the finishing was even completed, which was earlier than usual, and that the cracking had already begun by that time. Finally, there was no testimony presented about anyone pouring the mix at a high slump in this case. Thus, we find no error in the trial court's implicit decision to give little to no weight to this report.

Next, Supplier claims that the trial court failed to give appropriate weight to a petrographic examination of a sample of the concrete that indicated that the sample was "good concrete." Dr. Elsayed testified that he did not give the petrographic examination much weight in forming his opinion because he was unable to discern where the sample was removed from the concrete. He explained that it was possible to take good samples and bad samples from the same concrete. The report itself states that the test was performed on one concrete core sample that was approximately 7" in length and 2.75" in diameter. The report also stated that "due to damage during the core extraction process, **no** portion of the top surface of the core was evident; core damage extended to a depth of at least 1 ½"." The report further stated that due to the lack of a top surface on the sample, the laboratory was unable to evaluate "any near-surface features" such as "shrinkage cracks, etc." The "conclusion" section of the report lists three findings, which appear to indicate that no problems with the concrete sample were discovered, and then it states, "Given the lack of a top surface, . . . [we] cannot draw any other conclusions at this time." Due to the limitations of the petrographic examination, we cannot say that it was error for the trial court to conclude that something was wrong with the concrete despite the results of this test.

Finally, Supplier argues that a report prepared by another expert, Mr. Richard Chesteen, Jr., does not support the trial court's conclusion that the concrete was defective. Mr. Chesteen had prepared a written report for Supplier four years prior to trial, and it was introduced as an exhibit to Dr. Elsayed's testimony because it was one of the documents that he had reviewed in preparation for testifying in this matter. However, Mr. Chesteen did not testify at trial. Mr. Chesteen's report describes him as a "Consulting Engineer." Mr. Chesteen's report stated his opinion that two things "attributed to the cause of the random cracking, spalling and joint opening of the existing floor slab." First, he opined that it was improper to use calcium chloride on a day when the high temperature was forecast to be 53 degrees with a wind speed of 10-15 miles per hour.[6] However, as previously explained, Dr. Elsayed testified that it was unlikely that the wind caused the cracking at issue. Dr. Elsayed further testified that a temperature of 53 degrees would not cause the concrete to cure rapidly, and that 53 degrees was an allowable temperature for working the concrete. The second contributing cause listed in Mr. Chesteen's report was that the saw joint layout and

[6] At another point in Mr. Chesteen's report he lists the wind speed on the day of the pour as 5-10 mph.

construction did not comply with industry recommendations. Mr. Chesteen said that the saw joints were basically cut too far apart and not deep enough. However, as we have previously mentioned, several witnesses testified that the cracking began before the saw cuts were made, even though the crew started making the saw cuts earlier than usual. Mr. Chesteen's report states that "[c]ontrol joints are typically saw cut within 4 hours of fin[a]l finishing operations," but the number 4 is marked through, and the number 24 is handwritten beside it. Regardless of whether the control joints are typically cut within 4 or 24 hours of final finishing operations, however, the evidence was undisputed that the crews started the saw cuts on this slab before the finishing crews completed their work, as soon as the cracking began. Furthermore, as Dr. Elsayed noted, the cutting of the saw joints had absolutely nothing to do with the concrete setting up too fast.

Even after reviewing Mr. Chesteen's report, Dr. Elsayed continued to believe that the main cause of the cracking was due to the addition of an improper amount of calcium chloride. The trial court clearly agreed. We find no error in that decision.

V. CONCLUSION

Having reviewed the entire record in this case, we find that the evidence supports the trial court's conclusion that Supplier delivered defective concrete that was improperly mixed. Consequently, we affirm the trial court's decision in its entirety. Costs of this appeal are taxed to the appellant, Federal Materials Company, LLC, and its surety, for which execution may issue if necessary.

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ALAN E. HIGHERS, P.J., W.S.