Witness: Robert C. O’Neill

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Called by: People (prosecution)

Phase: Guilt

Examinations: Direct – David Harris; Cross – Mark Geragos; Redirect – David Harris; Recross – Mark Geragos; 2nd Redirect – David Harris; 2nd Recross – Mark Geragos

Day 1 of 1 for this witness

Court: San Mateo County Superior Court, Redwood City (People v. Scott Peterson)

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Direct Examination by David Harris

HARRIS: Mr. O'Neill, what is your profession?

O’NEILL: I'm president and senior petrographer for Micro-Chem Laboratories in Murphys, Californi 10. What is it that Micro-Chem Laboratories does?

O’NEILL: We are a specialized laboratory that analyzes construction materials by petrographic and chemical methods.

JUDGE: You better tell us what "petrographic" means.

O’NEILL: Petrography is a branch of geology, literally meaning "rock picture." A petrographer is one who studies construction materials, like concrete, stucco, mortar, grout, by microscopic methods.

HARRIS: And is this, let me back up for a second. Do you, is there some kind of educational background or training or experience that you have that allows you to be a petrographer?

O’NEILL: Well, originally I started off as a mason and a finisher of concrete. Building homes and commercial work. My training was in geology at the University of Wisconsin. But my training was initially at the Portland Cement Association back in Chicago, Illinois. This is kind of like the university of cement and concrete, where engineers and analysts study concrete and their effects, both in the field and in the laboratory.

HARRIS: And how long have you been in this field?

O’NEILL: Almost 30 years.

HARRIS: And during this time, are there any professional associations in this particular area?

O’NEILL: There are. Most notably is the American Concrete Institute, approximately 25,000 members worldwide. I belong to several other organizations, such as ASTM, which is the American Standards for Testing, Testing Methods, Testing Materials. I belong to the Association of American Geologists, and also the Society of Concrete Petrographers. A well-known field, well-known entity.

JUDGE: Have big conventions all the time.

O’NEILL: All the time.

HARRIS: Do you hold any licenses in this area as well?

O’NEILL: I do. I'm a licensed professional geologist with the State of Washington, and I'm also a certified professional geologist.

HARRIS: Have you also testified in court before in the area of, as an expert in the area of petro, petrography, I can't even get there, in concrete?

O’NEILL: That will do. Wait until we get to microscopy and then you'll really have a hard time with that one. Yes, I've testified in court many times. Mostly in construction defects litigation cases. They're civil cases.

HARRIS: And in those particular cases, do you examine concrete or how things work or interrelate in concrete?

O’NEILL: Yes. Typically something's gone wrong with the concrete or the stucco or grout where we analyze it forensically to determine what the causes of failure are, whether they were original quality of the materials, composition, the mixes, or there was some other factors involved after the materials were in place.

HARRIS: Now, in your professional capacity, have you ever received any awards or recognition?

O’NEILL: Yes. I'm a fellow of the American Concrete Institute, and also for that institute I've received the Del Mar Bloem Award for Distinguished Service.

HARRIS: Now, I want to move into kind of, trying to not say something about into the mix here, but what, let's just boil down to this. What is concrete?

JUDGE: Before we do that, are you offering him as an expert?

HARRIS: Yes.

JUDGE: All right. Mr. Geragos, do you have any questions as to Mr. O'Neill's qualifications to testify about concrete?

GERAGOS: No, Judge.

JUDGE: No? All right. Then, ladies and gentlemen of the jury, based on the witness's qualifications, the court will accept Mr. O'Neill as an expert in petrography, and he's qualified to give an opinion with respect to concrete and the composition thereof. Go ahead.

HARRIS: So let's go back to that. What is concrete?

O’NEILL: Concrete is a mixture of materials including Portland cement, which is the gray powder that's commonly found, rock, sand and water. When you mix all of those together, that becomes concrete. Sometimes there's other additives involved, including material known as fly ash. Fly ash is the residue from coal-generated plants. The ash that comes out after they burn the coal. And they sometimes add that to the concrete as, as an additive. But concrete is, is, those materials. There's no such thing as a cement sidewalk. It's concrete. So when we speak today, we have to talk about concrete and cement, or I'm going to get really mixed up.

HARRIS: Let me, let me ask you about that, then. So you're saying there's no such thing as a cement sidewalk?

O’NEILL: Right.

HARRIS: Why, why is that? Why could there not just be that Portland cement that you're talking about?

O’NEILL: Because there is Portland cement, but when you combine that with those other ingredients, then it becomes concrete. If you just had a cement concrete, you would fall right through because that's just the powder that's manufactured.

HARRIS: Now, when you talk about this as the powder that's manufactured, let's go through this a little bit. Is there, is there a process to actually make this Portland cement? Or is it just

something you go and scrape up off the side of a hill?

O'NEILL: No. As a matter of fact, there's a plant here in the Bay Area that I used to work, at Kaiser Cement, which is now Hanson Cement in Cupertino. If you ever look up there on the hill, there's a cement plant up there. The plant consists of a quarry, where they have limestone. Limestone is quarried and crushed, and then they add quartz sand, or some other kind of silica-type material, some clays to it, and they grind all this up and blend it together into a very fine powder. And then that material is then passed through a kiln at a very, very high temperature, and it burns so that it comes out like lava. And as it comes out it agglomerates into, like, little pebbles. Small down to an eighth of an inch, up to maybe an inch in diameter. That material then becomes crushed and added with some gypsum. And then it becomes that very fine powder. So you have the material that comes out of the kiln, and then you have the gypsum together, and that makes Portland cement. And it's probably the most common building material on the planet.

HARRIS: When you talk about Portland cement, and you were telling us about cement and concrete are not the same. When you add this Portland cement to these other materials, what is it that makes it go through this process that it becomes this concrete? That concrete sidewalk?

O'NEILL: Well, without boring everybody to death with the technical part of it, basically what happens is, when you add water to the Portland cement, there's a chemical reaction with the water and the Portland cement so that it transforms from one chemical compound, the dry material, to what they call a hydrated phase. So when the water reacts with it, it, it forms this hydrated phase. It's not simply for the fact that you add water and it dries out that you get the concrete. There's an actual chemical, very complex chemical change from the time that you add the water.

HARRIS: You used a term there, "hydrated phase." What is that?

O'NEILL: With this ground-up Portland cement you get these small particles, and they are called unhydrated Portland cement grains, or particles. And when water is added to it, there's a hydration, meaning that it reacts. Similar to something like plaster of Paris or other materials where the water combines with it. And so there will always be some unhydrated portions left in concrete. Even concrete that's a hundred and fifty years old will still have some unhydrated phases in the concrete.

HARRIS: Now, you're talking about and using another one of those big words there: Microscopy?

O'NEILL: Very good.

HARRIS: And what is that?

O'NEILL: Microscopy is one who also uses a microscope, but not just for construction materials, for looking at different things. Looking at hairs or other types of materials. A microscopist will look at a full range of materials.

HARRIS: Can you actually look at, you know, take a chunk of concrete or piece of concrete and look at it under a microscope?

O'NEILL: Yes, there's several, several techniques to do that.

HARRIS: And why, why is it that, that's something that's kind of big that we can look at. Why would you look at concrete under a microscope?

O'NEILL: Well, there's several reasons. One is to find out what the composition of that material is. Again, there are additives that may be in there, and we can look at the micro structure of the paste. Now, the paste is the water with the cement, and when it hardens, that's what you get is this glue that holds the rock and the sand particles. That's the essential part of the concrete. So

many times we want to look at the composition of the rock and the sand, which is known as aggregate, and we also want to look at the composition of the cement paste.

HARRIS: And when you, when you look at this, what, what does that tell you?

O'NEILL: Well, it depends on what we're looking for. If there's been a failure, we have to look at that to see if there's anything there, any damage to the microstructure of the paste. If we want to find just what the composition is, then we can go through and look and see does it have Portland cement, number one; does it have fly ash or does it not have fly ash; how advanced is this hydration process, is it not hydrated where there's been no reaction with the water; or is it very advanced where much of the Portland cement has reacted. So those are some reasons to look at it. But normally we look at things for failure reasons, but we have to describe what, the composition before we do anything.

HARRIS: Now, again, just taking this from the point of view, pretend ine I know nothing here, and we're talking about concrete. Is it something that you can go out and just buy this concrete mixed up already?

O'NEILL: There's really a couple ways that, that you can do it. One are ready-mix plants, and these are the trucks that you see with the big drum in the back that's turning, and they supply concrete usually in rather large loads. And there's a number of those here, obviously, in the Bay Area. Another way is that you can go to a hardware store, like a Home Depot or a Lowe's and you can buy pre-mixed bag materials. There are several companies that provide those, or manufacturers of those materials. For instance, Basalite and QuikRete, and they become pre-mixed. So you've got Portland cement and many times fly ash, and you've got sand and you've got usually just pea gravel.

HARRIS: Pea gravel. What is that?

O'NEILL: Pea gravel is a small-sized rock. Usually about three-eighths of an inch. And it's the material that's commonly found in Basalite or QuikRete type materials.

HARRIS: Now, you're, you're talking, it sounds like that there's kind of a technical term, if not a technical term: Pea gravel in a certain size. Are there different sizes of this gravel in concrete?

O'NEILL: Yes. Aggregate can range all the way from sand sized, which is just like we do find in normal beach-type sand or sandbox-type sand. Then there's rock, and we call that coarse aggregate. And some coarse aggregates are just pea gravel type materials. Other coarse aggregate are rock, are much larger than that. They're inch, three quarters of an inch, inch, all the way up to six inches, in some instances, where there are a manufacturing of a dam or a bridge where they use very large-size boulders. But typically in most ready-mix operations with the truck, the aggregate is usually half inch to inch, inch and a half.

HARRIS: And that's something that's different than this ready-mix that you find in the hardware stores?

O'NEILL: Right. In the bag materials that you find in the hardware stores, it will either be the pea gravel, or in some instances there are masonry sacks that just contain Portland cement and the sand, but you never find materials that are, are greater than the pea gravel, say, half inch or three quarters of an inch. It just doesn't work in bag materials. And they don't offer it.

HARRIS: Now, in this particular case were you contacted by the Modesto Police Department to assist them in looking at some concrete items?

O'NEILL: Yes. I believe the first time I was contacted was in June of 2003.

HARRIS: And was that by a Detective Craig Grogan?

O'NEILL: It was.

HARRIS: And did Detective Grogan actually send you some items for you to look at or for you to examine?

O'NEILL: Initially he just asked me some basic questions about what kind of tests that we could perform and conduct on samples. And he wasn't familiar with the kind of analysis we did, so I briefed him on what we, we could do. It wasn't until December that he had called back and said he would like to deliver some evidence items to our laboratory.

GERAGOS: Specify. December of?

JUDGE: 2003, I would assume.

GERAGOS: 3?

O'NEILL: Yes.

HARRIS: And did he, in fact, bring you some items to the laboratory?

O'NEILL: He did. He brought 14 evidence items, items with him.

HARRIS: Now, going through these, what I want to do is just kind of break it down. What was it that you received from him that you examined?

O'NEILL: We received a variety of evidence items, ranging anything from boots and socks to a hat to concrete samples, powder-type samples, and a concrete anchor.

HARRIS: Let me go ahead and show you some items at this point in time. The last one you mentioned was a concrete anchor, so let me go ahead and put this up here, what's been marked as number 72. Have you looked at this. Do you recognize this item?

O'NEILL: I do.

HARRIS: Is this one of the items that Detective Grogan submitted to you for testing?

O'NEILL: It is.

HARRIS: It's going to get a little crowded up here.

O'NEILL: No problem.

HARRIS: Showing you 123. Have you take a look at that.

O'NEILL: Yes.

HARRIS: Do you recognize this?

O'NEILL: Yes.

HARRIS: And inside it has a plastic pitcher?

O'NEILL: Yes, sir.

HARRIS: Do you recognize this particular item as well?

O'NEILL: I do.

HARRIS: Is this another item that Detective Grogan sent to you?

O'NEILL: He transferred and brought to me personally, yes.

HARRIS: You want to go ahead and put the anchor on the floor, so it doesn't slide down.

O'NEILL: Thank you.

HARRIS: Number 238.

O'NEILL: Yes. I recognize this.

HARRIS: Now, when you received these, these numbers, were you using, for identification purposes, the numbers that were assigned to these items by the Modesto Police Department?

O’NEILL: Yes.

HARRIS: And this particular item, People's number 238, was identified as 214-22?

O’NEILL: That's correct.

HARRIS: And,

JUDGE: Just so the jury knows what 238 is, that's been identified by Skultety as vacuum from the boat. Cement that was vacuumed from the boat.

HARRIS: Looking at this particular item, which is MPD number 43 A, People's Exhibit 241.

JUDGE: 43 A?

GERAGOS: What was the MPD number on it?

HARRIS: 43 A.

GERAGOS: Thanks.

HARRIS: This would be debris from the boat cover collected by the Department of Justice?

O’NEILL: That's right.

HARRIS: And did you receive this item?

O’NEILL: I did.

HARRIS: Looking at what was MPD number 60, that's been marked as People's number 80, and is this an item that you recognize?

O’NEILL: I do.

HARRIS: Item number 156, which was identified as 218-41, is this an item that you recognize?

O’NEILL: Yes.

JUDGE: 80 has been identified as a bag containing concrete debris, that you recognize.

GERAGOS: That was which exhibit, Judge?

JUDGE: 80.

GERAGOS: 80.

JUDGE: Bag containing concrete debris. And I believe this is, I think this was seized from the residence.

HARRIS: Is the court asking about item number 156?

JUDGE: I haven't got it yet. I just want to identify the stuff for the jury so they know what we're talking about.

HARRIS: Well, that's item 218-41. It's identified on the outside of the envelope as concrete from living room.

JUDGE: What number is that? 80 is, according to my notes, I have 80 as bag, concrete debris.

HARRIS: This is,

JUDGE: This was recovered from the living room?

HARRIS: No, just trying to get them matched up. Number, People's No. 80, which has an MPD number of number 60, that one doesn't have and identifier on the outside of the envelope. But it was testified to by Detective Brocchini, that –

JUDGE: Well –

HARRIS: is the item collected from the, by the driveway.

JUDGE: Okay. Also, and he testified to it and Anderson testified to it.

HARRIS: Yes.

JUDGE: Okay. So that was collected from the driveway.

HARRIS: Now, moving on to this one right here, which has been marked as 129 and contents, with an MPD number of 140, and subparts. Do you recognize these, the red and a blue drum, and the contents inside?

O'NEILL: Yes. I assume that the contents are what's labeled on here and what I looked at originally.

HARRIS: Now, this one is still bagged up, but there's a hole here. You see a pair of socks?

O'NEILL: Right. Yes.

HARRIS: And appears to be a stocking cap or some kind of a knit cap?

O'NEILL: Right.

HARRIS: Okay.

O'NEILL: Okay.

JUDGE: All right. Just so you know, so the jury knows what we're talking about, number 129 has been identified by Detective Hendee as coming out of a blue and red bucket that was recovered in the warehouse, correct?

HARRIS: Yes. Mr. O'Neill, what I want to do is go through this and try and talk about these. I don't know if you want to set those down and we'll just talk about them by the numbers that you received from MPD. You already described one of those items up there as the vacuuming from the boat. I think the judge mentioned that that was MPD's item number 214-212.

O'NEILL: Yes.

HARRIS: And did you do some type of examination of that particular item?

O'NEILL: I did.

HARRIS: Tell us what you did.

O'NEILL: I, after photographing the evidence envelopes, I removed the samples and placed them into plastic, what we call weigh boats. They're just little containers. Inside the weigh boat I then examined those materials with a stereo microscope. A stereo microscope is one where there's light that comes down and you can examine any kind of materials. Typically, if you go to a jewelry store, you'll look at your diamonds or your gems with a stereo microscope. The magnification goes somewhere between seven times to 45 times. So you can look at it at a relatively low power and also increased power.

HARRIS: Let me back up for a second. One of the terms you're using: A weigh boat?

O'NEILL: A weigh boat.

HARRIS: What is that?

O'NEILL: It's a little plastic container that, in some of the photographs that I've provided in this case. Generally when you're weighing out materials for chemical analysis, you'll use this weigh boat because you can, it's a very light material, and when you put contents into this weigh boat, you can very easily get everything out. So that you get full, the full sample back without leaving anything inside the container.

HARRIS: So with that particular item, the one that we're talking about, the debris vacuumed from the boat, did you go through this process, you, you document the outside packaging, you open it up, you get the contents out, put it in this weigh boat, and start to look at it visually?

O’NEILL: Right. And then I described on a, basically on this microscopic level, that's not real high power, I describe what's in the sample. And make notes in my lab book.

HARRIS: So starting with that particular item, what, what did you find?

O’NEILL: May I refer to,

JUDGE: Your notes? Go ahead.

O’NEILL: my notes? Thank you.

GERAGOS: May I approach?

JUDGE: Of course. You can look at it. Mr. Geragos is going to check to see what you're referring to in your notes, Mr. O'Neill, so he can correspond with his discovery.

HARRIS: That will be Bates stamp number 36694, appears to be.

GERAGOS: 36694?

HARRIS: Yes.

GERAGOS: You're not looking at this?

O’NEILL: No, I'm looking at, actually, my report.

GERAGOS: Okay. He's on a different page.

JUDGE: Do you have his report?

GERAGOS: Yeah. Can I just have a moment, your Honor?

HARRIS: He indicated looking at his notes, so we both turned to his notes page.

GERAGOS: Notes to his report. Thank you.

O’NEILL: You're welcome.

JUDGE: Okay. Go ahead, Mr. Harris.

HARRIS: Tell us what you found during your examination.

O’NEILL: In the sample 214-212, vacuumings from boat, there were two parts to this. One was a filter material that was about a hundred, hundred and seventy millimeters in diameter. And there was some material that was in the center of this filter, so obviously I assumed that this filter was taken out of the vacuum and then given to me. The other part of this was a debris sample where there was numerous various types of materials, and this, in this sample, anywhere from hair fibers to opaque materials and sand and concrete, and also a mineral known as sodium chloride.

HARRIS: So you sift through that material and see if there's anything that would be kind of something that you would be interested in the concrete area?

O’NEILL: Right. I would look for the concrete pieces and the sand. And also I was interested in the deposits that were in here. They were clear deposits, and I wanted to look at those, and those turned out to be the sodium chloride.

HARRIS: What is that?

O’NEILL: Sodium chloride is a salt. It's, the formula is NaCl. In seawater sodium chloride is a very common material that you would find. That's, it is the salt that you normally would find in seawater.

HARRIS: So you, you find these things there, and you, you sort out the materials that you're, that you're interested in. Do you start to examine those closer?

O’NEILL: Yes. The next phase is after I've looked at these materials under a microscope, I can then selectively go through with a fine tweezers and pull out some of the samples that I would like to further analyze. And in this case I pulled out some of the sodium chloride crystals that were in there. I didn't know what they were at this point. And I also pulled out some of the concrete fragments that were in the sample.

HARRIS: When you say "concrete fragments," describe what you mean by that.

O’NEILL: They're very small, little pieces of cement paste with some sand. Typically they're broken. They're very angular type materials.

GERAGOS: I'm sorry, your Honor.

O’NEILL: Angular.

GERAGOS: Angular.

HARRIS: Do you start to look at this concrete to see what the properties are?

O’NEILL: After I pull those out, I will then take portions of those and lightly either crush them in a mortar and pestle, or else scrape off some of the materials with a fine dental tool. And then take those materials and mount those on a glass slide. And with this little bit of powder that's on there, I then immerse it in what's known as a refractive index oil. It's an oil for mounting. So that I can go to the next phase. After it's mounted in this oil, I put a cover slip on the microscope slide, and then examine this sample under a high powered microscope, which is known as a petrographic microscope.

HARRIS: What is that, what does that do?

O’NEILL: That will tell us the composition of the materials and the mineralogy. Petrographers, both in geology and concrete, use this to identify substances under the microscope. Just a brief rundown of what it is, is once you put the slide under the microscope, there's a light that's transmitted through the slide, comes up to a, an objective, then comes out an eye piece. And we are looking at magnifications somewhere in the neighborhood of 20X to 600X. So we're looking at things under very high magnification.

HARRIS: And when you look at this particular slide from this sample under the high magnification, can you start seeing the chemical's almost basic properties of this particular sample?

O’NEILL: Right. I'm seeing the composition of the materials that are in that, that sample.

HARRIS: What do you find are the properties of that particular sample?

O’NEILL: Well, going back to the sodium chloride, I was able to identify the sodium chloride based on its, its optical properties under the microscope. Sodium chloride, like all minerals, has its own specific optical properties. e That's how we identify them. So I was able to clearly see there was this salt that was in the sample. With the concrete, I was able to go back and then look at the composition of the, of the cement paste, is what I was concerned with. And I found in the cement paste that there was Portland cement and that there was fly ash. And the, the Portland cement in this particular sample was well hydrated, meaning that there were very few unhydrated particles left of the Portland cement.

HARRIS: So, again, just from the layperson's point of view, what you're talking about is that particular concrete, when it was in that mixed state, kind of the gray powder you were describing, it was mixed up well with water and became hydrated?

O’NEILL: Well, the, what happens with time that the water, either from the original water or else water from a later point in time, if it's immersed in water, will then react with the Portland

cement. So what it showed me was that most of the cement had reacted with water at the time of my examination.

HARRIS: So you find Portland cement, fly ash, and is that pretty much it in terms of what you see in terms of the concrete there?

O'NEILL: And sand particles.

HARRIS: And sand particles?

O'NEILL: Right.

HARRIS: From that does that give you some idea of what type of mix or product this is?

O'NEILL: During this point all it tells me is just the identification of what, what's in there. I can't make any conclusions or jump to anything based on that, but this is just the data that I would develop during my examination. What's in here, how advanced is the hydration, what else do I find in here, is there anything else in here, like the salt.

HARRIS: Did you also examine, going to the next item, MPD's number 143, which is the anchor?

O'NEILL: Right.

HARRIS: And I don't know if you want to grab that bag back again and go, take us through the process of what, your examination with the anchor, what you discussed.

O'NEILL: There was a couple of things that I, I did with the anchor. One of the first things I did was just to look at it, again, under the microscope. But I also, obviously, looked at it with the unaided eye, just to get a general description of that anchor. In the first report that I prepared, I took the anchor and I took the plastic pitcher, which is item 128, and looked at the contents in the pitcher, and then looked at the anchor. And then removed the contents from the pitcher, the material that was on the bottom of that pitcher, removed that carefully, and then placed the anchor inside that pitcher. That was the very first thing I did.

HARRIS: What did you find?

O'NEILL: Although it looked very similar in size and shape with respect to the size and shape of the anchor to the interior of that pitcher, the size and shape inside that pitcher, when I put that in there, I saw that there, it e probably was not, that the pitcher was not the mold for the anchor. I had to do further work to confirm that, but after I put that in there and looked at it, I didn't believe that that anchor was the mold, I'm sorry, the pitcher was not the mold for the anchor.

HARRIS: Okay. Let me go back through this because there's a number, number of different things you were talking about. You, you were saying it wasn't, you had to do some additional work. So you take the pitcher and you put the anchor inside of it, and you're talking about it was not the mold. So let's talk about that particular thing. The anchor that we're looking at, why don't you just go ahead and grab that, if you would. So you take this particular item right there?

O'NEILL: Right.

HARRIS: And from looking at this, is this something that, when you're talking about a mold, why do you say there has to be a mold when you look at this particular item?

O'NEILL: Well, the sides are, are what we call formed. They've been formed against something. Plastic or metal, some type of material. This is not something where it's a finish-type surface, if somebody had troweled it or had done it by hand. This is something smooth up here that would indicate that it's been formed against some type of material.

HARRIS: So from your visual inspection, with your background you can look at that and say this is something that has to be poured into or somehow formed in some type of mold?

O'NEILL: Right. I prefer the word cast. We cast the concrete into some kind of mold.

HARRIS: Okay. So in kind of your industry, there's a casting process that has to occur?

O'NEILL: Yes. Or fabrication.

HARRIS: So you, when you look at this, and the police department provided you with the anchor and provided you with this pitcher, did it initially appear that that pitcher could have been the mold for that particular anchor?

O'NEILL: Initially when I looked at it, the size and shape of the anchor looked similar to the dimensions inside the pitcher.

HARRIS: When you put the anchor inside, did you actually kind of take measurements or examine it once it was inside?

O'NEILL: I did.

HARRIS: Was there any measurable gap?

O'NEILL: Yes.

HARRIS: About how much?

O'NEILL: About four and a half to five millimeters. When I put one side of the anchor up against the pitcher, then there was that gap on the opposite side. So I, I did observe that and did record that.

HARRIS: And you said that was four and a half to five millimeters?

O'NEILL: Yes.

HARRIS: About how long is that?

O'NEILL: 25 inch, 25 millimeters equal one inch. So twelve and a half millimeters would be a half inch. Four to five would be somewhere a little less than a quarter of an inch.

HARRIS: So when you put this in there and you push it to one side, you discover there's about a quarter of an inch gap?

O'NEILL: Right.

HARRIS: Now, you said that the sides of this particular anchor are smooth and they're not finished, like it had been troweled?

O'NEILL: Right.

HARRIS: Did it also have the same kind of shape of the pitcher?

O'NEILL: It, it did. As I said, the, the dimensions of the inside of the pitcher, the interior dimensions looked similar to the dimensions and shape of the, of the anchor.

HARRIS: Did you, let me just back up for a second. When you started to do the examination of this anchor, do you, do you weigh it at any point in time?

O'NEILL: Yes. As part of the examination, before we do any of the analysis part, we weigh all the samples. And we, and in this case we obviously don't need a weigh boat for this, but we weigh this on an analytical balance.

HARRIS: And what is the weight that you get for this anchor?

O'NEILL: In pounds it's about 8.6 pounds.

HARRIS: Now, you say in pounds. Did you initially measure this some, in metric?

O'NEILL: I weighed it in grams. And almost all of our weights are recorded in grams. And I think the weight of this was, if I could refer to my notes. The weight of this item was 3898.3 grams.

HARRIS: And roughly,

GERAGOS: What are you looking at, if I could ask.

JUDGE: He said he was referring to his notes. Do you need the page?

GERAGOS: I know. There's a report in the notes. Are you looking at the report itself?

O'NEILL: I am.

GERAGOS: Thank you.

O'NEILL: And that's January 5th, 2004 report, page two.

GERAGOS: Thank you.

O'NEILL: You're welcome.

HARRIS: So the rough approximation in pounds was about eight point something pounds?

JUDGE: 8.6 pounds.

HARRIS: 8.6 pounds.

O'NEILL: Yes. 450 grams equals one pound.

HARRIS: Now, you've told us that, so you make this initial examination of putting the two together, similar appearances, similar size, the sides are smooth, but there's the gap there. Let me, let's talk about that. You're the expert in concrete. Does something happen when you make concrete? Does it expand? Does it shrink?

O'NEILL: It will shrink. As it begins to hydrate the cement, and the water is evaporated over a period of time, the concrete will undergo some shrinkage.

HARRIS: And about how much shrinkage, I don't know if you can do it in percentage or size or what, what do you expect when you mix or cast concrete?

O'NEILL: It, it will shrink, but it's, it's, on a small sample like that it will be rather minor. Certainly not anything near four and a half to five millimeters.

HARRIS: So in your expert opinion, the shrinkage that you would expect is not what caused that gap?

O'NEILL: Right.

HARRIS: So you start to do further comparison in the pitcher and the concrete anchor. What do you discover next?

O'NEILL: After I pulled the anchor out of the pitcher, there was debris material, concrete pieces that were on the bottom of the pitcher. And I said, as I removed those, I went and painstakingly tried to put those pieces together in some kind of puzzle fashion. And I was able to make a semicircle of, of those pieces and place those back together. And I was a able to look at the shape of those pieces and the curvature of those pieces, then look at the bottom of the pitcher and then say Ah-hah; these pieces came, and were from the bottom of this pitcher and matched the curvature of the bottom of the pitcher. When I looked at the anchor, the curvature of the side of the specimen, the concrete specimen, this part right here, this curvature, did not match the bottom of the pitcher. And I could clearly see that, once I examined it in detail. It was, it was easy to see that this was not a match.

HARRIS: Okay. You were talking about going through this process of matching this up. So when you received the pitcher, was there concrete debris in it?

O'NEILL: Yes.

HARRIS: And just so that we're clear, it's not debris that came from this particular anchor when you put it into the pitcher?

O’NEILL: Correct. It was already there as delivered.

HARRIS: And you go through the process of putting that together to try and figure out what pattern is left from those pieces at the bottom of the pitcher?

O’NEILL: Right. There was fragments and pieces that I could put together, but there was quite a bit of material that was so small and dust material that I, I couldn't do anything with it. But I could get these main pieces together and clearly see that that was the material that was on the bottom of the pitcher.

HARRIS: Okay. Now, when you look at this particular anchor and you look at it, how it's there, I mean visually we can see that it almost looks like there's two shades of color there. Does that have any meaning when you examine it?

O’NEILL: During my examination, in looking at this I could see that there was a difference in hardness and the consolidation between the top part of this and the lower part of this. Consolidation meaning gaps or voids that would be present in this side. And the texture was different. This was a very smooth texture along the top and the bottom was grainy.

HARRIS: Does that mean anything to you when, in the field of concrete?

O’NEILL: Having dealt with concrete for about 30 years and mixed up numerous types of samples, when I saw that, it was a clear indication to me that the anchor was mixed in some container. I didn't know what kind of container, but it was mixed in a container. Meaning that the powder from the sack material was added to a container and then water was added. And it may have been a little bit of water, a little bit of, of this concrete mixture, and then mixed inside that container, as opposed to the concrete being mixed out, say, in a wheelbarrow or another type of container, mixed thoroughly and then added to a container. So what I saw was indicative of material being mixed in, within the container.

HARRIS: Now, when you, if you put the powder in a container and you add water and you start stirring it up as you were describing up there, why does that make a difference? And why is that different than mixing it up in a wheelbarrow?

O’NEILL: It's very difficult to get a homogenous type mixture. You'll get, to get the material on the bottom to mix thoroughly, you have to do it quite a while to make sure that you get it. And you still may not get it because the material is very grainy, it's very chunky, it's, it's, it's very e difficult. It's not like a cake batter that you can mix inside a bowl. So when I see this kind of feature, to me it's indicative of mixing inside the container where you just do not get a thorough mixing of the concrete.

HARRIS: Does it, the court want to continue, or is it about –

<morning recess>

HARRIS: Mr. O’Neill, before the break, we were talking about the anchor there. I want to go back through that a little bit, if you still have that item there with you.

O’NEILL: I do.

HARRIS: Now, you have, you were telling us about the different bands there, different colors. You were saying there was a difference in hardness. What did you mean by that?

O’NEILL: When I look at the concrete anchor, part of my practice is to determine the hardness of the cement paste. And that's done by scratching the concrete with a dental tool. Specifically we use an MT29 dental tool, just like a normal dentist would carry. But, for us, we can determine how difficult it is to scratch the cement paste, or how easy it is to scratch the cement paste, and then we can make determinations about how hard or how soft that is.

HARRIS: And were you saying that you found different levels of hardness there?

O’NEILL: Yes. The upper portion was significantly harder than the bottom portion.

HARRIS: And is there a usually a cause for that when it relates to concrete?

O’NEILL: There can be several things that can cause that. One is the amount of cement in an area. If it has a low amount of cement, Portland Cement, it will generally be weaker than an area that has a higher cement content. In addition to that, it can also be related to the degree of hydration. If the degree of hydration is more advanced, generally it's harder than the hydration that is low or less advanced.

HARRIS: Looking at the top of the anchor there, it's previously been described as a piece of rebar. Is that a basically a piece of metal that's at the top of that?

O’NEILL: It's a bent Number 3 reinforcing steel bar.

HARRIS: And, in short, it's gently called just rebar?

O’NEILL: Right. The "3" refers to the size of the bar. It's all based on an 8th. So a Number 3 bar is three-eighths inch in diameter.

HARRIS: Now, you told us that you were going through this process of comparing the anchor to the pitcher and looking at the physical characteristics of the anchor. You discovered that when you pieced together the pieces from the pitcher that there was that, more of a straight edge than the rounder edge; is that correct?

O’NEILL: Actually I think the opposite. In the pieces, they had more of a curvature as compared to the anchor.

HARRIS: So the anchor had straight edges?

O’NEILL: Had more of a straight edge than compared to the pieces.

HARRIS: Did you continue your visual inspection of the anchor and discover any other characteristics as you compared it to the pitcher?

O’NEILL: Yes. There was one major characteristic that was present on the bottom face of the concrete anchor.

HARRIS: What was that?

O’NEILL: There was an indentation that was approximately 25 millimeters across, one inch. That, to me, I called it a dimple. So there was an impression on the bottom in the middle, and it was about two millimeters deep into the concrete.

HARRIS: And did you find that corresponding, either a bump, or whatever it would be, in the pitcher?

O’NEILL: No, I did not.

HARRIS: So, again, that would be another reason to exclude the pitcher?

O’NEILL: Yes.

HARRIS: Now, as you made this determination, did you contact Detective Grogan and advise him that, in your examination, that pitcher had been excluded?

O’NEILL: Yes.

HARRIS: And did you have some discussion as to what it was that you found in terms of the corners and that particular dimple?

O’NEILL: We spoke on the phone, and I told him of my findings. And I said that there is no way that that pitcher is the mold for the concrete anchor. And then he asked me, well, what other things might the mold be? So we talked about that briefly.

HARRIS: After the discussion, did he eventually send something to you for you to make a comparison of?

O'NEILL: Actually he called me from Home Depot. And he was in Home Depot on his cell phone, and had pulled out of the shelves a white plastic painter's bucket. And then he had a tape measure with him. And he was, I believe it was a tape measure. He was describing to me the dimensions and the shape of that bucket. And also had noticed that there was a dimple, or a raised surface on the bottom of the bucket. And we talked about that. And I said why don't you send me one? Buy one, and send me one, and see if it's a match.

HARRIS: If I could have marked next in order.

JUDGE: 256.

HARRIS: Box and contents. If you can make room for this one up here. If you can go ahead and take a look at 256, and tell me if you recognize that particular item.

O'NEILL: I do.

HARRIS: And what is that particular item?

O'NEILL: It is a two and a half quart bucket made by the RG Corporation.

HARRIS: You can go ahead and take it out of the box. And is this the plastic bucket that Detective Grogan sent to you?

O'NEILL: It is.

HARRIS: If you could describe for the record what that is.

O'NEILL: It's a white two and a half quart bucket, painter's bucket. The dimensions of this are very similar to the concrete anchor. Obvious visual appearance. Also on the bottom of this bucket, again, is the indentation that's roughly 25 millimeters in diameter, and about two millimeters in depth.

HARRIS: And, again, just to complete this, does this have a wire holder or handle of some kind?

O'NEILL: It does. It's got a wire handle to it.

HARRIS: So when you received this particular item, did you, you said that you were making a visual inspection. Did you compare the anchor, again, to this particular item?

O'NEILL: I did. I looked at the interior of this painter's bucket to look at the curvature along the bottom. I looked at the positioning and the dimensions of that dimple. And after looking at that and comparing it, I then placed the anchor in the bucket.

HARRIS: What did you find?

O'NEILL: I found that it was a perfect match.

HARRIS: Do you have the anchor up there in front of you?

O'NEILL: I do.

HARRIS: You can go ahead and demonstrate that. Now, looking at this, how far, once you place the anchor into this particular bucket, how far up does the concrete go on the sides of the bucket?

O'NEILL: It goes up approximately an inch and a half. An inch and a half from the top to the top surface of the anchor.

HARRIS: And if you were to be mixing something into this, you have to put this, let me back up for a second. When you mix concrete, or you are making concrete, and you told us about the expansion. So if you are making something, say, the size of that anchor, do you need, pretty much, material that equals that size in the finished state. That's fairly, apparently a bad

question. Let me try it again. What you put in in terms of the cement, the Portland Cement, or Ready Mix and water, when you have those materials there in this mixed state, is it about the same size as the finished product?

O'NEILL: Yes.

HARRIS: So when this item was being mixed, or cast, or whatever, into a bucket like this, it would have had to have been to level pretty much where it's at right now in the mixing state as it was mixed in that bucket?

O'NEILL: I believe so, yes.

HARRIS: Go ahead and take that out.

O'NEILL: There we go. A good fit.

HARRIS: Did you also go through the microscopic kind of properties as you were looking at the debris from the pitcher and the concrete anchor at some point in time?

O'NEILL: I did.

HARRIS: Can you, let's start with the debris from the pitcher that was originally marked, lost my number here. That was MPD number 128. As you went through your inspection, you were telling us that you found debris in there. You looked through it, you are trying to reassemble it. Did you then measure that and weigh that, the process that you told us about before?

O'NEILL: I did.

HARRIS: If you could explain to us what your findings were there.

GERAGOS: For the record, you are referring to which date?

O'NEILL: That's the January 5th, 2004, report.

GERAGOS: What page?

O'NEILL: Page 2.

GERAGOS: Thank you.

O'NEILL: The debris that was on the bottom that I removed had a weight or a mass of 66 grams.

HARRIS: And did you, again, go to that microscopic kind of examination?

O'NEILL: Right. I looked at the pieces with a stereo microscope to get a general idea of the hardness and physical properties of those pieces, color, texture, those kinds of things. And then went on to do the examination at the higher powered microscope. I made what we call powder mounts, or I take the mount and then immerse them in oil and cover them with a glass slide or cover slip, and then examine them under the high-powered microscope to determine the composition of that material.

HARRIS: What did you find the composition of the debris from that pitcher that was supplied to you by the Modesto PD?

O'NEILL: The pieces were composed, again, of Portland Cement, fly ash, and aggregate materials.

HARRIS: Is there, do you look at that particular item to see what the hydration level is?

O'NEILL: I did. Let's see.

GERAGOS: Are you looking in the same page?

O'NEILL: Yes. I think in another report I may have looked at the hydration level.

HARRIS: That's okay.

O’NEILL: Okay.

HARRIS: So you found the characteristics of the components of this particular item had similar characteristics to the previous item that we have been talking about, which was the vacuumings from the boat, which was item number 214-12?

O’NEILL: Yes.

HARRIS: You had described for us earlier, I just want to go back through this. I'm a little bit unclear in my mind. You said that there was debris. You tried to put it together. How much debris, you have given us a weight. How much debris did you find in terms of putting something together?

O’NEILL: I believe there were probably an eight or nine pieces that I was able to assemble into a semicircle. And there is a picture of that in the report. So I had to go through these pieces, separate out the larger pieces from those smaller pieces, and then assemble the big pieces, then see if I could somehow piece together some of the smaller pieces that were missing. And I was only able to make a, roughly a little bit more of a semicircle, not a full circle, that would match the bottom of the pitcher.

HARRIS: Now, the pieces that you assembled, the semicircle, was it, I don't want you to pull back up the anchor again. But on the anchor, there is an area in the bottom that is missing. What you assembled from the debris of the pitcher, was that more than what was missing from the bottom of the anchor?

O’NEILL: Yes.

HARRIS: So that was another visual way that you could exclude the anchor from the pitcher?

O’NEILL: Right. And, in addition to that, the curvature of those pieces that, assembled pieces did not match the bottom of the anchor. So I knew that they, the pieces of the dust in the pitcher was not in the anchor.

HARRIS: Now, if you could grab the pitcher since we're talking about that. That's up there as well. Again, did you go through a process when you were, began examining this size, the comparison, also looking at this item in terms of what physical properties you observed about it?

O’NEILL: That is the pitcher?

HARRIS: Yes.

O’NEILL: Well, I actually took some of those assembled pieces and very carefully placed them in the bottom of the pitcher just to see how well they abutted up against the bottom and side of the pitcher. Again, it was a match.

HARRIS: I guess what I'm getting at is, looking at that, it's not exactly clear, is that the material itself, or does it appear that this pitcher has been used?

O’NEILL: Well, yes. There's quite a bit of debris on the inside. Seems to be a very fine powder that's adhered to the sides. There are also several rings within the pitcher as well.

HARRIS: And did you note those, or document those by your photographs as well?

O’NEILL: Yes, we did take a picture of the pitcher, both on the outside and inside.

HARRIS: You can go up here and put that back in the box.

JUDGE: Do you have an opinion as to whether or not all that smoky material is components of concrete?

O’NEILL: I believe that it's residue from concrete, which is probably, when I looked at it, it was calcium carbonate, which is a common efflorescence or residue that would come out of the concrete. And then when the water evaporates, would be adhered to the side. So, yes.

JUDGE: Go ahead.

HARRIS: Trying to decipher that last answer a little bit there. So what does that mean?

O'NEILL: Well, there are, in concrete there are water soluble constituents, and mainly there is a component in there that is basically made out of calcium. And if concrete is subjected to water, some of that may come out. Some of that calcium may come out. So typically if you would have concrete in a pitcher that's got water in it, calcium is going to become leached out and could float to the surface, and then could get deposited as calcium carbonate along the sides of the pitcher. And then it's a very common thing for calcium to be leached out of concrete, particularly with a lot of water present.

HARRIS: When you say a lot of water present, let's just back up for a second. When you are talking about making concrete, is there a ratio of the mix to water?

O'NEILL: Usually you, as far as the amount of water to cement, a typical ratio would be fifty percent water to a hundred percent cement. Meaning that if you have ten pounds of cement, then five pounds would be good for making concrete.

HARRIS: And five pounds of water?

O'NEILL: Five pounds of water. We're not including the aggregate. Just speaking of the Portland Cement and the water, the aggregates would be probably about 75%, then 25% of that would be the cement and, then another 12%, if you somehow worked that out.

HARRIS: Is that why, when you try and mix this stuff up on home projects, it's not always so simple?

O'NEILL: Right, because it's stiff. It's, the mix gets quite stiff and harsh. And it's difficult to mix. If you use too much water, then the concrete would be very weak and tend to crack. So you have to use just enough water to make sure that you mix it right. But you don't want to use too much water.

HARRIS: I'm going to move on to another item. There were, there was an item that I'm not going to present to you, but it was MPD number 126. That was previously been marked. And it was listed as a sample of the gray powder from the Shop Vac. Did you examine that particular item?

O'NEILL: I did.

HARRIS: And did you find that to have any connection to concrete?

O'NEILL: No.

HARRIS: You were provided another item, just let me go through this.

I believe it's up there in front of you. It was MPD number 132. That was the, 132 there was a sample from collected from the warehouse floor.

O'NEILL: Yes.

HARRIS: Did you examine that particular item?

O'NEILL: I did.

HARRIS: Go through the same general process that you are describing for us?

O'NEILL: Exactly.

HARRIS: Document the packaging, remove it from the packaging, and go through this microscopic process?

O'NEILL: And weigh it.

HARRIS: What in terms of the weight and microscopic examination, what did you find?

O’NEILL: This particular sample weighed 7.6 grams. And the sample consisted, again, of Portland Cement and the fly ash and sand. The Portland Cement in this particular sample was not hydrated at all. Basically it looked like material that came fresh out of a bag and had not been mixed with water.

HARRIS: When you look at this under the microscope, is there a difference that you see?

O’NEILL: Absolutely. Because the unhydrated grains are clearly visible under the microscope. And if there are hydration products, where the cement is hydrated, you can see that clearly. And in this sample all I saw were those three items: The Portland Cement and the fly ash and the sand. But I didn't see anything like a hydration product. So meaning there was no water that was added to this to this sample.

HARRIS: Now, we talked about, a little bit about the red drum and the blue drum. There were some items inside of it, like the mid calf and the socks.

Did you receive some clothing items as part of this process from the Modesto Police Department?

O’NEILL: I did.

HARRIS: And you didn't test any of the clothing items?

O’NEILL: No, sir.

HARRIS: We'll just skip right over those. Were you, there is also another item up there. It's MPD number 130, back on the package debris from the trailer. Did you examine that particular item?

O’NEILL: I don't think you gave me 130.

HARRIS: Did you receive an item 130 from the Modesto Police Department?

O’NEILL: I did.

HARRIS: And it was a package that was marked debris from a trailer?

O’NEILL: Yes.

HARRIS: Collected by Dodge Hendee?

O’NEILL: Yes.

HARRIS: And did you go through the same process of examining that?

O’NEILL: Yes.

HARRIS: Tell us what you found.

O’NEILL: I found it very similar to the sample from 132, with the exception that there were some metal, two metal screws, like sheet metal type screws in with this sample. And that there was also some pea gravel aggregate materials in here. And that the cement was hydrated. But I classified it as being poorly hydrated, meaning that it was hydrated a little bit. There was some water that was added to it, but it did not go through a full hydration process.

HARRIS: Can you explain what you mean by that? How do you add water and it not be hydrated?

O’NEILL: Because the water can evaporate and escape before the Portland Cement has fully hydrated. And that's what's known as curing in the trade. That concrete has to be cured. You must keep the water in there so that the water can then react with the Portland Cement. Many times curing for projects takes a week or longer. It's kind of a continuing process. If water is added to a mix, and shortly thereafter the water is evaporated out of the mix, then hydration will cease.

HARRIS: That will leave the characteristics that you saw in that particular item?

O’NEILL: Yes.

HARRIS: You were talking about the anchor. Then in the profession it had to be cast. So being poured into something, or being mixed into something. If you were to take and mix it and just leave it laying out and not have it in a form or a cast, is that something that would allow it to be in a less hydrated state?

O’NEILL: Actually the sides and the bottom of, say, the plastic bucket, or another type of container, like a cylinder will, the water will stay in better than if it was just pulled out and exposed. You would evaporate from all sides the bucket, tend to keep some of the water in and hydrate the cement.

HARRIS: If you were to, if something were to be spilled out or get knocked out of something, would that be one of those things that would occur without that lack of hydration process?

O’NEILL: If things were spilled out of the bucket, or out of the another container, or a spoon, or a shovel, that if it gets spilled out and then doesn't get protected, that evaporation can take place, and then the hydration is inhibited.

HARRIS: And you were saying that the characteristics of 130 and 132 were similar. 130 had the pea gravel, and the wood screws?

O’NEILL: Yes. The cementitious components of Portland Cement and fly ash were present in both samples.

HARRIS: You also received an item 1-GG that was labeled as debris from the truck bed?

O’NEILL: Yes, sir.

HARRIS: Did you examine that one as well?

O’NEILL: I did.

HARRIS: What did you find?

O’NEILL: That one contained nine pea gravel particles. And there was actually a few, well, five small pieces of what appeared to be a tan plaster type material, like a stucco or a finish coat. Kind of material with that. The pea gravel materials were coated with cement and sand and also fly ash.

HARRIS: And this particular item, was this consistent or inconsistent with the other items that we have been talking about?

O’NEILL: They are consistent in the fact that the cementitious component was identical in composition.

HARRIS: Now, moving on to the next item. One of the other items that you have up there was marked as 43A. And that's debris from the boat cover? Did you examine that particular item?

O’NEILL: Yes, I did.

HARRIS: And what did you find?

O’NEILL: This particular sample contained a potpourri of materials. There was many types. Organic debris, and fibers, and wood fragments, and concrete fragments, and a few pea gravel type materials. So this is one was different, because it contained all these other types of materials, as compared to 132 and 130.

HARRIS: Now, in terms of that, you take out the kind of organic materials that you are describing there, you are just talking about the concrete type materials. What did you find in terms of its composition?

O’NEILL: Again what I found, the cementitious components were composed of Portland Cement and fly ash. And I did find some very fine sand particles.

HARRIS: So would this particular item be consistent or inconsistent with these other items we have been talking about?

O'NEILL: They are consistent.

HARRIS: Now, you also had another item that was marked 218-41, dash 41, which is something that was collected from, we have heard testimony about this either living room or dining room, depending on what label is used off of the envelope. Did you examine this particular item?

O'NEILL: I did.

HARRIS: And what did you find?

O'NEILL: Just as you indicated, the outer envelope indicated the concrete is from the living room. There was an inner envelope that said concrete, dining room floor by hutch. This sample just consisted of one pea gravel particle. The pea gravel particle was coated with a thin layer of sand particles and Portland Cement and fly ash.

HARRIS: When you talk about, you are saying coated with. What do you mean by that?

O'NEILL: There wasn't any kind of big chunk or fragment attached to the particle. There is just a very thin layer just coating the outside portion of that pea gravel aggregate.

HARRIS: And when you are talking about coating, is this a dust? Or is this a hardened material? Or what is it?

O'NEILL: It's a hardened material, but it's rather weak. As I recall, it was, it wasn't difficult to remove some of that material to place on the glass slide. But it's in the hardened state.

HARRIS: Which would indicate that it's part of a mixed product?

O'NEILL: Yes.

HARRIS: And this particular item, was it consistent or inconsistent with the other items that we're talking about?

O'NEILL: It is consistent with the other items.

HARRIS: You also received the blue and red drum that we have been talking about the contents. You already told us that clothing items weren't examined. Did you look at those particular items to see if there was any concrete residue or debris?

O'NEILL: I did.

HARRIS: And anything of significance?

O'NEILL: On the blue and the red drum, I got a large what we call a drop cloth, which is used for mixing combining combined powder materials, and some paper. And I turned over each drum obviously separately, and then emptied the contents in there, and then collected those contents and then weighed that, and then examined it as before. But that was the only way I could really get the debris that was in the bottom of these drums out.

HARRIS: Did you go through the same type of microscopic examination?

O'NEILL: I did.

HARRIS: What did you find?

O'NEILL: The material that was inside the blue and the red drum was different from the other materials, as it did not contain fly ash. It was a different mix.

HARRIS: So something that was obviously inconsistent with the other items?

O'NEILL: It was.

HARRIS: The last item, MPD item number 60 that's up there in front of you, that was the debris from the yard?

O'NEILL: Yes.

HARRIS: Did you examine that particular item?

O'NEILL: I did.

HARRIS: And what, if anything, can you describe for us the process and what, if anything, you found?

O'NEILL: This was a rather large sample on a relative basis. It was 240.3 grams, which is about a half a pound, a little bit more. So we're working, I was working with a much larger sample in comparison to many of the other items that were delivered to me. This particular sample also contained Portland Cement and fly ash and pea gravel. But the big difference in this sample is, it contained large rock particles, or large, coarse aggregate particles that were what I would term to be, the particle would be three quarters of an inch.

HARRIS: So what does that mean?

O'NEILL: Well, that means that this is a different mix than what we found in the other mixes, and would not be consistent with what you would find in pre-mixed bags that are available commercially at Home Depot or Lowes.

HARRIS: Did you also go back through as part of the report process and examine, or just make comparisons of whether these items that are consistent, so we're not talking about the item from the yard, not talking about the red or blue drums, but the item from the trailer, the item in the truck, the item from the shop floor, from the dining room, living room, from the boat cover, if all of those items were consistent or inconsistent with the anchor?

O'NEILL: The samples from the blue and red drum were not consistent with the anchor. They did not contain fly ash. The item, the 60, or sample 60, which was the debris from the Peterson yard, was not consistent with the anchor, because it had large rock particles that was not found in the anchor or the materials that were collected from the warehouse, being sample 130 and 132.

HARRIS: That particular anchor, assuming that it's cast in some mold that's consistent with that bucket that you have up there, how long does it take for something like that to cure?

O'NEILL: Generally it will be, it will begin to harden and stiffen after a couple of hours, and start to gain some strength perhaps six to eight hours. I'm giving you very general approximate ranges, because all of that will depend on temperature. It will depend on the amount of water that was used in the mix. But, in general, six to eight hours will start to gain strength. After 24 hours it will be hard and dense.

HARRIS: And that particular item, the anchor, has this piece of rebar at the top, how long would it be before you could pick it up by the rebar and pull it out of something like that bucket?

O'NEILL: If it was, say, cast in the afternoon, you could come back probably the next morning and then pull that out.

HARRIS: The curing process with concrete, is that affected by the weather, or temperature, humidity?

O'NEILL: The colder the temperature, that will slow down the hydration of the cement and the strength gain. Because strength all depends on hydration. So the more advanced, the more hydration, the stronger that the concrete will get; and the less, the weaker it is. And that's dependent on temperature and also the amount of the water that was in the sample to begin with.

HARRIS: And what was the level of hydration that you were seeing in that anchor?

O'NEILL: I looked at both the top and the bottom –

GERAGOS: Still looking at the January 5th report?

O'NEILL: Yes. Actually, in the January 30th, 2000, report on,

GERAGOS: 2004?

O'NEILL: Yes, sir. Yes. The powder amounts that I made indicated that the bottom was moderately hydrated. And I believe that the hydration was very similar along the top. So even though there was a difference in hardness with these, there was, the hydration was similar.

HARRIS: When you say similar, that's within a range?

O'NEILL: Right. That I really couldn't positively say there is a big difference in hydration between the top and the bottom. They looked to be similar on visual appearance, under the microscope.

HARRIS: After you had made your examination of these particular items, the comparison of that, of that white plastic bucket, in your opinion, that it matched the anchor, did you report that back to Detective Grogan?

O'NEILL: I did.

HARRIS: And the analysis of what you found in terms of the different percentages, the material, that the composites of these particular items, and what is consistent or inconsistent, was that documented? It's put in your report?

O'NEILL: Yes.

HARRIS: People have no other questions.

Cross Examination by Mark Geragos

GERAGOS: Good morning.

O'NEILL: Good morning.

GERAGOS: If I understand correctly, on the day that you received, what was the date that you received the plastic pitcher and the anchor?

O'NEILL: The plastic pitcher and anchor were submitted together with the other fourteen items. And that was on December the 11th, 2003. And submitted by Detective Grogan.

GERAGOS: December the 11th of 2003?

O'NEILL: Yes, sir.

GERAGOS: And then the, viewed it on December 11th of 2003, that same day?

O'NEILL: No.

GERAGOS: What day did you first view it on?

O'NEILL: The samples were photographed with the evidence containers, and then processed to make sure that we had the right pictures before we went digging into the evidence containers. I don't remember the exact date that I looked at the samples.

GERAGOS: Do you remember having a conversation on January 30th of, just going to put this here if I can, on January 30th of 2003, with Detective Grogan? Let me show you something. You can read it silently to yourself.

O'NEILL: Yes.

GERAGOS: Okay. Does that refresh your recollection as to the date, or roughly the date that you talked to Detective Grogan?

O'NEILL: If that's what he's represented. I don't remember the conversation.

GERAGOS: Is it fair to say that it was some time in December, about a year, obviously, about a year after Laci disappeared? Does that make rough sense to you?

O'NEILL: It does.

GERAGOS: And you told him at that point, look, you sent me basically this substance. You sent me this anchor. You sent me the pitcher. I placed this inside. I looked at it. I realized that it's not going to shrink that much. I took a look at the bottom. The bottom has got a dimple on it, right there. Correct?

O'NEILL: On the outside, yes.

GERAGOS: On the outside the, not on the inside, correct?

O'NEILL: Right.

GERAGOS: You looked at the bottom of this. You saw on the bottom that there is a dimple that's about the size of a quarter. You see that? That's basically what you observed; is that correct? And then you tell them, this is not, this pitcher is not what made the anchor, correct?

O'NEILL: Correct.

GERAGOS: Okay. Then does he tell you, does he get back to you and say, well, wait a second, I'm going to go back. I'm going to look at my interview with Scott Peterson a year ago on December 30th of 2002. And Scott told me four days after, or five days after Laci went missing, Scott told me that I made it in the painter's bucket that I bought at Home Depot? And so for a year, while they are laboring under the misapprehension that it's the plastic thing, they had a taped interview where Scott Peterson had told them exactly what it was?

HARRIS: Objection.

GERAGOS: I'm asking, is that the conversation that you had with Detective Grogan?

JUDGE: Waiting for the question?

GERAGOS: I'm asking him.

JUDGE: He's asking the question.

GERAGOS: Is that basically what transpired?

O'NEILL: I think Detective Grogan indicated that he thought maybe there was a plastic bucket that had been used. But I don't think he stated that he went back and reviewed the statements and then called back to me. I don't remember that at all. But it was like something maybe jarred his memory.

GERAGOS: Okay. Then, because I'm looking at his report. I'm trying to jar your memory. Because it sounds like you didn't make notes of this conversation.

O'NEILL: I did not.

GERAGOS: Okay. Now, at least in his report he indicates that, while talking to you, he remembers that Scott Peterson, in the interview a year prior, I told him.

HARRIS: I object to this. If he's attempting to refresh the recollection of the witness, this is improper. If he's attempting to impeach him, it's improper.

JUDGE: Sustained on both grounds.

GERAGOS: Does he tell you, I'm going to go to Home Depot and see if I can find the bucket? Basically does he call you from Home Depot?

O'NEILL: I'm sorry, I really don't remember.

GERAGOS: I thought, maybe I'm mistaken. You told Mr. Harris that he actually called you from Home Depot?

O'NEILL: He did do that.

GERAGOS: Okay. So you at least remember the fact that, at some point you have this recollection that Scott Peterson had told him something; is that correct?

HARRIS: Objection. Calls for speculation.

JUDGE: Sustained. Calls for his testimony of the officer's state of mind.

GERAGOS: Then he finds this plastic bucket at Home Depot, he sends you the plastic bucket?

O'NEILL: Uh-huh.

GERAGOS: Then you do an examination on what date?

O'NEILL: I'm sorry?

GERAGOS: You do the examination, placing this inside of that, on what date?

O'NEILL: I can't tell you the exact date again, because we have to go through the logging-in process and the photographing process. I don't know when that was done after we received the sample. But it was shortly thereafter.

GERAGOS: You wrote one report on January 5th, some time between the 31st and the 5th, that's a fair statement, or some time before January 30th of 2004?

O'NEILL: Right. The sample was received January 8th, 2004. And then I wrote this report with regard to the plastic bucket on January 2004.

GERAGOS: January 30th date?

O'NEILL: Right. So within that interim, right.

GERAGOS: Okay. And is it a fair statement also that the amount of, I don't want to diminish your obvious technical expertise. But –

O'NEILL: Thank you.

GERAGOS: Did not require a whole lot of technical expertise to take that, the anchor and put it into this two and half quart painter's bucket and see that it makes a pretty good fit?

O'NEILL: I'll agree with you.

GERAGOS: Okay. And there is also a dimple right on the bottom, isn't there?

O'NEILL: Yes.

GERAGOS: Appeared to be the same size dimple that's on the bottom of the anchor. By the way, how much, they paid you about nine thousand dollars to come to this conclusion so far?

O'NEILL: Nobody paid me to come to any conclusion. They,

GERAGOS: Paid you had for your time?

O'NEILL: Paid me to do the analysis. And our fees are based on the analysis that we did.

GERAGOS: And you will get paid about $12,000 by the time it's all said and done?

O'NEILL: Yes, sir.

GERAGOS: Okay.

<noon recess>

GERAGOS: Thanks, Judge. Good afternoon.

O'NEILL: Good afternoon.

GERAGOS: The, if I understand this correct, you had basically a number of items that you wanted to compare. The one that I just opened up, this is item number 60, which has previously been testified by, on Monday, Officer Skultety said that Detective Brocchini picked this up from the side of the driveway, a clump of about a half a pound. That's roughly what you measured the weight of that?

O'NEILL: Yes, sir.

GERAGOS: Okay. So that's one item. This is item 60. This is the driveway, correct?

O'NEILL: Yes.

GERAGOS: And then the other comparison that you did, let's see, you had a, debris from the trailer. And that is the trailer that was inside of the warehouse; is that correct?

O'NEILL: As I understand it, yes.

GERAGOS: Okay. And you have that, so you can open that and see that?

O'NEILL: We never got 130. It must be back there.

HARRIS: Referring to People's number 124.

GERAGOS: It's what?

HARRIS: People's 124 and MPD number 130.

O'NEILL: I don't see it.

GERAGOS: Then you've got debris from the boat cover. The jury saw that yesterday. That was in a small bindle. Looked like some fine dust, basically?

O'NEILL: Yes.

GERAGOS: Okay. They've already seen that. And the debris vacuumed from the boat. Do you want to open that up and show us how that was?

O'NEILL: I'll need that scissors, Mr. Geragos, or opener that you had.

GERAGOS: Sure.

JUDGE: That's People's 138, Mr. O'Neill.

GERAGOS: And this was identified to you as the debris vacuumed from, I guess there was a filter, that's the filter you were talking about?

O'NEILL: Yes.

GERAGOS: Okay. That wasn't of any great moment for your comparison, correct?

O'NEILL: Well, I, I described what I found on it, but I didn't find any Portland cement products, but I did find sodium chloride on that particular sample.

GERAGOS: And then this debris here, what was that?

O'NEILL: This was the miscellaneous debris that was included with the sample, and I just separated the two out.

GERAGOS: Okay. And then this is the concrete debris,

O'NEILL: Correct.

GERAGOS: taken from the boat, correct?

O’NEILL: Well, on this particular sample what I did is I, I sorted out the concrete, what I thought was concrete debris and pebbles from the other debris, which included, there was a metal nut in here, and there were organic materials. Some hair. So what I did is I physically just went through and just separated it out, but it's all part of the same sample that was supplied to me.

GERAGOS: Originally, if we were to just take the debris that's like this over to the dust that's over here, these are both the same package?

O’NEILL: Yes.

GERAGOS: Okay. Now, then you had the concrete from the living room.

Which, I'm going to put this on here so you can see it. The, this was basically just a pebble?

O’NEILL: It was a piece of pea gravel, and then it was coated with a layer of fine sand and Portland cement, fly ash.

GERAGOS: Is that basically, it's obviously been blown up a number of times, but that's basically what that is, correct?

O’NEILL: Yes, sir.

GERAGOS: Okay. So you took this item, and I'm just going to show it to the jury so they get a sense of what the size is, and compared this item right here? Now, this item, if I understand correct, had contained in it, or on the coating of the pea gravel, "pea gravel" means a piece of rock?

O’NEILL: Right. Approximately a three-eighths inch rock.

GERAGOS: Okay. So you've got a piece of rock. Around the rock there is three substances, correct?

O’NEILL: Yes, sir.

GERAGOS: What are those three substances?

O’NEILL: Sand, Portland cement, fly ash.

GERAGOS: Okay. Sand, Portland cement, and fly ash were all on this rock?

O’NEILL: Yes.

GERAGOS: So the, what you call, you had a word for it. Cement?

O’NEILL: Cementitious paste.

GERAGOS: The cementitious paste that's on a piece of pea gravel?

O’NEILL: Right.

GERAGOS: Okay. So you're looking, when you're analyzing all this stuff, to see what the components of the paste are; is that correct?

O’NEILL: Yes.

GERAGOS: Okay. So here on this one, let me just write this down so that I can keep track of it. On this, which is the concrete from –

JUDGE: What's the exhibit number, Mr. Geragos?

GERAGOS: This is –

HARRIS: Either 156 or 186. I don't quite remember.

GERAGOS: It's on the reverse side.

O’NEILL: 156.

GERAGOS: Yeah. 156.

GERAGOS: So the concrete from the living room, and I call that the pebble, which is 156. 156 has got what in the paste?

O'NEILL: In the paste it has Portland cement and fly ash.

GERAGOS: Okay.

JUDGE: This was recovered by the hutch in the dining room.

GERAGOS: That's correct. On February 18th, during the search warrant.

JUDGE: For the jury's benefit.

GERAGOS: Portland cement and fly ash?

O'NEILL: Yes. Two words.

GERAGOS: Okay. And pea gravel is the component, and Portland cement and fly ash are on it?

O'NEILL: Right. And there's also some sand along with that.

GERAGOS: Okay. So we've got, at least for 156, which is the pebble, I'll label that "pebble", portland cement, fly ash, pea gravel and sand, right?

O'NEILL: Yes.

GERAGOS: Okay. Then for the debris from the boat cover, the jury saw this yesterday, this was in the small bindle, and this is People's Exhibit 241, and there was contained –

JUDGE: Wait, Mr. Geragos, I hate,

GERAGOS: That's okay.

JUDGE: I'm keeping track. I have People's 43 as the debris from the boat cover.

GERAGOS: I believe, Judge, that the 43 is the Modesto PD item number.

JUDGE: Okay.

GERAGOS: Because that's what they've got on here, and it's been marked as People's Exhibit 241.

JUDGE: All right. Let me see what I've got.

HARRIS: And that's correct.

GERAGOS: And I'll show you, if you want. It's right on the –

JUDGE: You're right. You're right.

GERAGOS: Okay.

HARRIS: What was the number again?

JUDGE: It's 241.

JUDGE: 241.

GERAGOS: Okay. Now, I've got on this the debris from the boat cover. You've got Portland cement, right?

O'NEILL: Yes, sir.

GERAGOS: And you've got fly ash?

O'NEILL: Yes, sir.

GERAGOS: And you've got very few pea gravel particles, is that right?

O'NEILL: Right.

GERAGOS: But no sand?

O'NEILL: No, there is fine sand in the sample. The concrete fragments consist of very few pea gravels, fine sand, and then the cementitious paste is composed of Portland cement and fly ash.

GERAGOS: Okay. So I'm looking at your notes here. See if I, maybe I'm misreading your handwriting. Portland cement, fly ash. That's paste?

O'NEILL: Right.

GERAGOS: What's that?

O'NEILL: "Sample is primarily sand. Very few pea gravel particles."

GERAGOS: Okay. So the thing that we saw yesterday, I won't, I won't reopen it today, that item had sand, very few pea gravel, and then there was a paste that contained cement, Portland cement and fly ash; is that right?

O'NEILL: Right.

GERAGOS: Now, the, so we've got the concrete from the living room. Then you did this item, the anchor?

O'NEILL: Yes.

GERAGOS: All right. And the anchor had, it had pea gravel; and that's Exhibit 72. That has pea gravel, right?

O'NEILL: Yes, sir.

GERAGOS: It's got sand, it's got Portland cement, and fly ash; is that right?

O'NEILL: Yes. Correct.

GERAGOS: Okay. And then the, let's see. The blue drum/red drum, that had, well, you weren't comparing that, those amongst themselves, because there was no fly ash; is that correct?

O'NEILL: Right.

GERAGOS: Okay. So put that aside for the time being. You then took the debris from the truck bed. That was what was 1 GG. You have that there?

HARRIS: People's 117, I believe.

JUDGE: What's the number?

GERAGOS: 117.

HARRIS: 117.

GERAGOS: Do you have that up in front of you?

O'NEILL: I don't think so.

GERAGOS: Do you have that, Marylin?

O'NEILL: No, I have 43 A. I don't have that.

CLERK: In the bucket.

GERAGOS: Is it in the bucket? Here we go. Let's open it up and take a look at it.

O'NEILL: Okay.

GERAGOS: That's the debris from the –

O'NEILL: Truck.

GERAGOS: truck bed?

O’NEILL: Yes, sir.

GERAGOS: Okay. Now, this debris from the truck bed, and that's obviously projected a lot more than, it's a lot larger.

O’NEILL: I'm sorry, I didn't hear you, Mr. Geragos.

GERAGOS: I said that's obviously projected a lot larger than it is in real life, correct?

O’NEILL: Yes.

GERAGOS: Okay. And that consists of pea gravel; is that right?

O’NEILL: Right.

GERAGOS: And is this very similar to what we saw as the pebble, what I called the pebble that was from the house?

O’NEILL: Well, the pea gravel particles are very similar to what was found in the house, but, in addition, there's also some additional items that are in here that I described as tan pieces of what I thought were lime plaster and paint.

GERAGOS: Right. That?

O’NEILL: Yes, I believe so.

GERAGOS: And this right there, that item? And then this, looks like that and that, correct?

O’NEILL: I think so. It's hard for me to tell from here.

GERAGOS: I'm sorry. You can see the difference in the color,

O’NEILL: Yes.

GERAGOS: pretty readily?

O’NEILL: Yes, it's obvious.

GERAGOS: Okay. And that was the,

O’NEILL: This one.

GERAGOS: All right. I just want to compare it to. If you can take a look at this. I've taken out here the pebble from the living room. And it appears that, if I were to put this out, it looks pretty much like it matches the ones that you call the pea gravel that are covered with the paste, right?

O’NEILL: Yes.

GERAGOS: Okay. Then the, so the pebble from the living room looks like it matches the pebbles that are in, at least, and also both visually and when you did the tests, correct?

O’NEILL: I would say that's a fair statement.

GERAGOS: Okay. And the coating on these is, when I say "these," I'll keep it there.

O’NEILL: Okay.

GERAGOS: Is the same thing? Portland cement, fly ash?

O’NEILL: Right. And, and there's some sand.

GERAGOS: Okay. Portland cement, fly ash and some sand?

O’NEILL: Yes.

GERAGOS: Okay. And then you, as you notated, there's some small tan pieces, right?

O’NEILL: Correct.

GERAGOS: As if something had, somebody had some stucco in the back of the truck at some point and that mixed up with these items, presumably?

O'NEILL: Apparently so.

GERAGOS: Okay. Then you also said that at some point there were, one of the things that you looked at had screws in it. Which was that?

O'NEILL: That was a sample 130. The debris from the trailer.

GERAGOS: Okay. So the debris from the trailer, obviously when they're selling the ready-mix bag, they're not selling it with screws it. So obviously when this stuff is on the trailer, obviously there's some screws from something else would be your guess, right?

O'NEILL: I would think that would be a safe assumption.

GERAGOS: Okay. Then we've got the debris from the pitcher. Is that the glass pitcher that you examined?

O'NEILL: Plastic pitcher.

GERAGOS: The plastic pitcher. And that's right next to you. And you looked at that, correct? That's this one right here?

O'NEILL: Right.

GERAGOS: Okay. And the items that are in the bottom, in fact, there's still some stuff there, this is 1, looks like 123 –

JUDGE: 123, right.

GERAGOS: A? Okay. Examined that. And what did that have in there?

O'NEILL: That was the sample that contained the pieces and the dust that I assembled together. That was the debris in the pitcher.

GERAGOS: Right. So that had Portland cement?

O'NEILL: Yes.

GERAGOS: It had fly ash?

O'NEILL: Right.

GERAGOS: And it had you called it aggregate materials?

O'NEILL: Right.

GERAGOS: And what is an aggregate material?

O'NEILL: Aggregate consists of both of sand and/or rock or pea gravel.

It's just the generic kind of term for, for rock and sand aggregate.

GERAGOS: Okay. So when you say, when we use the term aggregate, what we're talking about is rocks –

O'NEILL: Well, I think –

GERAGOS: of various sizes?

O'NEILL: I think in this case that it was probably just sand. I just described it as, as aggregate. I don't believe I found anything in there that was, say, a pea gravel type material.

GERAGOS: Okay. And then you also took out what you called sample 60, and you compared that. And that was the one we, that I, we took out of the envelope, correct?

O'NEILL: Right.

GERAGOS: And sample 60 had, let's see. Had Portland cement?

O'NEILL: Yes.

GERAGOS: And it had fly ash?

O'NEILL: Yes.

GERAGOS: And it had sand?

O'NEILL: Yes.

GERAGOS: Okay. So it, the paste itself that was present in 60 had all three of the same components that, for instance, 156, the pebble, had Portland cement, fly ash and sand, right?

O'NEILL: Right. But the –

JUDGE: Where did 60 come from, so the jury knows.

GERAGOS: Right. Let me just go through it for a second so I can get my bearings here. Exhibit 156, which I'm calling the pebble, had Portland cement, fly ash, and sand amongst the, amongst it, correct?

O'NEILL: Yes.

GERAGOS: And then 241 had Portland cement, fly ash and sand, correct?

O'NEILL: Right.

GERAGOS: And 241 was the, one thing I didn't do is write down what that was. That was the debris?

O'NEILL: I don't know. I've got my own sample ID, and then your evidence items are different than what I have.

GERAGOS: Okay. Okay.

A JUROR: The boat cover.

GERAGOS: The boat cover. So the boat cover, 241, has got Portland cement, fly ash and sand. And then 72 has got Portland cement, fly ash and sand as well, right?

O'NEILL: Which one is 72?

GERAGOS: 72 is going to be your anchor that's right there, up next to you.

O'NEILL: Okay.

GERAGOS: Okay. So the pebble, the boat cover, the anchor all have Portland cement, fly ash and sand. And then 117, which is going to be the debris from the truck bed, also has Portland cement, fly ash and sand, correct?

O'NEILL: Yes.

GERAGOS: And then we've got 123, which is?

JUDGE: It's the pitcher.

GERAGOS: The pitcher, has got Portland cement, fly ash, and then you said aggregate materials, which could be sand or rock or materials, correct?

O'NEILL: I believe it was probably just sand. I don't recall seeing any pea gravel in that particular sample.

GERAGOS: Okay. And then the item, even though you call it debris from Peterson yard, what it actually is, or was testified to is this was debris, a half pound of debris that was picked up next to the driveway. Did anybody tell you that?

O’NEILL: Yes. That's my understanding.

GERAGOS: Okay.

O’NEILL: It was directly adjacent to the driveway.

GERAGOS: Right. Did you ever go, and that, that has a component of Portland cement, fly ash and sand, right?

O’NEILL: Plus it's got the large rock in it.

GERAGOS: Right. Now, so the reason that you say that the, the, the cement, not the cement, the debris or sample that you have got up there is inconsistent with the other five items that I've mentioned, the pitcher, the truck bed, the anchor, the boat cover and the pebble, is because that's the only one that has had these larger rocks; is that correct?

O’NEILL: That's the difference.

GERAGOS: Okay. If you subtracted out the larger rocks, you would have, if I understand correctly, you would have the same components, and it would be consistent among all of those, these, correct?

O’NEILL: If I subtracted out the materials larger than the three-eighths inch pea gravel, that would be true.

GERAGOS: Okay. Now, have you been to the location?

O’NEILL: I have not.

GERAGOS: Okay. I'm going to show you what was previously marked as D6J1. Has anybody ever showed you that picture?

O’NEILL: No.

GERAGOS: Do you, are you aware that there was or there is a fence post that's in this picture over here?

O’NEILL: I have no knowledge of that.

GERAGOS: Were you aware that that fence post also had used, or appears to have used, what's called a post concrete?

HARRIS: Objection. Assumes a fact not in evidence.

GERAGOS: I'm asking him hypothetically.

JUDGE: But he hasn't seen it. Sustained.

GERAGOS: Well, I'm asking you hypothetically. You based this inconsistency on the fact that there was larger rock along with the identical three substances, correct?

O’NEILL: Yes.

GERAGOS: If that larger rock was already there, and somebody just took their bag of cement and poured it on top of the larger rock, wouldn't that also be a reasonable explanation and make it then consistent with the other five items?

O’NEILL: No.

GERAGOS: Can you tell me why?

O’NEILL: Sure. Because the rock particles were obviously mixed in with the other materials, as there are cementitious paste and portions that are embedded into that concrete.

GERAGOS: Have you, you haven't been out there, have you?

O’NEILL: No, I'm, I'm basing this on the sample that I observed.

GERAGOS: Okay. If you went out there and you dug up that cement and it turned out that the cement, on the top, did not have the large rock, but on the bottom did have the large rock, that would tend to undercut that theory, wouldn't it?

O'NEILL: That would be a lot of variables that could explain that.

GERAGOS: I'm asking if that would undercut your theory.

O'NEILL: No, because I could explain that by some other means.

GERAGOS: Well, but you haven't been there, correct?

O'NEILL: Well, of course; I haven't been there.

GERAGOS: Okay. And before you say that it's inconsistent, when you've got three of these particles there, or three of these compounds there, wouldn't the scientific thing to do be to go out there and take a look at what is there and see whether or not these other aggregate, what you call the bigger rocks, whether or not they pre-exist?

O'NEILL: Well, I wasn't asked to do that. And I was asked to conduct my analysis on the samples that were provided. And I could clearly see that that mix from Mr. Peterson's yard, was a different mix than, GERAGOS: Well, let me, the only thing that made it different, you keep saying that mix. The only thing that made it different, correct me if I'm wrong, 318. Uh-huh.

GERAGOS: is that in the others, the largest thing you saw was three-eighths of an inch, right?

O'NEILL: Right.

GERAGOS: And in this sample, you saw three quarters of an inch?

O'NEILL: But that's a huge difference.

GERAGOS: I understand that. And I'm asking you, if you went out there and you looked at the yard and you saw that there was a three quarters inch rock-type gravel that was in that yard, you're telling me that that wouldn't give you pause before you would say that it wasn't the same thing?

O'NEILL: Well, I'm basing my opinion and my conclusions on the comparison of the samples. That's all I can do, because I did not go out there.

GERAGOS: Okay. I have pictures that Mr. Harris informs me he wants a hearing before I show the witness the pictures.

JUDGE: 402 hearing?

HARRIS: (Nods head)

JUDGE: All right. Let's excuse the jury. We'll have another hearing out of your presence, and then when we get done, want me to excuse the witness, too?

GERAGOS: Yes, please.

JUDGE: Mr. O'Neill, if you will wait outside.

O'NEILL: Thank you, your Honor.

<402 hearing text>

JUDGE: All right. Let the record show that the jury's in the jury box, along with the alternates. Go ahead, Mr. Geragos.

GERAGOS: Thank you. Now, I'm going to show you this picture again. If you pulled up this piece that I'm showing you, D 6J1, if that is, I'm going to put this up on the board. If that is the piece of the sample of the concrete that you were examining, and if that had been poured, just the cement had been poured, onto the ground, do you understand what I'm saying so far?

O’NEILL: I do.

GERAGOS: I don't know if I'm using the right term.

O’NEILL: That's concrete.

GERAGOS: Concrete. The concrete goes on, you don't mix it, you just take the bag and you dump it. And if there is, if I'm accepting your theory, that this is a different, this area here is a different mix than the others, it's because of those large, larger rocks; is that correct?

O’NEILL: That's the difference.

GERAGOS: Okay. Now, if we were to dig up this piece of concrete, okay? We pick this up, and literally break it, what would you expect to see, if it was a different batch of concrete?

O’NEILL: Basically what I've seen is that this sample, item 60, is concrete rubble. There's some chunks and pieces and rocks and chunks of concrete. And that's what I would expect to see if something is, is dumped out there, as you say. It may be what we call waste concrete. It's concrete that is not part of a sidewalk or a driveway, or something. It's concrete that's off to the side.

GERAGOS: Okay. Now, you said, and this is the item 60, correct?

O’NEILL: Right.

GERAGOS: Okay. Now, item 60 has items in it, other types of what you call aggregate; is that right?

O’NEILL: Yes.

GERAGOS: Okay. The larger aggregate?

O’NEILL: They're larger aggregate.

GERAGOS: Okay. So would you expect to find larger aggregate in this here at various other spots in the yard away from where this cement had been dumped?

O’NEILL: I have no idea what you're asking me.

GERAGOS: I'm asking you if that was there, if the rocks were there pre-existing and if the cement had been poured on it okay?

O’NEILL: Uh-huh.

GERAGOS: And if it had rained, for instance, what would happen? Wouldn't the cement set up?

O’NEILL: Well, I think that you would not have rocks that are intimately mixed or embedded into the chunk of concrete.

GERAGOS: That's what I'm asking you.

O’NEILL: They would be, they would be by themselves.

GERAGOS: Would you, would you expect that you would find similar rocks at other spots of that yard? You would not expect that; isn't that correct?

O’NEILL: I would find similar rocks, but the difference would be that there's no cement paste coating on it, with sand.

GERAGOS: Right.

O’NEILL: That would be the difference.

GERAGOS: And that difference would be because the cement and the fly ash, the Portland cement and fly ash had not been poured on those rocks, correct?

O’NEILL: Yes, but this is different than that. This just isn't pea, GERAGOS: Well, how is it different?

O’NEILL: Well, it's not pea gravel concrete that's just been placed on, on, on, on artifacts like the other rocks that are out there. This is something that's been mixed, and then the concrete's been broken up somewhat.

JUDGE: Can I ask him a question?

GERAGOS: In –

JUDGE: Is this, is that sample with the, with the larger rocks that you examined, is that the type of concrete that's consistent with the type of concrete you would use to install fence posts?

O’NEILL: If it, if somebody was installing fence posts from a ready-mix truck, ordering it from a ready-mix truck, yes, because that would be very typical.

JUDGE: So if somebody was installing fence posts and some of it, from a ready-mix truck, and some of the concrete fell on the ground, that would to be consistent with the type of cement that you would use to insert fence posts?

O’NEILL: Yes, because a three quarters inch rock is a very typical concrete mix that you order from a ready-mix firm to deliver it.

JUDGE: You can't buy it in a bag?

O’NEILL: No. And that's a big difference.

JUDGE: Okay.

GERAGOS: Which then brings me back to the picture. If there's a fence post that is within twelve inches of that location, and the fence post has got cement residue on it, is that, are you, is it one of the possibilities you're looking at that that's residue from the fence post?

O’NEILL: Residue from the cement post how?

GERAGOS: Well, I would love to show you the picture, but I can't right now; is that correct?

JUDGE: Well, no, if it's, if it's a picture of a fence post.

GERAGOS: Yes.

JUDGE: That's okay.

GERAGOS: Okay.

JUDGE: All right.

GERAGOS: Here's a fence post.

JUDGE: The fence post was there in 2002.

GERAGOS: Right. Do you see this fence post? What does that look like you to on the fence post? Does that look like cement residue?

O’NEILL: It could be, but I certainly can't tell from that image.

GERAGOS: You're going to tell this jury after your 30 years of experience –

HARRIS: Objection.

GERAGOS: with concrete, you're going to tell . . .

JUDGE: Argumentative, Mr. Geragos. That's argumentative.

GERAGOS: I'm sorry. Are you going to tell this jury, based on your extensive experience, that this fence post and this right here, and this, you can't make an educated guess as so what that is right there?

O’NEILL: I don't like to guess.

GERAGOS: You don't?

O’NEILL: No.

GERAGOS: We could argue about that. The, specific . . .

JUDGE: Do you want to mark that photograph?

GERAGOS: Yes. I'm going to mark that as defense next in order.

JUDGE: All right. That's defendant's next in order.

GERAGOS: Now –

JUDGE: Defense 6P, photograph of fence post.

GERAGOS: Now, you don't know where on that location Detective Brocchini reached his hand and grabbed the, the sample, do you?

O’NEILL: I actually did see a picture last night of the general area where reportedly Mr., or Detective Brocchini obtained the sample.

GERAGOS: Is that the same picture I just showed you?

O’NEILL: No.

GERAGOS: Well, if I'm not mistaken, that's the only one that's in evidence.

DISTASO: No, it's in evidence.

HARRIS: Binder.

GERAGOS: Okay. Did they show you this picture?

O’NEILL: No, sir.

GERAGOS: You never saw a picture showing you that, right next to the, to this area there's a fence post with what appears to be concrete right next to it, did they? You never were shown that?

O’NEILL: Well, I never was shown this picture.

GERAGOS: Okay. I'm asking you did you know that there was concrete work that had been done in that same area?

O’NEILL: Again, I can't hear you when you're speaking that way.

GERAGOS: I said were you aware that there was concrete work done in that same area?

O’NEILL: I wasn't aware of that.

GERAGOS: Okay. Would one explanation, reasonable explanation be for why you've got this aggregate stone, as the judge asked you, that you would have from a post mix, a post mix is a different, or a fence post mix is a different kind of a mix, correct?

O’NEILL: Yes.

GERAGOS: And a fence post mix has the larger aggregate stone, correct?

O’NEILL: If, if that, if that mix was delivered by a ready-mix truck, and that would explain it because the ready-mix truck, if they delivered a three quarter inch aggregate for a fence post, then that would account for that.

GERAGOS: And that would also account for why you might have both the Portland cement, fly ash and sand and the aggregate, correct? If both, if you poured the cement there and if the fence post mix was there as well; is that correct?

O’NEILL: I'm not sure if I followed that. You lost me there,

GERAGOS: You say you have, you testified that the number 60 had Portland cement, fly ash and sand, correct?

O’NEILL: Right.

GERAGOS: All of that is consistent with the other five items that we talked about, correct?

O’NEILL: Yes.

GERAGOS: If you also add fence post mix in that same area, that would account for why you have Portland cement, fly ash and sand and larger aggregate; isn't that correct?

O’NEILL: It would be correct, assuming that the fence post mix contained Portland cement, fly ash, sand, and the aggregate.

GERAGOS: What if you . . .

O’NEILL: But it may not. It may not.

GERAGOS: What if the Portland cement, fly ash, and sand was from the same bag of cement that made the anchor and everything else and was poured there?

O’NEILL: I would say that that's, that is not likely from the sample that I have. The sample I looked, that I have looks like it's all been intimately mixed together.

GERAGOS: Well, when you say it looks like it's been intimately mixed together, it looks to me like rubble.

O’NEILL: Well, it is rubble now.

GERAGOS: Okay. And it was rubble when you got it?

O’NEILL: Well, there was some, looks like it's been broken up somewhat since I received it. There was a much larger chunk. If you look at the photograph, I think that's, looks like it's been broken up a little bit.

GERAGOS: Do you have a photograph of the way you received it?

O’NEILL: Yes, I do.

GERAGOS: Would you hand that to me?

O’NEILL: Sure. There we go.

GERAGOS: Okay.

O’NEILL: Do you want it?

GERAGOS: Tell me something, what's the, what's the width from here to here?

O’NEILL: There's a scale at the bottom of the photograph.

GERAGOS: Right.

O’NEILL: That's in centimeters.

GERAGOS: Okay. So how, how wide would you say this rock is right here?

O’NEILL: That's actually the concrete . . .

GERAGOS: Yeah.

O’NEILL: mixed in together.

GERAGOS: Yeah. How wide is that?

O’NEILL: Yeah.

GERAGOS: Is this to scale, by the way?

O’NEILL: No, this is our scale right here.

GERAGOS: Okay. So tell me how wide that is?

O’NEILL: Maybe approximately 30 to 40 millimeters, which would be, maybe 50 millimeters, which would be an inch to two inches. Probably, probably two inches. It's kind of hard to do without, okay.

GERAGOS: How big is this?

O’NEILL: That one's about an inch and a half.

GERAGOS: To two inches?

O’NEILL: Yeah.

GERAGOS: Yeah. Looks like about two inches to me. Yeah?

O’NEILL: Yeah.

GERAGOS: Maybe even, maybe even more. Three inches?

O’NEILL: Okay.

GERAGOS: So it doesn't look like that was, unless it just so happens that in your picture the much bigger piece that broke up is on the bottom, it looks to me like we've got, like this bag is exactly the way that it was produced to you; isn't that correct? I mean even down to the fact that we've still got the leaves in here, correct? And all the other, all the other junk that was picked up with it? Is that right?

O’NEILL: Hard to tell, but that piece does look like that chunk is still intact. But it just looked to me from my recollection that the sample now is just degraded a little bit more than when I got it. That's, that's just my line recollection.

GERAGOS: When you look at it right now and compare it, it doesn't look like it degraded at all?

O’NEILL: No, it . . .

GERAGOS: When you compare it now?

O’NEILL: As far as the big chunk, that one is probably intact. But other remaining pieces, just based, based on my visual recollection, it looks like it's been broken down a little more.

JUDGE: Okay. One second, Mr. O'Neill. Do you need that for your records? Because we can print a color copy for our court exhibits and return that to you.

O’NEILL: No, I've got, it's all digital. I can replace that.

JUDGE: We'll mark that defendant's next in order. Defendant's 6Q

GERAGOS: Okay. We saw a picture last night of the, of the area. Which –

DISTASO: It's in evidence. The Covena house.

GERAGOS: The Covena house? Is this the picture you saw?

O’NEILL: Right. Yes, it is.

GERAGOS: Okay. This is marked as 69 M?

JUDGE: 69, People's 69M?

GERAGOS: Right. Does this look like this area right here you were shown? It was taken from somewhere in here; is that correct?

O’NEILL: That's what was reported to me.

GERAGOS: Okay. And if the picture I showed you looks like that fence post, the picture that was just marked was taken from this angle; is that your understanding? When you looked at the picture?

O'NEILL: No idea

GERAGOS: Because you're not familiar with this area? Did you take a look at or have you examined, strike that. You already testified you haven't. The, there's that picture that was marked as D 6, is that P?

O'NEILL: Looks like a P.

GERAGOS: Okay. Now, does it look like that picture and this picture, looks like right here, this fence post would be right where this, see this little ivy right here and see this ivy right here?

O'NEILL: Can you lift that picture up for just a moment? Doesn't look that way to me.

GERAGOS: Well, okay. And, once again, you still can't figure out what that might be there?

O'NEILL: I really can't tell from the image, I'm sorry.

GERAGOS: Okay. Did anybody give you any samples from an area of brickwork in the backyard?

O'NEILL: They did not.

GERAGOS: Did anybody ask you to compare the paste that was in this red drum and this blue drum to any sample, to any other sample in the yard?

O'NEILL: No.

GERAGOS: Thank you. I have no further questions.

Redirect Examination by David Harris

JUDGE: Okay. Any other questions of Mr. O'Neill?

HARRIS: Yes. Mr. O'Neill, just to go through some of those points. The judge was asking you, questioning you, talking about ready-mix coming in for the fence post.

O'NEILL: Right.

HARRIS: When we're talking about this, I want to make sure that we're all clear about that. When you say ready-mix, you go to Home Depot and there's this bag of stuff that you buy; is that also ready-mix?

O'NEILL: No. Let me explain the difference so everybody knows the difference between those two types of concrete. The ready-mix concrete is batched at a plant where they have big supplies of rock and they have sand and they have Portland cement. And they're mixed at the plant, and then it is placed into a truck with the rotating drum that you commonly see. That is ready-mix concrete that is ordered and then prepared and then delivered to a site, such as the Peterson house, for the driveway or the sidewalk, flat work area, or for other uses, pools, that would be ordered. Now, the stuff, I'm sorry, the concrete that you would obtain at Home Depot is a pre-mix bag material that you, that comes in 50, 60, 80 or 90 pound sacks. And everything is in there except for the water. So you would open up the bag, put it into maybe a wheelbarrow, or some other container, add water to it, and then you have concrete. So that there are two distinctly different concretes, but the components could be the same.

HARRIS: So, again, just for clarification, when you're talking about ready-mix, it's just what it means, it's already mixed?

O'NEILL: It's already mixed and delivered at the site.

JUDGE: In a big truck.

O'NEILL: Yes.

HARRIS: In a big truck. And the bags of cement, that's a pre-mix, so everything's put together, you just add the water, and it's like buying something out of the store where you get the ingredients and just add something and stir it up?

O'NEILL: Right.

HARRIS: Now, when you were, you were being asked the questions about these hypothetical questions about Well, if there was a fence post in before. So let's go through that hypothetical, because there, we don't know any of the facts . . .

GERAGOS: There was an objection. You sustained the objection to the hypothetical.

JUDGE: I think so. I let him show the fence post because it was there in 2002, but he has no opinion about it in, he never saw it.

HARRIS: Well, you were shown that particular photograph of the fence post, and you were being asked if that was concrete there. Do you know that or not?

O'NEILL: I have no idea

HARRIS: So you haven't been there, you haven't examined the location?

O'NEILL: Right.

HARRIS: Now, to, in answer to the judge's question, if that fence post, again, part of that hypothetical, if that fence post was made with ready-mix, so somebody backs up that truck and they fill up that hole, set the post in with the ready-mix, is that the ready-mix concrete that we're talking about?

O'NEILL: Yes.

HARRIS: So this, the question that you're being asked about the sample that you were looking at, which was your sample number 60 and I believe it's People's number 80, that particular sample, I guess counsel was asking you if somebody had that pre-mixed and they made it, they added water to it and then took it to that location and dumped it at that particular location, if there were rocks there, would that make those rocks make it look like ready-mix. And your response was?

O'NEILL: Not in my opinion. That looks like ready-mix concrete that's out at the site at the Peterson yard, number six at, item number 60.

HARRIS: And you were saying something about how those rocks seem to be the bigger rocks, not the pea gravel that we were talking about with the pre-mix, but the bigger rocks with the ready-mix seem to be involved, I don't remember exactly.

O'NEILL: Embedded.

HARRIS: Embedded. Could you tell from that, looking at your examination and the microscopic examination?

O'NEILL: Yes, I could see that there was some embedment of those rocks, and that those larger rocks, there was a couple or three of those rocks, that they had cement paste and were coated with cement paste, not consistent with somebody dumping three-eighths inch pea gravel mix, pre-bag mix on that. That did not look like that to me. It looked like a different mix altogether, based on the size of the aggregate.

HARRIS: And just so that we're, we're all clear about this in terms of the numbers, because there was an issue about that. Your item number 130, which was the debris from the trailer, that's People's number 124; the debris from the truck bed, which was your number 1 GG, that's People's number 117; the debris from the boat cover, which is 43 A, is People's number 241; the debris from the yard, which is your number 60, and that was, I believe it's People's number 80; the blue drum/red drum, those have, were number 140, and they were People's, or defense

numbers AAAA, so four A's 1 and four A's 2; the vacuuming from the boat was 14-212, and that was People's number 238; and the anchor was your number of 143, and that's People's number 72; the plastic pitcher was your number 128, People's number 123; the debris from the warehouse floor was your number 132, that was People's number 125; and as Mr. Geragos called it, the pebble from the living room, and as the judge indicated by the hutch, was your number 218-41 and People's number 156. Are those the correct numbers that correspond to the items that you looked at?

O'NEILL: Yes.

HARRIS: I have no other questions.

Recross Examination by Mark Geragos

JUDGE: Any re-cross?

GERAGOS: Yeah. Are you testifying today that if I go down to Home Depot that I can't buy a bag of post concrete that's got three quarter inch aggregate in it? Is that your testimony? If I go down to Home Depot right now, you and I leave, we take a break at 3:00 o'clock, are you willing to bet all of your testimony today that you and I go down to Home Depot we're not going to find a three quarter inch aggregate in a bag?

O'NEILL: I can't answer that.

GERAGOS: Right. Because you know that you just made that up on the fly when . . .

O'NEILL: No, no.

GERAGOS: we were talking about it . . .

JUDGE: No, no, no. The jury can disregard that. That's a comment by counsel.

GERAGOS: Let me ask you another . . .

JUDGE: The jury can disregard it. Next question, please.

GERAGOS: Have you ever heard of QuikRete post mix?

O'NEILL: Yes.

GERAGOS: What is that?

O'NEILL: I've heard of it. I can't tell you the constituents.

GERAGOS: It's a post mix with three quarters inch aggregate, isn't it, that you buy in a bag?

O'NEILL: I don't know.

GERAGOS: Okay. Did you ever, did anybody ever show you any of the TradeCorp labels? Do you know what TradeCorp is?

O'NEILL: Heard of it. Not familiar with it.

GERAGOS: Okay. If I show you this label, TradeCorp, soluble calcium chelate, is that how you pronounce it?

O'NEILL: "Chee-late," I think.

GERAGOS: Right. Is that similar to the same substance that you found in your examination?

JUDGE: Of what?

GERAGOS: Of the shop vac?

O'NEILL: That I have no idea.

GERAGOS: Can you tell me do you know what that stands for right there, says: Fertilizer Containing Amino Acids?

O’NEILL: I have no idea.

GERAGOS: Do you know what product Mr. Peterson has in his warehouse?

O’NEILL: I'm not familiar with fertilizers or products in Mr. Peterson's warehouse.

GERAGOS: Okay. The pitcher has in it, which was number 72, calcium carbonate; is that correct?

O’NEILL: Right.

GERAGOS: Okay. Do you know what calcium chelate is?

O’NEILL: I don't know what that is.

GERAGOS: If I were to show you this item right here, which says TradeCorp, Soluble Calcium Chelate, were you aware, you said calcium carbonate; is that right?

O’NEILL: Right.

GERAGOS: Do you know what the chemical compound for calcium carbonate is?

O’NEILL: CaCo3.

GERAGOS: Okay. CaCo3. Do you know what, the numerical designation for that?

O’NEILL: I don't know what you mean.

GERAGOS: The chemical compound number?

O’NEILL: The chemical compound is CaCo3.

GERAGOS: Okay. And do you know what chemical chelate is?

O’NEILL: I don't know what calcium chelate is, I'm sorry.

GERAGOS: I'd like to mark these two next in order. Identify them as TradeCorp labels.

JUDGE: Defendant's Exhibit 6R.

CLERK: As one?

GERAGOS: Is it a fair statement, based upon what I asked you before, that the, you wouldn't need to bring a truck out, a cement truck out to pour that post if, in fact, there is such an animal as, or a mineral as a three quarter aggregate post ready-mix?

O’NEILL: That would be true.

GERAGOS: Thank you. No further questions.

2nd redirect Examination by David Harris

JUDGE: May this witness be excused?

HARRIS: Just briefly. Dealing with that, you were shown these two things here for TradeCorp. Was there some kind of gray chunky debris that was in the bottom of that clear pitcher?

O’NEILL: In the bottom of the plastic pitcher?

HARRIS: Yes.

O’NEILL: Yes. There was the fly ash, cement and the sand, and the residue on the bottom of that pitcher.

HARRIS: In your experience does that look like concrete to you?

O’NEILL: It looked like concrete that had floated to the bottom of that

pitcher, as it was hard along the bottom face and much softer along the top, like somebody had cleaned their tools and this material had come to the bottom.

HARRIS: The People have no other questions.

2nd recross Examination by Mark Geragos

GERAGOS: I have a question for you.

JUDGE: Yes.

GERAGOS: If I told you that that pitcher when they went into the warehouse, if I told you that when they went into the warehouse, that we had testimony in this case that that pitcher had water in it, would you expect to find the cement in it when it was delivered to you.

O'NEILL: Yes.

GERAGOS: And why is that?

O'NEILL: Because the cement and the concrete, or the cement, fly ash and sand would all sink to the bottom.

GERAGOS: And that's because?

O'NEILL: Because it's heavier than, the specific gravity is higher than water.

GERAGOS: Right. And so it, the cement, the sand, the fly ash all goes or goes, I guess it would sink and the water would be above it, correct?

O'NEILL: Right.

GERAGOS: Same phenomena you might have if you put that item on the ground and then it rains on top of it?

O'NEILL: Whole different phenomenon.

GERAGOS: Different laws of nature govern that than,

JUDGE: Argumentative.

GERAGOS: Thank you. I have no further questions.

JUDGE: Mr. O'Neill, thank you very much. You can be excused. Thank you for your time.

O'NEILL: Thank you, your Honor.