RED HILL VALLEY PARKWAY INQUIRY

TRANSCRIPT OF PROCEEDINGS
HEARD BEFORE THE HONOURABLE J. WILTON-SIEGEL
held via Arbitration Place Virtual
on Monday, May 16, 2022 at 9:30 a.m.

VOLUME 13

REVISED TRANSCRIPT

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Arbitration Place Virtual

--- Upon resuming on Monday, May 16, 2022
at 9:30 a.m.

MR. LEWIS: Good morning, Commissioner, Counsel, Ms. Lane.

I would like to open this week of hearing by acknowledging that the City of Hamilton is situated upon the traditional territory of the Erie, Neutral, Huron-Wendat, Haudenosaunee and Mississaugas. This land is covered by the Dish With One Spoon Wampum Belt Covenant which was an agreement between the Haudenosaunee and Anishinaabek to share and care for the resources around the Great Lakes. We further acknowledge that the land on which Hamilton sits is covered by the Between The Lakes Purchase 1792, between the Crown and the Mississaugas of the Credit First Nation.

Many of the counsel appearing on this hearing today are in Toronto which is on the traditional land of the Huron-Wendat, the Seneca, and most recently, the Mississaugas of the Credit River. Today this meeting place is still the home to many indigenous people from across Turtle Island and we are grateful to have the

opportunity work on this land.

We have Ms. Becca Lane today. If the court reporter could swear in the witness.

REBECCA LANE; affirmed

EXAMINATION BY MR. LEWIS:

Q. Good morning, Ms. Lane. Thank you for coming.

A. Thank you.

Q. I would like first to go through your education and some of your work history and so forth before we get into the rest of it.

Registrar, if we could go to MTO 38644. If you could open images 1 and 2, please. This is a copy of your CV, Ms. Lane. Do you recognize it?

A. I do.

Q. Just to start with your time at the MTO, you've been there since 1991; is that right?

A. Correct.

Q. And you're a licensed engineer?

A. I am.

Q. And prior to joining the

MTO you obtained your bachelor of science in geological science at Queen's in 1993?

A. Yes.

Q. And then your bachelor of applied science in geotechnical engineering at Queen's in 1991, right?

A. Correct, yes.

Q. And I guess you joined the MTO straight out of university?

A. I did.

Q. Okay. And you've held a number of positions at the MTO since 1991. I'm just going to start at 2003. And at the bottom part of 2003, from -- image 2 -- from 2003 to 2007 you were the senior pavement design engineer in the pavements and foundations section of what we call MERO, right, the materials engineering and research office?

A. Yes.

Q. And then just briefly, as the senior pavement design engineer, what does that position entail?

A. Well, I guess it entails being sort of the provincial lead for the Ministry of Transportation on anything to do with pavement

design. So we have five regions across the province that actually do the pavement design of individual pavements and we provide -- in the materials engineering and research office we would provide the support for them. So the technical expertise, new pavement technologies, new pavement research that comes along, we would investigate and help them implement it in the field.

Q. And the five regions, those are -- just name them off?

A. Northwest, northeast, east, west, and central.

Q. And senior pavement design engineer, is that asphalt and concrete pavements?

A. Yes, it is.

Q. And then in January 2008 to June 2008, it indicates you were the executive assistant to the assistant deputy minister. That's a sort of a brief period of time?

A. Yes, so, you know, it's good to get experience working on the political side. So you go down to Queen's Park and you understand what all the emerging issues are and what the focus of the ministry is from that

perspective. So everybody is recommended that they take an assignment down there so that they can see how the Ministry works. So I took that assignment, and it was brief because then the head pavements and foundations section position was posted, and so I wanted to compete for that position and so that's why I was only there for the six months.

Q. And previously the head of pavements and foundations, that was Tom Kazmierowski; is that right?

A. Yes, it was.

Q. And who you reported to in your position as senior pavement design engineer; is that right?

A. That's right.

Q. And were you in an -- it's not in here, but were you in an acting role as the head of pavements and foundations in 2007 before you joined the ADM's office?

A. Yes. So I believe Tom was acting in another position and so they rotated people through his position in an acting role. So I was one of the actors in his role, yes.

Q. Okay. And so that would

have been until January 2008. Do you recall when you took over that, the acting role as head of pavements and foundations?

A. I probably did it for six months, I'm guessing, so, you know, maybe even June or July 2007 to December 2007. I actually have no idea, but that's a guess.

Q. Sometime during the early to mid part of 2007 until the end?

A. Yeah, mid to end. It wouldn't be early. They don't let you act for longer than, you know, maybe a 529 we would say, so six months at the most.

Q. And then in that second entry from the top on image 2, you're the actual head, not acting any longer, of pavements and foundations from July 2008 to November 2011?

A. Yes.

Q. And you just have a brief description there, but maybe if you could describe the role?

A. So it's a bit broader than just pavement design. So it's the pavements and foundations section, so the pavements group which looks after the -- overseeing the I guess

provincial highway networks in terms of pavement management. So pavement design, support, pavement management support. And then on the foundation engineering side, a group of technical experts that are foundations engineers, and they provide support for things like foundations for bridges and things like that. So a much bigger group.

Q. And as the head of pavements foundations, you reported to the manager of MERO; is that right?

A. Yes, I did. Which was Tom again.

Q. At that time when he took over that position?

A. That's right.

Q. Again you were for -- from December 2011 to March 2013 you moved to a different area, I guess, the manager systems analysis and forecasting office?

A. Yes, I did. So that -- you want to know what that role is?

Q. Yeah, it's not on the pavement side exactly; is that right?

A. Oh, no, it's not. It's on I guess the system itself, so the highway

network itself monitoring the traffic volumes, the truck traffic origins and destinations, just modelling and predicting traffic growth and movement of people and goods over different time cycles.

Q. Okay. And from there you became the manager of MERO, the materials engineering and research office, in April 2013 to April 2020, correct?

A. Yes.

Q. And I guess then you were taking over from Tom when -- Tom Kazmierowski when he left; is that right?

A. That's right.

Q. And so could you describe that role and also the structure of MERO, which sections are underneath the head and in the office?

A. Yes, so it's a very big office, so we had about 94 staff and it's broken into five sections. So there's a section that focuses on the concrete and cement and steel that's called the concrete section. So anything to do with concrete materials used in infrastructure. And then there's a section called

the bituminous section which is a section that has everything to do with asphalt materials and different asphalt cement types, different asphalt technologies. There's a soils and aggregate section that deals with aggregate sources, soil types, excess soil management, aggregates to be used in concrete, aggregates to be used in asphalt. Aggregates to be used in road bases. So that's that section.

There's a -- now they have broken it into two, but back then it was the pavements and foundations section. Now it's a pavement section and foundation section. But that's the same section I was in. And then we have a large laboratory that does the laboratory testing and kind of I guess applied type research work for all of those different materials areas. So there's the separate lab as well.

Q. And that's the five. So concrete, bituminous, soils and aggregates, pavements and foundations, which is now broken into one for pavements, one for foundations but more recently, and the laboratory section?

A. Correct.

Q. And aside from that

relatively recent split in the pavements and foundations section, has that been more or less the structure of MERO, you know, during this time period that we're talking about from the early 2000s to -- you know, up to the present?

A. Yes. The pavements group actually joined MERO. We used to be called engineering materials office, but the pavement section joined MERO in the 90s, late 90s. Other than that it's been the same for decades.

Q. And in the overview document materials, there's quite a number references to the MTO's geotechnical committee or geocom, and you were on that. Are you still on that?

A. No, I'm not.

Q. So what is the geotechnical committee, what is its role?

A. So the geotechnical committee was the heads of the geotechnical sections in the five regions. So each geotechnical section has a head and the head sits on that group.

In addition to that, they would have sort of head office people. We're not

allowed to call head office, but anyway. So for example, the head of pavements and foundation section, the head of bituminous section would sit on the group. The head of soils and aggregate section too. And that way the people that sort of are working on the new technologies and research and that kind of thing are plugged into the people in the region that are actually delivering the program. It was a way of exchanging knowledge so that we could learn from each other.

Q. Now, you mentioned in relation to the soils and aggregate section about their involvement briefly in aggregates, and on both I think the concrete and asphalt side. And I would just like to discuss for a bit the MTO's approach to aggregate selection and then into that, into friction management, and particularly the front end approach, if we call it that, to friction management and the aggregate selection process for that.

So first could you tell us about the designated source of materials list, otherwise known as the DSM. What is it?

A. So the Ministry is trying to be a knowledgeable owner, so we want to know

what materials go into the work so that we understand what we've built and we have an understanding of how long it's going to last and things like that.

So one of the ways to do that is an upfront process where you pre-qualify materials to be used in the work, and we do this for not just aggregates, we do it for a large number of different materials. So the way we would do it is, you know, we would sample the material, test the material, make sure it was suitable, try it in an application, and then if it was found to be suitable, we would place it on a list of approved products for use in the work.

And this is a process that's used across many, many jurisdictions in North America. So the designated sources list, for example, we have one for concrete aggregates. They would go out and pre-qualify a number of aggregate sources for using concrete materials. One of the big things about concrete is you can get an aggregate in there that causes the concrete to actually break apart over time, so making sure you get the right aggregate and concrete is very important.

And similarly, the same thing for asphalt. You want to make sure you have an aggregate that's durable, long lasting. For example, we have a wet-freeze climate in Ontario. We want to make sure we have aggregate that holds up to the climate and -- that holds up under the conditions, roadway conditions. So those are the lists that they would build. They would evaluate a source; if it turned out to be suitable, they would put it on a list.

Q. And you're talking both generally there and then specific to aggregates; is that right?

A. Yeah, yeah, we have other lists as well of approved products, but this is specific to aggregates, yes.

Q. And that's what we'll talk about.

And before we go on with that, I realize I didn't finish on your career, and so I should finish that off. Where you're currently at since April 2020 -- and I apologize for that, I should have squared that off -- the director of central operations, which is what?

A. That's right. So that's

a different -- that's a real change for me actually. So it's been a great opportunity to learn new things. So they do corridor management, which is things like -- so you've already built your network and now somebody wants to come along and put a development in place, so it's working with developers on their new development to make sure that we have -- we are following all the safety requirements for the highway. It's also roadway maintenance, so making sure that the roads are plowed and that potholes are filled and those kind of things. So it's a number of different things, stakeholders, municipalities, developers, consultants, et cetera.

Q. Is that central -- is that affixed to central region?

A. Yes, it is.

Q. Okay. And central region broadly speaking encompasses what?

A. From the Niagara area up to Orillia, I guess, and then across to the Highway 115 in the east.

MR. LEWIS: If we could make that CV an exhibit. It's MTO 38644, and I believe, Registrar, that it's Exhibit 42.

THE REGISTRAR: All right, Counsel. Thank you.

EXHIBIT NO. 42: Rebecca Lane's curriculum vitae, MTO 38644.

MR. LEWIS: Sorry about that. I thought I should finish off your career up to the present.

BY MR. LEWIS:

Q. Okay. So having described the general purpose of the DSM, do you recall when it was originally developed specific to aggregates?

A. Oh, so far before my time. I don't know. Probably decades before my time. Maybe the 70s. I don't know.

Q. It was there when you got there?

A. For sure it was, yes.

Q. Okay. Well, we have some others we can ask about that, so that's fine.

And in terms of aggregate pre-qualification, what specific courses are the requirements for for being included on the DSM? Is it for all asphalt layers, or is it just surface courses?

A. Yeah, so obviously you still want good quality aggregate in the other layers of the payment, but they just do routine testing for that, right. The DSM for aggregates for asphalt is specific to the surface course.

Q. And it's the soils and aggregate section that, as I understand it, was and continues to be responsible for the administration of the DSM; is that right?

A. Yes, it is.

Q. And during your time I understand that the head of -- or the manager of soils and aggregates was first Chris Rogers; is that right?

A. Yes.

Q. And Steve Senior when Mr. Rogers retired in 2008. Does that sound correct?

A. That's right.

Q. And then there is another gentleman who has since retired, Bob Gorman, who was also there heavily involved in the DSM management and administration; is that correct?

A. Yeah, Bob Gorman is the -- was the geologist in the office, so he is

the one that -- well, we had other geologists too, but he was the one that was responsible for the DSM.

Q. And aggregate specifically?

A. Aggregate specifically.

Q. Okay. And we will get into the specific criteria, but in general terms could you just describe the approach that the MTO takes to the aggregate selection and listing on the DSM?

A. Okay. So there's two ways that -- one of them could be that we are looking for a source because we want to have close to market sources of good quality material. So the more sources that we have, the better value for people in Ontario because we would have -- not be trucking long distances and things.

So there's one aspect of the job that's you are out there looking for new sources. And then the second, more probably common is that the industry themselves is applying to the ministry to get their product on the designated sources list. So they will have a quarry and they will say, you know, we've got this

quarry, we think this is good quality material. We would like to apply get that listed on the designated sources and materials list. Obviously that means they would then be able to supply high quality aggregate for our surface course paving jobs.

Q. If we could go to overview document 4, image 9, Registrar.

So, Ms. Lane, we have a thing we call the overview document which puts into evidence lots of documents and facts and so forth, which I may refer you to. As well we can go to specific documents. If at any point I'm only going to the overview document and you think you need to look at the document itself, please let me know.

A. Okay.

Q. Again, it should be image 9 and 10, please. Thank you.

Paragraph 19 refers to a April 20th, 2004 paper titled "Pavement Surface Friction on Ontario Highways," which lists Chris Rogers who you mentioned, Bob Gorman, you, and Frank Marciello as authors. And there's some excerpts that we've taken and put into the

overview document here setting out the MTO's approach to friction management historically and at that time. Do you recall this paper?

A. I do.

Q. And was -- as I've learned through this, is the primary author the first one? Mr. Rogers is listed as the first author. Do you recall if he was the primary author on this?

A. Yes, he would be.

Q. And what was your role in it, if you recall?

A. Well, I don't really recall, but I am the third author, so I imagine I contributed something to the paper otherwise I wouldn't be on there. But Chris Rogers and Bob Gorman would be the primary authors.

Q. And you can take your time if you need to, but if you reviewed this before your testimony, at the time it was written did these excerpts and the paper as a whole accurately set out the MTO's approach in summary form to the various requirements that an applicant quarry must meet to be listed on the DSM?

A. Yes, it did.

Q. Does that -- has that remained your approach during your time at the MTO?

A. Yes.

Q. And we'll get into issues about performance specifications and stuff, but just in terms of the DSM itself, generally speaking this remains the approach that the MTO takes; yes?

A. As far as I know, it hasn't changed since I left.

Q. Okay. Oh, since you left as manager of MERO?

A. Yes.

Q. In 2020. Okay. Now, if we could look at the -- in the second image there, image 10, the paragraph -- it's the middle paragraphs, and if you could call those up, Registrar. It starts "MTO requires." Yeah, those three paragraphs. Thank you.

Can you see that all right? Does it stay on your screen?

A. Yes, I can see it, thank you.

Q. So as I understand it, in

paragraph 1, this sets out the main things for being listed on the DSM, and the first part as I understand it is that the quarry the aggregate is sourced from is inspected, so someone actually goes out and has a look at it; is that right?

A. Yes, that's true.

Q. And then it talks about second -- in general, satisfactory quarry sources contain rocks that are even grained, homogenous, consistent with uniform quality throughout the site, and a consistent aggregate density. And then it goes on to talk about undesirable rock types.

So what -- I mean, I can read what it says, but what are they talking about here?

A. They are talking about you want to have a -- a good source is one that doesn't have different rock types that are mixed in with the source. So it's a source that maintains its same quality throughout the source. So there's lots of aggregate quarries, for example, that would have the rock layer above it is bad or there's a lens in there that is bad that we don't want to use in our high quality rock.

So if there was a quarry with very inconsistent material, it really wouldn't be suitable because each time you get aggregate from the quarry it could be containing something different.

Q. Right. And if you're approving an aggregate for use on the DSM, you want to know what you are approving; presumably it's got to be similar or the same, right?

A. Exactly.

Q. And then a quarrying plan, it says in the middle of the first paragraph:

"A quarrying plan must be devised so as to ensure a homogenous, uniform product."

So is that how they are going to get the homogeneous material that we've just discussed?

A. Yeah. So for example, if there was an overlayer that was inferior quality material, the quarrying plan would say you need to strip off all of that material first and keep it out of the way, and then this is the part of the quarry that we've approved and you need to

continue to only quarry that material for this use.

Q. I see. Okay. And then it says:

"Since the early 1990s it's been a condition of approval of new sources that the aggregate maintain an average --"

Sorry, when I duck it's because I'm trying to get around my camera.

"-- a PSV of less than 50, quartzite excepted, with no value less than 48 and an AAV of 6.0 or less."

So PSV, that's polished stone value, right?

A. Yes, it is.

Q. And AAV is aggregate abrasion value?

A. Yes.

Q. And do you know where those particular thresholds were derived from, those numbers?

A. Well, actually I don't

know where they were derived from. I know the tests -- if I could -- well, I don't even want to speculate. But I know that the traditional way they derive a value for a test method is that they have a huge wall of aggregate types in the soils and aggregate section, and each one of them, they would know what the PSV is of that particular rock source, what the AAV is, and they would compare it against field performance.

That's -- I know that's what they did for other tests like the Micro-Deval abrasion which came on while I was there, so I witnessed that that is what they did for that. So I'm speculating that that's what they would have done for the PSV AAV.

Q. And the Micro-Deval abrasion, is that the AAV test that you're talking about?

A. No, sorry, the Micro-Deval abrasion is one of our tests that we use for aggregate quality. It's probably our most used test. And that was something that we introduced in the late 90s, early 2000s, I think.

And it abrades the aggregates in a large jar, but the way they set the

specification limits, like the limits, was by looking at all the different aggregate types, plotting them all and looking at field performance to see how they performed in the field. So I'm guessing that that's -- that was their process for how do they set a spec limit.

Q. And I see the Micro-Deval isn't listed here then.

A. Right.

Q. Even though it was I think you said in the late 90s, nonetheless that was a test that was done for DSM inclusion. Did I understand you correctly?

A. Yeah, so there's a number different tests for DSM inclusion and -- but that is a test that would apply to all of the aggregates, not just the surface course. So it would apply to all of the aggregates.

Q. I understand. Thank you. Then it says in the second paragraph:

"MTO normally requires a 500-metre pavement test section using the new aggregate, and the aggregate producer is responsible for

arranging for construction of the test section. The pavement is tested for frictional characteristics with the brake-force trailer for two years before the material will be considered for inclusion on the approved list. Inspection and skid testing will take place over the life of the test section."

So this is, I understand, testing with the MTO's ASTM brake-force trailer, also known has a skid tester?

A. Yes, it is.

Q. And it's not mentioned here, but I understand there's also a control section is also tested at the same time typically; is that right?

A. Well, so that's -- yeah, I guess I see what you're saying. So normally if you've got a 500-metre pavement test section, what that means is that the rest of the job is using another already pre-qualified aggregate, right. So you've got a new aggregate, the contractor

finds a test section for you and you say, okay, this is a suitable test section. The rest of the job is going to be another aggregate. So that's automatically a control.

Q. Right. Because it's already been pre-qualified, and so the test -- the new applied for aggregate is being tested against the already approved aggregate, but -- but the testing can occur at or around the same time and under the same conditions; is that right?

A. Yeah, if you were driving out to the site you would test everything at the same time.

Q. Am I correct that typically the ASTM skid tester is operated at the posted speed?

A. So I don't know if they have changed it now. We had a long debate about whether it should be tested according to the ASTM standard, the American standard testing materials standard, which is to test at 40 miles per hour. MTO traditionally tested at the posted speed, and that was thought to be, you know, the conservative approach because traffic is going at the posted speed, not at 40 miles per hour.

Q. Right. And it's conservative why?

A. Well, 40 miles per hour is slower, so if you are testing at a slower speed, the friction number will be higher, for one.

And the other consideration, by the way, was safety for the operator. So we are mostly looking at pre-qualifying our high volume, high-speed freeways, and the operator could not go out there at 40 miles per hour. So it was a bit of that as well, safety for the operator.

Q. Right. I mean, the alternative is to shut down the lanes on which they are testing, is the only other way you can do it at the ASTM stipulated speed?

A. That's right.

Q. And sorry, then your point was that at a higher speed, say it's 100 on a 400 series highway, that that's going to come up with a lower friction number than if tested at 64 or 65 kilometres an hour which is the ASTM standard?

A. Yes.

Q. And then in the last paragraph, MTO staff visit each source on a yearly basis and take samples for testing, and in addition, quality assurance samples of material used on contracts are obtained for testing. So the first sentence I take it is still referring to the quarries; is that right?

A. Yeah. I mean, I think this is something that we don't do anymore, certainly not a yearly basis, and that would just be the logistics of getting approvals to travel, for example, or -- I don't know. To be honest, you would have to ask them if they still do this. My thought is that they probably still don't do this on a yearly basis.

Q. And there is someone we can talk to about that, but at the time I take it that that was the practice, at the time this was written?

A. Yeah, and I know that when I worked there we would go on a fantastic tour of all -- like go and visit all these sources, take samples, and take them back to the lab.

Q. Sorry, when you were

there, do you mean in --

A. When I worked in soils and aggregates section.

Q. And that was back in -- I guess I should have taken you to that. I'm just looking back. 1995 to 2000 you worked in the -- you were a geologic engineer in the soils and aggregate section according to your CV?

A. Yeah. So all my knowledge about their processes is from 1995 to 2000. So it was a while ago, but it was a fun experience. I enjoyed it.

Q. To be fair, that's your insider knowledge. You did have soils and aggregates and Mr. Rogers and Mr. Senior reporting to you when you were I guess -- sorry, Mr. Senior when you were the head of MERO, right?

A. Yeah, Mr. Rogers did not report to me. I reported to him.

Q. Right. If we could go to the paper itself. This is MTO 18621. This is the paper we were just speaking of.

And, Registrar, if we could go to image 8.

And figure 5 is a map which

indicates the simplified map of geology of southern Ontario showing distribution of approved sources of skid-resistant aggregate. It's a bit of an old school map, but could you just describe what this is showing.

A. Yeah, so this is describing basically the Canadian Shield is the ones that say aggregates with good skid-resistant property. So we always used to say, like, draw a line across the province from Penetanguishene along Highway 7, you know, and those are the really good, durable materials, igneous, metamorphic rocks that are good sources of aggregate.

And then unfortunately for all of us in southern Ontario, the aggregate was local, limestones, dolostones, material that is very soft. And so obviously traditionally roads in southern Ontario were built with the local aggregates which was a softer material, limestones, that had poor skid resistance.

So that's why we developed this process of taking the aggregates with good skid resistance and transporting them down to the areas in southern Ontario that needed more skid

resistance.

Q. Okay. Thank you, Registrar. You can take that down.

So that's just what I would call the front end approach. Is there anything that we've missed, do you think, material on the front end approach to the testing and pre-qualification of aggregates?

A. Well, I mean, I think the idea would be that this was, I don't know, like, the more knowledgeable approach of what was being used in our roadway surfaces. And a back end approach, which I'm sure we're about to talk about, instead it was we will just let the contractor build the road, and then at the end of the -- when it's constructed, we will go out there and evaluate it and if it meets our requirements at this point in time or several other points in time to be determined, then it's acceptable.

But the knowledge about what was actually used in the road and how it was built, that oversight during construction, et cetera, was missing from that back end approach.

Q. So there again you're talking about warranty contracts and performance

specifications in using a friction number; is that right? When you're talking about leave it to the contractor, is that what you're talking about?

A. Yes.

Q. So we'll get to that. Before we get to that, I want to talk about even under the approach using the DSM about following construction of a highway what the MTO's approach has been over time. How are issues that are raised with potential friction problems and so forth dealt with traditionally and so forth.

So if we could put aside the performance specification stuff for a minute and talk about -- to this first.

So after it's been constructed, it's been used, whether -- you know, used the DSM surface course aggregates, and then what? What happens? How are friction issues dealt with?

A. So normally we expect the pavement to perform well because we've had the boots on the ground to make sure it was built properly and the right materials were used, and we do a lot of sampling and testing during construction as well. So the assumption is that

we've got good quality materials that will be performing well.

We also have, though, in the regional geotechnical sections and in our regional maintenance groups, we have eyes on the road. So we have pavement evaluation officers in the geotech section that go out annually and take a look at the network, and this is for maintenance programming reasons. So for example, they will say this road is performing really well. This road is starting to show some signs of deterioration, and they work as a team to try and program when that pavement will be repaired in the future.

So there's eyes on the ground from the maintenance folks as well who will have that sort of -- they are out on the street 24/7. I know now because they work for me. They are amazing. So they are out on the street, and they would be able to also raise any concerns that they had with us.

So we have multiple eyes on the ground. If there was to be some kind of issue, then that would be reported into the head for investigation.

Q. The head of the?

A. Well, usually head of geotech in the region, but then the -- if the head of geotech thought -- because you were talking about friction, if the head of geotech thought, okay, this seems like something we would like to investigate from a friction point of view, they would contact the pavements and foundations section.

Q. Okay. So if understood you correctly, typically it's a request -- if some issue about a potential friction problem issue has been identified, that would be sources from the region who would bring it to the central office, to pavements and foundations; is that right?

A. That's right.

Q. Okay. And if we could go to images 11 and 12. And it's on this topic. This is paragraph 20 in the image on the left, a November 4, 2004 presentation slide deck by Guy Cautillo who was the senior manager of MERO at the time in the highway standards branch, provincial highway management division, titled "Pavement Friction at MTO," and described a number of practices around friction testing in this memo.

And there's a reference in the bottom of the left-hand image to MTO practice, in the first bullet, talking about:

"Friction testing routinely carried out to evaluate new aggregate test sections or when the surface of the new pavement or new pavement technology needs evaluation."

And then second one:

"Regions also request skid resistance testing in high collision locations where lack of friction is suspected."

So could you describe -- that's one, but can you describe sort of the circumstances where the regions would be requesting friction testing on the pavements and foundation section.

A. Sure. So for example, I can think of a couple of examples. One example would be the pavement seems to be flushing. That's when the asphalt cement, the black glue that holds the pavement together, maybe there's too much of it in the pavement and it starts to

bleed through to the surface and now the concern is that the aggregates themselves aren't able to provide that skid resistance.

So that's probably our most frequent request. We think this pavement is flushing. Can you come out and send the friction trailer. So that's probably the number one.

Other requests. I can think of one that is a common one is we have like a high-speed ramp freeway to freeway. So people are driving along freeway at a high speed and then they're negotiating a ramp to another freeway at a high speed and there is a lot of collision there. And so, you know, can you come out and check the friction, the friction. In that particular case, the one I'm thinking of always turned out to be very, very good; it's just that it was too difficult for people to navigate that curve at a very high speed. And that is why we post our curves at a much lower speed.

Other things. You know, there might be, for example, some higher than expected collisions at an intersection, and could you go out and investigate the friction to see if the friction is a contributing factor to these

collisions.

We -- concrete pavement, we had challenges with our concrete pavement. Concrete pavement actually uses limestone aggregate in it. So one of the -- as I mentioned, limestone aggregate is one of the softer materials that polish readily, so the concrete pavements have this aggregate in it. And they also last a very long time. So they are supposed to last 30 years, 40 years, 50 years. So that's a lot of traffic on this aggregate and on the concrete surface.

So we have done a lot of work investigating concrete pavements that have polished over time, and so, for example, the 401 is a good example that used to be -- I think when I started at the Ministry the 401 through Toronto was concrete, and now it's all asphalt because it was resurfaced.

Highways -- another one, you know, I can give examples where the highway was built in the late 60s and by the time it makes it to the 90s or 2000s that's a lot of traffic on the concrete surface. Send out the friction trailer, find that, yes, the friction numbers are low and

that could be contributing to the collisions.

Q. Okay. And at the top of the second image there, the first bullet says:

"Regional request for service internally with no spare capacity."

That's the skid trailer that you're talking about, right?

A. Yeah, we had one skid trailer and one operator for the whole province.

Q. Right. And that was Frank Marciello until 2015; is that right?

A. Yes. Yeah, no, it was Frank Marciello. I was just wrapping my head around when it was that he left. 2015.

Q. Does that sound about right?

A. Yes, it does.

Q. The request comes into the pavements and foundations section and is it the -- who makes the decision that the testing will take place once the request comes in? Is that the head of pavements and foundations, whoever that is at the time?

A. Yeah, usually the --

either the senior pavement evaluation -- no, sorry, the senior pavement design engineer and the head would be the ones that would receive the call, and there would be a discussion about sending out the friction trailer, yes.

Q. And am I correct that Mr. Marciello, who was the operator of the skid trailer, reported to the head of pavements and foundations?

A. Yes.

Q. Similarly, am I correct that requests from -- for testing -- the type of testing that we discussed with respect to DSM application evaluation, that those came from soils and aggregates section to the pavements and foundations head; is that right?

A. Yes, it is.

Q. You can take that down, thank you.

What about municipalities? Do municipalities sometimes make requests to the MTO to conduct friction testing?

A. They sometimes do, yes.

Q. Is that a common thing or infrequent in your experience?

A. I think it's infrequent.

Q. How does the MTO decide whether to carry out the requested testing for a municipality or not?

A. I think it would depend on availability of the operator, location of the municipality. So, for example, if the operator -- one operator in the whole province was very busy, we wouldn't have the capacity to do that, but we would recommend other companies to them that could do the testing.

And yeah, so basically if it was a local municipality that was like a day trip, no more time than that, and we could fit it in, we would do it.

Q. But it might be a different situation again depending on the capacity at that point in time or the location of the request?

A. Yes, yes.

Q. Was there any written policy respecting friction testing requests by municipalities?

A. Not that I'm aware of. I know there was a general I guess discussion around

we don't really have the resources to support the municipalities too. It's kind of a general theme. We used to be a much larger ministry, you know, with way more staff, so I think it was a general theme that we didn't really have the resources to support municipalities.

Q. And when you're talking about used to be, if we're placing in time in the aughts, the first decade of the 2000s, are you talking about then as compared to at some point in the 90s?

A. Oh --

(Speaker overlap)

Q. Or more recently -- tell me what timeframe you're talking about?

A. Well, you know what, it's every year, isn't it? There was a massive downsizing in the mid to late 90s that everybody is well aware of, I'm sure, and still talks about. But, you know, over the years it's certainly been an aim to try and reduce the number of staff you have, and I think it's annual discussion in government, how can do you do more with less.

Q. And was there a typical way in which municipal requests for friction

testing would be handled as to how it would come in, where the request would go to once it did?

A. I don't know that there would be. I think it would be more like if the municipality had a contact at the MTO. So for example, if they had worked with the bituminous section on something, then they would know the bituminous section guy and they would route it through that person.

Q. I see. Or if it was a particular region, it could come through whoever they have been dealing with --

A. Absolutely. If it's in the Kingston area, because again Kingston area is all limestone, that might be something you would reach out to the local geotechnical section about and they would put them in touch with us in Toronto.

Q. And the "us" is the pavements and foundations, I take it?

A. Pavements and foundations, yes.

Q. And what about the results? Typically would the results of the friction testing if conducted for a municipality,

would those be provided to the municipality that requested it?

A. Yes, they would.

Q. And was there any particular practice about interpreting the results for the municipality about the results beyond providing the raw information?

A. Well, I would say that we just gave them the raw data and we didn't do any report writing. We're not consultants, right, so we weren't providing them with a consultant assessment; we would just give them the results.

Q. And if the results were troubling, that they result -- you know, that they could indicate potential safety concerns, what about in that instance? Is that --

A. I think we would alert them to that, yes.

Q. Right. And beyond sharing friction test results with the municipalities that requested testing, what is the MTO's practice about sharing friction test results otherwise? And I guess there's a few categories here.

First with the applicants, for

inclusion of their aggregates on the DSM, would they typically be provided -- the applicants be provided with the skid test results.

A. I don't think so, not in what I've seen. So what I've seen is that they would get a standard line that said, you know, after two years of testing it shows satisfactory performance in the field.

Q. And what about paving contractors, if a road that they constructed had been skid tested, would the results be shared with them typically?

A. Yeah. So if it was the type of contract that required friction testing, we would have to share it with the contractor, so absolutely we would, yes.

Q. Okay. What if not? If it's just like the example you described where some concern was raised by the region and the testing was questioned, what about in those circumstances?

A. I don't know that we would unless -- so the example that -- I don't know that we would. But I'm thinking that if the example we gave was the flushing of the material,

so you've got this very black oily surface, we've gone out and friction tested it, you know, we got really, really low numbers, then -- and we said to the contractor, you're going to have to remove that surface, it's bleeding and flushing everywhere, I'm guessing that if they questioned it and were saying, you know, we don't want it, we're not going to do it, that we may have shared it with them. But I -- like, that's a guess. I haven't personally shared that way.

Q. Not a typical practice in any event? To share it --

A. That would be a case where you could share it if the contractor was saying, well, I'm not going to do anything about that, you know.

Q. And again was there any formal policy governing practices about sharing of friction test results outside of when it's actually a performance requirement in a contract?

A. I have not seen any published policy on that, no.

Q. I just want to move over to MTO practices about the results and interpretation of skid test results. If we could

go to -- go directly to the documents. MTO 25395, please.

This is an e-mail exchange. At the top it's April 21st, 2009. It's from Tom Klement to Chris Raymond, copied to you and Frank Marciello. See at the top. And -- thank you. Take that down.

And it's about a presentation about the MTO's friction testing processes to those who manage the Highway 407 is the way I understand it; is that correct?

A. Yes.

Q. And at that time in April 2009, you were the head of pavements and foundations, correct?

A. Yes, I was.

Q. And so, yeah, there's the e-mail from Tom Clement at the top. Within that e-mail there's an imbedded e-mail from you that -- sort of halfway down where it says "hi Tom." Do you see that?

A. Yep.

Q. And if you could expand --

A. Expand it. It's very

small.

Q. We're going to blow it up. Is that better?

A. Yeah, perfect. Thank you.

Q. And I know you've reviewed this, but where it says "what Doug and I agreed to is as follows," do you know who Doug is there?

A. Doug Coulter I think is his name. Oh, gosh, my brain has stopped here. Doug was responsible for the concessions group that looked after the MTO liaison with the 407 ETR.

Q. So he was an MTO person?

A. Yes.

Q. And then you are saying "I propose a presentation as follows." And then the bullet is "background on our friction testing equipment." Next bullet:

"Our practice is, for example, if friction is greater than 30, no problem. If under 30, we investigate. If under 25 (question marked), we react."

(As read)

I don't want to get into a detailed discussion about the Highway 407 and arrangements with it, but it's just to use this as a springboard to talk about friction numbers and the MTO's use of them and the results from its friction testing.

So when you refer to the numbers 30 and 25 here, what is it that you're speaking of?

A. So again the 407 being a performance contract, right, with a number in there, so this is about talking about how do we manage friction in -- at the Ministry of Transportation, because they are responsible for managing friction on the 407. That's their role as the -- well, I guess VC of the 407.

Anyway, so this was literally spit-balling, you know, throwing a few ideas into a presentation, and it was basically saying, well, you know, if the friction is sturdy, you know, that's what we consider acceptable, satisfactory, whatever word you want to use.

And then at some point in time -- and that's why there is a question mark --

at some point in time we would want to investigate, and if we found there was an issue, then we would want to react, right.

And so in the middle is an area where you would need to understand the highway itself, if there were any issues on it, et cetera. I guess that's what investigate means. Like what type of friction demand is there on the roadway, you know, what are the aspects of the roadway that would help you understand what the friction need on the roadway was.

Q. So whole bunch of things in there. So just come back to the first part of it.

If I have understood you correctly, if it's over 30, you're saying that you said it's acceptable or okay, whatever word that you want to use. And that's FN30, right, which is the number obtained by the skid tester that the MTO used and uses to test friction on its highways at a posted speed, correct?

A. Correct.

Q. And then you referred to it as the midpoint and the looking into things, the investigation. That's if it's under FN30,

right?

A. Yes, that's where -- if the number -- if the average friction number was less than 30, then that might be an opportunity to investigate the roadway and see if there were any issues.

Now, understanding that a really important point here is that this -- we're talking about having something brought to our attention, right, like we have some concerns about this roadway. That's how we would use these numbers, right. We have some concerns about this roadway. Can you do some friction testing. You know, if the numbers came back 30 or above, we would say all those are satisfactory numbers. You know, if they came back significantly lower -- to be fair, most of the materials say less than 20, so to be fair, the question mark is there for a reason. And if it's less than 20, then we're concerned.

And then there's this area in the middle where we would need to understand from an engineering perspective all the factors about the roadway, like, what are the friction demands, you know, are there multiple stops and starts,

what are the geometrics like, what is the roadside I would say hazard, like, for example, is there giant rock cuts that if you accidentally went off the road there is a giant rock cut, or is it a nice farmer's field that you could just steer and get back on the highway. How wide is the shoulder. Like, so many aspects of what you would look into. That's what --

Q. So if it's under 30, what you are describing is that's a number which then you look at all of these different -- or some or all of these factors to see whether or not -- if I understood you correctly -- whether or not that friction number could pose a problem in the particular circumstances?

A. Yeah, whether it could be contributing, yes.

Q. Right. And so again, so there's road geometry is -- and so horizontal curves, vertical curves, grades, sight lines, those sorts of things?

A. Correct.

Q. And you mentioned shoulder width, lane width, all sorts of things like that.

A. Yeah, what are you going to hit if you did go off the roadway. For example, like I said, a rock cut or, you know, or fallen off a cliff, or is it just a nice broad grassy side that you just maybe just drift off into the field kind of thing.

Q. And is one of the things they might look at also the accident rates, if there's a history of collisions? Is that --

A. That's likely why -- one of the reasons they would come to us, right.

Q. In the first place?

A. In the first place to say, well, we're concerned about the friction, that might be one of the reasons.

Q. And looking for areas of aggregate polishing potentially, actually taking a visual look at it?

A. Yeah, well, certainly with our concrete pavements, you know, you could see kind of a shiny polishing look to them that told us that we had a polishing issue, yeah. Sorry, go ahead.

Q. Go ahead.

A. I was going say the 427

example that is right there was an example of an old concrete pavement, one that was built in the late 60s. In 2004 it's had traffic on it since the late 60s, early 70s, and so that's a lot of traffic wearing on the surface. Yeah.

Q. And each one of those, and I'll get to that, are examples of remediation methods that were taken following an investigation; is that right?

A. Yes.

Q. Okay. Now, how would you then describe -- you used a couple of words to describe FN30. What would you use to describe it?

A. Well, I think FN30 is what we would consider satisfactory.

Q. And if it's below FN30 does that mean it's unsatisfactory, or it depends based on the investigation?

A. Yeah, I think that's exactly right. So it depends (garbled audio) exactly right. So what are the friction demand needs for the roadway. If the roadway has, you know, lots of really, like, friction demand, like, really high speed down a hill and, I don't know, those kind friction demands.

So what friction -- the friction demand is all about the stopping distance, right. So the faster you're going, it impacts, like, how quickly you can stop basically. So looking at what is the friction demand is like what are the needs to stop.

So if it's a straightaway -- like, another example would be if it's a nice straightaway where nobody has to stop and start, nobody has to make decisions, there isn't any incoming, offcoming traffic, then, you know, the friction number is satisfactory for quite a long -- like, a lot of numbers would be very satisfactory. It's when you have a roadway that needs that friction demand where people need to apply the brakes that it comes into play.

Q. And then, as we just touched on, out of an investigation it may be the result that some remedial action is required, or not, depending on the circumstances; is that right?

A. Yes.

Q. These examples here that you gave, one is resurfacing is the first bullet. That's one way of dealing with if there's a

friction issue is identified, you can resurface, right?

A. Yep. In fact, that was the example I gave of the 401. Like, it was concrete pavement and they paved over it with asphalt.

Q. And then the 427 you described as diamond ground in or about 2004 I take the question mark as meaning?

A. Yeah, all of this is -- like I said, this is literally me, you know, brain dump, da da da da, send, right. But 427, again built in the late 60s, early 70s, and I can tell you this is -- I remember this job very well because people were phoning the ministry to thank us.

So we went out there and diamond ground the pavement, and that was improving the friction but it also improves the ride quality. So suddenly you've got a nice smooth ride, and it also really reduces the noise. So we were actually getting the public calling us to say thank you, which is rare.

Q. What is diamond grinding?

A. So it's a bunch of

diamond-bladed saws, and so you mount it on a large lane-width roller and it just grinds off the surface. So it's removing that polished surface down to a certain depth and then giving you a brand new, fresh surface, but it also removes any humps and bumps and dips and things as well. So you're getting just not a new texture in the surface, but also a smoother ride and a quieter pavement.

Q. The next one refers to skid abrading?

A. Yes, so skid abrading is you use these ball bearings, and it's basically a machine that shoots all these ball bearings at the surface and roughens the surface back up.

So Highway 115, again a concrete pavement that had polished and therefore decided to try skid abrading, which is a big machine that shoots down all these little ball bearings on the pavement and then vacuums them all up behind, but it gives a new texture to surface, so roughens it up for improving skid.

Q. And then there is micromilling is the next one referring to at --

A. So here's an example.

Highway 401 Harwood is an example where -- where a contractor -- there was a contract delay. So we had paved the base, the bottom course of asphalt, the middle course of asphalt, but we hadn't yet put on the surface course. And the surface course is where the high quality skid-resistant aggregate is. But this middle course was -- because of just contract delays and, you know, got ready to pave with the surface course, this was left open to traffic and very, very quickly polished, because the aggregate was not required to be a friction-resistant aggregate.

So over the course of the summer, the aggregate polished up significantly, and by the fall we had a condition where again the pavement was shiny and very, very polished.

So that's an example of when you use a limestone aggregate on a high traffic volume freeway, it polished within months. And so we had to go out there -- knowing we were going into winter, we had to go out there and micromill. And micromilling is like a bunch of -- it's like milling teeth on a machine, sort of -- they look like teeth, so that's why they call them that, and it sort of microgrinds the surface, so you'll get

a rough pattern again. So it's restoring the roughness of the surface.

Q. Now, you describe this as sort of a -- this e-mail as sort of a brain dump and that you are putting together -- you are just proposing a presentation. I understand all that.

That said, with respect to the practices more generally that you described as opposed to the specifics here of the highways and dates and so forth, but the practices that you've described with respect to the use of the FN friction number or skid number of 30 or under 30, does that nonetheless describe the practices, and as you've described them today, that's the MTO's approach generally speaking?

A. So in all of these cases it would have been identified to us as an issue from the people in the field.

Another example, the one below that is the Highway 401 Windsor. That was a really interesting example because we used an FC1, which meant that just the coarse aggregate in the mix was from this designated surface -- designated sources of materials list.

We should have used an FC2,

which meant -- means that both the coarse aggregate and the fine aggregate in the asphalt are both on this designated sources list. But coming up in the near future was a construction project, and so the thought was we will be able to use the FC1 mix, it will be cheaper, because we know it will probably give us five years' performance. And then when we redo the whole road we'll use the FC2. But again because it only had one coarse aggregate only that was on the DSM, it polished again.

So these are examples of, you know, honestly -- these ones were sort of like the nonroutine ones. Right. Like, I described that flashing would be kind of the routine. This is more like the interesting projects.

Q. And fair enough. So you're saying, though, that number one, that typically speaking these -- the testing occurs because the regions have some concern and then have brought it forward and requested testing. That's the first part, right?

A. Exactly.

Q. And that describes the typical practice --

A. Yes.

Q. -- for a long time, right? And then the second part is how you then apply the test results purely in those circumstances where they brought these forward. And I just want to be clear, though, that when you talk about the brain dump, you are not saying that it's inaccurately describing the use of FN30 and below in the way you've described it. Is that --

A. That's right.

Q. All right. And is there any written policy or directive describing the MTO's approach to FN30 that we've just been discussing?

A. Not that I'm aware of.

Q. And nothing published in that respect?

A. Nope.

Q. Now, if you could take that down, Registrar, but leave the document up.

In Mr. Klement's e-mail -- and Mr. Klement, he was a research engineer in the MTO, correct?

A. Yes.

Q. And I'll be asking you

and some others about the early age low friction issue with SMA, but I just want to highlight one thing there.

The last two paragraphs that start -- of the first part of the e-mail, Registrar, that starts "SMA implementation was paused because." Yeah.

So this is in 2009. He's describing something in the past at this point with an SMA implementation was still paused, and we'll talk about that.

But then he indicates:

"I suggest you do not even mention SMA unless the 407 has SMA segment. It is too controversial. It would support an argument that FN equals 30, or close to it, is not universally upheld by the MTO, considering uncertain SMA segments on high speed, high volume freeways we have lived width," quotes, "for relatively long periods with FNs well below 30." (As read)

Is that accurate, that FN30 is something that is not -- has not been universally applied by the MTO?

A. So I think this exactly goes to what I was talking about. So it would depend on the actual facility itself and an evaluation of all of those other causative factors.

So if there's no problem with the road, then there's no problem with the road, right. So if we've got a highway that's performing well, we don't have any concerns or issues, then, you know, living with the FN below 30, there's no issues.

I think we would see it as being even more irresponsible to actually address or, you know, treat pavements as soon as it went below 30 when there is absolutely nothing wrong with the pavement. It's performing well. It's safe. There's no concerns brought forward.

And so that whole point of what the highway -- what's going on on the highway is the most important feature, not this number. Like, if something isn't satisfactory at 30 and, you know, failed and removed at 29, that just

doesn't make any sense, right. So there has to be this middle area where we're looking at it from a knowledgeable perspective on how that particular highway is performing.

Q. And we've heard that described as an intervention level is something where there is a requirement of intervening and taking some sort of action, and you're saying it's not that. The FN30 is not that?

A. Exactly. We would never have said that that is the intervention level. And, you know, I think in your materials that were produced for this, you'll see over and over again that less than 20, less than 20 would be something that would be of concern.

Q. And you alluded to that earlier. You were talking about instances where just on its face something at less than 20 would be considered perhaps alarming, very much a concern if it got down to that level. Is that what you're talking about?

A. Yeah. I don't know if I would use the word "alarming," but certainly if it was less than 20 is where we started to say, okay, this could be of concern, the friction number less

than 20 is a concern, yeah.

Q. Potentially in and of itself?

A. Yeah. Again, depending on the highway, there may be no issues, but certainly most our cases are people bringing these concerns forward to us, and if it was less than 20, we would be saying, wow, it's less than 20 so it is a contributing factor.

Q. And then -- if you take that down, Registrar.

In your embedded e-mail here, you briefly mentioned it, that the under 25 question mark, we react. How does that play into it?

A. Well, that's -- I'm thinking that is me not remembering what it was.

Q. That's why the question mark?

A. Yes.

Q. Okay. And once the skid testing is conducted -- there's a request comes from a region typically, the testing takes place and the results are provided to the requesting region, whoever that was, who makes a decision

about what, if any, measures to take at that point?

A. Well, you know, if it's a construction project, at the end of the day we can only have a discussion about it, but the MTO people that are in the region are the ones that are responsible for that construction project. So all we can do is have a conversation about it and, you know, we can't actually direct them to do things. We can make recommendations.

Q. And, sorry, what about in the other instance where this is an in-service pavement, the request has come in, and so the results go back to them. Is it the same thing, you make recommendations to the region?

A. Yes. Yes. We would have no say in a regional contract. Usually they would be asking for --

(Speaker overlap)

A. -- can you send the friction trailer, we're concerned about friction. They would actually be looking for some thoughts on --

Q. On whether it's an issue, what these results mean, and advice in that

regard?

A. Yeah.

Q. Okay. And in the paper that we were talking about earlier, the 2004 paper titled "Pavement Surface Friction on Ontario Highways" that we discussed that Mr. Rogers, Mr. Gorman, you, and Mr. Marciello were listed as the co-authors of, in that paper there is no express mention of FN30 or any other threshold, guideline, expectation, however you want to describe it, but in that there's a reference in one of the footnotes to a 1982 paper by two individuals named Kamel and Gartshore titled "Ontario's Wet Pavement Accident Reduction Program."

And is that -- I can take you to it, but it's only just referenced in the paper that you wrote with Mr. Rogers, Mr. Gorman, Mr. Marciello. Is that a paper that you had -- that you recall or had recalled at the time of this paper being written?

A. No, but I have since read it.

Q. Okay. So is it something that your -- a paper that you were not aware of

prior to these proceedings, put it that way?

A. Yeah.

Q. Or you just forgot about it?

A. No, I mean, I didn't know about it. It was from 1982. I didn't start till 1991. I wasn't aware of the paper.

Q. And so if we could go to RHV610. This is the paper, and I absolutely appreciate what you just said about your knowledge of it at the time.

But if we could go to image 5. Towards the bottom there, yeah. Towards the bottom there, if you could expand it, Registrar, where it says "pavement skid resistance." And it refers in the first paragraph, expanded there, to "pavement skid resistance is evaluated using the MTC brake-force trailer," and then:

"Skid resistance is evaluated by considering the FN, the differences between desirable and existing friction levels. The tentative guidelines shown in table 1 are used for this purpose." (As read)

And then if you could go to image 8, table 1. So this is the table that's referred to. Now, appreciating what you said about not having a time and awareness of this paper, nonetheless there seems to be a similarity in the numbers that are referred to; is that fair?

A. Yes, that's fair.

Q. And --

A. But this is tentative guidelines in a research paper.

Q. Right. No, and I'm just wondering how, if at all, that filtered down, if you have any knowledge about how it related to the practices that you've just described?

A. I hadn't read the paper that I'm aware or that I remember, but I did read it with interest because later on, Tom Klement's work -- Tom Klement was working on something that seems to be familiar.

Q. So you read it with interest in the context of this proceeding, do you mean, or going back --

A. Yeah.

Q. Okay. In the context of this proceeding. Okay. If I understood you

correctly, this wasn't something that informed -- despite the fact you can recognize the similarities, that's not something that informed your practices or knowledge directly; is that fair?

A. Right, yes.

Q. Okay.

A. I mean, the background that I understood was the geometric design guide stopping distances is what people talked about. So they would say the geometric design guide FN30 for 100 kilometres per hour design speed. That's what I recall.

Q. That was -- your understanding was that that is where the FN30 as a the desirable number came from was starting from the -- what was in the MTO's geometric design guide for design?

A. Yes.

Q. And assumed friction values and design?

A. Yes.

Q. You can take that down, Registrar. Thank you.

And that's the part of the

calculation, the coefficient of friction that's used is part of the calculation that gets you to the stopping distance at a particular design speed. Does that accord with your understanding?

A. Yes.

Q. And in terms of your knowledge of it, you have been at the MTO for a long time, is that something that was passed down? Is that something that was understood? How would you describe the passing on of that knowledge and how you came to understand that?

A. Yeah, no, I think that that was just -- yeah, you're right, like, passing knowledge on it from the geometric design guide. And I'm not a -- as you know, I'm not a highway design engineer, so geometrics of a highway, et cetera, that's not my expertise.

Q. I understand that.

You can take that down as well, Registrar, thank you.

Can you describe the MTO's practices, what they were and if it at all changed over time, with respect to sharing or not sharing. It's the approach that you described to FN30 and when to investigate and so forth, however you want

to characterize it. Was that something that was widely disseminated or no?

A. So I would say when people ask me about FN30, because that is something that somebody might say, what about FN30, then I would give them exactly the same sort of information that I just provided. It's not about a number. It's about the friction demand on the particular facility that you're on. It's about how is the traffic flowing, what speed are they flowing at. Are they stopping and starting. Are they weaving, interacting with each other. How is the highway itself. Are there curves. Are there grades. Are there obstacles that you can hit on the side of the road.

It's comprehensive. It's not about a number that mysteriously you go from being good to bad. Like, it's just not like that. And I have explained that to people when they have asked me many times over the years.

Q. Do you mean when you're directly asked about that number?

A. Yeah.

Q. If we could go to overview document 4, images 128 to 129, please.

And this is paragraphs 308 to 309, which pertain to a June 23, 2011 media inquiry from -- and it's an e-mail exchange between you and then Mr. Kazmierowski, who I guess at the time was the manager of MERO, and you were the head of pavements at that time; is that right?

A. Yes.

Q. It's from -- it gives the e-mail address there in response to a Road Talk link, and he asked the question about:

"I would like to know if there are any publications that cover hot rolled asphalt compositions and friction coefficients for the hot rolled asphalts used in highways and roads in Ontario."

And then Mr. Raymond indicates internally with you and Mr. Kazmierowski that he'll work with you to prepare a response. And then he says:

"Noting that I am concerned with this type of judicial inquiry regarding frictional

assistance and safety of our highways surfaces, I would prefer we avoid any discussion of actual skid numbers/values/thresholds and keep the conversation on a more generic level. The sensitivity associated with this issue is high."

And then the response is paragraph 309 going onto the next page, which attaches a link to a couple publications, MTO's pavement and design and rehabilitation manual and Superpave and SMA guide and the skid resistance aggregates in Ontario paper, which is another paper from Mr. Rogers as a matter of fact. So he sends those to him, but it doesn't have any discussion of friction coefficients or friction numbers. And so is this reflective of the MTO's typical approach? It's a little different than I think what you just described to me if someone asked you directly about FN30.

A. Yeah, so in this particular case what he's concerned about is getting numbers out there that, you know, are

interpreted as meaning something when it's more than that, right.

So again exactly the same thing, like, if you have a published number, the concern is that people can point to a published number and say, you know, this is the reason that X, Y, Z, but in fact there's so many other factors that are associated. You know, we try to keep the focus discuss off the friction number and more into an engineering review of the roadway itself.

So to have a number out there that, you know, like I said, is kind of meaningless but could be looked at as being significant, when it's really meaningless unless you're taking that number in the context of the roadway itself.

Q. And so is it fair to say that typically the MTO would avoid communicating the FN30 number as a specific value, and -- in favour of more generic responses? Is that a fair assessment?

A. Yes, it is.

Q. Okay. In your experience, coming back to the testing and interpretation of results themselves, how does the

MTO determine if the FN30, whether we call it threshold or -- I'm not trying to come to a conclusion with that, but threshold or number, however you want to call it. If it's been reached, is it the average across the entire section of the highway being tested? Is it based on individual readings or done by lane as an average? What's -- and if it differs in -- depending on the circumstances. Could you discuss that.

A. Yeah. No, we look at the mean or the average of the data, so we would look at the particular section that we're investigating and determine what the mean was. Now, you know, one of the issues with the mean is that -- you know, I think you had mentioned this, how is the data distributed. So if the data is distributed like, you know, half above and half below the mean, so a standard or normal distribution of the data, then it makes sense to use the mean, 100 percent. So yes, we use the mean.

Q. You're talking about standard deviations in there? Is that....

A. I'm talking about -- no, I'm talking about distribution of the data. So,

for example, if the mean -- if the mean was 40, for example, and then the data was 35s and, you know, 40s and 45s, then -- and the mean -- the data was distributed normally, then you would say that that was representative of the data. If you had -- the first part of the section is, you know, like 20s and then the next part is 40s, you can't say, oh, well, the mean is 30, so it's okay. Right. So it's about how is the data distributed, like I guess a normalized or normalized data set rather than a skewed data set, she said. Do you know what I mean?

Q. I think I do. If I could come back to it. You know, if you're -- just, again, to use the FN30, if the first half of the tested section is 20 and the next half is 40, and it gets you an average of 30 based on what you've described, that would nonetheless -- you know, for the section that's half of the -- the tested section that's below 20 presumably would cause some concern and then trigger an investigation of at least that section to see what the issue is, and if there is any issue, what -- given rise by that; is that fair?

A. Yeah. You would look at

the data, and, you know, how it's distributed, and, again, if it was all distributed evenly, yes. If it was, you know, going low, low, low, low, high, high, high, high, then it's not normally distributed. So that would be -- you have a different -- you have a change in pavement type, for example. Like a good example would be hot mix patching. So, you know, that's where you have a piece of a highway that is deteriorating faster than another piece of the highway, and they go out and they put down a hot mix patch.

So that hot mix patch could be newer, and it could be, you know, really high friction, and then the rest of the pavement could be very old and have a low friction. You can't average it across that and say, therefore the friction is this. No, it's two distinct areas. Otherwise, yes, you would use the mean. That's what we always use, the mean.

Q. All right. And does it depend on the -- at all, what you've described, on the purpose of the testing? You know, there's the -- as we've described it, the front end and the back end. The back end being when a request has actually come in to test a particular stretch

of highway because some concern may have been identified versus the DSM application approach to it. Any difference in the way they are interpreted in those circumstances or is it the same --

A. I think every single case it would be interpreted by the engineer for that particular job. Like on a case-by-case basis for every data set that came in.

Q. If we could go to overview document 4, image 60. And I guess it's actually -- this is 60 and I guess 61. These are the -- no, let's make it 61 and 62, please.

And these are the October 16th, 2007 results. And I don't want to get into interpreting. I just want it so we have a visual of the way that the results -- that the skid tester that the MTO uses generates results and just have a look at it.

So maybe if we could use the first one. Expand that on page 61. There we go.

And so as I understand it reading these, it gives you the date, tells you the date of the testing, in this case October 16th, 2007. It tells you that it's --

that the direction is SBL 1. That's southbound lane 1; is that right?

A. Yes.

Q. And lane 1, that's the inside lane typically; is that right?

A. Yes.

Q. And lane -- and it moves out from there. Then lane 2 is the outside if it's a two-lane in that direction; is that right?

A. Yep, and if it's three lane, lane 3 is the outside lane, yes.

Q. Okay. And then on the site it tells you from where to where that the testing is taking place; is that right? Here the "CNR OH Structure to Greenhill Avenue in Hamilton"?

A. Yep.

Q. Giving you the limits of the testing?

A. That's right.

Q. And then temperature gives you -- there it's the temperature at the time of the testing, 12 degrees, and that's in centigrade as I understand it.

A. Yeah.

Q. Okay. And then we've got on the left-hand column there there's the distance. So it's given in kilometres, but getting from the starting of the testing to the end; is that right?

A. That's right, yeah.

Q. And then at each place where the testing takes place, where the locked -- where the locked wheel is applied, the brake is applied, it gives you the speed at that time of the testing, right?

A. Yes, it does.

Q. All right. And that's important, as you said, because the speed obviously impacts the friction number that's ultimately obtained, right?

A. Yes.

Q. And then it says "average friction number," and that's the number at each testing point, right?

A. Yes.

Q. Okay. And then the landmarks, saying what crossing street or crossing structure, railway tracks, for example, that you've got throughout the testing limits; is that

right?

A. Yes.

Q. Okay. And then on the right, it just gives some details about it. So here it's SMA; it gives the contract number and specifies unopened to traffic. And from what I've seen, that is a typical sort of approach. It says what's the surface course and often when it was -- when the pavement was placed, that sort of thing; is that right?

A. Yep.

Q. Is this a typical report? I appreciate that there's underlying data as well, but the typical report and chart that is generated from the ASTM skid tester used by the MTO?

A. Yes.

Q. And then at the bottom it's got the average speed and average FN, meaning the average friction number. So that's the averages of all the figures above, right?

A. Yes.

Q. And then the minimum and maximum and then standard deviation. And those are always given as well?

A. That's where it comes on

the report, yes.

Q. Okay. All right. You can take that down, Registrar. Thank you.

Commissioner, I'm going to move on to another topic which I can start or we could --

JUSTICE WILTON-SIEGEL: Why don't we take our break now, it's about that time. We'll come back in 15 minutes, will be 25 to 12:00.

MR. LEWIS: Thank you.

--- Recess taken at 11:21 a.m.

--- Upon resuming at 11:36 a.m.

MR. LEWIS: Back from break. May I proceed, Commissioner?

JUSTICE WILTON-SIEGEL: Please do.

BY MR. LEWIS:

Q. Ms. Lane, I just had a couple of questions from reviewing my notes before we move on to the other topic. One is one of the examples you gave from your e-mails with Mr. Klement was about remediation by way of diamond grinding, and we briefly talked about that. And the example that -- specific example

you were giving was for a concrete pavement. Is that also a diamond grinding remedial process that can be used for asphalt in your experience or no?

A. I know -- I'm sure that it can. I'm sure that it can. I'm not sure if I can recall anywhere we did use it. But just as an example, when you freshly pave a new highway or a new road and there's some bumps in it from the paving, they actually go out and diamond grind off those bumps to correct them right at the beginning so that you get a smoother ride. I'm not sure if it's the exact same equipment, but it's the similar thing.

Q. Okay. Thank you. And just on the skid testing generally, you described how regional requests and municipal requests for testing are made and dealt with. And then appreciating all the other variables that you described about road geometry and other issues that can go into evaluating the pavement and safety, is there any purpose for the MTO conducting skid testing in answer to those requests other than ultimately in relation to road safety issues?

A. Well, I guess not. I

mean, you've been asked -- because they've identified what they consider is a concern, you've been asked to go out there and measure the friction to see if that is what's contributing to the concern. So yes, it's about safety.

Q. Okay. And then skid testing -- I mean, you're right. They have raised it for a particular reason. Skid testing generally and friction testing, is there any ultimate purpose to it other than in relation to road safety?

A. I guess not. I mean, you're out there measuring the surface friction to see what the stopping distance -- as it relates to the stopping distance on the highway, so....

Q. Does it have anything -- is there any relationship between it and durability of the pavement?

A. Yes and no. I mean, no, the aggregates that tend to be giving the highest friction values are also more durable. So there is a relationship there, but we have lots of other tests that measure the durability of the aggregate like the Micro-Deval that I mentioned earlier.

Q. Right. And I get, like,

durability in the one sense is -- I mean, polished stone value, you are measuring the durability of the microtexture in relation to its frictional qualities, right?

A. True.

Q. Okay. So if I've understood you correctly, though, it's like there may be some relationship in the sense that the most -- the best frictional quality aggregates tend to be the ones that also are the most durable, but there's other tests that you use for the durability purpose?

A. Not quite. So you can have --

Q. No?

A. -- something that is -- no.

Q. Okay. Sorry.

A. So you can have something that's got very high friction but low durability, and we did have those as well. So something that MTO had used, steel slag aggregate, for example, that had high -- very high friction properties but didn't last very long on the road. So there could be aggregates that have very good friction

properties but low durability in terms of how they stay on the road. I'd give -- another example would be something that's very highly siliceous, meaning very --

Q. Sorry. Sinicious?

A. Sorry, siliceous, very rich in quartz --

Q. Okay.

A. -- that could be -- strippable, sorry. So what that means is that the asphalt cement doesn't stick to the aggregate itself very well. So even though it's very hard and would give you high friction numbers, it doesn't stay in the mix, so, you know, it would be a durability issue. So that's why we have all of those other tests that we do. Is it resistant to freeze-thaw, you know, those kind of other tests as well.

Q. Okay. So to come back again, not the purpose of the friction testing, skid testing for durability. That's not the purpose of those tests; is that right?

A. Correct.

Q. Okay.

A. That's right.

Q. And then on the steel slag, I won't go to it, I think I recall from the paper that we've already looked at, the 2004 paper, there's a reference to the MTO put an end to the use of steel slag in its projects in 1991; is that right? Am I remembering that correctly?

A. It could be. I don't know the date, but yes --

Q. Okay.

A. -- we stopped using steel slag. I thought it was later than that, but yeah.

Q. Okay. I don't want to get it wrong just since I raised it, and I was going from memory. So if we could go back, Registrar, hopefully I can pull it up. This is MTO 18621. Yeah, and image 8. And it's the bottom paragraph, if you could expand that, the last --

A. Yeah, you've got a good memory.

Q. It was just this morning we were looking at it, right? So is that -- that's where -- that was the reference I was referring to. Does that sound right, then?

A. Yeah, so we had trouble

with durability. So they see the pavements had a relatively short life. So even though we had good friction, they didn't last very long, and therefore we stopped using them.

Q. Okay. Thank you. You can take that down and the document as well, Registrar. Thank you.

So I would like to move on to a topic that you mentioned in passing and then I put you off, which is performance contracts, performance criteria, and the use of the friction number in relation to those kinds of contracts.

And, Commissioner, just for your reference, in overview document 4, paragraphs 392 to 455 set out in detail a debate on and discussion and application of friction number standards or specifications either in lieu of or in addition to DSM pre-approved aggregates from 2005 to 2015.

So this was a -- Ms. Lane, this was a long, long discussion and debate, right?

A. It was.

Q. Okay. And I'll take you in a minute to a presentation from March 2011

which is sort in the middle of it all, but -- to look at some specific stuff. But I wonder, could you describe the nature of this debate and what we're talking about in relation to performance-based contracts and performance criteria and so forth and its relationship to friction.

A. Yeah. So I think it all comes down to, as I mentioned, the sort of resource intensive -- the ministry downsizing over the years, year after year, and do we have enough resources to deliver our contracts in a traditional way. I think that is sort of the idea behind it. And our traditional way, as I mentioned, is to pre-qualify all these materials and, you know, have these lists of materials that we've evaluated and tested, and then putting out a contract where we provide oversight on the contract.

So we have people in the field that are, you know, making -- sampling the materials, testing it in the lab, making sure we got what we asked for, et cetera. So that's our traditional contracting model.

And so the idea was, how can

we move to one where -- we know that the contractors know how to build a road, so can we just put out a contract that says we need a new road, and it will be from this interchange to that interchange, and you give it to the contractor, and then the contractor is allowed to use any materials that they want, build it any way they want. The advantage being that if they had something new or innovative that they wanted to try, they could do that. The disadvantage in my mind, understanding that I'm from the materials, engineering and research office, was that the ministry wasn't heavily involved in that contract. So we weren't pre-qualifying the materials. We weren't providing the oversight. We weren't doing sampling and testing. And then the -- at the end of the day the contractor goes out and builds us a road.

And so from my perspective I was, like, well, what's in the road. Now, you showed that map of aggregates in Ontario, and you can see all of those good quality sources are in the north, and most of our major freeways and roads are in the south. And so it costs a lot of money to transport the aggregate from the north to

the south, so my thought was why would the contractor use these pre-qualified excellent materials when they could just use a local source, not have -- they own a lot of their own sources; the contractors own a lot of sources, and the most cost-effective for them is to use the closest locally available source. And that might be in no way meeting any of our requirements. So that was my concern as a materials person, right.

And so the idea of the performance spec is they build it however they want, and when it's built, you go out there and you measure friction on it. Right. And okay, so we've got a friction number; great. But, you know, what's in the road, and how is it built, and is it consistent, and did they use good quality materials. Those are all the questions that I would have had.

Q. Okay. And in the measuring friction in these instances you would have, as I understand it, a minimum friction number stipulated in the contract. Is that right?

A. Yes.

Q. Okay. And that the contractor, then, is to maintain that for a period

of time?

A. Right.

Q. Is that fair? Yes?

A. Yes.

Q. Okay. And we've seen reference to different kinds of contracts. There's the pavement warranty contracts and MinO contracts, which I understand are minimum oversight contracts, and area testing contracts. Could you -- the difference between these eludes me sometimes. I wonder if you could describe that.

A. Okay. So the pavement warranty contract was a seven-year contract, and the idea was supposedly to go out for a two-lane rural King's highway that was considered to be a low-risk project, and that we would just let the contractor build the roadway with whatever -- you know, trust the contractor to build with whatever materials that he felt would give him that performance, right. So it's more like a performance target. Like, I'm going to design and build the road to meet this target. Right. And so that's what the seven-year warranty was.

And over the year -- over the

course of the seven years you might check in several times, and then at the end of the contract as well a final check-in and measure whatever properties that we've -- performance targets we've asked. So, for example, a friction number of 30 would be the performance target, and we would check in at year, I don't know, 1, 3, 5 and 7, for example, and make sure that they were able to hit 30, 30, 30, 30 over those seven years, right. So that's the seven-year warranty.

Q. Okay. And who is doing the testing in those --

A. So -- well, I mean, originally it would be us in the -- sorry, them in the pavements and foundations section, but the idea was how many of these contracts are we going to have because we only have this one that -- it's very different to have a project here, a project there, and a project here versus a very -- a planned program that you normally do, right. So suddenly you're adding these extra contracts to the workload. So the idea was there could also be other consultants out there that can do the testing too.

Q. Okay.

A. That's the seven-year one. And then you asked about the MinO. So the MinO was a totally different -- well, similar concept but three years only. So it was like, we're going to put out this contract, and it only has -- no, I shouldn't say it only has to last three years. That's not right. We're only going to measure it for three years, right. So however long it lasts, we've only measured up to year 3, right. But the same concept of you can build it with whatever materials and things that you want. These are your performance targets. We're going to monitor it at year 1 and year 3, for example.

And then you mentioned an area term contract. So that's something that we never implemented. So we did implement the seven-year pavement warranty, and we did implement the minimum oversight. The area term contract concept was that you would hand a whole area of the province over to a particular contractor, and they would be responsible for the entire pavement network in that area. And I can draw a parallel to my job right now. We have eight -- in central region we have eight area maintenance contracts, so we have eight contracts where we've outsourced

maintenance to these different contractors. So the idea would be exactly like that. An area term contract, you would put that out to those people, and they would be responsible for the entire pavement management, design, rehabilitation, construction, everything. That's that contract model.

Q. I see. And in that -- and friction would be one of the issues that would be part of that, of the larger piece?

A. Exactly, yeah.

Q. Okay. But as you said, those were never implemented?

A. Right.

Q. Okay. Okay. So if we could then go to overview document 4, and it's paragraph 412, but it's at images 171 to 172, please, Registrar.

On the preceding page it just references that this is in March 2011 that you prepared a draft memorandum and a presentation for the HST. HST is the highway --

A. Highway standards team.

Q. Thank you. It's an acronym that I have not managed to get into my

head yet, so thank you. And it's respecting the views of the geotechnical and quality assurance committees. And your presentation is what there are excerpts from here, and if at any point you feel like we need to go to the presentation itself, we can do so, but there's just some of these that I would like to talk about. And you've given us the sort of overall, but there's some specific comments in here that --

A. I --

Q. Yeah?

A. I do want to say, don't forget that the -- like, while you say "this is you," it wasn't me. It was me and the geotechnical committee, which is all the heads of geotech, and the quality assurance committee, which is all the heads of quality assurance as well. Like, it wasn't just Becca Lane felt like this; it was the whole community of geotech, quality assurance, materials engineering people.

Q. No, I think that's -- thank you for that. If we go back to the prior page just so we have it on there; 170 is the beginning at 412. That it's -- at the bottom there that -- prepared by you, but it's regarding

the concerns and views of the geotechnical and quality assurance committees. So that is in there. But this is -- I take it you're synthesizing the views, if I understand you correctly? You're taking the pen and you're putting it into this presentation; is that fair?

A. Correct, yes.

Q. Okay. And so in the first bullet there if -- and we can -- yeah, maybe expand that. Yeah.

And this is in 2011, as I said. I think describes what you were already talking about, but the overall purpose of the using FN as performance measure is to replace the use of the DSM respecting aggregates, right?

A. Yes.

Q. That was the point. And then in the next bullet -- and I want to be clear because there are some -- if you could pull that down. Oh, no, sorry, we've got it all up. I'm sorry.

Just to be clear, I'm not asking you for any legal advice that was received, and there may be some redactions in this document, I think. But -- so just to be clear on that

before I ask you the questions. But in here, it is something that we see in other references as well about concern about liability, and specifically here:

> "GeoCom is concerned that the use of FN as a performance measure will increase MTO's liability, especially where checks and balances in place to ensure pavement friction are replaced with rarely measured performance targets based on failure criteria."

Could you just describe that concern in a little more detail.

A. Yeah, sure. So the concern was around -- like, you put out these contracts, and they have got a number of them that says, you know, this is the number, and it's like the number is somehow now, ta-da, a number, whether it be for friction or rutting or whatever number it is, and then how -- where are the checks and balances in place to ensure that over the life of the pavement it's performing well and things like that, right.

So basically we felt that that would increase MTO's liability because if we were asked, well, does it meet this requirement now, and we would say, well, we don't know because we haven't checked since year 3. But -- well, do you know what materials it was built with, or do you know quality of the aggregate it was built with. Well, no, we don't. So we felt like that would be increasing our liability, right.

So there were no checks and balances. The seven-year pavement warranty ends at year 7. Pavements last 20, 25 years. The three-year MinO lasted -- you know, was three years and pavements last much longer than three years, so we just felt like we had replaced this. It would be replacing this upfront, making sure the contract is built properly with the right materials, sampling and testing and oversight during construction, that we've built it properly, and then we're confident that the road is going to perform over its life.

Q. Okay. And in the third bullet you've already described the historical approach, so I don't need to cover that, I don't think. The fourth bullet is a reference to the:

"MTO does not carry out network level friction testing."

What's the point of that in this context? Is that about --

A. Yeah, that -- sorry. What that is about is exactly what we're saying. So you've built these different contracts out there. If we were out there measuring friction over the entire network every year, then we would be able to catch any trends or things like that on a pavement, but we don't have the resources to do that. We have one person with one friction trailer that can barely manage the DSM -- I guess he wouldn't be doing that anymore. It just didn't make sense to us. The other thing is the equipment that we've traditionally used is really not conducive to network level friction testing. Although we did do that for one year. The trailer requires a tank full of water to spray water on the road, so every so often you have to stop and find somewhere to fill it back up with water, et cetera. So the friction trailer that we had traditionally used would also not be very suitable for network level friction.

Q. Okay. And the one -- the year that you conducted, are you talking about 2013?

A. Yes.

Q. Yeah. Okay. And we'll talk about that a little bit in a bit. And then there's your --

A. Oh, hello?

Q. Yeah, I'm sorry. I'm there. Just give me one moment.

And after that there's the reference to, "FN on its own does not relate directly to safety."

And then you go on to talk about the other things that you've already spoken about. So I think it's a summary of what we've been speaking about so far, and -- but eventually FN at some point becomes a safety concern.

A. Right.

Q. Okay. And, again, not asking for what legal advice was, but the second last bullet in that expanded text is:

"Most highway agencies do not publish friction numbers for liability reasons."

Did you have any insight into that?

A. To be honest, it's exactly the same thing. So if we have a standard out there that we're not meeting, that really is a standard that doesn't make sense to us because on its own it doesn't relate to safety. So that's why we didn't establish it as a standard number. Right. So there's so many other factors.

But if there was to be some kind of published number that people could point to and say, well, you dropped below this published number, and therefore instead of taking into consideration all those other important factors which we would take into consideration while we're managing our network, so that's the concern. If you move to a model where we're no longer invested or engaged in the design and construction of the highway, then we've sort of lost our control over what was built and how it's going to perform. That was our concern.

Don't forget, we're the people that -- like the group that I just mentioned, the people in the MERO, the people in geotech, the people in quality assurance, we are the people

that are trying to upfront get the right design and the right materials and the right construction and those kind of things and get a good product, right. So that was why it was our concern.

Q. Okay. If we could go on to the next page. Expand that.

Some of these we've already covered. The top one:

"The MTO does not have the resources to carry out network level friction testing."

The next paragraph, and, Commissioner, you'll see the reference to MinO. Just so that you -- it's not minnow; it's Min and O.

And AMC, is that, Ms. Lane, the area maintenance contracts that you were talking about? Is that what AMC --

A. Yes. I mean, AMC is our area maintenance contract. I don't know if that's -- frankly, I don't know if that's a typo. Like, I don't know. But AMC -- because AMC doesn't have a friction number in it that I'm aware of. The AMC, area maintenance contractors, are -- have performance measures in there like,

you shall, you know, plow this much snow; the snow has to be off the highway within this many hours, et cetera. Like it does have performance measures, but it's not about the pavement itself.

Q. I see.

A. It's about bare pavement during a winter storm, for example.

Q. Okay. But I thought you were -- and this would be a -- you were talking about it being a similar thing, the area term contracts being a similar thing to that but with respect to friction testing.

A. Yeah, I think that should have been area term contract.

Q. Okay.

A. Although we don't -- I don't know what it was, honestly. It could be either a typo or -- I don't really know what's in the AMC contracts. Like I said, I'm compiling. I'm compiling from the QA and geotech people as well, so --

Q. Okay.

A. -- not my expertise, the AMC contracts.

Q. And then the next two

bullets about the MinO contracts, including a "three-year warranty" and:

> "The use of failure criteria in short-term contracts does not guarantee that acceptable frictional performance will be maintained over the life."

Is that -- that's what you were talking about, is like, so what happens once the warranty, once the oversight period is over and what do you do at that point? Is that what those are addressing?

A. Yeah. I mean, basically the contract said if you hit this -- below this number, you're going to remove and replace the pavement which could be perfectly fine. But over three years, who knows if that 30 is still going to be good. Like, is the 30 -- you know, what is going to happen beyond that; you don't know because you don't even know the material, the material type, what is going to happen to it, right.

So the shorter-term warranty is even more concerning because three years' performance on a material you don't even know

about and could be the cheapest locally available material. Could be intentionally designed, and I'm, you know, playing devil's advocate here, but the contractors are very knowledgeable about building roads. They have been given something that says, you know, you have to hit this by year 3. They could be looking at their very cost-effective inferior products and saying, which one of these products can we use to get three years out of it, right.

So like, why would they give you the best, highest quality material for a three-year warranty. They just wouldn't, or they would be crazy to. So it wouldn't be a good business model.

Q. They are in the money making business?

A. Yes. Exactly.

Q. And then in the fifth bullet reference to:

"Is FN greater than 30 an appropriate performance measurement?" (As read)

Was there debate about what number to use in these contracts?

A. Yes. So there was extensive debate about that, so -- on two sides. But anyway, the extensive debate was based on the -- two things: One, the short term of the warrant, and two, fact that we wouldn't be continuing to monitor these pavements outside of the pavement warranty life; that we might possibly not even be measuring them during warranty life, and frankly, that is something that happened. And that was what I had been concerned about.

So, for example, we're going to do these MinO contracts. They're really great. They're quick and easy to award. You can just imagine. You're going out with a contract that says, give me a new surface on this highway from X to Y; there's the contract, go. And then you go back to the region and you say, okay, have you guys done any friction testing or performance measurement on this. And, you know, in some cases people couldn't even remember where the contracts were.

And if you go out -- if you think we have five different regions and this is a very quick and easy tool to put out a paving contract, and then next thing you know, like, is

anybody measuring them; does anybody know where they are. Like -- so that's exactly what happened. And in the first year you might have 10 of them, and in the second year you might have 30 of them, and then after that, like, how are you supposed to stay on top of all these different contracts.

This year in central, in my region, we put out 108 construction contracts, right, so that's a lot of contracts in one year. Are you supposed to go out and measure all these things on all these contracts, or would it be better to just build them properly in the first place with the right oversight?

Q. Okay. Right. And I take it your view was the latter? But --

A. Yeah.

Q. Clearly. But how does the friction number debate come into that? Are you suggesting that you would do a higher one because of the lack of -- as a practical matter that because of the lack of oversight and the fact that warranties expire after a period of time, that there was discussion over having a higher number used, friction number used to account for

potentially lack of oversight and the reduction in -- over time of friction on the highway? Is that what you're getting at?

A. Yeah. I mean, I gave the example of the pavement on the 401 that we had paved in the summer and by the fall had already become extremely slippery, so different aggregate. Knowing that they could use any aggregate, you could get an aggregate that polishes, you know, quickly, or for whatever reason, it's not a good quality aggregate. And therefore, you need to set the bar much higher if you don't know what you're going to get and you don't know how it's going to perform and you may or may not be measuring it beyond year 3 and year 7, then you can't set the bar at 30 and say, that's acceptable; that's satisfactory, which it is, because you're going to lose sight of where all these contracts are over the course of the years.

Q. Okay. And then there's references to the:

"Friction testing doesn't evaluate aggregate quality."

(As read)

A. Right.

Q. What does? Are those the other tests that are then referred to after that? Two bullets after that you talk about the other testing that's used?

A. Yeah. So if you see that bullet that says:

"Aggregate quality is assessed through laboratory tests."

So the Micro-Deval abrasion, freeze-thaw durability. We also said, you know, aggregate abrasion value. Right. So there's -- all of those tests would be gone in this model where the only thing you would do is come and friction test the surface.

Q. Right. Okay. And then, you know, as you've already said:

"Aggregates with acceptable friction in the short term are not necessarily durable over time."

And is that talking about the -- maintaining the frictional qualities? Is that what that is referring to specifically or anything else?

A. No. I think they were

trying to use the friction number as a substitute for -- because we wouldn't be sampling and testing this material, so the idea was use the friction number for quality of the aggregate. And yet there's so many other things about the aggregate that -- like I mentioned, you could have a very high quartz rich -- everybody can think of quartz like -- and how sort of glassy that material is. And then how do you stick asphalt cement well to that, et cetera, et cetera.

So there's all kinds of other durability issues where it might have good friction performance over a couple of years, but it may be all in the ditch by year 8, right.

Q. Right. And that's the -- and sorry, you mean the asphalt would be in the ditch because it's --

A. Yeah, exactly. The aggregate, you know, it can just ravel out the surface, and then it's all in the ditch.

Q. Okay. And I guess that's the second last bullet that -- no, sorry, the last bullet, requiring an FN of 30 or more "will not ensure quality, longevity or value." That's the overall point that you're referring to?

A. Yes.

Q. Okay. And if we could go to -- take that down, and go to -- actually, still there. 172 and 173, please.

And this is continuing on with the same presentation. And there's some options that are given there, and I think these are paraphrased from there, but there's a -- the options are, you know, you could:

"Remove FN performance measure and propose an alternative performance measure."

Do you know what that's talking about?

A. (Witness reviews document). So propose an alternative performance measure. Yeah, I actually don't know. I can't think what that would be. But I mean, what we were really lobbying for is to do the upfront testing, sampling and testing of the material, right.

Q. Right.

A. So --

Q. And then the second -- sorry, I interrupted you. Go ahead.

A. No. I was going to say, that's what the second one is. Like, give the contractors an option to use the DSM material. So if they are using the DSM material, again, and we're sure and, you know, monitoring and checking that they are, then we could drop this requirement because we're confident in our DSM list.

Q. So maintaining two tracks would be....

A. Yeah, like an option. Yeah.

Q. Okay.

A. This was all about -- that was all about contractor risk because the contractors were saying, I don't know how to bid this contract because I don't have enough information about how difficult aggregates perform in terms of friction. So the outcome theoretically would be that the cost of these contracts would be much higher if the contractors were bidding in risk.

So they would bid in -- so if they knew that if they dropped below a friction number of 30, for example, over three years that they would have to remove and replace that surface

course, they would bid the cost of removing and replacing the surface course into their bid. They would add it to their bid, so it would be increasing bid prices.

Q. Right. And is that in part because contractors didn't have experience in monitoring friction and because that was managed technically through the -- with the MTO through the DSM?

A. Yes, exactly.

Q. At least in part. Okay.

And then the third one, instead of a -- at the top of the next page:

"Instead of a failure criteria, monitor net change annually, based on a percentage reduction in friction; implement a monitoring program to ensure performance requirements are being met." (As read)

This is about instead of having one number, see if it's -- see if the friction number is decreasing by some set amount; is that right?

A. Yeah. So if there was a real high rate of change with the friction, then that would trigger some kind of response, so showing that it was very quickly changing versus a gradual change over time.

Q. Okay. And then the last one:

"If FN is maintained as a performance measure, implement a monitoring program."

So that's about what -- the MTO monitoring after even the warranty period is up or....

A. Yeah, and it didn't have to be MTO. I mean, we would have -- you know, we could have easily also implemented consultant monitoring of the program. But again, it's a lot of back-end work when you could have done upfront work.

Q. If we could go to images 181 and 182.

And this is about a meeting in -- on December 16, 2013 with OHMPA and ORBA -- sorry, ORBA, Ontario Road Builders Association, about friction data collected from 110 sections

across the province from 400-series highways and two-lane highways with various mix designs. And you're not indicated as having been attended at this meeting, but there's just a few things I want to ask you about it. And Stephen Lee was there, and we'll ask him some questions about it. But -- so at this point in the end of 2013, by then you were the manager of MERO, right?

A. Yes.

Q. Okay. And Mr. Lee, then, was reporting to you from your prior position as head of pavements and foundations; is that right?

A. Correct.

Q. Okay. And it was in 2013, we briefly talked about that before, that the MTO did network testing, right?

A. Yep.

Q. Okay. And is that what's being referred to here? Is this the data from that network testing, 110 sections?

A. I guess so.

Q. Okay. Not sure, though. Okay. So do you recall when -- what prompted the network testing to be done that year? Is that something you have insight into?

A. So to be clear, I was in -- I was downtown at systems analysis and forecasting office, so I didn't come back to MERO until the spring --

Q. Right.

A. -- of 2013. So I had been away. So I wasn't really plugged into what was going on with these performance contracts. And as the head of pavements and foundations, Stephen Lee would have been the one that was liaising with the committees and all of those things. I had very little involvement in this --

Q. Okay.

A. -- after that point.

Q. And that was going -- by the time you came -- you were back at -- well --

A. Yeah.

Q. -- not in the same position, but you were the manager of MERO, the network testing, it was already ongoing at that point in time as well?

A. Well, they would have made the decisions to do it, done the planning for it, all of those things, while I was not working in MERO.

Q. All right.

A. So I don't even know that I was really aware about it, honestly, because I came back to -- I came back to a massive section with all kinds of other issues going on. So yeah, I mean, obviously I wasn't micromanaging my wonderful experts in the different areas.

Q. And this was just one issue among many that were being managed at the level below. It's really just the third paragraph I want to ask you about in that that starts "MTO has" -- yeah, that's it. Thank you.

And whether you know this type of discussion was ongoing about:

"MTO has not determined if we would be going with one friction number for all highways or friction numbers for different classifications or highway types, i.e., one friction number for 400-series highways and one for two-lane highways. MTO will wait until the analysis is complete before the details are worked

out."

Was that something that you were familiar with being under discussion about different -- using different numbers and different types of highways?

A. No.

Q. No. Okay.

A. I was aware of talking about different numbers for different projects maybe, types of projects -- oh, maybe that's what it -- well, I don't know if they had -- okay. I was aware of them talking about different types of projects with different numbers, but I hadn't seen it as 400-series versus two-lane highways.

Q. Okay.

A. So that wasn't part of when I was working there.

Q. Okay. Sorry, by "different projects," you mean what?

A. The different kinds of MinO projects.

Q. Yeah.

A. There was a whole bunch of MinO projects. There was -- you know, honestly, it was from the late -- like 2010, '11.

They were just talking about could we have type A MinO and type B MinO and type C MinO, and I think that was to do with traffic volumes. So it's kind of a similar concept except 400 series versus two lane is a highway classification and what -- the work that I had seen was about traffic volumes. Do we have this kind of criteria for very low volume roads, this one for moderate volume roads, and this one for high volume roads.

Q. Okay.

A. And that's the work I had seen.

Q. So sort of a demand category, if I can put it that way, with the higher number, if I catch what you're saying correctly, for the higher volume roads; is that right?

A. Yes.

Q. Okay.

A. Because it's about speed, right.

Q. Right. Well, and as you said at the outset, though, that the -- MTO's approach to FN30 is to apply FN30 at whatever the posted speed is.

A. Yes.

Q. And you referred to that as being, I think you said, conservative for -- if I understood you correctly, for the 400 series that are being tested at a hundred. Is that --

A. Yeah.

Q. Did I understand you correctly in that respect?

A. No. What I meant was if you were testing at a lower speed using a different method -- like, the ASTM method tests at a lower speed, so if you were to get a 30 at a lower speed versus a 30 at a higher speed, it's just there's -- it's more conservative to use the 30 at the higher speed.

Q. Right. I know I -- I think I put it badly, but I understand now. But here when you say, well, it's all -- it's about speed, is it the same sort of thought process, though, that you're talking about which is that testing -- is it about testing at a higher speed or is this actually about the absolute -- the absolute value that would go into the contracts?

A. No, no. I was thinking about the driver performance on a 400-series

highway where, you know, the highways are designed at 120 kilometres an hour; traffic is flowing much faster than that, I'm going to go with. So it's the -- you know, really that's why I was thinking on a 400-series highway they would be more concerned about the speed of travel.

Q. And then after all of this over quite a long period of time, am I correct that the MTO then determined to continue using the DSM as it had for many years as you've described it, rather than moving generally and permanently to performance standards in contracts where the friction number would be specified?

A. Yes, so we still have some performance contracts, so I wouldn't say -- we did not eliminate performance contracts. So we still have some. But the idea was basically to move fully to performance contract models on every one of our projects, and so that decision was made not to do that.

Q. Right. Okay. And you can take that down, please, Registrar.

And so new ones continue to be -- some new ones, performance contracts, continue to be issued in respect of friction; is

that right?

A. Okay, so with respect to friction. I think we've eliminated the friction number from our performance contracts.

Q. Okay.

A. So -- but we still have some performance contracts.

Q. Right. On other issues.

A. Yeah, with using other measures of determining quality.

Q. Okay. And if we tie that off, go to image 188.

In paragraph 453, this is just a meeting agenda for a meeting with the ORBA on May 13, 2015. And you were e-mailed this agenda, but it refers to a meeting that Mr. Lee apparently attended dealing with the performance specification and skid numbers, and it's referring back to a meeting on May 1st, 2015. It says:

"MTO developed friction number to use in performance specifications. Decision is to revert back to the DSM list. Item closed."

Is that around and about the

time when the decision was made to stop including friction numbers in performance contracts?

A. I think so, yes.

Q. Okay. Okay. You can take that down, Registrar. Thank you.

So now -- we moved forward in time -- to go back in time, again, to some fairly basic things. I just want to talk about the MTO surface course directive and what that is.

And if we could pull up, just for a little bit of assistance, overview document 4 still, image 7. And it's paragraph 11 at the top which is referring to a specific one in 2003, but if you could just describe the surface course directive and what that's about.

A. Okay. The surface course directive, mostly it's based on traffic volumes. So it tells you what surface you need to put on a particular highway based on the traffic volume. So if you have a low volume road, and this was 2003; I'm guessing it was like HL mixes. So you could, you know, use an HL4, I'm not sure, and then it would step up. So as your traffic volumes got higher, you would start using better quality materials. And then when you got into your next

highest category, it would be, you know, both your coarse and your fine aggregate would have to come from a DSM source. And it would tell you what your surface course had to be. So I honestly can't remember if this was Superpave years or not. But, you know, we had Superpave 12, and then we have Superpave 12.5 -- sorry, 12.5FC1, Superpave 12.5FC2, and then the highest category of freeways, we have SMA. Oh, yeah, so 3 million, that means equivalent single axles. More than 3 million equivalent single axles in the design lane would be the trigger for going to SMA pavement. So most of our really high volume freeways at MTO, like the 401 corridor, you know, within the high volume areas, would be an SMA surface.

Q. Okay.

A. If that makes sense.

Q. And maybe it would help you just to narrow it down, if we go right to the -- because you raised the question about whether you were in Superpave or not. If we could just go to MTO 53 which is that -- it's the surface course directive referred to in that paragraph. There we are. If you could show

images 1 and 2, please.

A. Oh, you see that there at the bottom there under "background." Oh, sorry. Oh, yeah. Okay.

Q. Expand background for us, please, on that. Yeah, I thought that is what you were referring to.

A. Yeah, so that's talking about our old mix types HL3 and HL4. So it's saying if you've got a low volume road, HL3, HL4 would be used. If you get into sort of a higher volume road, now you're getting into an HL1. An HL1 would have a good quality coarse aggregate. And then if you get into the highest volume, a dense friction coarse would be used like a DFC.

So it's saying, we no longer allow you to use an HL3 on freeways and King's highways, and it was because you didn't have any high quality aggregates.

So then -- so this says Superpave mixes and stone asphalt -- mastic asphalt have only recently been introduced. So I think this is the version where we now introduce the Superpave mixes, and it's the same concept. Like a Superpave 12.5 and that -- for the lower

volume roads, and a Superpave 12.5FC1 for the sort of moderate volume roads, Superpave 12.5FC2 for the higher volume roads up to a -- like, I think a million ESALS, so between 1 million ESALS and 3 million ESALS. And then as soon as you hit the 3 million ESALS it triggers the stone mastic asphalt.

Q. Okay. And that was a great memory test because if we pull that down, and on image 2 there's a table. I think that's what you were --

A. Oh, yeah.

Q. -- doing from -- what you were doing from memory. And I think what you described was -- this is what you were talking about?

A. Yeah, exactly. Exactly.

Q. Okay. All right.

A. So AADT is annual average daily traffic. So this is entirely based on traffic volumes, right. So it steps up to the better quality mixes as you get more and more traffic.

Q. Right. As distinct from ESALS over --

A. Yeah, the -- well, so the ESALS now -- so instead of just the -- annual average daily traffic refers to vehicles like cars and -- and once you get into the ESALS, now you're seriously including the truck traffic and the types of trucks --

Q. Right. You're taking --

A. -- that are on the road.

Q. Right. Because they have a greater effect on durability of the road.

A. Exactly.

Q. And so you're taking into account something more than just the vehicles themselves but the size and weight of those vehicles?

A. Exactly.

Q. Okay. You can take that down, please. Thank you, Registrar. And if we could go to images 21 and 22.

And while they are pulling that up, this wasn't, though -- even though it is in the surface course directive, this wasn't the MTO's first use of SMA, correct?

A. That's correct.

Q. And what we're pulling

up --

THE REGISTRAR: Sorry, Counsel, 21, 22 of the overview document?

MR. LEWIS: Yeah, sorry. Yeah. And it's paragraph 43 and then the top of 44.

BY MR. LEWIS:

Q. And so this is May 1, 2006. Mr. Kazmierowski, who at the time was the manager of MERO, e-mailed a number of people, including you and Mr. Cautillo, Mr. Kai Tam, Chris Rogers, Dennis Billings and you and it's:

"10 Years Comparative Friction Testing-SMA Versus Highway 401 Contract 96-50 Milton."

And attaching some test results, and he refers to the 10 years of friction testing there, indicating that the comparison between SMA and dense friction course, DFC, on that placement, and that:

"There appears to be no advantage to the SMA surface over the 10-year period."

So is this something that you recall?

A. Okay. So two things. First, I wanted to correct you that Tom was the head of pavements and foundations. We just used to call it manager back then. So Mr. Cautillo was the manager of materials, engineering and research office at the time, and I would have been the senior engineer. I'm pointing that out.

Q. No, no. You're right, and also I think I said that Mr. Kazmierowski was the head of MERO at the time, but --

A. Yes.

Q. -- he was with pavements. Yes, I apologize.

A. Yes.

Q. You're quite right. It's 2006.

A. So I think -- I don't know if I -- I can't put myself back into that time to know if I recalled or not, but obviously I've read the stuff since. So it seems to me that they are saying the SMA and the DFC have the same friction performance, and so what I would say is that one of the things about SMA -- like, if you see all the promotional materials about SMA, it was like, and it's got enhanced frictional

performance.

So Tom is saying, I don't see any enhanced frictional performance here. You know, it appears that there's no advantage over the DFC which is our other high mix.

So what I would say is that I believe that the frictional performance of the SMA was supposed to be also related to -- of course you've got a high quality aggregate, so compared to other mixes that don't have a high quality aggregate, then of course you'll have better friction performance.

So, you know -- so other jurisdictions, for example, that don't have a DFC, the SMA, they could say, wow, this SMA has significantly better frictional performance. Right. So maybe when people were researching, let's try SMA, let's find advantages, they there learned this is an advantage, but what they don't know is actually MTO already has a system in place for pre-qualifying high quality aggregates, and our DFC mixes already have good friction, so actually there's no real advantage from a friction perspective for the SMA.

Q. Okay. And I was actually

thinking -- was meaning to ask whether you recall the issue of and this project from the 401 rather than testing your memory about the specific e-mail, but your explanation is quite helpful. There's a paper that you wrote on it later on. Do you recall that? Okay.

A. Yes.

Q. Okay. Great. So if we could go to images 34 and 35.

And was this essentially a pilot project or a trial for SMA?

A. Yeah. And that's -- you know, that's what I mean about we had a research branch, and they did -- they would bring new technologies or -- and we would study them. And, you know, so this would have been -- I can remember the folks involved with this, I think it was perhaps Joseph Ponniah and Gerhard Kennepohl, were originally from the -- MTO's -- they had their own research office, and so I think that's part of the trial work that we do in MERO. Like, we ended up adopting the research part from them.

So any new technologies that came, that, you know, we learned about from conferences or meetings with other jurisdictions

or industry brought back from their counterparts internationally or whatever it was, that they would evaluate them through a trial. And so this was a full-scale trial, and that's why we wrote papers on it. I mean, there's no point in doing a trial that nobody knows about.

Q. Fair enough. And then at paragraph 71 to 72 there's reference to it. And I'll take you briefly to the paper, but first one at paragraph 71, you're writing -- you're seeking approval to write the paper.

And if you could expand at the top of image 35 there, and maybe in the next paragraph as well, 72, yeah.

You're indicating that it's been 10 years since it was constructed and the reference to the adjacent DMC pavement, and then in the last paragraph in that e-mail from you is:

"I realize we're currently addressing SMA friction issues, and this paper would be sensitive to this issue. The friction on this SMA trial has been monitored annually since 1996, and the average FN

is only marginally less than the adjacent DFC. We can remain silent on friction if necessary."

And am I correct, there you're talking about the early age SMA friction issue that was current at that time?

A. Yes. So the early age friction was current at that time, but we hadn't known about that and didn't have any data for this particular job to report on, right.

Q. Okay. And then in the next, paragraph 72 there indicates just as an average, an average FN of 38 for the SMA and 39 for the dense friction course over the entire 10-year period, and then an average in 2006 of 34 for SMA and the dense friction course of 36. So 10 years out from the original construction. And, again, this was measured at the posted speed, a hundred on the 401; is that right?

A. Yes, yes.

Q. Okay. If we could go to the paper itself. Counsel circulated that on Friday. The paper itself is not referenced in the OD, so this is GOL1571. There we are.

And this is a scan from a hard copy, and on the cover there it say the CTAA proceedings in 2007; I think it's a November 2007 conference. Did you typically go to the CTAA conferences every year or just from year -- depended on year to year?

A. Well, I would love to say I could have gone, but they, you know, choose one or two people that can go. Right.

Q. Right.

A. So this was my lucky year, if I went in 2007, and that's also the part about the writing the paper. So if you've written a paper then -- and they are publishing it, then they actually want you to go there and present, so it actually gives you a step up on somebody else that also wants to go to the conference but hasn't written a paper. So the short story is, no, I didn't go every year. I would have loved to go every year, but they don't have the resources for that. So what we did is try to write a paper that's going to be published, and if you can, then you may be lucky enough to get funded to go.

Q. Got it. And so there's actually two papers. If you could go to -- it

might be the next image. This just shows that it's November 2007 in Niagara Falls. Next image, please. Okay.

So this is not the paper that I was going to go to in detail, but there was actually two papers that you were involved with for that. So I assume that that gives you an extra chance of going if you have two papers.

A. Well, now that I see it's in Niagara Falls, I love Niagara Falls, but you know --

Q. Okay.

A. It's much easier to get permission to travel to something local.

MR. LEWIS: I see Ms. Roberts has popped up. Yes.

MS. JENNIFER ROBERTS: Yeah, I think it's image 13 is the paper you're looking for.

MR. LEWIS: Yeah. No, I actually wanted to ask her that there were two papers, but thank you.

It might be 12. Image 12. Ms. Roberts was right. Image 13, please. Here we go. Actually the problem was my screen went

blank, so I was having a little technical problem. Thank you for bearing with me.

BY MR. LEWIS:

Q. So this is the paper dealing with the 401, 10-year performance issue that we were just talking about. And --

A. Yep.

Q. Okay. And so if we could go to -- oh, and you referred to a Mr. Kennepohl. Is that the second author there, Gerhard Kennepohl?

A. Yeah, that's why I was smiling. So this would have been his project, but he would have retired now, and so he was now teaching at University of Waterloo. So this would have been kind like a collaborative effort between, like, the guy whose project this was and me that I'm still at the ministry -- well, that I am at the Ministry -- working with him to make sure his project gets published.

Q. All right. And if we could go to image 15. And -- we might be one image behind.

I guess there's the map that shows where this is on the 401 around Milton.

A. Yeah.

Q. Okay. If we go to the next image. There we go. Under -- in the right-hand page under "SMA Construction Issues, 3.5," could you please expand that.

And it refers to a steep learning curve when placing the SMA. I'm just wondering with the way you described it that it was Mr. Kennepohl's project, were you actually there or involved at the time of the construction or is this -- this all is coming from him, I expect, from the way you've described it?

A. Yeah, yeah. I was not involved.

Q. Okay.

A. This was me working with him to write up the story about the project.

Q. Okay. Nonetheless, it's describing that there were -- as a new technology that there were issues in the placement, including some of it had to be removed and replaced, and that there were issues in production as well because of the volume of fibres and so forth.

And there's also a reference to compaction -- yeah, in the second paragraph, in

the last sentence:

"Construction records also show that the contractor was not achieving the targeted 94 percent compaction, typically achieving 90 to 92 percent."

(As read)

But, again, we just clarified, that's all coming from -- that's Mr. Kennepohl, and you're just involved with him in the paper overall as opposed to that specific information; is that right?

A. Yeah, yeah. Exactly. So reading up in the contract records and talking with him about the project. I wasn't there.

Q. Okay.

A. But this is typical of a new product trial, right. So --

Q. Right.

A. -- yeah. Things go wrong when you do something for the first time I guess.

Q. Right. And the problem with the -- where it was removed and replaced was because of asphalt cement content was flushing. That's the issue you described earlier?

A. Yes, exactly. So the SMA mix has very high asphalt cement content, which is why it's so durable, and it has these fibres that are supposed to be -- to stop that -- to sort of hold the asphalt cement in the aggregate matrix, but if it's not done properly, and it seems like there was a problem with the fibres and da, da, then you could end up with the asphalt cement and the aggregate but not necessarily the fibres that are giving them -- giving that higher asphalt cement content the stability to stay in the mix. And "it's flushing" means it's pumping the asphalt cement to the surface and causing flushing, which is like black, shiny, oily surface, so.... I could see that happening.

Q. Okay. And then if we could go to -- I think I'm one page off in my notes -- image 19 I believe. No, let's try 18. Yeah.

And so friction is described in the bottom left of the image, and then there's a table in the top right there.

And, again, maybe if you could expand the bottom of the left-hand image first, or maybe expand that and -- okay. We'll leave it at

that.

And were you -- this is, again, from review of records. Did you have involvement at any point in time in directing the friction testing or no?

A. So I wouldn't have been directing the friction testing, but I would have been in the section after 2000. So this was paved in '96, so from 2000 to 2006 I would have been in the section, and Frank would have been in the section, Tom Kazmierowski was the head of the section, and we would have been doing this performance monitoring.

Q. And as you indicated before, carried out at a test speed of a hundred kilometres per hour, and indicating that they used the same or more a trap rock coarse and fine aggregate, and the friction results are very similar, and that they are in the acceptable range.

And if we could go on to the figure at the top of the right-hand side. Yeah. If you could expand that, that would be great. Thank you.

And it's a little hard to tell

without colour or anything. It's the one that starts off "in 1996." That line is the SMA; is that right?

A. Yes.

Q. And then the dense friction course starts in 1997, and they both go through to 2007?

A. Yes.

Q. Okay. And if I'm reading correctly on the SMA, it seems to show there is a -- that there isn't a low early age friction issue in this instance by the looks of it?

A. We don't know when the friction testing was carried out, though, right. So --

Q. You don't know if it was -- right. Right. So it could have been immediately after or not? It could have been done after it was open to traffic at some point?

A. Yeah. No idea.

Q. Okay. And then it drops for a couple of years and then seems to level off. Is that a fair read of it?

A. Agree, yes.

MR. LEWIS: Okay. I was going

to move on, Commissioner, to the SMA early age friction issue. We're approaching the lunch break, though, but I'm reminded before I suggest a break, if we could make an exhibit of Golder GOL1571, which was the CTAA paper that we have in front of us.

JUSTICE WILTON-SIEGEL: Okay.

MR. LEWIS: Exhibit 43, I believe.

JUSTICE WILTON-SIEGEL: Mr. Registrar.

THE REGISTRAR: Exhibit 43.

EXHIBIT NO. 43: Canadian Technical Asphalt Association Proceedings 2007 paper, GOL1571.

MR. LEWIS: And it's 5 to 1:00, Commissioner. Would this be a good time for --

JUSTICE WILTON-SIEGEL: Sure. Let's return then at 10 past 2:00.

MR. LEWIS: Great, and I wonder, Registrar, if we could just have the all counsel breakout room just for a couple of minutes, counsel available.

JUSTICE WILTON-SIEGEL: So

we'll stand adjourned till 10 past 2:00.

--- Recess taken at 12:55 p.m.

--- Upon resuming at 2:10 p.m.

MR. LEWIS: Good afternoon. May I proceed, Commissioner?

JUSTICE WILTON-SIEGEL: Please do.

BY MR. LEWIS:

Q. Ms. Lane, so I would like to move on to a different topic now. And I'm going to be asking more detailed questions for -- anticipate to Mr. Chris Raymond about the SMA task group and the early age low friction issue for SMA, but I would like to briefly talk about it with you and sort of the start and middle and end of it perhaps.

And could you just describe what the SMA early age friction issue was?

A. Yes. So there's a history of it. So we were at a -- I guess there was a conference in 2004. MTO attended. And at the conference there was a learning moment where we found out that there was an early age friction problem on SMA, and that means -- what that meant was that in the, you know, early weeks, months

after SMA is first paved, the asphalt cement coating on the aggregate hasn't worn off yet, and because the stone mastic asphalt mix has very high asphalt cement content, this was a challenge. So instead of vehicles riding on the exposed aggregate surface, they would be riding on the asphalt cement surface, and therefore friction would be lower.

So that's what was understood at the conference, but we then checked our data and we didn't have any issues of early age friction that we could find. But of course the friction data that we did have on our SMA pavements wasn't necessarily taken right after it was paved. It could have been taken significantly later, and therefore, we didn't really -- we just looked at the data and said, oh, oh, it seems to be okay; we don't have an early age friction issue.

So then fast forward to a bit later, I can't remember the date exactly, but we received some, you know, information that there was a pavement that was very rich looking, and they wanted to know if we would come out and test it right after paving, and we went and tested it,

and the numbers were very low, in the teens. And then we -- from that moment on, we went and we had an internal discussion about, wow, this may really be a thing. So that's how we learned about early age friction.

Q. Okay. And there was a task group that -- a joint MTO industry task group, and you weren't actually on the task group yourself; is that right?

A. I was not on the task group.

Q. Okay. And eventually, though, there was a pause that was implemented, and that -- and then a number of things were trialed and tested in order to address the issue. If you could just -- we know the pause was placed in November of 2007, and then this -- then the pause continued for a number of years.

Could you just describe sort of the pause, and then the things that the MTO trialed and tested just in a summary way.

A. Okay. So it's kind of a long story, but it started off with, okay, we've got this early age friction problem; is there any way that we can address it; is there anything in

the mix design or in how the mix is compacted or the asphalt cement content itself or the aggregate type itself, like all of the different components of the mix; how can we look at these different components of the mix and try to adjust things so that we get -- we don't have this early age friction problem.

So, like, one of them was we could reduce the asphalt cement content so it's less rich. One of them was we could only use certain aggregates that we feel will give us this early age friction, which I'll come back to. The other -- there was also we could blend different aggregates in there, and I'm trying to think -- construction looking at mix design and construction practices, which is not my area of expertise.

So the short story is one of the options was, let's look at the aggregate types themselves, and we have some very, very premium aggregate. Like the dolomitic sandstone is an example of that where we know that that is performing well.

And then we have some other aggregates that aren't performing so well, and an

example there would have been the Ontario Trap Rock. And so we have two different sources of material -- one that's giving really good friction; one that is not giving us good friction.

So the idea became maybe we could manage this problem by only specifying these dolomitic sandstones, but that didn't seem practical because it's one source in one very eastern part of the province. So could we look at some sources are meeting and could we blend, so all of these things were being discussed.

So the short story is -- leading up to the pause is what you're asking for, so all of these things were being investigated by this task group to try and get a solution for SMA, and all of these things were coming at a cost to the construction contract.

So we had all these construction contracts out there, but as soon as you go to make a change to a contract, it's going to cost you in change-order-type money. So it was expensive to try and make these changes. And the people in the regions that deliver the work were a bit fed up with the product.

And so the short story is we

had a project in the Woodstock area. This is going to be the straw that broke the camel's back I would say on this issue. And what happened was we had already had some change order, like, let's -- we have a trap rock that is working which is the Marmora trap rock, and we have the trap rock that they bid the job with, the Ontario Trap Rock; it's not working. Maybe we could also try blending with this dolomitic sandstone. So they actually tried, you know, different aggregate, aggregate blending. And at great cost to the contract to make these changes to the contract, they placed it, and it just didn't work. So they went out in testing and hoping we would get some, ta-da, great values, and instead we got values in the low 20s. I believe the average was 23.

So after that effort of trying to improve the aggregate, improve the mix, et cetera, paying all kinds of money to do that, and then the numbers came back, and there was no -- no benefit had been realized at all.

So that's when it was decided to put a pause on it until we could figure out what the solution was.

Q. Okay. And we'll come to

that chronologically because it was around the same time as the Red Hill testing that was done in October 2007 -- that the testing you're referring to I think was done, but I'll come to -- I think come to that chronologically.

But you described that as being, I think you said, the straw that broke the camel's back, I think is what you said. And that's what -- that was sort of the last thing that led to the pause being implemented; is that correct?

A. Yes.

Q. Okay. So we'll get to that specifically because there are some documents right around that issue, but I'll take that chronologically.

And so leading up to the pause being implemented, do you have a sense of how known, widely known, not widely known within the paving industry the SMA early age friction issue was leading up to the pause? Not after it because that would have to be announced clearly, but....

A. My understanding is that the SMA task group was a joint task group between MTO and industry because SMA was a new mix that

the industry was very, very supportive of, and really had made all kinds of changes to their plant and things like this to try and implement, so it was really in everybody's best interests to work together and try to solve this issue so that we could continue with SMA. It was a product that the industry really, really wanted to have, and from the Ministry's perspective, we knew that we would get a durable, long-lasting product suitable for use on our high volume freeways, but we wanted to fix this early age friction issue.

So I would say that ORBA, the Ontario Road Builders Association, is our one window to the construction industry. They were participating on the task group through -- well, actually through OHMPA --

Q. It was OHMPA at the time.

A. -- Ontario Hot Mix Producers Association. Now they are together, so I apologize. So through OHMPA, and they are -- anybody who produces hot mix is part of the Ontario Hot Mix Association for the most part. So how they disseminate their information to their members is a separate issue.

Q. And so I'll take that in

part. Am I correct, you don't know how they communicated to their membership internally? Is that right? Or you --

A. I don't know. I mean, I assume they have communications, and I know they have an annual meeting and things like that.

Q. Right. Okay. And in terms of the task force itself, as you pointed out, it was a joint task group. What about -- other than through the task group itself, was there -- was it something that was being communicated outside of the MTO?

A. I don't know. I don't know because I wasn't part of that group.

Q. Okay. And then just in terms of timing, we know that the -- to jump forward, the pause was lifted in 2014.

And just for good order, if we could go, Registrar, to images 154 and 155. Looking at paragraphs 371 through -- 371 and 372, I guess to begin, and then 375 to 376. Yeah, start there.

And this is Pamela Marks who is someone that you worked with.

A. Yes.

Q. And this is in October 2014, Ms. Marks circulating a memorandum and gritting specifications related to the lifting of the SMA pause.

And so what was the ultimate solution that led to the lifting of the pause?

A. So ironically, the gritting was the idea that first came forward because we learned that in Germany, I believe, they were gritting the SMA pavement. So it was something that was very first proposed right at the beginning. And then we tried all kinds of other things. We tried water blasting, and I don't know, all those other things, adjusting the aggregate and all of those other things. But at the end of the day --

Q. I think skid abrading -- was skid abrading something that you -- because you had mentioned that before?

A. I don't -- I don't know if we actually did skid abrading. I mean, I think there was a concern that because it -- well, I don't know. I can't remember if we actually did it, but certainly skid abrading was one of the proposals. There was all kinds of proposals

actually. Even -- there was even a proposal to sort of grit it after -- like just grit it without -- what we landed on which was sort of like an asphalt-coated grit that will stick to the surface, so it's hot-coated grit rather than just spreading sand over it or anything like that. So we tried a number of different things, but at the end of the thing we landed on this hot grit which has an AC -- an asphalt cement coating, and it sticks very well, and that was found to be very effective, so that's what we went with.

Q. Okay. And that's applied at the time of the placement of the --

A. Yeah.

Q. -- asphalt in the first place; yes?

A. Yeah.

Q. Okay.

A. Yeah.

Q. Can you take that down, Registrar, please, and pull up 375 and 376.

And then this is October 31st. So Mr. Raymond e-mailed the ORBA regarding lifting of the SMA pause, and the surface course directive being revised to reinstate the use of SMA at the

end of 2014.

And so after the lifting of the pause, did the MTO resume using SMA in the normal course?

A. Yes, we did.

Q. Okay. And does that continue to be the case?

A. Yes, it does.

Q. All right. And we looked earlier at the surface course direction and the directive and the number of ESALS and so forth. Is it currently the standard surface course for the highest volume roads?

A. Yes, it is.

Q. Okay. Thank you. You can take that down, please, Registrar.

Okay. So in -- I'd like to now talk about the lead-up to the Red Hill Valley Parkway skid testing which ultimately took place on October 16th, 2007.

But if we could start off with going to overview document 4, image 47, please, Registrar.

This is an e-mail on August 1st, 2007, that Chris Raymond sent to you,

to Kai Tam and Chris Rogers reporting on a call that he had the prior day -- refers to August 31st, but we know it was July 31st -- reporting on a call with Ludomir Uzarowski of Golder. And I won't read through the whole e-mail. Have you had a chance to review this e-mail?

A. Yes, I have.

Q. Okay. And at this point in time why was Mr. Raymond reporting to you? Your position at the time was acting head of pavements; is that right?

A. Yes.

Q. Okay.

A. Yes. And so Ludomir would have known Chris, possibly from his role in bituminous section; I'm not sure. But anyway, Ludomir would have phoned Chris, and then Chris reported this to us.

Q. Okay. And are you involved at that point because your position -- is Chris Raymond reporting to you at that point in time in your acting role?

A. I mean, I -- possibly, yes.

Q. Okay. All right.

A. I mean, he often refers to he has two jobs. I think he was in kind of a hybrid where he was reporting to Kai in the bituminous section as well.

Q. Okay.

A. You'll see some of his stuff where he says, I've got two bosses.

Q. Right. And so he's referring to a couple of issues. One is a discussion where Mr. Uzarowski had heard a rumour about the Ministry no longer allows Ontario Trap Rock in SMA, and that he informed Dr. Uzarowski that the Ministry had concerns with the early life friction in some SMA pavements and describes some things that have been going on.

And actually that brings me back to something you said earlier. You referred to the two types of rock, and you referred to I think the dolomitic sandstones and Ontario Trap Rock before. And were you specifically referring to the company and quarry Ontario Trap Rock or to the type -- or to trap rock from Ontario?

A. Oh, no, no, no. Yeah, to be clear, I was referring to the source. It's

called Ontario Trap Rock; it's a particular quarry. So the example that I gave of where we had a rock type that they thought was doing well, that was the Marmora trap rock, so still a trap rock.

Q. Right. Okay. Thank you.

A. It's a rock type.

Q. Yeah. But Ontario Trap Rock, capitalized of the first three letters, is a particular source of trap rock?

A. Exactly. Exactly.

Q. Okay. And so, again, referring to Ontario Trap Rock having been removed as an acceptable source at that time, and then in the second paragraph about Dr. Uzarowski expressing concern in respect of the aggregate to be used for the SMA on the Red Hill Valley Parkway not being on the DSM, and that he indicated he was going to follow up with Chris Rogers. And then a possible outcome is the City of Hamilton can make a request for friction testing.

And do you -- did his e-mail, Mr. Raymond's e-mail, did this cause you any pause or concern at the time that you recall about the issues being raised?

A. No.

Q. Okay. And are municipalities required by the province to use any particular aggregate in their surface course pavements?

A. No, they are not.

Q. Okay. And do you recall if you had any discussions with Mr. Raymond or Mr. Rogers about issues raised in his e-mail or in the call that it's reporting on with Dr. Uzarowski?

A. I think, to be honest, the reason that I'm cc'd on here or sent this is because the possible outcome is that they could make a request for friction testing.

Q. I see.

A. So he's giving me the heads up that, you know, if they decide to go ahead with this project, that they could request friction testing.

Q. Because in your role as acting head of pavements and foundations, the skid tester came under your purview?

A. Correct, yes.

Q. Okay. And more generally

are -- you said that municipalities or Hamilton -- municipalities aren't required to use any particular aggregate in their surface course pavements. Are Ontario municipalities required to follow MTO specific -- specifications for municipal road building projects more generally?

A. No, they are not. There are municipal standards that municipalities can adopt. Municipalities can also develop their own municipal specs. So the City of Hamilton could have their own SMA spec, their own aggregate spec, et cetera. So no, they are not required to use MTO standards, and similarly I don't think they are required to use the municipal standards. I know many municipalities that just have their own specs and standards.

Q. Right. Okay. And then there's the Ontario Provincial Standard Specification, the OPSS, which municipalities can use them or modify them with special provisions; is that right?

A. That's true. The Ontario -- and there's two types. There's Ontario Provincial Standards and Specifications, OPS Prov, which stands for provincial spec that would be

used by MTO, and there's a similar one that's the OPSS Muni which is for municipalities, and, again, even then I think it's up to the municipality. If they plan to use a provincial spec, they can. If they want to use a municipal spec, they can, or if they want to make their own spec up as well, they can as well.

Q. And if we could go to, Registrar, to overview document 4, images 5 and 6, just so -- make sure we're talking about the same things.

In paragraph 7, in the image on the left there, I think is what you were just referring to that there's the provincial-oriented specifications developed by the MTO, but OPS specialty committees update and revise some of them for municipal use. Is that what you were talking about there?

A. Yeah, so there's a committee, a specialty committee, and it would have members from the municipality and the province to help draft a municipal spec, and often industry also sits on those municipal spec writing committees as well. So it's a committee to write a spec. I mean, the idea is obviously for

everybody's benefit, including the contractor's. If everybody uses the same spec it's much more helpful to them, easier to bid the work, easier to perform the work, and so that's why they develop these specs. But it's not mandatory for them to use the provincial spec which is MTO spec.

Q. And then if we could go to overview document 4, image 52, please. Just give me one second, please. So in paragraph 116 through -- actually if we could bring up the next image as well. It's 116 through 122.

There's a number of e-mails in late September, September 27th and 28th, 2007, about conducting friction testing on the Red Hill. And do you recall how the request came about? We already looked at the conversation Mr. Raymond had back in -- at the beginning of August. Do you recall how the actual request came about?

A. Do I recall it? Umm, that's a good question. So I mean, I think the short story is that Chris Raymond was asking about could we go out and do the testing. Then there was a bit of back and forth where I was saying, well, is the City of Hamilton okay with us doing this testing, and Chris was saying, yes, they are

okay with it, but they are not willing to put that in writing. But at the end of the day we agreed to do the testing.

So, you know, one of the complications here is -- that can be confusing is that because this was for Hamilton and Golder, like, this was their big project, you know, they wanted to have some kind of partnership with CPATT, the Centre for Pavement and Transportation Technology, where they would have some kind of research work there, so monitoring and sensoring in the road and then tracking how the pavement is performing.

And so the back story is that they had come to us and said, would the ministry be interested in participating in this monitoring program because this was a -- oh, boy -- this was a new technology, so not just the SMA, but also the fact that it was a perpetual pavement. So we had been given their plan for how they were going to invent sensors in the road, and we'd been asked to look at it. And we had been asked to help fund it, and we had offered up a minimal amount, you know, sort of $10,000 to say, sure, you know, let's give them some money, a little bit of money

in the big scheme of things. So here there's a discussion around that as well.

You know, the short story is that although we reviewed their instrumentation plan, and we were willing to give them $10,000, we never -- we cannot find any evidence that we did ever do that. I don't believe that we did. I don't think that ever happened. And so this was sort of like, so let's go -- we could do this friction testing for them. You know, maybe that would -- I don't know -- maybe that would go a way to help them with their monitoring or, you know, research work around this project.

Q. Okay. So a number of things in there. You're referring to there's a reference in one of these e-mails between you and Mr. Kazmierowski and Mr. Raymond where -- and this is in paragraph 118 where you forward Mr. Raymond's e-mail to Mr. Kazmierowski, and say:

"Hi Tom, I seem to remember we offered to do some monitoring of the Red Hill Creek expressway perpetual pavement. Did that not include friction testing?"

And Mr. Kazmierowski in paragraph 19 responds saying:

"Yes, but we should have Ludomir instruct the City to either request the testing or at least approve Ludomir's request for testing and give permission for us to test on their facility."

So you're referring back in your e-mail to this earlier offer. That's what you were just talking about; is that right?

A. Yes, yes. Earlier, like a month before this or something like that, we had been -- you know, reviewed their instrumentation plan, had said we could fund them $10,000, ta-da, ta-da, which I guess never happened. And there had been some discussion about could we run the ARAN over it; could we do some friction testing. And so even though we didn't have an official request in writing from the City, there had been these requests to, you know, somehow participate in their research.

Q. Right. And that's in 122, you say on the right -- and I'll come back to

the first part in a sec, but you say:

"Anyway we had agreed earlier this year to provide testing (rather than money for instrumentation, which was their original request). Please coordinate with Frank."

That's again --

A. Yeah.

Q. -- what you're referring to there?

A. Yeah.

Q. Okay. So there is an e-mail back -- referring to this in the number of e-mails back in May of 2007, so, what, four months earlier I guess.

And if we could go to -- in a moment to that, Registrar, image 41, in overview document 4.

And in paragraph 86 you'll see there's a reference there. These aren't e-mails that you are included in, but it's indicating, as you described, about perpetual pavement design and instrumenting and monitoring pavement performance and the financial participation potentially by the

province. And potentially -- and there's a contribution, OHMPA contributing $10,000.

And then Mr. Kazmierowski writes at the bottom there:

"I've already offered to do skid testing on the SMA surface of the Red Hill Creek Perpetual Pavement." (As read)

You've described what happened in the past. Were you actually involved in those discussions back earlier in the year, or are these things that you were informed about?

A. The instrumentation plan was submitted to me for review, and so this whole thing about the instrumentation plan, it came to me as -- at the time as the senior pavement engineer, not as the head. And it came to me for review, and I made comments on it, and they said that's where the $10,000 came from. Like, only we could pay 10,000 towards their instrumentation plan of the parkway, and then the idea being that, you know, we could all learn from this. We would receive the data from the instruments, et cetera, et cetera. So that was the idea behind it.

Q. Right.

A. And so Mr. Kazmierowski is my boss, so he would have submitted that to me, and then, you know, I guess he must've said to me -- because typically when we have like a research project, so I give -- this morning we talked about the SMA on the 401, so typically when we have a research project like that, we would be driving our ARAN vehicle over it which measures the roughness of the road, we would maybe do some friction testing, and we would write a paper about the road.

So this is the kind of thing that we would offer in kind. It's very hard to get money to donate to somebody else's research plan, so sometimes if somebody else had a research project, we would say, oh, we could do some ARAN testing for you, or we could do skid testing for you, and then that's sort of like what we can do. We don't have to seek approval for money or funding or any of those things. So it's sort of like an in kind.

So I imagine this as Tom saying, oh, we could do some testing in kind to avoid us having to pay a lot of money, because it

was very, very hard to seek any kind of funding.

Q. Okay. And the monitoring -- a couple of things.

A. Yeah.

Q. So do I understand you correctly, though, you didn't have those conversations with anyone at Hamilton or Golder about offering the skid testing back in May? Is that correct?

A. Correct. Correct. Yeah.

Q. Okay. You heard that from Mr. Kazmierowski?

A. Yes.

Q. Okay. And the second thing, the instrumentation, this is about monitoring the performance of the perpetual pavement overall and the stresses and so forth on it, right, with embedded sensors that are being used; is that right?

A. Exactly, yes. The embedded sensors in the different layers of the pavement, and then there would be a box on the side of the road that collects all the data, and, you know, that's how you access how there's stress and strain relationship with the different

pavement layers.

Q. Okay. So then going back to images 51 and 52, Registrar.

So, again, in this set of e-mails back in September 27th and 28th, that's what you were referring back to were those discussions going back to May and about recalling that there was a prior offer made that involved -- that included friction testing.

Now, in terms of the discussions here, did you have any direct discussions with Dr. Uzarowski or anyone at the City of Hamilton in respect of this, or was everything done through Mr. Raymond at this point?

A. Everything was done through Mr. Raymond.

Q. And do you recall if there were any discussions outside of these e-mails about the reluctance expressed in these e-mails about the City of Hamilton making a request for the friction testing itself?

A. Yes. So I think the concern was, you know, if we detect that there's an early friction issue on a contract that they are literally building right now, so, you know,

what's going to be the outcome of that.

So, you know, the City of Hamilton has to be aware or permitting us to do this testing in case they have to take some kind of action, right, so that was the discussion. We could get some really low numbers, and then the City of Hamilton would have to take some kind of action, so we'd better get their permission before we go and take this friction reading.

Q. Okay. So I just want to make sure I understand that. The impetus for wanting a direct request from the City rather than it coming through Golder was thinking down the road, so to speak, thinking in the future about what would happen if there were bad results, if I can put it that way, and how those results would be communicated; is that right?

A. Yes, because Ludomir, he is not -- it's the same position that I would be in with my own regional staff. Like, Ludomir isn't directing the contract. He's a consultant providing, you know, guidance to the City, but he's not the person in charge of that particular contract. So if anything has to happen on the contract, Ludomir doesn't have any, I guess, say

in that. He can only make recommendations, and so the people actually that are the owners of that contract have to take responsibility.

Q. Okay. So then it was about, right, that if there was a problem that was disclosed, that the problem would be dealt with? Is that -- or at least communicated to those who could make the decision about dealing with --

A. Exactly.

Q. -- the problem; is that the point?

A. Yes.

Q. Okay. And -- but in the end there was not a direct request, is that right, from the City?

A. So I didn't get anything in writing. I was relying on Chris who was saying, the City has said it's okay to go ahead and do the testing.

Q. Okay. And that you're referring there to -- I think there's --

A. Oh, sorry, Chris Raymond.

Q. Chris Raymond, yeah. Sorry, could you pull up 53 as well. Should be 52 and 53. Thank you.

A. It's there in 117.

Q. Yeah, my camera is in front of it. That's the problem. There we go. Thank you.

A. So it says:

"The City does not have objections to the testing."

Q. Right.

A. But they are not the ones making the request. Ludomir is making the request, but the City does not have objections. So I took that as being the City is aware of this request and has no objections to the testing going forward. So that was -- for me, that was a go ahead to let the testing go forward.

Q. All right. And in your e-mail on paragraph 122, in the first sentence, when responding to Mr. Raymond's observation where he says:

"Yes, the City is in agreement about the testing, but it's strange that the City are not willing to write a request. I asked Ludomir specifically to send me a request from the

City a few weeks ago." (As read)

And your response is the first sentence:

"Maybe they are concerned about the results from a liability perspective..."

What was that of based on, that particular comment?

A. Well, I mean, what it was based on is, well, if the results come back and they are, you know, clearly unacceptable results, then the City is going to have to take some kind of action, and maybe that's what their concern is. Frankly, it doesn't -- you know, it's not like I put a lot of thought into that sentence. I mean, it -- actually if you look at it, it doesn't make any sense, but that is what I was actually thinking. So it was sort of like -- I mean, it wouldn't matter anyway because they had requested or they had -- they were aware of the testing; they were okay with this going forward. So they are automatically taking on that responsibility.

Q. Okay. Why do you say "it doesn't make any sense"?

A. Well, it's not that they

didn't -- so to me, if they didn't know about it, it's different from -- you know, they are -- they are aware that we're out there doing the testing, and they are -- they are going to get these results, and they are going to have to take action if these results tend -- you know, turn out to be unacceptable.

Q. Okay. So it wouldn't affect anything anyway is I think what you're saying.

A. Right. Right.

Q. They're going to be aware of them anyway?

A. Yeah.

Q. Okay. And then you indicate in that same e-mail, "please, coordinate with Frank." So at that point, you're directing that the testing go ahead at that point and coordination take place with Frank Marciello, the operator, right?

A. That's right.

Q. Okay. And we know that from that point forward there are logistics and discussions about how it's going to take place. Did you have any further -- any further

involvement in the testing until the results were reported on?

A. No, I didn't.

Q. Okay. And appreciating -- so you described about the early offer of testing back, again, in May or so, and the report from Mr. Raymond on August 1st about his discussion with Dr. Uzarowski. What -- do you recall what your understanding was at that point of what the purpose was of the testing, what the impetus was for it?

A. What the purpose of this testing was?

Q. Yeah, yeah. I mean, there's a number of things that you described, right. The offer in kind that was made back in May, and then there was a discussion that Mr. Raymond had with Dr. Uzarowski on August 1st, and then you jump forward into September.

So did you think that there was any -- about any specific concern that was being addressed -- why don't I put it that way. Were you aware of any specific concern that was being addressed?

A. Well, that is likely

where -- why I wrote that sentence, because maybe they were concerned about the results from a liability perspective because I was aware of the SMA early friction issue. So --

Q. Okay.

A. -- that's what I assumed friction testing was all about.

Q. Okay. So if we can go to image -- OD image 60, please.

And in paragraphs 137 and 138 there's reference how on October 17th, 2007, Mr. Marciello e-mailed Mr. Raymond and you that the test results from the Red Hill on October 16th -- that were taken on October 16th. I just wanted to place that in time. We'll come back to that.

And I want to go back two pages to 58 and 59, please, Registrar.

And we can see in paragraph 135 that on the same day, October 17th, Mr. Marciello circulated friction test results from the Highway 401 for SMA placed in 2006 and recently for MTO contract 2005-3030 with -- had in some places low -- FNs of low 20s in some places.

So is this the contract and

the issue that you talked about before lunch about the 401 and the early -- context of the early age friction problem for SMA?

A. I believe that MTO contract 2005-3030 is the Woodstock contract.

Q. Okay. That's right. And then if we back up there on 132 on the prior page, Mr. Raymond sends an e-mail -- it's quite a detailed e-mail to Mr Tam, you, Mr. Rogers and Mr. Kazmierowski. And maybe you could expand that because it's a little bit tough on the eyes.

And this is actually on the same day that the testing itself was done on the Red Hill, but day before the actual results are coming in. And so he's referring to Highway 401 at Woodstock contract 2005-3030, and that testing that was conducted the prior day on October 15th.

And I think before you talked about the blended aggregate trial using OTR, which is Ontario Trap Rock, and Aecon dolomitic sandstone. So this is the one -- this is the contract you were talking about?

A. Yes, so the Aecon trap rock is the Marmora trap rock. So that's one that had traditionally been performing well, and we had

expected to do well. And then the SMA 50/50 blend with Ontario Trap Rock and the dolomitic sandstone, also, you know, not as successful as we would have liked considering we went to this huge expense to truck in dolomitic sandstone from the Ottawa area to try and achieve good friction results. So --

Q. Right. And indicating values in the low 20s in some instances, and then there's suggestions about measures that would be -- might or would taken about reducing speed, slippery-when-wet signs.

And if we could go onto the next page at the end of the e-mail about what signing and advisory speed tabs to be in place. And then advisory signing would be removed when FN equals 30 or greater are reached. And....

A. Yeah, I believe the average was 23 and -- something like that. So it was like, okay, we need to do something, so let's post some slippery-when-wet signs and advisory speed tabs, meaning keep the lower speed limit, and these measures could be removed once we got to acceptable friction levels.

Q. Right. Yeah. So we'll

open the westbound lane 1 briefly actually in a moment. I think it's worth looking at. But then at 144 which is at image 64. Yeah.

And on October 18th, so these are all happening within a couple of days, you had some comments on these test results on the same contract, and there, yes, you indicated in the first paragraph that:

"Westbound lane 1 is exhibiting friction numbers in the low 20s, with an average FN100 of 23."

And then the other lanes are in the high 20s, with the one eastbound lane 1 being closed.

And then in the second paragraph you refer to that you suspect that:

"We suspect that friction numbers are lower in lane 1 in both directions, because lane 1 receives less traffic." (As read)

So does this go -- this goes to the wearing off of the asphalt cement; yeah?

A. Yeah.

Q. Okay. And if we go to I believe it is MTO 2228 which is not -- actually I think that we should open that. I think we have that as a native, Registrar. Reversed it. 2882.

THE REGISTRAR: It's read only for me, so....

MR. LEWIS: You may not have the native for that one. Could you go to the detailed tab. There we go.

BY MR. LEWIS:

Q. Is that large enough for you to read, or would you like us to expand that?

A. Oh, no, I can see that.

Q. Okay. So this is -- you were referring in your e-mail in your testimony to the westbound lane 1 on this 401 contract. And if I interpret this correctly, the yellow there is the -- that's the -- where it says "recently placed SMA" in the comments, that's the very recently placed SMA, and then in the green it's the SMA that was placed the prior year; is that right?

A. Correct.

Q. And when you're talking --

A. Yes. I assume so, yes.

Q. Yeah. Okay. And then the overall average below is set at 33.1, but I take it the 23 average you're talking about in your e-mail is the newly placed?

A. Right.

Q. Okay. All right. And we can see that the results there are all well below 25, ranging from 20.7 to 24.1 in the recent (indiscernible). So I take it from this and what you described earlier, these were concerning results given the efforts that had been taken?

A. Right. And you can see in column K that somebody has calculated the average.

Q. Yes. Right. The 22.7 in the white part of it, right.

A. Yeah.

Q. And 40.6 on the 2006 placement, right.

A. Yes.

Q. Thank you. Okay. Now, if we could go back to the Red Hill, that overview document 4, image 60. And paragraph 137, if you could call that out, please, Registrar.

This is on October 17th. Mr. Marciello is -- e-mails you and Mr. Raymond the Red Hill test results. And he indicates the test limits, the CNR structure to Greenhill that we already -- that we looked at this morning. And indicates:

"Dufferin and Philips Engineering and Andros Delos Reyes are eager for results."

And then:

"Note, friction numbers below 30 were collected in areas situated directly under overhead structures (least likely to get weathered)."

And did you review these results at the time you received them or shortly thereafter?

A. Yes.

Q. Okay. And if we take that down, Registrar, and if you could go to the next two images. These are a little harder to read. But what did you take from the results at the time when you reviewed them?

A. I thought that they were

good results, actually.

Q. Okay. And why is that?

A. Because this was us going out to -- with concerns about early age friction literally in the middle of the construction project, get right on the newly paved surface, and we have acceptable numbers without any concerns right from the get-go, and yeah, so I was like, oh, these are good.

Q. Okay. And by "good," are you -- I take that as you mean good in the context of what you had already been discussing about the early age friction issue; is that fair?

A. That's fair.

Q. Okay. And is it fair to say that you may not have had the same reaction to it if it -- out of the context of early age friction -- early age low friction for SMA; is that fair?

A. That's fair, yes.

Q. Okay. And appreciating -- I mean, what -- at the time you were also receiving those results from the 401 that we just looked at?

A. Yes, but I also had

received the very early results from the other contracts where -- that caused the pause in the first place -- or not the pause, that caused the concern in the first place. I had seen those early numbers.

Q. Yeah. I didn't mean to suggest that it was just the 401 --

A. Okay.

Q. -- issues that you were going to. But at this moment on these couple of days, you're also looking at the 401 Woodstock contract results as well, right?

A. True.

Q. And did you understand at the time -- what did you understand at the time Mr. Marciello's comments to mean about the areas of FN under 30 being situated directly under head over -- directly under overhead structures?

A. Yeah, I thought that was really interesting. To me it was -- what he was saying is that we're on the pavement so early that the pavement that's in the shade from the bridge hasn't even been exposed to the sun, like hasn't had a time to age and sort of catch up with the other friction numbers. You know what I mean?

It's so freshly placed that the asphalt hasn't oxidized. Like, whatever wasn't under the bridge would be exposed to the sun, would start to stiffen and oxidize and -- apparently faster according to his comment.

Q. Okay. Do you recall any discussion with him around that, or is it just the e-mail that -- or that --

A. I don't -- no, I don't recall a discussion at all.

Q. Okay. And the idea or theory about it being related to being under overhead structures, is that something that had been investigated or studied, or was this just an idea that came from Mr. Marciello which you thought was interesting?

A. Yeah. No, I hadn't thought of that before at all, so....

Q. Sorry, you had not thought of that before?

A. I had not thought of it at all before this.

Q. Right. Okay. Okay. And the results -- the average results we know are -- in both cases, both the lane southbound in 1 and

2, 33.9 and 33.8, with some of the results you indicated being under 30. Did those in the context cause you any concern?

A. No. No, I was pleased with the results.

Q. And you mentioned Philips and Dufferin being, I think, eager for the results. Is that something you had any further discussions about or any knowledge of other than what he wrote in his e-mail?

A. To be honest, I had no discussion on that at all. My thought was that Mr. Raymond organized the testing; Frank showed the results to me. My thought would be the next step would be Frank would give them to Mr. Raymond, and he would go back to the requesters. I actually, you know, hadn't even given it a thought about who else was seeing the results.

Q. Okay. And then if we could go to image 72 in OD 4.

A. That might have been by the way -- they might have been -- like, I'm speculating, sorry. They might have been interested in the results with the idea of trying to get their aggregate on the designated sources

list in the future. That's the only thing I can think of, but it's pure speculation.

Q. Right. You don't actually -- you don't have any personal knowledge of that; that is just something you are speculating on based on what you see?

A. Yeah.

Q. Okay. In image 72 and paragraph 162, and maybe if you could pull up 73 as well so I just make sure there is nothing on the next page. No. Okay.

So in paragraph 162, on November 6, 2007 -- and there is a lead up to this, but just to place it in time -- Mr. Raymond e-mailed an information note or briefing note titled "Pausing the use of stone mastic asphalt pavement" to Mr. Tam and to you indicating --

If you could expand the note itself there, thank you, Registrar:

"The Ministry is pausing the use of stone mastic asphalt, SMA, pavement due to concerns with low pavement friction immediately after construction. The decision to

pause the use of SMA is related in part to low pavement friction on a construction contract on Highway 401 at Woodstock. The issue affects selected projects on 400 series highways primarily in central and southwestern region. Recommendation, the ADM should be aware of the decision to pause the use of SMA and the low pavement friction concerns encountered on Highway 401 at Woodstock."

And so that's -- again, that's the same contract that we were just talking about from -- tested in October 2007; yes?

A. Yes, it is.

Q. Okay. And on or about this day was when the pause was first instituted; is that right?

A. Yes.

Q. Yeah. Okay. Just wanted it for the record. You can take that down,

please.

A. So --

Q. Go ahead.

A. -- I mean, I only say yes hesitatingly because, you know, until it's actually sent out, like, it -- like, I don't know if, you know, now we have to go to the ADM for a decision note or -- you know what I mean? This was like a briefing note that says --

Q. Yeah.

A. -- we're recommending that we pause the use of SMA. So if it was that day, I don't know. I mean, what happened to the info note after that? Did it take three weeks to get to ADM? Do you know what I mean?

Q. You know, I don't -- it's a little unclear. There's not a specific thing that says this is the date on which the decision was made, but it does appear at the very bottom of image 72 to refer to the ADM should be aware of the decision. And I don't think anything turns on the specific date. And maybe on the break I will find it. But that's certainly a fair comment by you. It might be -- if you look at paragraph 164, on November 13th the SMA task group meeting to

discuss pause, and it's being discussed at that point, and it's in the minutes and so forth, so....

A. Okay.

MR. LEWIS: Okay. It is 3:15, Commissioner. Would this be a good time for the afternoon break?

JUSTICE WILTON-SIEGEL: Yes, it is, and let's take 15 minutes this afternoon. I have one matter I've got to attend to related to this. So we'll stand adjourned until 3:30.

--- Recess taken at 3:16 p.m.

--- Upon resuming at 3:30 p.m.

MR. LEWIS: We're back. Commissioner, may I proceed?

JUSTICE WILTON-SIEGEL: Please proceed.

MR. LEWIS: Thank you.

BY MR. LEWIS:

Q. Ms. Lane, just to close off on the SMA pause. Did the Red Hill Valley Parkway skid test results taken in October 2007 have any bearing on the MTO's decision to pause the use of SMA?

A. No, they did not.

Q. And if we could go to overview document 4, images 69 and 70.

And in paragraphs 155 and 156 there are some communications in early November, November 2nd, 2007, where Dr. Uzarowski e-mails Mr. Raymond about a company called Blastrac, and under the subject line "Friction on SMA on Hamilton's Red Hill Valley Parkway," and then Mr. Raymond forwards that to you in paragraph 156.

And we know that Blastrac uses a method to improve pavement friction. And in his e-mail Dr. Uzarowski is giving the contact information for Blastrac and so forth. We'll be asking Mr. Raymond who is involved in -- more deeply in the discussions about this -- about this issue. But do you know what was going on here? Do you recall what this discussion was about?

A. So I'm imagining that -- obviously one of things that we wanted to do is find out what different techniques we could use to try and improve the early friction. So for example, we mentioned water blasting or spraying sand or -- there's a bunch of different things that we could try, and then one of them would be Blastrac. So I'm sure in the conversations that

Chris was having -- sorry, Chris Raymond was having with Dr. Uzarowski, that it came up that we were looking at all these different options, and he said he knew somebody at Blastrac, and that's the information. So, you know, that is what I see this as being, him giving us a contact for somebody that operates a skid abrader.

Q. Okay. Right. And it's a skid abrader. That is what we were talking about earlier as one of methods for potentially remediating low friction, right?

A. Yeah.

Q. Okay. And -- all right. Well, as I said, we'll ask Mr. Raymond more about it. To your knowledge, did this have anything to do with the Red Hill Valley Parkway?

A. No, I don't believe it did, and it seems to me they wouldn't have to tell us about it if they were planning on using this technique. I mean, it's -- yeah, so I don't know. I don't think it did.

Q. Okay.

A. Yeah.

Q. And if we could go to image 80. And I guess 79 and 80.

And in paragraph 183 you are e-mailing the Red Hill Valley Parkway skid test results to Tom Kazmierowski with the subject line "Friction results on Demix Aggregates in SMA in Hamilton," and then you giving the FN90 average, the minimum and the maximum from the results. Do you recall why you were sending that to Mr. Kazmierowski at that time?

A. Well, I think it was after Demix applied to get their aggregate on the designated sources of materials list. So the discussion would have been, oh, we already used it on the Red Hill Valley Parkway, and so the question had been, well, what were the results like.

Q. Okay. And now, Mr. -- at that point Mr. Kazmierowski, he is what position at that point? End of 2007.

A. He's in the manager of materials engineering and research office role. Yeah.

Q. And you're still at that point in the acting pavements and foundations role; is that right?

A. Yes. The reason I

believe it was because Demix applied is that nowhere in any of the previous information was there anything about Demix Aggregates or what type of aggregate it was. So all of our discussions prior to this had been about early friction testing. You know, concerned about early friction testing. Somehow suddenly we're talking about the aggregate itself, so I'm thinking this might be because they had just applied to put their aggregate on the designated sources and materials list.

Q. Well, they had indeed just applied in -- earlier in December. That's correct. And you can see in the immediately preceding paragraph, December 13th, Mr. Rogers, Chris Rogers is writing back to Demix in response to its application.

A. Okay.

Q. But there was -- give me a moment.

Mr. Raymond did in his e-mail back on August 1st, he did mention Demix in relation to the call from Dr. Uzarowski. He did mention it back then. But -- so do I take from what you're saying that you don't have a specific

recollection at this point about why you provided (indiscernible). That makes sense to you given the chronology of events?

A. Oh, yeah. I was totally tieing it together that Demix had applied to get their aggregate on the DSM on -- and the question would be, okay, well, you know, they have this trial on the Red Hill Valley Parkway. Oh, what were the results. There it is.

Q. And Mr. --

A. It was the same day.

Q. Sorry? That was a little garbled.

A. It happened on the same day.

Q. Right. And Mr. Kazmierowski responds -- this is in paragraph 184 -- by saying:

"Not great results but still consistently acceptable even at 90 kph. Have you shared these results with our MTO task group members?"

And then in paragraphs 185 and 86 you -- keep 80 up and move to 81 as well,

Registrar.

In 85 you -- 185 you indicate they went to Mr. Raymond and Bob Gorman:

"I'm not sure he shared with the MTO task group members."

And then you send the results to Mr. Tam, Mr. Rogers and Mr. Billings.

And so are they the task group members at that point, the SMA task group members?

A. These are the internal task group members --

Q. Yeah.

A. -- so they would be my colleagues at MTO.

Q. Right. Yeah, sorry, the MTO members of the task group at that point.

A. Yeah.

Q. And Mr. Billings, we understand from the meeting minutes, was on the joint SMA task group throughout 2007, 2008. Do you recall what his position was at that time?

A. Yeah, he was the head of Geotech in central region.

Q. In central region, okay. And did you yourself ever share the Red Hill test

results outside of the MTO?

A. Eventually, yes.

Q. Sorry, at this point in time? I think you're jumping ahead to 2019. Fair enough. Around this point in time?

A. No, I didn't.

Q. Until -- okay. You did not?

A. No.

Q. Okay. And are you aware of anyone else at the MTO sharing the October 16, 2007 skid test results with anyone outside of the MTO other than Mr. Raymond providing it to Dr. Uzarowski?

A. No, I'm not aware.

Q. Right. And then we know that the MTO continued -- did conduct skid testing on the Red Hill between 2008 and 2014 with the exception of 2013. And what is your knowledge of the purpose of that testing?

A. So that was part of this Demix Aggregate approval for approving the aggregate on the designated sources and materials list. So they followed our process which is to apply to the Ministry with their quarried source,

request that we evaluate them and -- with the idea of putting them on the designated sources of materials list.

So a letter was sent to Mr. Chris Rogers that -- to initiate that process, and then the process would kick in. So send somebody out to the quarry, take samples, evaluate the source, do the laboratory testing, and if everything is good, then you go to the next step which would be placing the test section and evaluating it in the field. But of course because there was already a test section built, they decided to evaluate the test section that we had tested already.

Q. And is that something that you had any involvement with at the time, or is that something that you became aware of later?

A. No, I didn't have involvement in selecting that test section.

Q. Okay. And if we could go to overview document 4, image 84.

And we know that in 2008 Mr. Marciello conducted skid testing on the Red Hill on June 12th of that year, 2008, and e-mailed them to Mr. Gorman, Mr. Raymond and Mr. Ponniah on

June 18, 2008. And am I correct you're in a different -- you're in the ADM position at that point; is that right?

A. That's right. So --

Q. Sorry, you weren't the ADM, you were --

A. I wasn't the ADM, no. I was in the ADM's office. So yeah, I would have left -- so, you know, Christmas holidays or whatever, and then from January to the end of June I would have been working downtown. So this whole selection of where they are going place it, et cetera, et cetera, that would've been all done while I was in different position.

Q. Okay. And then jumping ahead to 2009, if we could go to images 86 and 87.

And if I've got your career trajectory correct, you're back in the head pavements and foundations position at this point but in a permanent capacity instead of acting; is that right?

A. Correct, yes.

Q. Okay. And we see here in paragraph 200 Mr. Gorman, in the soils and aggregate section, provides a memo to you to

conduct skid resistance surveys for the 2009 season, and one of those requested is that the:

"Red Hill Valley Parkway SMA be evaluated as soon as possible, since it will have passed to the second winter."

(As read)

And then there's a table and a list of contracts and so forth. And he describes the test section for the Red Hill.

And is this the typical approach that was made when soils and aggregates is requesting testing of sections in relation to the DSM?

A. Yes. So the protocol would be that the -- whoever wants testing done would submit an e-mail or a memo. In this particular case because it was for the DSM, it was like a formalized process, you know, with standard memo that was used every single year. And so it would come into the head to document. These are the -- this is the work plan for the year, and the head would receive it and agree. Thank you very much.

But the real communication

would be between Mr. Gorman and Mr. Marciello who were the ones that actually engaged in the discussion about the job.

Q. Okay. And then if we could go to the reference document. It's MTO 21224.

And this is just the first page. This is the sort of typical kind of memo that would come from soils and aggregates to you as the head of the pavements and foundation section?

A. Exactly.

Q. Okay. And I see if -- if we scroll through it, we see the Red Hill there and one other contract.

Could we go to the next image, Registrar.

Again, there's an ongoing list of items and test sections.

A. Yes. So this is formalizing the request from soils and aggregate section to the pavement and foundations section.

Q. Right. The next page as well, please, Registrar. Okay. It's four or five pages of listing them, and then if you go to image

6 -- no, image 5, sorry, image 5. Okay. There we go.

There's a table which then, again, lists the pavements and the years to be surveyed. It looks like in this particular iteration it starts in 2002 and goes to 2011, and there's -- and is this indicating sort of the past and future schedule for the test request? Is that what this is indicating?

A. Yes, yes.

Q. Okay.

A. I just imagine this being used year after year. I don't know if you got out the same table, it would be the same, and then they'd just add an X in the column.

Q. Right. With skid testing in 2008/2009 and in the subsequent years up to 2014, did they have any relationship to the original arrangements made with -- between Golder and the MTO for the testing that was conducted in October 2007?

A. No, because it was done for different reasons. So the testing that we did here is specific to soils and aggregates section evaluating aggregates for the designated sources

of materials list. And the one that we did in 2007 was specifically for the early SMA friction concern, and we liaised with Ludomir Uzarowski and the City about the early age friction concern for the SMA.

This is just routine designated sources of materials work where we're evaluating the aggregate that's used in the road. So the other one was aggregate. That was evaluating the SMA mix and its early friction concerns.

Q. And to your knowledge, were any of the test results from 2008 to 2014, were any of those skid test results shared with Hamilton or its representatives prior to 2019, which we'll talk about later? But up until then, to your knowledge, were any of those results ever shared with Hamilton or its representatives?

A. I have no knowledge of sharing them with Hamilton.

Q. Okay. You yourself did not do that?

A. I have no recollection of doing that, correct.

Q. And do you recall if you

ever -- if not sharing the physical tests either in the hard copy or electronically, did you ever tell Hamilton or its representatives that the skid testing in those years was taking place?

A. So I believe I did. And I only believe this because I said that I would, and if I say that I'm going to do something, I usually do. And that was in 2010, I believe. There's an e-mail chain about that where I say, I will reach out to this -- I'll reach out to Ludomir Uzarowski for a contact for the City of Hamilton, and so I imagine that I did follow through on that.

Q. Okay. So what -- okay. So why don't we just hold that for a moment and talk about the results prior to that so that we have the lead up to that discussion. I think you're talking about an e-mail in late 2010?

A. Correct.

Q. Right. When you said:

"Perhaps I will call Ludomir for a City of Hamilton contact." (As read)

Okay. So if we could then -- we'll hold that and still cover it. But if we could talk about these -- the 2009 results. So

in -- if we go to -- actually, I'll back up.

I understand that you received the results in -- from the Red Hill in each of 2009, 2010 and 2011. Is that correct?

A. So yes, I would have received them, yes.

Q. Okay. And that's because you were the head of pavements and foundations in those years, right?

A. Yes.

Q. Okay. And then the 2009 testing, if we go to image 87. And on May -- this is paragraph 202. On May 8, 2009, Mr. Marciello e-mailed Mr. Senior, Mr. Gorman and Ms. Lane attaching the friction test results from the RHVP the previous day, and he stated:

"Gentlemen, might be too early tell, but it appears that friction levels/trends may be starting to decline with time."

And the response on May 11th from Mr. Senior in paragraph 203 is:

"Frank, both Bob and I agree there is no clear indication

of any early trend in the data. Maybe you just have a 'gut' feel for what's going on there. Time will tell. We will be sending out a notice regarding conditional approval of the source pending satisfactory performance of the pavement and of the source materials. Thanks for everything." (As read)

And do you recall if you had any views or input on this issue about the potential decline in numbers?

A. I know I wasn't involved in this, and so, I mean, although you say the e-mail is to me, it was actually to Mr. Senior and Mr. Gorman, and --

Q. Right.

A. -- I was just cc'd on it because he was cc'ing me as the head. But this aggregate sources list, you know, approval of the source, all of those things is the soils and aggregate section. So when Mr. Senior writes back and says, "Bob and I agree," it's because

Mr. Senior and Mr. Bob Gorman were the experts in this area, and they are the ones that are managing the designated sources of materials list and pre-qualifying aggregates, looking at the data over -- you know, that's what they do. That's their job. So this is -- you know, this is what the soils and aggregate section does. That's their role.

Q. Okay. So -- and then shorter, do I -- did I understand what you're saying is you're copied on this, but it's at this point Mr. Gorman and Mr. Marciello that are having the -- and, sorry, Mr. Senior who are having the discussion about what to do at that point, and you're not directly involved other than receiving the information? Is that --

A. Correct, yes.

Q. -- a fair summary?

And he refers to "conditional approval." Is that a word you were familiar with for approval of aggregates that had been applied for inclusion on the DSM?

A. No, not particularly, no.

Q. Okay. I'll ask him about that.

And if we can go to images 118 and 119, paragraph 286. I think it's 286.

In the same year, the MTO was conducting friction testing on the SMA placed by Dufferin in contract 2005-2008 on the -- at the QEW/Red Hill Valley Parkway interchange. And is this something that you recall?

A. Well --

Q. Other than -- other than --

A. -- I'm aware of it now. I -- honestly, like this is the problem when you read all this stuff. So yes, I'm aware of it. Did I know about it then? Doubtful.

Q. Well, you did receive -- you're indicated as receiving the e-mail on June 29th. You're one of the many recipients for it. Fair to say that other than reading this, you don't have a specific recollection of it at this time; is that fair?

A. Yes.

Q. And when you at the -- going up to the top of the page there, it indicates that the:

"Preliminary results indicate

average friction numbers throughout all lanes range from 32 to 36."

And then in paragraph 289, going onto next page, page 120, Registrar.

On July 23rd Mr. Marciello e-mails you, Joseph Della Mora and Mr. Raymond with the friction test results on -- for the trial of SMA on the QEW in that same contract at the interchange of the QEW and Red Hill and indicating "early friction appears to be improving," and then the results show the test range between 33 and 35.4, with one lane falling slightly below 30.

Again, do you have any specific recollection of these results beyond what's in the documents themselves?

A. So this is the QEW/Red Hill Valley Parkway interchange which is an MTO contract.

Q. Yeah.

A. So I seem to recall the idea would be this was past the time that we had paused the use of SMA, but we were still allowing some SMAs to proceed, and the reason being, like,

in this case here, the contract was 2005-2008, which means that it was already awarded when we came along with, you know, the pause and all of those things.

So now we're in a scenario where we're going let the SMA go even though we're in an SMA pause situation. So they are looking for ways to improve the early age friction. We're still in the experimental, I guess, phase of trying different things to try and see if whatever we do to tweak the mix or the aggregate or the, you know, asphalt cement content or whatever it is will improve the friction. So yeah -- so that's where we are with this job.

Q. Right. And you refer to it as a trial, and it's what you're doing to try to work out what the best way is of dealing with the early age friction issue ultimately. Is that fair?

A. Yeah, yeah. I don't think we would have -- I don't know if we would have called it a trial, but it would have been -- you know, we would have -- we would have looked at it. We would have said, the contract is already awarded. You know, this is what they are saying

they are going to do. You know, what tweaks can be made to try and improve this early age friction problem. And so when he says that early friction appears to be improving, I'm reading into it that whatever tweak or whatever we did on the contract has -- is improving the early friction results. I mean, honestly, it's a long time ago.

Q. I understand. And then moving into 2010 at page -- image 89.

JUSTICE WILTON-SIEGEL: Sorry, page 89?

MR. LEWIS: Image 89, yeah. Page 89. And paragraph 210. Do you have that, Commissioner?

JUSTICE WILTON-SIEGEL: I will have. Go ahead.

BY MR. LEWIS:

Q. So on April 1st, 2010, Mr. Marciello e-mailed the results of testing that had taken place on March 31st, and he sent it to Mr. Gorman, you and Mr. Senior. I'll just check and see, but I suspect it was copied to you rather than direct, but let me have a look. Yeah, sent actually to Mr. Gorman, copied to you and Mr. Senior from Mr. Marciello. And he indicates,

again, that the testing had taken place on the Red Hill. And he says:

> "The attached read-only files will show a decline in friction in the NB "-- northbound lanes "-- averaging 5FN. Some values are at or below FN100 of 30. SB --" southbound lanes "-- performed at similar levels, mid 30s, as in 2009. Please review and if any questions arise, please e-mail or call me." (As read)

And do you recall if at the time -- there's a response actually in the next paragraph, sorry. At top of the next image in paragraph 211, Mr. Gorman replies to the same group, stating:

> "We'll have to watch this one. Maybe do again after the summer."

And Mr. Marciello agreed.

And do you recall if at that time with these if you would have reviewed the specific results attached and -- or paid further

attention to them at that time?

A. I probably wouldn't. I don't recall doing it, but I -- you know, the reason I say that is because, again, this is going to Mr. Gorman, and Mr. Gorman is responding, so I'm thinking that Mr. Gorman and Mr. Marciello are communicating on it. You know, we're going to have to watch this one gives me the impression that they are on it. Like, I don't need to get involved. They have spotted something, and they are on it.

Q. Okay. And then the next thing to bring forward, what you referred to earlier when I asked you about contacting or informing anyone outside of the MTO about the test results. If we could go to image 90, please, 9-0. Yeah. No, sorry, it's right on the same page.

So in paragraph 212 on November 15th, and maybe we could expand 212 and 213. Thank you.

So Mr. Marciello e-mails you sort of a brief history in the first paragraph of what happened in 2007, and then indicates that:

"Northbound lanes have shown declining friction performance

properties from the start, while southbound lanes improved in the first year and then started declining afterwards."

And then you reply as you had referred to.

"Good stuff, Frank. Thank you. Perhaps I will call Ludomir for a City of Hamilton contact."

And then separately you asked him for the most recent friction test results from the Red Hill from the spring of 2010, and he provided those to you.

So first of all, is this what you were talking about earlier when I asked you generally if you recall whether you had informed anyone outside of the MTO about the testing of the Red Hill having occurred?

A. Yes, this is what I was referring to.

Q. Okay. So do you recall why Mr. Marciello sent this information summary to you? It's in paragraph 212.

A. So I -- from previous paragraphs we saw that Mr. Marciello and Mr. Gorman were having a conversation around concerns they had with the data. They said they were going to watch it.

So fast forward to November of the same year, it's -- you know, what I'm seeing here is I -- Mr. Marciello and I are in the office together. He says to me, I'm still a little concerned about the declining numbers on the Red Hill Valley Parkway, and you know -- and then I say, oh, really, send me whatever. And next thing you know, I get this. So this is what I'm imagining a scenario. So what made me think I called them is because I'm saying, you know, thank you, I will -- perhaps I will call Ludomir for a City of Hamilton contact. Can you please send me the results.

So, like, to me, Frank has gone the extra mile of coming to me in the fall and saying to me, actually, you know, I think, you know, I'm not happy with how these numbers are declining, and so my reaction to that was maybe I should call the City of Hamilton and let me them know the numbers are declining. That's -- I want

to say that that is what I think I would do knowing who I am as a person, and I'm very diligent at my job, so that's what I think I would do. But do I actually recollect the conversation that -- who I talked to or anything like that, I don't have a recollection of that. You know, but it seems to me very likely that it is something I would do.

Q. Okay. So a couple of things there. Going back to what you described about -- and I think you used the word well, I'm imagining a scenario about the discussions with Mr. Marciello. Do I take from that that that seems logical from the course of correspondence here, but you also do not have a specific recollection of that occurring? That's just what you think seems likely given the e-mails that we just reviewed?

A. Yeah, because the e-mail itself is -- it looks like the continuation of a discussion, right. You know, this isn't the kind of e-mail you just send and e-mail like this without any context or background or discussion, so....

Q. And Mr. Marciello is in

the -- you're at the time in the same general space?

A. Yeah, exactly.

Q. Okay. Right. And his e-mail on November 15th, it's not likely just coming out of the blue for no reason after -- several months later if there hadn't been some discussion between you, right?

A. Yeah. Like, to me, the e-mail is too truncated or -- you know, it looks like we had a discussion, and then this e-mail was the follow-up to that.

Q. Okay. I just wanted to be clear about your current recollections and so forth.

A. You're right. I don't have a recollection of that.

Q. Okay. And then, if I understand you correctly, similarly with whether you contacted Dr. Uzarowski for a City of Hamilton contact, you similarly don't have a specific recollection at this time of doing it, but you think it's quite likely that you would have based on how you operate your practices and so forth. If you say you're going to contact someone, you

typically do; is that fair?

A. Yes.

Q. And at that time did you know Dr. Uzarowski? Had you dealt with him in a professional capacity at that point?

A. Yes. I mean, I've known Ludomir for a long time. I don't know how far back that would go, but, you know, I in particular have known him for a long time, worked with him on many things. The early asphalt cracking, which is a totally different issue, you know, we worked very closely together on that, and yeah, I couldn't pinpoint how far back I've known him.

Q. Okay. Right. But, again, he was someone that you knew and had dealt with previously at this point?

A. Oh, yes.

Q. Okay. And -- sorry, and that's with respect to Dr. Uzarowski. What about the City of Hamilton contact? Do you have any recollection of contacting someone at the City at any point?

A. I don't have a recollection of who that would be.

Q. Okay. And in terms of

authority to disclose results, you know, clearly you had the authority to discuss and disclose results in your position at the time; is that correct?

A. So I would have been the head of pavements and foundations section. I think, you know, what I -- I'm almost a hundred percent sure that I wouldn't have shared the actual data. It probably would have been a conversation, right, because we typically don't send out data. So -- and I have no evidence that I did do that.

So I'm thinking it would be more along a conversation like, we started to notice that the friction is declining, and in particular there was, I think, a six-point drop over the course of the year. So that could be concerning. If it drops another six points, you know, we're down into the mid-20s and who knows how -- what's going to happen with the performance.

So I am -- you know, I doubt that I would have actually sent data, and I have no evidence that I did, but I think I would have had a conversation around seeing the friction

numbers decline.

Q. Okay. And then if we could go to -- take that down, Registrar, and go to image 92.

In paragraph 219 you'll see that Mr. Marciello on May 25th conducted the Red Hill friction testing, and on May 26th he e-mails that, again, to the same group, Mr. Senior, Mr. Gorman and you, and if we could expand his e-mail. And Mr. Marciello indicates that the 2010 data that we were just discussing was collected and reported at 100 kilometres per hour, being 10K over the previous year's collection speed. And he indicates:

"This would definitely explain why this SMA's performance dropped significantly last year. I made and reported an adjustment to the 2010 data in the data below."

And then goes on to describe the results. And do you recall if you paid any more attention to these results than the ones in the past? Do you have any recollection one way or the other on that issue?

A. So this would indicate that this rapid polishing that we were concerned about wasn't happening. So, you know, it was actually a testing error. And, you know, we're expecting some kind of gradual, you know -- gradual decrease in the friction number over time with the traffic volumes, but not that rapid drop that we had seen. So this explains that there was no rapid drop. It was a testing error. It also says that some of the frictional numbers have maintained -- are maintaining exactly the same or a very slight drop. So this would have sort of put us at ease that there wasn't some kind of rapid deterioration going on.

Q. And what's the distinction in your mind between, you know, a rapid drop and a more gradual one? What's the -- what do you see as the significance of that?

A. Well, I had seen in the previous data there was a six-point drop, and so, you know, that to me looked like some kind of rapid -- more rapid deterioration versus, you know, losing a couple of -- one or two points is more of a gradual over time deterioration of the friction. When you only have two data points, you

don't know where that third data point is going, right.

So if your first two data points go one, two, then point number three could be down here. It could also be back up here again, right. So having just the two data points is like cause for, hmm, I wonder where that third data point is going, right.

Q. Right.

A. But then when we did the testing, we found out actually not only was it not this data point, it was more like this data point, and it's kind of stabilized. So the data is very, very gradually decreasing in friction. It's not at all a rapid polishing --

Q. Okay.

A. -- that we were concerned about.

Q. And if we could open up, please, then -- I think we can put up two at once -- the attachments to the 2011 results. These are MTO 34405 and 34406. Do we have the natives for those, sorry, so we can see the -- could we pull those up instead? Okay. And could we put up the chart for those too. Can we do that

for both? Is that possible? For 05 and 06. It's the chart button on the second -- yeah, on both of them. Maybe is it -- can you pull them both up or no? If you can't, then it's fine.

THE REGISTRAR: It's a little hard.

MR. LEWIS: Okay. Why don't we just look at the --

(DISCUSSION OFF THE RECORD)

BY MR. LEWIS:

Q. Can you see that, Ms. Lane?

A. Yes, I can.

Q. Okay. And so these are the two southbound lanes, southbound lane 2 on the left and southbound lane 1 on the right. And these are the ones that were also tested in 2007. And I think the average in southbound lane 2 has dropped from 2008. It's gone down a total of six, and in FN6 from 38 to 32, and in southbound lane 1 it's gone down 40 to 35. Is that right?

A. Oh, from 2008?

Q. Yeah, from 2008.

A. Sorry. Yeah, I was looking at the wrong number. Yes.

Q. Okay. I was not looking at the 2007 result because you already described the early age issue, and you saw the increase after that. Okay. So did I understand you correctly in saying that this is a -- a gradual drop that did not cause you any concern at the time?

A. Correct.

Q. Okay. And then could we open the two northbound lanes. That's MTO 34407 and 34408. Again in native. Sorry, I didn't specify that.

So these are the two northbound lanes. First is northbound lane 1 and then northbound lane 2. And both of which start in 2008, because they weren't tested in 2007, and showing a drop from 2008 to 2011 in the case of lane 1 from 41 to 35, and in lane 2, 39 to 34.

A. Yeah, over the course of four years, though. I mean, the thing that alarmed me with the other data was it was showing a six-point drop in one year.

Q. Right.

A. So this is a gradual deterioration of the pavement friction, so the

drivers aren't noticing a huge -- you know, they are driving it every day. They are not -- it's not -- it's gradually, gradually reducing in friction.

Q. Right. So you're talking about driver expectation?

A. Yeah.

Q. Okay. Maybe before we sign off for the day, if we could go to -- take those down, Registrar. If we could go back to the 2010 testing, which is before it was corrected. And this is -- going to bring up the first two, MTO 34019 and 34020, both in native, please.

These are the 2010, the southbound lanes, later then corrected by Mr. Marciello. And we're looking at the difference between 2009 in southbound lane 2 on the left is 35, and then it's decreased to 32, and in southbound lane -- sorry, sorry -- that's northbound lane 1, sorry, on the right, is a decrease of 4 from 39 to 35. So it's not quite six. It's three and four in those instances.

We can go to the other ones, though. Pull that up -- those up. If you could -- so is -- that's 19 and 20. If we could

go to, Registrar, 34 -- MTO 34021 and 34022.

JUSTICE WILTON-SIEGEL: And these numbers are corrected by Mr. Marciello?

MR. LEWIS: These are before they are corrected. These are the 2010.

JUSTICE WILTON-SIEGEL: These are before corrected?

MR. LEWIS: The ones that we were looking at from 2011 were the ones after correction.

BY MR. LEWIS:

Q. And here in -- make sure I have the right one. Doesn't say which lane that is. If you could -- on the one on the left, Registrar -- oh, it's southbound lane 2. There it is. Sorry, could you -- yeah. Thank you. You may have pulled the same one up. I'm not sure. That's -- sorry, on the one on the left, please close. 19. Yeah, I would like 20 and -- 21 and 22. Yeah. That's correct. Thank you.

So northbound lane 2 on the left, and that's a drop of -- from 2009 to 2010 of 5, from 37 to 32, and in southbound lane 1 of 4 from 2009 to 2010. Right.

And is that -- I know you had

said six. I think Mr. Marciello talked about five later on. I just wanted to go back and make sure we were accurate on this.

A. I thought it was six, so -- I mean, I see here it's five, but for some reason I had it in my mind it was six.

Q. Okay. That's fine.

A. So yeah, I mean, you know, it's cause for -- it's going 39, 37, 32. That's a -- you know, that's quite a drop, right. So that was, like, okay, you know, where is it going next. When you go back to the following year and you find it's actually -- it hasn't dropped even further, right, that's when you realize, okay, we tested it at the wrong speed. That's why there was this big drop. And you know the -- all of these numbers are still acceptable. They're still satisfactory, and, you know, they're also likely to level off, right.

So this is not -- when you see the big drop, that was what made Frank want to talk to me about it, which is why, you know, I was suggesting I will call the City of Hamilton, because I saw this drop. It turned out to be not real, and then the numbers seem to, you know, like

I said, be gradually deteriorating and levelling even towards -- not here, but, you know, gradually deteriorating. They are not at all accelerated in their friction number reduction.

Q. Okay. And I understand from your CV and our discussions earlier that later in 2011 into 2013 that's when you moved into the new position?

A. Yes.

Q. In the systems analysis and forecasting office?

A. Correct.

Q. Okay. And there was testing in 2012. Did you receive the results in that year?

A. No.

MR. LEWIS: Okay. I note it is 4:30, Commissioner, which is our new end time. I will have some more questions for Ms. Lane tomorrow, as will participants' Counsel. We did build in extra time to come back tomorrow. So if -- this may be a good time to break for the day.

JUSTICE WILTON-SIEGEL: Okay. Let's then stand adjourned until 9:30 tomorrow

morning.

MR. LEWIS: Thank you very much.

--- Whereupon at 4:31 p.m. the proceedings were adjourned until Tuesday, May 17, 2022 at 9:30 a.m.