

RED HILL VALLEY PARKWAY INQUIRY

AFFIDAVIT OF LUDOMIR UZAROWSKI (affirmed on September 30, 2022)

I, **LUDOMIR UZAROWSKI**, of the City of Mississauga, in the Province of Ontario,

MAKE OATH AND SAY:

1. The evidence provided in this affidavit relates to the approval of the Demix-Varenes quarry aggregate, sourced from Demix Agrégats in Quebec, for use in the Stone Mastic Asphalt (“**SMA**”) surface course on the Red Hill Valley Parkway (“**RHVP**”) mainline, and compliance of the aggregate with the contract specifications. The topics of aggregate and SMA mix design approval are covered extensively in RHVPI Overview Document #3 at paragraphs 54, 66(b)-67, 73-78, 80, 97-98, 100-103, 105-106, 108-109, 120 and 126. I also provided *viva voce* evidence regarding the contract specifications and approval of the Demix aggregate before this Inquiry on April 28 and 29, 2022.

2. Golder Associates Ltd. (“**Golder**”) was retained by the City of Hamilton to prepare Special Provisions for the RHVP mainline paving (“**Special Provisions**”) and identify the applicable Ontario Provincial Standards (“**OPSS**”) that applied to the RHVP asphalt mixes, including for the SMA surface course layer. The Special Provisions and applicable OPSS specifications were incorporated in the City of Hamilton’s tender document (*Public Works Department, Red Hill Valley Project, Mainline Paving, Mud Street Interchange to QEW Interchange, Contract NO. PW-06-243*), in the Special Provisions section as specifications for the paving contract (the “**Specifications**”) [**DUF0002533.001**].

3. Trow Associates Inc. ("**Trow**") was retained by Dufferin Construction Company ("**Dufferin**") as their Asphalt Consultant, to prepare the SMA mix design and provide quality control testing of asphalt for conformance with the Specifications [**HAM0007868_0001**].

4. Golder was also retained to provide Quality Assurance services during the RHVP paving project, which included the review of the Demix aggregate and the SMA mix design for conformance with the Specifications. As part of this process, Golder reviewed test results pertaining to the physical properties of the Demix aggregate to determine if the aggregate met the requirements of the Specifications.

5. The Special Provisions included the OPSS 1003 (Material Specification for Aggregates – Hot Mix Asphalt, November 2004) ("**OPSS 1003**") [**DUF0002533.001 at images 91-93**]. OPSS 1003 applied to, and set the standards for, the SMA surface course on the RHVP. The applicable physical property requirements in OPSS 1003 for the RHVP SMA layer were:

- For the fine aggregate: Section 1003.05.02.02 and the applicable laboratory testing acceptance requirements is set out in Table 1 [**GOL0003905 at images 5, 11**]; and
- For the coarse aggregate: Section 1003.05.03.02 and the applicable laboratory testing acceptance requirements is set out in Table 4 [**GOL0003905 at images 6, 12**].

6. On April 28, 2007, I received an email from Paul Janicas at Dufferin, which attached the test results of the physical properties of the Demix aggregate [**GOL0001768 attaching GOL0001769, GOL0001770**]. The testing was performed by Trow and included test data for both the fine aggregate and the coarse aggregate.

7. The fine aggregate test results are provided at images 1 and 2 of **GOL0001770**. These results pertain to the physical properties of the following fine aggregate sources: '*Chips – 1 / DEMIX Varennes Quarry*' and '*Screenings / DEMIX Varennes Quarry*', respectively. The samples were obtained on April 5, 2007 and tested on April 20, 2007. It is important to note that only one type of fine aggregate was used in the SMA mix design (i.e., screenings). Golder was satisfied, based on my review of these test results, that the Demix fine aggregate met the requirements in OPSS 1003, Section 1003.05.02.02 as set out in Table 1 for SMA mix.

8. The chart below reflects the applicable laboratory tests in Table 1 of OPSS 1003, the requirements of each laboratory test, and the results of Trow's testing of the Demix fine aggregate physical properties.

OPSS 1003, Section 1003.05.02.02 Requirements As set out in Table 1 [GOL0003905 at image 11]			
Laboratory Test	Requirement(s) for Acceptance	Chips – 1 / DEMIX Varennes Quarry Results [GOL0001770 at image 1]	Screenings / DEMIX Varennes Quarry Results [GOL0001770 at image 2]
Micro-Deval Abrasion loss, % maximum	15	1.7	8.5
Plasticity Index, maximum	0	0	0

9. The coarse aggregate test results are provided at images 3 and 4 of **GOL0001770**. These results pertain to the physical properties of the following coarse aggregate sources: '12.5mm Coarse / DEMIX Varennes Quarry' and 'Chips – 2 / DEMIX Varennes Quarry' respectively. Only the 12.5mm coarse aggregate was used in the SMA mix design. Samples of the 12.5mm coarse aggregates were obtained on April 5, 2007 and tested on April 20, 2007. The test results for *Chips – 2 DEMIX* aggregate submitted by Dufferin contain a number of discrepancies in the header section, specifically with respect to the contract number, the contractor, the contract location, and the sample date. However, the *Chips – 2 DEMIX* aggregate was not used in the SMA mix design completed by Trow and therefore, the *Chips – 2 DEMIX* aggregate test results are outside the scope of this affidavit.

10. Golder was satisfied, based on my review of these test results, that the 12.5mm Stone Demix coarse aggregate met the requirements in OPSS 1003, Section 1003.05.03.02 as set out in Table 4 for Traprock, Diabase, and Andesite Quarry Rock.

11. The chart below reflects the applicable laboratory tests in Table 4 of OPSS 1003, the requirements of each laboratory test, and the results of Trow and Golder’s testing of the Demix coarse aggregate physical properties.

OPSS 1003, Section 1003.05.03.02 Requirements As set out in Table 4 [GOL0003905 at image 12]			
Laboratory Test	Requirement(s) for Acceptance	12.5mm Coarse / DEMIX Varenes Quarry Results [GOL0001770 at image 3]	Chips – 2 / DEMIX Varenes Quarry Results [GOL0001770 at image 4]
Loss by Washing, % maximum	1.0	1.0	1.0
Absorption by Mass, % maximum	1.0	0.79	0.85
Flat and Elongated Particles, % maximum	15	8.0	1.9
Petrographic Number, maximum	120	101	100
Insoluble Residue, % minimum	-	-	-
Freezing and Thawing, % loss maximum	6	3.8	-
Particles with 2 Faces Crushed, % minimum	-	100	100
Micro-Deval Abrasion loss, % maximum	10	3.0	1.4

12. The form for Superpave Consensus Property Requirement Test Data, as set out in Appendix 1003-E of OPSS 1003, contains a note stating: “*This appendix is not a mandatory part of the standard specification. However, it is written in mandatory language to permit invoking it by reference in the Contract Documents.*” [GOL0003905 at image 24]. Appendix 1003-E does not include SMA, as it is not a Superpave mix. However, it is my belief that Dufferin included the results from the Superpave Consensus Properties testing of the Demix aggregates because the Superpave Consensus Properties increase

the quality requirements for aggregates compared to conventional aggregates [DUF0002374.01 at image 1]. The test results are as follows:

- The 12.5mm Stone and Screenings from Demix Varennes Quarry were sampled on July 9, 2007, and tested on August 1, 2007 by Construction Testing Asphalt Lab Ltd. ("**Construction Lab**"). Although the test results for 19.0 mm Stone and HL 3 Stone and Manufactured Sand from DFA-Cayuga, Flamborough Quarry were submitted by Dufferin, these aggregates were not used in the SMA surface course mix on the RHVP, and are therefore outside the scope of this affidavit. The fine and coarse aggregates used on the RHVP were only from the Demix Quarry.
- The requirements for the Consensus Properties were met by the Demix aggregates for the Ontario Traffic Category E, which is defined as greater than 30 million Equivalent Single Axle Load (ESAL) "*for the projected traffic level expected in the design lane over a 20-year period, regardless of the actual design life of the pavement*". Typical applications include "*Freeways, major arterial roads with heavy truck traffic, and special applications such as truck and bus climbing lanes or stopping areas.*" The RHVP is considered a Category E roadway. [GOL0003905 at image 12]
- The chart below reflects the applicable laboratory tests in Appendix 1003-E of the OPSS 1003, the requirements of each laboratory test, and the results of Construction Lab's testing of the coarse aggregate's Consensus Properties:

OPSS 1003, Appendix 1003-E Requirements for Traffic Category E [GOL0003905 at image 24]			
Laboratory Test	Requirement(s) for Acceptance	Test Results (DUF0002374.01 at image 1)	Requirements Met (Y/N)
Fractured Particles in Coarse Aggregate (% minimum)	100/100	100/100	Yes
Flat and Elongated (% maximum)	10	0.3	Yes
Uncompacted Void Content of Fine Aggregate (% minimum)	45	47.5	Yes
Sand Equivalent (% minimum)	50	83	Yes

13. In addition to the testing performed by Trow and Construction Lab, Golder also performed micro-deval testing on the Demix 12.5mm coarse aggregate on July 18, 2007 **[GOL0000245]**. The result of Golder's micro-deval testing was 2.5%. The result was very good and in accordance with OPSS 1003, Section 1003.05.03.02, which includes Micro-Deval abrasion loss (% maximum) as one of the laboratory tests in Table 4 **[see GOL0003905 at image 12]**.

14. Although not a requirement of OPSS 1003, Golder also performed L.A. abrasion testing on the Demix 12.5mm coarse aggregate on July 17, 2007 **[GOL0000244]**. The result of the L.A. abrasion testing was 19.2% of lost particles. The result was very good.

15. In summary, based on the aforementioned test results, Golder determined that the fine and coarse aggregates from the Demix Varennes Quarry were very good and well within the requirements of OPSS 1003. Additional test results for Superpave Consensus

Properties of the Demix aggregates, although not required for the SMA mix, confirmed Golder's opinion that the aggregate was of good quality.

16. In addition, Walter Maranzan at Philips Engineering Limited forwarded Dufferin's letter, dated March 20, 2007, which included the test results of characteristics required by Ministère des Transports, Quebec ("MTQ"). One of the characteristics tested was the Polishing-by-Projection Coefficient ("Cpp"), which is used by MTQ for determining the polishing resistance or frictional characteristics of the aggregate. The Cpp test is similar in purpose to the Polished Stone Value (PSV) test used by the Ministry of Transportation of Ontario. MTQ requires a minimum Cpp value of 0.45. In comparison, the Demix aggregate Cpp test result was 0.49, thereby exceeding the MTQ specified Cpp requirement. **[GOL0004871, attaching GOL0004872, GOL0004873, GOL0004874, GOL0004875, GOL0004876; see GOL0004873 for Cpp test results]**

17. I make this affidavit for use in the Red Hill Valley Parkway Inquiry.

Affirmed remotely by Ludomir Uzarowski
in the City of Mississauga before me in the
City of Toronto in the Province of Ontario,
this 30th day of September, 2022, in
accordance with O. Reg. 431/20,
Administering Oath or Declaration
Remotely



Commissioner for Taking Affidavits
Nivedhya (Nivi) Ramaswamy



Ludomir Uzarowski