

APPENDIX

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DESIGNATED
SUBSTANCES
SURVEY – BRIDGE
SITES

ONTARIO MINISTRY OF TRANSPORTATION

HIGHWAY 417 (OTTAWA QUEENSWAY) BRIDGE REPLACEMENT/REHABILITATION AND OPERATIONAL IMPROVEMENTS

DESIGNATED SUBSTANCES SURVEY

NOVEMBER 21, 2018





**HIGHWAY 417 (OTTAWA
QUEENSWAY) BRIDGE
REPLACEMENT/REHABILITATION
AND OPERATIONAL
IMPROVEMENTS
DESIGNATED SUBSTANCES SURVEY**

ONTARIO MINISTRY OF TRANSPORTATION

PROJECT NO.: G.W.P.4145-10-00
DATE: NOVEMBER 2018

WSP
SUITE 300
2611 QUEENSVIEW DRIVE
OTTAWA, ON, CANADA K2B 8K2

T +1 613 829-2800
WSP.COM

EXECUTIVE SUMMARY

WSP Canada Group Limited (WSP) was retained by the Ministry of Transportation Ontario (MTO) to conduct a Designated Substances Survey (DSS) at ten (10) bridge structures along Highway 417 located at Preston Street, Rochester Street, Booth Street, Bronson Avenue and Percy Street in Ottawa, Ontario (the “Sites”). Each of the structures are scheduled for replacement.

This report includes the following structures:

- SN-3-55.1 Preston Street Overpass EBL, Highway 417
- SN-3-55.2 Preston Street Overpass WBL, Highway 417
- SN-3-56.1 Rochester Street Overpass EBL, Highway 417
- SN-3-56.2 Rochester Street Overpass WBL, Highway 417
- SN-3-57.1 Booth Street Overpass EBL, Highway 417
- SN-3-57.2 Booth Street Overpass WBL, Highway 417
- SN-3-60.1 Bronson Avenue Overpass EBL, Highway 417
- SN-3-60.2 Bronson Avenue Overpass WBL, Highway 417
- SN-3-61.1 Percy Street Overpass EBL, Highway 417
- SN-3-61.2 Percy Street Overpass WBL, Highway 417

This survey is required to satisfy an owner’s requirements under Section 30 of the Ontario *Occupational Health & Safety Act* (OHSA) which requires owners to determine if there are any Designated Substances present, prior to commencement of a project, which may involve construction, renovation or demolition related activities. This information allows workers to take appropriate steps to prevent accidental exposure to these harmful substances. This report should be provided to all maintenance workers, prospective contractors (and in turn to their sub-trades) who are likely to handle, come into contact with, or disturb the building materials. Contractors who may work in close proximity to the identified materials and who may also disturb the materials should also be notified.

The primary objectives of the survey were to:

- Develop an up-to-date inventory, and gain a better understanding of the Designated Substances and/or hazardous materials that are present in the structures scheduled for upcoming replacement; and
- Document their locations, applications, concentrations, quantities, and conditions in the structure in order to provide workers, and prospective contractors, with adequate information to prevent accidental exposures.

A total of 11 Designated Substances are regulated under the Occupational Health and Safety Act (OSHA). These include: acrylonitrile, arsenic, asbestos, benzene, coke oven emissions, ethylene oxide, isocyanates, lead, mercury, silica, and vinyl chloride. Of these 11 Designated Substances, asbestos, lead, silica, arsenic, and mercury are more commonly found in older structures and as such are applicable to this project. In addition to those listed above, this report also considered polychlorinated biphenyls (PCBs). The asbestos information in this survey report complies with the requirements of the Occupational Health & Safety Act, Ontario Regulation 278/05: Designated Substance - Asbestos on Construction Projects and in Building and Repair Operations with respect to asbestos-containing materials for the structures.

A summary of the results of WSP’s background review, site inspection and bulk sampling is presented below:

Substance	Location
Arsenic	May be present throughout the working area including, but not limited to pressure treated lumber, sign posts, guiderail posts and some steel structure coatings.
Asbestos on Construction Projects and in Buildings and Repair Operations (O. Reg. 278/05)	<p>Asbestos Containing Materials (ACMs) are commonly found in pipe-coverings, insulating cement, insulating block, transite board, mastics, as well as in coatings found on structures and culverts (i.e. asphalt coated asbestos protected corrugated steel). In addition, asbestos fibers can be found in some old concrete products and precast materials including flat and corrugated sheets.</p> <p><u>SN-3-55.1 and SN-3-55.2 (Preston Street):</u></p> <p>The document review identified the following confirmed and potential non-friable ACM:</p> <ul style="list-style-type: none"> — 2.5” (6.35 cm) transite electrical ducts embedded within the sidewalk on the north and south side of the bridge structures. A previous sample of the duct was completed by Morrison Hershfield (MH) from the sidewalk at Percy Street confirmed the duct contains 15% Chrysotile and 10% Crocidolite asbestos (confirmed ACM). It is assumed the duct within the sidewalk at Percy Street is the same type as the duct at Preston Street, — Three 4” (10.16 cm) transite electrical ducts embedded below the sidewalk on the north side (suspect ACM, all structures), — 4” (10.16 cm) transite drainage ducts located below grade and through the retaining walls on 12’ (3.66 m) centres (suspect ACM, all structures), and — The original drawings indicated the presence of a 1” (2.54 cm) thick cork asphalt board in the expansion joint between the eastbound and westbound structures; however, the rehabilitation drawings indicate the expansion joint was to be removed and replaced with a pre-compressed joint sealant. (potential ACM, only if expansion joint not fully removed during previous rehabilitation). <p>The following materials were sampled by WSP (or others) and confirmed to be non-ACM.</p> <ul style="list-style-type: none"> — Concrete from the abutments (SN-3-055-CON 1A, 1B, and 1C), — The original drawings reportedly indicated that 0.5” (1.27 cm) thick cork asphalt board was present in the expansion joint between the retaining and abutment walls. MH indicated that this was sampled during their assessment at a different bridge structure and found to be non-ACM. WSP sampled and confirmed the cork asphalt board is non-ACM (EXP1A, 1B and 1C). — Cork expansion board from between the sidewalk concrete slabs (EXP 2A, 2B, 2C); and — Fibrous cork expansion board (EXP3A, 3B, 3C). <p><u>SN-3-56.1 and SN-3-56.2 (Rochester Street):</u></p> <p>The document review identified the following confirmed and/or potential non-friable ACM</p> <ul style="list-style-type: none"> — 2.5” (6.35 cm) transite electrical ducts embedded within the sidewalk on the north and south side of the bridge structure. A previous sample of the duct was completed by MH from the sidewalk at Percy Street confirmed the duct contains 15% Chrysotile and 10% Crocidolite asbestos (confirmed ACM). It is assumed the duct within the sidewalk at Percy Street is the same type as the duct at Rochester Street, — Three 4” (10.16 cm) transite electrical ducts embedded below the sidewalk on the north side (suspect ACM, all structures), — 4” (10.16 cm) transite drainage ducts located below grade and through the retaining walls on 12’ (3.66 m) centres (suspect ACM, all structures), and

- The original drawings indicated the presence of a 1” thick cork asphalt board in the expansion joint between the eastbound and westbound structures; however, the rehabilitation drawings indicate the expansion joint was to be removed and replaced with a pre-compressed joint sealant. (potential ACM, only if expansion joint not fully removed during previous rehabilitation).

The following building materials were sampled by WSP (or others) and confirmed to be non-ACM:

- Concrete from abutments (SN-3-056-CON 1A, 1B and to 1C)
- The original drawings reportedly indicated that 0.5” thick cork asphalt board was present in the expansion joint between the retaining and abutment walls. MH indicated that this was sampled during their assessment at a different bridge structure and found to be non-ACM. WSP collected additional samples and confirmed the material is non-ACM (SN-3-056-EXP 2A, 2B and 2C).
- Expansion board between sidewalk concrete slabs and along base of abutment walls (SN-3-056-EXP1A, 1B and 1C)

SN-3-57.1 and SN-3-57.2 (Booth Street):

The document review identified the following confirmed and/or potential non-friable ACM:

- 2.5” (6.35 cm) transite electrical ducts embedded within the sidewalk on the north and south side of the bridge structure. A previous sample of the duct was completed by MH from the sidewalk at Percy Street confirmed the duct contains 15% Chrysotile and 10% Crocidolite asbestos (confirmed ACM). It is assumed the duct within the sidewalk at Percy Street is the same type as the duct at Booth Street,
- Three 4” (10.16 cm) transite electrical ducts embedded below the sidewalk on the north side (suspect ACM, all structures),
- 4” (10.16 cm) transite drainage ducts located below grade and through the retaining walls on 12’ (3.66 m) centres (suspect ACM, all structures), and
- The original drawings indicated the presence of a 1” thick cork asphalt board in the expansion joint between the eastbound and westbound structures; however, the rehabilitation drawings indicate the expansion joint was to be removed and replaced with a pre-compressed joint sealant. (potential ACM, only if expansion joint not fully removed during previous rehabilitation).

The following building materials were sampled by WSP (or others) and confirmed to be non-ACM:

- Concrete from abutments (SN-3-057-CON1A, CON-1B, CON-1C)
- The original drawings reportedly indicated that 0.5” thick cork asphalt board was present in the expansion joint between the retaining and abutment walls. MH indicated that this was sampled during their assessment and found to be non-ACM.

SN-3-60.1 and SN-3-60.2 (Bronson Avenue):

The document review identified the following confirmed and/or potential non-friable ACM

- 2.5” (6.35 cm) transite electrical ducts embedded within the sidewalk on the north and south side of the bridge structure. A previous sample of the duct was completed by MH from the sidewalk at Percy Street confirmed the duct contains 15% Chrysotile and 10% Crocidolite asbestos (confirmed ACM). It is assumed the duct within the sidewalk at Percy Street is the same type as the duct at Bronson Avenue,
- Three 4” (10.16 cm) transite electrical ducts embedded below the sidewalk on the north side (suspect ACM, all structures),

	<ul style="list-style-type: none"> — The original drawings reportedly indicated the presence of a 1” thick cork asphalt board in the expansion joints between the eastbound and westbound lane structures; however, the rehabilitation drawings indicated that the expansion joint was to be removed and replaced with a pre-compressed joint sealant. MH indicated that there is potential for residual expansion joints to still be present (suspect ACM, all structures). — The original drawings reportedly indicated the presence of 4” (10.16 cm) transite drainage ducts located below grade and through the retaining walls on 12’ (3.66 m) centres (suspect ACM, all structures). <p>The following building materials were sampled by WSP (or others) and confirmed to be non-ACM:</p> <ul style="list-style-type: none"> — Concrete from abutments (SN-3-060- CON1A, 1B and 1C) — The original drawings reportedly indicated that 0.5” thick cork asphalt board was present in the expansion joint between the retaining and abutment walls. MH indicated that this was sampled during their assessment at a different bridge structure and found to be non-ACM. WSP sampled and confirmed the cork asphalt board is non-ACM. <p><u>SN-3-61.1 and SN-3-61.2 (Percy Street):</u></p> <p>The document review and bulk sampling by WSP (or others) identified the following confirmed and/or potential non-friable ACM</p> <ul style="list-style-type: none"> — The original drawings (no date provided) reportedly indicated that one 2.5” (6.35 cm) transite electrical duct embedded in the coping/sidewalk on the north and south side of each bridge and three 4” (10.16 cm) transite electrical ducts embedded below the coping/sidewalk on the north side of each bridge structure. The rehabilitation drawings (dated 1982) indicated that the ducts were to be left in place and filled with expanding cement grout (all structures). A previous sample by MH from the sidewalk at Percy Street confirmed the duct contains 15% Chrysotile and 10% Crocidolite asbestos (confirmed ACM). — The original drawings reportedly indicated the presence of a 1” thick cork asphalt board in the expansion joints between the eastbound and westbound lane structures; however, the rehabilitation drawings indicated that the expansion joint was to be removed and replaced with a pre-compressed joint sealant. MH indicated that there is potential for residual expansion joints to still be present (suspect ACM, all structures). — The original drawings reportedly indicated the presence of 4” (10.16 cm) transite drainage ducts located below grade and through the retaining walls on 12’ (3.66 m) centres (suspect ACM, all structures). — Concrete from the abutments were sampled at three locations and found to contain 2% Chrysotile asbestos. The concrete itself is considered non-friable however, if the concrete releases fine dust due to deterioration or during removal, the free dust is considered friable. <p>The following building materials were sampled by WSP (or others) and confirmed to be non-ACM:</p> <ul style="list-style-type: none"> — The original drawings reportedly indicated that 0.5” (1.27 cm) thick cork asphalt board was present in the expansion joint between the retaining and abutment walls. MH indicated that this was sampled during their assessment, and found to be non-asbestos containing. WSP collected additional samples and the material was found to be non-ACM (SN-3-061-EXP1A, 1B, 1C).
Lead	Lead can be present in paint and/or other coatings on steel elements (guiderails,

	conduits, bracing, girders, diaphragms, beams, bearing plates and steel/rebar).
Silica	Present throughout the working area including, but not limited to, asphalt, concrete and granular materials.
Benzene	Benzene may be present in soils encountered during construction. None identified.
Vinyl Chloride, Coke Oven Emissions, Ethylene Oxide, Acrylonitrile and Isocyanates	None identified.
Mercury	No mercury containing equipment was identified at any of the bridge structures.
PCBs	It is noted that original light fixtures were removed during the rehabilitation of the mid 1980s. No PCB containing equipment was noted in drawings or during the site inspection.
Ozone Depleting Substances (ODS)	No ODSs were noted or observed at the bridge structures.

RECOMMENDATIONS

Removal of all asbestos-containing materials (ACMs) must be conducted prior to construction activities or demolition work that may damage these materials. Removal must be conducted in accordance with the Occupational Health and Safety Act (OSHA) regarding worker protection, to avoid the inhalation or ingestion of asbestos fibres. Non-friable ACM identified can be removed using Type 1 or Type 2 removal procedures, depending on removal procedures used by the contractor as specified in Ontario Regulation 278/05.

We understand that all Designated Substances and hazardous materials will be managed/removed prior to/during construction (if encountered). Confirmation that the asbestos removal has been conducted in accordance with the OSHA is recommended. All Designated Substances must be handled in accordance with the appropriate guidelines and regulations.

Special precautions should be taken when disturbing any concrete given the presence of silica, lead and potentially arsenic at all bridge structures. Management of the concrete as ACM will be required at the Percy Street Structure. All Designated Substances must be handled in accordance with the appropriate guidelines and regulations. The Ministry of Labour (MOL) has published guidelines for handling and controlling lead and silica in construction and it is recommended that these guidelines be followed when removing and cutting into the concrete. Coring, sawing or breaking up the materials containing silica, lead and potentially arsenic should be completed only with appropriate dust suppression methods, proper respiratory protection and general worker safety precautions as outlined in the MOL Guidance documents and in the Occupational Health and Safety Act.

If during demolition, additional materials suspected of containing asbestos are encountered, they must be handled in accordance with the appropriate guidelines and regulations. It should be noted that asbestos may be present in enclosed spaces not accessible at the time of the site visit.

Complete commentary on each of the Designated Substances in the project area will be discussed in the report to follow. This executive summary is not intended to substitute for the complete report, nor does it discuss certain specific issues documented within the report.



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1 INTRODUCTION

1.1 BACKGROUND

WSP Canada Group Limited (WSP) was retained by the Ministry of Transportation Ontario (MTO) to conduct a Designated Substances Survey (DSS) at ten (10) bridge structures along Highway 417 located at Preston Street, Rochester Street, Booth Street, Bronson Avenue and Percy Street in Ottawa, Ontario (the “Sites”). Each of the structures are scheduled for replacement.

This report includes the following structures:

- SN-3-55.1 Preston Street Overpass EBL, Highway 417
 - SN-3-55.2 Preston Street Overpass WBL, Highway 417
 - SN-3-56.1 Rochester Street Overpass EBL, Highway 417
 - SN-3-56.2 Rochester Street Overpass WBL, Highway 417
 - SN-3-57.1 Booth Street Overpass EBL, Highway 417
 - SN-3-57.2 Booth Street Overpass WBL, Highway 417
 - SN-3-60.1 Bronson Avenue Overpass EBL, Highway 417
 - SN-3-60.2 Bronson Avenue Overpass WBL, Highway 417
 - SN-3-61.1 Percy Street Overpass EBL, Highway 417
 - SN-3-61.2 Percy Street Overpass WBL, Highway 417
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1.2 SURVEY OBJECTIVES

This survey is required to satisfy an owner’s requirements under Section 30 of the Ontario *Occupational Health & Safety Act* (OHSA) which requires owners to determine if there are any Designated Substances present, prior to commencement of a project, which may involve construction, renovation or demolition related activities. This information allows workers to take appropriate steps to prevent accidental exposure to these harmful substances. This report should be provided to all maintenance workers, prospective contractors (and in turn to their sub-trades) who are likely to handle, come into contact with, or disturb the building materials. Contractors who may work in close proximity to the identified materials and who may also disturb the materials should also be notified.

The primary objectives of the survey were to:

- Develop an up-to-date inventory, and gain a better understanding of the Designated Substances and/or hazardous materials that are present in the structures scheduled for upcoming rehabilitation/replacement/removal; and
- Document their locations, applications, concentrations, quantities, and conditions in the structure in order to provide workers, and prospective contractors, with adequate information to prevent accidental exposures.
- Provide recommendations for the safe removal, handling, and disposal of the identified Designated Substances and hazardous materials as necessary.

The asbestos information in this survey report complies with the requirements of the *Occupational Health & Safety Act*, Ontario Regulation 278/05: Designated Substance - Asbestos on Construction Projects and in Building and Repair Operations with respect to asbestos-containing materials for the structures.

Regulation 490/09 states that all necessary measures and procedures are to be taken to ensure the time-weighted average exposure of a worker to any form of airborne asbestos does not exceed 0.1 fibres per cubic centimeter of air, averaged over an 8-hour work period. In order to abide by this regulation, contractors specializing in asbestos removal are required to

remove all asbestos-containing building materials from the buildings prior to any renovation or demolition that will disturb these materials.

1.3 SCOPE OF WORK

A total of 11 Designated Substances are regulated under the Occupational Health and Safety Act (OSHA). These include: acrylonitrile, arsenic, asbestos, benzene, coke oven emissions, ethylene oxide, isocyanates, lead, mercury, silica, and vinyl chloride. Of these 11 Designated Substances, asbestos, lead, silica, arsenic, and mercury are more commonly found in older structures and as such are applicable to this project. In addition to those listed above, this report also considered polychlorinated biphenyls (PCBs).

This DSS considered the age of the structures and typical manufacturing processes for building materials in the assessment of potentially hazardous substances. The scope of work included the following:

- Review of previous DSS reports (where available). The review of previous reports was supplemented (as required) by reviewing available drawings of the existing structures (e.g. structural drawings, rehabilitation drawings, architectural drawings);
- Visual assessment of bridge materials for the presence of Designated Substances and/or hazardous materials;
- Recovery of representative samples of bridge materials and submission for laboratory analysis, as required;
- Review of the Preliminary Design drawings; and
- Preparation of a summary report documenting the findings of the DSS.

The survey did not involve destructive sampling (i.e. inspection within concrete sidewalks, or within electrical conduits), except those which may be accessed by moveable (non-fixed) barriers. These areas are considered not accessible to the surveyor and as such, materials suspected to contain asbestos and other Designated Substances and hazardous materials may be present within these inaccessible areas.

The survey included the identification of potential friable and non-friable asbestos-containing materials within the structures. Asbestos means any of the following fibrous silicates: actinolite, amosite, anthophyllite, chrysotile, crocidolite or tremolite. According to the above-mentioned Ontario Regulation 278/05, the term 'friable material' is applied to a material that when dry, can be crumbled, pulverized or powdered with moderate hand pressure. Asbestos materials that are friable have a greater potential to release airborne asbestos fibres when disturbed. Common friable asbestos-containing building materials used in the past include sprayed fireproofing, stucco texture coat, and thermal pipe and jacket insulation.

Common non-friable asbestos containing materials include vinyl floor tiles, gasket materials, asbestos cement (Transite™) pipe, Transite™ board and asbestos textiles. However, if these materials do release fine dust due to deterioration or during removal, the free dust is considered friable.

2 METHODOLOGY

2.1 GENERAL SURVEY METHODOLOGY

WSP's survey sought to identify those substances defined as Designated Substances under the *Ontario Occupational Health and Safety Act* including: asbestos (friable and non-friable), lead, mercury, silica, benzene, acrylonitrile, arsenic, coke oven emissions, ethylene oxide, isocyanates, and vinyl chloride. In addition, other hazardous materials, such as PCBs, ozone-depleting substances (ODS), urea-formaldehyde foam insulation (UFFI) and other stored chemicals and wastes were included in the survey scope.

WSP's surveyors performed a systematic survey of the sites for the purposes of identifying Designated Substances and hazardous materials and documenting observations made about their locations, estimated quantities and respective conditions. Survey procedures specific to asbestos and lead are documented in the following sections of this report.

The survey of the sites for Designated Substances consisted of a walk-through and physical examination of suspected materials in accessible areas of the structure. A physical examination was completed to assess the condition of materials and to examine for underlying layers.

Based on the MTO Guideline for the Identification of Designated Substances (MTO DSS Policy), coatings on structures and steel elements (guiderails, conduits, bracing, girders, diaphragms, beams, etc.) may contain lead, asbestos, arsenic and mercury.

2.2 ASBESTOS

Asbestos is a commercial term given to six naturally occurring minerals that are incombustible and separable into fibres. The fibres are strong, durable, resistant to heat and fire, and are long, thin and flexible enabling them to be woven into cloth. These qualities have resulted in the wide use of asbestos in commercial, industrial, automotive and building materials. Common ACMs include pipe-coverings, insulating cement, insulating block, transite board, conduits/ducts, fireproofing spray, joint compound, mastics, bearing components, as well as in coatings found on structures and culverts (i.e. asphalt coated asbestos protected corrugated steel). Although the common construction use of friable (crumbles easily under hand pressure) ACM generally ceased voluntarily in the mid-1970s, it was not until the mid to late 1980s that ACM use was banned through legislation.

Asbestos fibres were used in some concrete products in the past; however, asbestos fibres were typically added to precast materials including flat and corrugated sheets, pressure pipes and fire-resistant boards. These materials were not typically used during construction of the main components of bridges (i.e. concrete footings); however, precast products are typically used in piping and conduits for electrical, mechanical and drainage systems.

Bulk samples were collected from suspect materials (i.e. materials known as having the potential to be asbestos-containing) and analyzed to identify or confirm the presence/absence of asbestos. Asbestos samples are collected by taking a small volume of material (approximately two square centimeters in size) from either intact material or preferably from a damaged section. The collected samples were placed in zipper storage plastic bags, sealed and forwarded to an analytical laboratory.

A minimum of three bulk samples were collected and submitted to an accredited, independent laboratory for analysis (accompanied by a chain of custody form) of asbestos content via US EPA Method EPA/600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials in accordance with the requirements of O. Reg. 278/05. The laboratory was instructed to use "stop-positive" analysis when asbestos is identified via Polarized Light Microscopy (PLM) analysis.

In accordance with the analysis techniques required by O. Reg. 278/05:

- For layered materials, subsamples are taken from each individual or discrete layer and each subsample is then treated as a discrete sample; and
- If a material is found to contain greater than 0.5% asbestos, additional bulk material samples taken from the same homogeneous material are not required to be analyzed.

As per the requirements set out in Table 1 of O. Reg. 278/05, a total of eighteen (18) samples were collected and submitted for asbestos analysis as part of this survey.

2.3 LEAD

Bulk paint samples (paint chips) were collected from each distinct colour of paint observed at the sites. Samples were collected with the aid of a thin-bladed knife, which was cleaned prior to each sampling event. WSP's surveyor selected sample locations where it appeared that the paint application was most representative of all areas on which it was applied. Each paint chip sample was placed in a clear bag with a tight closure, uniquely labelled and then placed in a second, similar bag. A chain of custody form was completed and accompanied the bulk samples to an accredited, independent laboratory for analysis of lead content. Lead analysis was performed following ASTM Method, ASTM D3335-85A "*Standard Method to Test for Low Concentrations of Lead in Paint by Atomic Absorption Spectrophotometry*".

Lead can be present in paint and/or other coatings on steel elements (guiderails, conduits, bracing, girders, diaphragms, beams, etc.), bearing plates and steel/rebar. Lead was used as a white pigment in paint until the mid-1950s, in concentrations as high as 50% by weight. As such, structures built before the mid-1950s are likely to contain lead based paint (LBP). Smaller amounts of lead may also be found in structures constructed up to 1980.

2.4 SILICA

Silica is a naturally occurring mineral and can be present in materials used for building construction, such as mortar, concrete, block and brick. Silica is a designated substance and dust generated through the handling of materials containing silica must be controlled. If future renovation activities affect the integrity of these materials, standard demolition dust control measures should be implemented where practical to ensure airborne dusts are controlled.

Based on the MTO DSS Policy, silica is suspected to be present in concrete, mortar and block used in construction materials and samples are not required.

2.5 ARSENIC

Arsenic is a naturally occurring mineral and can be present in hot-mix asphalt (also referred to as asphalt concrete), pressure treated lumber (guiderail posts, retaining walls, supports, etc.), paint coatings on steel elements (guiderails, conduit, bracing, girders, diaphragms, beams, etc.) and creosote coatings (wood culverts, retaining walls, etc.).

Although there are no specific regulations for the use of arsenic-treated wood, under O. Reg. 490/09 and OSHA regulations in effect for Ontario the occupational exposure limit (OEL) for arsenic is 0.01 mg of inorganic arsenic per cubic meter of air (0.01 mg/m³).

If future construction activities affect the integrity of materials containing arsenic, standard demolition dust control measures should be implemented where practical to ensure airborne dusts are controlled as per O. Reg. 490/09, as amended.

Arsenic containing materials were not encountered during the site visit; thus, no samples were collected or analyzed.

2.6 MERCURY

Mercury is commonly found in thermostats and electrical switches, as well as mercury vapour-containing fluorescent light bulbs. Based on the MTO DSS Policy, mercury is not likely to be encountered in fluorescent light bulbs as mercury vapour lamps have been replaced with high pressure sodium and light emitting-diode (LED) for illumination. In addition, paint coatings on structures and steel elements (guidrails, conduits, bracing, girders, diaphragms, beams, etc.) may contain mercury. No samples were collected or analyzed.

2.7 POLYCHLORINATED BIPHENYLS (PCB)

Light ballasts, capacitors and transformers have the potential to contain PCBs. If ballasts, capacitors or transformers are encountered during construction activities, label information should be inspected carefully. Typically, ballasts manufactured after 1978 are labeled "No PCBs".

Florescent light bulbs (FLB) manufactured before July 1, 1979 may contain PCBs. FLBs manufactured between July 1, 1979 and July 1, 1998 are labeled "No PCBs" and FLBs manufactured after 1998 are not required to be labeled. No samples were collected or analyzed.

2.8 BENZENE

Benzene has been classified as carcinogenic to humans. It is an aromatic hydrocarbon, and is a clear, usually colourless liquid with a gasoline-like odour. Benzene occurs naturally as a constituent of crude oil and has been synthesized from coal since 1849 and from petroleum sources since 1941. Benzene contamination in soils and groundwater may also arise from oil and gas spills, underground storage tank leaks, and seepage from waste disposal sites. Trace amounts of benzene can be produced from the incomplete combustion of organic materials. Benzene may also be referred to as, benzol or coal naphtha.

Soil impacted with petroleum hydrocarbons and/or hydrocarbon odours may be encountered during construction activities. The standard for the assessment and remediation of contaminated lands or groundwater is regulated by the Ontario *Environmental Protection Act* (EPA) as set out in Ontario Regulation 153/04 (O. Reg. 153/04). Excess soil should be managed as outlined in OPSS 180 and/or project specific documentation. No samples were collected or analyzed as part of the DSS.

3 REGULATORY CONTEXT

3.1 DESIGNATED SUBSTANCES

Section 30 of the *Occupational Health and Safety Act* (the Act) stipulates that prior to the commencement of a project, a list shall be prepared of all Designated Substances that are present at the project site (i.e. a Designated Substances survey). In accordance with the Act, the locations of Designated Substances must be identified in writing to all prospective constructors, contractors and sub-contractors who may work, disturb or come into contact with this type of material, at the same time as, or prior to, project tendering.

The term “Designated Substance” refers to the eleven chemical or physical agents specifically identified within the Act. Each of these substances is governed by a consolidated regulation, Designated Substances - Ontario Regulation 490/09 (O. Reg. 490/09) that defines the minimum health and safety requirements for assuring safe worker-substance interaction, as well as the obligations of employers and workers in workplaces containing these substances. O. Reg. 490/09 further stipulates the maximum concentrations of each of the respective substance to which a worker may be exposed, according to short-term exposure values and time-weighted average exposure values.

3.2 ADDITIONAL REGULATORY REQUIREMENTS FOR ASBESTOS

Among the Designated Substances, asbestos is unique in that it is governed by two regulations under the Act - one for the general mining and processing operations of asbestos and one for asbestos on construction projects and in buildings and repair operations.

Ontario Regulation 278/05 (O. Reg. 278/05), made under the Act, entitled “Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations” came into effect on November 1, 2005, with some sections contained therein becoming effective on November 1, 2007. This regulation revoked and replaced the previous asbestos regulation, O. Reg. 838/90.

3.3 ADDITIONAL REGULATORY REQUIREMENTS FOR LEAD

The Ontario Ministry of Labour (MOL) has not prescribed specific criteria for classification of lead-containing paints or other surface coatings and construction materials. The Surface Coating Materials Regulation (SOR/2005-109) made under the federal *Hazardous Products Act* (HPA) prescribes an acceptable level of 0.009% (90 ppm) lead by dry weight or less, as determined by bulk chemical analysis in accordance with good laboratory practises. Under the Surface Coating Materials Regulation (SOR/2005-109) Section 4.2, the following paints and surface coatings are excluded from the above noted acceptable lead level:

- 1 As an anti-corrosive or an anti-weathering coating applied on the interior or exterior surface of any building or equipment that is used for an agricultural or industrial purpose;
- 2 As an anti-corrosive or an anti-weathering coating applied on any structure other than a building, that is used for an agricultural, industrial or public purpose;
- 3 As a touch-up coating for metal surfaces;
- 4 On traffic signs;
- 5 For graphic art on billboards or similar displays;
- 6 For identification marks in industrial buildings; or
- 7 As materials for the purposes of arts, crafts or hobbies, other than material for use by children.

However, based on a recent publication (EACO Lead Guideline For Construction, Renovation, Maintenance or Repair dated October 2014) from the Environmental Abatement Council of Ontario (EACO), an industry group representing consultants

and contractors in the Ontario abatement industry, various occupational and workplace safety authorities and agencies consider that any detectable amount of lead in paint and similar materials has the potential to produce an airborne hazard to workers and building occupants when these materials are disturbed.

As such, for the purposes of this survey, WSP has classified any material containing detectable/measurable amounts of lead as “lead-containing” materials and recommends that all disturbances to these materials be conducted in accordance with the EACO or MOL document Guidelines, Lead on Construction Projects.

3.4 ADDITIONAL REGULATORY REQUIREMENTS FOR SILICA

The Regulation for Construction Projects (O. Reg. 213/09) does not specifically mention silica; however, Sections 46 and 59 would apply to situations where there is the potential for worker exposure to airborne silica. Under O. Reg. 490/09 and OSHA regulations in effect for Ontario the occupational exposure limits (OEL) for respirable crystalline silica is 0.05 milligrams per cubic meter (mg/m³) of air by volume as an 8-hour daily. Although O. Reg. 490/09 and the OEL for silica do not apply to an employer on a construction project or to their workers at the project, employers still have a responsibility to protect the health of their workers and to comply with the OHSA and other applicable regulations.

If future construction activities affect the integrity of these materials, standard demolition dust control measures should be implemented where practical to ensure airborne dusts are controlled. At higher concentrations, abatement, worker protection or enhanced dust control measures may be required.

3.5 ADDITIONAL REGULATORY REQUIREMENTS FOR WASTE MANAGEMENT

The disposal of Designated Substances is regulated under the Ontario *Environmental Protection Act*, specifically R.R.O. 1990, Regulation 347, General – Waste Management (most recently amended by O. Reg. 334/13). The regulation details the minimum requirements for the appropriate transport and disposal of wastes.

3.6 OTHER APPLICABLE REGULATIONS AND GUIDELINES

The following regulations and guidance documents may also apply to this survey:

- Guideline for Lead on Construction Projects (MOL, September 2004, as amended)
- Guideline for Silica on Construction Projects (MOL, September 2004, as amended)
- The United States Department of Housing and Urban Development (HUD) Guidelines for the Evaluation and Control of Lead-Based Paint in Housing
- Canadian PCB Regulations (SOR/2008-273)
- O. Reg. 362 Waste Management – PCBs
- Mercury-Containing Products Pollution Prevention Fact Sheet #21 (Ministry of Environment (MOE), September 2001, as amended)
- O. Reg. 347/90 General Waste Management
- Canadian Construction Association document CCA 82/2004
- Canadian Chlorofluorocarbon Regulations (SOR/90-127), Ozone-depleting, Substances Regulation (SOR/94-408) and Ozone Depleting Substances Products Regulations (SOR/90-584)
- O. Reg. 463/10 ODS and Other Halocarbons
- Lead Guideline For Construction, Renovation, Maintenance or Repair (Environmental Abatement Council of Ontario – October 2014)

- EACO Lead Guideline for Construction, Renovation, Maintenance and Repair, October 2014.
- EACO Mould Abatement Guidelines, 2010

4 STRUCTURE DISCUSSION

Available background documentation (including previous Designated Substance Survey reports, site contract drawings and structural rehabilitation drawings) were reviewed to determine the potential for Designated Substances to be present within each of the structures. Following the background review, a site reconnaissance was conducted at each of the sites, and a sampling program completed if potential Designated Substances were identified and accessible for sampling.

4.1 SN-3-55.1 (PRESTON STREET OVERPASS EBL, HIGHWAY 417) AND SN-3-55.2 (PRESTON STREET OVERPASS WBL, HIGHWAY 417)

4.1.1 DOCUMENT REVIEW

As part of the previous Transportation Environmental Study Report (TESR, 2016), a Designated Substance Survey completed by MH in July 2013 was included. As part of the DSS, available as built drawings and inspection reports were reviewed and summarized at that time. The information gathered in that review is provided below.

- The original drawings (no date provided) reportedly indicated that one 2.5" (6.35 cm) transite electrical duct embedded in the coping/sidewalk on the north and south side of each bridge and three 4" (10.16 cm) transite electrical ducts embedded below the coping/sidewalk on the north side of each bridge structure. The rehabilitation drawings (dated 1982) indicated that the ducts were to be left in place and filled with expanding cement grout. A previous sample by MH from the sidewalk at Percy Street confirmed the duct contains 15% Chrysotile and 10% Crocidolite asbestos (confirmed ACM). It is assumed that the transite electrical ducts encountered and sampled at Percy Street are representative of the electrical ducts at each of the other bridge structures.
- The original drawings reportedly indicated the presence of a 1" thick cork asphalt board in the expansion joints between the eastbound and westbound lane structures; however, the rehabilitation drawings indicated that the expansion joint was to be removed and replaced with a pre-compressed joint sealant. MH indicated that there is potential for residual expansion joints to still be present (suspect ACM, all structures).
- The original drawings reportedly indicated the presence of 4" (10.16 cm) transite drainage ducts located below grade and through the retaining walls on 12' (3.66 m) centres (suspect ACM, all structures).
- The DSS report indicated that cork asphalt board was observed within the abutment-retaining wall joints & expansion joints; however, they were not sampled. Paint was sampled from the abutment walls and submitted for lead analysis. The laboratory analysis indicated that the lead content in the paint was 10 µg/g, below the limit of 600 µg/g.
- The original drawings reportedly indicated that 0.5" thick cork asphalt board was present in the expansion joint between the retaining and abutment walls. MH indicated that this was sampled during their assessment, and found to be non-asbestos containing.

4.1.2 STRUCTURE DESCRIPTION AND SITE OBSERVATIONS

A site reconnaissance was completed on April 5, 2017. The Preston Street bridge is a reinforced, cast in place concrete rigid frame structure that was built in 1962 and rehabilitated in 1984. The span length of the bridge is 18.29 m and the structure has an east to west orientation. The structures have a concrete barrier wall on the south side and a concrete median wall on the north side.

During the site reconnaissance, accessible suspect building materials were collected for laboratory analysis. Buried piping and conduits were not encountered and no samples could be retrieved. Samples collected from SN-3-55.1 and SN-3-55.2 included concrete samples from the abutment (CON-1A, CON-1B, and CON-1C), cork asphalt board from the abutment -

between the retaining wall joints and expansion joints (EXP-1A, EXP-1B and EXP-1C). Paint was sampled from the abutment walls and submitted for lead analysis. The laboratory analysis indicated that the paint was 17 µg/g, below the limit of 600 µg/g.

Samples were submitted to EMSL Canada for the analysis of asbestos.

4.1.3 SAMPLING RESULTS

The sample details are provided in Table 4: below and the Laboratory Certificates of Analysis can be found in Appendix A. The analytical results indicate that the samples collected from Site SN-3-55.1 and SN-3-55.2 by WSP did not contain asbestos.

Table 1 : SN-3-55.1 and SN-3-55.2 Summary of Sampling Results

MATERIAL DESCRIPTION	ASSESSMENT	ACTION	PHOTO
Concrete, from the east abutment stand	<p><u>Sample ID:</u> SN-3-055-CON-1A)</p> <p><u>Concentration:</u> None detected.</p>	None	1
Concrete, from the west abutment stand	<p><u>Sample ID:</u> SN-3-055-, CON-1B, CON-1C</p> <p><u>Concentration:</u> none detected</p>	None	1

4.1.4 SUMMARY

The document review identified the following confirmed and potential ACM:

- 2.5” (6.35 cm) transite electrical ducts embedded within the sidewalk on the north and south side of the bridge structure. A previous sample by MH from the sidewalk at Percy Street confirmed the duct contains 15% Chrysotile and 10% Crocidolite asbestos (confirmed ACM). It is assumed that the transite electrical ducts encountered and sampled at Percy Street are representative of the electrical ducts at each of the other bridge structures;
- Three 4” (10.16 cm) transite electrical ducts embedded below the sidewalk on the north side (suspect ACM, all structures),
- 4” (10.16 cm) transite drainage ducts below located below grade and through the retaining walls on 12’ (3.66 m) centres (suspect ACM, all structures), and
- The original drawings indicated the presence of a 1” thick cork asphalt board in the expansion joint between the eastbound and westbound structures; however, the rehabilitation drawings indicate the expansion joint was to be removed and replaced with a pre-compressed joint sealant. (potential ACM, only if expansion joint not fully removed during previous rehabilitation).

The following materials were sampled by WSP (or others) and confirmed to be non-ACM.

- Concrete from the abutments (SN-3-055-CON 1A, 1B, and 1C),
- The original drawings reportedly indicated that 0.5” (1.27 cm) thick cork asphalt board was present in the expansion joint between the retaining and abutment walls. WSP sampled and confirmed the cork asphalt board is non-ACM (EXP1A, 1B and 1C).
- Cork expansion board from between the sidewalk concrete slabs (EXP 2A, 2B, 2C); and

- Fibrous cork expansion board (EXP3A, 3B, 3C).

4.2 SN- 3-56.1 (ROCHESTER STREET OVERPASS EBL, HIGHWAY 417) AND SN-3-56.2 (ROCHESTER STREET OVERPASS WBL, HIGHWAY 417)

4.2.1 DOCUMENT REVIEW

As part of the previous TESR completed by MH in April 2016, all available as built drawings and inspection reports were reviewed and summarized at that time. The information gathered in that review is provided below.

- The original drawings (no date provided) reportedly indicated that one 2.5” (6.35 cm) transite electrical duct embedded in the coping/sidewalk on the north and south side of each bridge and three 4” (10.16 cm) transite electrical ducts embedded below the coping/sidewalk on the north side of each bridge structure. The rehabilitation drawings (dated 1982) indicated that the ducts were to be left in place and filled with expanding cement grout (all structures). A previous sample by MH from the sidewalk at Percy Street confirmed the duct contains 15% Chrysotile and 10% Crocidolite asbestos (Confirmed ACM). It is assumed that the transite electrical ducts encountered and sampled at Percy Street are representative of the electrical ducts at each of the other bridge structures;
- The original drawings reportedly indicated the presence of a 1” thick cork asphalt board in the expansion joints between the eastbound and westbound lane structures; however, the rehabilitation drawings indicated that the expansion joint was to be removed and replaced with a pre-compressed joint sealant. MH indicated that there is potential for residual expansion joints to still be present (suspect ACM, all structures).
- The original drawings reportedly indicated the presence of 4” (10.16 cm) transite drainage ducts located below grade and through the retaining walls on 12’ (3.66 m) centres (suspect ACM, all structures).
- The original drawings reportedly indicated that 0.5” (1.27 cm) thick cork asphalt board was present in the expansion joint between the retaining and abutment walls. MH indicated that this was sampled during their assessment, and found to be non-asbestos containing.
- The report indicated that polystyrene located between the barrier wall and expansion joints were sampled from the structure, and asbestos was not detected. Cork asphalt board was observed, but not submitted for analysis to confirm. Grey paint located on the abutment walls was observed but not sampled for lead.

4.2.2 STRUCTURE DESCRIPTION AND SITE OBSERVATIONS

A site reconnaissance was completed on April 5, 2017. The Rochester Street bridge is a reinforced, cast in place concrete rigid frame structure that was built in 1962 and rehabilitated in 1984. The span length of the bridge is 18.29 m and the structure has an east to west orientation. The structures have a concrete barrier wall on the south side and a median barrier wall on the north side.

During the site reconnaissance, accessible suspect building materials were collected for laboratory analysis. Buried piping and conduits were not encountered and no samples could be retrieved. Samples collected from SN-3-56.1 and SN-3-56.2 included concrete samples from the abutment (CON-1A, CON-1B, and CON-1C), expansion board from between the sidewalk concrete slabs and along the wall of the bridge (EXP-1A, EXP-1B and EXP-1C) and asphalt expansion board from between the expansion joints (EXP-2A, EXP-2B and EXP-2C). Paint was sampled from the abutment walls and submitted for lead analysis. The laboratory analysis indicated that the paint was 14 µg/g, below the limit of 600 µg/g.

Samples were submitted to EMSL Canada for the analysis of asbestos.

4.2.3 SAMPLING RESULTS

The sample details are provided in Table 2 and the Laboratory Certificates of Analysis can be found in Appendix A. The analytical results indicated that the samples collected by WSP from Site SN-3-56.1 and SN-3-56.2 did not contain asbestos and no lead containing paint was identified.

Table 2: SN-3-56.1 and SN-3-56.2 Summary of Sampling Results

MATERIAL DESCRIPTION	ASSESSMENT	ACTION	PHOTO
Expansion board between concrete sidewalk cracks and along base of abutment walls	<u>Sample ID:</u> SN-3-056-EXP-1A to 1C <u>Concentration:</u> None detected.	None	2
Asphalt Expansion Board	<u>Sample ID:</u> SN-3-056-EXP-2A to 2C <u>Concentration:</u> None detected.	None	3
Concrete, from abutments	<u>Sample ID:</u> SN-3-056-CON-1A to 1C <u>Concentration:</u> None detected.	None	2
Grey paint Applied to the abutment walls	<u>Sample ID:</u> P-1 <u>Concentration:</u> <0.0090%wt	None	2

4.2.4 SUMMARY

The document review identified the following confirmed and/or potential ACM

- 2.5” (6.35 cm) transite electrical ducts embedded within the sidewalk on the north and south side of the bridge structure. A previous sample by MH from the sidewalk at Percy Street confirmed the duct contains 15% Chrysotile and 10% Crocidolite asbestos (confirmed ACM). It is assumed that the transite electrical ducts encountered and sampled at Percy Street are representative of the electrical ducts at each of the other bridge structures;
- Three 4” (10.16 cm) transite electrical ducts embedded below the sidewalk on the north side (suspect ACM, all structures),
- 4” (10.16 cm) transite drainage ducts below located below grade and through the retaining walls on 12’ (3.66 m) centres (suspect ACM, all structures), and
- The original drawings indicated the presence of a 1” thick cork asphalt board in the expansion joint between the eastbound and westbound structures; however, the rehabilitation drawings indicate the expansion joint was to be removed and replaced with a pre-compressed joint sealant. (potential ACM, only if expansion joint not fully removed during previous rehabilitation).

The following building materials were sampled by WSP (or others) and confirmed to be non-ACM:

- Concrete from abutments (SN-3-056-CON 1A, 1B and to 1C)

- The original drawings reportedly indicated that 0.5” thick cork asphalt board was present in the expansion joint between the retaining and abutment walls. WSP collected samples and confirmed the material is non-ACM (SN-3-056-EXP 2A, 2B and 2C).
- Expansion board between sidewalk concrete slabs and along base of abutment walls (SN-3-056-EXP1A, 1B and 1C)

4.3 SN-3-57.1 (BOOTH STREET OVERPASS EBL, HIGHWAY 417) AND SN-3-57.2 (BOOTH STREET OVERPASS WBL, HIGHWAY 417)

4.3.1 DOCUMENT REVIEW

As part of the previous TESR completed by MH in April 2016, all available as built drawings and inspection reports were reviewed and summarized at that time. The information gathered in that review is provided below.

- The original drawings (no date provided) reportedly indicated that one 2.5” (6.35 cm) transite electrical duct embedded in the coping/sidewalk on the north and south side of each bridge and three 4” (10.16 cm) transite electrical ducts embedded below the coping/sidewalk on the north side of each bridge structure. The rehabilitation drawings (dated 1982) indicated that the ducts were to be left in place and filled with expanding cement grout (all structures). A previous sample by MH from the sidewalk at Percy Street confirmed the duct contains 15% Chrysotile and 10% Crocidolite asbestos (Confirmed ACM).
- The original drawings reportedly indicated the presence of a 1” thick cork asphalt board in the expansion joints between the eastbound and westbound lane structures; however, the rehabilitation drawings indicated that the expansion joint was to be removed and replaced with a pre-compressed joint sealant. MH indicated that there is potential for residual expansion joints to still be present (suspect ACM, all structures).
- The original drawings reportedly indicated the presence of 4” (10.16 cm) transite drainage ducts located below grade and through the retaining walls on 12’ (3.66 m) centres (suspect ACM, all structures).
- The original drawings reportedly indicated that 0.5” (1.27 cm) thick cork asphalt board was present in the expansion joint between the retaining and abutment walls. MH indicated that this was sampled during their assessment, and found to be non-asbestos containing.
- The report indicated that expansion joint cork asphalt board was sampled from the abutment-retaining wall joints & expansion joints and submitted for analysis of asbestos. The results indicated that asbestos was not detected in the samples submitted.

4.3.2 STRUCTURE DESCRIPTION AND SITE OBSERVATIONS

A site reconnaissance was completed on March 31, 2017. The Booth Street bridge is a reinforced, cast in place concrete rigid frame structure that was built in 1962 and last rehabilitated in 2015. The span length of the bridge is 18.29 m and the structure has an east to west orientation. The structures have a concrete barrier wall on the south side and a concrete median wall on the north side.

During the site reconnaissance, accessible suspect building materials were collected for laboratory analysis. Buried piping and conduits were not encountered and no samples could be retrieved. Samples collected from SN-3-57.1 and SN-3-57.2 included concrete samples from the abutment (CON-1A, CON-1B, and CON-1C). A paint sample (P-1) was also collected from the west abutment.

Samples were submitted to EMSL Canada for the analysis of asbestos and lead.

4.3.3 SAMPLING RESULTS

The sample details are provided in Table 3: below and the Laboratory Certificates of Analysis can be found in Appendix A. The analytical results indicated that the samples collected from Site SN-3-57.1 and SN-3-57.2 did not contain asbestos and no lead containing paint was identified.

Table 3: SN-3-57.1 and SN-3-57.2 Summary of Sampling Results

MATERIAL DESCRIPTION	ASSESSMENT	ACTION	PHOTO
Concrete, from west Abutment Stand	<p><u>Sample ID:</u> SN-3-057-CON-1A, CON-1B</p> <p><u>Concentration:</u> None detected.</p>	None	4
Concrete, from east Abutment Stand	<p><u>Sample ID:</u> SN-3-057-CON-1C</p> <p><u>Concentration:</u> None detected.</p>	None	4
Grey paint Applied to the abutment walls	<p><u>Sample ID:</u> P-1</p> <p><u>Concentration:</u> <0.0090%wt</p> <p><u>Condition:</u> Fair to Good</p>	None	4

4.3.4 SUMMARY

The document review identified the following confirmed and/or potential ACM

- 2.5” (6.35 cm) transite electrical ducts embedded within the sidewalk on the north and south side of the bridge structure. A previous sample by MH from the sidewalk at Percy Street confirmed the duct contains 15% Chrysotile and 10% Crocidolite asbestos (confirmed ACM), It is assumed that the transite electrical ducts encountered and sampled at Percy Street are representative of the electrical ducts at each of the other bridge structures;
- Three 4” (10.16 cm) transite electrical ducts embedded below the sidewalk on the north side (suspect ACM, all structures),
- 4” (10.16 cm) transite drainage ducts located below grade and through the retaining walls on 12’ (3.66 m) centres (suspect ACM, all structures), and
- The original drawings indicated the presence of a 1” thick cork asphalt board in the expansion joint between the eastbound and westbound structures; however, the rehabilitation drawings indicate the expansion joint was to be removed and replaced with a pre-compressed joint sealant. (potential ACM, only if expansion joint not fully removed during previous rehabilitation).

The following building materials were sampled by WSP (or others) and confirmed to be non-ACM:

- Concrete from abutments (SN-3-057-CON1A, CON-1B, CON-1C)
- The original drawings reportedly indicated that 0.5” thick cork asphalt board was present in the expansion joint between the retaining and abutment walls. MH indicated that this was sampled during their assessment and found to be non-ACM.

4.4 SN-3-60.1 (BRONSON AVENUE OVERPASS EBL, HIGHWAY 417) AND SN-3-60.2 (BRONSON AVENUE OVERPASS WBL, HIGHWAY 417)

4.4.1 DOCUMENT REVIEW

As part of the previous TESR completed by MH in April 2016, all available as built drawings and inspection reports were reviewed and summarized at that time. The information gathered in that review is provided below.

- The original drawings (no date provided) reportedly indicated that one 2.5” (6.35 cm) transite electrical duct embedded in the coping/sidewalk on the north and south side of each bridge and three 4” (10.16 cm) transite electrical ducts embedded below the coping/sidewalk on the north side of each bridge structure. The rehabilitation drawings (dated 1982) indicated that the ducts were to be left in place and filled with expanding cement grout (all structures). A previous sample by MH from the sidewalk at Percy Street confirmed the duct contains 15% Chrysotile and 10% Crocidolite asbestos (Confirmed ACM). It is assumed that the transite electrical ducts encountered and sampled at Percy Street are representative of the electrical ducts at each of the other bridge structures;
- The original drawings reportedly indicated the presence of a 1” thick cork asphalt board in the expansion joints between the eastbound and westbound lane structures; however, the rehabilitation drawings indicated that the expansion joint was to be removed and replaced with a pre-compressed joint sealant. MH indicated that there was potential for residual expansion joints to still be present (suspect ACM, all structures).
- The original drawings reportedly indicated the presence of 4” (10.16 cm) transite drainage ducts located below grade and through the retaining walls on 12’ (3.66 m) centres (suspect ACM, all structures).
- The original drawings reportedly indicated that 0.5” (1.27 cm) thick cork asphalt board was present in the expansion joint between the retaining and abutment walls. MH indicated that this was sampled during their assessment, and found to be non-asbestos containing.
- The report indicated that cork asphalt board was observed within the abutment-retaining wall joints & expansion joints; however, they were not sampled at this structure. Paint was sampled from the abutment walls and submitted for lead analysis. The laboratory analysis indicated that the lead content in the paint was 17 µg/g, below the limit of 600 µg/g.

4.4.2 STRUCTURE DESCRIPTION AND SITE OBSERVATIONS

A site reconnaissance was completed on July 28, 2017. SN-3-60.1 and SN-3-60.2. The Bronson Avenue bridge is a reinforced, cast in place concrete rigid frame structure that was built in 1965 and last rehabilitated in 1985. The span length of the bridge is 23.77 m and the structure has an east to west orientation. The structures have a concrete barrier wall on the south side and a concrete median wall on the north side.

During the site reconnaissance, accessible suspect building materials were collected for laboratory analysis. Buried piping and conduits were not encountered and no samples could be retrieved. Samples collected from SN-3-60.1 and SN-3-60.2 included concrete samples from the abutment (CON-1A, CON-1B, and CON-1C), cork asphalt board from the abutment - between the retaining wall joints and expansion joints (EXP-1A, EXP-1B and EXP-1C).

Samples were submitted to EMSL Canada for the analysis of asbestos.

4.4.3 SAMPLING RESULTS

The sample details are provided in Table 4: below and the Laboratory Certificates of Analysis can be found in Appendix A. The analytical results indicate that the samples collected from Site SN-3-60.1 and SN-3-60.2 did not contain asbestos.

Table 4: SN-3-60.1 and SN-3-60.2 Sampling Results

MATERIAL DESCRIPTION	ASSESSMENT	ACTION	PHOTO
Concrete, from the east abutment stand	<u>Sample ID:</u> SN-3-060-CON-1A <u>Concentration:</u> None detected.	None	5
Concrete, from the west abutment stand	<u>Sample ID:</u> SN-3-060-, CON-1B, CON-1C <u>Concentration:</u> None detected	None	5
Asphalt Board	<u>Sample ID:</u> SN-3-060-, EXP-1A, 1B, 1C) <u>Concentration:</u> None detected	None	NA

4.4.4 SUMMARY

The document review identified the following confirmed and/or potential ACM

- The original drawings (no date provided) reportedly indicated that one 2.5” (6.35 cm) transite electrical duct embedded in the coping/sidewalk on the north and south side of each bridge and three 4” (10.16 cm) transite electrical ducts embedded below the coping/sidewalk on the north side of each bridge structure. The rehabilitation drawings (dated 1982) indicated that the ducts were to be left in place and filled with expanding cement grout (all structures). A previous sample by MH from the sidewalk at Percy Street confirmed the duct contains 15% Chrysotile and 10% Crocidolite asbestos (Confirmed ACM). It is assumed that the transite electrical ducts encountered and sampled at Percy Street are representative of the electrical ducts at each of the other bridge structures;
- The original drawings reportedly indicated the presence of a 1” thick cork asphalt board in the expansion joints between the eastbound and westbound lane structures; however, the rehabilitation drawings indicated that the expansion joint was to be removed and replaced with a pre-compressed joint sealant. MH indicated that there is potential for residual expansion joints to still be present (suspect ACM, all structures).
- The original drawings reportedly indicated the presence of 4” (10.16 cm) transite drainage ducts located below grade and through the retaining walls on 12’ (3.66 m) centres (suspect ACM, all structures).

The following building materials were sampled by WSP (or others) and confirmed to be non-ACM:

- Concrete from abutments (SN-3-060- CON1A, 1B and 1C)
- The original drawings reportedly indicated that 0.5” thick cork asphalt board was present in the expansion joint between the retaining and abutment walls. WSP sampled and confirmed the cork asphalt board is non-ACM.

4.5 SN-3-61.1 (PERCY STREET OVERPASS EBL, HIGHWAY 417) AND SN-3-61.2 (PERCY STREET OVERPASS WBL, HIGHWAY 417)

4.5.1 DOCUMENT REVIEW

As part of the previous TESR completed by MH in April 2016, all available as built drawings and inspection reports were reviewed and summarized at that time. The information gathered in that review is provided below.

- The original drawings (no date provided) reportedly indicated that one 2.5" (6.35 cm) transite electrical duct embedded in the coping/sidewalk on the north and south side of each bridge and three 4" (10.16 cm) transite electrical ducts embedded below the coping/sidewalk on the north side of each bridge structure. The rehabilitation drawings (dated 1982) indicated that the ducts were to be left in place and filled with expanding cement grout (all structures). A previous sample by MH from the sidewalk at Percy Street confirmed the duct contains 15% Chrysotile and 10% Crocidolite asbestos (Confirmed ACM).
- The original drawings reportedly indicated the presence of a 1" thick cork asphalt board in the expansion joints between the eastbound and westbound lane structures; however, the rehabilitation drawings indicated that the expansion joint was to be removed and replaced with a pre-compressed joint sealant. MH indicated that there is potential for residual expansion joints to still be present (suspect ACM, all structures).
- The original drawings reportedly indicated the presence of 4" (10.16 cm) transite drainage ducts located below grade and through the retaining walls on 12' (3.66 m) centres (suspect ACM, all structures).
- The original drawings reportedly indicated that 0.5" (1.27 cm) thick cork asphalt board was present in the expansion joint between the retaining and abutment walls. MH indicated that this was sampled at other bridge locations during their assessment, and found to be non-asbestos containing.
- The report indicated that cork asphalt board was observed within the abutment-retaining wall joints & expansion joints; however, they were not sampled at Percy Street. Paint was sampled from the abutment walls and submitted for lead analysis. The laboratory analysis indicated that the lead content in the paint was 14 µg/g, below the limit of 600 µg/g.

4.5.2 STRUCTURE DESCRIPTION AND SITE OBSERVATIONS

A site reconnaissance was completed on April 5, 2017. The Percy Street bridge is a reinforced, cast in place concrete rigid frame structure that was built in 1962 and last rehabilitated in 1985. The span length of the bridge is 18.29 m and the structure has an east to west orientation. The structures have a concrete barrier wall on the south side and a concrete median wall on the north side.

During the site reconnaissance, accessible suspect building materials were collected for laboratory analysis. Buried piping and conduits were not encountered and no samples could be retrieved. Samples collected from SN-3-61.1 and SN-3-61.2 included concrete samples from the abutments (SN3-061-CON-1A, CON-1B, and CON-1C), cork asphalt board from the abutment - between the retaining wall joints and expansion joints (SN-3-061-CLK-1A, CLK-1B and CLK-1C) and the asphalt expansion board (SN3-061-EXP-1A, 1B and 1C). Grey paint was sampled from the abutment walls and submitted for lead analysis (SN3-061-P-1). The laboratory analysis indicated that the paint was 8.2 µg/g, below the limit of 600 µg/g.

Samples were submitted to EMSL Canada for the analysis of asbestos and lead.

4.5.3 SAMPLING RESULTS

The sample details are provided in Table 4: below and the Laboratory Certificates of Analysis can be found in Appendix A. The analytical results indicate that the concrete samples collected from Site SN-3-61.1 and SN-3-61.2 contain asbestos. No lead containing paint was identified.

Table 5: SN-3-61.1 and SN-3-61.2 Summary of Asbestos Containing Material

MATERIAL DESCRIPTION	ASSESSMENT	ACTION	PHOTO
Concrete, from the abutment stand	<u>Sample ID:</u> SN-3-061-CON-1A, 1B, 1C) <u>Concentration</u> : 2%, 3%, 2%, Chrysotile Asbestos (non-friable)	Removal and management of ACM following applicable abatement and management procedures.	6
Asphalt Expansion Board between the retaining and abutment walls	<u>Sample ID:</u> SN-3-061-EXP-1A, 1B, 1C) <u>Concentration</u> : None Detected	None	7
Asphalt Cork Expansion Board – Black tar like caulking between sidewalk on east side	<u>Sample ID:</u> SN-3-061-CLK-1A, 1B, 1C) <u>Concentration</u> : None Detected	None	7
Grey paint – Abutment wall	<u>Sample ID:</u> SN-3-061-P1 <u>Concentration:</u> 8.2 ug/g	None	

4.5.4 SUMMARY

The document review and bulk sampling by WSP (or others) identified the following confirmed and/or potential ACM

- The original drawings (no date provided) reportedly indicated that one 2.5” (6.35 cm) transite electrical duct embedded in the coping/sidewalk on the north and south side of each bridge and three 4” (10.16 cm) transite electrical ducts embedded below the coping/sidewalk on the north side of each bridge structure. The rehabilitation drawings (dated 1982) indicated that the ducts were to be left in place and filled with expanding cement grout (all structures). A previous sample by MH from the sidewalk at Percy Street confirmed the duct contains 15% Chrysotile and 10% Crocidolite asbestos (confirmed ACM).
- The original drawings reportedly indicated the presence of a 1” thick cork asphalt board in the expansion joints between the eastbound and westbound lane structures; however, the rehabilitation drawings indicated that the expansion joint was to be removed and replaced with a pre-compressed joint sealant. MH indicated that there was potential for residual expansion joints to still be present (suspect ACM, all structures).
- The original drawings reportedly indicated the presence of 4” (10.16 cm) transite drainage ducts located below grade and through the retaining walls on 12’ (3.66 m) centres (suspect ACM, all structures).
- Concrete from the abutments were sampled and found to contain 2% Chrysotile asbestos. The concrete itself is considered non-friable however, if the concrete releases fine dust due to deterioration or during removal, the free dust is considered friable.

The following building materials were sampled by WSP (or others) and confirmed to be non-ACM:

- The original drawings reportedly indicated that 0.5” (1.27 cm) thick cork asphalt board was present in the expansion joint between the retaining and abutment walls. MH indicated that this was sampled during their assessment, and found to be non-asbestos containing. WSP collected additional samples and the material was found to be non-ACM (SN-3-061-EXP1A, 1B, 1C).

In addition, paint was sampled from the abutment walls and submitted for lead analysis. MH sampled and confirmed that the lead content in the paint was 14 µg/g, below the limit of 600 µg/g. WSP collected additional sampled and the content was 8.2 ug/g (SN3-061-P1)

5 CONCLUSIONS

Information in this section of the report should be provided to all prospective contractors and/or workers who are likely to handle, come into contact with, or disturb asbestos or other Designated Substances. Detailed specifications that outline specific abatement procedures are recommended when tendering the structural rehabilitation/replacement work.

Contractors and maintenance personnel should be warned of the possibility of undisclosed materials when breaking into enclosed areas. Friable and non-friable materials discovered in enclosed areas should be treated as asbestos until proven otherwise and other substances, self-evident as Designated Substances, should be handled in a likewise fashion.

Substance	Location
Arsenic	Present throughout the working area including, but not limited to pressure treated lumber, sign posts, guiderail posts and some steel structure coatings (e.g. paints, creosote, etc.).
Asbestos on Construction Projects and in Buildings and Repair Operations (O. Reg. 278/05)	<p>Asbestos Containing Materials (ACMs) are commonly found in pipe-coverings, insulating cement, insulating block, transite board, mastics, as well as in coatings found on structures and culverts (i.e. asphalt coated asbestos protected corrugated steel). In addition, asbestos fibers can be found in some old concrete products and precast materials including flat and corrugated sheets.</p> <p><u>SN-3-55.1 and SN-3-55.2 (Preston Street):</u></p> <p>The document review identified the following confirmed and potential non-friable ACM:</p> <ul style="list-style-type: none"> — 2.5” (6.35 cm) transite electrical ducts embedded within the sidewalk on the north and south side of the bridge structures. A previous sample of the duct was completed by Morrison Hershfield (MH) from the sidewalk at Percy Street confirmed the duct contains 15% Chrysotile and 10% Crocidolite asbestos (confirmed ACM). It is assumed the duct within the sidewalk at Percy Street is the same type as the duct at Preston Street, — Three 4” (10.16 cm) transite electrical ducts embedded below the sidewalk on the north side (suspect ACM, all structures), — 4” (10.16 cm) transite drainage ducts located below grade and through the retaining walls on 12’ (3.66 m) centres (suspect ACM, all structures), and — The original drawings indicated the presence of a 1” (2.54 cm) thick cork asphalt board in the expansion joint between the eastbound and westbound structures; however, the rehabilitation drawings indicate the expansion joint was to be removed and replaced with a pre-compressed joint sealant. (potential ACM, only if expansion joint not fully removed during previous rehabilitation). <p>The following materials were sampled by WSP (or others) and confirmed to be non-ACM.</p> <ul style="list-style-type: none"> — Concrete from the abutments (SN-3-055-CON 1A, 1B, and 1C), — The original drawings reportedly indicated that 0.5” (1.27 cm) thick cork asphalt board was present in the expansion joint between the retaining and abutment walls. MH indicated that this was sampled during their assessment at a different bridge structure and found to be non-ACM.

WSP sampled and confirmed the cork asphalt board is non-ACM (EXP1A, 1B and 1C).

- Cork expansion board from between the sidewalk concrete slabs (EXP 2A, 2B, 2C); and
- Fibrous cork expansion board (EXP3A, 3B, 3C).

SN-3-56.1 and SN-3-56.2 (Rochester Street):

The document review identified the following confirmed and/or potential non-friable ACM

- 2.5" (6.35 cm) transite electrical ducts embedded within the sidewalk on the north and south side of the bridge structure. A previous sample of the duct was completed by MH from the sidewalk at Percy Street confirmed the duct contains 15% Chrysotile and 10% Crocidolite asbestos (confirmed ACM). It is assumed the duct within the sidewalk at Percy Street is the same type as the duct at Rochester Street,
- Three 4" (10.16 cm) transite electrical ducts embedded below the sidewalk on the north side (suspect ACM, all structures),
- 4" (10.16 cm) transite drainage ducts located below grade and through the retaining walls on 12' (3.66 m) centres (suspect ACM, all structures), and
- The original drawings indicated the presence of a 1" thick cork asphalt board in the expansion joint between the eastbound and westbound structures; however, the rehabilitation drawings indicate the expansion joint was to be removed and replaced with a pre-compressed joint sealant. (potential ACM, only if expansion joint not fully removed during previous rehabilitation).

The following building materials were sampled by WSP (or others) and confirmed to be non-ACM:

- Concrete from abutments (SN-3-056-CON 1A, 1B and to 1C)
- The original drawings reportedly indicated that 0.5" thick cork asphalt board was present in the expansion joint between the retaining and abutment walls. MH indicated that this was sampled during their assessment at a different bridge structure and found to be non-ACM. WSP collected additional samples and confirmed the material is non-ACM (SN-3-056-EXP 2A, 2B and 2C).
- Expansion board between sidewalk concrete slabs and along base of abutment walls (SN-3-056-EXP1A, 1B and 1C)

SN-3-57.1 and SN-3-57.2 (Booth Street):

The document review identified the following confirmed and/or potential non-friable ACM:

- 2.5" (6.35 cm) transite electrical ducts embedded within the sidewalk on the north and south side of the bridge structure. A previous sample of the duct was completed by MH from the sidewalk at Percy Street confirmed the duct contains 15% Chrysotile and 10% Crocidolite asbestos (confirmed ACM). It is assumed the duct within the sidewalk at Percy Street is the same type as the duct at Booth Street,
- Three 4" (10.16 cm) transite electrical ducts embedded below the sidewalk on the north side (suspect ACM, all structures),

- 4" (10.16 cm) transite drainage ducts located below grade and through the retaining walls on 12' (3.66 m) centres (suspect ACM, all structures), and
- The original drawings indicated the presence of a 1" thick cork asphalt board in the expansion joint between the eastbound and westbound structures; however, the rehabilitation drawings indicate the expansion joint was to be removed and replaced with a pre-compressed joint sealant. (potential ACM, only if expansion joint not fully removed during previous rehabilitation).

The following building materials were sampled by WSP (or others) and confirmed to be non-ACM:

- Concrete from abutments (SN-3-057-CON1A, CON-1B, CON-1C)
- The original drawings reportedly indicated that 0.5" thick cork asphalt board was present in the expansion joint between the retaining and abutment walls. MH indicated that this was sampled during their assessment and found to be non-ACM.

SN-3-60.1 and SN-3-60.2 (Bronson Avenue):

The document review identified the following confirmed and/or potential non-friable ACM

- 2.5" (6.35 cm) transite electrical ducts embedded within the sidewalk on the north and south side of the bridge structure. A previous sample of the duct was completed by MH from the sidewalk at Percy Street confirmed the duct contains 15% Chrysotile and 10% Crocidolite asbestos (confirmed ACM). It is assumed the duct within the sidewalk at Percy Street is the same type as the duct at Bronson Avenue,
- Three 4" (10.16 cm) transite electrical ducts embedded below the sidewalk on the north side (suspect ACM, all structures),
- The original drawings reportedly indicated the presence of a 1" thick cork asphalt board in the expansion joints between the eastbound and westbound lane structures; however, the rehabilitation drawings indicated that the expansion joint was to be removed and replaced with a pre-compressed joint sealant. MH indicated that there is potential for residual expansion joints to still be present (suspect ACM, all structures).
- The original drawings reportedly indicated the presence of 4" (10.16 cm) transite drainage ducts located below grade and through the retaining walls on 12' (3.66 m) centres (suspect ACM, all structures).

The following building materials were sampled by WSP (or others) and confirmed to be non-ACM:

- Concrete from abutments (SN-3-060- CON1A, 1B and 1C)
- The original drawings reportedly indicated that 0.5" thick cork asphalt board was present in the expansion joint between the retaining and abutment walls. MH indicated that this was sampled during their assessment at a different bridge structure and found to be non-ACM. WSP sampled and confirmed the cork asphalt board is non-ACM.

SN-3-61.1 and SN-3-61.2 (Percy Street):

The document review and bulk sampling by WSP (or others) identified the following confirmed and/or potential non-friable ACM

- The original drawings (no date provided) reportedly indicated that one 2.5" (6.35 cm) transite electrical duct embedded in the coping/sidewalk

	<p>on the north and south side of each bridge and three 4" (10.16 cm) transite electrical ducts embedded below the coping/sidewalk on the north side of each bridge structure. The rehabilitation drawings (dated 1982) indicated that the ducts were to be left in place and filled with expanding cement grout (all structures). A previous sample by MH from the sidewalk at Percy Street confirmed the duct contains 15% Chrysotile and 10% Crocidolite asbestos (confirmed ACM).</p> <ul style="list-style-type: none"> – The original drawings reportedly indicated the presence of a 1" thick cork asphalt board in the expansion joints between the eastbound and westbound lane structures; however, the rehabilitation drawings indicated that the expansion joint was to be removed and replaced with a pre-compressed joint sealant. MH indicated that there is potential for residual expansion joints to still be present (suspect ACM, all structures). – The original drawings reportedly indicated the presence of 4" (10.16 cm) transite drainage ducts located below grade and through the retaining walls on 12' (3.66 m) centres (suspect ACM, all structures). – Concrete from the abutments were sampled at three locations and found to contain 2% Chrysotile asbestos. The concrete itself is considered non-friable however, if the concrete releases fine dust due to deterioration or during removal, the free dust is considered friable. <p>The following building materials were sampled by WSP (or others) and confirmed to be non-ACM:</p> <p>The original drawings reportedly indicated that 0.5" (1.27 cm) thick cork asphalt board was present in the expansion joint between the retaining and abutment walls. MH indicated that this was sampled during their assessment, and found to be non-asbestos containing. WSP collected additional samples and the material was found to be non-ACM (SN-3-061-EXP1A, 1B, 1C).</p>
Lead	<p>Lead can be present in paint and/or other coatings on steel elements (guiderails, conduits, bracing, girders, diaphragms, beams, bearing plates and steel/rebar).</p> <p>None identified at the bridge structures.</p>
Silica	<p>Present throughout the working area including, but not limited to, asphalt, concrete and granular materials.</p>
Benzene	<p>Benzene may be present in soils encountered during construction however, soil sampling was not completed as part of this DSS.</p> <p>None identified as part of this assessment.</p>
Vinyl Chloride, Coke Oven Emissions, Ethylene Oxide, Acrylonitrile and Isocyanates	<p>None identified.</p>
Mercury	<p>No mercury containing equipment was identified at any of the bridge structures.</p>
PCBs	<p>It is noted that original light fixtures were removed during the rehabilitation of the mid 1980s. No PCB containing equipment was noted in drawings or during the site inspection.</p>

5.1 RECOMMENDATIONS

Removal of all asbestos-containing materials (ACMs) must be conducted prior to or during construction activities or demolition work that may damage these materials. Removal must be conducted in accordance with the Occupational Health and Safety Act (OSHA) regarding worker protection, to avoid the inhalation or ingestion of asbestos fibres. Non-friable ACM identified can be removed using Type 1 or Type 2 removal procedures, depending on removal procedures used by the contractor as specified in Ontario Regulation 278/05.

We understand that all Designated Substances and hazardous materials will be managed/removed prior to/during construction (if encountered). Confirmation that the asbestos removal has been conducted in accordance with the OHSA is recommended. All Designated Substances must be handled in accordance with the appropriate guidelines and regulations.

Special precautions should be taken when disturbing any concrete given the presence of silica, lead and potentially arsenic at all bridge structures. Management of the concrete as ACM will be required at the Percy Street Structure. All Designated Substances must be handled in accordance with the appropriate guidelines and regulations. The Ministry of Labour (MOL) has published guidelines for handling and controlling lead and silica in construction and it is recommended that these guidelines be followed when removing and cutting into the concrete. Coring, sawing or breaking up the materials containing silica, lead and potentially arsenic should be completed only with appropriate dust suppression methods, proper respiratory protection and general worker safety precautions as outlined in the MOL Guidance documents and in the Occupational Health and Safety Act.

If during demolition, additional materials suspected of containing asbestos are encountered, they must be handled in accordance with the appropriate guidelines and regulations. It should be noted that asbestos may be present in enclosed spaces not accessible at the time of the site visit.

6 SIGNATURES

PREPARED BY



Kathryn Maton, C.E.T.
Environmental Technologist

REVIEWED BY



Amanda Park, P.Geo
Senior Project Manager

7 STANDARD LIMITATIONS

This report was prepared by WSP Canada Group Limited (WSP) for the account of the Ontario Ministry of Transportation (MTO), in accordance with the professional services agreement. The disclosure of any information contained in this report is the sole responsibility of the intended recipient. The material in it reflects WSP's best judgement in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. WSP accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report. This limitations statement is considered part of this report.

The original of the technology-based document sent herewith has been authenticated and will be retained by WSP for a minimum of ten years. Since the file transmitted is now out of WSP's control and its integrity can no longer be ensured, no guarantee may be given with regards to any modifications made to this document.

8 REFERENCES

- Canadian National Master Construction Specification, Section E028200.01 Asbestos Abatement – Minimum Precautions, December 31, 2008.
- Canadian National Master Construction Specification, Section E028200.02 Asbestos Abatement – Intermediate Precautions, December 31, 2008.
- Canadian National Master Construction Specification, Section E028200.03 Asbestos Abatement – Maximum Precautions, December 31, 2008.
- Hazardous Products Act, Surface Coating Materials Regulation SOR/2005-109. Government of Canada, April 2005.
- Morisson Hershfield (MH), April, 2016. Transportation Environmental Study Report, Volume II, Preliminary Design and Environmental Assessment for the Rehabilitation / Replacement of Ottawa Queensway Mid-town Bridges from Holland Avenue to O'Connor Street. GWP 4075-11-00.
- Occupational Health & Safety Act, Ontario Regulation 278/05 Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations (as amended by O. Reg. 479/10). e-Laws, Service Ontario.
- Occupational Health and Safety Act, Revised Statutes of Ontario, 1990, Chapter O.1 (as amended in 2011). e-Laws, Service Ontario.

PHOTOGRAPHS





Photograph 1: View of the structure SN-3-055.1 (sidewalk) facing north.



Photograph 2: View of the northwest side of structure SN-3-056.2 (sidewalk) facing north.



Photograph 3: Representative photograph of asphalt expansion board located between the expansion joints of structures SN-3-056.1 and SN-3-056.2.



Photograph 4: View of the northeast side of structure SN-3-57.1 facing southeast.



Photograph 5: View of the south side of structure SN-3-60.2 facing north.



Photograph 6: View of structure SN-3-61.2.



Photograph 7: Representative photograph of asphalt expansion board located between the expansion joints at SN-3-061.1

APPENDIX

A

**LABORATORY
CERTIFICATES OF
ANALYSIS**



EMSL Canada Inc.

2756 Slough Street, Mississauga, ON L9T 5N4

Phone/Fax: 289-997-4602 / (289) 997-4607

<http://www.EMSL.com>

torontolab@emsl.com

EMSL Canada Or	551703723
CustomerID:	55MMMMG25
CustomerPO:	16M-01636-01
ProjectID:	

Attn: Amanda Park MMM Group 100 Commerce Valley Drive West Thornhill, ON L3T 0A1	Phone: (905) 882-4211 Fax: (905) 882-1857 Received: 04/05/17 10:28 AM Collected: 3/31/2017
Project: 16M-01636-01	

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)*

<i>Client Sample Description</i>	<i>Lab ID</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Lead Concentration</i>
SN-3-057-P-1	551703723-0001	3/31/2017	4/11/2017	<0.0090 % wt
Site: GREY PAINT - ABUTMENT WALLS				

Rowena Fanto, Lead Supervisor
or other approved signatory

*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.010 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities. Samples received in good condition unless otherwise noted. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements unless specifically indicated otherwise. Definitions of modifications are available upon request.

Samples analyzed by EMSL Canada Inc. Mississauga, ON A2LA Accredited Environmental Testing Cert #2845.08

Initial report from 04/12/2017 07:55:52



EMSL Canada Inc.

2756 Slough Street, Mississauga, ON L9T 5N4

Phone/Fax: 289-997-4602 / (289) 997-4607

<http://www.EMSL.com>

torontolab@emsl.com

EMSL Canada Or	551703723
CustomerID:	55MMMMG25
CustomerPO:	16M-01636-01
ProjectID:	

Attn: **Amanda Park**
MMM Group
100 Commerce Valley Drive West
Thornhill, ON L3T 0A1

Phone: (905) 882-4211
Fax: (905) 882-1857
Received: 04/05/17 10:28 AM
Collected: 3/31/2017

Project: **16M-01636-01**

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)*

<i>Client Sample Description</i>	<i>Lab ID</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Lead Concentration</i>
SN-3-057-P-1	551703723-0001	3/31/2017	4/11/2017	<90 mg/Kg
Site: GREY PAINT - ABUTMENT WALLS				

Rowena Fanto, Lead Supervisor
or other approved signatory

*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.010 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities. Samples received in good condition unless otherwise noted. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements unless specifically indicated otherwise. Definitions of modifications are available upon request.

Samples analyzed by EMSL Canada Inc. Mississauga, ON A2LA Accredited Environmental Testing Cert #2845.08

Initial report from 04/12/2017 07:55:56



Lead (Pb) Chain of Custody

EMSL Order ID (Lab Use Only):

551703723

EMSL CANADA, INC.
 2756 SLOUGH STREET
 MISSISSAUGA, ON L4T 1G3
 PHONE: (289) 997-4602
 FAX: (289) 997-4609

Company : MMM Group Limited		EMSL-Bill to: <input type="checkbox"/> Same <input checked="" type="checkbox"/> Different If Bill to is Different note instructions in Comments**	
Street: 100 Commerce Valley Dr W		Third Party Billing requires written authorization from third party	
City: Thornhill	State/Province: ON	Zip/Postal Code: L3T 0A1	Country: Canada
Report To (Name): Kathryn Maton/Amanda Park		Telephone #: 905 882-4211	
Email Address: kathryn.maton@wspgroup.com / parka@mmm.ca		Fax #:	Purchase Order:
Project Name/Number: 16M-01636-01		Please Provide Results: <input type="checkbox"/> Fax <input checked="" type="checkbox"/> Email	
U.S. State Samples Taken: none		CT Samples: <input type="checkbox"/> Commercial/Taxable <input type="checkbox"/> Residential/Tax Exempt	

Turnaround Time (TAT) Options* - Please Check

3 Hour 6 Hour 24 Hour 48 Hour 72 Hour 96 Hour 1 Week 2 Week

*Analysis completed in accordance with EMSL's Terms and Conditions located in the Price Guide

Matrix	Method	Instrument	Reporting Limit	Check
Chips <input checked="" type="checkbox"/> % by wt. <input checked="" type="checkbox"/> mg/cm ² <input type="checkbox"/> ppm	SW846-7000B	Flame Atomic Absorption	0.01%	<input checked="" type="checkbox"/>
Air	NIOSH 7082	Flame Atomic Absorption	4 µg/filter	<input type="checkbox"/>
	NIOSH 7105	Graphite Furnace AA	0.03 µg/filter	<input type="checkbox"/>
	NIOSH 7300 modified	ICP-AES/ICP-MS	0.5 µg/filter	<input type="checkbox"/>
Wipe* ASTM <input type="checkbox"/> non ASTM <input type="checkbox"/> *If no box is checked, non-ASTM Wipe is assumed	SW846-7000B	Flame Atomic Absorption	10 µg/wipe	<input type="checkbox"/>
	SW846-6010B or C	ICP-AES	1.0 µg/wipe	<input type="checkbox"/>
	SW846-7000B/7010	Graphite Furnace AA	0.075 µg/wipe	<input type="checkbox"/>
TCLP	SW846-1311/7000B/SM 3111B	Flame Atomic Absorption	0.4 mg/L (ppm)	<input type="checkbox"/>
	SW846-1131/SW846-6010B or C	ICP-AES	0.1 mg/L (ppm)	<input type="checkbox"/>
Soil	SW846-7000B	Flame Atomic Absorption	40 mg/kg (ppm)	<input type="checkbox"/>
	SW846-7010	Graphite Furnace AA	0.3 mg/kg (ppm)	<input type="checkbox"/>
	SW846-6010B or C	ICP-AES	2 mg/kg (ppm)	<input type="checkbox"/>
Wastewater Unpreserved <input type="checkbox"/> Preserved with HNO ₃ pH < 2 <input type="checkbox"/>	SM3111B/SW846-7000B	Flame Atomic Absorption	0.4 mg/L (ppm)	<input type="checkbox"/>
	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)	<input type="checkbox"/>
	EPA 200.7	ICP-AES	0.020 mg/L (ppm)	<input type="checkbox"/>
Drinking Water Unpreserved <input type="checkbox"/> Preserved with HNO ₃ pH < 2 <input type="checkbox"/>	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)	<input type="checkbox"/>
	EPA 200.8	ICP-MS	0.001 mg/L (ppm)	<input type="checkbox"/>
TSP/SPM Filter	40 CFR Part 50	ICP-AES	12 µg/filter	<input type="checkbox"/>
	40 CFR Part 50	Graphite Furnace AA	3.6 µg/filter	<input type="checkbox"/>
Other:				<input type="checkbox"/>

Name of Sampler:		Signature of Sampler:	
Sample #	Location	Volume/Area	Date/Time Sampled
SN-3-057-P-1	Grey Paint - Abutment Walls		31/03/2017 9 am
Client Sample #'s	SN-3-057-P-1 - SN-3-057-P-1	Total # of Samples:	1
Relinquished (Client):	Kathryn Maton <i>[Signature]</i>	Date:	31/03/2017
Received (Lab):		Date:	
		Time:	4pm
		Time:	

Comments: Bill to MMM Accounts Payable at: accountspayable@mmm.ca

Page 2 of 2 pages



EMSL Canada Inc.

2756 Slough Street Mississauga, ON L9T 5N4
Phone/Fax: 289-997-4602 / (289) 997-4607
<http://www.EMSL.com> / torontolab@emsl.com

EMSL Canada Order 551703783
Customer ID: 55MMMG25
Customer PO: 16M-01627-01
Project ID:

Attn: Amanda Park
MMM Group
100 Commerce Valley Drive West
Thornhill, ON L3T 0A1
Phone: (905) 882-4211
Fax: (905) 882-1857
Collected: 3/31/2017
Received: 4/05/2017
Analyzed: 4/12/2017
Proj: 16M-01627-01

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: SN-3-057-CON-1A **Lab Sample ID:** 551703783-0001

Sample Description: Concrete

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	4/12/2017	Gray	0%	100%	None Detected	

Client Sample ID: SN-3-057-CON-1B **Lab Sample ID:** 551703783-0002

Sample Description: Concrete

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	4/12/2017	Gray	0%	100%	None Detected	

Client Sample ID: SN-3-057-CON-1C **Lab Sample ID:** 551703783-0003

Sample Description: Concrete

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	4/12/2017	Gray	0%	100%	None Detected	

Analyst(s): _____

- John Biesiadecki PLM (1)
- Natalie D'Amico PLM (2)

Reviewed and approved by:

Matthew Davis
or Other Approved Signatory

None Detected = <0.1%. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted. This report must not be used to claim product endorsement by NVLAP of any agency of the U.S. Government.

Samples analyzed by EMSL Canada Inc. Mississauga, ON NVLAP Lab Code 200877-0

Initial report from: 04/12/2017 16:15:28

**EMSL Canada Inc.**

2756 Slough Street, Mississauga, ON L9T 5N4

Phone/Fax: 289-997-4602 / (289) 997-4607

<http://www.EMSL.com>torontolab@emsl.com

EMSL Canada Or	551703818
CustomerID:	55MMMG25
CustomerPO:	16M-01636-01
ProjectID:	

Attn: **Amanda Park**
MMM Group
100 Commerce Valley Drive West
Thornhill, ON L3T 0A1

Phone: (905) 882-4211
 Fax: (905) 882-1857
 Received: 04/07/17 11:05 AM
 Collected: 4/4/2017

Project: **16M-01636-01****Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)***

<i>Client Sample Description</i>	<i>Lab ID</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Lead Concentration</i>
SN-3-056-P-1	551703818-0001	4/4/2017	4/13/2017	<0.0090 % wt
Site: Grey Paint - Abutment Walls				

 Rowena Fanto, Lead Supervisor
 or other approved signatory

*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.010 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities. Samples received in good condition unless otherwise noted. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements unless specifically indicated otherwise. Definitions of modifications are available upon request.

Samples analyzed by EMSL Canada Inc. Mississauga, ON A2LA Accredited Environmental Testing Cert #2845.08

Initial report from 04/17/2017 07:28:17



Lead (Pb) Chain of Custody

EMSL Order ID (Lab Use Only):

551703818

EMSL CANADA, INC.
2756 SLOUGH STREET
MISSISSAUGA, ON L4T 1G3
PHONE: (289) 997-4602
FAX: (289) 997-4609

Company : MMM Group Limited		EMSL-Bill to: <input type="checkbox"/> Same <input checked="" type="checkbox"/> Different If Bill to is Different note instructions in Comments**	
Street: 100 Commerce Valley Dr W		Third Party Billing requires written authorization from third party	
City: Thornhill	State/Province: ON	Zip/Postal Code: L3T 0A1	Country: Canada
Report To (Name): Kathryn Maton/Amanda Park		Telephone #: 905 882-4211	
Email Address: kathryn.maton@wspgroup.com / parka@mmm.ca		Fax #:	Purchase Order:
Project Name/Number: 16M-01636-01		Please Provide Results: <input type="checkbox"/> Fax <input checked="" type="checkbox"/> Email	
U.S. State Samples Taken: none		CT Samples: <input type="checkbox"/> Commercial/Taxable <input type="checkbox"/> Residential/Tax Exempt	

Turnaround Time (TAT) Options* - Please Check

3 Hour
 6 Hour
 24 Hour
 48 Hour
 72 Hour
 96 Hour
 1 Week
 2 Week

*Analysis completed in accordance with EMSL's Terms and Conditions located in the Price Guide

Matrix	Method	Instrument	Reporting Limit	Check
Chips <input checked="" type="checkbox"/> % by wt. <input checked="" type="checkbox"/> mg/cm ² <input type="checkbox"/> ppm	SW846-7000B	Flame Atomic Absorption	0.01%	<input checked="" type="checkbox"/>
Air	NIOSH 7082	Flame Atomic Absorption	4 µg/filter	<input type="checkbox"/>
	NIOSH 7105	Graphite Furnace AA	0.03 µg/filter	<input type="checkbox"/>
	NIOSH 7300 modified	ICP-AES/ICP-MS	0.5 µg/filter	<input type="checkbox"/>
Wipe* ASTM <input type="checkbox"/> non ASTM <input type="checkbox"/> *if no box is checked, non-ASTM Wipe is assumed	SW846-7000B	Flame Atomic Absorption	10 µg/wipe	<input type="checkbox"/>
	SW846-6010B or C	ICP-AES	1.0 µg/wipe	<input type="checkbox"/>
	SW846-7000B/7010	Graphite Furnace AA	0.075 µg/wipe	<input type="checkbox"/>
TCLP	SW846-1311/7000B/SM 3111B	Flame Atomic Absorption	0.4 mg/L (ppm)	<input type="checkbox"/>
	SW846-1131/SW846-6010B or C	ICP-AES	0.1 mg/L (ppm)	<input type="checkbox"/>
Soil	SW846-7000B	Flame Atomic Absorption	40 mg/kg (ppm)	<input type="checkbox"/>
	SW846-7010	Graphite Furnace AA	0.3 mg/kg (ppm)	<input type="checkbox"/>
	SW846-6010B or C	ICP-AES	2 mg/kg (ppm)	<input type="checkbox"/>
Wastewater Unpreserved <input type="checkbox"/> Preserved with HNO ₃ pH < 2 <input type="checkbox"/>	SM3111B/SW846-7000B	Flame Atomic Absorption	0.4 mg/L (ppm)	<input type="checkbox"/>
	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)	<input type="checkbox"/>
	EPA 200.7	ICP-AES	0.020 mg/L (ppm)	<input type="checkbox"/>
Drinking Water Unpreserved <input type="checkbox"/> Preserved with HNO ₃ pH < 2 <input type="checkbox"/>	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)	<input type="checkbox"/>
	EPA 200.8	ICP-MS	0.001 mg/L (ppm)	<input type="checkbox"/>
TSP/SPM Filter	40 CFR Part 50	ICP-AES	12 µg/filter	<input type="checkbox"/>
	40 CFR Part 50	Graphite Furnace AA	3.6 µg/filter	<input type="checkbox"/>
Other:				<input type="checkbox"/>

Name of Sampler:		Signature of Sampler:	
Sample #	Location	Volume/Area	Date/Time Sampled
SN-3-056-P-1	Grey Paint - Abutment Walls		04/04/2017 9 am

Client Sample #'s	SN-3-056-P-1 - SN-3-056-P-1	Total # of Samples:	1
Relinquished (Client):	Kathryn Maton <i>Maton</i>	Date:	06/04/2017
Received (Lab):		Date:	
		Time:	1:30pm

Pg 1 of 2

04-07-17A11:05

7700 4145 7329 *me*

Comments: Bill to MMM Accounts Payable at: accountspayable@mmm.ca

Page 2 of 2 pages

551703818



EMSL Canada Inc.

2756 Slough Street, Mississauga, ON L9T 5N4

Phone/Fax: 289-997-4602 / (289) 997-4607

<http://www.EMSL.com>

torontolab@emsl.com

EMSL Canada Or 551703723
CustomerID: 55MMMMG25
CustomerPO: 16M-01636-01
ProjectID:

Attn: **Amanda Park**
MMM Group
100 Commerce Valley Drive West
Thornhill, ON L3T 0A1

Phone: (905) 882-4211
Fax: (905) 882-1857
Received: 04/05/17 10:28 AM
Collected: 3/31/2017

Project: **16M-01636-01**

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)*

<i>Client Sample Description</i>	<i>Lab ID</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Lead Concentration</i>
SN-3-057-P-1	551703723-0001	3/31/2017	4/11/2017	<0.0090 % wt
Site: GREY PAINT - ABUTMENT WALLS				

Rowena Fanto, Lead Supervisor
or other approved signatory

*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.010 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities. Samples received in good condition unless otherwise noted. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements unless specifically indicated otherwise. Definitions of modifications are available upon request.

Samples analyzed by EMSL Canada Inc. Mississauga, ON A2LA Accredited Environmental Testing Cert #2845.08

Initial report from 04/12/2017 07:55:52



EMSL Canada Inc.

2756 Slough Street Mississauga, ON L4T 1G3
Phone/Fax: 289-997-4602 / (289) 997-4607
<http://www.EMSL.com> / torontolab@emsl.com

EMSL Canada Order 551708214
Customer ID: 55WPTH42
Customer PO: 16M-01636-01
Project ID:

Attn: Amanda Park
WSP Canada, Inc.
100 Commerce Valley Road
Thornhill, ON L3T 0A1

Phone: (905) 882-1100
Fax:
Collected: 7/20/2017
Received: 7/21/2017
Analyzed: 7/28/2017

Proj: 16M-01636-01

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: SN-3-060-EXP-1A

Lab Sample ID: 551708214-0001

Sample Description: TAR EXPANSION BOARD

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/28/2017	Black	3%	97%	None Detected	

Client Sample ID: SN-3-060-EXP-1B

Lab Sample ID: 551708214-0002

Sample Description: TAR EXPANSION BOARD

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/28/2017	Black	0%	100%	None Detected	

Client Sample ID: SN-3-060-EXP-1C

Lab Sample ID: 551708214-0003

Sample Description: TAR EXPANSION BOARD

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/28/2017	Black	0%	100%	None Detected	

Client Sample ID: SN-3-060-CON-1A

Lab Sample ID: 551708214-0004

Sample Description: CONCRETE

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/28/2017	Gray	2%	98%	None Detected	

Client Sample ID: SN-3-060-CON-1B

Lab Sample ID: 551708214-0005

Sample Description: CONCRETE

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/28/2017	Gray	1%	99%	None Detected	

Client Sample ID: SN-3-060-CON-1C

Lab Sample ID: 551708214-0006

Sample Description: CONCRETE

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/28/2017	Gray	0%	100%	None Detected	



EMSL Canada Inc.

2756 Slough Street Mississauga, ON L4T 1G3
Phone/Fax: (289) 997-4602 / (289) 997-4607
<http://www.EMSL.com> / torontolab@emsl.com

EMSL Canada Order 551810373
Customer ID: 55MMMG25
Customer PO: 16M-01636-01
Project ID:

Attn: Amanda Park
WSP Canada Group Limited
100 Commerce Valley Drive West
Thornhill, ON L3T 0A1

Phone: (905) 882-4211
Fax: (905) 882-1857
Collected: 8/23/2018
Received: 9/05/2018
Analyzed: 9/07/2018

Proj: 16M-01636-01, 460, 466

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: SN-3-061-CLK-1A **Lab Sample ID:** 551810373-0004

Sample Description: Asphalt Cork Expansion Board

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/07/2018	Black	8%	92%	None Detected	

Client Sample ID: SN-3-061-CLK-1B **Lab Sample ID:** 551810373-0005

Sample Description: Asphalt Cork Expansion Board

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/07/2018	Black	6%	94%	None Detected	

Client Sample ID: SN-3-061-CLK-1C **Lab Sample ID:** 551810373-0006

Sample Description: Asphalt Cork Expansion Board

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/07/2018	Black	6%	94%	None Detected	

Client Sample ID: SN-3-061-CON-1A **Lab Sample ID:** 551810373-0007

Sample Description: Concrete

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/07/2018	Gray	0%	98%	2% Chrysotile	

Client Sample ID: SN-3-061-CON-1B **Lab Sample ID:** 551810373-0008

Sample Description: Concrete

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/07/2018					Positive Stop (Not Analyzed)

Client Sample ID: SN-3-061-CON-1C **Lab Sample ID:** 551810373-0009

Sample Description: Concrete

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/07/2018					Positive Stop (Not Analyzed)



EMSL Canada Inc.

2756 Slough Street Mississauga, ON L4T 1G3
Phone/Fax: (289) 997-4602 / (289) 997-4607
<http://www.EMSL.com> / torontolab@emsl.com

EMSL Canada Order 551810373
Customer ID: 55MMMG25
Customer PO: 16M-01636-01
Project ID:

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Analyst(s): _____

Natalie D'Amico PLM (4)

Reviewed and approved by: _____

Matthew Davis or other approved signatory
or Other Approved Signatory

None Detected = <0.1%. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted. This report must not be used to claim product endorsement by NVLAP of any agency of the U.S. Government.

Samples analyzed by EMSL Canada Inc. Mississauga, ON NVLAP Lab Code 200877-0

Initial report from: 09/07/2018 16:23:55



EMSL CANADA, INC.
LABORATORY • PRODUCTS • TRAINING

Asbestos Chain of Custody

EMSL Order Number (Lab Use Only):

551810373

EMSL CANADA, INC.
2756 SLOUGH STREET
MISSISSAUGA, ON L4T 1G3
PHONE: (289) 997-4602
FAX: (289) 997-4609

Company : WSP Canada Group Limited		EMSL-Bill to: <input type="checkbox"/> Same <input checked="" type="checkbox"/> Different If Bill to is Different note instructions in Comments**	
Street: 100 Commerce Valley Dr W		Third Party Billing requires written authorization from third party	
City: Thornhill	State/Province: ON	Zip/Postal Code: L3T 0A1	Country: Canada
Report To (Name): Amanda Park/Kathryn Maton		Fax #:	
Telephone #: 613-617-9237 Amanda.park@wsp.com / Kathryn.maton@wsp.com		Email Address: payables.ontario@wsp.com	
Project Name/Number: 16M-01636-01, 460, 466			
Please Provide Results: <input type="checkbox"/> Fax <input checked="" type="checkbox"/> Email		Purchase Order: _____ U.S. State Samples Taken: none	

Turnaround Time (TAT) Options* – Please Check

3 Hour
 6 Hour
 24 Hour
 48 Hour
 72 Hour
 96 Hour
 1 Week
 2 Week

*For TEM Air 3 hours through 6 hours, please call ahead to schedule. *There is a premium charge for 3 Hour TEM AHERA or EPA Level II TAT. You will be asked to sign an authorization form for this service. Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide.

PCM - Air <input type="checkbox"/> NIOSH 7400 <input type="checkbox"/> w/ OSHA 8hr. TWA	TEM - Air <input type="checkbox"/> 4-4.5hr TAT (AHERA only) <input type="checkbox"/> AHERA 40 CFR, Part 763 <input type="checkbox"/> NIOSH 7402 <input type="checkbox"/> EPA Level II <input type="checkbox"/> ISO 10312	TEM - Dust <input type="checkbox"/> Microvac - ASTM D 5755 <input type="checkbox"/> Wipe - ASTM D6480 <input type="checkbox"/> Carpet Sonication (EPA 600/J-93/167)
PLM - Bulk (reporting limit) <input checked="" type="checkbox"/> PLM EPA 600/R-93/116 (<1%) <input type="checkbox"/> PLM EPA NOB (<1%) Point Count <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1000 (<0.1%) Point Count w/Gravimetric <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1000 (<0.1%) <input type="checkbox"/> NYS 198.1 (friable in NY) <input type="checkbox"/> NYS 198.6 NOB (non-friable-NY) <input type="checkbox"/> NIOSH 9002 (<1%)	TEM - Bulk <input type="checkbox"/> TEM EPA NOB <input type="checkbox"/> NYS NOB 198.4 (non-friable-NY) <input type="checkbox"/> Chatfield SOP <input type="checkbox"/> TEM Mass Analysis-EPA 600 sec. 2.5	Soil/Rock/Vermiculite <input type="checkbox"/> PLM CARB 435 - A (0.25% sensitivity) <input type="checkbox"/> PLM CARB 435 - B (0.1% sensitivity) <input type="checkbox"/> TEM CARB 435 - B (0.1% sensitivity) <input type="checkbox"/> TEM CARB 435 - C (0.01% sensitivity) <input type="checkbox"/> EPA Protocol (Semi-Quantitative) <input type="checkbox"/> EPA Protocol (Quantitative)
<input checked="" type="checkbox"/> Check For Positive Stop – Clearly Identify Homogenous Group		Filter Pore Size (Air Samples): <input type="checkbox"/> 0.8µm <input type="checkbox"/> 0.45µm

Samplers Name: Kathryn Maton Samplers Signature: _____

Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
SN-3-061-EXP-1A	Asphalt Expansion board		23/08/2018 / 11 am
SN-3-061-EXP-1B	Asphalt Expansion board		23/08/2018 / 11 am
SN-3-061-EXP-1C	Asphalt Expansion board		23/08/2018 / 11 am
SN-3-061-CLK-1A	Asphalt cork expansion board		23/08/2018 / 11 am
SN-3-061-CLK-1B	Asphalt cork expansion board		23/08/2018 / 11 am
SN-3-061-CLK-1C	Asphalt cork expansion board		23/08/2018 / 11 am
SN-3-061-CON-1A	Concrete		23/08/2018 / 11 am
SN-3-061-CON-1B	Concrete		23/08/2018 / 11 am

Client Sample # (s): SN-3-061-EXP-1A - SN-3-061-CON-3C Total # of Samples: 9

Relinquished (Client): Kathryn Maton *[Signature]* Date: 04/09/2018 Time: 10:30 AM

Received (Lab): _____ Date: _____ Time: _____

Comments/Special Instructions: Bill to Accounts Payable at: payables.ontario@wsp.com

9/5/2018 5:11 PM
C/VP



EMSL Canada Inc.

2756 Slough Street Mississauga, ON L4T 1G3
Phone/Fax: 289-997-4602 / (289) 997-4607
<http://www.EMSL.com> / torontolab@emsl.com

EMSL Canada Order 551708214
Customer ID: 55WPTH42
Customer PO: 16M-01636-01
Project ID:

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Analyst(s):

Ioana Taina PLM (4)
John Biesiadecki PLM (2)

Reviewed and approved by:

Matthew Davis
or Other Approved Signatory

None Detected = <0.1%. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted. This report must not be used to claim product endorsement by NVLAP of any agency of the U.S. Government.

Samples analyzed by EMSL Canada Inc. Mississauga, ON NVLAP Lab Code 200877-0

Initial report from: 07/28/2017 15:52:21



EMSL CANADA, INC.
LABORATORY PRODUCTS - TRAINING

Asbestos Chain of Custody
EMSL Order Number (Lab Use Only):

551708214

EMSL CANADA, INC.
2756 SLOUGH STREET
MISSISSAUGA, ON L4T 1G3
PHONE: (289) 997-4602
FAX: (289) 997-4609

Company : WSP Canada Inc.		EMSL-Bill to: <input type="checkbox"/> Same <input checked="" type="checkbox"/> Different If Bill to is Different note instructions in Comments**	
Street: 100 Commerce Valley Dr W		Third Party Billing requires written authorization from third party	
City: Thornhill	State/Province: ON	Zip/Postal Code: L3T 0A1	Country: Canada
Report To (Name): Amanda Park/Kathryn Maton		Fax #:	
Telephone #: 613-617-9237 amanda.park@wsp.com/kathryn.maton@wsp.com		Email Address: accountspayable@mmm.ca	
Project Name/Number: 16M-01636-01 ^{16M-01636-01}		Purchase Order:	
Please Provide Results: <input type="checkbox"/> Fax <input checked="" type="checkbox"/> Email		U.S. State Samples Taken: none	
Turnaround Time (TAT) Options* - Please Check			
<input type="checkbox"/> 3 Hour	<input type="checkbox"/> 6 Hour	<input type="checkbox"/> 24 Hour	<input type="checkbox"/> 48 Hour
<input type="checkbox"/> 72 Hour	<input type="checkbox"/> 96 Hour	<input checked="" type="checkbox"/> 1 Week	<input type="checkbox"/> 2 Week
*For TEM Air 3 hours through 6 hours, please call ahead to schedule *There is a premium charge for 3 Hour TEM AHERA or EPA Level II TAT. You will be asked to sign an authorization form for this service. Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide.			
PCM - Air <input type="checkbox"/> NIOSH 7400 <input type="checkbox"/> w/ OSHA 8hr. TWA PLM - Bulk (reporting limit) <input checked="" type="checkbox"/> PLM EPA 600/R-93/116 (<1%) <input type="checkbox"/> PLM EPA NOB (<1%) Point Count <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1000 (<0.1%) Point Count w/Gravimetric <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1000 (<0.1%) <input type="checkbox"/> NYS 198.1 (friable in NY) <input type="checkbox"/> NYS 198.6 NOB (non-friable-NY) <input type="checkbox"/> NIOSH 9002 (<1%)		TEM - Air <input type="checkbox"/> 4-4.5hr TAT (AHERA only) <input type="checkbox"/> AHERA 40 CFR, Part 763 <input type="checkbox"/> NIOSH 7402 <input type="checkbox"/> EPA Level II <input type="checkbox"/> ISO 10312 TEM - Bulk <input type="checkbox"/> TEM EPA NOB <input type="checkbox"/> NYS NOB 198.4 (non-friable-NY) <input type="checkbox"/> Chatfield SOP <input type="checkbox"/> TEM Mass Analysis-EPA 600 sec. 2.5 TEM - Water: EPA 100.2 Fibers >10µm <input type="checkbox"/> Waste <input type="checkbox"/> Drinking All Fiber Sizes <input type="checkbox"/> Waste <input type="checkbox"/> Drinking	
		TEM- Dust <input type="checkbox"/> Microvac - ASTM D 5755 <input type="checkbox"/> Wipe - ASTM D6480 <input type="checkbox"/> Carpet Sonication (EPA 600/J-93/167) Soil/Rock/Vermiculite <input type="checkbox"/> PLM CARB 435 - A (0.25% sensitivity) <input type="checkbox"/> PLM CARB 435 - B (0.1% sensitivity) <input type="checkbox"/> TEM CARB 435 - B (0.1% sensitivity) <input type="checkbox"/> TEM CARB 435 - C (0.01% sensitivity) <input type="checkbox"/> EPA Protocol (Semi-Quantitative) <input type="checkbox"/> EPA Protocol (Quantitative) Other: <input type="checkbox"/>	
<input checked="" type="checkbox"/> Check For Positive Stop - Clearly Identify Homogenous Group		Filter Pore Size (Air Samples): <input type="checkbox"/> 0.8µm <input type="checkbox"/> 0.45µm	
Samplers Name: Kathryn Maton		Samplers Signature:	
Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
SN-3-060-EXP-1A	Tar Expansion board		20/07/2017 / 12 am
SN-3-060-EXP-1B	Tar Expansion board		20/07/2017 / 12 am
SN-3-056-EXP-1C	Tar Expansion board		20/07/2017 / 12 am
SN-3-060-CON-1A	Concrete		20/07/2017 / 12 am
SN-3-060-CON-1B	Concrete		20/07/2017 / 12 am
SN-3-060-CON-1C	Concrete		20/07/2017 / 12 am
Client Sample # (s): SN-3-060-EXP-1A - SN-3-056-CON-3C		Total # of Samples: 6	
Relinquished (Client): Kathryn Maton <i>[Signature]</i>		Date: July 20, 2017	Time: 12 pm
Received (Lab):		Date:	Time:
Comments/Special Instructions: Bill to WSP Accounts Payable at: Payables.Ontario@wspgroup.com			



EMSL Canada Inc.

2756 Slough Street Mississauga, ON L4T 1G3
 Phone/Fax: (289) 997-4602 / (289) 997-4607
<http://www.EMSL.com> / torontolab@emsl.com

EMSL Canada Order 551810370
 Customer ID: 55MMM25
 Customer PO: 16M-01636-01
 Project ID:

Attn: Amanda Park
 WSP Canada Group Limited
 100 Commerce Valley Drive West
 Thornhill, ON L3T 0A1

Phone: (905) 882-4211
Fax: (905) 882-1857
Collected: 8/23/2018
Received: 9/05/2018
Analyzed: 9/07/2018

Proj: 16M-01636-01,460, 466

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: SN-3-055-EXP-2A **Lab Sample ID:** 551810370-0004
Sample Description: Cork Expansion Board

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/07/2018	Black	50%	50%	None Detected	

Client Sample ID: SN-3-055-EXP-2B **Lab Sample ID:** 551810370-0005
Sample Description: Cork Expansion Board

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/07/2018	Black	50%	50%	None Detected	

Client Sample ID: SN-3-055-EXP-2C **Lab Sample ID:** 551810370-0006
Sample Description: Cork Expansion Board

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/07/2018	Black	65%	35%	None Detected	

Client Sample ID: SN-3-055-CON-1A **Lab Sample ID:** 551810370-0007
Sample Description: Concrete

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/07/2018	Gray	0%	100%	None Detected	

Client Sample ID: SN-3-055-CON-1B **Lab Sample ID:** 551810370-0008
Sample Description: Concrete

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/07/2018	Gray	0%	100%	None Detected	

Client Sample ID: SN-3-055-CON-1C **Lab Sample ID:** 551810370-0009
Sample Description: Concrete

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/07/2018	Gray	0%	100%	None Detected	

Client Sample ID: SN-3-055-EXP-3A **Lab Sample ID:** 551810370-0010
Sample Description: Cork Expansion Board

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/07/2018	Black	60%	40%	None Detected	



EMSL Canada Inc.

2756 Slough Street Mississauga, ON L4T 1G3
Phone/Fax: (289) 997-4602 / (289) 997-4607
<http://www.EMSL.com> / torontolab@emsl.com

EMSL Canada Order 551810370
Customer ID: 55MMMG25
Customer PO: 16M-01636-01
Project ID:

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: SN-3-055-EXP-3B **Lab Sample ID:** 551810370-0011
Sample Description: Cork Expansion Board

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/07/2018	Black	60%	40%	None Detected	

Client Sample ID: SN-3-055-EXP-3C **Lab Sample ID:** 551810370-0012
Sample Description: Cork Expansion Board

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/07/2018	Black	65%	35%	None Detected	

Analyst(s): _____

Anne Balayboa PLM (3)
Harman Sohi PLM (6)

Reviewed and approved by:

Matthew Davis or other approved signatory
or Other Approved Signatory

None Detected = <0.1%. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted. This report must not be used to claim product endorsement by NVLAP of any agency of the U.S. Government.

Samples analyzed by EMSL Canada Inc. Mississauga, ON NVLAP Lab Code 200877-0

Initial report from: 09/07/2018 19:04:24



EMSL Canada Inc.

2756 Slough Street Mississauga, ON L9T 5N4
Phone/Fax: 289-997-4602 / (289) 997-4607
<http://www.EMSL.com> / torontolab@emsl.com

EMSL Canada Order 551703704
Customer ID: 55MMM25
Customer PO: 16M-01627-01
Project ID:

Attn: Amanda Park
MMM Group
100 Commerce Valley Drive West
Thornhill, ON L3T 0A1

Phone: (905) 882-4211
Fax: (905) 882-1857
Collected: 4/ 4/2017
Received: 4/07/2017
Analyzed: 4/15/2017

Proj: 16M-01627-01

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: SN-3-056-EXP-1A **Lab Sample ID:** 551703704-0001

Sample Description: Expansion Board

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	4/15/2017	Brown	75%	25%	None Detected	

Client Sample ID: SN-3-056-EXP-1B **Lab Sample ID:** 551703704-0002

Sample Description: Expansion Board

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	4/15/2017	Brown	75%	25%	None Detected	

Client Sample ID: SN-3-056-EXP-1C **Lab Sample ID:** 551703704-0003

Sample Description: Expansion Board

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	4/15/2017	Black	70%	30%	None Detected	

Client Sample ID: SN-3-056-EXP-2A **Lab Sample ID:** 551703704-0004

Sample Description: Asphalt Cork Expansion Board

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	4/15/2017	Brown/Black	25%	75%	None Detected	

Client Sample ID: SN-3-056-EXP-2B **Lab Sample ID:** 551703704-0005

Sample Description: Asphalt Cork Expansion Board

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	4/15/2017	Brown/Black	25%	75%	None Detected	

Client Sample ID: SN-3-056-EXP-2C **Lab Sample ID:** 551703704-0006

Sample Description: Asphalt Cork Expansion Board

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	4/15/2017	Black	0%	100%	None Detected	

Client Sample ID: SN-3-056-CON-1A **Lab Sample ID:** 551703704-0007

Sample Description: Concrete

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	4/15/2017	Gray/Black	0%	100%	None Detected	



EMSL Canada Inc.

2756 Slough Street Mississauga, ON L9T 5N4
Phone/Fax: 289-997-4602 / (289) 997-4607
<http://www.EMSL.com> / torontolab@emsl.com

EMSL Canada Order 551703704
Customer ID: 55MMMG25
Customer PO: 16M-01627-01
Project ID:

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: SN-3-056-CON-1B **Lab Sample ID:** 551703704-0008
Sample Description: Concrete

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	4/15/2017	Gray/Black	0%	100%	None Detected	

Client Sample ID: SN-3-056-CON-1C **Lab Sample ID:** 551703704-0009
Sample Description: Concrete

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	4/15/2017	Gray	0%	100%	None Detected	

Analyst(s):
Benjamin Verghese PLM (6)
Daniel Fricker PLM (3)

Reviewed and approved by:

Matthew Davis
or Other Approved Signatory

None Detected = <0.1%. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted. This report must not be used to claim product endorsement by NVLAP of any agency of the U.S. Government.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NVLAP Lab Code 101048-0, AIHA-LAP, LLC-IHLAP Lab 100194, NYS ELAP 10872, NJ DEP 03036, PA ID# 68-00367

Initial report from: 04/15/2017 13:00:48



Asbestos Chain of Custody

EMSL Order Number (Lab Use Only):

551703704

EMSL CANADA, INC.
 2756 SLOUGH STREET
 MISSISSAUGA, ON L4T 1G3
 PHONE: (289) 997-4602
 FAX: (289) 997-4609

Company : MMM Group Limited		EMSL-Bill to: <input type="checkbox"/> Same <input checked="" type="checkbox"/> Different If Bill to is Different note instructions in Comments**	
Street: 100 Commerce Valley Dr W		Third Party Billing requires written authorization from third party	
City: Thornhill	State/Province: ON	Zip/Postal Code: L3T 0A1	Country: Canada
Report To (Name): Amanda Park/Kathryn Maton		Fax #:	
Telephone #: 613-617-9237 parka@mmm.ca/Kathryn.maton@wspgroup.com		Email Address: accountspayable@mmm.ca	
Project Name/Number: 16M-01627-01			
Please Provide Results: <input type="checkbox"/> Fax <input checked="" type="checkbox"/> Email		Purchase Order:	U.S. State Samples Taken: none

Turnaround Time (TAT) Options* - Please Check

3 Hour
 6 Hour
 24 Hour
 48 Hour
 72 Hour
 96 Hour
 1 Week
 2 Week

*For TEM Air 3 hours through 6 hours, please call ahead to schedule.*There is a premium charge for 3 Hour TEM AHERA or EPA Level II TAT. You will be asked to sign an authorization form for this service. Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide.

PCM - Air <input type="checkbox"/> NIOSH 7400 <input type="checkbox"/> w/ OSHA 8hr. TWA	TEM - Air <input type="checkbox"/> 4-4.5hr TAT (AHERA only) <input type="checkbox"/> AHERA 40 CFR, Part 763 <input type="checkbox"/> NIOSH 7402 <input type="checkbox"/> EPA Level II <input type="checkbox"/> ISO 10312	TEM- Dust <input type="checkbox"/> Microvac - ASTM D 5755 <input type="checkbox"/> Wipe - ASTM D6480 <input type="checkbox"/> Carpet Sonication (EPA 600/J-93/167)
PLM - Bulk (reporting limit) <input checked="" type="checkbox"/> PLM EPA 600/R-93/116 (<1%) <input type="checkbox"/> PLM EPA NOB (<1%) Point Count <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1000 (<0.1%) Point Count w/Gravimetric <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1000 (<0.1%) <input type="checkbox"/> NYS 198.1 (friable in NY) <input type="checkbox"/> NYS 198.6 NOB (non-friable-NY) <input type="checkbox"/> NIOSH 9002 (<1%)	TEM - Bulk <input type="checkbox"/> TEM EPA NOB <input type="checkbox"/> NYS NOB 198.4 (non-friable-NY) <input type="checkbox"/> Chatfield SOP <input type="checkbox"/> TEM Mass Analysis-EPA 600 sec. 2.5	Soil/Rock/Vermiculite <input type="checkbox"/> PLM CARB 435 - A (0.25% sensitivity) <input type="checkbox"/> PLM CARB 435 - B (0.1% sensitivity) <input type="checkbox"/> TEM CARB 435 - B (0.1% sensitivity) <input type="checkbox"/> TEM CARB 435 - C (0.01% sensitivity) <input type="checkbox"/> EPA Protocol (Semi-Quantitative) <input type="checkbox"/> EPA Protocol (Quantitative)
<input checked="" type="checkbox"/> Check For Positive Stop - Clearly Identify Homogenous Group		Filter Pore Size (Air Samples): <input type="checkbox"/> 0.8µm <input type="checkbox"/> 0.45µm

Samplers Name: **Kathryn Maton** Samplers Signature: _____

Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
SN-3-056-EXP-1A	Expansion board		04/04/2016 / 11 am
SN-3-056-EXP-1B	Expansion board		04/04/2016 / 11 am
SN-3-056-EXP-1C	Expansion board		04/04/2016 / 11 am
SN-3-056-EXP-2A	Asphalt cork expansion board		04/04/2016 / 11 am
SN-3-056-EXP-2B	Asphalt cork expansion board		04/04/2016 / 11 am
SN-3-056-EXP-2C	Asphalt cork expansion board		04/04/2016 / 11 am
SN-3-056-Con-1A	Concrete		04/04/2016 / 11 am
SN-3-056-Con-1B	Concrete		04/04/2016 / 11 am

Client Sample # (s): **SN-3-056-EXP-1A - SN-3-056-CON-1C** Total # of Samples: **9**

Relinquished (Client): **Kathryn Maton** *[Signature]* Date: **06/04/2017** *[Signature]* Time: **1:30 PM**

Received (Lab): _____ Date: _____ Time: _____

Comments/Special Instructions: **Bill to MMM Accounts Payable at: accountspayable@mmm.ca**

7788 4145 7329 Mc

**EMSL Canada Inc.**

2756 Slough Street, Mississauga, ON L9T 5N4

Phone/Fax: 289-997-4602 / (289) 997-4607

<http://www.EMSL.com>torontolab@emsl.com

EMSL Canada Or	551703818
CustomerID:	55MMMMG25
CustomerPO:	16M-01636-01
ProjectID:	

Attn: **Amanda Park**
MMM Group
100 Commerce Valley Drive West
Thornhill, ON L3T 0A1

Phone: (905) 882-4211
 Fax: (905) 882-1857
 Received: 04/07/17 11:05 AM
 Collected: 4/4/2017

Project: **16M-01636-01****Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)***

<i>Client Sample Description</i>	<i>Lab ID</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Lead Concentration</i>
SN-3-056-P-1	551703818-0001	4/4/2017	4/13/2017	<0.0090 % wt
Site: Grey Paint - Abutment Walls				

 Rowena Fanto, Lead Supervisor
 or other approved signatory

*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.010 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities. Samples received in good condition unless otherwise noted. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements unless specifically indicated otherwise. Definitions of modifications are available upon request.

Samples analyzed by EMSL Canada Inc. Mississauga, ON A2LA Accredited Environmental Testing Cert #2845.08

Initial report from 04/17/2017 07:28:17



Lead (Pb) Chain of Custody

EMSL Order ID (Lab Use Only):

551703818

EMSL CANADA, INC.
 2756 SLOUGH STREET
 MISSISSAUGA, ON L4T 1G3
 PHONE: (289) 997-4602
 FAX: (289) 997-4609

Company : MMM Group Limited		EMSL-Bill to: <input type="checkbox"/> Same <input checked="" type="checkbox"/> Different If Bill to is Different note instructions in Comments**	
Street: 100 Commerce Valley Dr W		Third Party Billing requires written authorization from third party	
City: Thornhill	State/Province: ON	Zip/Postal Code: L3T 0A1	Country: Canada
Report To (Name): Kathryn Maton/Amanda Park		Telephone #: 905 882-4211	
Email Address: kathryn.maton@wspgroup.com / parka@mmm.ca		Fax #:	Purchase Order:
Project Name/Number: 16M-01636-01		Please Provide Results: <input type="checkbox"/> Fax <input checked="" type="checkbox"/> Email	
U.S. State Samples Taken: none		CT Samples: <input type="checkbox"/> Commercial/Taxable <input type="checkbox"/> Residential/Tax Exempt	

Turnaround Time (TAT) Options* - Please Check

3 Hour
 6 Hour
 24 Hour
 48 Hour
 72 Hour
 96 Hour
 1 Week
 2 Week

*Analysis completed in accordance with EMSL's Terms and Conditions located in the Price Guide

Matrix	Method	Instrument	Reporting Limit	Check
Chips <input checked="" type="checkbox"/> % by wt. <input checked="" type="checkbox"/> mg/cm ² <input type="checkbox"/> ppm	SW846-7000B	Flame Atomic Absorption	0.01%	<input checked="" type="checkbox"/>
Air	NIOSH 7082	Flame Atomic Absorption	4 µg/filter	<input type="checkbox"/>
	NIOSH 7105	Graphite Furnace AA	0.03 µg/filter	<input type="checkbox"/>
	NIOSH 7300 modified	ICP-AES/ICP-MS	0.5 µg/filter	<input type="checkbox"/>
Wipe* ASTM <input type="checkbox"/> non ASTM <input type="checkbox"/> *if no box is checked, non-ASTM Wipe is assumed	SW846-7000B	Flame Atomic Absorption	10 µg/wipe	<input type="checkbox"/>
	SW846-6010B or C	ICP-AES	1.0 µg/wipe	<input type="checkbox"/>
	SW846-7000B/7010	Graphite Furnace AA	0.075 µg/wipe	<input type="checkbox"/>
TCLP	SW846-1311/7000B/SM 3111B	Flame Atomic Absorption	0.4 mg/L (ppm)	<input type="checkbox"/>
	SW846-1131/SW846-6010B or C	ICP-AES	0.1 mg/L (ppm)	<input type="checkbox"/>
Soil	SW846-7000B	Flame Atomic Absorption	40 mg/kg (ppm)	<input type="checkbox"/>
	SW846-7010	Graphite Furnace AA	0.3 mg/kg (ppm)	<input type="checkbox"/>
	SW846-6010B or C	ICP-AES	2 mg/kg (ppm)	<input type="checkbox"/>
Wastewater Unpreserved <input type="checkbox"/> Preserved with HNO ₃ pH < 2 <input type="checkbox"/>	SM3111B/SW846-7000B	Flame Atomic Absorption	0.4 mg/L (ppm)	<input type="checkbox"/>
	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)	<input type="checkbox"/>
	EPA 200.7	ICP-AES	0.020 mg/L (ppm)	<input type="checkbox"/>
Drinking Water Unpreserved <input type="checkbox"/> Preserved with HNO ₃ pH < 2 <input type="checkbox"/>	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)	<input type="checkbox"/>
	EPA 200.8	ICP-MS	0.001 mg/L (ppm)	<input type="checkbox"/>
TSP/SPM Filter	40 CFR Part 50	ICP-AES	12 µg/filter	<input type="checkbox"/>
	40 CFR Part 50	Graphite Furnace AA	3.6 µg/filter	<input type="checkbox"/>
Other:				<input type="checkbox"/>

Name of Sampler:		Signature of Sampler:	
Sample #	Location	Volume/Area	Date/Time Sampled
SN-3-056-P-1	Grey Paint - Abutment Walls		04/04/2017 9 am

Client Sample #'s	SN-3-056-P-1 - SN-3-056-P-1	Total # of Samples:	1
Relinquished (Client):	Kathryn Maton <i>Maton</i>	Date:	06/04/2017
Received (Lab):		Date:	
		Time:	1:30pm

pg 1 of 2

04-07-17A11:05

7700 4145 7329 me

Comments: Bill to MMM Accounts Payable at: accountspayable@mmm.ca

Page 2 of 2 pages

551703818



EMSL CANADA, INC.
LABORATORY • PRODUCTS • TRAINING

Asbestos Chain of Custody

EMSL Order Number (Lab Use Only):

551810370

EMSL CANADA, INC.
2756 SLOUGH STREET
MISSISSAUGA, ON L4T 1G3
PHONE: (289) 997-4602
FAX: (289) 997-4609

Company : WSP Canada Group Limited		EMSL-Bill to: <input type="checkbox"/> Same <input checked="" type="checkbox"/> Different If Bill to is Different note instructions in Comments**	
Street: 100 Commerce Valley Dr W		Third Party Billing requires written authorization from third party	
City: Thornhill	State/Province: ON	Zip/Postal Code: L3T 0A1	Country: Canada
Report To (Name): Amanda Park/Kathryn Maton		Fax #:	
Telephone #: 613-617-9237 Amanda.park@wsp.com / Kathryn.maton@wsp.com		Email Address: payables.ontario@wsp.com	
Project Name/Number: 16M-01636-01, 460, 466			
Please Provide Results: <input type="checkbox"/> Fax <input checked="" type="checkbox"/> Email		Purchase Order:	U.S. State Samples Taken: none

Turnaround Time (TAT) Options* - Please Check

3 Hour
 6 Hour
 24 Hour
 48 Hour
 72 Hour
 96 Hour
 1 Week
 2 Week

*For TEM Air 3 hours through 6 hours, please call ahead to schedule. *There is a premium charge for 3 Hour TEM AHERA or EPA Level II TAT. You will be asked to sign an authorization form for this service. Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide.

PCM - Air <input type="checkbox"/> NIOSH 7400 <input type="checkbox"/> w/ OSHA 8hr. TWA PLM - Bulk (reporting limit) <input checked="" type="checkbox"/> PLM EPA 600/R-93/116 (<1%) <input type="checkbox"/> PLM EPA NOB (<1%) Point Count <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1000 (<0.1%) Point Count w/Gravimetric <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1000 (<0.1%) <input type="checkbox"/> NYS 198.1 (friable in NY) <input type="checkbox"/> NYS 198.6 NOB (non-friable-NY) <input type="checkbox"/> NIOSH 9002 (<1%)	TEM - Air <input type="checkbox"/> 4-4.5hr TAT (AHERA only) <input type="checkbox"/> AHERA 40 CFR, Part 763 <input type="checkbox"/> NIOSH 7402 <input type="checkbox"/> EPA Level II <input type="checkbox"/> ISO 10312 TEM - Bulk <input type="checkbox"/> TEM EPA NOB <input type="checkbox"/> NYS NOB 198.4 (non-friable-NY) <input type="checkbox"/> Chatfield SOP <input type="checkbox"/> TEM Mass Analysis-EPA 600 sec. 2.5 TEM - Water: EPA 100.2 Fibers >10µm <input type="checkbox"/> Waste <input type="checkbox"/> Drinking All Fiber Sizes <input type="checkbox"/> Waste <input type="checkbox"/> Drinking	TEM- Dust <input type="checkbox"/> Microvac - ASTM D 5755 <input type="checkbox"/> Wipe - ASTM D6480 <input type="checkbox"/> Carpet Sonication (EPA 600/J-93/167) Soil/Rock/Vermiculite <input type="checkbox"/> PLM CARB 435 - A (0.25% sensitivity) <input type="checkbox"/> PLM CARB 435 - B (0.1% sensitivity) <input type="checkbox"/> TEM CARB 435 - B (0.1% sensitivity) <input type="checkbox"/> TEM CARB 435 - C (0.01% sensitivity) <input type="checkbox"/> EPA Protocol (Semi-Quantitative) <input type="checkbox"/> EPA Protocol (Quantitative) Other: <input type="checkbox"/>
---	--	--

Check For Positive Stop - Clearly Identify Homogenous Group Filter Pore Size (Air Samples): 0.8µm 0.45µm

Samplers Name: Kathryn Maton Samplers Signature: _____

Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
SN-3-055-EXP-1A	Asphalt Expansion board		23/08/2018 / 10 am
SN-3-055-EXP-1B	Asphalt Expansion board		23/08/2018 / 10 am
SN-3-055-EXP-1C	Asphalt Expansion board		23/08/2018 / 10 am
SN-3-055-EXP-2A	Cork expansion board		23/08/2018 / 10 am
SN-3-055-EXP-2B	Cork expansion board		23/08/2018 / 10 am
SN-3-055-EXP-2C	Cork expansion board		23/08/2018 / 10 am
SN-3-055-CON-1A	Concrete		23/08/2018 / 10 am
SN-3-055-CON-1B	Concrete		23/08/2018 / 10 am

Client Sample # (s): SN-3-055-EXP-1A - SN-3-055-EXP 3C Total # of Samples: 12

Relinquished (Client): Kathryn Maton Date: _____ Time: _____

Received (Lab): _____ Date: _____ Time: _____

Comments/Special Instructions: Bill to Accounts Payable at: payables.ontario@wsp.com

9/5/2018 5:11 PM
C ~~W~~ / VP



EMSL Canada Inc.

2756 Slough Street Mississauga, ON L4T 1G3
Phone/Fax: (289) 997-4602 / (289) 997-4607
<http://www.EMSL.com> / torontolab@emsl.com

EMSL Canada Order 551810373
Customer ID: 55MMM25
Customer PO: 16M-01636-01
Project ID:

Attn: Amanda Park
WSP Canada Group Limited
100 Commerce Valley Drive West
Thornhill, ON L3T 0A1

Phone: (905) 882-4211
Fax: (905) 882-1857
Collected: 8/23/2018
Received: 9/05/2018
Analyzed: 11/14/2018

Proj: 16M-01636-01, 460, 466

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: SN-3-061-CLK-1A **Lab Sample ID:** 551810373-0004

Sample Description: Asphalt Cork Expansion Board

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/07/2018	Black	8%	92%	None Detected	

Client Sample ID: SN-3-061-CLK-1B **Lab Sample ID:** 551810373-0005

Sample Description: Asphalt Cork Expansion Board

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/07/2018	Black	6%	94%	None Detected	

Client Sample ID: SN-3-061-CLK-1C **Lab Sample ID:** 551810373-0006

Sample Description: Asphalt Cork Expansion Board

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/07/2018	Black	6%	94%	None Detected	

Client Sample ID: SN-3-061-CON-1A **Lab Sample ID:** 551810373-0007

Sample Description: Concrete

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/07/2018	Gray	0%	98%	2% Chrysotile	

Client Sample ID: SN-3-061-CON-1B **Lab Sample ID:** 551810373-0008

Sample Description: Concrete

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	11/14/2018	Gray	0%	97%	3% Chrysotile	

Client Sample ID: SN-3-061-CON-1C **Lab Sample ID:** 551810373-0009

Sample Description: Concrete

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	11/14/2018	Gray	0%	98%	2% Chrysotile	



EMSL Canada Inc.

2756 Slough Street Mississauga, ON L4T 1G3
Phone/Fax: (289) 997-4602 / (289) 997-4607
<http://www.EMSL.com> / torontolab@emsl.com

EMSL Canada Order 551810373
Customer ID: 55MMMG25
Customer PO: 16M-01636-01
Project ID:

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Analyst(s): _____

Natalie D'Amico PLM (6)

Reviewed and approved by: _____

Matthew Davis or other approved signatory
or Other Approved Signatory

None Detected = <0.1%. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted. This report must not be used to claim product endorsement by NVLAP of any agency of the U.S. Government.

Samples analyzed by EMSL Canada Inc. Mississauga, ON NVLAP Lab Code 200877-0

Report amended: 11/14/2018 13:46:03 Replaces initial report from: 09/07/2018 16:24:01 Reason Code: Client-Additional Analysis



EMSL CANADA, INC.
LABORATORY • PRODUCTS • TRAINING

Asbestos Chain of Custody

EMSL Order Number (Lab Use Only):

551810373

EMSL CANADA, INC.
2756 SLOUGH STREET
MISSISSAUGA, ON L4T 1G3
PHONE: (289) 997-4602
FAX: (289) 997-4609

Company : WSP Canada Group Limited		EMSL-Bill to: <input type="checkbox"/> Same <input checked="" type="checkbox"/> Different If Bill to is Different note instructions in Comments**	
Street: 100 Commerce Valley Dr W		Third Party Billing requires written authorization from third party	
City: Thornhill	State/Province: ON	Zip/Postal Code: L3T 0A1	Country: Canada
Report To (Name): Amanda Park/Kathryn Maton		Fax #:	
Telephone #: 613-617-9237 Amanda.park@wsp.com / Kathryn.maton@wsp.com		Email Address: payables.ontario@wsp.com	
Project Name/Number: 16M-01636-01, 460, 466			
Please Provide Results: <input type="checkbox"/> Fax <input checked="" type="checkbox"/> Email		Purchase Order: _____ U.S. State Samples Taken: none	

Turnaround Time (TAT) Options* – Please Check

3 Hour
 6 Hour
 24 Hour
 48 Hour
 72 Hour
 96 Hour
 1 Week
 2 Week

*For TEM Air 3 hours through 6 hours, please call ahead to schedule. *There is a premium charge for 3 Hour TEM AHERA or EPA Level II TAT. You will be asked to sign an authorization form for this service. Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide.

PCM - Air <input type="checkbox"/> NIOSH 7400 <input type="checkbox"/> w/ OSHA 8hr. TWA	TEM - Air <input type="checkbox"/> 4-4.5hr TAT (AHERA only) <input type="checkbox"/> AHERA 40 CFR, Part 763 <input type="checkbox"/> NIOSH 7402 <input type="checkbox"/> EPA Level II <input type="checkbox"/> ISO 10312	TEM - Dust <input type="checkbox"/> Microvac - ASTM D 5755 <input type="checkbox"/> Wipe - ASTM D6480 <input type="checkbox"/> Carpet Sonication (EPA 600/J-93/167)
PLM - Bulk (reporting limit) <input checked="" type="checkbox"/> PLM EPA 600/R-93/116 (<1%) <input type="checkbox"/> PLM EPA NOB (<1%) Point Count <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1000 (<0.1%) Point Count w/Gravimetric <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1000 (<0.1%) <input type="checkbox"/> NYS 198.1 (friable in NY) <input type="checkbox"/> NYS 198.6 NOB (non-friable-NY) <input type="checkbox"/> NIOSH 9002 (<1%)	TEM - Bulk <input type="checkbox"/> TEM EPA NOB <input type="checkbox"/> NYS NOB 198.4 (non-friable-NY) <input type="checkbox"/> Chatfield SOP <input type="checkbox"/> TEM Mass Analysis-EPA 600 sec. 2.5	Soil/Rock/Vermiculite <input type="checkbox"/> PLM CARB 435 - A (0.25% sensitivity) <input type="checkbox"/> PLM CARB 435 - B (0.1% sensitivity) <input type="checkbox"/> TEM CARB 435 - B (0.1% sensitivity) <input type="checkbox"/> TEM CARB 435 - C (0.01% sensitivity) <input type="checkbox"/> EPA Protocol (Semi-Quantitative) <input type="checkbox"/> EPA Protocol (Quantitative)
<input checked="" type="checkbox"/> Check For Positive Stop – Clearly Identify Homogenous Group		TEM - Water: EPA 100.2 Fibers >10µm <input type="checkbox"/> Waste <input type="checkbox"/> Drinking All Fiber Sizes <input type="checkbox"/> Waste <input type="checkbox"/> Drinking
		Filter Pore Size (Air Samples): <input type="checkbox"/> 0.8µm <input type="checkbox"/> 0.45µm

Samplers Name: Kathryn Maton Samplers Signature: _____

Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
SN-3-061-EXP-1A	Asphalt Expansion board		23/08/2018 / 11 am
SN-3-061-EXP-1B	Asphalt Expansion board		23/08/2018 / 11 am
SN-3-061-EXP-1C	Asphalt Expansion board		23/08/2018 / 11 am
SN-3-061-CLK-1A	Asphalt cork expansion board		23/08/2018 / 11 am
SN-3-061-CLK-1B	Asphalt cork expansion board		23/08/2018 / 11 am
SN-3-061-CLK-1C	Asphalt cork expansion board		23/08/2018 / 11 am
SN-3-061-CON-1A	Concrete		23/08/2018 / 11 am
SN-3-061-CON-1B	Concrete		23/08/2018 / 11 am

Client Sample # (s): SN-3-061-EXP-1A - SN-3-061-CON-3C Total # of Samples: 9

Relinquished (Client): Kathryn Maton *[Signature]* Date: 04/09/2018 Time: 10:30 AM

Received (Lab): _____ Date: _____ Time: _____

Comments/Special Instructions: Bill to Accounts Payable at: payables.ontario@wsp.com

9/5/2018 5:11 PM
C/VP



April 16, 2020

Mr. Ken Rogers, P.Eng. MTO Senior Project Engineer,
MINISTRY OF TRANSPORTATION ONTARIO – EASTERN REGION
1355 John Counter Blvd., Postal Bag 4000
Kingston, ON K7L 5A3

Subject: Addendum to Highway 417 (Ottawa Queensway) Bridge Replacement/Rehabilitation and Operational Improvements - Designated Substances Survey – Percy Street Bridge at Highway 417, Ottawa, Ontario

WSP Ref #: 16M-01636-01

Dear Mr. Rogers:

WSP Canada Group Limited (WSP) was retained by the Ministry of Transportation Ontario (MTO) to conduct additional asbestos sampling of the Percy Street Bridge at Highway 417 (the subject area), which is scheduled for replacement.

The purpose of this sampling is to determine the presence/absence of asbestos within the concrete and the surface coating of the structure and to satisfy an owner's requirements under Section 30 of the Ontario Occupational Health & Safety Act (OHSa) which requires owners to determine if there are any Designated Substances present, prior to commencement of a project, which may involve construction, renovation or demolition related activities.

The following report is an addendum to the original report "Highway 417 (Ottawa Queensway) Bridge Replacement/Rehabilitation and Operational Improvements - Designated Substances Survey" conducted by WSP dated October 1st, 2018 and should be used in conjunction with this original report.

1 BACKGROUND

WSP Canada Inc. (WSP) was retained by the Ministry of Transportation Ontario (MTO) to conduct additional asbestos sampling of the Percy Street Bridge at Highway 417 (the subject area).

The sampling was conducted by Raymond Ockrant of WSP on February 25th, 2019 and was restricted to the abutments from ground level to a maximum height of approximately 10'. Additional sampling was done on September 18th, 2019 and was focused on the upper portion of the abutments and soffit that were inaccessible during the previous sampling. The inspections concentrated specifically on the concrete and surface coating of the abutments and soffit of the bridge.

The original report indicated that the concrete structure of the bridge contained asbestos, this additional inspection was required to identify and delineate where the asbestos is present within the bridge structure.

2 SCOPE OF WORK

The inspection was intrusive, which consists of investigating components which are easily accessible, or those which may be accessed by moveable (non-fixed) barriers such as access doors, hatches, panels, etc.

Bulk sampling was performed in a manner that minimized repetition of testing of like materials or materials which have previously been surveyed.

Suite 300
2611 Queensview Drive
Ottawa, ON, Canada K2B 8K2

T: +1 613 829-2800
F: +1 613 829-8299
wsp.com



WSP's scope of work for this project consisted of:

- A thorough visual inspection of accessible areas that will be affected by the upcoming project, for asbestos containing materials
- Collection of bulk samples of materials suspected of containing asbestos according to the requirements stipulated in *O.Reg. 278/05*

2.1 SITE DESCRIPTION:

The Percy Street bridge is a reinforced, cast in place concrete rigid frame structure that was built in 1962 and last rehabilitated in 1985. The span length of the bridge is 18.29 m and the structure has an east to west orientation. The structure has a concrete barrier wall on the south side and a concrete median wall on the north side.

2.2 RECORDS REVIEW

The following reports were reviewed for this assignment:

- "Highway 417 (Ottawa Queensway) Bridge Replacement/Rehabilitation and Operational Improvements - Designated Substances Survey" conducted by WSP dated October 1st, 2018.

3 REGULATORY CONTEXT

WSP's inspection identified those substances defined as asbestos substances under the Ontario Occupational Health and Safety Act as part of the survey scope.

In Ontario, designated substances, including asbestos, are defined as a group of eleven physical or chemical agents in the Occupational Health and Safety Act (RSO 1990, c. O.1). The eleven substances are governed by the regulation O. Reg. 490/09 that defines the minimum health and safety requirements. Asbestos is included among these eleven substances. Asbestos on construction projects is further defined by the regulation O.Reg. 278/05.

The purpose of the Occupational Health and Safety Act (OHSA) is to eliminate hazards to the health, safety and physical well-being of workers at the source. An inventory shall be conducted to determine the presence of designated substances prior to the commencement of any project, including any activities related to construction or demolition. This information allows workers to take the necessary precautions to prevent accidental exposure to these harmful substances.

Recommended actions for management, repair or removal of any asbestos-containing materials are based on the requirements and procedures specified by the Safety Code for the Construction Industry (provincial). Alternate handling, repair and removal procedures must comply with the requirements of the Canada Occupational Health and Safety Regulation (SOR/86-304) and Occupational Health and Safety Act.

4 OBSERVATIONS AND RESULTS

Information in this section of the report should be provided to all prospective contractors and/or workers who are likely to handle, come into contact with, or disturb asbestos or other designated substances. Detailed specifications that outline specific abatement procedures are recommended when tendering the renovation/demolition work.

It is possible that unidentified asbestos containing materials are present in concealed areas, such as access doors, hatches, panels, etc. Friable and Non-Friable building materials discovered in these concealed areas should be treated as asbestos until proven otherwise and other substances, self-evident as designated substances, should be handled in a likewise fashion.

ASBESTOS MATERIALS

WSP’s surveyor performed a systematic survey of the study area for the purposes of identifying asbestos containing materials (ACM) and documenting observations made about their locations, estimated quantities and respective conditions. These observations form the basis for developing the recommendations provided within this report.

The survey of the study area for ACM consisted of a walk through and physical examination of suspected materials on the accessible areas of the structure. A physical examination was completed to assess the condition of materials and to examine for underlying layers.

It should be noted that additional asbestos-containing materials (ACM) may be concealed by existing structure finishes, components or fixtures, and were not accessible during the time of this survey. If demolition or construction activities uncover materials suspected to contain asbestos, lead, other designated substances or hazardous materials, all work must stop prior to the disturbance of these materials, and the suspect materials should either be sampled by a qualified person, or presumed to contain the suspected substance. Whether the suspect material(s) are confirmed, or presumed, to contain these substances, they must be handled and disposed of in accordance with the appropriate and applicable guidelines and regulations including, but not limited to: O. Reg. 278/05, O. Reg. 490/09 and R.R.O. 1990, Regulation 347 (as amended).

4.1 ASBESTOS

4.1.1 ASBESTOS CONTAINING MATERIAL

In accordance with the requirements of O. Reg. 278/05, homogeneous materials (i.e. materials uniform in colour and texture) must be considered as asbestos-containing, if any sample which is collected from that homogeneous material, is identified to have an asbestos concentration of 0.5% or greater.

Recommended actions for management, repair or removal of these materials, are based on the requirements and procedures specified by the O. Reg. 278/05 and have been suggested based on the type of disturbance which is anticipated or likely. Alternate handling, repair and removal procedures must comply with the requirements of O. Reg. 278/05 (as amended), and O. Reg. 490/09.

4.1.2 SUMMARY OF BULK SAMPLES:

BULK SAMPLES INDENTIFIED AS ASBESTOS CONTAINING:

The table below summarizes the results of bulk material samples collected from suspect materials during this survey, which had either detectable concentration of asbestos, or had asbestos concentrations greater than the regulated threshold limit of 0.5% (by weight), and therefore, are to be considered as “Asbestos Containing” in accordance with Ontario Regulations.

Table 1 Asbestos-Containing Materials

MATERIAL DESCRIPTION & LOCATION	ASSESSMENT ¹	ACTION ¹	PHOTO ²
<p><u>Grey Sealant Coating</u> observed on abutment walls throughout the subject area.</p>	<p>Sample ID: PRCY-CON-1D, 1F, 1G, 1h, 1J PRCY-CON-2A and 2G Concentration: 1-3% Chrysotile Material: Non-Friable Accessibility: A (Areas of the structure within reach of all structure users). Condition: Fair</p>	<p>Action 7 Routine surveillance of ACM in good condition. Prior to demolition activities which may disturb this material, remove the material following:</p>	<p>1-7</p>

MATERIAL DESCRIPTION & LOCATION	ASSESSMENT ¹	ACTION ¹	PHOTO ²
		<p>Type 2 abatement procedures – if the material is wetted and the work is done using non-powered hand tools.</p> <p>Type 3 abatement procedures – if the work is done using powered tools.</p>	
<p>1 For sample ID and concentration levels refer to Appendix A: Analytical Results – Asbestos. Actions and procedures recommended are based on the requirements of O. Reg. 278/05, refer to this regulation for details.</p> <p>2 For relevant photographs taken during the survey refer to Appendix B: Project Photographs.</p>			

SUSPECTED ASBESTOS-CONTAINING MATERIALS

No additional materials are suspected of being asbestos containing, within the subject area, however, it should be noted that materials containing asbestos (ACM) can be concealed by existing structure finishes. If demolition or renovation work reveals materials likely to contain asbestos, all work must be discontinued and the materials must either be considered as containing asbestos or samples of the material must be collected for analysis to determine whether asbestos is present. If laboratory tests determine that the material contains asbestos, it must be handled in accordance with all applicable asbestos regulations and procedures.

4.1.3 SUMMARY OF BULK SAMPLES IDENTIFIED AS “NON-ASBESTOS”

The table below summarizes the results of bulk material samples collected from suspect materials during this survey, which had either no detectable concentration of asbestos, or had asbestos concentrations less than the regulated threshold limit of 0.5% (by weight), and therefore can be considered as “non-asbestos” in accordance with O. Reg. 278/05.

Table 2 Summary of Bulk Samples Identified as “Non-Asbestos”

MATERIAL DESCRIPTION / LOCATION	SAMPLE ID ¹
Concrete surface on the underside of the bridge decking	PRCY-CONC-2B, 2C, 2D, 2E, 2F, 2H
Fibrous expansion joint material on the underside of the bridge decking	PRCY-EXP-3A, 3B, 3C
<p>1 Laboratory confirmation of non-asbestos-containing material is provided in the laboratory results found within Laboratory Certificates of Analysis Appendix A: Analytical Results – Asbestos.</p>	

5 CONCLUSIONS AND RECOMMENDATIONS

Asbestos containing grey sealant coating was observed on the north facing, south facing and underside abutment walls as well as the north and south facing soffits of the bridge. The asbestos containing coating was observed to be in fair condition and is considered to be non-friable. In its current condition, there are no health and safety concerns to workers if it remains undisturbed.



Recommendations

In the event that the asbestos containing grey sealant coating will be disturbed as part of the bridge replacement, the coating must be abated in accordance with the appropriate regulations by a certified contractor. Based on our observations, it is our opinion that abatement can be conducted under Type 2 procedures if the material is wetted and the work is done using non-powered hand tools or type 3 procedures if the work is done using powered tools, as defined in O.Reg. 278/05.

MTO must provide a copy of this report and others to the contractors bidding on this project and ensure that the renovations are completed per the following.

- O. Reg. 278/05 (as amended), and O. Reg. 490/09 – Asbestos repair or removal work
- Ontario Regulation 347- Waste Management General

It is WSP's understanding that parts of the original bridge structure (i.e. the bottom section of the abutment walls), will remain in place. The abutment walls were found to be coated with an asbestos containing coating and as such requires the preparation and establishment of an Asbestos Management Plan for the structure in accordance with O. Reg. 278/05. Following the removal of the upper bridge structure (which is understood to include the upper portion of the abutment walls), a close out report stating that the materials are no longer present would be required once the material is removed.

6 LIMITATIONS

The information contained in this report represents the professional opinion of WSP Canada Inc. (the Consultant) and their best judgment under the natural limitations imposed by the work.

This report is intended solely for The Ministry of Transportation Ontario as an indication of the physical condition of the building components addressed in the report. The material in this report reflects the Consultant's best judgment in light of the information available to it at the time of preparation.

Any use a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. The Consultant accepts no responsibility for damages, if any suffered by any third party as a result of decisions made or actions based on this report.

This report is limited in scope to only those areas or building components that are specifically referenced in this study. There may be existing deficiencies in this building that we did not record in this report. Such deficiencies were not apparent to us due to the natural limitations imposed. We can, therefore, accept no liability for any costs incurred by the Client for subsequent discovery, manifestation or rectification of such deficiencies.

Do not use any part of this report as a separate entity. The report has been written to be read in its entirety and for the exclusive use of the Client named. All files, notes, source data, test results and master files are retained in the offices of WSP Canada Inc. and remain the property of the Consultant.

7 CLOSURE

If you have any questions or concerns, please do not hesitate to contact the undersigned project manager.



Prepared by:
Raymond Ockrant
Hazardous Materials Technician - Environment



Reviewed by:
Adrian Menyhart, P.Eng., ing.
Environmental Engineer

Encl. Appendix A – Analytical Results – Asbestos
 Appendix B – Project Photographs
 Appendix C – Figures

APPENDIX

A LABORATORY CERTIFICATES OF ANALYSIS



EMSL Canada Inc.

22 Antares Drive Suite 102 Ottawa, ON K2E 7Z6
 Phone/Fax: (343) 882-6076 / (343) 882-6077
<http://www.EMSL.com> / ottawalab@EMSL.com

EMSL Canada Order 671900453
 Customer ID: 55WSPQ42
 Customer PO:
 Project ID:

Attn: Raymond Ockrant Phone: (613) 829-2800
 WSP Canada Inc. Fax: (613) 829-8299
 2611 Queensview Drive, Suite 300 Collected: 2/25/2019
 Ottawa, ON K2B 8K2 Received: 2/25/2019
 Analyzed: 2/25/2019

Proj: Percy St. - #16M-01636-01, Phase: 865

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: PRCY-CON-01A **Lab Sample ID:** 671900453-0001

Sample Description: Concrete bridge wall samples

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/25/2019	Gray	0.0%	100.0%	None Detected	

Client Sample ID: PRCY-CON-01B **Lab Sample ID:** 671900453-0002

Sample Description: Concrete bridge wall samples

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/25/2019	Gray	0.0%	100.0%	<1% Chrysotile	
400 PLM Pt Ct	2/25/2019	Gray	0.0%	100.0%	<0.25% Chrysotile	

Client Sample ID: PRCY-CON-01C **Lab Sample ID:** 671900453-0003

Sample Description: Concrete bridge wall samples

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/25/2019	Gray	0.0%	100.0%	None Detected	

Client Sample ID: PRCY-CON-01D **Lab Sample ID:** 671900453-0004

Sample Description: Concrete bridge wall samples

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/25/2019	Gray	0.0%	97.0%	3% Chrysotile	

Client Sample ID: PRCY-CON-01E **Lab Sample ID:** 671900453-0005

Sample Description: Concrete bridge wall samples

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/25/2019	Gray	0.0%	100.0%	<1% Chrysotile	
400 PLM Pt Ct	2/25/2019	Gray	0.0%	100.0%	<0.25% Chrysotile	

Client Sample ID: PRCY-CON-01F **Lab Sample ID:** 671900453-0006

Sample Description: Concrete bridge wall samples

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/25/2019	Gray	0.0%	100.0%	<1% Chrysotile	
400 PLM Pt Ct	2/25/2019	Gray	0.0%	99.0%	1.00% Chrysotile	



EMSL Canada Inc.

22 Antares Drive Suite 102 Ottawa, ON K2E 7Z6
Phone/Fax: (343) 882-6076 / (343) 882-6077
<http://www.EMSL.com> / ottawalab@EMSL.com

EMSL Canada Order 671900453
Customer ID: 55WSPQ42
Customer PO:
Project ID:

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: PRCY-CON-01G **Lab Sample ID:** 671900453-0007
Sample Description: Concrete bridge wall samples

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/25/2019	Gray	0.0%	99.0%	1% Chrysotile	

Client Sample ID: PRCY-CON-01H **Lab Sample ID:** 671900453-0008
Sample Description: Concrete bridge wall samples

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/25/2019	Gray	0.0%	99.0%	1% Chrysotile	

Client Sample ID: PRCY-CON-01I **Lab Sample ID:** 671900453-0009
Sample Description: Concrete bridge wall samples

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/25/2019	Gray	0.0%	100.0%	None Detected	

Client Sample ID: PRCY-CON-01J **Lab Sample ID:** 671900453-0010
Sample Description: Concrete bridge wall samples

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/25/2019	Gray	0.0%	97.0%	3% Chrysotile	

Analyst(s):
Hilary Belleville PLM (8)
400 PLM Pt Ct (3)
Simon Parent PLM (2)

Reviewed and approved by: 
Simon Parent, Laboratory Manager
or Other Approved Signatory

None Detected = <0.1%. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted. This report must not be used to claim product endorsement by NVLAP of any agency of the U.S. Government.

Samples analyzed by EMSL Canada Inc. Ottawa, ON

Report amended: 02/25/2019 16:58:49 Replaces initial report from: 02/25/2019 16:51:31 Reason Code: DataEntry-Other (see report comment)

Certificate of Analysis

WSP Canada Inc. (Ottawa)

2611 Queensview Dr, Suite 300
Ottawa, ON K2B 8K2
Attn: Raymond Ockrant

Client PO:

Project: 16M-01636-01: 865 - Percy St. Bridge
Custody:

Report Date: 25-Sep-2019

Order Date: 19-Sep-2019

Order #: 1938534

This Certificate of Analysis contains analytical data applicable to the following samples as submitted :

Parcel ID	Client ID
1938534-01	PRCY-CONC-2A
1938534-02	PRCY-CONC-2B
1938534-03	PRCY-CONC-2C
1938534-04	PRCY-CONC-2D
1938534-05	PRCY-CONC-2E
1938534-06	PRCY-CONC-2F
1938534-07	PRCY-CONC-2G
1938534-08	PRCY-CONC-2H
1938534-09	PRCY-EXP-3A
1938534-10	PRCY-EXP-3B
1938534-11	PRCY-EXP-3C

Approved By:



Heather S.H. McGregor, BSc

Laboratory Director - Microbiology

Certificate of Analysis
 Client: WSP Canada Inc. (Ottawa)
 Client PO:

Report Date: 25-Sep-2019
 Order Date: 19-Sep-2019

Project Description: 16M-01636-01: 865 - Percy St. Bridge

Asbestos, PLM Visual Estimation **MDL - 0.5%**

Parcel ID	Sample Date	Colour	Description	Asbestos Detected	Material Identification	% Content
1938534-01	18-Sep-19	Grey	Concrete	Yes	Client ID: PRCY-CONC-2A	[Z-01]
					Chrysotile	1
					Non-Fibers	99
1938534-02	18-Sep-19	Grey	Concrete	No	Client ID: PRCY-CONC-2B	
					Non-Fibers	100
1938534-03	18-Sep-19	Grey	Concrete	No	Client ID: PRCY-CONC-2C	
					Non-Fibers	100
1938534-04	18-Sep-19	Grey	Concrete	No	Client ID: PRCY-CONC-2D	
					Non-Fibers	100
1938534-05	18-Sep-19	Grey	Concrete	No	Client ID: PRCY-CONC-2E	
					Non-Fibers	100
1938534-06	18-Sep-19	Grey	Concrete	No	Client ID: PRCY-CONC-2F	
					Non-Fibers	100
1938534-07	18-Sep-19	Grey	Concrete	Yes	Client ID: PRCY-CONC-2G	
					Chrysotile	1
					Non-Fibers	99
1938534-08	18-Sep-19	Grey	Concrete	No	Client ID: PRCY-CONC-2H	
					Cellulose	3
					Non-Fibers	97
1938534-09	18-Sep-19	Beige/Black	Joint Compound	No	Client ID: PRCY-EXP-3A	[AS-PRE]
					Cellulose	65
					Non-Fibers	35
1938534-10	18-Sep-19	Beige/Black	Joint Compound	No	Client ID: PRCY-EXP-3B	[AS-PRE]
					Cellulose	65
					Non-Fibers	35

Certificate of Analysis
 Client: **WSP Canada Inc. (Ottawa)**
 Client PO:

Report Date: 25-Sep-2019
 Order Date: 19-Sep-2019

Project Description: **16M-01636-01: 865 - Percy St. Bridge**

Asbestos, PLM Visual Estimation **MDL - 0.5%**

Parcel ID	Sample Date	Colour	Description	Asbestos Detected	Material Identification	% Content
1938534-11	18-Sep-19	Beige/Black	Joint Compound	No	Client ID: PRCY-EXP-3C	
						[AS-PRE]
					Cellulose	65
					Non-Fibers	35

**** Analytes in bold indicate asbestos mineral content.**

Analysis Summary Table

Analysis	Method Reference/Description	Lab Location	NVLAP Lab Code *	Analysis Date
Asbestos, PLM Visual Estimation	by EPA 600/R-93/116	2 - Ottawa West Lab	200812-0	25-Sep-19

* Reference to the NVLAP term does not permit the user of this report to claim product certification , approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Ottawa West Lab: 25 Northside Rd, Unit C Nepean, Ontario K2H 8S1

Qualifier Notes

Sample Qualifiers :

AS-PRE: Due to the difficult nature of the bulk sample (interfering fibers/binders), additional NOB preparation was required prior to analysis

Z-01: Potential contamination of chrysotile bundles.

Work Order Revisions | Comments

None

APPENDIX

B PROJECT PHOTOGRAPHS

PHOTO NO.	MATERIAL DESCRIPTION & LOCATION	PHOTO
1	<p><u>Asbestos Containing Textured Coated Wall Covering</u></p> <p>observed on abutment walls throughout the subject area.</p> <p>Sample ID: PRCY-CON-1D</p>	
2	<p><u>Asbestos Containing Textured Coated Wall Covering</u></p> <p>observed on abutment walls throughout the subject area.</p> <p>Sample ID: PRCY-CON-1F</p>	

<p><u>3</u></p>	<p><u>Asbestos Containing Textured Coated Wall Covering</u></p> <p>observed on abutment walls throughout the subject area.</p> <p>Sample ID: PRCY-CON-1G</p>	
<p><u>4</u></p>	<p><u>Asbestos Containing Textured Coated Wall Covering</u></p> <p>observed on abutment walls throughout the subject area.</p> <p>Sample ID: PRCY-CON-1H</p>	

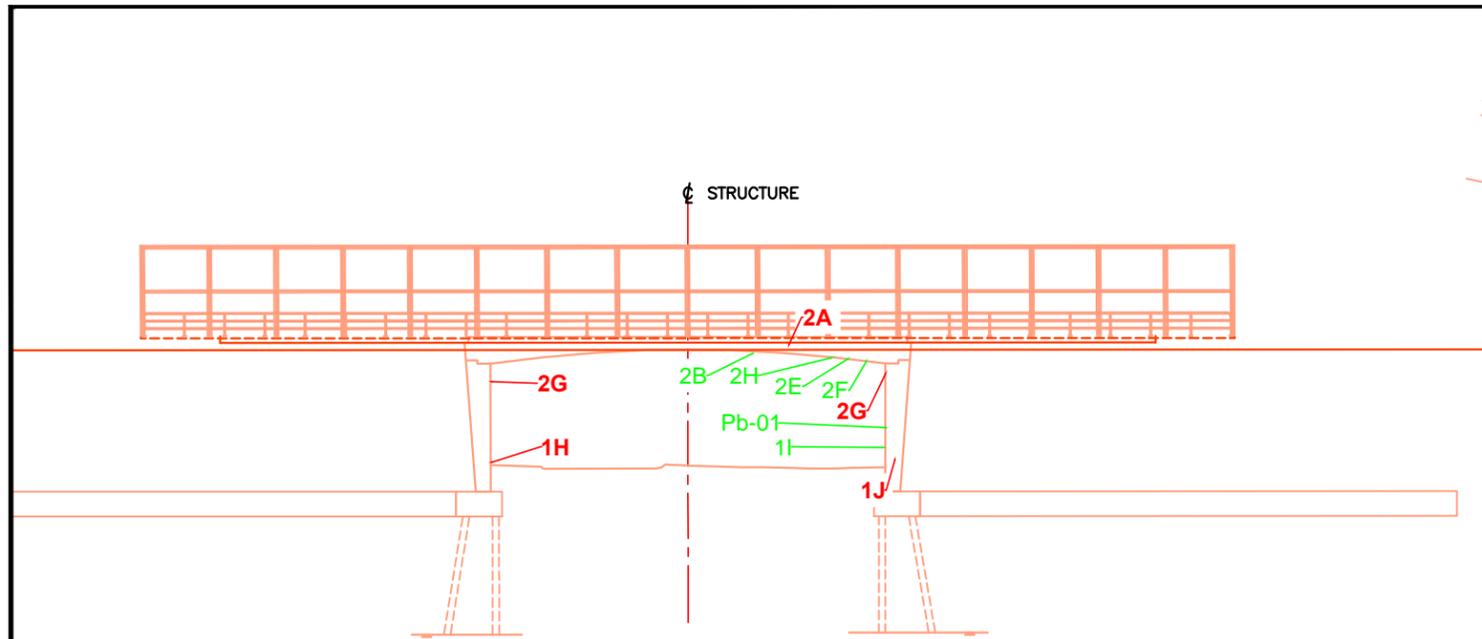
<p>5</p>	<p><u>Asbestos Containing Textured Coated Wall Covering</u></p> <p>observed on abutment walls throughout the subject area.</p> <p>Sample ID: PRCY-CON-1J</p>	
<p>6</p>	<p><u>Asbestos Containing Textured Coated Wall Covering</u></p> <p>observed on abutment walls throughout the subject area.</p> <p>Sample ID: PRCY-CON-2A</p>	

<p>7</p>	<p><u>Asbestos Containing Textured Coated Wall Covering</u></p> <p>observed on abutment walls throughout the subject area.</p> <p>Sample ID: PRCY-CON-2G</p>	
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APPENDIX

C FIGURES

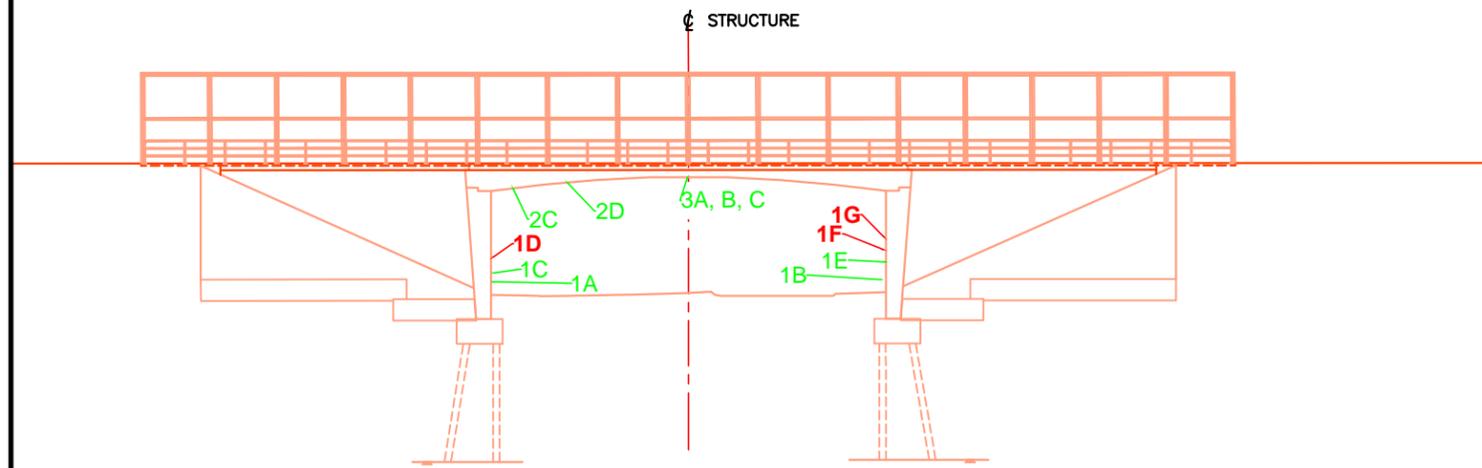




NORTH ELEVATION

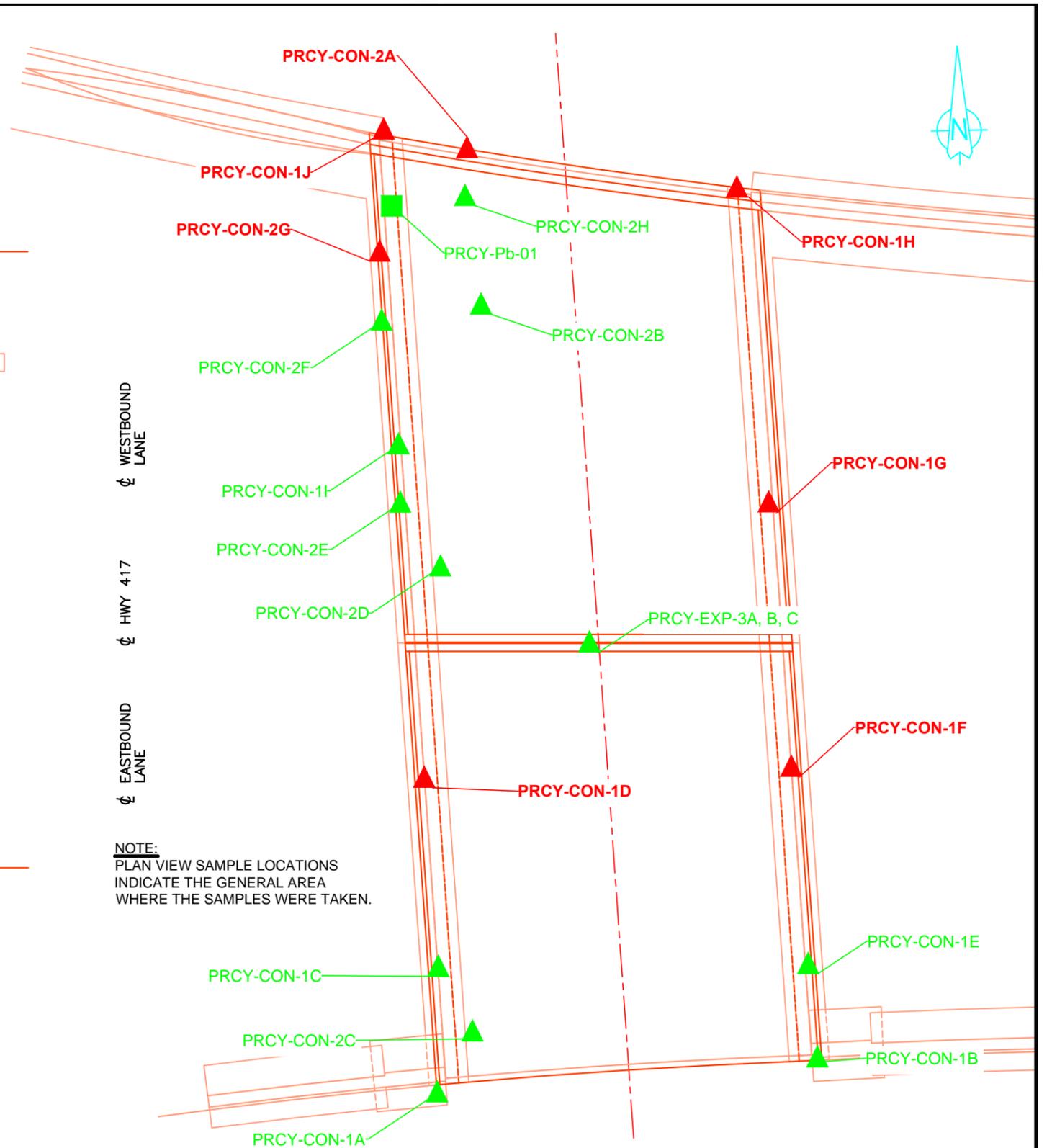
1:1

NOTE:
ELEVATION VIEW SAMPLE LOCATIONS
INDICATE THE HEIGHT FROM GROUND
LEVEL WHERE THE SAMPLES WERE
TAKEN.



SOUTH ELEVATION

1:1



PLAN

NOTE:
PLAN VIEW SAMPLE LOCATIONS
INDICATE THE GENERAL AREA
WHERE THE SAMPLES WERE TAKEN.

Legend	▲ NON-ASBESTOS BULK SAMPLE LOCATION
	▲ ASBESTOS BULK SAMPLE LOCATION
	■ NON-LEAD PAINT BULK SAMPLE LOCATION
	■ LEAD PAINT BULK SAMPLE LOCATION

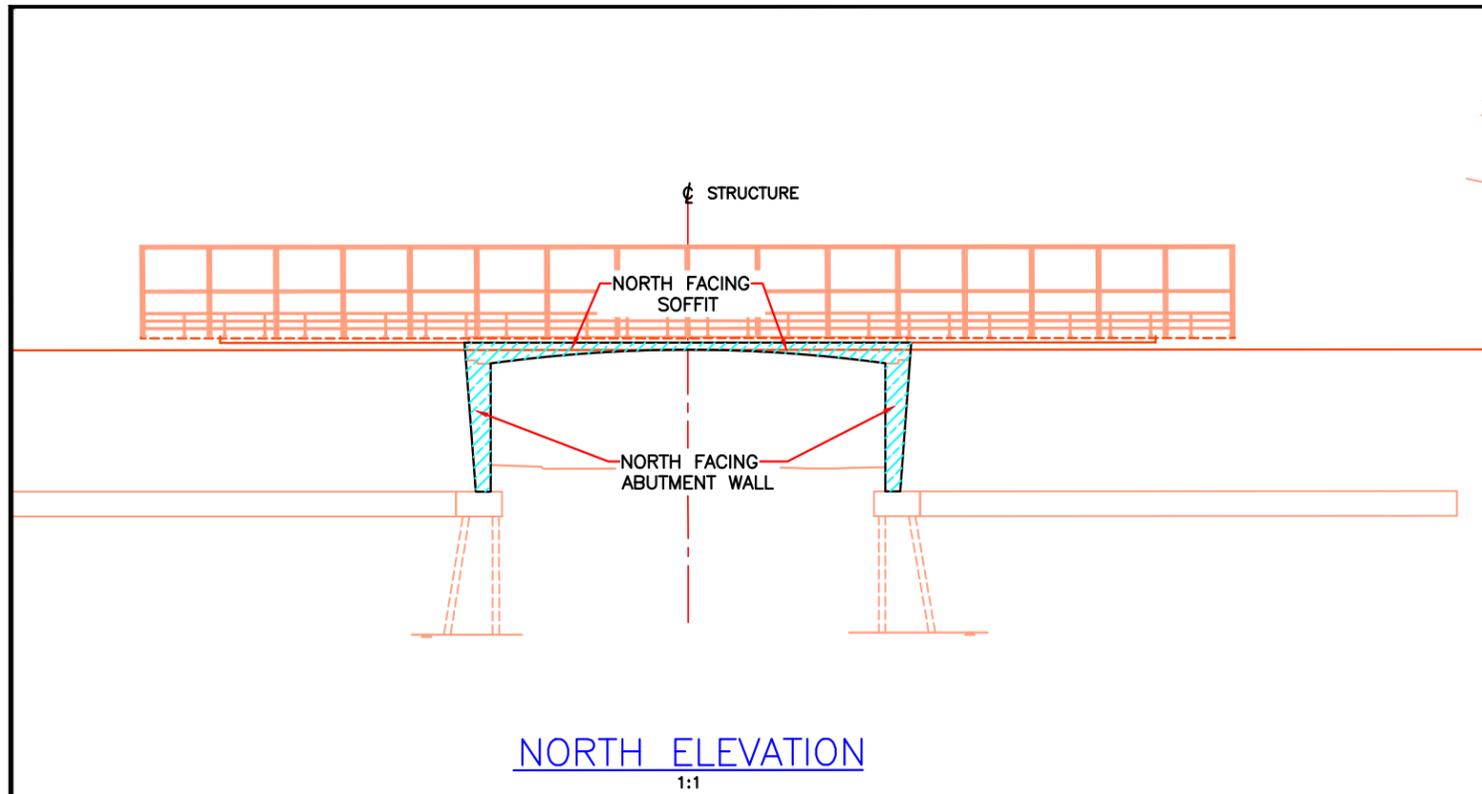
Project No: 16M-01636-01
Scale: Not To Scale
Date: November 2019
Drawn By: RO
App'd By: AM

Client: ONTARIO MINISTRY OF TRANSPORTATION
Site Address: PERCY STREET BRIDGE AT HIGHWAY 417, OTTAWA, ONTARIO

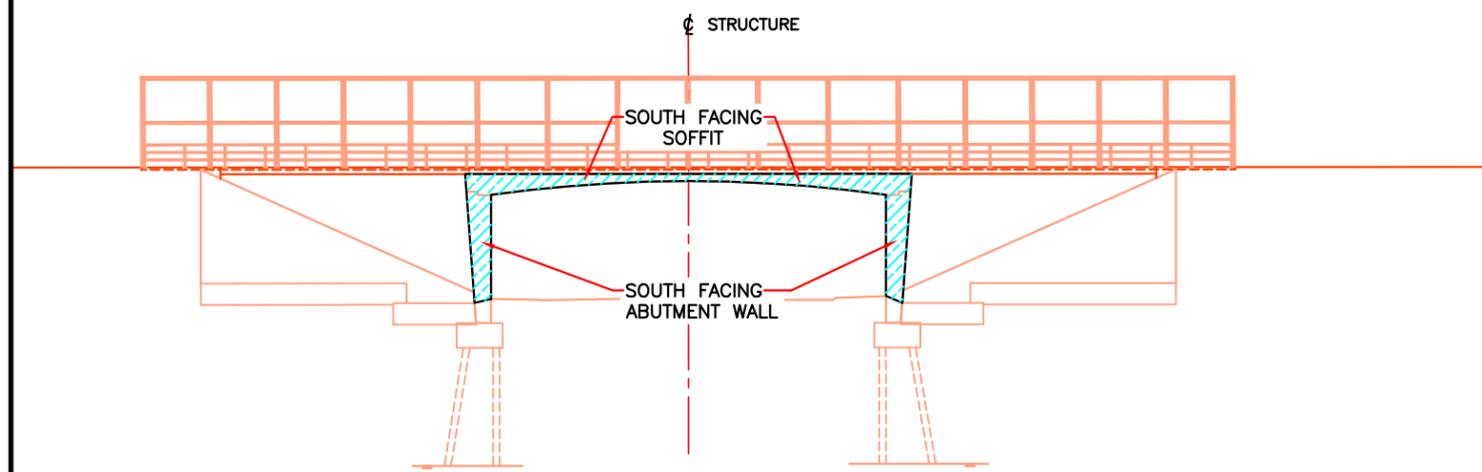
LOCATIONS OF ASBESTOS AND LEAD SAMPLES

PERCY STREET BRIDGE

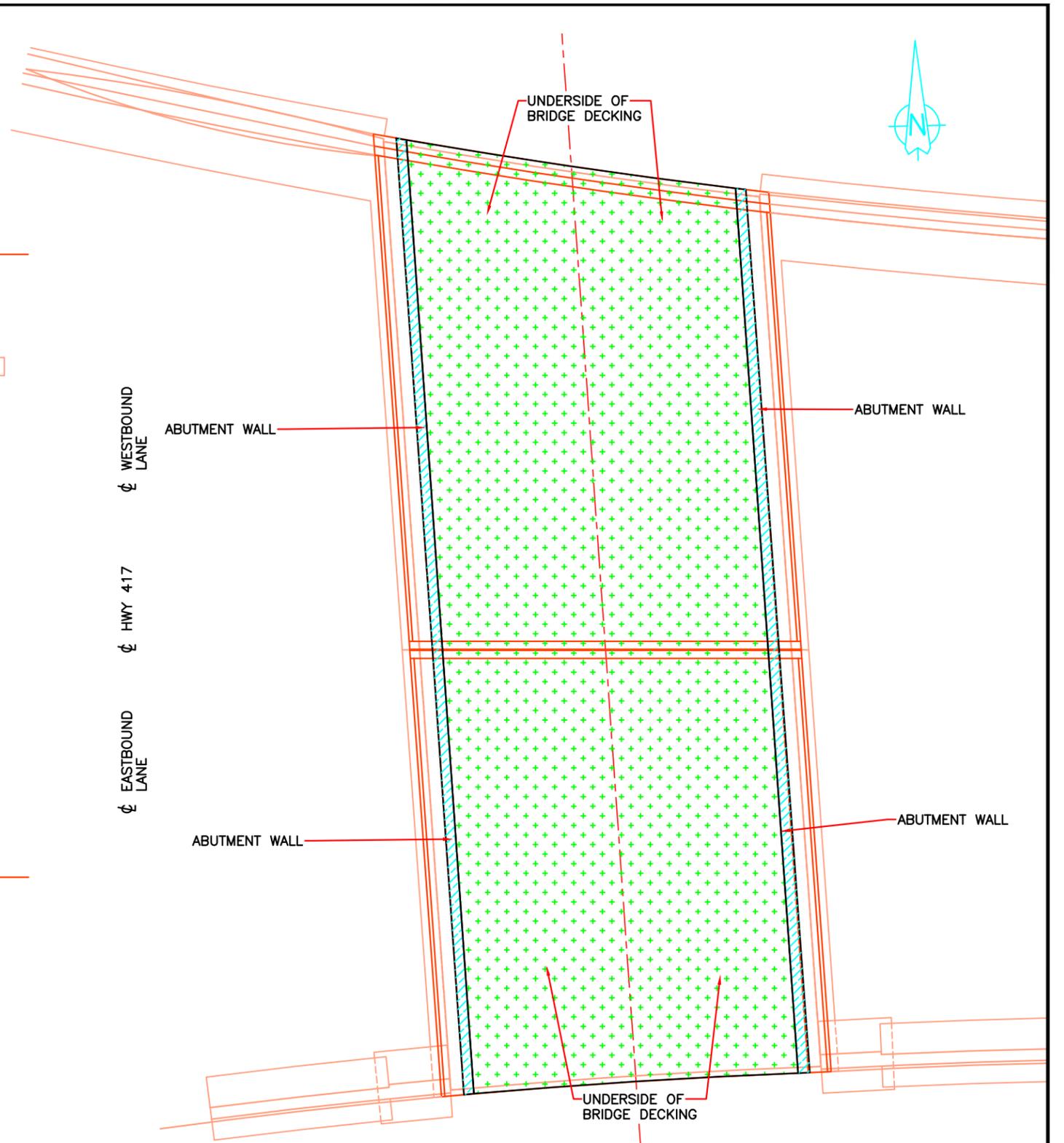
Figure No: **1**



NORTH ELEVATION
1:1



SOUTH ELEVATION
1:1



PLAN

Legend		ASBESTOS CONTAINING GREY SEALANT COATING
		NON ASBESTOS CONTAINING CONCRETE BRIDGE DECKING

Project No: 16M-01636-01
Scale: Not To Scale
Date: November 2019
Drawn By: RO
App'd By: AM

Client: ONTARIO MINISTRY OF TRANSPORTATION
Site Address: PERCY STREET BRIDGE AT HIGHWAY 417, OTTAWA, ONTARIO

AREAS OF ASBESTOS CONTAINING GREY SEALANT COATING
PERCY STREET BRIDGE

Figure No: **2**

