ECOH
Environmental Consulting
Occupational Health

DESIGNATED SUBSTANCES AND HAZARDOUS MATERIALS SURVEY

Tacoma Engineers

CITY OF COLLINGWOOD

COLLINGWOOD TERMINALS

Submitted to:

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ECOH Project No.: 17384

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ECOH Management Inc. (ECOH) was retained by Tacoma Engineers (Tacoma) to conduct a Designated Substances and Hazardous Materials (DSHM) survey of the Collingwood Terminals, which includes the towers, silos, and red brick building, (referred to as the "Project Areas"), located on Heritage Drive, Collingwood, Ontario. The purpose of the survey was to identify the presence of Designated Substances (asbestos, lead, mercury, etc.), as well as any Hazardous Materials (Polychlorinated Biphenyls, Mould, etc.), associated with the Project Areas. This survey report fulfils requirements set forth within Section (30) of the Ontario Occupational Health and Safety Act. ECOH performed the DSHM Survey on April 4th, 2017.

This executive summary provides a brief overview of the key survey findings and associated recommendations. Detailed information regarding the findings and recommendations are discussed in the body of the report.

FINDINGS

The following presents a brief outline of ECOH's findings within the Project Area. Refer to Appendix I for analytical results for asbestos. Refer to the main body of the report and Appendices II and III for specific details and locations of Designated Substances and Hazardous Materials in the Project Area.

Material	Findings
Asbestos	Asbestos-containing materials (ACM) are present in various locations throughout the Project Area in the following forms: • Grey Window Caulking on all windows (confirmed ACM) • Grey Caulking on the backside in between sheets of transite board (confirmed ACM) • Grey Mastic on Ducts on Bin Floor (confirmed ACM) • Transite Cement Boards throughout the Project Area (confirmed ACM) • Roofing Materials (confirmed ACM) Additional asbestos-containing materials may be present within concealed conditions of the Project Area (i.e. above fixed ceilings, within wall cavities, pipe chases, etc.).
Lead	Lead-based paints (i.e. concentrations of lead equal to or greater than 0.5%, or 5000 parts per million (ppm), which is comparable to 1 milligram per square centimeter (mg/cm^2)) were identified during this assessment as follows: • Grey Wall Paint – Compressor Room (Basement of Main Terminal) • Silver Duct Paint – Bin Floor (2nd Floor)-Main Terminal • Grey Wall Paint – Transformer Room (Red Brick Building) All other paints sampled as part of this assessment were non-lead-based, however, all paints are assumed to contain varying percentages or trace amounts of lead. No other major sources of lead or lead-containing products were identified during the survey; however, lead may be present in:

	• Internal batteries associated with emergency lighting system, • Ceramic tile glazing, • Wiring connectors and electric cable sheathing, and • Solder joints on copper piping. • Lead piping.
Mercury	Minor quantities are present as a vapour within fluorescent tubes lights and as a possible constituent of paints and adhesives.
Silica	Present in all concrete and masonry products.
Other Designated Substances (ODS)	Assumed to be present in all HVAC units throughout the Project Area.
Polychlorinated Biphenyls (PCBs)	May be present in light ballasts throughout the Project Area. Presumed to be present in transformer units observed in the transformer room of the Project Area.
Mould	Visible mould-growth and water damage was observed to be present throughout the Project Area in several locations.
Bird Droppings (Guano)	Bird droppings (varying in depth from several inches to several feet) were observed on all surfaces throughout the Marine Tower and associated areas. Many live birds inhabit this part of the Project Area.
Other Hazardous Materials	Acrylonitrile, Arsenic, Benzene, Coke Oven Emissions, Ethylene Oxide, Isocyanates, Urea Formaldehyde Foam Insulation (UFFI) and Vinyl Chloride Monomer were not noted in significant quantities or forms, if at all.

RECOMMENDATIONS

The following recommendations meet the requirements of the Occupational Health and Safety Act. Asbestos recommendations meet the requirements of the Designated Substance – Regulation respecting *Asbestos on Construction Projects and in Buildings and Repair Operations*, Ontario Regulation 278/05. Based upon review of historical reports, as well as analytical results and observations of this assessment, ECOH offers the following for your consideration.

- **Asbestos**

  Based on survey results, the following conclusion are made with regards to asbestos-containing materials (ACMs) within the Project Area:

  - As asbestos-containing materials (ACM) are present with the Project Area, ECOH recommends that all workers have asbestos awareness and respirator training before commencing work. Asbestos awareness training will provide on-site workers the understanding of asbestos-related health and safety issues; the ability to recognize ACM and any situation that may present a potential asbestos exposure, and' the ability to respond appropriately to an inadvertent disturbance of ACM in the work area.
  - Type 1 asbestos safety should be utilized, provided that material is wetted to control the spread of dust or fibres and work is not completed using powered hand tools, for the removal of Non-Friable Asbestos-Containing Materials (mastic, caulking, transite board, roofing materials, etc.).

- Type 2 Asbestos Safety Precautions should be utilized if any of the Asbestos-Containing Materials are being disturbed or removed by the use of powered hand tools that are attached to dust collecting devices equipped with HEPA filters (mastic, caulking, transite board, roofing materials, etc.).
- Type 3 Asbestos Safety Precautions should be utilized if any of the Asbestos-Containing Materials are being disturbed or removed by the use of powered hand tools without a dust collecting device equipped with HEPA filters attached (mastic, caulking, transite board, roofing materials, etc.).
- Any demolition, renovation or maintenance activities involving materials found NOT to contain asbestos, or not suspected of containing asbestos, should implement general health and safety precautions including, in part, the use of dust suppression techniques and appropriate respiratory protection.
- The asbestos-related findings of this report and any required removal of identified ACM should be used to update information within, or be inserted into, the facility's inventory of asbestos-containing building materials.
- During project work, if any additional materials are found beyond those which are described in this report, or described in the existing inventory of asbestos-containing materials (i.e. materials not previously identified, or materials that are not homogenous to those previously identified, or materials that become revealed during the work), additional testing for asbestos-content should be completed immediately and prior to disturbance of the material. Alternatively, these materials can be assumed to contain asbestos, and the appropriate level of asbestos safety precautions must be implemented.
- Prior to renovation work, confirmed asbestos-containing materials that have the potential to be disturbed during the renovation work must be removed using asbestos safety procedures detailed within Ontario Regulation 278/05. Classification of the asbestos operation should be determined by an experienced and qualified person.

- **Lead**

  Any work involving the removal or disturbance of building materials confirmed to contain lead (e.g. lead-based paints, wiring connectors, electric cable sheathing, glazing on ceramic tile finishes and soldering joints on copper piping, etc.) should be conducted following recommendations detailed within the Ministry of Labour document "Guideline - Lead on Construction Projects", dated April 2011, and the Environmental Abatement Council of Ontario (EACO) Lead Guideline, dated October 2014.

  Renovation, demolition or general construction work involving the removal of materials containing only trace concentrations of lead (i.e. lead concentrations below 0.5% by dry weight, 5000ppm or $1mg/cm^2$) can be completed without lead specific safety precautions provided that:

  a) Work does not include 'fume generating activities' (heat producing) such as welding, torching, burning, high temperature cutting, etc.,
  b) Work does not include dust-generating activities such as grinding, cutting or chemical stripping,
  c) Dust levels are maintained below $3mg/m^3$, and
  d) General health and safety construction procedures are implemented, which would include dust suppression methods, proper respiratory protection (minimum of a 1/2-face respirator) and protective clothing, as is appropriate for the work being completed.

- **Mercury**

  The presence of mercury as a possible constituent of paints and adhesives and within assembled units (e.g. fluorescent light bulbs) should not be considered a hazard provided that the assembled units remain sealed and intact. However, if the seals are broken, the all efforts should be made to avoid direct skin contact inhalation of mercury vapour. Prior to demolition, mercury-containing units (i.e. fluorescent light bulbs, etc.) should be removed and stored in a safe, secure location or disposed of following the requirements of O. Reg. 347/90, amended by O. Reg. 588/00.

- **Mould**

  All mould remediation work should be conducted in accordance with the following, the Environmental Abatement Council of Ontario (EACO), Edition 3, 2015 Mould Abatement Guidelines or similar industry accepted documents. Conversely, demolition of a building containing mould-affected building materials can be undertaken if appropriate measures are taken to protect the worker and avoid cross-contamination to adjacent spaces.

- **Bird Droppings**

  All bird dropping remediation work should be conducted with specific avian pathogens precautions in accordance with the following, the Environmental Abatement Council of Ontario (EACO), Edition 3, 2015 Mould Abatement Guidelines (Appendix B) or similar industry accepted documents.

- **Silica**

  Any work involving the disturbance of materials that may contain silica should be conducted following recommendations detailed in the Ministry of Labour document "*Guideline - Silica on Construction Projects*", dated April 2011.

- **Ozone Depleting Substances (ODS)**

  Prior to demolition, decommissioning of equipment that may contain Ozone Depleting Substances (ODS) should be completed by certified personnel and in compliance with Ozone Depleting Substances and Other Halocarbons (O. Reg. 463/10), and Ontario's General Waste Management Regulation (O. Reg. 347/90).

- **Polychlorinated Biphenyls (PCBs)**

  Florescent light fixtures should be disassembled to observe ballast serial codes, then compare them to standard PCB Identifier Code literature. Ballasts with unidentifiable serial codes, or from manufactures who are not included in the standard PCB Identifier Code literature, or are not clearly labeled as "PCB Free", or no date is clearly visible (ballasts dated 1981 or later do not contain PCBs), must be assumed to contain PCBs. Ballasts and transformers confirmed or assumed to contain PCBs must be disposed of following Ontario Regulation 362 of the Environmental Protection Act, O. Reg 347/90 and Transportation of Dangerous Goods Act (TDGA) requirements.

  If required, transformer units should be inspected and/or assessed for PCBs prior to disposal. Conversely, the units can be presumed to contain PCBs. If confirmed or presumed to contain PCBs, decommissioning of the transformer unit must be completed in accordance with Ontario Regulation 347, General –Waste Management, Ontario Regulation 362, Waste Management – PCB's, and amended PCB Regulations, 2008 established under the Canadian Environmental Protection Act, 1999 by a qualified contractor, experienced in PCB transformer removal.

This executive summary provides a brief overview of the study findings. It is not intended to substitute for reading the complete report, nor does it discuss specific issues documented in the report.

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1. INTRODUCTION AND REGULATORY REQUIREMENTS

1.1 Introduction and Scope

ECOH Management Inc. (ECOH) was retained by Tacoma Engineers (Tacoma) to conduct a Designated Substances and Hazardous Materials (DSHM) survey of the Collingwood Terminals, which includes the towers and red brick building, (referred to as the "Project Area"), located at Heritage Drive, Collingwood, Ontario. The purpose of the survey was to identify the presence of, and quantify, Designated Substances (asbestos, lead, mercury, etc.), as well as any Hazardous Materials (Polychlorinated Biphenyls, Mould, etc.), associated with the Project Areas. This survey report fulfils requirements set forth within Section (30) of the Ontario Occupational Health and Safety Act. ECOH performed the DSHM Survey on April 4th, 2017.

The survey included an investigation for the presence of Designated Substances including;

- → ***Acrylonitrile***
- → ***Arsenic***
- → ***Asbestos***
- → ***Benzene***
- → ***Coke Oven Emissions***
- → ***Ethylene Oxide***
- → ***Isocyanates***
- → ***Lead***
- → ***Mercury***
- → ***Silica***
- → ***Vinyl Chloride Monomer***

And for Hazardous Materials including;

- → ***Polychlorinated Biphenyls (PCB)s***
- → ***Mould***
- → ***Bird Droppings***
- → ***Ozone Depleting Substances (ODS)***
- → ***Other Hazardous Materials***

The following report details the project scope of work, regulatory requirements, survey and analytical methodologies, survey findings and recommendations, and survey statement of limitations.

1.2 Building Description

The subject building, known as Collingwood Terminals, was constructed in 1929 and was used for grain storage service until 1993.

1.3 Regulatory Requirements

A Designated Substances Report is completed to fulfil the Owner's responsibilities under Section 30 of the Ontario Occupational Health and Safety Act. Prior to tendering project work in a building, the building owner must provide this report to contractors tendering on the work.

Ontario Regulation 490/09 *"Designated Substances"* provides guidance for the assessment and control of exposure to the eleven (11) listed Designated Substances (noted above)

Ontario Ministry of Labour Regulation 278/05, *Regulation respecting Asbestos on Construction Projects and in Buildings and Repair Operations*, part of O.Reg 490/09, provides specific guidance for assessment, control of asbestos exposure, and abatement on construction and renovation projects.

Ministry of Environment Regulation, R.R.O. 347, sets the requirements for the disposal of asbestos waste.

The Ministry of Labour has also issued guidelines for the control of Lead and Silica on construction projects, entitled, *Guideline - Lead on Construction Projects* and *Guideline - Silica on Construction Projects* respectively.

Ministry of Labour actively enforces the general duty clause of the Occupational Health and Safety Act S.(25)(2)(h).

2. SURVEY SCOPE OF WORK AND METHODOLOGY

2.1 General Approach

Details of the survey methodology, as was applied to this facility, are as follows:

- To ensure familiarity with the facility, the surveyor referred to project drawings provided by Tacoma Engineers.
- All accessible areas of the Project Area were inspected as part of this assessment.

2.2 Records Review

ECOH was not provided with any previous reports or surveys for review.

2.3 Survey Drawings

Locations of known Asbestos-Containing Materials (ACMs) identified during the survey and sample locations for asbestos and lead are illustrated (to the best extent possible) on the drawings presented in Appendix II.

2.4 Asbestos Survey Methodology

2.4.1 Asbestos Survey Omissions from Scope

When conducting an asbestos survey, it is standard practice to assume that certain building materials potentially contain asbestos. Depending on the material, this assumption is undertaken for one or more of the following reasons:

- The material is inaccessible (i.e., underground piping);
- There is an inherent danger in sampling the material (i.e., high voltage wires);
- Sampling will compromise the integrity of the building structure or envelope (i.e., roofing felts).

Therefore, for the purpose of this survey, ECOH has assumed that the following materials (if present) are asbestos-containing:

- Fire doors
- High voltage wiring
- Mechanical packing and gaskets
- Underground services or piping

In addition, no identification was made of asbestos products used in manufacturing processes or operations (i.e. manufacturing equipment, laboratories, etc.).

2.4.2 Asbestos Sampling Strategy and Analytical Methods

Bulk samples of potential asbestos-containing materials were collected for analysis during the survey. As per the requirements of Ontario Regulation 278/05, multiple samples (ranging from 1 to 7 depending on quantity and type of material) are required to confirm the absence of asbestos. Only one positive result (i.e. confirming the presence of asbestos) is required to classify a material as asbestos-containing. Therefore, ECOH's sampling strategy involves the collection of sufficient numbers of samples to meet regulatory requirements, followed by instructions to the laboratory to cease analysis when one sample within a series has already proven positive for asbestos. Sampling required a small volume of material to be removed either from a damaged section of suspect material or cut from intact material and then repaired by sealing with tape to prevent fibre release. The collected samples were placed in plastic bags and sealed during shipment to an independent laboratory. A formal chain of custody procedure was maintained between ECOH and the sub-contract laboratory during sample transport. Samples were then analysed following the analytical procedure prescribed by the Regulation 278/05, U.S. Environmental Protection Agency Test Method EPA/600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials. June 1993. Although not required by provincial regulation, all laboratories used by ECOH are accredited under the U.S. National Voluntary Laboratory Accreditation Program (NVLAP) to ensure consistent, accurate and defendable results.

Where possible, ECOH has used existing analytical data, rather than collect and analyze additional bulk samples. Although historical sample information is used to confirm the presence of asbestos in suspect materials, historical samples are not used in defining materials as non-asbestos. Historical sample results were only used if the surveyor, based on his/her experience, could clearly associate the sample information with the material present at the Site.

The collection of samples was performed with sufficient frequency to obtain a general pattern of asbestos use within the building. Due to building renovations or modifications that may have occurred in the past, the consistency of the application of asbestos materials may not be uniform throughout the entire facility. It is important to note that without sampling every wall, pipe section, ceiling tile, etc., it is not possible to identify the asbestos content in every material present in the building. For this reason, similar materials to those already sampled elsewhere in the building were visually identified as being the same as those samples without additional analysis.

The Chain of Custody and the Certificate of Analysis, which details analytical results referenced in the findings section, for all bulk sampling is presented within Appendix I.

2.4.3 Asbestos Survey Assessment Criteria

The recommendations in this report take into consideration the condition and accessibility of the asbestos material as well as other factors such as water damage, vibration, air movement and general activities in the area.

Where ACM is found to be in GOOD condition and not likely to deteriorate or fall, the general recommendation is to re-evaluate the condition of the material on an annual basis. This recommendation is subject to change if the material is located in a manner that persons untrained in asbestos awareness could physically damage it.

Where the ACM is found to be damaged, a recommendation to have the material repaired, removed, encased, or encapsulated is offered. The recommendation will also indicate which asbestos safety precautions (i.e. Type 1, Type 2 or Type 3) should be undertaken when performing the remedial work.

2.5 Analysis of Lead in Paint

The presence of lead in paint was assessed by the collection of bulk samples of potential lead-based paints identified during the survey. Samples were analysed by Flame Atomic Absorption Spectroscopy, EPA SW-846 3050B/6010C/7420 method. The Chain of Custody and the Certificate of Analysis, which details analytical results referenced in the findings section, for all bulk sampling is presented within Appendix I. Lead-based paint is considered to have concentrations of lead equal to or greater than 0.5%, or 5000 parts per million (ppm) by dry weight.

2.6 Mould Assessment

Visual mould assessment of the facility was conducted in accordance with industry-accepted protocols, specifically:

- Canadian Construction Association, Standard Construction Document CCA 82-2004; "*Mould Guidelines for the Canadian Construction Industry*", 2004.
- New York City Department of Health and Mental Hygiene: Bureau of Environmental & Occupational Disease Epidemiology; "*Guidelines on Assessment and Remediation of Fungi in Indoor Environments*", 2008.
- Institute of Inspection Cleaning and Restoration (IICRC): S520, "*Standard and Reference Guide for Professional Mold Remediation*", December 2003.

Please note that the mould assessment carried out during this survey included visual assessment only and did not include bulk sampling or intrusive investigation (i.e. test-cuts).

2.7 Survey of other Hazardous Materials

Materials suspected of containing Designated Substances and Hazardous Materials, other than lead in paint or asbestos, were identified by appearance, age, and knowledge of historic applications in building construction and equipment design.

3. FINDINGS

3.1 Asbestos

The following is a brief discussion of the extent to which asbestos-containing materials (ACM) were identified in the Project Area. The discussion is organized under the headings of materials that are generally suspected of containing asbestos. Please refer to Table 1 for sample details and laboratory analysis results.

TABLE 1

Summary of Analysis of Asbestos Bulk Samples

Sample Number	Sample Location	Sample Description	Results
17384-ASB-01A	Bin Floor Office	Drywall Joint Compound	None Detected
17384-ASB-01B	Bin Floor Office	Drywall Joint Compound	None Detected
17384-ASB-01C	Bin Floor Office	Drywall Joint Compound	None Detected
17384-ASB-02A	4th Floor Old Transformer Room	Drywall Joint Compound	None Detected
17384-ASB-02B	4th Floor Old Transformer Room	Drywall Joint Compound	None Detected

TABLE 1

Summary of Analysis of Asbestos Bulk Samples

Sample Number	Sample Location	Sample Description	Results
17384-ASB-02C	4th Floor Old Transformer Room	Drywall Joint Compound	None Detected
17384-ASB-03A	Basement Tower	Grey Window Caulking	1% Chrysotile
17384-ASB-03B	Bin Floor	Grey Window Caulking	Positive Stop (Not Analyzed)
17384-ASB-03C	Office - 3rd Floor	Grey Window Caulking	Positive Stop (Not Analyzed)
17384-ASB-04A	Bin Floor	Grey Duct Mastic	1% Chrysotile
17384-ASB-04B	Bin Floor	Grey Duct Mastic	Positive Stop (Not Analyzed)
17384-ASB-04C	Bin Floor	Grey Duct Mastic	Positive Stop (Not Analyzed)
17384-ASB-05A	Stairwell	Grey Caulking Between Transite Board Backside	2% Chrysotile
17384-ASB-05B	Stairwell	Grey Caulking Between Transite Board Backside	Positive Stop (Not Analyzed)
17384-ASB-05C	Stairwell	Grey Caulking Between Transite Board Backside	Positive Stop (Not Analyzed)
17384-ASB-06A	Basement Tower - Belt Room	Duct Wrap	None Detected
17384-ASB-06B	Basement Tower - Belt Room	Duct Wrap	None Detected
17384-ASB-06C	Basement Tower - Belt Room	Duct Wrap	None Detected
17384-ASB-07A	Mezzanine - 4th Floor	Fan Gasket	None Detected
17384-ASB-07B	Mezzanine - 4th Floor	Fan Gasket	None Detected
17384-ASB-07C	Mezzanine - 4th Floor	Fan Gasket	None Detected
17384-ASB-08A	Basement Tower - Train Pulley Room	Unknown Material on Mechanical Equipment	None Detected
17384-ASB-08B	Basement Tower - Train Pulley Room	Unknown Material on Mechanical Equipment	None Detected
17384-ASB-08C	Basement Tower - Train Pulley Room	Unknown Material on Mechanical Equipment	None Detected
17384-ASB-09A	Exterior - Bottom of Silos	Tar	None Detected
17384-ASB-09B	Exterior - Bottom of Silos	Tar	None Detected
17384-ASB-09C	Exterior - Bottom of Silos	Tar	None Detected
17384-ASB-10A	Basement Tower	Transite Board	10% Chrysotile
17384-ASB-10B	Bin Floor	Transite Board	Positive Stop (Not Analyzed)
17384-ASB-10C	2nd Floor Transformer Room - Red Brick Building	Transite Board	Positive Stop (Not Analyzed)

TABLE 1
Summary of Analysis of Asbestos Bulk Samples

Sample Number	Sample Location	Sample Description	Results
17384-ASB-11A	Basement - Red Brick Building	Drywall Joint Compound	None Detected
17384-ASB-11B	Basement - Red Brick Building	Drywall Joint Compound	None Detected
17384-ASB-11C	Basement - Red Brick Building	Drywall Joint Compound	None Detected
17384-ASB-12A	Basement - Red Brick Building	Ceiling Tile - 2'x4' White	None Detected
17384-ASB-12B	Basement - Red Brick Building	Ceiling Tile - 2'x4' White	None Detected
17384-ASB-12C	Basement - Red Brick Building	Ceiling Tile - 2'x4' White	None Detected
17384-ASB-13A	2nd Floor Transformer Room - Red Brick Building	Flex Duct Connector	None Detected
17384-ASB-13B	2nd Floor Transformer Room - Red Brick Building	Flex Duct Connector	None Detected
17384-ASB-13C	2nd Floor Transformer Room - Red Brick Building	Flex Duct Connector	None Detected
17384-ASB-14A	Ground Floor Storage Room - Red Brick Building	Grey Window Caulking	10% Chrysotile
17384-ASB-14B	2nd Floor Classroom - Red Brick Building	Grey Window Caulking	Positive Stop (Not Analyzed)
17384-ASB-14C	2nd Floor Transformer Room - Red Brick Building	Grey Window Caulking	Positive Stop (Not Analyzed)
17384-ASB-15A	Exterior - Red Brick Building	Brick Mortar	None Detected
17384-ASB-15B	Exterior - Red Brick Building	Brick Mortar	None Detected
17384-ASB-15C	Exterior - Red Brick Building	Brick Mortar	None Detected
17384-ASB-16A	Roof	Roofing Materials	7% Chrysotile
17384-ASB-16B	Roof	Roofing Materials	Positive Stop (Not Analyzed)
17384-ASB-16C	Roof	Roofing Materials	Positive Stop (Not Analyzed)
	- shading indicates sample result positive for asbestos (if applicable)		

3.1.1 Spray Applied Fireproofing or Thermal Insulation (Friable)

Spray applied fireproofing was not observed during this survey.

3.1.2 Texture Finishes (Friable)

Texture finish was not observed during this survey.

3.1.3 Thermal Mechanical Insulation (Friable)

Mechanical insulations observed within the Project Area consist of non-asbestos materials (i.e. fibreglass, neoprene foam, unknown insulation, etc.). ECOH sampled insulation material from

mechanical equipment in the train pulley room (basement) and laboratory analysis determined this material does not contain asbestos.

Gaskets were observed on air handling units on the 4th floor mezzanine of the main terminal building. ECOH sampled this material and laboratory analysis determined this material does not contain asbestos.

3.1.3.1 Piping systems:

Pipe fittings (which may include elbows, valves, tees, hangers, etc.) present throughout the Project Area were observed to be not insulated, or insulated with non-asbestos materials (i.e. fibreglass).

Straight sections of pipe observed throughout the Project Area were observed to be not insulated, or insulated with non-asbestos materials (i.e. fibreglass).

3.1.3.2 Duct Systems:

Ducts observed throughout the Project Area were observed to be not insulated or insulated with non-asbestos materials (i.e. fibreglass, paper wrap, etc.). ECOH sampled paper wrap from duct work in the belt room (basement) and laboratory analysis determined this material does not contain asbestos.

ECOH also sampled flex duct connectors from the 2nd floor transformer room within the red brick building and laboratory analysis determined this material does not contain asbestos.

3.1.3.3 Mechanical Equipment:

Mechanical equipment in the Project Area was observed to be not insulated.

3.1.4 Asbestos Cement Products (Non-Friable)

Transite cement board was observed in the stairwells of the main terminal building, on the walls and ceilings of the mini offices throughout the Project Area, and on the second-floor walls of the transformer room (red brick building). ECOH sampled transite cement board from various locations and laboratory analysis determined this material is **asbestos-containing**. Transite cement board is presumed to be present in other locations throughout the Project Area not mentioned above.

3.1.5 Acoustic Ceiling Tiles (Friable)

One (1) type of acoustic ceiling tile (2'x4' White) was observed within the basement of the red brick building. ECOH sampled this material and laboratory analysis determined this material does not contain asbestos.

3.1.6 Vinyl Floor Tiles (Non-Friable)

Vinyl floor tiles were not observed during this survey.

3.1.7 Vinyl Sheet Flooring (Potentially-Friable)

Vinyl sheet flooring was not observed during this survey.

3.1.8 Drywall Joint Compound (DJC) (Non-Friable)

Drywall joint compound was observed to be present as drywall walls, ceilings, etc. in various locations throughout the Project Area. ECOH sampled drywall joint compound from the bin floor

office, 4th floor old transformer room, and the basement of the red brick building and laboratory analysis determined this material does not contain asbestos.

3.1.9 Plaster (Non-Friable)

Plaster was not observed during this survey.

3.1.10 Mastic (Non-Friable)

Grey mastic was observed to be present on ducts within the Bin Floor (2nd Floor) of the main terminal building. ECOH sampled this material and laboratory analysis determined this material is **asbestos-containing**.

3.1.11 Caulking (Non-Friable)

Two (2) visually distinct types of caulking were observed within the Project Area:

- Grey caulking around windows was observed to be present around all windows throughout the Project Area. ECOH sampled this material from various locations and laboratory analysis determined this material is **asbestos-containing.**
- Grey caulking on the backside, between sheets of transite board was observed to be present in the stairwells of the terminals. ECOH sampled this material from the stairwells of the main terminal building and laboratory analysis determined this material is **asbestos-containing.** This material may be present in areas that are inaccessible.

3.1.12 Roofing Materials (Non-Friable)

Black roofing materials were observed to be present on the roof of the Project Area. ECOH sampled this material and laboratory analysis determined this material is **asbestos-containing,**

3.1.13 Brick Mortar (Non-Friable)

Brick mortar was observed on the exterior and on some interior locations of the red brick building. ECOH sampled this material and laboratory analysis determined this material does not contain asbestos.

3.1.14 Tar (Non-Friable)

Tar was observed on the exterior base of the terminals. ECOH sampled this material and laboratory analysis determined this material does not contain asbestos.

3.2 Lead

Although no regulations exist in Ontario, accepted practices within the industry indicate that paint containing 0.5% lead concentration by dry weight (i.e. concentrations of lead at or above 0.5%, or 5000 parts per million (ppm) or micrograms per gram (µg/g) is considered to be a lead-based paint or lead-based building material (e.g. brick mortar). For the purposes of this project, paints that exceed or approach the guideline limit are considered lead-based.

Please refer to Table 2 for sample details and laboratory analysis results for paints. Certificates of Analysis and Chains of Custody are presented in Appendix I.

TABLE 2
Summary of Analysis for Lead Samples

Sample Number	Location	Description	Analytical Results (ppm)	Result
17384-Pb-01	Exterior of Terminals	White Wall Paint	<90	NEGATIVE
17384-Pb-02	Compressor Room (Basement) – Main Terminal	Grey Wall Paint	100000	POSITIVE
17384-Pb-03	Bin Floor – Main Terminal	Silver Duct Paint	32000	POSITIVE
17384-Pb-04	Bin Floor – Main Terminal	White Wall Paint	280	NEGATIVE
17384-Pb-05	3rd Floor Office – Main Terminal	Yellow Wall Paint	640	NEGATIVE
17384-Pb-06	3rd Floor Office – Main Terminal	Blue/Brown Wall Paint	620	NEGATIVE
17384-Pb-07	Basement – Red Brick Building	White Ceiling Paint	260	NEGATIVE
17384-Pb-08	Storage Room – Red Brick Building	White Wall Paint	330	NEGATIVE
17384-Pb-09	2nd Floor Transformer Room – Red Brick Building	Grey Wall Paint	6800	POSITIVE
17384-Pb-10	Exterior – Red Brick Building	Brick Mortar	<40mg/kg	NEGATIVE
	- shading indicates sample result positive for lead (if applicable)			

Bulk sample analysis results confirm that lead-based paints are present in various locations throughout the Project Area.

No other major sources of lead or lead-containing products were observed during this survey. However, lead may be present in:

- Internal batteries associated with emergency lighting system,
- Ceramic tile glazing,
- Wiring connectors and electric cable sheathing, and
- Solder joints on copper piping.
- Lead piping.

3.3 Mercury

Mercury is present in minor quantities throughout the Project Area in the following forms:

- As a possible constituent of paints and adhesives, and
- As a vapour within fluorescent tubes lights.

3.4 Silica

Free crystalline silica, in the form of common construction sand, is present in all concrete and masonry products within the Project Area.

3.5 Mould

Mould-affected and water damaged building materials were identified in various locations throughout the Project Area at the time of assessment.

3.6 Bird Droppings (Guano)

Bird droppings (varying in depth from several inches to several feet) were observed on all surfaces throughout the Marine Tower and associated areas. Many live birds inhabit this part of the project area.

3.7 Ozone Depleting Substances (ODS)

Ozone Depleting Substances are assumed, unless labelled to denote otherwise, to be present in all HVAC units throughout the Project Area.

3.8 Polychlorinated Biphenyls (PCBs)

A representative number of fluorescent light ballasts were inspected and assessed for PCB content in the Project Area. Visual inspections confirmed that fluorescent light ballasts are presumed to contain PCBs in the Project Area.

3.9 Other Designated Substances and Hazardous Materials

The following Designated Substances and Hazardous Materials were not noted in significant quantities or forms, if at all, during this survey; Acrylonitrile, Arsenic, Benzene, Coke Oven Emissions, Ethylene Oxide, Isocyanates, Urea Formaldehyde Foam Insulation (UFFI), and Vinyl Chloride Monomer.

If present on site in insignificant quantities or forms, these Designated Substances and Hazardous Materials would not be expected to pose an immediate or potential risk to human health. Adequate worker protection should be achieved when implementing general health and safety precautions during general demolition or renovation activities.

Refer to Appendix IV for general information on all Designated Substances and Hazardous Materials.

4. CONCLUSIONS AND RECOMMENDATIONS

The following recommendations meet the requirements of the Occupational Health and Safety Act. Asbestos recommendations meet the requirements of the Designated Substance – Regulation respecting *Asbestos on Construction Projects and in Buildings and Repair Operations*, Ontario Regulation 278/05. Based upon review of historical reports, as well as analytical results and observations of this assessment, ECOH offers the following for your consideration.

4.1 Asbestos

Based on survey results, the following conclusion are made with regards to asbestos-containing materials (ACMs) within the Project Area:

- As asbestos-containing materials (ACM) are present with the Project Area, ECOH recommends that all workers have asbestos awareness and respirator training before

commencing work. Asbestos awareness training will provide on-site workers the understanding of asbestos-related health and safety issues; the ability to recognize ACM and any situation that may present a potential asbestos exposure, and' the ability to respond appropriately to an inadvertent disturbance of ACM in the work area.

- Type 1 asbestos safety should be utilized, provided that material is wetted to control the spread of dust or fibres and work is not completed using powered hand tools, for the removal of Non-Friable Asbestos-Containing Materials (mastic, caulking, transite board, roofing materials, etc.).
- Type 2 Asbestos Safety Precautions should be utilized if any of the Asbestos-Containing Materials are being disturbed or removed by the use of powered hand tools that are attached to dust collecting devices equipped with HEPA filters (mastic, caulking, transite board, roofing materials, etc.).
- Type 3 Asbestos Safety Precautions should be utilized if any of the Asbestos-Containing Materials are being disturbed or removed by the use of powered hand tools without a dust collecting device equipped with HEPA filters attached (mastic, caulking, transite board, roofing materials, etc.).
- Any demolition, renovation or maintenance activities involving materials found NOT to contain asbestos, or not suspected of containing asbestos, should implement general health and safety precautions including, in part, the use of dust suppression techniques and appropriate respiratory protection.
- The asbestos-related findings of this report and any required removal of identified ACM should be used to update information within, or be inserted into, the facility's inventory of asbestos-containing building materials.
- During project work, if any additional materials are found beyond those which are described in this report, or described in the existing inventory of asbestos-containing materials (i.e. materials not previously identified, or materials that are not homogenous to those previously identified, or materials that become revealed during the work), additional testing for asbestos-content should be completed immediately and prior to disturbance of the material. Alternatively, these materials can be assumed to contain asbestos, and the appropriate level of asbestos safety precautions must be implemented.
- Prior to renovation work, confirmed asbestos-containing materials that have the potential to be disturbed during the renovation work must be removed using asbestos safety procedures detailed within Ontario Regulation 278/05. Classification of the asbestos operation should be determined by an experienced and qualified person.

4.2 Lead

Any work involving the removal or disturbance of building materials confirmed to contain lead (e.g. lead-based paints, wiring connectors, electric cable sheathing, glazing on ceramic tile finishes and soldering joints on copper piping, etc.) should be conducted following recommendations detailed within the Ministry of Labour document "Guideline - Lead on Construction Projects", dated April 2011, and the Environmental Abatement Council of Ontario (EACO) Lead Guideline, dated October 2014.

Renovation, demolition or general construction work involving the removal of materials containing only trace concentrations of lead (i.e. lead concentrations below 0.5% by dry weight, 5000ppm or 1mg/cm^2) can be completed without lead specific safety precautions provided that:

a. Work does not include 'fume generating activities' (heat producing) such as welding, torching, burning, high temperature cutting, etc.,
b. Work does not include dust-generating activities such as grinding, cutting or chemical stripping,
c. Dust levels are maintained below 3mg/m^3, and
d. General health and safety construction procedures are implemented, which would include dust suppression methods, proper respiratory protection (minimum of a 1/2-face respirator) and protective clothing, as is appropriate for the work being completed.

4.3 Mercury

The presence of mercury as a possible constituent of paints and adhesives and within assembled units (e.g. fluorescent light bulbs) should not be considered a hazard provided that the assembled units remain sealed and intact. However, if the seals are broken, the all efforts should be made to avoid direct skin contact inhalation of mercury vapour. Prior to demolition, mercury-containing units (i.e. fluorescent light bulbs, etc.) should be removed and stored in a safe, secure location or disposed of following the requirements of O. Reg. 347/90, amended by O. Reg. 588/00.

4.4 Mould

All mould remediation work should be conducted in accordance with the following, the Environmental Abatement Council of Ontario (EACO), Edition 3, 2015 Mould Abatement Guidelines or similar industry accepted documents. Conversely, demolition of a building containing mould-affected building materials can be undertaken if appropriate measures are taken to protect the worker and avoid cross-contamination to adjacent spaces.

4.5 Bird Droppings (Guano)

All bird dropping remediation work should be conducted with specific avian pathogens precautions in accordance with the following, the Environmental Abatement Council of Ontario (EACO), Edition 3, 2015 Mould Abatement Guidelines or similar industry accepted documents.

4.6 Silica

Any work involving the disturbance of materials that may contain silica should be conducted following recommendations detailed in the Ministry of Labour document "*Guideline - Silica on Construction Projects*", dated April 2011.

4.7 Ozone Depleting Substances (OSD)

Prior to demolition, decommissioning of equipment that may contain Ozone Depleting Substances (ODS) should be completed by certified personnel and in compliance with Ozone Depleting Substances and Other Halocarbons (O. Reg. 463/10), and Ontario's General Waste Management Regulation (O. Reg. 347/90).

4.8 Polychlorinated Biphenyls (PCBs)

Fluorescent light fixtures should be disassembled to observe ballast serial codes, then compare them to standard PCB Identifier Code literature. Ballasts with unidentifiable serial codes, or from manufactures who are not included in the standard PCB Identifier Code literature, or are not

clearly labeled as "PCB Free", or no date is clearly visible (ballasts dated 1981 or later do not contain PCBs), must be assumed to contain PCBs. Ballasts and transformers confirmed or assumed to contain PCBs must be disposed of following Ontario Regulation 362 of the Environmental Protection Act, O. Reg 347/90 and Transportation of Dangerous Goods Act (TDGA) requirements.

If required, transformer units should be inspected and/or assessed for PCBs prior to disposal. Conversely, the units can be presumed to contain PCBs. If confirmed or presumed to contain PCBs, decommissioning of the transformer unit must be completed in accordance with Ontario Regulation 347, General –Waste Management, Ontario Regulation 362, Waste Management – PCB's, and amended PCB Regulations, 2008 established under the Canadian Environmental Protection Act, 1999 by a qualified contractor, experienced in PCB transformer removal).

5. STATEMENT OF LIMITATIONS

Due to the nature of building construction, some limitations exist as to the possible thoroughness of an environmental audit for the purpose of management and regulatory compliance. The field observations, measurements and analysis are considered sufficient in detail and scope to form a reasonable basis for the findings and conclusions presented in this report. The findings and conclusions drawn by ECOH Management Inc. (ECOH), concerning the survey for Designated Substances and Hazardous Materials, are limited to the specific scope of work for which ECOH was retained and are based solely on information generated as a result of the specific scope of work authorized by the Client. The results of the survey for Designated Substances and Hazardous Materials are limited to visual inspection of areas made accessible to ECOH personnel and information obtained from facility personnel, when obtained.

ECOH warrants that the findings and conclusions contained herein have been made in accordance with generally accepted evaluation methods in the industry and applicable regulations at the time of the performance of the building survey. However, there is no warranty, expressed or implied, that this survey has uncovered all environmental considerations on the subject site. In addition, ECOH cannot guarantee the completeness or accuracy of information supplied by a third party.

This report was prepared by ECOH for Tacoma Engineers. The material in it reflects ECOH's professional interpretation of information available at the time of report 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.

ECOH
Environmental Consulting
Occupational Health

Prepared By:

Mahir Bholat, B.Sc.
Senior Environnemental Scientist

Reviewed By:

Robert Lovegrove
Senior Project Manager

APPENDIX I

RESULTS OF BULK SAMPLE ANALYSIS FOR ASBESTOS & LEAD

EMSL Canada Inc.

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

EMSL Canada Order:	551703556
Customer ID:	55ECOH45
Customer PO:	17384
Project ID:	

Attention:	Mahir Bholat	**Phone:**	(416) 318-4909
	ECOH Management, Inc.	**Fax:**	(905) 795-2870
	75 Courtneypark Drive West	**Received Date:**	04/05/2017 5:00 PM
	Unit 1	**Analysis Date:**	04/07/2017 - 04/08/2017
	Mississauga, ON L5W 0E3	**Collected Date:**	04/05/2017
Project:	17384- COLLINGWOOD TERMINALS		

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
17384-AS8-01A *551703556-0001*	Bin Floor Office - Drywall Joint Compound	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
17384-AS8-01B *551703556-0002*	Bin Floor Office - Drywall Joint Compound	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
17384-AS8-01C *551703556-0003*	Bin Floor Office - Drywall Joint Compound	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
17384-AS8-02A *551703556-0004*	4th Floor Old Transformer Room - Drywall Joint Compound	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
17384-AS8-02B *551703556-0005*	4th Floor Old Transofrmer Room - Drywall Joint Compound	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
17384-AS8-02C *551703556-0006*	4th Floor Old Transofrmer Room - Drywall Joint Compound	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
17384-AS8-03A *551703556-0007*	Basement Tower - Window Caulking	Gray Non-Fibrous Homogeneous		99% Non-fibrous (Other)	1% Chrysotile
17384-AS8-03B *551703556-0008*	Bin Floor - Window Caulking				Positive Stop (Not Analyzed)
17384-AS8-03C *551703556-0009*	Office - 3rd Floor - Window Caulking				Positive Stop (Not Analyzed)
17384-AS8-04A *551703556-0010*	Bin Floor - Duct Mastic	Gray Non-Fibrous Homogeneous		99% Non-fibrous (Other)	1% Chrysotile
17384-AS8-04B *551703556-0011*	Bin Floor - Duct Mastic				Positive Stop (Not Analyzed)
17384-AS8-04C *551703556-0012*	Bin Floor - Duct Mastic				Positive Stop (Not Analyzed)
17384-AS8-05A *551703556-0013*	Stairwell - Grey Caulking Between Transite Board Backside	Gray Non-Fibrous Homogeneous		98% Non-fibrous (Other)	2% Chrysotile
17384-AS8-05B *551703556-0014*	Stairwell - Grey Caulking Between Transite Board Backside				Positive Stop (Not Analyzed)

Initial report from: 04/08/2017 10:43:29

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EMSL Canada Order:	551703556
Customer ID:	55ECOH45
Customer PO:	17384
Project ID:	

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
17384-AS8-0SC *551703556-0015*	Stairwell - Grey Caulking Between Transite Board Backside				Positive Stop (Not Analyzed)
17384-AS8-06A *551703556-0016*	Basement Tower- Belt Room - Duct Wrap	Brown Fibrous Homogeneous	60% Cellulose	40% Non-fibrous (Other)	None Detected
17384-AS8-06B *551703556-0017*	Basement Tower- Belt Room - Duct Wrap	Brown/White Fibrous Homogeneous	70% Cellulose	30% Non-fibrous (Other)	None Detected
17384-AS8-06C *551703556-0018*	Basement Tower- Belt Room - Duct Wrap	Brown Fibrous Homogeneous	70% Cellulose	30% Non-fibrous (Other)	None Detected
17384-AS8-07A *551703556-0019*	Mezzanine- 4th Floor - Fan Gasket	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
17384-AS8-07B *551703556-0020*	Mezzanine- 4th Floor - Fan Gasket	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
17384-AS8-07C *551703556-0021*	Mezzanine- 4th Floor - Fan Gasket	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
17384-AS8-08A *551703556-0022*	Basement Tower- Train Pulley Room - Unknown Material on Mechanical Equipment	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
17384-AS8-08B *551703556-0023*	Basement Tower- Train Pulley Room - Unknown Material on Mechanical Equipment	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
17384-AS8-08C *551703556-0024*	Basement Tower- Train Pulley Room - Unknown Material on Mechanical Equipment	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
17384-AS8-09A *551703556-0025*	Exterior- Bottomof Towers - Tar	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
17384-AS8-09B *551703556-0026*	Exterior- Bottomof Towers - Tar	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
17384-AS8-09C *551703556-0027*	Exterior- Bottomof Towers - Tar	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
17384-AS8-10A *551703556-0028*	Basement Tower - Transite Board	Gray Non-Fibrous Homogeneous		90% Non-fibrous (Other)	10% Chrysotile
17384-AS8-10B *551703556-0029*	Bin Floor - Transite Board				Positive Stop (Not Analyzed)
17384-AS8-10C *551703556-0030*	2nd Floor Transformer Room- Red Brick Building - Transite Board				Positive Stop (Not Analyzed)

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EMSL Canada Order:	551703556
Customer ID:	55ECOH45
Customer PO:	17384
Project ID:	

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
17384-AS8-11A *551703556-0031*	Basement- Red Brick Building - Drywall Joint Compound	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
17384-AS8-11B *551703556-0032*	Basement- Red Brick Building - Drywall Joint Compound	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
17384-AS8-11C *551703556-0033*	Basement- Red Brick Building - Drywall Joint Compound	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
17384-AS8-12A *551703556-0034*	Basement- Red Brick Building - Ceiling Tile- 2'x4' White	Brown Fibrous Homogeneous	90% Cellulose	10% Non-fibrous (Other)	None Detected
17384-AS8-12B *551703556-0035*	Basement- Red Brick Building - Ceiling Tile- 2'x4' White	Brown Fibrous Homogeneous	90% Cellulose	10% Non-fibrous (Other)	None Detected
17384-AS8-12C *551703556-0036*	Basement- Red Brick Building - Ceiling Tile- 2'x4' White	Brown Fibrous Homogeneous	90% Cellulose	10% Non-fibrous (Other)	None Detected
17384-AS8-13A *551703556-0037*	2nd Floor Transformer Room- Red Brick Building - Flex Duct Connector	Brown Fibrous Homogeneous	30% Cellulose 60% Synthetic	10% Non-fibrous (Other)	None Detected
17384-AS8-13B *551703556-0038*	2nd Floor Transformer Room- Red Brick Building - Flex Duct Connector	Brown Fibrous Homogeneous	30% Cellulose 60% Synthetic	10% Non-fibrous (Other)	None Detected
17384-AS8-13C *551703556-0039*	2nd Floor Transformer Room- Red Brick Building - Flex Duct Connector	Brown Fibrous Homogeneous	30% Cellulose 60% Synthetic	10% Non-fibrous (Other)	None Detected
17384-AS8-14A *551703556-0040*	Ground Floor Storage Room- Red Brick Building - Window Caulking	Gray Non-Fibrous Homogeneous		99% Non-fibrous (Other)	1% Chrysotile
17384-AS8-14B *551703556-0041*	2nd Floor Classroom- Red Brick Building - Window Caulking				Positive Stop (Not Analyzed)
17384-AS8-14C *551703556-0042*	2nd Floor Transformer Room- Red Brick Building - Window Caulking				Positive Stop (Not Analyzed)
17384-AS8-15A *551703556-0043*	Exterior- Red Brick Building - Brick Mortar	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
17384-AS8-15B *551703556-0044*	Exterior- Red Brick Building - Brick Mortar	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
17384-AS8-15C *551703556-0045*	Exterior- Red Brick Building - Brick Mortar	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
17384-AS8-16A *551703556-0046*	Tower- Roof - Roofing Materials	Black Non-Fibrous Homogeneous		93% Non-fibrous (Other)	7% Chrysotile
17384-AS8-16B *551703556-0047*	Tower- Roof - Roofing Materials				Positive Stop (Not Analyzed)

Initial report from: 04/08/2017 10:43:29

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EMSL Canada Order:	551703556
Customer ID:	55ECOH45
Customer PO:	17384
Project ID:	

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
17384-AS8-16C *551703556-0048*	Tower- Roof - Roofing Materials				Positive Stop (Not Analyzed)

Analyst(s)
John Biesiadecki (26)
Shorthri Kalikutty (10)

Matthew Davis
or Other Approved Signatory

Initial report from: 04/08/2017 10:43:29

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CustomerID:	55ECOH45
CustomerPO:	17384
ProjectID:	

Attn: **Mahir Bholat**
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75 Courtneypark Drive West
Unit 1
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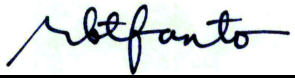
Fax:	(905) 795-2870
Received:	04/05/17 5:30 PM
Collected:	4/4/2017

Project: **17384- COLLINGWOOD TERMINALS**

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

Client Sample Description	*Lab ID*	*Collected*	*Analyzed*	*Lead Concentration*
17384-PB-01	*551703554-0001*	4/4/2017	4/7/2017	<90 ppm
	Site: White Paint- Exterior Tower			
17384-PB-02	*551703554-0002*	4/4/2017	4/7/2017	100000 ppm
	Site: Grey Wall Paint- Compressor Room- Basement			
17384-PB-03	*551703554-0003*	4/4/2017	4/7/2017	32000 ppm
	Site: Silver Duct Paint- Bin Floor			
17384-PB-04	*551703554-0004*	4/4/2017	4/7/2017	280 ppm
	Site: White Wall Paint- Bin Floor			
17384-PB-05	*551703554-0005*	4/4/2017	4/7/2017	640 ppm
	Site: Yellow Wall Paint- Office- 3rd Floor			
17384-PB-06	*551703554-0006*	4/4/2017	4/7/2017	620 ppm
	Site: Blue/ Brown Wall Paint- Office- 3rd Floor			
17384-PB-07	*551703554-0007*	4/4/2017	4/7/2017	260 ppm
	Site: White Ceiling Paint- Basement- Red Brick Bldg.			
17384-PB-08	*551703554-0008*	4/4/2017	4/7/2017	330 ppm
	Site: White Wall Paint- Storage Room- Red Brick Bldg.			
17384-PB-09	*551703554-0009*	4/4/2017	4/7/2017	6800 ppm
	Site: Grey Wall Paint- Transformer Room- Red Brick Bldg			



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 04/10/2017 10:29:22

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EMSL Canada Or	551703554
CustomerID:	55ECOH45
CustomerPO:	17384
ProjectID:	

Attn: **Mahir Bholat**
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Phone:	(905) 795-2800
Fax:	(905) 795-2870
Received:	04/05/17 5:30 PM
Collected:	4/4/2017

Project: **17384- COLLINGWOOD TERMINALS**

Test Report: Lead by Flame AAS (SW 846, 7000B)

Client Sample Description	*Lab ID*	*Collected*	*Analyzed*	*Lead* ***Concentration***
17384-PB-10	*551703554-0010*	4/4/2017	4/7/2017	<40 mg/Kg
	Site: Brick Mortar- Exterior- Red Brick Bldg			

Rowena Fanto, Lead Supervisor
or other approved signatory

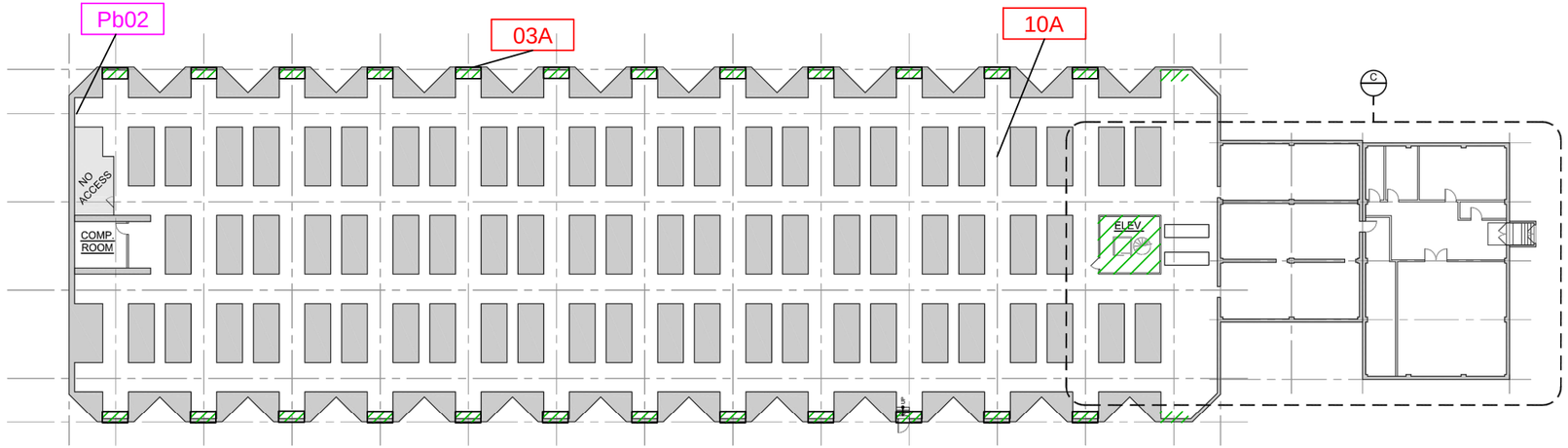
Detection limit is 40 mg/kg based on a 0.5 gram sample weight. This report relates only to those items tested. Samples received in good condition unless otherwise noted. Quality Control Data associated with this sample set is within acceptable limits, unless otherwise noted. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit.

Samples analyzed by EMSL Canada Inc. Mississauga, ON A2LA# 2845.08

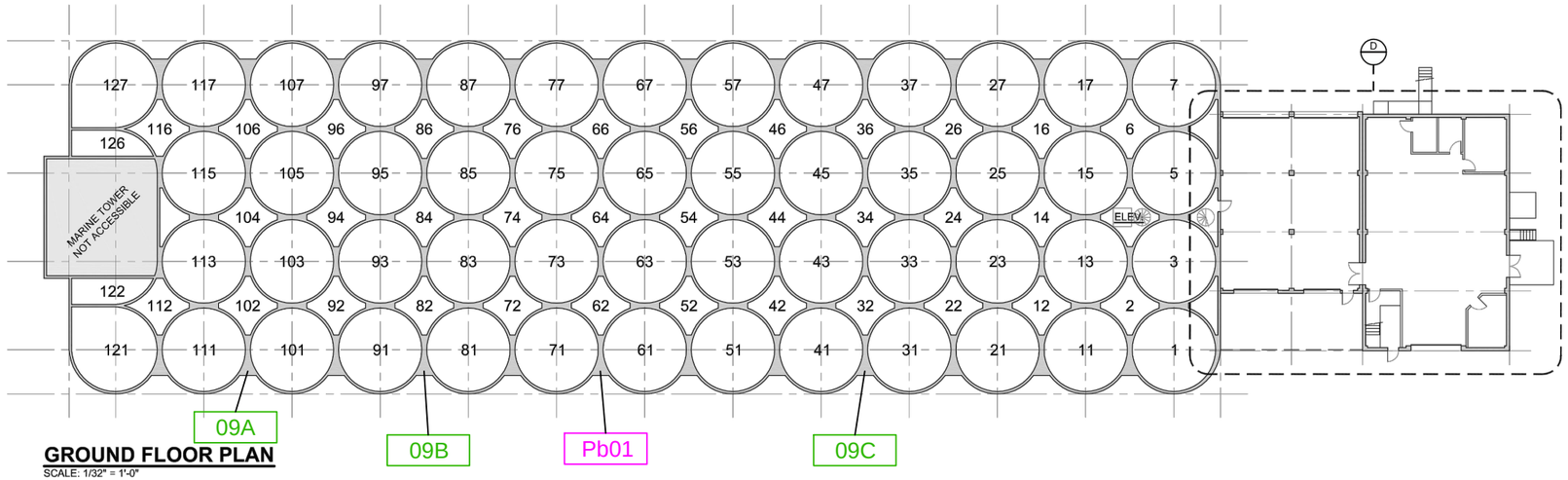
Initial report from 04/10/2017 10:29:22

APPENDIX II

PROJECT DRAWINGS



BASEMENT PLAN
SCALE: 1/32" = 1'-0"



GROUND FLOOR PLAN
SCALE: 1/32" = 1'-0"

Legend

01a	Positive Asbestos Bulk Sample Location (17384-xx)
01a	Negative Asbestos Bulk Sample Location (17384-xx)
Pb01	Lead Bulk Sample Location (17384-Pb-xx)
	Non-Friable Asbestos-Containing Material

All information relating to room size and location is approximate and for visual aid only. ECOH does not guarantee the drawing to be complete, absolute, accurate or current. The drawing should not be used by any party in lieu of obtaining architectural drawings.

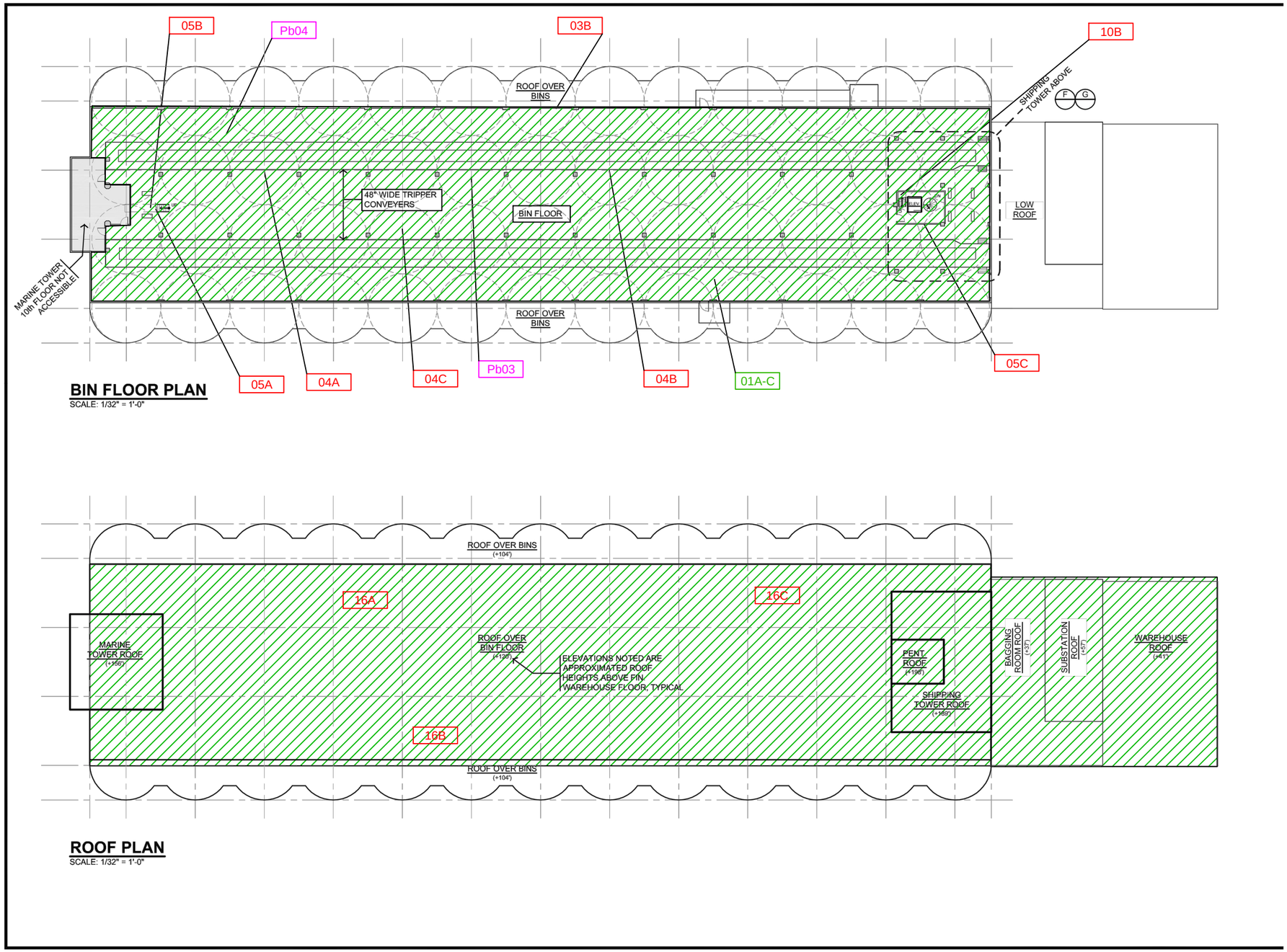
Figure 1

LOCATION:
Collingwood Terminals,
Collingwood, Ontario

PROJECT:
Designated Substance Survey

CLIENT:	Collingwood Terminals		
PROJECT NUMBER:	17384	DATE: May 2017	DRW BY: JK
CAD FILE:	FIG1- 6P17384 DSS-Collingwood Terminals	SCALE: Not to Scale	CHK BY: BE

ECOH
Environmental Consulting
Occupational Health



Legend

01a	Positive Asbestos Bulk Sample Location (17384-xx)
01a	Negative Asbestos Bulk Sample Location (17384-xx)
Pb01	Lead Bulk Sample Location (17384-Pb-xx)
	Non-Friable Asbestos-Containing Material

All information relating to room size and location is approximate and for visual aid only. ECOH does not guarantee the drawing to be complete, absolute, accurate or current. The drawing should not be used by any party in lieu of obtaining architectural drawings.

Figure 2

LOCATION:
Collingwood Terminals,
Collingwood, Ontario

PROJECT:
Designated Substance Survey

CLIENT:	Tacoma Engineers		
PROJECT NUMBER: 17384	**DATE:** May 2017	**DRW BY:** JK	
CAD FILE: FIG1- 6P17384 DSS-Collingwood Terminals	**SCALE:** Not to Scale	**CHK BY:** BE	

ECOH
Environmental Consulting
Occupational Health

PARTIAL BASEMENT PLAN
3/32" = 1'-0"

Legend

01a	Positive Asbestos Bulk Sample Location (17384-xx)
01a	Negative Asbestos Bulk Sample Location (17384-xx)
Pb01	Lead Bulk Sample Location (17384-Pb-xx)
	Non-Friable Asbestos-Containing Material

All information relating to room size and location is approximate and for visual aid only. ECOH does not guarantee the drawing to be complete, absolute, accurate or current. The drawing should not be used by any party in lieu of obtaining architectural drawings.

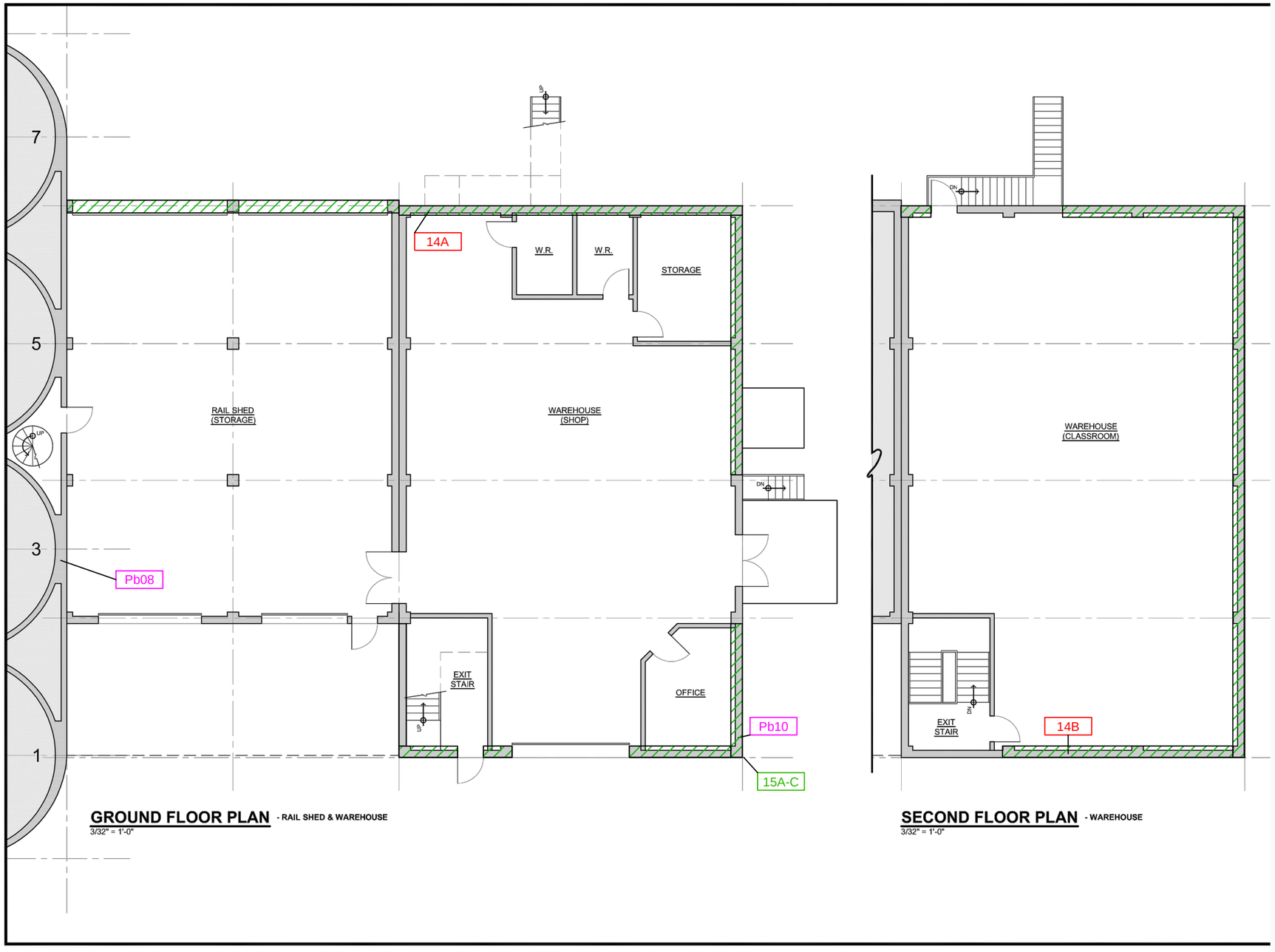
Figure 3

LOCATION:
Collingwood Terminals,
Collingwood, Ontario

PROJECT:
Designated Substance Survey

CLIENT:	Tacoma Engineers		
PROJECT NUMBER: 17384		DATE: May 2017	DRW BY: JK
CAD FILE: FIG1- 6P17384 DSS-Collingwood Terminals		SCALE: Not to Scale	CHK BY: BE

ECOH
Environmental Consulting
Occupational Health



GROUND FLOOR PLAN - RAIL SHED & WAREHOUSE
3/32" = 1'-0"

SECOND FLOOR PLAN - WAREHOUSE
3/32" = 1'-0"

Legend

01a	Positive Asbestos Bulk Sample Location (17384-xx)
01a	Negative Asbestos Bulk Sample Location (17384-xx)
Pb01	Lead Bulk Sample Location (17384-Pb-xx)
	Non-Friable Asbestos-Containing Material

All information relating to room size and location is approximate and for visual aid only. ECOH does not guarantee the drawing to be complete, absolute, accurate or current. The drawing should not be used by any party in lieu of obtaining architectural drawings.

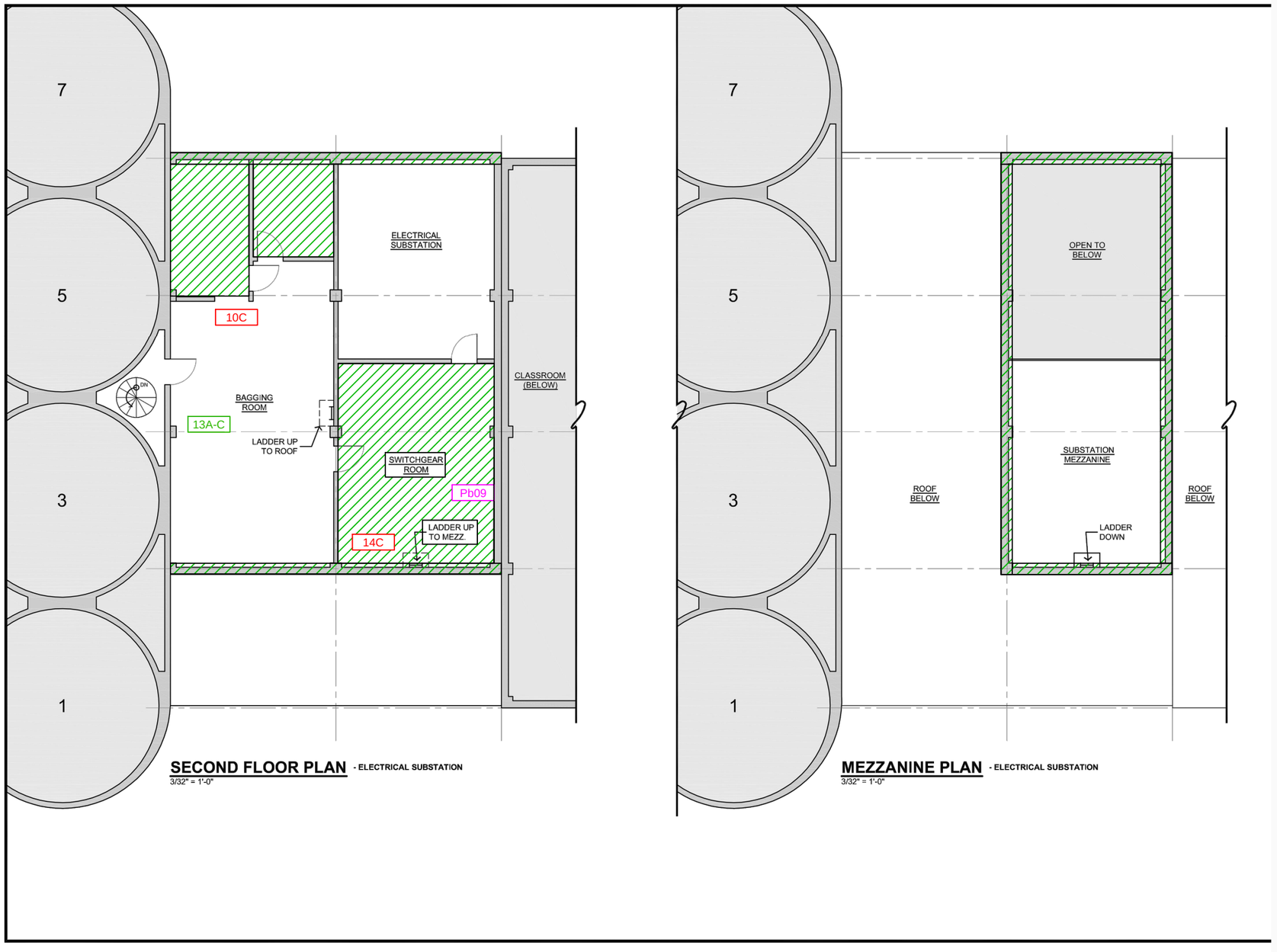
Figure 4

LOCATION:
Collingwood Terminals,
Collingwood, Ontario

PROJECT:
Designated Substance Survey

CLIENT:	Tacoma Engineers		
PROJECT NUMBER:	17384	DATE: May 2017	DRW BY: JK
CAD FILE:	FIG1- 6P17384 DSS-Collingwood Terminals	SCALE: Not to Scale	CHK BY: BE

ECOH
Environmental Consulting
Occupational Health



SECOND FLOOR PLAN - ELECTRICAL SUBSTATION
3/32" = 1'-0"

MEZZANINE PLAN - ELECTRICAL SUBSTATION
3/32" = 1'-0"

Legend

01a	Positive Asbestos Bulk Sample Location (17384-xx)
01a	Negative Asbestos Bulk Sample Location (17384-xx)
Pb01	Lead Bulk Sample Location (17384-Pb-xx)
	Non-Friable Asbestos-Containing Material

All information relating to room size and location is approximate and for visual aid only. ECOH does not guarantee the drawing to be complete, absolute, accurate or current. The drawing should not be used by any party in lieu of obtaining architectural drawings.

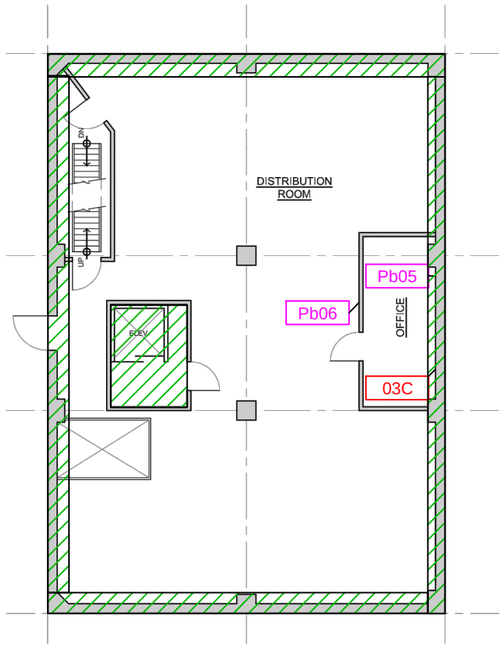
Figure 5

LOCATION:
Collingwood Terminals,
Collingwood, Ontario

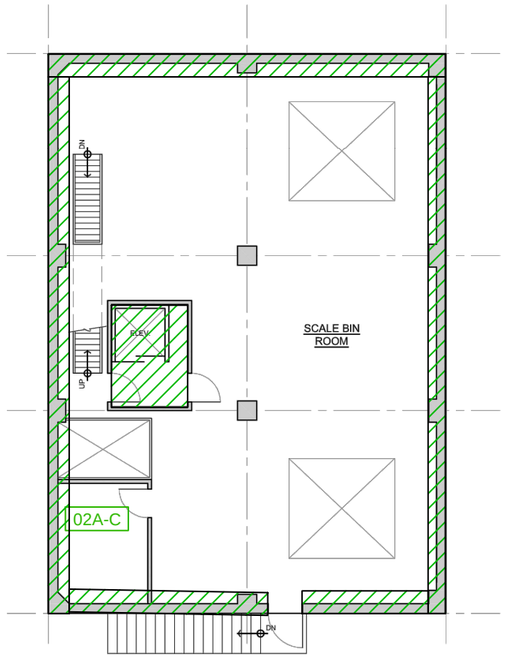
PROJECT:
Designated Substance Survey

CLIENT:	Tacoma Engineers		
PROJECT NUMBER:	17384	**DATE:** May 2017	**DRW BY:** JK
CAD FILE:	FIG1- 6P17384 DSS-Collingwood Terminals	**SCALE:** Not to Scale	**CHK BY:** BE

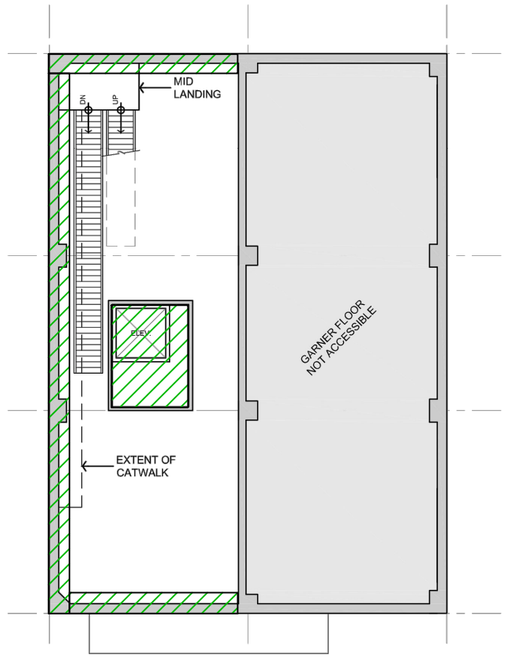
ECOH
Environmental Consulting
Occupational Health



FLOOR 1 PLAN - SHIPPING TOWER SCALE DISTRIBUTION FLOOR
3/32" = 1'-0"



FLOOR 2 PLAN - SHIPPING TOWER SCALE BIN FLOOR
3/32" = 1'-0"



FLOOR 3 PLAN - SHIPPING TOWER GARNER FLOOR
3/32" = 1'-0"

Legend

01a	Positive Asbestos Bulk Sample Location (17384-xx)
01a	Negative Asbestos Bulk Sample Location (17384-xx)
Pb01	Lead Bulk Sample Location (17384-Pb-xx)
	Non-Friable Asbestos-Containing Material

All information relating to room size and location is approximate and for visual aid only. ECOH does not guarantee the drawing to be complete, absolute, accurate or current. The drawing should not be used by any party in lieu of obtaining architectural drawings.

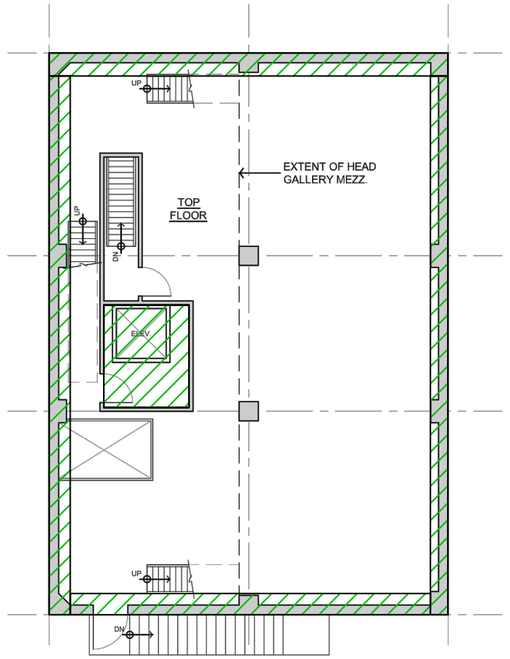
Figure 6

LOCATION:
Collingwood Terminals,
Collingwood, Ontario

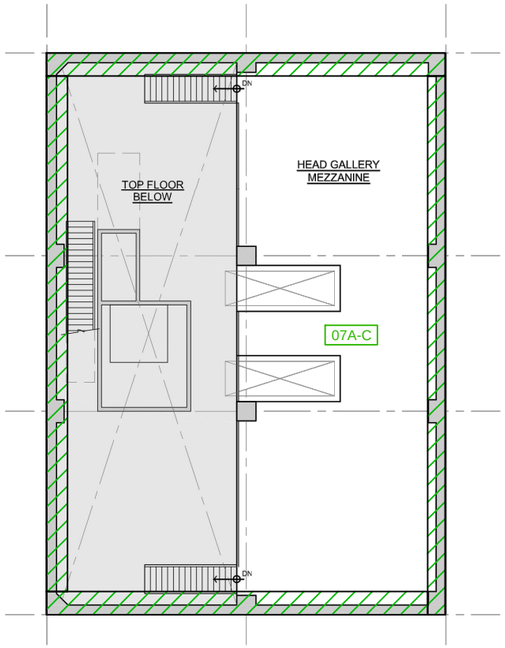
PROJECT:
Designated Substance Survey

CLIENT:	Tacoma Engineers		
PROJECT NUMBER: 17384	**DATE:** May 2017	**DRW BY:** JK	
CAD FILE: FIG1- 6P17384 DSS-Collingwood Terminals	**SCALE:** Not to Scale	**CHK BY:** BE	

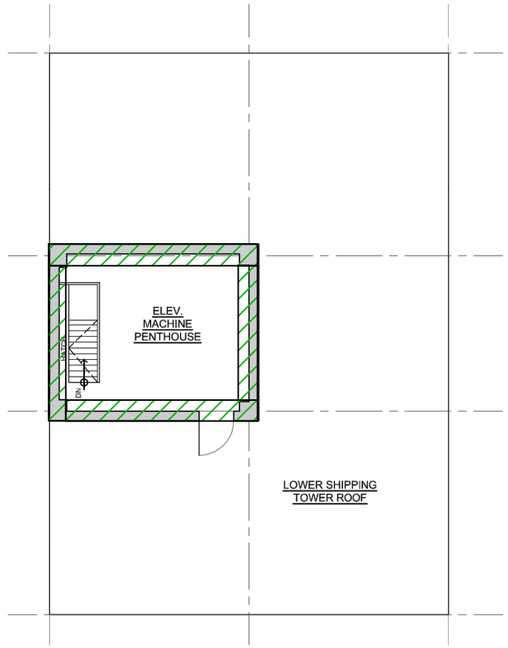
ECOH
Environmental Consulting
Occupational Health



FLOOR 4 PLAN - SHIPPING TOWER TOP FLOOR
3/32" = 1'-0"



FLOOR 4 MEZZ. - SHIPPING TOWER HEAD GALLERY
3/32" = 1'-0"



FLOOR 5 PLAN - SHIPPING TOWER PENTHOUSE
3/32" = 1'-0"

Legend

01a	Positive Asbestos Bulk Sample Location (17384-xx)
01a	Negative Asbestos Bulk Sample Location (17384-xx)
Pb01	Lead Bulk Sample Location (17384-Pb-xx)
	Non-Friable Asbestos-Containing Material

All information relating to room size and location is approximate and for visual aid only. ECOH does not guarantee the drawing to be complete, absolute, accurate or current. The drawing should not be used by any party in lieu of obtaining architectural drawings.

Figure 7

LOCATION:
Collingwood Terminals,
Collingwood, Ontario

PROJECT:
Designated Substance Survey

CLIENT:	Tacoma Engineers		
PROJECT NUMBER: 17384		**DATE:** May 2017	**DRW BY:** JK
CAD FILE: FIG1- 6P17384 DSS-Collingwood Terminals		**SCALE:** Not to Scale	**CHK BY:** BE

ECOH
Environmental Consulting
Occupational Health

APPENDIX III

SITE PHOTOGRAPHS

Client Name:	**Site Location:**	**Project No.**
Tacoma Engineers	Collingwood Terminals, Heritage Drive, Collingwood, ON	17384

Photo No. 1. **Date: April 4th, 2017** **Location:** Bin Floor – 2nd Floor – Main Terminal **Description:** Grey mastic on ducts, **asbestos-containing**.	

Photo No. 2. **Date: April 4th, 2017** **Location:** Bin Floor – 2nd Floor – Main Terminal **Description:** Grey caulking around the windows, **asbestos-containing**.	

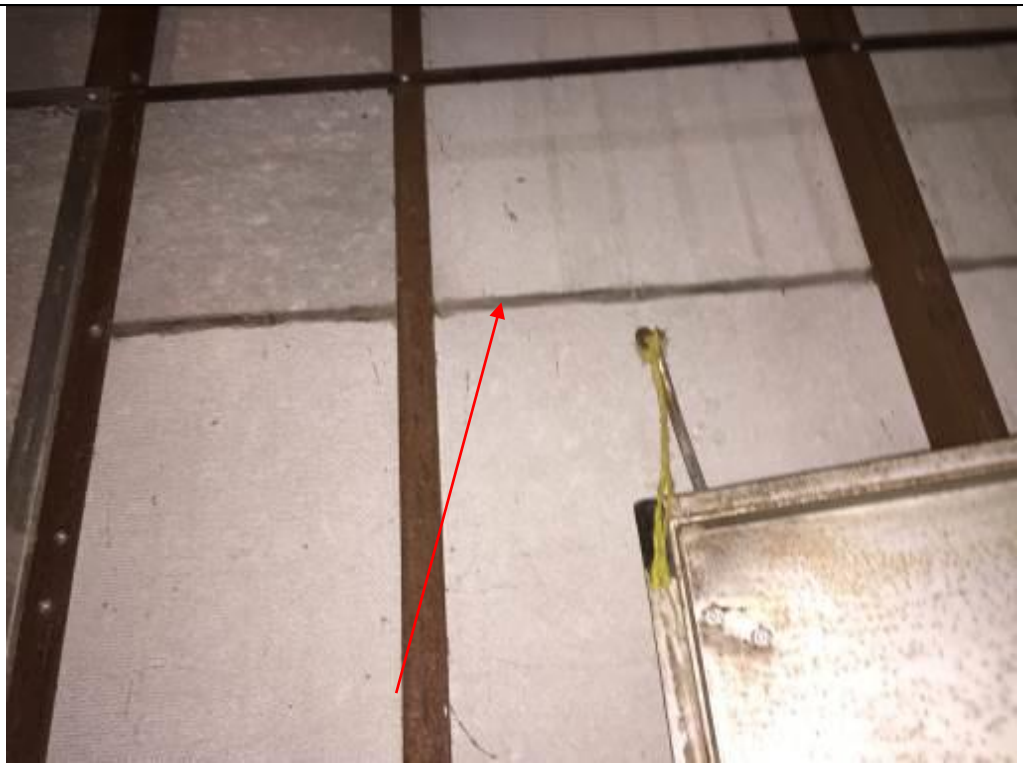
Client Name:	**Site Location:**	**Project No.**
Tacoma Engineers	Collingwood Terminals, Heritage Drive, Collingwood, ON	17384

Photo No. 3. **Date: April 4th, 2017** **Location:** Bin Floor – 2nd Floor – Main Terminal **Description:** Mini office made from transite cement board, **asbestos-containing**.	

Photo No. 4. **Date: April 4th, 2017** **Location:** Basement – Main Terminal **Description:** Storage room made from transite cement board, **asbestos-containing**	

Client Name:	**Site Location:**	**Project No.**
Tacoma Engineers	Collingwood Terminals, Heritage Drive, Collingwood, ON	17384

Photo No. 5. **Date: April 4th, 2017** **Location:** Roof **Description:** Black roofing material, **asbestos-containing**.	

Photo No. 6. **Date: April 4th, 2017** **Location:** Stairwell – Main Terminal **Description:** Grey caulking on the backside, between sheets of transite board, **asbestos-containing**.	

Client Name:	**Site Location:**	**Project No.**
Tacoma Engineers	Collingwood Terminals, Heritage Drive, Collingwood, ON	17384

Photo No. 7.

Date: April 4th, 2017

Location:
Marine Tower

Description:
Bird droppings present all throughout the Marine Tower.

Photo No. 8.

Date: April 4th, 2017

Location:
Bin Floor – 2nd Floor – Main Terminal

Description:
Mildew observed on walls and ceilings throughout the floor.

Client Name:	**Site Location:**	**Project No.**
Tacoma Engineers	Collingwood Terminals, Heritage Drive, Collingwood, ON	17384

Photo No. 9. **Date: April 4th, 2017** **Location:** 3rd & 4th Floor – Main Terminal **Description:** Mildew observed on walls and ceilings throughout the floor.	

Photo No. 10. **Date: April 4th, 2017** **Location:** 4th Floor – Mezzanine **Description:** Gaskets on mechanical equipment, does not contain asbestos.	

Client Name:	**Site Location:**	**Project No.**
Tacoma Engineers	Collingwood Terminals, Heritage Drive, Collingwood, ON	17384

Photo No. 11. **Date: April 4th, 2017** **Location:** Train Pulley Room (Basement) – Main Terminal **Description:** Unknown insulation material on mechanical equipment, does not contain asbestos.	

Photo No. 12. **Date: April 4th, 2017** **Location:** Belt Room (Basement) – Main Terminal **Description:** Paper wrap on ducts, does not contain asbestos.	

Client Name:	**Site Location:**	**Project No.**
Tacoma Engineers	Collingwood Terminals, Heritage Drive, Collingwood, ON	17384

Photo No. 13. **Date: April 4th, 2017** **Location:** Exterior of Terminals **Description:** Tar on the base of the terminals, does not contain asbestos.	

Photo No. 14. **Date: April 4th, 2017** **Location:** Basement – Red Brick Building **Description:** 2'x4' White Ceiling Tiles, do not contain asbestos.	

Client Name:	**Site Location:**	**Project No.**
Tacoma Engineers	Collingwood Terminals, Heritage Drive, Collingwood, ON	17384

Photo No. 15. **Date: April 4th, 2017** **Location:** Transformer Room (2nd Floor) – Red Brick Building **Description:** Flex duct connector, does not contain asbestos.	

Photo No. 16. **Date: April 4th, 2017** **Location:** Exterior – Red Brick Building **Description:** Brick mortar, does not contain asbestos.	

Client Name:	**Site Location:**	**Project No.**
Tacoma Engineers	Collingwood Terminals, Heritage Drive, Collingwood, ON	17384

Photo No. 17. **Date: April 4th, 2017** **Location:** Workshop – Red Brick Building **Description:** Light ballast, presumed to contain PCBs.	

Photo No. 18. **Date: April 4th, 2017** **Location:** Transformer Room (2nd Floor) – Red Brick Building **Description:** Transformers, assumed to contain PCBs.	

Client Name:	**Site Location:**	**Project No.**
Tacoma Engineers	Collingwood Terminals, Heritage Drive, Collingwood, ON	17384

Photo No. 19. **Date: April 4th, 2017** **Location:** 2nd Floor Classroom – Red Brick Building **Description:** Mould affected and water damaged drywall.	

Photo No. 20. **Date: April 4th, 2017** **Location:** Basement – Red Brick Building **Description:** Mould affected and water damaged drywall.	

APPENDIX IV

HAZARDOUS MATERIALS INFORMATION

ACRYLONITRILE

Acrylonitrile is a synthetic chemical used in the manufacturing of plastics, paints and adhesives, including acrylonitrile-butadiene-styrene (ABS) piping. Acrylonitrile is hazardous as a gas, a vapour, a mist, a particulate or a liquid. Acrylonitrile-based products in solid form are non-toxic unless these products are burned or caused to create dust. Dust suppression and personal protection procedures should be implemented during the demolition of products that may contain Acrylonitrile.

ARSENIC

Arsenic is a naturally occurring element. It has historically been used in insecticides, paints and pigments, adhesives, and in the manufacture of integrated circuits. Arsenic is also present in wood that has been treated with chromated copper arsenate (also known as pressure treated, Tanalith and CCA wood). Arsenic gas, liquid, vapours and particulates are harmful if ingested, inhaled, or absorbed through the skin. Arsenic in painted finishes, adhesives, circuits and wood is generally non-hazardous provided the material is not burned or caused to create dust. Dust suppression and personal protection procedures should be implemented during the demolition of products that may contain Arsenic.

ASBESTOS

Asbestos is a naturally occurring mineral that was added to various materials to add fire, heat and chemical resistance, strength and texture. Asbestos may be present in fireproofing, surfacing materials (e.g. plaster, drywall joint compound, textured finishes), mechanical insulations, vinyl floor tiles, asbestos cement products, ceiling tiles, mastics and caulking, as well as many other miscellaneous building materials. Asbestos is hazardous as a particulate if it is inhaled. Precautionary methods for the safe removal of asbestos-containing materials are detailed in Ontario Regulation 278/05, and include the use of site isolation techniques, dust suppression and personal protection equipment.

BENZENE

Benzene is naturally present in crude oil and is found in hydraulic oils and fuels. Additionally, benzene is an industrial solvent and is used in the manufacture of plastics, paints, adhesives, rubber, resins, detergents and lubricants. Benzene is harmful if inhaled (as a mist, vapour or gas) or ingested. The removal and disposal of petroleum-based products such as hydraulic oils and fuels (gasoline, diesel, heating oil, etc.) must be completed by certified persons and in accordance to applicable regulations. Dust suppression and personal protection procedures should be implemented during the removal of solid products that may contain Benzene.

COKE OVEN EMISSIONS

Coke Oven Emissions are mixtures of coal and coke particles, vapours, gases, and tars that are released during the production of coke from coal. Coke Oven Emissions contain other hazardous materials including lead, benzene and arsenic. Coke is used to extract metals from ore, to synthesize calcium carbide and to manufacture graphite and electrodes. Exposure to Coke Oven Emissions may occur during the production of coke or while using coke during the above noted processes.

ETHYLENE OXIDE

Ethylene Oxide is a flammable gas used in the production of textiles, detergents, polyurethane foam, antifreeze, solvents, medicinal products and adhesives. Ethylene Oxide is hazardous as a gas, vapour or mist if inhaled or as a liquid if contact is made with the skin. Ethylene Oxide gas is also highly reactive and flammable. Solid finished products with which Ethylene Oxide was manufactured are non-toxic unless these products are burned or caused to create dust. Dust suppression and personal protection procedures should be implemented during the removal of products that may contain Ethylene Oxide.

FECAL WASTE

Animal fecal waste poses serious health risks in both the spread of zoonotic diseases (those diseases which are transferred from animals to humans) and the presence of noxious ammonia. Examples of zoonotic diseases include influenza, rabies, cat scratch fever, hookworm, and ringworm. Toxoplasmosis, a parasitic disease caused by the fungus *Histoplasma capsulatum,* can be transferred to human through animal feces and is known to cause severe birth defects or stillbirth in the case of infected pregnant women. Dust suppression and personal protection procedures should be implemented during the removal of animal feces and/or bird and bat guano.

ISOCYANATES

Isocyanates are used in the manufacturing of all polyurethane products. They may be present in polyurethane foams, paints and coatings. Isocyanates are harmful as vapours, mists, particulates or liquids. Solid finished products with which isocyanates were manufactured are non-toxic unless these products are burned or caused to create dust. Dust suppression and personal protection procedures should be implemented during the removal of products that may contain Isocyanates.

LEAD

Lead is a malleable metal with a variety of applications. Lead may be present in paint, in wiring connectors and electric cable sheathing, in piping and solder joints, in ceramic products (including floor tiles), in baffling, in batteries and in equipment designed to protect from radioactivity. The use of lead in paint was gradually phased out during the mid-1970s. Although no regulations exist in Ontario, the USA Housing and Urban Development (HUD) and the EPA's Toxic Substance Control Act define lead based paint as paint that has lead equal to or exceeding 0.5 percent by weight. Lead is harmful if ingested or inhaled; direct skin contact with lead should be avoided. Materials known or suspected to be lead-containing should not be burned or caused to create dust.

MERCURY

Mercury is a naturally occurring metal that is a liquid at room temperature. Liquid mercury is used in batteries, paints and adhesives, thermostats, thermometers, barometers, monometers, and as a catalyst in the production of polymers. Mercury gas is present in fluorescent light tubes. Mercury that is contained in assembled units does not pose a health hazard provided the assembled units remain intact. Mercury vapours are toxic if inhaled or ingested. Mercury in all forms may be hazardous and attempts should be made to avoid direct skin contact with this material. Disposal of mercury-containing assembled units should be conducted in accordance with applicable regulations. Mercury-containing paints and adhesives should be conducted using dust suppression and personal protection procedures.

MOULD

Moulds and fungi are ubiquitous, found in nature and are necessary for the breakdown of leaves, wood and other plant debris. These micro-organisms can enter a building directly or by their spores being carried in by the air. The presence of mould does not always mean that health problems will occur. However, for some people the inhalation of the mould, fragments of the moulds, or spores can lead to health problems or make certain health conditions worse.

In addition, many of these moulds make "mycotoxins". Mycotoxins are metabolites or by-products from the moulds that have been identified as being toxic to humans. These toxins can slowly wear down the immune system and can lead to allergic or respiratory problems.

In general, the most commonly reported symptoms include:

- runny nose or nasal congestion
- fatigue

- eye irritation
- cough or congestion
- aggravation of asthma
- headaches
- difficulty concentrating.

Moulds can also exacerbate (make worse) the symptoms of allergies including wheezing, chest tightness, shortness of breath as well as nasal congestion and eye irritation. People who are immuno-suppressed, or recovering from surgery are usually more susceptible to health problems from moulds.

OZONE DEPLETING SUBSTANCES

Ozone depleting substances (ODS) are chemicals that breakdown in the stratosphere and release chlorine or bromine, which destroy the stratospheric ozone layer. Most of these substances are also greenhouse gases. Ozone depleting substances are used as foam blowing agents, solvents, fire extinguishing agents and refrigerants for air conditioning and refrigeration applications.

Ontario Regulation 184/94 *Refrigerants* require that refrigeration equipment with a total capacity of 22 kilowatts and a minimum of one compressor (with some exceptions for chillers) cannot be refilled with a chlorofluorocarbon as of January 1, 2009, and that all refrigeration equipment containing chlorofluorocarbons with a total capacity of 22 kilowatts and a minimum of one compressor must be removed from service by January 1, 2012.

POLYCHLORINATED BIPHENYLS

Polychlorinated biphenyls (PCBs) are a group of man-made chemicals. They were widely used in many different products, including electrical equipment, surface coatings, inks, adhesives, flame-retardants, paints, industrial processes, and in the manufacture and recycling of carbonless copy paper until research revealed that they pose risks to human health, wildlife and the natural environment.

The commercial production of PCBs started in 1929 but their use has been banned or severely restricted in many countries since the 1970s and 80s because of the possible risks to human health and the environment.

RADIOACTIVE SMOKE DETECTORS

Smoke detectors are found in both residential and commercial properties and may use one or both systems of smoke detection; ionization smoke detection and photoelectric smoke detection. Ionization smoke detectors use a small amount of radioactive source, americium-241, as a key component of smoke detection. Americium-241 emits alpha particles and low-energy gamma rays. A sensor detects the flow of alpha particles radiating from the source material, when the flow of alpha particles is blocked by smoke particles, the alarm is activated.

When smoke detectors are used in accordance with manufacturer instructions and are not tampered with, they pose no radiation health risk. According to the Canadian Nuclear Association, ionization smoke detectors do not pose a health risk to the public or to waste disposal workers and may be disposed of as household waste.

SILICA

Silica is a component of sand, quartz and granite. It is present in brick, concrete, cement mortar, topsoil and asphalt. Silica is hazardous as a particulate when it is inhaled and may cause skin irritation if direct skin contact is made. Products containing Silica are not hazardous provided the particle size is not small enough to be inhaled. Demolition of Silica-containing building materials should be conducted following recommendations detailed within the Ministry of Labour Guideline, "*Silica on Construction Projects*", dated September 2004. This involves the use of general safety precautions such as appropriate dust suppression methods and proper personal protective equipment.

UREA FORMALDEHYDE FOAM INSULATION (UFFI)

Urea-formaldehyde foam insulation (UFFI) was developed in Europe in the 1950s as an improved means of insulating difficult-to-reach cavities in house walls. It is typically made at a construction site from a mixture of urea-formaldehyde resin, a foaming agent and compressed air. When the mixture is injected into the wall, urea and formaldehyde unite and "cure" into an insulating foam plastic. In the insulating process, a slight excess of formaldehyde was often added to ensure complete "curing" with the urea to produce the urea-formaldehyde foam. That excess was given off during the curing, almost entirely within a day or two of injection. Properly installed, UFFI might not have resulted in any problem. Unfortunately, however, UFFI was sometimes improperly installed or used in locations where it should not have been.

Formaldehyde gas is an irritant and is a toxic gas in significant concentrations. Symptoms of overexposure to formaldehyde include irritation to eyes, nose and throat; persistent cough and respiratory distress; skin irritation; nausea; headache; and dizziness.

VINYL CHLORIDE MONOMER

Vinyl chloride monomer is a colourless, flammable gas that is used in the manufacturing of Polyvinyl Chloride (PVC). PVC is a plastic that is used to make containers, pipes and conduits, flooring and latex paint. Trace amounts of this material would be expected on PVC piping and conduit as a by-product of the manufacturing process. As a component of PVC, vinyl chloride monomer is non-hazardous unless it is burned or caused to create dust. During the demolition of products that may contain vinyl chloride monomer dust suppression and personal protection procedures should be implemented.