Public Works and Government Services Canada

Requisition No: EZ108-222083

DRAWINGS & SPECIFICATIONS
for

Building 1007 Demolition
Esquimalt Graving Dock
Project No.: R.118910.001
2021-12-22

APPROVED BY:

Fung, Philip
Digitally signed by: Fung, Philip
DN: CN = Fung, Philip C = CA O = GC OU = PWGSC-TPSGC
Date: 2021.12.24 09:59:29 -08'00'

Regional Manager, AES — Date

Patterson, Christopher
Digitally signed by Patterson, Christopher
Date: 2021.12.22 14:16:18 -08'00'

Construction Safety Coordinator — Date

TENDER:

Siska, Jon
Digitally signed by: Siska, Jon
DN: CN = Siska, Jon C = CA O = GC OU = PWGSC-TPSGC
Date: 2021.12.22 14:04:00 -08'00'

Project Manager — Date

Real Property Services Branch, Professional and Technical Services, Pacific Region
Room 219 - 800 Burrard Street, Vancouver, B.C., V6Z 0B9

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Part 1 Summary of Work

1.1 WORK COVERED BY CONTRACT DOCUMENTS

.1 Work of this Contract consists of execution of hazardous materials abatement and demolition of Building 1007 (also known as the Kiln Building), located at the Esquimalt Graving Dock, Esquimalt, BC; further identified as the Work, and summarized as follows:

- .1 Hazardous Building Materials Abatement
  - .1 Remove and dispose of asbestos-containing black firestop/wall mastic applied sporadically to red masonry block walls, concrete wall surfaces and upper wall seams between concrete wall and red masonry block walls throughout both the interior and exterior.
  - .2 Remove and dispose of asbestos-containing roof tar present as the base layer of roofing on top of the wood roof deck (roof is approximately 760 square metres), penetrating through seams on the underside of roof decking in various locations on the interior and on masonry materials at the tops of walls where it has dripped down from the roof.
    - .1 Due to the extent of this material, it is anticipated that the entire roof assembly (wood decking, tar, tar felt, asphalt sheet) will be considered ACM, as separation of layers for demolition is not anticipated to be reasonable.
  - .3 Remove and dispose of, or implement appropriate exposure control plans to address other hazardous building materials as indicated in Section 02 81 01 Hazardous Materials, as generally summarized below:
    - .1 Implement appropriate exposure control plans for demolition of lead-containing items or building materials coated with lead-containing paints.
    - .2 Remove and dispose of building components that actually or potentially contain other hazardous building materials (e.g., fluorescent light fixtures with potential PCBs, fluorescent light tubes with mercury vapour, etc.)
    - .3 Implement appropriate exposure control plans for demolition of building materials that contain silica.
- .2 Building Demolition
  - .1 Remove and dispose of building structures down to existing concrete slab, maintaining various curbs and retaining curb/wall where indicated herein. Building is generally described as follows (see Appendix D General Photos).
    - .1 Single storey structure with an overall footprint of approximately 760 square metres (64 m long by 12 m deep).

.2 Generally arranged into eight bays, consisting of either metal roll-up bay doors or in-fill metal wall system and steel man door approximately 5 m height and 6 m width.

.3 Slab to underside of roof is approximately 6 m at the front, 4.8 m at the back.

.4 Reinforced concrete columns (35 cm x 35 cm) with reinforced concrete spandrel beams (175 cm x 35 cm) comprise the primary structural framework, along with a concrete curbs/footings between columns measuring approximately 30 cm in height.

.1 Localized areas of concrete walls extend to 3.5 m in height.

.5 Steel substructure of various dimensions for structural support and overhead crane system including support posts and miscellaneous connection components.

.6 Flat, low-slope roof comprised of asphalt sheeting over tar felt and tar, applied to solid wood decking which is supported by built-up wood beams.

.7 Primary walls (perimeter and some partition walls between bays) are comprised of both clay brick and hollow clay block masonry walls installed between the curb and spandrel beam.

.8 Wood structures for mezzanines and/or platforms including wooden stairs are located in various bays.

.2 Materials to remain in place post demolition:

.1 Exterior concrete foundations walls on the south, east, and north elevations.

.2 Exterior concrete retaining wall which projects above grade at the partial south and east elevations.

.3 Concrete foundation walls at steps in building.

.3 Concrete columns at all locations are to be removed flush to the top of existing concrete slab grade where interior foundation walls are to be removed and where concrete foundation walls are to remain at steps in building.

.1 All other interior foundation walls are to be removed flush to the top of existing slab grade.

.4 Removal and disposal of miscellaneous mechanical components, electrical components and various other remaining contents at the exterior and interior of the structure is included in the Work.

.3 Measurements or quantities provided herein are approximate and intended for descriptive purposes only. It is the responsibility of the contractor to understand the construction materials present (types, quantities), site restrictions and associated efforts for demolition.

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1.2 CONTRACT METHOD

.1 Conduct Work under stipulated price (lump sum) contract.

1.3 WORK BY OTHERS

.1 The Contractor will have exclusive use and control of the project worksite. Other contracts will not be undertaken within the worksite during the execution of the work by the Contractor.

1.4 FAMILIARIZATION WITH SITE AND CONDITIONS

.1 Before submitting tender, visit site – as indicated in the tender documents and become familiar with all **conditions likely to affect the cost of the work**. No extra costs will be considered for addressing materials or site conditions/restrictions that could reasonably have been seen and/or reviewed during the mandatory bidder's site meeting or questioned during the bid period.

1.5 OCCUPANCY

.1 The building will be unoccupied during execution of the Work.

.2 Owner and Tenant operations adjacent to Project Worksite will be on-going and will remain operational 24 hours per day during the duration of the contract.

.3 Adjust work schedule and contractor's operations as directed by the Departmental Representative to minimize conflict and to facilitate Owner and Tenant usage of adjacent areas outside of the Project Worksite.

1.6 CONTRACTOR'S USE OF PREMISES

.1 Use of site:

- .1 Project Worksite is shown on the drawings.
- .2 Exclusive and complete for execution of work
- .3 Assume responsibility for assigned premises for performance of this work
- .4 Be responsible for coordination of all work activities on site
- .5 Access to and from the worksite is shown on the drawings
- .6 Provide necessary protection and hoarding/fencing to prevent unauthorized entry into the worksite at all times
- .7 Do not use any areas outside of the worksite unless approved in writing by the Departmental Representative

.2 Contractor workers will not be permitted to park on-site

.3 Contractor is subject to on-site directives of Departmental Representative.

.4 At completion of operations, condition of existing property: equal to or better than that which existed before new work started and to the satisfaction of the Departmental Representative.

.5 Adjacent portions of property and roads to remain in use. Do not impede, restrict or obstruct use of adjacent property.

.1 Where access to the adjacent roadways is required during the performance of the work, the roadways shall remain open at all times. Where temporary use of the roadway is required during performance of the work qualified flag persons shall be used.

.1 One-way traffic at a minimum shall be maintained at all times. No blocking of traffic unless approved in writing by the Departmental Representative

.6 Protect environment as required in Section 01 35 43 Environmental Procedures.

1.7 EXISTING SERVICES

.1 Notify Departmental Representative of intended interruption of services. Do not proceed without permission from Departmental Representative.

.2 Temporary services to maintain critical building and tenant systems are not required.

.3 Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.

1.8 DOCUMENTS REQUIRED

.1 Maintain at job site, one copy each document as follows, where applicable:

.1 Contract Drawings.
.2 Specifications.
.3 Addenda.
.4 Change Orders.
.5 Other Modifications to Contract.
.6 Field Test Reports.
.7 Copy of Approved Work Schedule.
.8 Site Specific Safety Plan, ACM, Lead, Silica Exposure Control Plans, and other safety documentation as required.
.9 Environmental Protection Plan, relevant environmental permits and other environment related documents.
.10 Other documents as specified.

Part 2 Work Restrictions

.1 Contractor will be provided with temporary power and water for use during the execution of the work. Refer to Section 01 51 00 Temporary Utilities.

.2 Where security is reduced by work, provide temporary means to maintain security.

.3 Contractor to supply their own sanitary facilities. Keep facilities clean.

.4 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

.5 Security Requirements:

.1 Non-security cleared personnel can be utilized during the work. Escort by Commissionaires will be provided by PWGSC at no cost to the contract.

.2 For each work day, non-security cleared personnel shall muster at the back gate turnstiles for escort to site by Commissionaires.

.3 Where contractor's personnel hold valid Reliability Status, contractor's pass will be issued by PWGSC for use during the execution of the work.

.4 Contractor vehicle traffic will be monitored by CCTV when transiting between the Back Gate and the worksite.

.6 Hours of work:

.1 Schedule work during normal weekday working hours of the Esquimalt Graving Dock. Normal weekday working hours are 07:30 – 17:00 Monday through Friday, excluding statutory holidays.

.2 Submit written request to Departmental Representative for authorization prior to working outside of normal working hours including weekends or holidays.

.7 Access into Facility:

.1 Access to the facility and the worksite is exclusively for the performance of the work. Access to other areas of the facility is not permitted.

.2 Access to the facility is controlled. Photo identification must be shown prior to entering the facility. Contractor's access passes will only be issued to persons holding valid Reliability Status clearance.

.3 Design, construct and maintain temporary "access to" and "egress from" work areas, including stairs, runways, ramps or ladders and scaffolding, where required, and in accordance with relevant municipal, provincial and other regulations.

.8 Use of Site and Facilities:

.1 Execute work with least possible interference or disturbance to normal use of premises or property.

.2 Maintain existing services to building as required to facilitate the Work, and provide for personnel and vehicle access.

.3 Execute work with least possible interference or disturbance to site operations, public and normal use of premises and property. Arrange with Departmental Representative to facilitate execution of work.

.9 Special Requirements:

.1 Carry out noise generating Work in accordance with applicable Municipal bylaws.

.2 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.

.3 Keep within limits of work and avenues of ingress and egress.

.4 Deliver materials between 07:30 and 17:00 unless otherwise approved by Departmental Representative.

.5 Relics and antiquities and items of historical or scientific interest shall remain property of the Department. Protect such articles and request directives from the Departmental Representative in advance of Work.

.10 Building Smoking Environment

.1 Smoking within a building and within 7.5m of all air intakes is not permitted.

.2 A “No Smoking” sign to be put up by the Contractor at the project area.

.3 Smoking is only allowed in the designated locations at the EGD. Use of “Designated Smoking Areas” must be approved by the Departmental Representative.

Part 3 Protocol Requirements due to COVID-19

.1 Contractor is to be responsible for costs of all labour, expenses, accommodations, meals and/or materials, etc. required to comply with current recommended or otherwise legislated requirements for minimizing the spread of COVID-19, including, but not limited to:

.1 Requirements for quarantine of workers, if entering BC from other countries, provinces and/or territories where the BC Government has implemented such requirements.

.2 Requirements for physical distancing – during travel and on-site.

.3 Requirements for personal protective equipment – supply, use and disposal.

.4 COVID-19 screening forms should be filled out at least 72-hours prior to visiting site, forms will be provided upon request.

.5 Meeting and/or exceeding the protocols listed in the current version of the Canadian Construction Association 2020 publication *COVID-19 – Standardized Protocols for All Canadian Construction Sites*

.6 As of November 15, 2021, supplier personnel who access federal workplaces where they may encounter federal public servants must be fully vaccinated. Federal government workplaces include all places of work under the responsibility of the Government of Canada.

Part 4 Time of Completion

.1 Commence work immediately upon official notification of acceptance of offer and complete the project within four (4) weeks after Contract Award.

Part 5 Work Schedule

.1 Within one (1) week of contract award provide schedule detailing performance of the work within time of completion.

.2 Revise schedule as directed by the Departmental Representative. Do not alter or change approved schedule without notifying Departmental Representative.

Part 6 Cost Breakdown

.1 Before submitting the first progress claim, submit a breakdown of the Contract lump sum prices in detail as directed by the Departmental Representative.

Part 7 Project Meetings

.1 Specified in Section 01 31 19 Project Meetings.

Part 8 Health and Safety

.1 Specified in Section 01 35 33 - Health and Safety Requirements.

Part 9 Environmental Procedures

.1 Specified in Section 01 35 43 – Environmental Procedures.

Part 10 Regulatory Requirements

10.1 REFERENCES AND CODES

.1 Perform Work in accordance with National Building Code of Canada including all amendments up to tender closing date.

.2 Comply with applicable provincial and local bylaws, rules and regulations enforced at the location.

.3 Meet or exceed requirements of Contract documents, specified standards, codes and references documents.

Part 11 Quality Control

11.1 INSPECTION

.1 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or applicable standards or regulations.

.2 Departmental Representative may order any part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction.

11.2 REJECTED WORK

.1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

Part 12 Temporary Utilities

12.1 TEMPORARY VENTILATION

.1 Ventilating:

.1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during abatement.

.2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.

.3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.

.4 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.

.2 Maintain strict supervision of operation of temporary ventilating equipment to:

.1 Conform with applicable codes and standards.

.2 Enforce safe practices.

.3 Prevent abuse of services.

.4 Prevent damage to finishes.

12.2 TEMPORARY POWER AND LIGHT

.1 Provide own electrical lines from source, and lighting as necessary to complete the work safely, and in accordance with applicable regulations.

12.3 FIRE PROTECTION

.1 Provide and maintain temporary fire protection equipment during performance of Work required by governing codes, regulations and bylaws.

Part 13 Construction Facilities

13.1 LIFTING EQUIPMENT

.1 Where required, provide, operate and maintain lifting equipment and manpower required for moving of heavy products in accordance with applicable standards and regulations.

13.2 SITE STORAGE/LOADING

.1 Confine work and operations of employees to areas specified in Contract Documents. Do not unreasonably encumber premises with products.

13.3 CONTRACTOR'S SITE OFFICE

.1 A site office (trailer or similar) will not be required, nor permitted.

.2 Provide a clearly marked and fully stocked first-aid case in a readily available location in accordance with British Columbia’s Occupational Health and Safety Regulation requirements.

13.4 EQUIPMENT AND TOOLS STORAGE

.1 Provide and maintain, in a clean and orderly condition, lockable secure lock box for storage of tools and materials, as necessary.

13.5 SANITARY FACILITIES

.1 Contractor is required to supply their own sanitary facilities.

13.6 CONSTRUCTION SIGNS

.1 If signage is requested or required, format, location and quantity of site signs and notices to be approved by Departmental Representative.

.2 Signs and notices for safety or instruction to be in English language, or commonly understood graphic symbols.

.3 Maintain signboards, signs and notices for duration of project.

.4 Remove signs from site at completion of project or as directed by Departmental Representative.

Part 14 Temporary Barriers and Enclosures

14.1 ENCLOSURE OF WORK AREA

.1 Provide temporary dust barriers around work areas where dust or harmful vapours are being generated. Exhaust dust and vapours to exterior.

Part 15 Cleaning

15.1 PROJECT CLEANLINESS

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris.

.2 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative and/or in accordance with applicable transportation and disposal regulations and guidelines.

.3 Provide on-site containers for collection of waste materials and debris.

.4 Provide and use clearly marked separate bins for recycling.

.5 If generated, store volatile waste in covered metal containers, and remove from premises at end of each working day.

.6 Provide adequate ventilation during use of volatile or noxious substances.

.7 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

.8 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

15.2 FINAL CLEANING

.1 When Work is Substantially Performed, remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

.2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.

.3 Remove waste products from site.

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Part 16 Closeout Procedures

16.1 INSPECTION AND DECLARATION

.1 Contractor's Inspection: Conduct an inspection of Work with all subcontractors, identify deficiencies and defects, and repair as required to conform to Contract Documents.

.2 Notify Departmental Representative in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.

.3 Request Departmental Representative's Inspection.

16.2 INSPECTION

.1 Departmental Representative and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Contractor shall correct Work accordingly, at no additional cost to the Contract.

16.3 COMPLETION

.1 Submit written certificate that the following have been performed:

.1 Work has been completed and inspected for compliance with Contract Documents.

.2 Defects have been corrected and deficiencies have been completed.

.3 Work is complete and ready for Final Inspection.

16.4 FINAL INSPECTION

.1 When items noted above are completed, request final inspection of Work by Departmental Representative. If Work is deemed incomplete by Departmental Representative, complete outstanding items and request re-inspection, at no additional cost to the Contract.

END OF SECTION

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General

1.1 ADMINISTRATIVE

.1 Project meetings will be scheduled and administered throughout the progress of the work at the direction of Departmental Representative.

.2 Representative of Contractor, Subcontractor and/or suppliers attending meetings will be qualified and authorized to act on behalf of the party each represents.

1.2 PRECONSTRUCTION MEETING

.1 Departmental Representative will schedule a pre-commencement meeting.

.2 Departmental Representative, the Contractor, and major sub-contractor(s) will be in attendance.

.3 Agenda to include:

- .1 Appointment of official representative of participants in the Work.
- .2 Schedule of Work: in accordance with schedule stipulated in Contract Documents.
- .3 Schedule of submission. Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .4 Delivery schedule of specified equipment.
- .5 Site security.
- .6 Proposed changes, change orders, procedures, approvals required time extensions, administrative requirements.
- .7 Transcript of policies.

1.3 PROGRESS MEETINGS

.1 Progress meetings will be held as required during the work. Departmental Representative will schedule the meetings and arrange for a meeting location. Meetings may be held virtually.

.2 Site meetings may be held as required to address issues which may arise during the performance of the work.

.3 Departmental Representative will chair the meeting, and distribute meeting minutes. Contractor will record the meeting minutes and provide within 5 business days.

.4 Agenda typically to include the following:

- .1 Review, approval of minutes of previous meeting.
- .2 Review of Work progress since previous meeting.

.3 Field observations, problems, conflicts.
.4 Problems which impede construction schedule.
.5 Corrective measures and procedures to regain projected schedule.
.6 Revision to construction schedule.
.7 Progress schedule, during succeeding work period.
.8 Review submittal schedules: expedite as required.
.9 Maintenance of quality standards.
.10 Review proposed changes for effect on construction schedule and on completion date.
.11 Other business.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

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Part 1 General

1.1 ADMINISTRATIVE

.1 Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.2 Do not proceed with Work affected by submittal until review is complete.

.3 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.

.4 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.5 Verify field measurements and affected adjacent Work.

.6 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.

.7 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.

.8 Keep one reviewed copy of each submission on site.

1.2 SHOP DRAWINGS AND PRODUCT DATA

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work, where required or requested by Departmental Representative.

.2 Allow 3 days for Departmental Representative's review of each submission.

.3 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.

.4 After Departmental Representative's review, distribute copies.

.5 Submit electronic copies of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.

.6 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before installation of Work may proceed.

1.3 PHOTOGRAPHIC DOCUMENTATION

.1 Submit electronic copies of colour digital photography in ".jpg" format, standard resolution as directed by Departmental Representative.

.2 Project identification: name and number of project and date of exposure indicated.

.3 Viewpoints and their location as determined by Departmental Representative.

.4 Frequency of photographic documentation:

.1 Necessary only to the extent required to provide indication of any newly discovered site conditions that require clarification and/or as directed by Departmental Representative.

1.4 CERTIFICATES AND TRANSCRIPTS

.1 Immediately after award of Contract, submit British Columbia Workers' Compensation Health and Safety Board status or clearance letter.

.2 Submit transcription of insurance immediately after award of Contract.

Products

1.5 NOT USED

.1 Not Used.

Part 2 Execution

2.1 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

PWGSC Update on Asbestos Use
Effective April 1, 2016, all Public Works and Government Services of Canada (PWGSC) contracts for new construction and major rehabilitation will prohibit use of asbestos-containing materials.

COVID-19
All contractors shall follow Canadian Construction Association COVID-19 - Standardized Protocols for All Canadian Construction Sites, Provincial Regulations, and EGD site specific COVID-19 Procedures.

1.1 REFERENCES

.1 Government of Canada.

.1 Canada Labour Code - Part II (as amended)

.2 Canada Occupational Health and Safety Regulations (as amended)

.2 National Building Code of Canada (NBC): (as amended)

.1 Part 8, Safety Measures at Construction and Demolition Sites.

.3 The Canadian Electrical Code (as amended)

.4 Canadian Standards Association (CSA) as amended:

.1 CSA Z797-2018 Code of Practice for Access Scaffold.

.2 CSA S269.1-2016 Falsework for Construction Purposes.

.3 CSA S350-M1980 (R2003) Code of Practice for Safety in Demolition of Structures.

.4 CSA Z1006-10 Management of Work in Confined Spaces.

.5 CSA Z462-18 Workplace Electrical Safety Standard

.5 National Fire Code of Canada 2015 (as amended)

.1 Part 5 – Hazardous Processes and Operations and Division B as applicable and required.

.6 American National Standards Institute (ANSI): (as amended)

.1 ANSI/ASSP A10.3-2013, Operations – Safety Requirements for Powder-Actuated Fastening Systems.

.7 Province of British Columbia:

.1 Workers Compensation Act Part 3-Occupational Health and Safety. (as amended)

.2 Occupational Health and Safety Regulation (as amended)

.9 Esquimalt Graving Dock (EGD) Contractors Safety Booklet (as amended)

.10 Refer to the following reports (attached in Appendix A), for information pertaining to hazardous materials that have been identified and will require disturbance during the Work:

.1 Stantec Consulting Ltd. Report for Project No. 123221957 entitled “Supplemental Pre-Demolition Hazardous Building Materials Assessment Report” for “Project Name: Demolition of Esquimalt Graving Dock Building 1007 – Kiln Building”, issued December 3, 2021, prepared for Public Services and Procurement Canada.

2. Stantec Consulting Ltd. Report for Project No. 123221425 entitled “Pre-Demolition Hazardous Building Materials Assessment, Building 1007 – Kiln Building, Esquimalt Graving Dock, 825 Admirals Road, Victoria” dated March 31, 2020, prepared for Public Services and Procurement Canada.

3. North West Environmental Group Ltd. Report No. 15609 entitled “Hazardous Building Material Assessment; Esquimalt Graving Dock—DND Buildings” dated December, 2011, prepared for Public Works and Government Services Canada.

1.2 RELATED SECTIONS

.1 Refer to the current NMS sections as indicated in Section 00 30 30 Table of Contents, including Appendices.

1.3 WORKERS' COMPENSATION BOARD COVERAGE

.1 Comply fully with the Workers' Compensation Act, regulations and orders made pursuant thereto, and any amendments up to the completion of the work.

.2 Maintain Workers' Compensation Board coverage during the term of the Contract, until and including the date that the Certificate of Final Completion is issued.

1.4 COMPLIANCE WITH REGULATIONS

.1 PWGSC may terminate the Contract without liability to PWGSC where the Contractor, in the opinion of PWGSC, refuses to comply with a requirement of the Workers' Compensation Act or the Occupational Health and Safety Regulations.

.2 It is the Contractor's responsibility to ensure that all workers are qualified, competent and certified to perform the work as required by the Workers' Compensation Act or the Occupational Health and Safety Regulations.

1.5 SUBMITTALS

.1 Submit to Departmental Representative submittals listed for review in accordance with Section 01 33 30.

.2 Work affected by submittal shall not proceed until review is complete.

.3 Submit the following:

.1 Organizations Health and Safety Plan.

.2 Site Specific Safety Plan or Health and Safety Plan (SSSP or HASP)

.2 Copies of reports or directions issued by Federal and Provincial health and safety inspectors.

.3 Copies of incident and accident reports.

.4 Complete set of Safety Data Sheets (SDS), and all other documentation required by Workplace Hazardous Materials Information System (WHMIS 2015) requirements.

.5 Emergency Response Plan and Emergency Evacuation Plan and Procedures.

.4 The Departmental Representative will review the Contractor's Site Specific Safety Plan or Health and Safety Plan (SSSP/HASP) and emergency response procedures, and provide comments to the Contractor within 5 days after receipt of the plan. Revise the plan as appropriate and resubmit to Departmental Representative.

.5 Medical surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of work, and submit additional certifications for any new site personnel to Departmental Representative.

.6 Submission of the Site Specific Safety Plan or Health and Safety Plan, and any revised version, to the Departmental Representative is for information and reference purposes only. It shall not:

.1 Be construed to imply approval by the Departmental Representative.

.2 Be interpreted as a warranty of being complete, accurate and legislatively compliant.

.3 Relieve the Contractor of his legal obligations for the provision of health and safety on the project.

1.6 RESPONSIBILITY

.1 Assume responsibility as the Prime Contractor for work under this contract.

.2 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.

.3 Comply with and enforce compliance by employees with safety requirements of Contract documents, applicable Federal, Provincial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

.4 All contractor workers shall attend an EGD Safety Orientation prior to ant work starting.

.5 The contractor is responsible for reviewing the Esquimalt Graving Dock (EGD) Contractors Safety Handbook and ensuring that the Site Specific Safety Plan and/or Health and Safety Plan are harmonized with the EGD Contractors Safety Handbook.

1.7 HEALTH AND SAFETY COORDINATOR

.1 The contractor must assign a competent and qualified Health and Safety Coordinator who shall:

.1 Be responsible for completing all health and safety training, and ensuring that personnel that do not successfully complete the required training are not permitted to enter the site to perform work.

.2 Be responsible for implementing, daily enforcing, and monitoring the Site Specific Safety Plan (SSSP) or Health and Safety Plan (HASP)

.3 Be on site during execution of work.

.4 Have minimum two (2) years' site-related working experience

.5 Have working knowledge of the applicable occupational safety and health regulations.

1.8 GENERAL CONDITIONS

.1 Provide safety barricades and lights around work site as required to provide a safe working environment for workers and protection for pedestrian and vehicular traffic.

.2 Ensure that non-authorized persons are not allowed to circulate in designated construction areas of the work site.

.1 Provide appropriate means by use of barricades, fences, warning signs, traffic control personnel, and temporary lighting as required.

.2 Secure site at night time or provide security guard as deemed necessary to protect site against entry.

1.9 PROJECT/SITE CONDITIONS

.1 Work at site will involve contact with:

.1 PWGSC and other Federal employees,

.2 EGD (federal) operational staff,

.3 Ship repair and other contractors,

.5 Overhead cranes,

.6 Work at heights,

.7 Unpredictable weather conditions,

.8 Threat of tsunami and earthquake,

.9 Confined space and restricted access space,

.10 Work with hazardous substances, and

.11 Refer to PWGSC Preliminary Hazard Assessment (Appendix C)

1.10 UTILITY CLEARANCES

.1 The Contractor is solely responsible for all utility detection and clearances prior to starting work that will require disturbance of ground surfaces.

.2 The Contractor will not rely solely upon the Reference Drawings or other information provided for Utility locations.

1.11 REGULATORY REQUIREMENTS

.1 Comply with specified codes, acts, bylaws, standards and regulations to ensure safe operations at site.

.2 In event of conflict between any provision of (.1) above, the authorities having the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, the Departmental Representative will advise on the course of action to be followed.

1.12 WORK PERMITS

.1 Obtain specialty permit(s) related to project before start of work.

1.13 FILING OF NOTICE

.1 The General Contractor shall file Notice of Project with Provincial authorities prior to commencement of work. (All PWGSC construction projects require a Notice of Work)

.2 Provide copies of all notices to the Departmental Representative.

1.14 SITE SPECIFIC HEALTH AND SAFETY PLAN

.1 Conduct a site-specific hazard assessment based on review of Contract documents, required work, and all project work sites. Identify any known and potential health risks and safety hazards.

.2 Develop, implement, and enforce a Site Specific Safety Plan (SSSP) or Health and Safety Plan (HASP) based on hazard assessment, including, but not limited to, the following:

.1 Primary requirements:

.1 Contractor's safety policy.

.2 Identification of applicable compliance obligations.

.3 Definition of responsibilities for project safety/organization chart for project.

.4 General safety rules for project.

.5 Job-specific safe work, procedures.

.6 Inspection policy and procedures.

.7 Incident reporting and investigation policy and procedures.

.8 Occupational Health and Safety Committee/Representative procedures.

.9 Occupational Health and Safety meetings.

.10 Occupational Health and Safety communications and record keeping procedures.

.11 COVID 19 Protocols and Procedures (National, Provincial and EGD Site Specific)

.12 EGD Contractors Safety Handbook

.2 Summary of health risks and safety hazards resulting from analysis of hazard assessment, with respect to site tasks and operations which must be performed as part of the work.

.3 List hazardous materials to be brought on site as required by work. WHMIS 2015 SDS required for all products.

.4 Indicate Engineering and administrative control measures to be implemented at the site for managing identified risks and hazards.

.5 Identify personal protective equipment (PPE) to be used by workers.

.6 Identify personnel and alternates responsible for site safety and health.

.7 Identify personnel training requirements and training plan, including site orientation for new workers.

.3 Develop the site specific safety plan or health and/or safety plan in collaboration with all subcontractors. Ensure that work/activities of subcontractors are included in the hazard assessment and are reflected in the plan.

.4 Revise and update Site Specifc Safety Plan (SSSP) and/or Health and Safety Plan (HASP) as required, and re-submit to the Departmental Representative.

.5 Departmental Representative's review: the review of Site Specific Safety Plan and/or Health and Safety Plan by Public Works and Government Services Canada (PWGSC) shall not relieve the Contractor of responsibility for errors or omissions in final Site Specific Safety Plan and/or Health and Safety Plan of responsibility for meeting all requirements of construction and Contract documents and legislated requirements.

1.15 EMERGENCY PROCEDURES

.1 List standard operating procedures and measures to be taken in emergency

situations. Include an emergency response and emergency evacuation plan and emergency contacts (i.e. names/telephone numbers) of:

.1 Designated personnel from own company.

.2 Regulatory agencies applicable to work and as per legislated regulations.

.3 Local emergency resources.

.4 Departmental Representative and Other PWGSC staff as required. (reference: EGD Contractors Safety Handbook)

.5 A route map with written directions to the nearest hospital or medical clinic.

.2 Include the following provisions in the emergency procedures:

.1 Notify workers and the first-aid attendant, of the nature and location of the emergency.

.2 Evacuate all workers safely.

.3 Check and confirm the safe evacuation of all workers.

.4 Notify the fire department or other emergency responders.

.5 Notify adjacent workplaces or residences which may be affected if the risk extends beyond the workplace.

.6 Notify Departmental Representative and PWGSC site staff.

.3 Provide written rescue/evacuation procedures as required for, but not limited to:

.1 Work at high angles.

.2 Work in confined spaces or where there is a risk of entrapment.

.3 Work with hazardous substances.

.4 Underground work.

.5 Work on, over, under and adjacent to water.

.6 Workplaces where there are persons who require physical assistance to be moved.

.4 Design and mark emergency exit routes to provide quick and unimpeded exit.

.5 Revise and update emergency procedures as required, and re-submit to the Departmental Representative.

.6 Contractors must not rely solely upon 911 for emergency rescue in a confined space, working at heights, etc.

.7 At least once each year, emergency drills, must be held to ensure awareness and effectiveness of emergency exit routes and procedures, and a record of the drills must be kept

1.16 HAZARDOUS PRODUCTS

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS 2015) regarding use, handling, storage and disposal of hazardous materials, and regarding labelling and provision of Safety Data Sheets (SDS) acceptable to the Departmental Representative and in accordance with the Canada Labour Code.

.2 Where use of hazardous and toxic products cannot be avoided:

.1 Advise Departmental Representative beforehand of the product(s) intended for use. Submit applicable SDS and WHMIS 2015 documents as per Section 01 33 30.

.2 In conjunction with Departmental Representative schedule to carry out work during "off hours" when tenants have left the building.

.3 Provide adequate means of ventilation.

.4 The contractor shall ensure that the product is applied as per manufacturers recommendations.

.5 The contractor shall ensure that only pre-approved products are bought onto the site.

1.17 OFF SITE CONTINGENCY and EMERGENCY RESPONSE PLAN

.1 Prior to commencing Work involving handling of hazardous materials, develop off site Contingency and Emergency Response Plan.

2. Plan must provide immediate response to serious site occurrence such as explosion, fire, or migration of significant quantities of toxic or hazardous material from Site.

3. Notification of fire departments [4.17 – WorkSafeBC Regulations Part 4 Buildings, Structures, Equipment, and Site Conditions]

(1) An employer having at a workplace hazardous products covered by WHMIS, explosives, pesticides, radioactive material, consumer products or hazardous wastes in quantities which may endanger firefighters, must ensure the local fire department is notified of the nature and location of the hazardous materials or substances and methods to be used in their safe handling.

(2) Subsection (1) does not apply to a workplace

(a) where materials are kept on site for less than 15 days if the employer ensures an alternative effective means for notification of fire departments is in place in the event of fire or other emergency, or

(b) which is not within the service area of a fire department. [Amended by B.C. Reg. 30/2015, effective August 4, 2015.]

1.18. PERSONAL PROTECTIVE CLOTHING and EQUIPMENT

.1 Work shall be performed in compliance with Part 8 - Personal Protective Clothing and Equipment, and Part 5 – Chemical Agents and Biological Agents, (as applicable) WorkSafeBC OHS Regulations (as amended)

1.19 ASBESTOS HAZARD

.1 Carry out any activities involving asbestos shall be in accordance with current applicable Federal and Provincial Regulations.

.2 Removal and handling of asbestos shall be in accordance with current applicable Provincial / Federal Regulations (as amended)

1.20 PCB REMOVALS

.1 Mercury-containing fluorescent tubes and ballasts which contain polychlorinated biphenyls (PCBs) are classified as hazardous waste.

.2 Remove, handle, transport and dispose of as indicated in Section 02 81 01 Hazardous Materials.

1.21 REMOVAL OF LEAD-CONTAINING PAINT

.1 All paint containing TCLP lead concentrations above 5 ppm are classified as hazardous.

.2 Carry out demolition and/or remediation activities involving lead-containing paints in accordance with current applicable Provincial / Territorial Regulations.

.3 Work with lead-containing paint shall be completed as per Provincial and Federal regulations.

.4 Dry Scraping/Sanding of any materials containing lead is strictly prohibited.

.5 The use of Methylene Chloride based paint removal products is strictly prohibited.

1.22 SILICA

.1 Carry out work in accordance with WorkSafeBC regulations.

1.23 ELECTRICAL SAFETY REQUIREMENTS
(Reference: WorkSafeBC OHS Regulation Part 19 – Electrical Safety)

.1 Comply with authorities and ensure that, when installing new facilities or modifying existing facilities, all electrical personnel are completely familiar with existing and new electrical circuits and equipment and their operation.

.1 Before undertaking any work, coordinate arc flash protection, required energizing and de-energizing of new and existing circuits with Departmental Representative.

.2 Maintain electrical safety procedures and take necessary precautions to ensure safety of all personnel working under this Contract, as well as safety of other personnel on site.

.3 Develop, implement and enforce a communication plan with Departmental representative and EGD maintenance staff for all electrical work and lockout procedures.

1.24 ELECTRICAL LOCKOUT

.1 Develop, implement and enforce use of established procedures to provide electrical lockout and to ensure the health and safety of workers for every event where work must be done on any electrical circuit or facility.

.2 Prepare the lockout procedures in writing, listing step-by-step processes to be followed by workers, including how to prepare and issue the request/authorization form. Have procedures available for review upon request by the Departmental Representative.

.3 Keep the documents and lockout tags at the site and list in a log book for the full duration of the Contract. Upon request, make such data available for viewing by Departmental Representative or by any authorized safety representative.

4. Comply with EGD Lockout Policy and Procedures (as amended)

1.25 OVERLOADING

.1 Ensure no part of work is subjected to a load which will endanger its safety or will cause permanent deformation.

1.26 FALSEWORK

.1 Design and construct falsework in accordance with CSA S269.1-1975 (R2003) (as amended)

1.27 SCAFFOLDING

.1 Design, construct and maintain scaffolding in a rigid, secure and safe manner, in accordance with CSA Z797-2009 (as amended) and B.C. Occupational Health and Safety Regulations. (as amended)

1.28 CONFINED SPACES

.1 Carry out work in compliance with current WorkSafeBC Part 9 Confined Spaces and CSA Z1006-10 Management of Work in Confined Space.

1.29 RESTRICTED ACCESS

.1 Contractor shall perform a hazard assessment and develop an appropriate restricted access entry and emergency rescue plan in accordance with WorkSafeBC regulations.

1.30 CONFINED SPACE AND RESTRICTED SPACE OUTSIDE OF DEFINED WORK SITE

.1 Carry out work in confined spaces in compliance with WorkSafeBC Part 9 Confined Spaces and CSA Z1006-10 Management of Work in Confined Space. Coordinate all confined space entry work with PWGSC Departmental Representative through the contractor's confined space entry permit system.

.2 Contractor shall perform a hazard assessment and develop an appropriate restricted access entry and emergency rescue plan in accordance with WorkSafeBC regulations. Coordinate all restricted access space entry work with the Departmental Representative prior to entry.

.3 The Contractor is required to provide a reasonable amount of time to the Departmental Representative for making arrangements for entry and/or access to Confined Space or Restricted Access spaces located outside the designated work site.

1.31 POWDER-ACTUATED DEVICES

.1 Use powder-actuated devices in accordance with ANSI A10.3 (as amended) only after receipt of written permission from the Departmental Representative.

1.32 FIRE SAFETY AND HOT WORK

.1 Obtain Departmental Representative's authorization before any welding, cutting or any other hot work operations can be carried out on site.

.2 Hot work includes cutting/melting with use of torch, flame heating roofing kettles, or other open flame devices and grinding with equipment which produces sparks.

.3 Coordinate all hot work with Departmental Representative through the contractors' hot work permit system. Hot Work permits are a mandatory requirement for any hot work activities.

1.33 FIRE SAFETY REQUIREMENTS

.1 Store oily/paint-soaked rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.

.2 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada. (as amended)

.3 Portable gas and diesel fuel tanks are not permitted on most federal work sites. Approval from the Departmental Representative is required prior to any gas or diesel tank being brought onto the work site.

1.34 FIRE PROTECTION AND ALARM SYSTEM

.1 Fire protection and alarm systems shall not be:

.1 Obstructed.

.2 Shut off.

.3 Left inactive at the end of a working day or shift.

.2 Do not use fire hydrants, standpipes and hose systems for purposes other than firefighting.

.3 Be responsible/liable for costs incurred from the fire department, the building owner and the tenants, resulting from false alarms.

1.35 UNFORESEEN HAZARDS

.1 Should any unforeseen or peculiar safety-related factor, hazard or condition become evident during performance of the work, immediately stop work and immediately advise the Departmental Representative verbally and in writing.

1.36 BLASTING OPERATIONS

.1 Blasting will not be permitted.

1.37 POSTED DOCUMENTS

.1 Post legible versions of the following documents on site:

.1 Site Specific Safety Plan (SSSP) or Health and Safety Plan (HASP)

.2 Sequence of work.

.3 Emergency procedures.

.4 Site drawing showing project layout, locations of the first-aid station, evacuation route and marshalling station, and the emergency transportation provisions.

.5 Notice of Project.

.6 Floor plans or site plans.

.7 Notice as to where a copy of the Workers' Compensation Act and Regulations are available on the work site for review by employees and workers.

.8 Workplace Hazardous Materials Information System (WHMIS 2015) documents.

.9 Safety Data Sheets (SDS).

.10 List of names of Joint Health and Safety Committee members, or Health and Safety Representative, as applicable.

.11 All Hazardous Material and Substance Reports including Lab Analysis

.2 Post all Safety Data Sheets (SDS) on site, in a common area, visible to all workers and in locations accessible to tenants when work of this Contract includes construction activities adjacent to occupied areas.

.3 Postings should be protected from the weather, and visible from the street or the exterior of the principal construction site shelter provided for workers and equipment, or as approved by the Departmental Representative.

1.38 MEETINGS

.1 Attend health and safety pre-construction meeting and all subsequent meetings called by the Departmental Representative.

1.39 CORRECTION OF NON-COMPLIANCE

.1 Immediately address health and safety non-compliance issues identified by the Departmental Representative.

.2 Provide Departmental Representative with written report of action taken to correct non-compliance with health and safety issues identified.

.3 The Departmental Representative may issue a "stop work order" if noncompliance of health and safety regulations is not corrected immediately or within posted time. The General Contractor/subcontractors will be responsible for any costs arising from such a "stop work order".

2 PRODUCTS

.1 Not used.

3 EXECUTION

.1 Not used.

END OF SECTION

Public Works Government Services Canada
Esquimalt Graving Dock
Building 1007 Demolition
Project No. R.118910.001

Part 1 General

1.1 REFERENCES

.1 Definitions:

.1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade environment aesthetically, culturally and/or historically.

.2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Prior to commencing construction activities or delivery of materials to site, provide Environmental Protection Plan for review and approval by Departmental Representative.

.3 Ensure Environmental Protection Plan includes comprehensive overview of known or potential environmental issues to be addressed during construction.

.4 Address topics at level of detail commensurate with environmental issue and required abatement task[s].

.5 Include in Environmental Protection Plan:

.1 Name[s] of person[s] responsible for ensuring adherence to Environmental Protection Plan.

.2 Name[s] and qualifications of person[s] responsible for manifesting hazardous waste to be removed from site.

.3 Name[s] and qualifications of person[s] responsible for training site personnel.

.4 Descriptions of environmental protection personnel training program.

.5 Traffic Control Plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Ensure plans include measures to minimize amount of mud transported onto paved public roads by vehicles or runoff.

.6 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Ensure plan includes

measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.

.7 Spill Control Plan including procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.

.8 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.

.9 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, are contained on project site.

.10 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.

.11 Waste Water Management Plan identifying methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, water used in flushing of lines and dust emission suppression.

1.3 FIRES

.1 Fires and burning of rubbish on site not permitted.

1.4 DRAINAGE

.1 Ensure pumped water into waterways, sewer or drainage systems is free of suspended materials.

.2 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.5 POLLUTION CONTROL

.1 Maintain temporary erosion and pollution control features installed at the Site.

.2 Control emissions from equipment and plant to local authorities' emission requirements.

.3 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area.

.1 Provide temporary enclosures where required.

.4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

1.6 NOTIFICATION

.1 Departmental Representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.

.2 Contractor: after receipt of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.

.1 Do not take action until after receipt of written approval by Departmental Representative.

.3 Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.

.4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 CLEANING

.1 Clean in accordance with Section 01 74 11 - Cleaning.

.2 Waste Management: dispose of waste in accordance with Section 02 81 01 – Hazardous Materials.

.3 Rubbish and waste materials are not to be buried on site

.4 Ensure public waterways, storm and sanitary sewers remain free of waste and volatile materials disposal.

END OF SECTION

Public Works Government Services Canada
Esquimalt Graving Dock
Building 1007 Demolition
Project No. R.118910.001

Part 1 General

1.1 INSTALLATION AND REMOVAL

.1 Provide necessary electrical cords, hoses and associated equipment to provide utilities at the worksite.

.2 Remove from site all such work after use.

1.2 WATER SUPPLY

.1 PWGSC will provide hose-bib near to the worksite for use by the Contractor at no cost to the contract.

.2 Provide necessary water hoses and associated equipment to provide water at the worksite.

1.3 TEMPORARY HEATING AND VENTILATION

.1 If required, provide temporary heating during construction period, including attendance, maintenance and fuel.

.2 Construction heaters used inside building must be vented to outside or be non-flameless type. Solid fuel salamanders are not permitted.

.3 Provide temporary heat and ventilation in enclosed areas as required to:

- .1 Facilitate progress of Work.
- .2 Protect Work and products against dampness and cold.
- .3 Prevent moisture condensation on surfaces.
- .4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
- .5 Provide adequate ventilation to meet health regulations for safe working environment.

.4 Ventilating:

- .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during work.
- .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
- .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
- .4 Ventilate storage spaces containing hazardous or volatile materials.
- .5 Ventilate temporary sanitary facilities.

.6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.

1.4 TEMPORARY POWER AND LIGHT

.1 PWGSC will provide temporary source of power near to the worksite at no additional cost to the contract. Temporary panel consists of 125Amp 3 phase 120/208V panel complete with 20Amp GFCI receptacles and 50Amp 208V outlet.

.2 Provide and maintain temporary lighting throughout project, where required and in accordance with applicable Health and Safety standards.

1.5 FIRE PROTECTION

.1 Provide and maintain temporary fire protection equipment during performance of Work required by insurance companies having jurisdiction and governing codes, regulations and bylaws.

.2 Burning rubbish and construction waste materials is not permitted on site.

Part 2 Products

2.1 NOT USED

.1 Not Used.

END OF SECTION

Public Works Government Services Canada
Esquimalt Graving Dock
Building 1007 Demolition
Project No. R.118910.001

Part 1 General

1.1 INSTALLATION AND REMOVAL

.1 Provide temporary controls in order to execute Work expeditiously.

.2 Remove from site all such work after use.

1.2 GUARD RAILS AND BARRICADES

.1 Provide secure, rigid guard rails and barricades around deep excavations, open shafts, open stair wells, open edges of floors and roofs as necessary

.2 Provide as required by governing authorities.

1.3 DUST TIGHT SCREENS

.1 Provide dust tight screens or partitions to localize dust generating activities, and for protection of workers and public, as required.

.2 Maintain and relocate protection until such work is complete.

1.4 FIRE ROUTES

.1 Maintain access to property including overhead clearances for use by emergency response vehicles.

1.5 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

.1 Protect surrounding private and public property from damage during performance of Work.

.2 Be responsible for damage incurred.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Public Works Government Services Canada
Esquimalt Graving Dock
Building 1007 Demolition
Project No. R.118910.001

Part 1 General

1.1 PROJECT CLEANLINESS

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris generated at site.

.2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.

.3 Clear snow and ice from worksite, if necessary.

.4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.5 Provide on-site containers for collection of waste materials and debris.

.6 Provide and use marked separate bins for recycling.

.7 Dispose of waste materials and debris off site.

.8 Store volatile waste in covered metal containers, and remove from premises at end of each working day.

.9 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.

.10 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

1.2 FINAL CLEANING

.1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

.2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.

.3 Prior to final review remove surplus products, tools, construction machinery and equipment.

.4 Remove all waste products and debris.

.5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.

.6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.7 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.

.8 Clean and sweep areaways and sunken wells.

.9 Sweep and wash clean paved areas.

1.3 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials in accordance with Section 02 81 01 – Hazardous Materials

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Public Works Government Services Canada
Esquimalt Graving Dock
Building 1007 Demolition
Project No. R.118910.001

Part 1 General

1.1 WASTE MANAGEMENT GOALS

.1 Prior to start of Work conduct meeting with Departmental Representative to review and discuss Waste Management Plan and Goals.

.2 Waste Management Goal: Wood, concrete and metal Project Waste to be diverted from landfill sites unless not safe to do so (e.g. contaminated with asbestos, lead, mould, rodent/avian/other animal waste or other hazardous building materials). Provide Departmental Representative documentation certifying that waste management, recycling and/or reuse of recyclable and reusable materials have been extensively practiced.

.3 Accomplish maximum control of solid demolition waste.

.4 Preserve environment and prevent pollution and environment damage.

1.2 REFERENCES

.1 Canadian Environmental Protection Act (CEPA)

.1 CCME PN 1326-[2008], Environmental Code of Practice for Aboveground and Underground Storage Tank Systems for Petroleum Products and Allied Petroleum Products.

.2 CSA International

.1 CSA S350-[M1980(R2003)], Code of Practice for Safety in Demolition of Structures.

.3 Department of Justice Canada (Jus)

.1 Canadian Environmental Assessment Act (CEAA), 2012, c. 37.

.2 Canadian Environmental Protection Act (CEPA), 1999, c. 33.

.1 SOR/2003-2, On-Road Vehicle and Engine Emission Regulations.

.2 SOR/2006-268, Regulations Amending the On-Road Vehicle and Engine Emission Regulations.

.3 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

1.3 DEFINITIONS

.1 Class III: non-hazardous waste - construction renovation and demolition waste.

.2 Inert Fill: inert waste - exclusively asphalt and concrete.

.3 Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.

.4 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.

.5 Recycling: process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

.6 Reuse: repeated use of product in same form but not necessarily for same purpose. Reuse includes:

.1 Salvaging reusable materials from re-modelling projects, before demolition stage, for resale, reuse on current project or for storage for use on future projects.

.2 Returning reusable items including pallets or unused products to vendors.

.7 Salvage: removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.

.8 Separate Condition: refers to waste sorted into individual types.

.9 Source Separation: acts of keeping different types of waste materials separate beginning from first time they became waste.

1.4 SUBMITTALS

.1 Submit before final payment summary of waste materials salvaged for reuse, recycling or disposal.

.1 Failure to submit could result in hold back of final payment.

.2 Provide receipts, scale tickets, waybills, and show quantities and types of materials reused, recycled or disposed of.

.3 For each material reused, sold or recycled from project, include amount in tonnes and the destination.

.4 For each material land filled or incinerated from project, include amount in tonnes of material and identity of landfill, incinerator or transfer station.

1.5 STORAGE, HANDLING AND PROTECTION

.1 Store materials to be reused, recycled and salvaged in locations as directed by Departmental Representative.

.2 Unless specified otherwise, materials for removal become Contractor's property.

.3 Protect, stockpile, store and catalogue salvaged items.

.4 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.

.5 Protect structural components not removed for demolition from movement or damage.

.6 Support affected structures. If safety of building is endangered, cease operations and immediately notify Departmental Representative.

.7 Protect surface drainage, mechanical and electrical from damage and blockage.

.8 Separate and store materials produced during dismantling of structures in designated areas.

.9 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated facilities.

.1 On-site source separation is recommended.
.2 Remove co-mingled materials to off-site processing facility for separation.
.3 Provide waybills, receipts and/or scale tickets for separated materials removed from site.
.4 Materials reused on-site are considered to be diverted from landfill and as such are to be included in all reporting.

1.6 DISPOSAL OF WASTES

.1 Do not bury rubbish or waste materials.

.2 Do not dispose of waste, volatile materials, mineral spirits, oil, paint thinner or any other liquid hazardous wastes into waterways, storm, or sanitary sewers.

.3 Keep records of construction waste including:

.1 Number and size of bins.
.2 Waste type of each bin.
.3 Total tonnage generated.
.4 Tonnage reused or recycled.
.5 Reused or recycled waste destination.

.4 Remove materials from deconstruction as deconstruction/disassembly Work progresses.

.5 Prepare project summary to verify destination and quantities on a material-by-material basis as identified in pre-demolition material audit.

1.7 USE OF SITE AND FACILITIES

.1 Execute work with least possible interference or disturbance to normal use of premises.

.2 Provide temporary security measures approved by Departmental Representative.

1.8 SCHEDULING

.1 Co-ordinate Work with other activities at site to ensure timely and orderly progress of Work.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 APPLICATION

.1 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

3.2 CLEANING

.1 Remove tools and waste materials on completion of Work, and leave work area in clean and orderly condition.

.2 Clean-up work area as work progresses.

.3 Source separate materials to be reused/recycled into specified sort areas.

.4 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

.5 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

.6 Waste Management: separate waste materials for reuse, recycling in accordance with this Section.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

.2 Source separate materials to be reused/recycled into specified sort areas.

3.3 DIVERSION OF MATERIALS

.1 From following list, separate materials from general waste stream and stockpile in separate piles or containers, as reviewed by Departmental Representative, and consistent with applicable fire regulations.

.1 Mark containers or stockpile areas.

.2 Provide instruction on disposal practices.

.2 On-site sale of salvaged, recovered, reusable and/or recyclable materials is NOT permitted.

.3 Demolition Waste:

Material Type	Recommended Diversion %
Doors and Frames	[100]
Electrical Equipment	[80]
Mechanical Equipment	[100]
Metals	[100]
Concrete	[100]
Wood (uncontaminated)	[100]

END OF SECTION

Public Works Government Services Canada
Esquimalt Graving Dock
Building 1007 Demolition
Project No. R.118910.001

1.1 General

1.2 ADMINISTRATIVE REQUIREMENTS

.1 Acceptance of Work Procedures:

.1 Contractor's Inspection: Contractor to conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.

.1 Notify Departmental Representative in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.

.2 Request Departmental Representative inspection.

.2 Departmental Representative Inspection:

.1 Departmental Representative and Contractor to inspect Work and identify defects and deficiencies.

.2 Contractor to correct Work as directed.

.3 Completion Tasks: submit written certificates that tasks have been performed as follows:

.1 Work: completed and inspected for compliance with Contract Documents.

.2 Defects: corrected and deficiencies completed.

.3 Work: complete and ready for final inspection.

.4 Final Inspection:

.1 When completion tasks are done, request final inspection of Work by Departmental Representative.

.2 When Work is incomplete according to Departmental Representative, complete outstanding items and request re-inspection, at no additional cost to the Contract.

.5 Final Payment:

.1 When Departmental Representative considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.

1.3 FINAL CLEANING

.1 Clean in accordance with Section 01 74 11 - Cleaning.

.1 Remove surplus materials, excess materials, rubbish, tools and equipment.

.2 Waste Management: dispose of waste materials in accordance with Section 02 81 01 – Hazardous Materials

Public Works Government Services Canada
Esquimalt Graving Dock
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Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Public Works Government Services Canada
Esquimalt Graving Dock
Building 1007 Demolition
Project No. R.118910.001

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 35 43 - Environmental Procedures.

.2 Section 01 56 00 - Temporary Barriers and Enclosures

.3 Section 01 74 21 - Waste Management and Disposal

.4 Section 02 81 01 - Hazardous Materials

.5 Section 01 35 33 - Health and Safety Requirements

1.2 REFERENCES

.1 Definitions:

.1 Hazardous Materials: dangerous substances, dangerous goods, hazardous commodities and hazardous products, include but not limited to: poisons, corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or materials that endanger human health or environment if handled improperly.

.2 Waste Management Co-ordinator (WMC): contractor representative responsible for supervising waste management activities as well as co-ordinating related, required submittal and reporting requirements.

.2 Reference Standards:

.1 Canadian Environmental Protection Act (CEPA)

.1 CCME PN 1326-[2008], Environmental Code of Practice for Aboveground and Underground Storage Tank Systems for Petroleum Products and Allied Petroleum Products.

.2 CSA International

.1 CSA S350-[M1980(R2003)], Code of Practice for Safety in Demolition of Structures.

.3 Department of Justice Canada (Jus)

.1 Canadian Environmental Assessment Act (CEAA), 1995, c. 37.

.2 Canadian Environmental Protection Act (CEPA), 1999, c. 33.

.1 SOR/2003-2, On-Road Vehicle and Engine Emission Regulations.

.2 SOR/2006-268, Regulations Amending the On-Road Vehicle and Engine Emission Regulations.

.3 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

.4 U.S. Environmental Protection Agency (EPA)

.1 EPA CFR 86.098-10, Emission standards for 1998 and later model year Otto-cycle heavy-duty engines and vehicles.

.2 EPA CFR 86.098-11, Emission standards for 1998 and later model year diesel heavy-duty engines and vehicles.

.3 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

.5 WorkSafe BC

.1 British Columbia's Occupational Health and Safety Regulation (BC Reg. 296/97, including amendments to date of work)

.2 "Safe Work Practices for Handling Asbestos" (2012 Edition)

.3 "Lead-Containing Paints and Coatings; Preventing Exposure in the Construction Industry", 2011

.6 Canadian Construction Association (CCA)

.1 Standard Construction Document CCA 82 "mould guidelines for the Canadian construction industry", 2004

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Pre-Work Meetings:

.1 Convene pre-work meeting minimum forty-eight (48) hours prior to beginning work of this Section, with Contractor's Representative and Departmental Representative to:

.1 Verify project requirements.

.2 Verify existing site conditions adjacent to demolition work.

.3 Co-ordination with other construction subtrades.

.2 Hold project meetings on an "as required" basis, or as requested by Departmental Representative

.3 Ensure key personnel attend, as required.

.4 WMC must document and provide verbal report on status of waste diversion activity at each meeting.

.2 Scheduling:

.1 Employ necessary means to meet project time lines without compromising specified minimum rates of material diversion.

.1 In event of unforeseen delay notify Departmental Representative in writing.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 WMC is responsible for fulfilment of reporting requirements.

.2 Prior to beginning of Work on site submit the following:

.1 Schedule of selective demolition, if applicable.

.2 Number and location of dumpsters.

.3 Anticipated frequency of tippage.

.4 Name and address of haulers, waste disposal facilities and/or waste receiving organizations (e.g. recycling or re-use facilities).

.3 Submit copies of weigh bills, bills of lading and/or receipts from authorized disposal sites and reuse and recycling facilities for material removed from site upon completion of the project.

.4 Shop Drawings:

.1 Submit for review demolition plan including drawings, diagrams or details showing sequence of demolition work and supporting structures and underpinning, where required.

.1 Demolition plan must be signed by a qualified Professional Engineer registered in the Province of British Columbia.

.2 Demolition Plan shall be submitted minimum seventy-two (72) hours prior to proceeding with the work.

.5 Sustainable Design Submittals:

.1 Erosion and Sedimentation Control: submit erosion and sedimentation control plan in accordance with authorities having jurisdiction.

.2 Construction Waste Management:

.1 Submit project Waste Management Plan highlighting recycling and salvage requirements.

1.5 QUALITY ASSURANCE

.1 Regulatory Requirements: Ensure Work is performed in compliance with applicable Federal, Provincial and Municipal regulations.

1.6 SITE CONDITIONS

.1 Environmental protection:

.1 Ensure Work is done in accordance with Section 01 35 43 - Environmental Procedures.

1.7 EXISTING CONDITIONS

.1 The building contains hazardous materials. Refer to hazardous materials reports within Appendix A. If additional materials resembling asbestos or other substance listed as hazardous are encountered in course of demolition, stop work, take preventative measures, and notify Departmental Representative immediately. Proceed only after receipt of written instructions has been received from Departmental Representative.

.2 Structures to be demolished are based on their condition at time of examination prior to tendering.

Part 2 Products

2.1 EQUIPMENT

.1 Equipment and heavy machinery:

.1 On-road vehicles to: CEPA-SOR/2003-2, On-Road Vehicle and Engine Emission Regulations and CEPA-SOR/2006-268, Regulations Amending the On-Road Vehicle and Engine Emission Regulations.

.2 Off-road vehicles to: EPA CFR 86.098-10 and EPA CFR 86.098-11.

.2 Leave machinery running only while in use, except where extreme temperatures prohibit shutting machinery down.

.3 Where steel tracked equipment is used, protect surfaces to remain to prevent damage from tracks.

Part 3 Execution

3.1 PREPARATION

.1 Temporary Erosion and Sedimentation Control:

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during demolition.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal after completion of demolition work.

.2 Protection of in-place conditions:

.1 Work in accordance with Section 01 35 43 - Environmental Procedures.

.2 Prevent movement, settlement or damage of adjacent trees, landscaping, adjacent grades, properties and roadways

.1 Provide bracing, shoring and underpinning, as required.

.2 Repair damage caused by demolition as directed by Departmental Representative.

.3 Support affected structures and, if safety of structure being demolished appears to be endangered, take preventative measures, stop Work and immediately notify Departmental Representative.

.4 Prevent debris from blocking surface drainage system, elevators, mechanical and electrical systems which must remain in operation.

.5 Protect all surfaces to remain to prevent damage during the performance of work. Where damage occurs, make good to the satisfaction of the Departmental Representative.

.6 Protect in-ground electrical vault and tenant owned security turnstile electrical service located at southeast corner of the building.

.7 Protect surfaces, equipment and buildings outside of the worksite as necessary during the performance of Work. Adjust work as necessary to avoid damage to existing conditions. Where damage occurs, make good to the satisfaction of the Departmental Representative.

.3 Surface Preparation:

.1 Do not disrupt active or energized utilities designated to remain undisturbed.

3.2 DEMOLITION

.1 Blasting operations are NOT permitted during demolition.

.2 Remove contaminated or dangerous materials as defined by authorities having jurisdiction, relating to environmental protection, from site and dispose of in safe manner to minimize danger at site or during disposal.

.3 Prior to start of demolition, remove contaminated or hazardous materials from site and dispose of at designated disposal facilities in a safe manner and in accordance with TDGA and other applicable requirements, Section 01 35 33 Health and Safety and Section 02 81 01 - Hazardous Materials.

.4 Demolish structure.

.5 Leave surfaces identified to remain.

.6 At end of each day's work, leave Work in safe and stable condition.

.1 Protect interiors of parts not yet demolished from entry at all times.

.7 Demolish to minimize dusting. Keep materials wetted as necessary.

.8 Remove structural framing.

.9 Contain fibrous materials to minimize release of airborne fibres while being transported.

.10 Only dispose of material specified by selected alternative disposal option.

.1 Additional disposal options to be provided by on-site waste diversion representative prior to disposal.

.11 Remove and dispose of demolished materials except where noted otherwise and in accordance with authorities having jurisdiction.

.12 Use natural lighting to do Work where possible.

.1 Shut off lighting except those required for security purposes at end of each day.

3.3 DISPOSAL

.1 Waste Management: separate and document waste materials for reuse and recycling in accordance with Section 01 74 21 - Waste Management and Disposal.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

.2 Divert excess materials from landfill to approved site.

.3 Designate appropriate security resources / measures to prevent vandalism, damage and theft.

.4 Locate stockpiled materials convenient for loading into containers for off-site recycling or disposal. Eliminate double handling wherever possible.

.5 Stockpile materials designated for alternate disposal in location which facilitates removal from site and examination by potential end markets, and which does not impede disassembly, processing, or hauling procedures.

.6 Separate from general waste stream each of following materials, where safe to do so and/or where not removed for disposal as part of hazardous materials abatement. Stockpile materials in neat and orderly fashion in location and as directed by Departmental Representative for alternate disposal. Stockpile materials in accordance with applicable fire and safety regulations.

.7 Supply separate, clearly marked disposal bins for categories of waste material. Notify Departmental Representative prior to removal of bins from site.

.8 Remove stockpiles of like materials by alternate disposal option once collection of materials is complete, or materials stockpiled will fill one transport container.

.9 Transport material designated for alternate disposal using approved haulers, waste disposal facilities and/or waste receiving organizations in accordance with applicable regulations.

.10 Dispose of materials not designated for alternate disposal in accordance with applicable regulations.

END OF SECTION

Public Works Government Services Canada
Esquimalt Graving Dock
Building 1007 Demolition
Project No. R.118910.001

Part 1 General

1.1 REFERENCES

.1 Reports (collectively referred to herein as the “Assessment Reports”)

.1 Stantec Consulting Ltd. Report for Project No. 123221957 entitled “Supplemental Pre-Demolition Hazardous Building Materials Assessment Report” for “Project Name: Demolition of Esquimalt Graving Dock Building 1007 – Kiln Building”, issued December 3, 2021, prepared for Public Services and Procurement Canada.

.2 Stantec Consulting Ltd. Report for Project No. 123221425 entitled “Pre-Demolition Hazardous Building Materials Assessment, Building 1007 – Kiln Building, Esquimalt Graving Dock, 825 Admirals Road, Victoria” dated March 31, 2020, prepared for Public Services and Procurement Canada.

.3 North West Environmental Group Ltd. Report No. 15609 entitled “Hazardous Building Material Assessment; Esquimalt Graving Dock—DND Buildings” dated December, 2011, prepared for Public Works and Government Services Canada.

1.2 DEFINITIONS

.1 Dangerous Goods: product, substance, or organism specifically listed or meets hazard criteria established in Transportation of Dangerous Goods Regulations.

.2 Hazardous Building Material: component of a building or structure that will cause adverse impact to environment or adversely affect health of persons, animals, or plant life when altered, disturbed or removed during maintenance, renovation or demolition.

.3 Hazardous Material: product, substance, or organism used for its original purpose; and is either dangerous goods or material that will cause adverse impact to environment or adversely affect health of persons, animals, or plant life when released into the environment.

.4 Hazardous Waste: hazardous material no longer used for its original purpose and that is intended for recycling, treatment or disposal.

.5 Workplace Hazardous Materials Information System 2015 (WHMIS): Canada-wide system designed to give employers and workers information about hazardous materials used in workplace. Under WHMIS, information on hazardous materials is provided on container labels, safety data sheets (SDS), and worker education programs. WHMIS is put into effect by combination of Federal and Provincial laws.

1.3 REFERENCE STANDARDS:

.1 Canadian Environmental Protection Act,1999 (CEPA 1999)

.1 Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations (SOR/2005-149).

.2 Department of Justice Canada (Jus)

.1 Transportation of Dangerous Goods Act, 1992 (TDG Act) [1992], (c. 34).

.2 Transportation of Dangerous Goods Regulations (T-19.01-SOR/2001-286).

.3 Health Canada / WHMIS

.1 Safety Data Sheets (SDS).

.4 National Research Council Canada Institute for Research in Construction (NRC-IRC).

.1 National Fire Code of Canada-(2010).

.5 WorkSafe BC

.1 British Columbia's Occupational Health and Safety Regulation (BC Reg. 296/97), including amendments to date of work)

.2 "Safe Work Practices for Handling Asbestos" (2017)

.3 "Lead-Containing Paints and Coatings; Preventing Exposure in the Construction Industry" (2011)

.4 "Safe Work Practices for Handling Lead" (2017)

.6 Government of British Columbia

.1 British Columbia Hazardous Waste Regulation (BC Reg. 63/88)

.7 Government of Canada

.1 The Canada Labour Code, Part II, Canada Occupational Health and Safety Regulations (COHSR)

.2 The Federal PCB Regulations (SOR/2008-273).

.3 The Federal Halocarbons Regulation (FHR 2003).

.8 Environment Canada

.1 Identification of Lamp Ballasts Containing PCBs, Report EPS 2/CC/2, dated August 1991 (PCB Guide)

.9 Canadian Construction Association

.1 Standard Construction Document CCA 82 "Mould Guidelines for the Canadian Construction Industry" (2004 – further referred to herein as "CCA 82").

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for hazardous materials and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit two copies of WHMIS SDS in accordance with Sections 01 35 33 – Health and Safety Requirements and 01 35 43 – Environmental Procedures to Departmental Representative for each hazardous material required prior to bringing hazardous material on site.

.3 Submit environmental management plan to Departmental Representative that identifies hazardous materials, usage, location, personal protective equipment requirements, and disposal arrangements.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Transport hazardous materials and wastes in accordance with Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable Provincial regulations.

.4 Storage and Handling Requirements:

.1 Co-ordinate storage of hazardous materials with Departmental Representative and abide by internal requirements for labelling and storage of materials and wastes.

.2 Store and handle hazardous materials and wastes in accordance with applicable Federal and Provincial laws, regulations, codes, and guidelines.

.3 Store and handle flammable and combustible materials in accordance with National Fire Code of Canada requirements.

.4 Keep no more than 45 litres of flammable and combustible liquids such as gasoline, kerosene and naphtha for ready use.

.1 Store flammable and combustible liquids in approved safety cans bearing the Underwriters' Laboratory of Canada or Factory Mutual seal of approval.

.2 Storage of quantities of flammable and combustible liquids exceeding 45 litres for work purposes requires the written approval of the Departmental Representative.

.5 Transfer of flammable and combustible liquids is prohibited within buildings.

.6 Transfer flammable and combustible liquids away from open flames or heat-producing devices.

.7 Solvents or cleaning agents must be non-flammable or have flash point above 38 degrees C.

.8 Store flammable and combustible waste liquids for disposal in approved containers located in safe, ventilated area. Keep quantities to minimum.

.9 Observe smoking regulations, smoking is prohibited in areas where hazardous materials are stored, used, or handled.

.10 Storage requirements for quantities of hazardous materials and wastes in excess of 5 kg for solids, and 5 litres for liquids:

.1 Store hazardous materials and wastes in closed and sealed containers.

.2 Label containers of hazardous materials and wastes in accordance with WHMIS.

.3 Store hazardous materials and wastes in containers compatible with that material or waste.

.4 Segregate incompatible materials and wastes.

.5 Ensure that different hazardous materials or hazardous wastes are stored in separate containers.

.6 Store hazardous materials and wastes in secure storage area with controlled access.

.7 Maintain clear egress from storage area.

.8 Store hazardous materials and wastes in location that will prevent them from spilling into environment.

.9 Have appropriate emergency spill response equipment available near storage area, including personal protective equipment.

.10 Maintain inventory of hazardous materials and wastes, including product name, quantity, and date when storage began.

.11 Ensure personnel have been trained in accordance with WHMIS requirements.

.12 Report spills or accidents immediately to Departmental Representative. Submit a written spill report to Departmental Representative within 24 hours of incident.

1.6 TRANSPORTATION

.1 Transport hazardous materials and wastes in accordance with Federal Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable Provincial regulations.

.2 When hazardous waste is generated on site:

.1 Co-ordinate transportation and disposal with Departmental Representative.

.2 Ensure compliance with applicable Federal, Provincial and municipal laws and regulations for generators of hazardous waste.

.3 Use licensed carrier authorized by Provincial authorities to accept subject material.

.4 Prior to shipping material obtain written notice from intended hazardous waste treatment or disposal facility that it will accept material and that it is licensed to accept this material.

.5 Label containers with legible, visible safety marks as prescribed by Federal and Provincial regulations.

.6 Ensure that trained personnel handle, offer for transport, or transport dangerous goods.

.7 Provide photocopy of shipping documents and waste manifests to Departmental Representative.

.8 Track receipt of completed manifest from consignee after shipping dangerous goods. Provide a photocopy of completed manifest to Departmental Representative.

.9 Report discharge, emission, or escape of hazardous materials immediately to Departmental Representative and appropriate Provincial authority. Take reasonable measures to control release.

1.7 EXISTING CONDITIONS

.1 Reports and information pertaining to hazardous building materials present within the buildings that may be handled, removed, or otherwise disturbed and disposed of during this Project are bound into this specification in the Appendix.

.2 Notify Departmental Representative of suspected hazardous building material discovered during Work and not apparent from drawings, specifications, or reports pertaining to the Work. Do not disturb such material pending instructions from Departmental Representative.

Part 2 Products

2.1 MATERIALS

.1 Bring on site only quantities hazardous material required to perform Work.

.2 Maintain SDS in proximity to where materials are being used. Communicate this location to personnel who may have contact with hazardous materials.

Part 3 Execution

3.1 HAZARDOUS MATERIALS ABATEMENT

.1 Scope of Abatement Activities

.1 Abatement shall be conducted to remove and dispose of hazardous building materials as identified in the Assessment Report in accordance with applicable regulations, guidelines, standards and/or best practices for such work, to the extent required to allow for building demolition.

.2 Contractor is responsible for reviewing plans, specifications and reports such that they understand the locations and amounts of hazardous building materials that require abatement.

.3 Where there is a discrepancy between the information in this specification as compared to the information in the Assessment Report as it pertains to identities, locations and/or quantities of identified hazardous building materials, the information in the Assessment Report will prevail.

.1 If discrepancies are present pertaining to identities, locations and/or quantities of identified hazardous building materials, it is the Contractor's responsibility to request information to clarify such discrepancies during the bidding period. No additional costs will be allowed by the Contractor for additional labour or materials required to complete required abatement related to such discrepancies that could otherwise have been clarified during the bidding period.

.4 The listing below is a summary of the identified hazardous building materials and associated considerations and/or removal and disposal requirements including regulations, guidelines and/or standards.

.1 Asbestos-Containing Materials (ACMs)

.1 The Assessment Reports has identified the following ACMs that will require abatement:

.1 Black firestop/wall mastic applied sporadically to red masonry block walls, concrete wall surfaces and upper wall seams between concrete wall and red masonry block walls throughout both the interior and exterior.

.2 Roof tar present as the base layer of roofing on top of the wood roof deck, penetrating through seams on the underside of roof decking in various locations on the interior and on masonry materials at the tops of walls where it has dripped down from the roof.

.2 Abatement shall be conducted to remove and dispose of ACMs as identified in the Assessment Reports in accordance with applicable regulations, guidelines, standards and/or best practices for such work.

.1 Submit Provincial and/or local requirements for Notice of Project Form.

.2 Submit proof of Contractor's Asbestos Liability Insurance.

.3 Submit to Departmental Representative necessary permits for transportation and disposal of asbestos containing waste and proof that asbestos containing waste has been received and properly disposed.

.4 Submit proof that all asbestos workers and/or supervisor have received appropriate training and education by a competent person in the hazards of asbestos exposure, good personal hygiene and work practices while working in Asbestos Work Areas, and the use, cleaning and disposal of respirators and protective clothing.

.3 Contractor is responsible for any and all supplemental assessment and/or pre-work site visits necessary to satisfy the requirements of the BC Reg. 296/97 as they may pertain to appropriate documentation of the following:

.1 Project plan (sequencing of work, duration of work, addressing unknowns [if any], work methods, tools PPE, etc.)

.2 Site-specific hazard assessments/risk assessments, and development of site-specific safe work practices

.3 Addressing potential for concealed or previously un-assessed potential ACMs

.4 Removal of identified ACMs is to be conducted in accordance with the requirements of the 2017 WorkSafe BC publication “Safe Work Practices for Handling Asbestos”, by appropriately trained personnel.

.1 Contractor is to conduct a risk assessment and document site-specific work procedures for actions/tasks that will disturb identified ACMs.

.2 Contractor is to submit the documented site specific work procedures to the Departmental Representative for review, minimum 3 days prior to initiation of work.

.1 Work procedure documents must be specific to the ACMs present at the site, with details pertaining to how ACMs will be removed, including consideration of the following, at a minimum:

.1 Roofing materials – consideration of entire roof structure as ACM due to

extent of roofing tar, or alternative plan that meets the requirements of the 2017 WorkSafe BC publication “Safe Work Practices for Handling Asbestos

.2 Firestop/wall mastic material – will the material be removed from each localized area it is present, or will entire wall structures be demolished with this ACM in place with all wall-related waste being disposed of as ACM waste, or alternative plan that meets the requirements of the 2017 WorkSafe BC publication “Safe Work Practices for Handling Asbestos ACM

.3 Contractor must not proceed with work that will impact identified ACMs without approval from Departmental Representative.

.4 If air monitoring is required as part of the Contractor’s work procedures, Departmental Representative will take air samples inside and outside of Asbestos Work Areas in accordance with the most stringent of the recommendations set forth in the Canada Labour Code Part II, Occupational Health and Safety Regulations, BC Reg. 296/97 and the 2017 WorkSafeBC Manual “Safe Work Practices for Handling Asbestos”.

.1 Air samples will be collected and analyzed in accordance with NIOSH method 7400.

.2 Air sample results will be provided to the Contractor and project team within 24-hours of sample collection.

.3 Analysis will be conducted by qualified persons or laboratories that take part in a documented QA/QC program for such analysis.

.4 Contractor will be notified to stop Work when airborne fibre measurements exceed 0.05 fiber/cubic centimetre (f/cc), when PPE and protection factors are considered, and to correct procedures.

.5 Subsequent to abatement activities conducted within enclosures, post-abatement (“air clearance”) sampling will be completed by Departmental Representative. Post-abatement results must indicate

airborne fibre measurements less than 0.01 f/cc prior to the Contractor being provided with notification that containment structures can be removed.

.1 Contractor must include appropriate time in their schedule to allow for post-abatement air sampling, if work will be conducted in enclosures. This will require a minimum of 48 hours to account for settling of encapsulant, sampling and analysis by the Departmental Representative.

.6 Additional monitoring will be conducted, where deemed necessary by the Departmental Representative, to verify procedural corrections were effective.

.7 If air monitoring shows that areas outside Asbestos Work Area are contaminated as determined by the Departmental Representative, Contractor will be notified to maintain and clean these areas in same manner as that applicable to Asbestos Work Area, at no additional cost to the Contract.

.1 When asbestos leakage from Asbestos Work Area has occurred, or is likely to occur, Departmental Representative may order Work shutdown and correction of deficiencies.

.8 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

.5 If, in the opinion of the Departmental Representative, the work procedures developed by the Contractor do not meet the intent of the 2017 WorkSafeBC publication “Safe Work Practices for Handling Asbestos”, revisions will be required, at no cost to the Owner, and at no impact to the schedule.

.5 Waste transportation to be conducted in accordance with BC Reg. 63/88 and the Federal Transportation of Dangerous Goods Regulation.

.6 Waste disposal to be conducted in accordance with BC Reg. 63/88.

.7 Notify Departmental Representative of suspected ACM discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material pending instructions from Department Representative.

.2 Lead

.1 Refer to the Assessment Reports for identities and locations of identified lead-containing materials (including paints with varying concentrations of lead).

.2 Actions that will disturb lead-containing materials (including paints) are to be conducted such that airborne exposure to lead dust does not exceed the 8-hour COHSR Occupational Exposure Limit (OEL) for lead of 0.05 milligram per cubic metre (mg/m^3).

.3 The actual methods to be used by the Contractor to complete the general Work of this Project may impact how and to what extent various lead-containing items and LCPs will require removal and disposal.

.1 The work tasks required and the ways in which lead-containing materials (including LCPs) will be impacted will determine the appropriate respirators, measures and procedures that should be followed to protect workers from lead or arsenic exposure. This is to be determined by the Contractor through their own Risk Assessment.

.1 Contractor is to submit the documented Risk Assessment and site-specific Safe Work Practices pertaining to lead to the Departmental Representative for review, minimum 3 days prior to initiation of work.

.2 If, in the opinion of the Departmental Representative, the work procedures developed by the Contractor do not meet the intent of the 2017 WorkSafeBC publication “Safe Work Practices for Handling Lead”, revisions will be required, at no cost to the Owner, and at no impact to the schedule.

.4 Although LCPs and items coated with LCPs may be disturbed and/or removed for disposal during the Work, unless deemed necessary through risk assessment or cost analysis conducted by the Contractor, comprehensive removal of LCPs from items or surfaces and/or specific removal of building materials coated with LCPs is not expected to be required during the Work.

.5 Refer to the provisions of the 2017 WorkSafeBC document "Safe Work Practices for Handling Lead" for removal of LCPs from surfaces before any welding and torch-cutting, should the Contractor plan to use such methods to complete the Work.

.1 Contractor will be responsible for verification testing of surfaces where LCPs have been removed. Confirmation of acceptable results is to be provided to the Departmental Representative for review before proceeding with any welding or torch-cutting on surfaces where LCPs were present.

.6 Waste transportation to be conducted in accordance the Federal Transportation of Dangerous Goods Regulation.

.7 Waste disposal to be conducted in accordance with Disposal requirements of BC Environment—Contaminated Sites Regulations and the BC Government Special Waste Regulations.

.3 Polychlorinated Biphenyls (PCBs)

.1 When fluorescent fixtures are decommissioned, verify the PCB content of fluorescent lamp ballasts as per the PCB Guide.

.2 Should a material suspected to contain PCBs become uncovered during demolition activities (i.e., dielectric fluids, hydraulic fluids), all work in the areas that may disturb the material should be stopped. Samples of the suspect material should be submitted for laboratory analysis to determine if PCBs are present.

.3 If PCB-containing items (including lamp ballasts) are identified for removal and disposal, these should be handled, transported, stored and disposed of in accordance with the following:

.1 Transportation requirements of the Federal Transportation of Dangerous Goods Regulation.

.2 Disposal requirements of BC Environment—Contaminated Sites Regulations and the BC Government Special Waste Regulations.

.3 Requirements of the Federal PCB Regulations (SOR/2008-273).

.4 Mould and Other Microbial Contamination

.1 For Work of this contract, contact with and/or working around mould-contaminated items is not expected to be required.

.5 Mercury

.1 Complete removal of mercury-containing equipment is required prior to demolition activities.

.2 When mercury-containing items (e.g., fluorescent light bulbs/tubes) are removed, ensure all mercury waste is handled, stored and disposed of in accordance with the requirements the following:

.1 British Columbia Hazardous Waste Regulation (BC Reg. 63/88).

.2 Transportation requirements of the Federal Transportation of Dangerous Goods Regulation.

.3 Precautions should be taken if workers may potentially be exposed to mercury or mercury vapours to ensure that worker exposure levels do not exceed the COHSR occupational exposure limit of 0.025 mg/m^3. This can be achieved by providing respiratory and skin protection applicable to the hazard and task to be completed.

.6 Ozone-Depleting Substances (ODSs)

.1 Removal, alteration and/or disposal of ODS-containing equipment is not anticipated to be required during the Work

.7 Silica

.1 Specific removal and disposal of silica-containing items is not required as part of this Contract, however, disturbance to silica-containing items will occur during the Work.

.2 When silica-containing materials are to be disturbed, ensure dust control measures are employed such that airborne silica dust concentrations do not exceed the applicable exposure limits indicated in the current version of the COHSR and BC Reg. 296/97.

.3 Contractor must develop a project-specific silica exposure control plan in accordance with the recommendations provided in the WorkSafeBC document “Developing a silica exposure control plan”.

.1 Contractor is to submit the documented silica exposure control plan to the Departmental Representative for review, minimum 3 days prior to initiation of work.

.2 If, in the opinion of the Departmental Representative, the work procedures developed by the Contractor do not meet the intent of the WorkSafeBC publication “Developing a silica exposure control plan”, revisions will be required, at no cost to the Owner, and at no impact to the schedule.

3.2 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning. Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

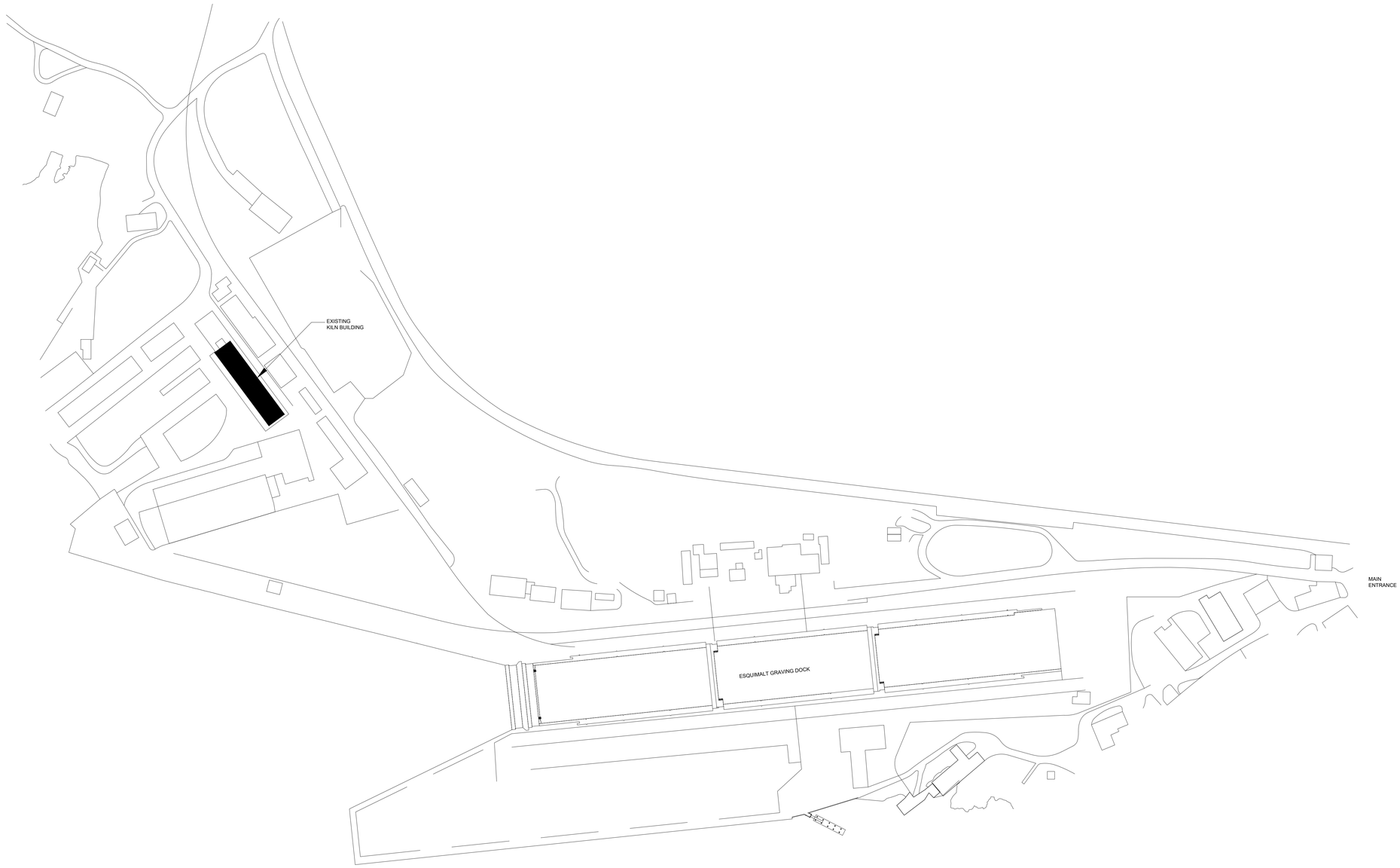
.3 Waste Management: dispose of waste materials in accordance with the regulations and guidelines as outlined in this Section.

- .1 Dispose of hazardous waste materials in accordance with applicable Federal and Provincial acts, regulations, and guidelines.
- .2 Recycle hazardous wastes for which there is approved, cost effective recycling process available.
- .3 Send hazardous wastes to authorized hazardous waste disposal or treatment facilities.
- .4 Burning, diluting, or mixing hazardous wastes for purpose of disposal is prohibited.
- .5 Disposal of hazardous materials in waterways, storm or sanitary sewers, or in Municipal solid waste landfills is prohibited.
- .6 Dispose of hazardous wastes in timely fashion in accordance with applicable Federal and Provincial regulations.
- .7 Minimize generation of hazardous waste to maximum extent practicable. Take necessary precautions to avoid mixing clean and contaminated wastes.
- .8 Identify and evaluate recycling and reclamation options as alternatives to land disposal, such as:
  - .1 Hazardous wastes recycled in manner constituting disposal.
  - .2 Hazardous waste burned for energy recovery.
  - .3 Lead-acid battery recycling.
  - .4 Hazardous wastes with economically recoverable precious metals.

END OF SECTION

DRAWINGS

1. Building 1007 – Site Location Plan
2. Building 1007 – Contractor Worksite
3. Building 1007 – Floor Plan and West Elevation
4. Building 1007 General Arrangement and Details
5. Building 1007 General Arrangement and Details Continued



LOCATION PLAN

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

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Région de Pacifique

Revision/ Revision	Description/Description	Date/Date
2		
1		
0	Base Map Compilation	21/12/17

Client/client

PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

825 ADMIRAL ROAD
VICTORIA, BC, V9A 2P1

Project title/Titre du projet

BUILDING 1007 DEMOLITION ESQUIMALT GRAVING DOCK

Consultant Signature Box Only
STANTEC CONSULTING LTD.

Designed by/Concept par
KIM WIESE

Approved by/Approuvée par
SEAN BRIGDEN

Drawn by/Dessine par
DM

PWGSC Project Manager/Administrateur de Projets TPSGC
JON SISKA

PWGSC, Regional Manager, Architectural and Engineering Services/ Gestionnaire régionale, Services d'architectural et de génie, TPSGC
PREETIPAL PAUL

Drawing title/Titre du dessin

BUILDING 1007

SITE LOCATION PLAN

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R.118910.001	1	

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1		
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Designed by/Concept par	Approved by/Approuvée par
KIM WIESE	**SEAN BRIGDEN**

Drawn by/Dessine par
DM

PWGSC Project Manager/Administrateur de Projets TPSGC
JON SISKA

PWGSC, Regional Manager, Architectural and Engineering Services/ Gestionnaire régionale, Services d'architectural et de génie, TPSGC
PREETIPAL PAUL

Drawing title/Titre du dessin

BUILDING 1007

CONTRACTOR WORKSITE

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.118910.001	2	

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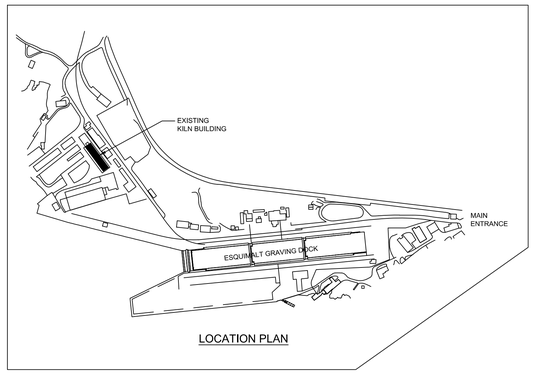
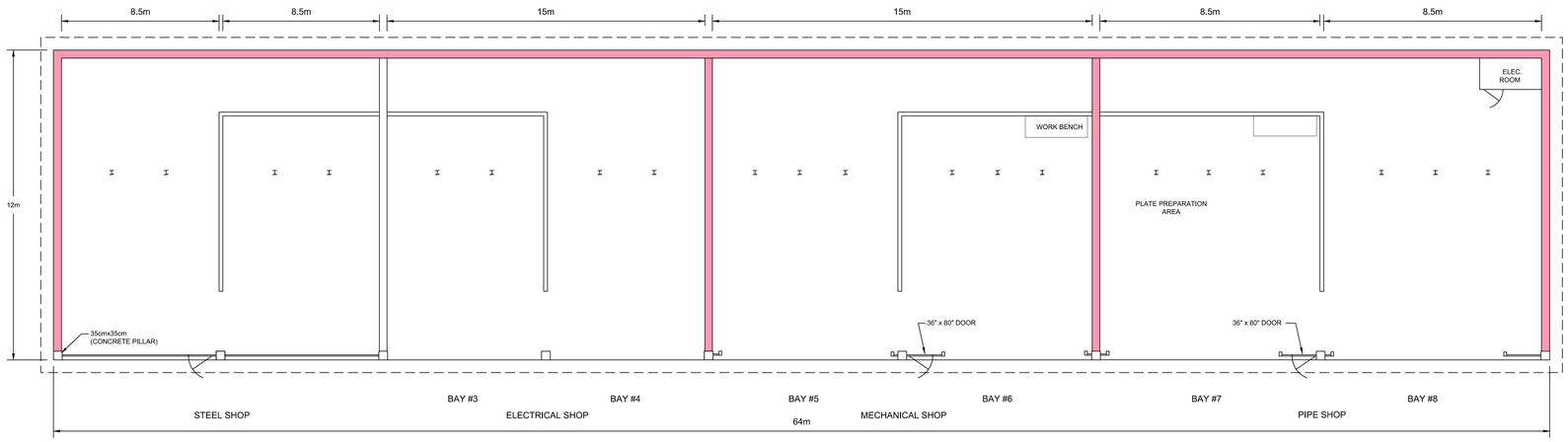
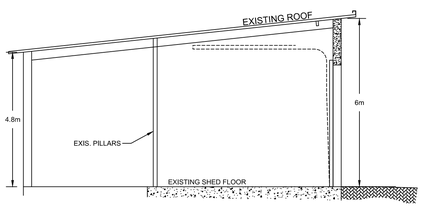


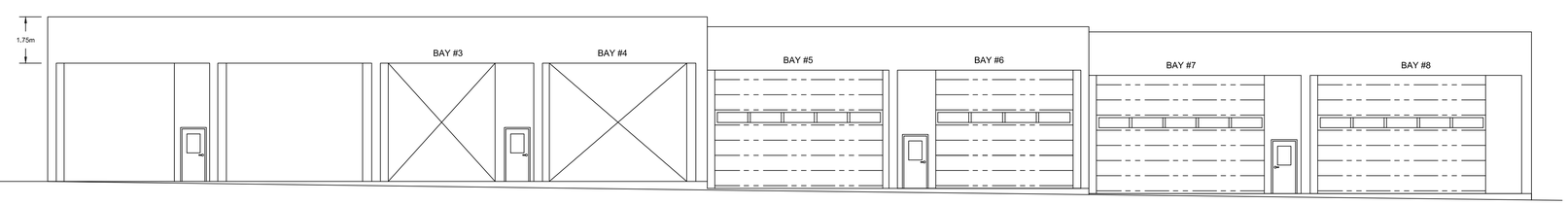
LOCATION PLAN



PLAN VIEW OF BUILDING 1007



GENERAL SECTION



FRONT VIEW OF BUILDING 1007

NOTE: ALL MEASUREMENTS APPROXIMATE.

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Legend

CONCRETE FOUNDATION WALLS TO REMAIN

Revision/ Revision	Description/Description	Date/Date
2		
1		
0	Base Map Compilation	21/12/21

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PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

825 ADMIRAL ROAD
VICTORIA, BC, V9A 2P1

Project title/Titre du projet

BUILDING 1007 DEMOLITION ESQUIMALT GRAVING DOCK

Consultant Signature Box Only
STANTEC CONSULTING LTD.

Designed by/Concept par
KIM WIESE

Approved by/Approuvée par
SEAN BRIGDEN

Drawn by/Dessine par
DM

PWGSC Project Manager/Administrateur de Projets TPSGC
JON SISKA

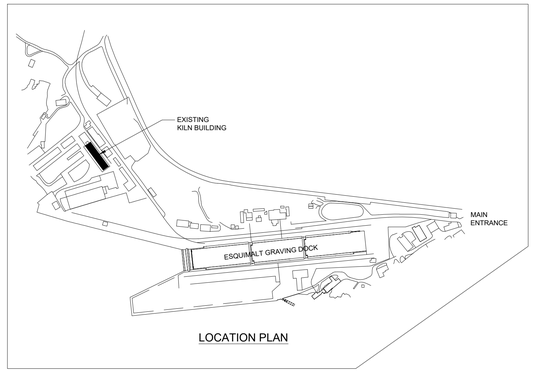
PWGSC, Regional Manager, Architectural and Engineering Services/ Gestionnaire régionale, Services d'architectural et de génie, TPSGC
PREETIPAL PAUL

Drawing title/Titre du dessin

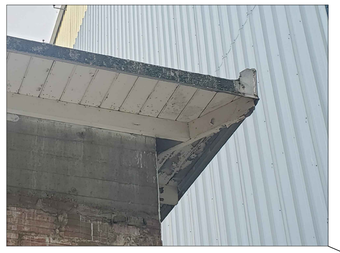
BUILDING 1007

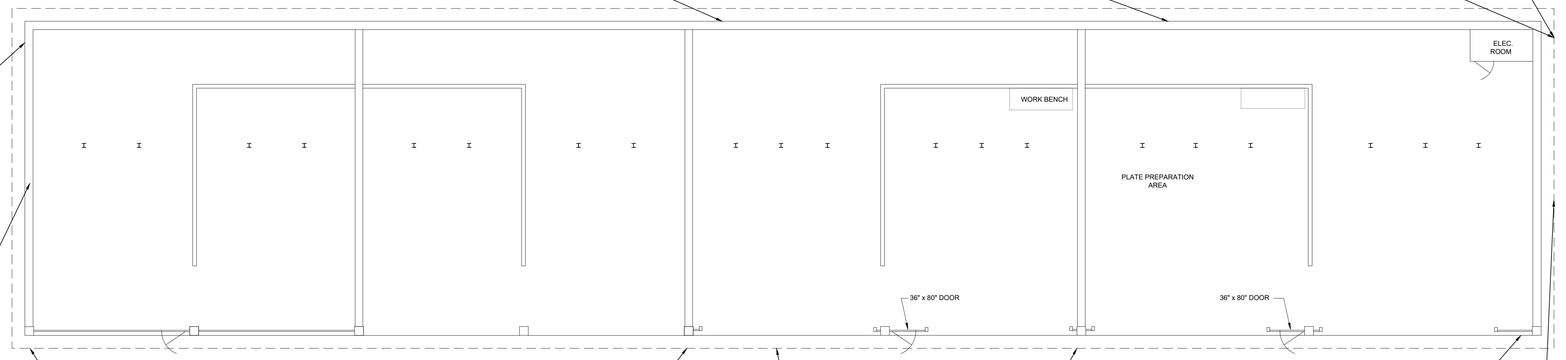
FLOOR PLAN AND WEST ELEVATION

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.118910.001	3	

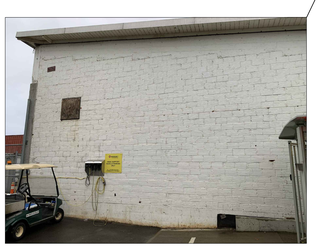


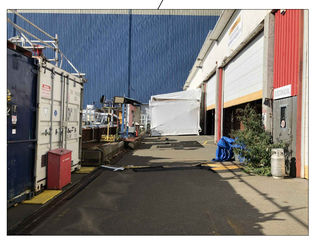
LOCATION PLAN

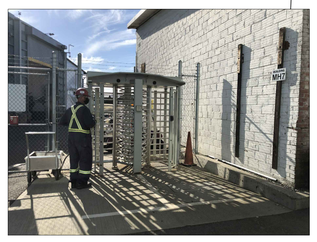




PLAN VIEW OF BUILDING 1007







NOTE: ALL MEASUREMENTS APPROXIMATE.

NOTE: ALL EQUIPMENT WITHIN THE PROJECT WORK SITE SHOWN IN THE PHOTOS WILL BE REMOVED BY PSPC PRIOR TO CONTRACT AWARD.

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2		
1		
0	Base Map Compilation	21/12/15

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PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

825 ADMIRAL ROAD
VICTORIA, BC, V9A 2P1

Project title/Titre du projet

BUILDING 1007 DEMOLITION ESQUIMALT GRAVING DOCK

Consultant Signature Box Only
STANTEC CONSULTING LTD.

Designed by/Concept par
KIM WIESE

Approved by/Approuvée par
SEAN BRIGDEN

Drawn by/Dessine par
DM

PWGSC Project Manager/Administrateur de Projets TPSGC
JON SISKA

PWGSC, Regional Manager, Architectural and Engineering Services/ Gestionnaire régionale, Services d'architectural et de génie, TPSGC
PREETIPAL PAUL

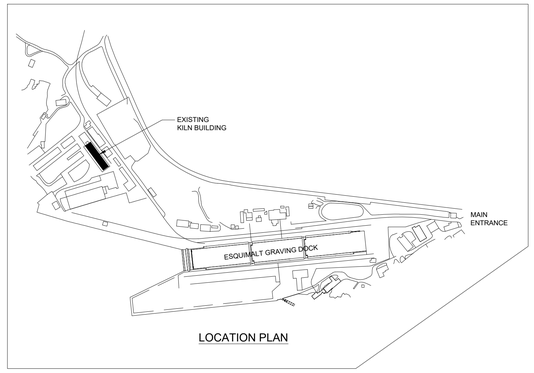
Drawing title/Titre du dessin

BUILDING 1007

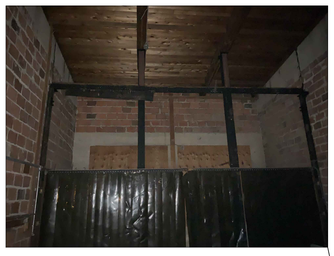
GENERAL ARRANGEMENT AND DETAILS

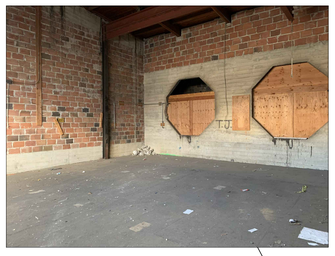
Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.118910.001	4	

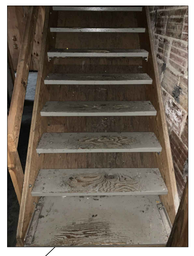
PWGSC – B1 – 1000X707

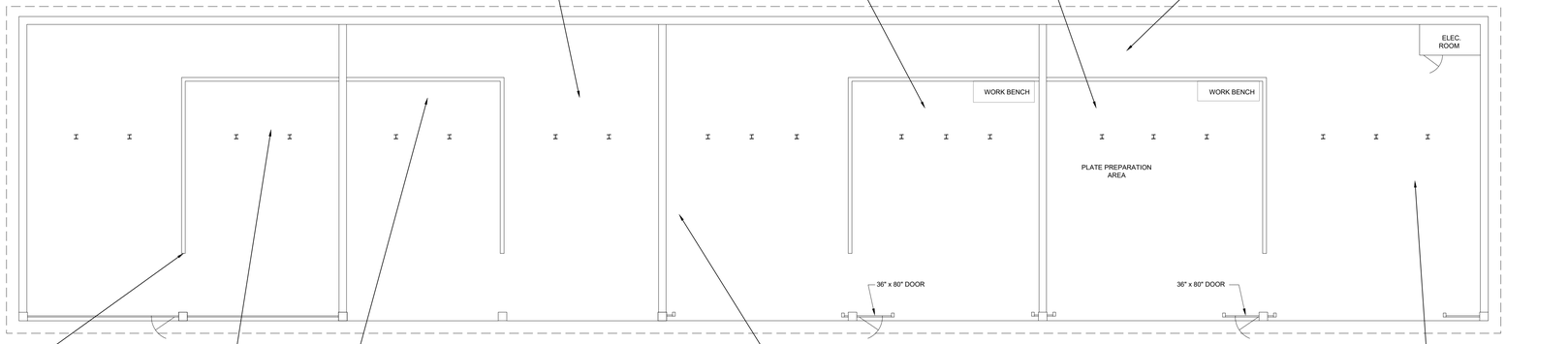


LOCATION PLAN

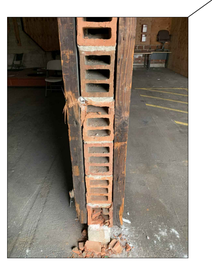


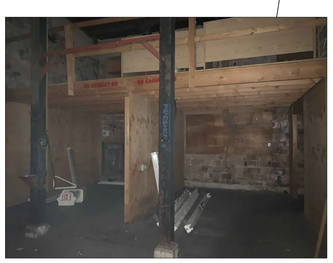


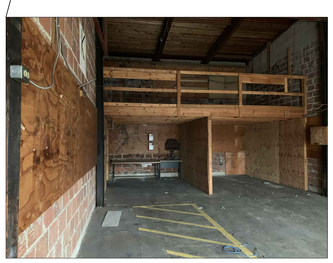


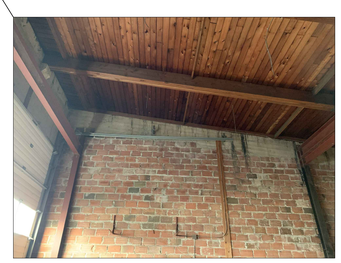


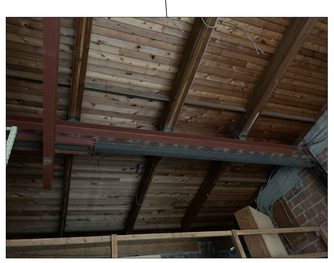
PLAN VIEW OF KILN SHED











NOTE: ALL MEASUREMENTS APPROXIMATE.

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Région de Pacifique

Note: All equipment within the project work site shown in the photos will be removed by PSPC prior to contract award.

Revision/ Revision	Description/Description	Date/Date
2		
1		
0	Base Map Compilation	21/12/16

Client/client

PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

825 ADMIRAL ROAD
VICTORIA, BC, V9A 2P1

Project title/Titre du projet

BUILDING 1007 DEMOLITION ESQUIMALT GRAVING DOCK

Consultant Signature Box Only
STANTEC CONSULTING LTD.

Designed by/Concept par
KIM WIESE

Approved by/Approuvée par
SEAN BRIGDEN

Drawn by/Dessine par
DM

PWGSC Project Manager/Administrateur de Projets TPSGC
JON SISKA

PWGSC, Regional Manager, Architectural and Engineering Services/ Gestionnaire régionale, Services d'architectural et de génie, TPSGC
PREETIPAL PAUL

Drawing title/Titre du dessin

BUILDING 1007

GENERAL ARRANGEMENT AND DETAILS, CONTINUED

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APPENDIX A – REPORTS

1. Stantec Consulting Ltd. Report for Project No. 123221957 entitled “Supplemental Pre-Demolition Hazardous Building Materials Assessment Report” for “Project Name: Demolition of Esquimalt Graving Dock Building 1007 – Kiln Building”, issued December 3, 2021, prepared for Public Services and Procurement Canada.
2. Stantec Consulting Ltd. Report for Project No. 123221425 entitled “Pre-Demolition Hazardous Building Materials Assessment, Building 1007 – Kiln Building, Esquimalt Graving Dock, 825 Admirals Road, Victoria” dated March 31, 2020, prepared for Public Services and Procurement Canada.
3. North West Environmental Group Ltd. Report No. 15609 entitled “Hazardous Building Material Assessment; Esquimalt Graving Dock—DND Buildings” dated December, 2011, prepared for Public Works and Government Services Canada.

Project Name: Demolition of Esquimalt Graving Dock Building 1007 – Kiln Building

Client:	PSPC	PSPC Contract #	E0276-171394/001/VAN
Stantec Site Assessor:	Steve Chou, Kim Wiese and Sean Brigden	Stantec Project #:	123221957
		Date of Site Visit:	October 18, 2021 and October 29, 2021
Location:	Building 1007 – Kiln Building, Esquimalt Graving Dock, 825 Admirals Road, Victoria, British Columbia (BC)	Date of Issue:	December 3, 2021

Project Name: Demolition of Esquimalt Graving Dock Building 1007 – Kiln Building

Stantec was retained by Public Services and Procurement Canada (PSPC) to provide a supplemental pre-demolition hazardous building materials assessment within Building 1007 – Kiln Building, Esquimalt Graving Dock, 825 Admirals Road, Victoria, British Columbia (subject building).

The purpose of the assessment was to review the extent of previously identified hazardous building materials and to check for additional hazardous building materials that may require special attention in accordance with applicable federal and provincial regulations, prior to planned demolition activities.

PSPC commissioned this assessment as a measure of diligence in maintaining compliance with the following, as they pertain to identifying hazardous building materials in support of demolition projects:

- Canada Labour Code, Part II Canada Occupational Health and Safety Regulations (COHSR)
- British Columbia's Occupational Health and Safety Regulation (BC Reg. 296/97)
- WorkSafeBC 2017 publication *Safe Work Practices for Handling Asbestos* (BC Asbestos Guide)
- PSPC June 5, 2017 Asbestos Management Standard (AMS) and Asbestos Management Directive (AMD).

The information provided herein is to be considered supplemental to the information regarding hazardous building materials within the subject building as provided in the following reports (further referred to collectively as the "Previous Reports", or as indicated below where referred to singularly):

- Stantec Consulting Ltd. Report No. 123221425 entitled *Pre-Demolition Hazardous Building Materials Assessment; Building 1007 – Kiln Building, Esquimalt Graving Dock, 825 Admirals Road, Victori*a, dated March 31, 2020, prepared for Public Services and Procurement Canada (2020 Stantec Report)
- North West Environmental Group Ltd. Report No. 15609 entitled *Hazardous Building Material Assessment; Esquimalt Graving Dock—DND Buildings*, dated December 2011, prepared for Public Works and Government Services Canada (2011 North West Report)
  - NOTE: the subject building is referred to as "Building 8 Kiln Building" in this report.

BACKGROUND, STANDARDS, SCOPE AND METHODOLOGY

Site work was conducted in general compliance with the requirements of the COHSR, BC Reg. 296/97, the BC Asbestos Guide, the PSPC AMS and AMD, and Stantec's Safe Work Practices (SWPs).

Mechanical systems, structures and finishes within the subject building were visually examined to determine the confirmed or suspected presence of the following potential hazardous building materials:

- Asbestos-containing materials (ACMs)
- Lead, including lead-containing paints (LCPs)

- Other hazardous building materials including electrical equipment containing polychlorinated biphenyls (PCBs); building materials impacted by mould; electrical items containing mercury; equipment that may contain ozone- depleting substances (ODSs); and materials presumed to contain silica.

Applicable standards for each hazardous building material considered during this assessment are summarized below, along with the scope and methodology completed pertaining to those materials, during this assessment.

- Asbestos
  - Asbestos is a naturally occurring form of fibrous silicate that is durable and flexible; has high thermal and tensile strength; is resistant to heat, chemical corrosion and friction; does not conduct electricity; and insulates well against condensation, heat and noise. Due to these properties, asbestos was used in over 3,000 commercial products, and it is estimated that approximately 70% of the asbestos that was used in North America was used in building materials.
  - Undisturbed asbestos within building materials poses no health risks. Asbestos poses a risk when building materials containing asbestos are impacted, or disturbed, thereby releasing the asbestos fibres into the air.
  - Asbestos-related diseases are caused when suspended airborne asbestos fibres are inhaled and the fibres settle into various regions of the lungs and remain for extended periods. Once embedded in the lungs the asbestos fibres cause scarring within the lung tissue, ultimately leading to impaired lung function (asbestosis) and/or various cancers (lung cancer; mesothelioma).
  - The presence of asbestos in federal workplaces and pertaining to federally regulated workers is governed by the COHSR. According to the COHSR, ACM means:
    - Any article that is manufactured and contains 1% or more asbestos (by weight) at the time of manufacture, or any material that contains 1% or more asbestos when tested in accordance with accepted methods.
  - The presence of asbestos in the workplace in British Columbia pertaining to provincially regulated workers is governed by BC Reg. 296/97. According to the current version of BC Reg. 296/97, ACM means:
    - Any material containing at least 0.5% asbestos, or vermiculite insulation with any asbestos
  - As both federally regulated workers and provincially regulated workers (e.g., contractors) are expected to carry out work activities within the subject building, and as the provincial regulations have a more stringent definition of ACM, and generally include the requirements noted in the COHSR, this assessment was conducted to meet the requirements of BC Reg. 296/97.
  - Where observed, samples were collected from each “homogenous application” of suspected ACMs (materials suspected to contain asbestos that are uniform in material type, colour, texture application and estimated installation date) for which sampling had not previously been completed and/or for which additional samples were necessary to supplement existing information.
  - Samples were submitted to EMSL Canada Inc. (EMSL) in Mississauga, Ontario for analysis of asbestos content using polarized light microscopy (PLM) with dispersion staining, in accordance with the United States Environmental Protection Agency (EPA) 600/R-93/116 analytical method “Asbestos (bulk) by PLM.” EMSL’s analytical laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).
    - Regarding the roof, Stantec was assisted by Flynn Canada Ltd. (Flynn), a qualified roofing contractor, that provided personnel with appropriate training and expertise to safely access the roof and collect full-thickness samples of roofing layers down to original substrate, complete with installation of appropriate patching.
  - The number of samples collected for each homogenous application of a suspected ACM was based on the recommendations provided in the BC Asbestos Guide along with the assessor’s experience and understanding of the consistency of the observed building material applications.

  - When asbestos is detected in concentrations greater than 0.5% in one of the samples within a set that was collected to represent a "homogenous application" of a particular material (or detected in any concentration, in a set of samples collected for applications of vermiculite), the entire sample set, and the entire application of that material is then considered to be an ACM.
    - In addition to the above, a "positive stop" option was used during the laboratory analysis of the building material samples submitted for asbestos analysis. The "positive stop" option is utilized by the laboratory when asbestos is detected at a concentration of greater than half of one percent in one of the samples within a set that was collected to represent a "homogenous application" of that material (or in any concentration, for vermiculite). At this point, further analysis of subsequent samples within the set is deemed to be unnecessary (as the entire set will be considered an ACM, per above), and the remainder of the samples within the set are not analyzed.
- Lead
  - Lead is commonly found in buildings in items such as the solder used on copper domestic pipes; the caulking on bell fittings of cast iron drainage pipes; electrical equipment/wiring; batteries (e.g., emergency exit signage batteries); lead sheeting (e.g., x-ray rooms); vent and pipe flashings; and paints and ceramic tile glazes.
  - Elemental lead and inorganic lead compounds are absorbed through ingestion or inhalation and can incorporate into the bone marrow, nerve tissue, brain, and kidneys, causing a variety of health effects.
  - Excessive airborne lead and surface contamination can be transferred to employees' hands and may results in lead inhalation or ingestion. Typically, regimented work practices are developed and implemented to minimize airborne and surface lead concentrations during work that may impact lead and lead-containing coatings.
  - Under the COHSR and BC Reg. 296/97, a regulatory limit has been established for occupational exposure to airborne lead that may be present in a workplace. The occupational exposure limit (OEL) for airborne lead dust or fumes per both regulatory instruments should not exceed the time-weighted average value of 0.05 milligram per cubic metre of air (mg/m^3). The OEL represents the time-weighted average concentration for a conventional 8-hour workday and a 40-hour workweek, to which it is believed that nearly all workers may be repeatedly exposed, day after day, without adverse health effects.
  - WorkSafeBC has published the following document, which is intended to provide guidelines for managing lead exposures within applicable limits during renovation or demolition work, and which would meet the requirements of both the COHSR and BC Reg. 296/97:
    - WorkSafeBC 2017 publication entitled Safe Work Practices for Handling Lead (BC Lead Guide)
  - Lead in paint:
    - In Canada, the *Surface Coating Materials Regulations* (SOR/2005-109) under the federal *Hazardous Products Act* provides a concentration of lead that must not be exceeded in surface coatings that are presently sold in this country (90 parts per million, or "ppm"). However, it is important to note that this regulation does not comment on the potential occupational exposure if the material is disturbed.
    - With respect to potential lead exposures associated with disturbance to surfaces coated with lead-containing products:
      - The 2011 WorkSafeBC manual titled Lead-Containing Paint and Coatings: Preventing Exposure in the Construction Industry, indicates the following:
        - Improper removal of lead paint containing 600 mg/kg (equivalent to "parts per million" or "ppm") lead results in airborne lead concentrations that exceed half of the exposure limit.
          - Potential for exposure exceeding half of the occupational exposure limit would be the trigger for implementation of an exposure control plan.
        - Lead concentrations as low as 90 mg/kg may present a risk to pregnant women and children.
          - Any risk assessment should include for the presence of high risk individuals within the workplace.

    - The BC Lead Guide indicates the following:
        - Unlike for asbestos-containing material, WorkSafeBC does not numerically define what would be considered a lead-containing paint or coating. All suspected paints or coatings should be tested for lead because, depending on the nature of the work, even a small amount could pose a risk to workers. In order to determine which controls and personal protective equipment would be required for a particular job, a qualified person must consider this information as part of the risk assessment.
    - When reviewing the above, "high risk" individuals are not expected to be present in the workplace associated with this building/structure/site during building material alteration activities (i.e., demolition) that would create significant disturbance to paint with such individuals present. As such, paints containing 600 ppm lead or more will be considered "lead-containing" for the purpose of this report, such that appropriate risk assessments can be completed for demolition planning. However, information regarding the lead content of all paints tested is provided herein, for reference and risk assessment should the consideration of high risk individuals be necessary, based on the requirements of a particular situation.
- Other hazardous building materials:
    - Various other hazardous building materials may be present that would have special management requirements, and/or requirements for appropriate handling and/or disposal if they were to be impacted by renovation activities.
    - Assessment for the presence of other hazardous building materials was completed through visual means, to supplement and/or verify the information in the Previous Reports, as follows:
        - Visual review for the presence of PCBs in electrical equipment was completed. Equipment that is generally suspected of containing PCBs includes lamp ballasts, transformers, hydraulic systems, compressors, switchgear and capacitors. No sampling of dielectric fluids was undertaken as part of this assessment.
        - The presence of suspect visible mould and/or animal waste was assessed through visual observations. Material observed with dark-coloured staining and/or a textured and discoloured appearance is described as "suspected mould". Mould identified visually is defined as "suspected mould" unless it is confirmed as mould by laboratory analysis.
        - Assessment for equipment likely to contain ODSs was completed. Information on the type of equipment, manufacturer and type and quantity of refrigerants was recorded, where available.
        - Assessment for equipment that is likely to contain mercury was completed visually. Information on the type of equipment (i.e., gauges, switches, batteries, thermometers, etc.), model and serial numbers and quantities was recorded, where such information was available.
        - Assessment for the presence of silica was conducted. The presence of silica in building materials such as concrete, masonry, stone, terrazzo, refractory brick, ceramic tile, ceiling tile etc. was noted.

RESULTS

Table 1 below summarizes the findings of the assessment with respect to previously identified hazardous building materials as well as supplemental sampling activities undertaken within the subject building during the current assessment. A floor plan drawing indicating the locations of samples collected during the current assessment along with pertinent information related to hazardous building materials identified through current and previous assessments (where practical) is attached to this document, for reference.

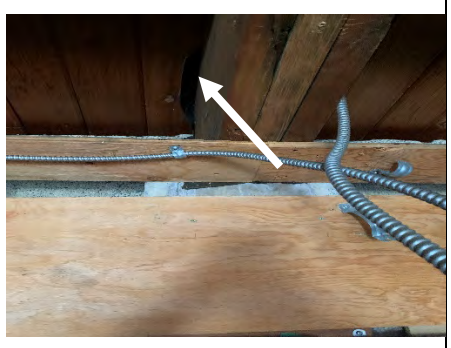
Project Name: Demolition of Esquimalt Graving Dock Building 1007 – Kiln Building

Table 1 Assessment Summary

Location	Hazardous Building Material Observations	Photo	Samples collected?	Analytical Results
Throughout	The following ACM that was identified in the Previous Reports was observed to remain: - Black firestop/wall mastic applied sporadically to red masonry block walls throughout both the interior and exterior During the current assessment additional black mastic material was observed on interior concrete wall surfaces and on upper wall seams between concrete wall and red masonry block walls. Observations made during the current assessment would indicate that this material may not necessarily be firestop applied to penetrations, but a mastic or sealant material applied in various applications – potentially to seal cracks or deteriorations in bricks or associated grout. In addition, the colour ranges from black to grey. Identified ACM was observed to be in good condition.	 ACM black/grey wall mastic applied to red masonry block walls (interior).  ACM black wall mastic applied to concrete wall surfaces.  ACM black/grey wall mastic applied to red masonry block walls (exterior) and upper wall seams between concrete walls and red masonry block walls.  Potential ACM black/grey wall mastic applied to red masonry block walls (exterior) painted over white on two exterior sides of the building  ACM black/grey wall mastic applied to red masonry block walls	N/A	Previously confirmed ACM: 9.2% Chrysotile (2020 Stantec Report) 10% Chrysotile (2011 North West Report)

Project Name: Demolition of Esquimalt Graving Dock Building 1007 – Kiln Building

Table 1 Assessment Summary

Location	Hazardous Building Material Observations	Photo	Samples collected?	Analytical Results
Roof	The following ACM that was identified in the Previous Reports was observed to remain: - Black roof tar Previous assessments did not involve access to or sampling of the roof from the top, and assumptions were made that the black tar-like material present "dripping down" the tops of interior walls was a roofing product. During the current assessment full thickness sampling was completed to determine whether this was indeed a roofing product. Investigation conducted by Flynn indicated the following roof layers to be present (with sampling completed for each layer): - Top layer – asphalt sheet - Middle layer – tar felt - Bottom layer – tar, applied directly to above wood deck. This material appears to be present around various roof seams Roofing materials and associated tar were observed to be in good condition.	  <u>Excess roof tar applied ('dripping down') between upper concrete wall and roof.</u>  <u>Top View of Roof Assembly</u> (Photo Provided by Flynn)	Asphalt sheet layer: KR-01 KR-02 KR-03	No Asbestos Detected
			Tar felt layer KR-01 KR-02 KR-03	0.26% Chrysotile detected in first sample (KR-01-Tar Felt) NOTE: anticipated to be residue from underlying tar layer
			Tar layer KR-01 KR-02 KR-03	2.8% Chrysotile detected in first sample (KR-01-Tar) 10% Chrysotile (2011 North West Report)
Throughout interior ceiling	Additional suspected ACM: - Black building paper applied between wood beam and walls/ceiling		1007-BP-01A 1007-BP-01B 1007-BP-01C	No Asbestos Detected
Pipe Shop	Additional suspected ACM: - Grey duct mastic applied to seams of dismantled ducting system on ground		1007-DM-01A 1007-DM-01B 1007-DM-01C	No Asbestos Detected
Throughout Interior	Previously confirmed LCP: - Black on structural steel (typical interior)	 <u>Black LCP on Strucural Steel</u>	N/A	1,500 ppm Lead (2020 Stantec Report)

Project Name: Demolition of Esquimalt Graving Dock Building 1007 – Kiln Building

Table 1 Assessment Summary

Location	Hazardous Building Material Observations	Photo	Samples collected?	Analytical Results
Throughout Interior	Previously confirmed LCP: - Yellow on concrete walls	 Yellow LCP on Concrete Walls	N/A	96,000 ppm Lead (2020 Stantec Report)
Throughout Interior	Previously confirmed LCP: - Yellow on concrete floor lines (typical throughout)	 Yellow LCP on Concrete Floor Lines	N/A	68,000 ppm Lead (2020 Stantec Report)
Exterior	Previously confirmed LCP: - White on exterior masonry block walls and underside of roof decking (on wood soffits)	 White LCP on Masonry Block Walls  White LCP on Underside of Roof Decking (soffits)	N/A	690 ppm Lead (2020 Stantec Report)
Exterior	Red on metal corrugated walls (typical front exterior)	 Red LCP on Metal Corrugated Walls	N/A	22,000 ppm Lead (2020 Stantec Report)

Table 1 Assessment Summary

Location	Hazardous Building Material Observations	Photo	Samples collected?	Analytical Results
Throughout	Lead is expected to be present in older electrical wiring materials and sheathing, solder used on domestic water lines, solder used in bell fittings for cast iron pipes, electrical equipment, and vent and pipe flashings. Lead is also expected to be present in lead-acid batteries used in emergency lighting observed during the current assessment.	No Photo	N/A	N/A
Throughout Interior	Mercury-containing items observed during the current assessment: - The tubes in approximately 10 light fixtures contain mercury vapour.		N/A	N/A
Throughout	Silica is expected to be present in cement products such as: Concrete – foundations, floors walls, blocks Brick/masonry units and associated grout and mortar Asphalt and asphalt products containing rock or stone (e.g. roof sheeting)	No Photo	N/A	N/A
Throughout	Suspected PCB-containing items were not observed (fluorescent light fixtures are not expected to contain PCBs based on labels).		N/A	N/A
Throughout	Suspect mould or moisture-impacted building materials were not observed.	No Photo	N/A	N/A
Throughout	Suspected ODS-containing equipment was not observed.	No Photo	N/A	N/A

The certificates of analysis for the samples submitted as part of this assessment, as provided by EMSL, are attached to this document, for reference.

CONCLUSIONS AND RECOMMENDATIONS

In summary, based on the findings of the current assessment and our review of Previous Reports, the following hazardous building materials are present that will require appropriate handling and disposal during demolition:

- ACMs (observed to be in good condition)
  - Black/grey mastic (previously referred to as “firestop”) applied sporadically throughout to the following:
    - red masonry block walls (bricks and grout) throughout both the interior and exterior (anticipated to be present beneath paint in areas where exterior walls are painted)
    - interior concrete wall surfaces
    - upper seams between concrete beams and red masonry block walls.
  - Roof tar present as the base layer of roofing on top of the wood roof deck. Due to the extent of this material, the entire roof assembly (wood decking, tar, tar felt, asphalt sheet) should be considered ACM, as separation of layers for demolition is not anticipated to be reasonable.
  - Roof tar in the following additional locations:
    - Penetrating through seams on the underside of roof decking in various locations on the interior
    - On masonry materials at the tops of walls, where it has dripped down from the roof.
- Lead
  - The following LCPs were identified
    - Black on structural steel (typical interior)
    - Yellow on concrete walls
    - Yellow on concrete floor lines (typical throughout)
    - White on exterior masonry block walls
    - Red on metal corrugated walls (typical front exterior)
  - No additional LCPs were identified in the current assessment
  - The building materials coated with identified LCPs are not anticipated to be disposed of via landfill (e.g., steel, concrete, masonry block wall, metal) and/or did not contain lead concentration that would be anticipated to create lead-leachable waste
    (e.g., wood soffit coated with paint that contains 690 ppm lead)
- Lead is expected to be present in lead-acid batteries used in emergency lighting, older electrical wiring materials and sheathing, solder used on domestic water lines, solder used in bell fittings for cast iron pipes and electrical equipment, and vent and pipe flashings.
- Tubes in approximately ten fluorescent light fixtures contain mercury vapour.
- Silica is expected to be present in cement products such as:
  - Concrete – foundations, floors walls, blocks
  - Brick/masonry units and associated grout and mortar
  - Asphalt and asphalt products containing rock or stone (e.g. roof shingles)

Based on the above, the following recommendations are provided as they pertain to the demolition of the subject building:

- Asbestos
  - ACMs must be removed by appropriately trained personnel (e.g., asbestos abatement contractor personnel), in accordance with the requirements of the COHSR, BC Reg. 296/97 and the BC Asbestos Guide.
  - Suspected ACMs deemed visually similar to the ACMs identified in this report should be considered asbestos-containing and handled as such, unless proven otherwise, through analytical testing.

  - Should a material suspected to contain asbestos fibres become uncovered during demolition or other activities, all work in the areas that may disturb the material should be stopped, and the material should be considered ACM and handled as such, unless proven otherwise through analytical testing.
  - Asbestos-containing cement pipe may be present below ground—caution should be used at any time when excavation is required.
  - Ensure asbestos containing waste is handled, stored, transported and disposed of in accordance with the requirements of the Federal Transportation of Dangerous Goods Regulation and the British Columbia Hazardous Waste Regulation (BC Reg. 63/88).
  - If the building is not demolished, identified ACMs in good condition can continue to be managed in place, in accordance with the Asbestos Management Plan documentation on-file for the Esquimalt Graving Dock.

- Lead
  - When paints or other lead-containing equipment/materials within the subject building are to be disturbed and/or removed, including in instances where paint chip debris is removed, ensure compliance with the following:
    - Exposure protection requirements of the COHSR and BC Reg. 296/97, including the provisions of the BC Lead Guide.
    - Transportation and disposal requirements of the British Columbia Hazardous Waste Regulation (BC Reg. 63/88) or BC Reg. 63/88.
    - Transportation requirements of the Federal Transportation of Dangerous Goods Regulation.
  - Corrective action or remedial work on lead-containing materials or paint applications containing any concentration of lead should be undertaken in a manner so as to avoid generating fine particulate matter or dust (i.e., avoid sanding). Airborne lead dust or fumes should not exceed the COHSR and BC Reg. 296/97 eight-hour occupational exposure limit (OEL) of 0.05 mg/m^3 during the removal of paints and products containing any concentration of lead.
  - Ultimately, the Contractor is responsible to review the work tasks required and the ways in which materials (including those coated with paints that may contain lead in varying concentrations) will be impacted, as well as the individuals that will be present in the immediate vicinity of the work (i.e., potential for high-risk individuals) in order to determine the appropriate personal protective equipment (PPE—including respirators and protective clothing), containment and/or decontamination measures and work procedures that should be followed to protect workers from lead exposure.
  - Using an arc welder or oxyacetylene torch on steel that is coated with lead-containing paint can create hazardous lead fumes and is prohibited by section 12.115 of BC Reg. 296/97. In addition, the following information is provided in the BC Lead Guide:
    - Welding or torch cutting of paints or coatings on metal can create very high concentrations of airborne lead fumes. Torch cutting structural steel, coated with paint containing as little as 130 mg/kg (equivalent to ppm) lead, can release airborne levels of lead as high as 0.8 mg/m^3 (16 times the exposure limit).
    - Given this information and that the analytical detection limit for lead paint analysis is in the order of 90 ppm (not significantly different than 130 ppm, which, per above, may release airborne lead levels 16 times the exposure limit), any paint coating on a metal surface to be welded, burned or torch-cut must be removed prior to that action being undertaken, unless a project-specific or tasks-specific risk assessment and safe work practices are developed by a qualified person.
- PCBs
  - As no PCB-containing items were identified, no recommendations have been developed.

- Mercury
  - Complete removal of mercury-containing equipment is required prior to demolition activities that may disturb the equipment. When mercury-containing items (e.g., fluorescent light tubes) are removed, ensure all mercury waste is handled, stored transported and disposed of in accordance with the requirements the following:
    - Transportation and disposal requirements of BC Reg. 63/88
    - Transportation requirements of the Federal Transportation of Dangerous Goods Regulation
  - Precautions should be taken if workers may potentially be exposed to mercury or mercury vapours to ensure that workers exposure levels do not exceed the occupational exposure limit of 0.025 mg/m^3 as per the COHSR and BC Reg. 296/97. This can be achieved by providing respiratory and skin protection applicable to the hazard and task to be completed.
- Mould and Animal Waste
  - As no mould or moisture-impacted building materials were identified, no recommendations have been developed.
- ODSs
  - As no suspect ODS-containing equipment was observed within the subject building during the assessment, no recommendations have been provided.
- Silica
  - When silica-containing materials are to be disturbed during demolition activities, ensure dust control measures are employed such that airborne silica dust concentrations do not exceed the exposure limit as stipulated by the COHSR and BC Reg. 296/97 (cristobalite and quartz—each 0.025 mg/m^3). This would include, but not be limited to, the following:
    - Providing workers with respiratory protection
    - Wetting the surface of the materials, use of water or dust suppressing agents to prevent dust emissions
    - Providing workers with facilities to properly wash prior to exiting the work area

LIMITATIONS

In preparation of this report, Stantec used professional judgment based on experience. The work was conducted in accordance with generally accepted professional standards. Stantec relied on information gathered during the site investigation and laboratory analytical reports.

This report reflects the observations made within accessible and accessed areas of the subject building, and the results of analyses performed on specific materials sampled during the current. Analytical results reflect the sampled materials at the specific sample locations.

This report has been prepared for the exclusive use of PSCP on behalf of the RCMP, for the purpose of assessing general conditions in the subject building. Any use that a third party makes of this report, or reliance on, or decisions to be made on it, are the responsibility of such third parties. Stantec accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

PHYSICAL AND SAMPLING LIMITATIONS

Due to limitations on the agreed to scope of work for this project as well as physical limitations in accessing concealed areas there are specific limitations to the information that can be provided regarding each hazardous building material considered in this assessment, as outlined below.

- Building materials that may contain asbestos, but were not accessible for sampling include, but are not limited to the following:
  - Sub-grade materials (e.g., asbestos cement drainage pipe)

- Samples of paint applications suspected to contain lead were collected from surfaces of major paint applications, where visually different paint colours and/or types were identified. Although the surfaces where samples were collected may be covered with more than one coat of paint, the paint samples are described by the surface (visible) colour only. Attempts were made to represent all layers of paint in the samples collected. As analytical results are referenced to the surface paint colour only, the lead content of all painted surfaces similar to that represented by the surface paint colour were presumed to be the same, regardless of differing sub surface paints, if any.
- Due to height restrictions and the risk of electrical shock in handling operational light fixtures, the ballasts present in the fixtures observed were not inspected for PCB labels or other PCB identifiers. Conclusions and recommendations regarding the presence of PCBs are based on limited observations in combination with information provided by building staff regarding lighting renovations (where requested by Stantec, based on visual observations) and are presented to provide guidance regarding the likelihood that PCB-containing equipment is or is not present. The exact extent and/or number of fluorescent lamp ballasts containing PCBs, if any, will not be commented on.
  - Although they may also be present in other items in limited amounts (e.g., plastics, molded rubber parts, applied dried paints, coatings or sealants, caulking, adhesives, paper, sound-deadening materials, insulation, or felt and fabric products such as gaskets), PCBs are not expected to be present in those materials in concentrations that would necessitate the requirement for PCB-specific handling procedures, separate removal and/or disposal considerations for demolition. As such, these items were not considered in our assessment.
- Visual assessment for the presence of suspected visible mould and/or suitable conditions for mould growth (e.g., moist and/or water-stained building materials) was conducted. The conclusions made in this report provide description(s) of the potential source(s) of moisture that may have led to suitable conditions for mould growth, only in those cases where potential source(s) of moisture were identified. The conclusions provided herein will not necessarily identify all sources of moisture leading to suitable conditions for mould growth within the impacted area(s).
  - This assessment does not constitute a building envelope/building systems assessment, which would include an intrusive investigation to assess the internal condition, potential moisture sources, and expected remaining service life of the various components and systems comprising the envelope of a building.
- The potential presence of mercury or mercury-containing equipment in inaccessible areas or as internal parts of HVAC mechanisms or other equipment was not assessed.
  - Although limited amounts of mercury may be present in paints and adhesives, mercury is not expected to be present in those materials in concentrations that would necessitate the requirement for mercury-specific handling procedures, separate removal and/or disposal considerations for demolition. As such, these items were not considered in our assessment.
- Investigation was limited to a visual review in accessed areas of readily accessible building-related cooling and refrigeration equipment which could contain ODSs. Testing was not conducted.
- In general, the assessment for the presence of hazardous building materials was visual in nature and was conducted pertaining to readily visible surfaces within accessible accessed spaces only.

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CLOSING

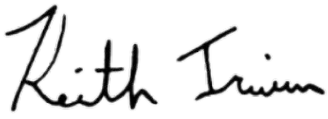
If any conditions become apparent that differ significantly from our understanding of conditions as presented in this document, we request that we be notified immediately to reassess the information provided herein.

We trust that the document meets your current requirements. Should you have any questions or concerns regarding the above, please do not hesitate to contact the undersigned.

Regards,

Stantec Consulting Ltd.

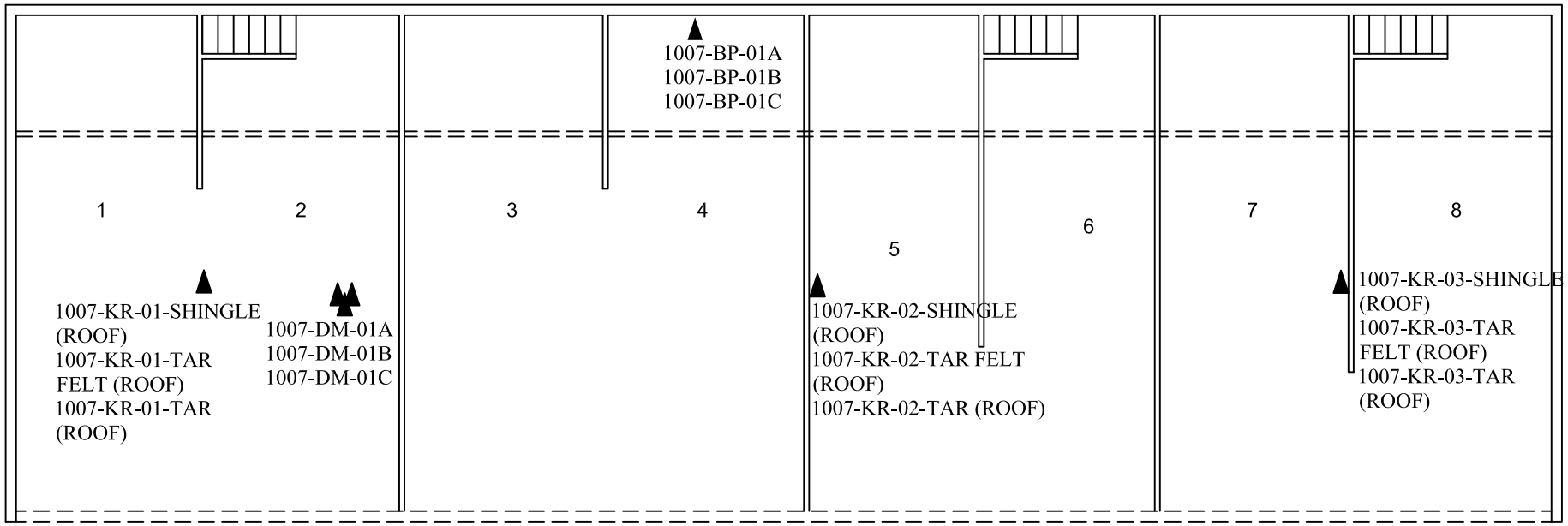
Steve Chou B.A., Dipl. Tech.
Report Writer
Phone: 604-396-6791
Steve.Chou@stantec.com



Keith Irwin Dipl. Tech.
Team Lead
Phone: 604-369-0055
Keith.Irwin@stantec.com

Sean Brigden B.Sc., P.B.Dipl., CRSP
Senior Associate
Phone: 250-655-6062
Sean.Brigden@stantec.com

Attachments: Building Floor Plan—1 page
Suspected ACM Bulk Sample Analytical Record (EMSL)—4 pages



BUILDING 1007 - KILN BUILDING

LEGEND

▲ BULK SAMPLE FOR ASBESTOS

NOTES:
1. **BLACK/GREY MASTIC APPLIED SPORADICALLY THROUGHOUT INTERIOR/EXTERIOR MASONRY BLOCK AND CONCRETE SURFACES IS ASBESTOS-CONTAINING.**
2. **ROOF TAR PRESENT AS THE BASE LAYER OF ROOFING ON TOP OF THE WOOD ROOF DECK IS ASBESTOS-CONTAINING. ADDITIONAL LOCATIONS INCLUDE:PENETRATING THROUGH SEAMS ON THE UNDERSIDE OF ROOF DECKING AND ON MASONRY MATERIALS AT THE TOP OF WALLS.**
3. THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

FLOOR PLAN SHOWING HAZARDOUS BUILDING MATERIALS AND BULK SAMPLE LOCATIONS

ESQUIMALT GRAVING DOCK, 825 ADMIRALS ROAD, VICTORIA, BC

Client: PUBLIC SERVICES AND PROCUREMENT CANADA

Project No.:	123221957
Scale:	N.T.S.
Date:	21/11/20
Dwn. By:	CD SL2021110149 CS/DM
App'd By:	TW

Dwg. No.: 1

Stantec

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 552117620
Customer ID: 55JACQ30L
Customer PO: 123221957
Project ID:

Attn: Kim Wiese
Stantec Consulting Ltd.
500 - 4730 Kingsway
Burnaby, BC V5H 0C6

Phone: (604) 412-3004
Fax:
Collected:
Received: 10/28/2021
Analyzed: 11/04/2021

Proj: 123221957

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: 1007-BP-01A **Lab Sample ID:** **552117620-0153**
Sample Description: Room 4, mechanical, mezzanine/Black building paper - tar paper

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	11/04/2021	Brown/Black	0.0%	100%	None Detected	

Client Sample ID: 1007-BP-01B **Lab Sample ID:** **552117620-0154**
Sample Description: Room 4, mechanical, mezzanine/Black building paper - tar paper

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	11/04/2021	Brown/Black	0.0%	100%	None Detected	

Client Sample ID: 1007-BP-01C **Lab Sample ID:** **552117620-0155**
Sample Description: Room 4, mechanical, mezzanine/Black building paper - tar paper

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	11/04/2021	Brown/Black	0.0%	100%	None Detected	

Client Sample ID: 1007-DM-01A **Lab Sample ID:** **552117620-0156**
Sample Description: Room 2, pipe shop, sitting on floor/Grey duct mastic on round ducting

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	11/04/2021	Gray	0.0%	100%	None Detected	

Client Sample ID: 1007-DM-01B **Lab Sample ID:** **552117620-0157**
Sample Description: Room 2, pipe shop, sitting on floor/Grey duct mastic on round ducting

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	11/04/2021	Gray	0.0%	100%	None Detected	

Client Sample ID: 1007-DM-01C **Lab Sample ID:** **552117620-0158**
Sample Description: Room 2, pipe shop, sitting on floor/Grey duct mastic on round ducting

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	11/04/2021	Gray	0.0%	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 552117620
Customer ID: 55JACQ30L
Customer PO: 123221957
Project ID:

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Analyst(s):

Caroline Allen	PLM Grav. Reduction (2)
Kira Ramphal	PLM Grav. Reduction (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. Interpretation and use of test results are the responsibility of the client. 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. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. Estimation of uncertainty available upon request. This report is a summary of multiple methods of analysis, fully compliant reports are available upon request. A combination of PLM and TEM analysis may be necessary to ensure consistently reliable detection of asbestos. This report must not be used to claim product endorsement by NVLAP of any agency or the U.S. Government.

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

Initial report from: 11/04/202120:36:20

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 552117893
Customer ID: 55STBC42
Customer PO: 123221957
Project ID:

Attn: Sean Brigden
Stantec Consulting Ltd.
11-2042 Mills Road
Sidney, BC V8L 5X4

Phone: (902) 565-0662
Fax:
Collected:
Received: 11/02/2021
Analyzed: 11/09/2021

Proj: 123221957

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: KR-01-Shingle ***Lab Sample ID:*** **552117893-0001**
Sample Description: 1007 Roof - South

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	11/09/2021	Brown/Black	0.0%	100%	None Detected	

Client Sample ID: KR-01-Tar Felt ***Lab Sample ID:*** **552117893-0001A**
Sample Description: 1007 Roof - South

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	11/09/2021	Black	0.0%	99.7%	**0.26% Chrysotile**	

Client Sample ID: KR-01-Tar ***Lab Sample ID:*** **552117893-0001B**
Sample Description: 1007 Roof - South

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	11/09/2021	Black	0.0%	97.2%	**2.8% Chrysotile**	

Client Sample ID: KR-02-Shingle ***Lab Sample ID:*** **552117893-0002**
Sample Description: 1007 Roof - Central

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	11/09/2021	Brown/Black	0.0%	100%	None Detected	

Client Sample ID: KR-02-Tar Felt ***Lab Sample ID:*** **552117893-0002A**
Sample Description: 1007 Roof - Central

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	11/09/2021	Black	0.0%	100%	None Detected	

Client Sample ID: KR-02-Tar ***Lab Sample ID:*** **552117893-0002B**
Sample Description: 1007 Roof - Central

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	11/09/2021				Positive Stop (Not Analyzed)	

Client Sample ID: KR-03-Shingle ***Lab Sample ID:*** **552117893-0003**
Sample Description: 1007 Roof - North

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	11/09/2021	Brown/Black	0.0%	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 552117893
Customer ID: 55STBC42
Customer PO: 123221957
Project ID:

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: KR-03-Tar Felt ***Lab Sample ID:*** **552117893-0003A**

Sample Description: 1007 Roof - North

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	11/09/2021	Black	0.0%	100%	None Detected	

Client Sample ID: KR-03-Tar ***Lab Sample ID:*** **552117893-0003B**

Sample Description: 1007 Roof - North

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	11/09/2021				Positive Stop (Not Analyzed)	

Analyst(s):

Kira Ramphal PLM Grav. Reduction (2)
Stephanie Achaiya PLM Grav. Reduction (5)

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. Interpretation and use of test results are the responsibility of the client. 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. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. Estimation of uncertainty available upon request. This report is a summary of multiple methods of analysis, fully compliant reports are available upon request. A combination of PLM and TEM analysis may be necessary to ensure consistently reliable detection of asbestos. This report must not be used to claim product endorsement by NVLAP of any agency or the U.S. Government.

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

Initial report from: 11/09/202115:39:41

Pre-Demolition Hazardous Building Materials Assessment

Building 1007—Kiln Building,
Esquimalt Graving Dock,
825 Admirals Road, Victoria

March 31, 2020

Prepared for:

Public Services and Procurement
Canada, Pacific Region
825 Admirals Road
Victoria, BC
V9A 2P1

Prepared by:

Stantec Consulting Ltd.
500-4730 Kingsway
Burnaby, BC V5H 0C6

Project No.: 123221425

This document entitled Pre-Demolition Hazardous Building Materials Assessment was prepared by Stantec Consulting Ltd. (“Stantec”) for the account of Public Services and Procurement Canada, Pacific Region on behalf of the Royal Canadian Mounted Police (the “Client”). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec’s professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Personnel conducting site work and documentation reviews for this project, as indicated below, have appropriate knowledge and experience in the management and control of asbestos hazards to be considered “qualified persons” by WorkSafeBC as it pertains to the provision of consultation in relation to asbestos in buildings.

Prepared by _____
(signature)
Steve Chou, B.A., Dipl Tech.

Reviewed by _____
(signature)
Lovy Mangat, B.Sc.

Approved by _____
(signature)
Sean Brigden, B.Sc., P.B.Dipl., CRSP

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Executive Summary

Stantec Consulting Ltd. (Stantec) was commissioned by Public Services and Procurement Canada (PSPC) to conduct a pre-demolition hazardous building materials assessment of Building 1007—Kiln Building, Esquimalt Graving Dock, 825 Admirals Road, Victoria, British Columbia (BC) (subject building).

The purpose of the assessment was to check for potential hazardous building materials that may require special attention in accordance with applicable federal and provincial regulations, prior to planned demolition activities.

The work was carried out in accordance with the requirements of the following:

- Canada Labour Code, Part II Canada Occupational Health and Safety Regulations (COHSR)
- British Columbia's Occupational Health and Safety Regulation (BC Reg. 296/97)
- Asbestos Management Plan (AMP) and Lead Management Plan (LMP) documentation on-file for the Esquimalt Graving Dock (EGD)

The hazardous building materials considered during this assessment included the following:

- Asbestos-containing materials (ACMs)
- Lead, including lead-containing paints (LCPs)
- Polychlorinated biphenyls (PCBs) in electrical equipment
- Mould and/or moisture-impacted building materials
- Mercury in electrical equipment
- Ozone-depleting substances (ODSs) in heating, ventilation and air conditioning (HVAC) equipment or fire suppression systems
- Silica in building materials

Based on Stantec's visual assessment and the laboratory analyses performed on the samples collected, as well as a review of previous reports or sampling records/reports, hazardous building materials were identified to be present.

A summary of our findings is presented in Table ES 1, below. Recommendations pertaining to the handling, removal, transportation and disposal of identified hazardous building materials are provided in the body of this report.

Table ES 1 Summary of Findings

Hazardous Building Material	Summary of Findings
Asbestos	The following ACMs were identified through the Previous Report, and were confirmed to remain within the building during the current assessment, through visual assessment or sampling: • Roofing materials – Roof not accessed. Previous Report indicates “roof tar” as ACM. Observations indicate that this may be a “base” layer. As such, overlying roofing materials are unlikely to be reasonably separable from the base tar layer, and roofing materials in general should be considered ACM unless additional assessment and testing proves otherwise. • Black firestop/wall mastic applied to red masonry block walls throughout various interior/exterior penetrations The above-noted materials were observed to be in good condition. Additional ACMs were not identified through the current assessment.
Lead	The following LCPs were identified through the Previous Report, and were visually confirmed to remain within the building during the current assessment: • White paint on exterior red masonry block walls (typical exterior) The following additional LCPs were identified through this assessment: • Black paint on structural steel (typical interior) • Yellow on concrete walls • Yellow on concrete floor lines (typical throughout) • Red on metal corrugated walls (typical exterior) Identified LCPs were observed to be in good condition. The building materials coated with identified LCPs are not anticipated to be disposed of via landfill (e.g., metal, concrete, masonry block) and/or did not contain lead in concentrations that would be anticipated to create lead-leachable waste. Lead may also be present in the following materials: • Older electrical wiring materials and sheathing • Solder used on domestic water lines • Solder used in bell fittings for cast iron pipes and in electrical equipment • Vent and pipe flashings
Polychlorinated biphenyls (PCBs)	No suspected PCB-containing electrical equipment was observed.
Mould	No suspect mould or moisture staining was observed.
Mercury	Suspected mercury-containing electrical items were not observed.
Ozone-depleting substance (ODS)	Building related cooling and refrigeration equipment suspected to be ODS-containing was not observed.
Silica	Silica is expected to be present in the following, which were observed in various locations throughout: • Cement products such as: – Concrete—foundations, floors, walls, blocks – Brick/masonry units and associated grout and mortar

The statements made in this Executive Summary text are subject to the same limitations included in this report and are to be read in conjunction with the remainder of this report.

Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
ACM	asbestos-containing material
AIHA	American Industrial Hygiene Association
AMP	Asbestos Management Plan
BC	British Columbia
COHSR	Canada Occupational Health and Safety Regulations
ELLAP	Environmental Lead Laboratory Approval Program
EMSL	EMSL Canada Inc.
HVAC	heating, ventilation and air conditioning
LCP	lead-containing paint
NVLAP	National Voluntary Laboratory Accreditation Program
ODS	ozone-depleting substance
OEL	occupational exposure limit
PCB	polychlorinated biphenyl
PSPC	Public Services and Procurement Canada
USEPA	United States Environmental Protection Agency

1.0 INTRODUCTION

Stantec Consulting Ltd. (Stantec) was commissioned by Public Services and Procurement Canada (PSPC) to conduct a pre-demolition hazardous building materials assessment of Building 1007—Kiln Building, Esquimalt Graving Dock, 825 Admirals Road, Victoria, British Columbia (BC) (subject building).

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- Ozone-depleting substances (ODSs) in heating, ventilation and air conditioning (HVAC) equipment or fire suppression systems
- Silica in building materials

The site work was conducted by Mr. Steve Chou on November 25, 2019

1.1 UNDERSTANDING OF THE PROJECT

The following documentation related to hazardous building materials was reviewed prior to undertaking the assessment (further referred to herein as the "Previous Report"):

- North West Environmental Group Ltd. Report No. 15609 entitled *Hazardous Building Material Assessment; Esquimalt Graving Dock—DND Buildings*, dated December 2011, prepared for Public Works and Government Services Canada
  - NOTE: the subject building is referred to as "Building 8 Kiln Building" in the Previous Report.

This documentation provided Stantec with an understanding of ACMs or hazardous building materials that were anticipated to be present at the subject building. According to the above-noted document, the following hazardous building materials were previously identified:

- ACM roof tar and black firestop/wall
- LCP on walls and trim

Based on the planned demolition of the subject building, PSPC requested this assessment to provide supplemental and current information as a measure of diligence in maintaining compliance with the requirements of the COHSR, BC Reg. 296/97 and the AMP/LMP on-file for the EGD, as they pertain to identifying hazards associated with hazardous building materials for demolition projects.

2.0 SCOPE

The scope of work for this assessment involved the following:

- Review of existing information, including site drawings, previous assessment and/or abatement documentation and discussions with site personnel, where available
- Visual assessment of readily accessible areas for the presence of suspected hazardous building materials
- Review of condition of previously identified ACMs
- Collection of representative bulk samples from additional building materials suspected to contain asbestos fibres—materials that were either not sampled as part of the Previous Report, or that required additional sampling to appropriately characterize asbestos content in accordance with current regulations and guidelines.
- Review of condition of previously identified LCPs.
- Collection of paint chip samples for the determination of the lead content in additional paint finishes—paints that were either not samples as part of the Previous Report, or that required additional sampling to clarify colours or extents
- Review of painted building materials to assess whether waste generated during demolition is expected to be disposed via landfill, and may require supplemental sampling and analysis of leachable lead content to determine landfill disposal options
- Submission of samples collected for laboratory analysis
- Evaluation and interpretation of field findings along with current and previous sample analytical results to develop conclusions and recommendations pertaining to hazardous building materials identified.

2.1 LIMITATIONS

In preparation of this report, Stantec used professional judgment based on experience. The work was conducted in accordance with generally accepted professional standards. Stantec relied on information gathered during the site investigation and laboratory analytical reports.

This report reflects the observations made within accessible and accessed areas of the subject building, and the results of analyses performed on specific materials sampled during the current and previous assessments. Analytical results reflect the sampled materials at the specific sample locations.

This report has been prepared for the exclusive use of the Client for the purpose of assessing general conditions in the subject building. Any use that a third party makes of this report, or reliance on, or decisions to be made on it, are the responsibility of such third parties. Stantec accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

2.1.1 Physical and Sampling Limitations

Sampling was conducted pertaining only to suspected ACMs, suspected LCPs and bulk building materials coated with paint presumed to be destined for landfill disposal. The assessment for the presence of other hazardous building materials was visual in nature and was conducted pertaining to readily visible surfaces within accessible spaces only. Concealed spaces were inspected via existing access panels, where present. Interior and exterior finishes, solid ceilings, walls, flooring and structural elements were removed and/or penetrated in limited locations to access concealed areas.

Due to limitations on the agreed to scope of work for this project, there are specific limitations to the information that can be provided regarding each hazardous building material considered in this assessment, as outlined below.

- Building materials that may contain asbestos but were not accessible for sampling include, but are not limited to the following:
  - Roofing materials not already confirmed as ACM, if present
  - Sub-grade materials (e.g., asbestos cement drainage pipe)
  - Heat protection materials inside mechanical installations and light fixtures
- Samples of paint applications suspected to contain lead were collected from surfaces of major paint applications where visually different paint colours and/or types were identified. Although the surfaces where samples were collected may be covered with more than one coat of paint, the paint samples are described by the surface (visible) colour only. Attempts were made to represent all layers of paint in the samples collected. As analytical results are referenced to the surface paint colour only, the lead content of all painted surfaces similar to that represented by the surface paint colour were presumed to be the same, regardless of differing sub surface paints, if any.
- When assessing potential for disposal options for painted building materials, Stantec made assumptions of the waste types that would be created when painted surfaces are demolished, without having paint removed. Testing was not completed, as summarized below:
  - Materials such as metal and concrete that are coated with LCPs are typically not tested for leachable lead content for the following reasons:
    - If removed with paint in-tact, these materials are expected to be recycled, not disposed of via landfill. As such, the leachable lead content will not impact the “disposal” option, as recycling facilities will typically accept metal or concrete with lead-containing paint.
    - If removal of the paint from the substrate is considered, the waste associated with that process (paint chips and removal substrate—sand, beads, etc.) is typically presumed to be hazardous waste (leachable for lead in excess of 5.0 mg/L) or must be tested in its actual form (once removed, with the removal substrate) to confirm.
    - In most cases, during an initial assessment, it is not practical to try to remove sufficient paint from the substrate in order to appropriately analyze for lead leachate, as a significant area would have to be “scraped” (50–100 g of sample is required).

- Due to height restrictions and the risk of electrical shock in handling operational light fixtures, the ballasts present in the fixtures observed were not inspected for PCB labels or other PCB identifiers. Conclusions and recommendations regarding the presence of PCBs are based on limited observations in combination with information provided by building staff regarding lighting renovations (where requested by Stantec, based on visual observations) and are presented to provide guidance regarding the likelihood that PCB-containing equipment is or is not present. The exact extent and/or number of fluorescent lamp ballasts containing PCBs, if any, will not be commented on.
  - Although they may also be present in other items in limited amounts (e.g., plastics, molded rubber parts, applied dried paints, coatings or sealants, caulking, adhesives, paper, sound-deadening materials, insulation, or felt and fabric products such as gaskets), PCBs are not expected to be present in those materials in concentrations that would necessitate the requirement for PCB-specific handling procedures or separate removal/disposal considerations for demolition. As such, these items were not considered in our assessment.
- Visual assessment for the presence of suspected visible mould and/or suitable conditions for mould growth (e.g., moist and/or water-stained building materials) was conducted. The conclusions made in this report provide description(s) of the potential source(s) of moisture that may have led to suitable conditions for mould growth, only in those cases where potential source(s) of moisture were identified. The conclusions provided herein will not necessarily identify all sources of moisture leading to suitable conditions for mould growth within the impacted area(s).
  - This assessment does not constitute a building envelope/building systems assessment, which would include an intrusive investigation to assess the internal condition, potential moisture sources, and expected remaining service life of the various components and systems comprising the envelope of a building.
- The potential presence of mercury or mercury-containing equipment in inaccessible areas or as internal parts of HVAC mechanisms or other equipment was not assessed.
  - Although limited amounts of mercury may be present in paints and adhesives, mercury is not expected to be present in those materials in concentrations that would necessitate the requirement for mercury-specific handling procedures or separate removal/disposal considerations for demolition. As such, these items were not considered in our assessment.
- Investigation was limited to a visual review in accessed areas of readily accessible building-related cooling and refrigeration equipment which could contain ODSs. Testing was not conducted. Equipment or materials that were not assessed but that may contain ODSs included, but were not limited to, portable equipment (including domestic-type refrigerators and water coolers, occupant-owned refrigeration equipment), flexible plastic foam or rigid insulation foam, solvents, aerosol spray propellants and portable fire extinguishing equipment.
- In general, the assessment for the presence of hazardous building materials was visual in nature and was conducted pertaining to readily visible surfaces within accessible accessed spaces only. Additional hazardous building materials are potentially present in inaccessible areas not assessed including, but not limited to: ceiling spaces, wall cavities and crawlspace areas not accessed, as well as buried materials.

2.1.2 Areas Not Accessed

The following areas were not accessed, for the reasons indicated:

- Rooftop (safe access not available; agreed scope limitation)
- Bay 1,2,3 and 4 (access not available from site representative)

As such, limited comments, if any, will be provided regarding the presence, quantity or condition of hazardous building materials within the above-noted areas. However, given the observed consistency in construction throughout the subject building, it is unlikely that significant additional hazardous building materials are present that were not already assessed in other areas.

2.1.3 Information from Previous Reports

Stantec reviewed the Previous Report outlined herein for information purposes only. Although the information provided in the documentation outlined in Section 1.1 was reviewed and considered in developing our sampling plan, Stantec did not rely entirely on the documentation or all of the sample analytical results within. However, for the purposes of this report and in accordance with the Client's direction, where previous sampling and analytical data indicated the presence of a hazardous building material (e.g., asbestos, lead), additional sampling was not conducted, and the material was considered to be hazardous.

3.0 HAZARDOUS BUILDING MATERIALS ASSESSMENT

Building information and the results of the assessment for each of the considered hazardous building materials are provided in the following sub-sections.

Background information and health effects information, as well as information regarding regulatory framework and relevant legislation with respect to hazardous building materials are provided in Appendix A.

Floor plans showing the locations of samples collected during this assessment as well as identified hazardous building materials (where practical) are provided in Appendix B.

3.1 FACILITY DESCRIPTION

The subject building is located at 825 Admirals Road, Victoria, BC and consists of a two-story building (main floor and mezzanine level in the rear). The reported construction date of the building is unknown, but it appears to be of pre-1990 construction. Based on appearances, the construction time period is expected to be consistent with those dates when hazardous building materials were commonly used.

The typical structural components, mechanical components and building finishes associated with this building consist of the following:

- Foundation—concrete
- Exterior cladding—corrugated metal panel and masonry block
- Structural—wood and steel framing
- Mechanical—un-insulated pipes and systems
- Interior walls—concrete and masonry block
- Interior ceilings—wood
- Interior flooring—combination of bare concrete and plywood
- Roofing material—Tar-based roofing (assumption based on information in the Previous Report. Not accessed by Stantec to verify; images on-line (Google Maps) appear to indicate asphaltic sheet roofing material)

3.2 ASBESTOS

A summary list of the bulk samples collected by Stantec, including a description of the material, sampling location and laboratory test results is provided in Appendix C. Copies of the Laboratory Certificates of Analysis for bulk samples analyzed are provided in Appendix D.

Based on our observations of building construction (estimated vintage of interior finishes and uniformity of building material use) and on our interpretations of the analytical results of suspected ACMs collected through this assessment as well as the previous documentation reviewed as outlined herein, the materials presented in the table in Appendix E were identified as ACMs. The following information is included for each identified ACM:

- Type of material that contains asbestos
- Location/approximate extent of the ACM within the building
- Asbestos type and percentage identified
- Friability
- Condition
- Representative photographs, where available

Our assessment methodologies and findings are further summarized in the following sub-sections.

3.2.1 Methodology

Asbestos-containing materials are grouped into two classifications, friable and non-friable materials. Friable ACMs are those that can easily be crumbled or broken apart by mere hand pressure. When these materials break apart asbestos fibres are then released into the atmosphere. Non-friable ACMs are materials that by the nature of their manufacturing and/or construction do not readily allow the release of asbestos fibres. Some non-friable materials such as plaster, drywall joint compound and ceiling tiles that are considered to be non-friable in an undisturbed state can more readily release fibres when damaged or disturbed.

The presence of asbestos in federal workplaces and pertaining to federally regulated workers is governed by the COHSR. According to the COHSR, ACM means:

- Any article that is manufactured and contains 1% or more asbestos (by weight) at the time of manufacture, or any material that contains 1% or more asbestos when tested in accordance with accepted methods.

The presence of asbestos in the workplace in British Columbia pertaining to provincially regulated workers is governed by BC Reg. 296/97. According to the current version of BC Reg. 296/97, ACM means:

- Any material containing at least 0.5% asbestos, or vermiculite insulation with any asbestos.

As both federally regulated workers and provincially regulated workers (e.g., contractors) are expected to carry out work activities within the subject building, and as the provincial regulations have a more stringent definition of ACM, and generally include the requirements noted in the COHSR, this assessment was conducted to meet the requirements of BC Reg. 296/97.

Based on these criteria, a visual assessment of accessible areas was undertaken to check for the presence of suspected ACMs. Locations to collect discrete bulk samples of suspected ACMs were identified and samples of representative materials were then collected at these locations.

Multiple samples were collected from each “homogenous application” of observed suspected ACMs (materials suspected to contain asbestos that are uniform in material type, colour, texture application and estimated installation date) and submitted to EMSL Canada Inc. (EMSL) in Burnaby, BC for analysis of asbestos content using polarized light microscopy (PLM) with dispersion staining, in accordance with the United States Environmental Protection Agency (USEPA) 600/R-93/116 method.

The number of samples to be collected for each homogenous application of a suspected ACM was based on accepted occupational hygiene standards and protocols, on the recommendations provided in the 2017 WorkSafeBC publication *Safe Work Practices for Handling Asbestos* (Asbestos Guide), and on the assessor’s experience and understanding of the consistency of that building material’s application.

EMSL’s analytical laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

3.2.1.1 Potential Asbestos-Containing Vermiculite Insulation

As part of the assessment, Stantec assessed the subject building for areas where vermiculite insulation, a potential ACM, would likely be present. This included making note of and assessing attic spaces, floor cavities and masonry block or brick walls, which are typical areas where vermiculite is found. Where masonry or brick walls were observed, destructive assessment (drilling) was conducted to assess the cavity for the presence of vermiculite, unless penetrations, breaches and/or sufficient other openings were present.

3.2.1.2 Sample Results Interpretation

When asbestos is detected in concentrations greater than 0.5% percent in one of the samples within a set that was collected to represent a “homogenous application” of a particular material (or detected in any concentration, in a set of samples collected for applications of vermiculite), the entire sample set, and the entire application of that material is then considered to be an ACM.

In addition to the above, a “positive stop” option was used during the laboratory analysis of the building material samples submitted for asbestos analysis. The “positive stop” option is utilized by the laboratory when asbestos is detected at a concentration of greater than half of one percent in one of the samples within a set that was collected to represent a “homogenous application” of that material (or in any concentration, for vermiculite). At this point, further analysis of subsequent samples within the set is deemed to be unnecessary (as the entire set will be considered an ACM, per above), and the remainder of the samples within the set are not analyzed.

3.2.1.3 Asbestos Sampling Quality Assurance/Quality Control

Sampling activities pertaining to asbestos were conducted in accordance with Stantec’s safe work practices, which take into account current provincial and/or territorial regulations pertaining to such work (i.e., sampling procedures, required number of samples and laboratory analytical procedures).

Representative bulk samples were collected of accessible suspect ACMs in sufficient quantities for laboratory analysis. Suspect ACM samples were sealed in polyethylene zip-lock bags labeled with the sample number, suspect material description, and sample location. As part of sampling procedures, sampling tools were cleaned between sample collection events to avoid the potential for cross-contamination of samples.

All sample bags were compiled in order and placed into a single container accompanied with a chain of custody form outlining the project information, date, building location, number of samples, and sample description. Samples were submitted to the analytical laboratory in a sealed container via courier.

3.2.1.4 Assessment of Material Condition

A visual assessment of the condition and accessibility was also completed for each occurrence of suspect ACM. A description of the criteria used in evaluating the condition, accessibility and exposure risk of ACMs is provided below. The criteria are generally based on the June 5, 2017 Public Services and Procurement Canada "Asbestos Management Standard", and industry standards of practice.

Friable ACMs other than Mechanical Insulation

In evaluating the condition of friable ACMs other than mechanical insulation (e.g., spray-applied as fireproofing, texture, decorative or acoustic finishes), the following criteria apply:

Good

- Surface of material shows no significant signs of damage, deterioration or delamination. Up to one percent visible damage to surface is allowed within range of **GOOD**. Evaluation of sprayed fireproofing requires the Assessor to be familiar with the irregular surface texture typical of sprayed asbestos products. **GOOD** condition includes un-encapsulated or un-painted fireproofing or texture finishes, where no delamination or damage is observed, and encapsulated fireproofing or texture finishes where the encapsulation has been applied after the damage or fallout occurred.

Poor

- Sprayed materials show signs of damage, delamination or deterioration. More than one percent damage to surface of ACM spray.

In observation areas, where damage exists in isolated locations, both **GOOD** and **POOR** condition may be reported. The extent or percentage of each condition will be recorded on the Assessor's assessment form.

Fair condition is not utilized or considered as a valid criterion in the evaluation of sprayed fireproofing, sprayed insulation, or texture coat finishes.

The evaluation of ACM spray-applied as fireproofing, non-mechanical thermal insulation, or texture, decorative or acoustic finishes, which are present above ceilings, may be limited by the number of observations made, and by building components such as ducts or full height walls that obstruct the above ceiling observations. Persons entering the ceiling area are advised to be watchful for ACM DEBRIS prior to accessing or working above ceilings in areas of building with ACM, regardless of the reported condition.

Mechanical Insulation

In evaluating the condition of mechanical insulation (on boilers, breaching, ductwork, piping, tanks, equipment, etc.) the following criteria are used:

Good

- Insulation is completely covered in jacketing and exhibits no evidence of damage or deterioration. No insulation is exposed. Includes conditions where the jacketing has minor surface damage (i.e., scuffs or stains), but the jacketing is not penetrated.

Fair

- Minor penetration damage to jacketed insulation (cuts, tears, nicks, deterioration or delamination) or undamaged insulation that has never been jacketed. Insulation is exposed but not showing surface disintegration. The extent of missing insulation ranges should be minor to none.

Poor

- Original insulation jacket is missing, damaged, deteriorated or delaminated. Insulation is exposed and significant areas have been dislodged. Damage cannot be readily repaired. The evaluation of mechanical insulation may be limited by the number of observations made and building components such as ducts or full height walls that obstruct observations. In these circumstances, it is not possible to observe each foot of mechanical insulation from all angles.

Non-Friable and Potentially Friable Materials

Non-friable materials generally have little potential to release airborne fibres, even when damaged by mechanical breakage. However, some non-friable materials, i.e., exterior asbestos cement products, may have deteriorated so that the binder no longer effectively contains the asbestos fibres. In such cases of significantly deteriorated non-friable material, the material will be treated as a friable product, and evaluated per the above criteria.

Asbestos-Containing Material Debris

Debris from Friable ACM

The presence of fallen ACM is noted separately from the presumed friable ACM source (sprayed fireproofing, thermal insulation, texture, decorative or acoustic finishes or mechanical insulation) and is referred to as debris.

Debris from Damaged Non-Friable ACM

The presence of fallen ACM, from damaged non-friable ACM, is reported separately from the non-friable ACM source. Only fallen non-friable ACM that has become friable, is reported as debris.

3.2.2 Findings

A summary of the ACMs that were identified within the subject building as indicated in the Previous Report reviewed is provided below, complete with notes regarding current conditions of identified ACMs, where applicable:

- Roof tar
  - Based on photographs in the Previous Report, this appears to be based on results from tar residue that was sampled on the interior of the building—present at the tops of walls, where it appears to have "oozed down" through spaces, cracks or other breaches, during application on the roof.
    - Roof tar residue remains at the tops of walls in various locations
  - This tar is expected to be the original roofing layer on the entire roof. Removal as a separate material is unlikely to be practical during demolition. As such, all roofing materials should be considered ACM for demolition purposes.
    - Additional assessment and testing immediately prior to or during initial stages of demolition may serve to determine whether layers of roofing materials are present and/or reasonably separable during demolition, to allow for some materials to be removed and disposed-of as non-ACM
- Black firestop/wall mastic (observed by Stantec to be present and in good condition; verified to be an ACM through samples collected during the current assessment)

Additional ACMs were not identified through the current assessment.

3.2.2.1 Non-Asbestos-Containing Materials

The bulk samples collected during this assessment for which no asbestos was detected through laboratory analysis can be seen in the table in Appendix C.

Refer to the documentation in Section 1.1 for materials that have been previously sampled and identified as non-asbestos-containing through sampling and laboratory analysis.

Materials Not Suspected to Contain Asbestos

Various materials within the subject building were observed and/or presumed to be present, which are not suspected to contain asbestos. Typical materials of this nature that were observed and are not considered suspected ACMs, include but are not limited to the following:

- Materials comprised of glass, such as:
  - Window panes
  - Lights and lighting components
- Materials comprised of metal, such as:
  - Flashings on siding or roofs
  - Electrical wiring (excluding wrap) and conduit
  - Components of doors, windows and associated trim
  - Structural components
  - Siding
- Materials comprised of wood, such as:
  - Wall framing
  - Components of doors, windows and associated trim
  - Structural components
  - Handrails
  - Siding
  - Roofing
- Other materials generally not suspected to contain asbestos:
  - Poured concrete items such as foundations, floors, pads or structural beams (excluding suspected ACM finishing compounds)
  - Masonry units such as bricks or blocks (excluding mortar or potential loose-fill insulation)
  - Silicone-based clear caulkings or sealants

3.2.2.2 Potential for Vermiculite Insulation

Destructive testing was conducted by Stantec at the time of this assessment to assess wall cavities (and other potential locations of vermiculite) as indicated on the drawings in Appendix B. No vermiculite insulation was observed within the subject building through observations or destructive testing.

3.2.3 Recommendations

Based on the visual assessment and results of laboratory analyses and review of previous documentation, Stantec recommends the following with regards to meeting the requirements of the COHSR and BC Reg. 296/97 as they pertain managing asbestos during demolition projects:

- Identified ACMs should be removed by appropriately trained personnel (e.g., asbestos abatement contractor personnel), in accordance with the requirements of the COHSR, BC Reg. 296/97 and the Asbestos Guide, and prior to the initiation of project work that will disturb them.
- Prior to demolition activities:
  - Additional assessment and sampling of the roof should be conducted, which may serve to better delineate the ACM type and location, and potentially to confirm layers as “non-ACM”.
  - Additional assessment of inaccessible areas should be conducted, which may serve to confirm similar finishes or may identify additional ACMs (and other hazardous materials).
- Should a material suspected to contain asbestos fibres become uncovered during demolition activities, all work in the areas that may disturb the material should be stopped. Samples of the suspect material should be submitted for laboratory analysis to determine if asbestos fibres are present. Confirmed ACMs should be handled in accordance with applicable guidelines and regulations.
- Suspected ACMs deemed visually similar to the ACMs identified in this report should be considered asbestos-containing and handled as such, unless proven otherwise, through analytical testing.
- Asbestos-containing cement pipe may be present below ground—caution should be used at any time when excavation is required.
- Ensure asbestos containing waste is handled, stored, transported and disposed of in accordance with the requirements of the Federal Transportation of Dangerous Goods Regulation and the British Columbia Hazardous Waste Regulation (BC Reg. 63/88).
- If the building is not demolished, identified ACMs in good condition can continue to be managed in place, in accordance with the Asbestos Management Plan documentation on-file for the Esquimalt Graving Dock.

3.3 LEAD

A summary list of the samples collected including a description of the samples, sampling locations and laboratory analytical results is provided in Appendix F. Copies of the Laboratory Certificates of Analysis for paint chip samples analyzed are included in Appendix G.

Based on our observations and interpretations of suspected LCP sample analytical results, as well as the previous documentation reviewed as outlined herein, the paints presented in the table in Appendix H were identified as LCPs.

The following information is included for each identified LCP:

- Paint colour
- Substrate to which paint is applied
- Location/approximate extent of the LCP within the building
- Lead content of paint
- Condition
- Representative photographs, where available

Our assessment methodologies and findings are further summarized in the following sub-sections.

3.3.1 Methodology

A visual assessment of accessible areas was undertaken in order to check for the presence of materials that may contain lead. These materials included paint applications, wiring and plumbing, batteries, etc.

3.3.1.1 Lead in Paint

With respect to potential lead exposures associated with disturbance to surfaces coated with lead-containing products, the 2011 WorkSafeBC manual titled *Lead-Containing Paint and Coatings: Preventing Exposure in the Construction Industry*, indicates the following:

- Improper removal of lead paint containing 600 mg/kg lead results in airborne lead concentrations that exceed half of the exposure limit
  - The exposure limit indicated in both the COHSR and BC Reg. 296/97 is 0.05 mg/m^3.
  - The potential for exposure exceeding half of the occupational exposure limit would be the trigger for implementation of an exposure control plan.
- Lead concentrations as low as 90 mg/kg may present a risk to pregnant women and children
  - Any risk assessment should include for the presence of high risk individuals within the workplace.

In addition to the above, the 2017 WorkSafeBC publication *Safe Work Practices for Handling Lead* (Lead Guideline) indicates the following:

> Unlike for asbestos-containing material, WorkSafeBC does not numerically define what would be considered a lead-containing paint or coating. All suspected paints or coatings should be tested for lead because, depending on the nature of the work, even a small amount could pose a risk to workers. In order to determine which controls and personal protective equipment would be required for a particular job, a qualified person must consider this information as part of the risk assessment.

When reviewing the above, “high risk” individuals are not expected to be present in the workplace associated with this building during building material alteration activities (i.e., demolition) that would create significant disturbance to paint with such individuals present. As such, paints containing 600 ppm lead or more will be considered “lead-containing” for the purpose of this report, such that appropriate risk assessments can be completed for demolition planning. However, information regarding the lead content of all paints tested is provided herein, for reference and risk assessment should the consideration of high risk individuals be necessary, based on the requirements of a particular situation.

Based on the above, samples of potential LCPs were collected from major paint applications, in sufficient quantity to conduct analysis for total lead content. The sampling of paint applications involved the collection of paint chip samples of paint layers to the substrate, where possible. A minimum volume of 5 cc or a half teaspoon of paint chips was typically collected. Wherever necessary and possible, paint was separated from any backing material such as paper, concrete or wood and placed in a sealed, clearly labelled plastic bag.

Samples collected were submitted to EMSL for analysis of total lead content using EPA Method SW 846 3050B*/7000B. EMSL’s analytical laboratory is also accredited by the American Industrial Hygiene Association (AIHA) Environmental Lead Laboratory Approval Program (ELLAP).

Welding, Burning or Torch Cutting

Although a concentration of 600 ppm lead has been used to define paint coatings as LCPs, it should be noted that this is related to painted surfaces and the determination of appropriate provisions to protect occupants and employees from exposure to elevated concentrations of lead during typical operations and maintenance or simple renovation. This does not include painted metal surfaces that are to be welded, burned or torch-cut.

Using an arc welder or oxyacetylene torch on steel that is coated with lead-containing paint can create hazardous lead fumes and is prohibited by section 12.115 of BC Reg. 296/97.

> Regulatory excerpt: **12.115 Coatings on metals**
>
> A coating on metal which could emit harmful contaminants (such as lead, chromium, organic materials, or toxic combustion products) must be removed from the base metal, whenever practicable, before welding or cutting begins.

In addition, the following information is provided in the Lead Guideline:

- Welding or torch cutting of paints or coatings on metal can create very high concentrations of airborne lead fumes. Torch cutting structural steel, coated with paint containing as little as 130 mg/kg (equivalent to ppm) lead, can release airborne levels of lead as high as 0.8 mg/m^3 (16 times the exposure limit).

Given this information and that the analytical detection limit for lead paint analysis is approximately 80–90 ppm (not significantly different than 130 ppm, which, per above, may release airborne lead levels 16 times the exposure limit), any paint coating on a metal surface to be welded, burned or torch-cut must be removed prior to that action being undertaken, unless a project-specific or tasks-specific risk assessment and safe work practices are developed by a qualified person.

3.3.1.2 Building Materials—Leachable Lead Content

According to BC Reg. 63/88, lead waste may be considered a toxic leachate (and require special disposal) if lead is in a dispersible form and its leachate contains greater than 5.0 mg/L lead.

Based on the above, bulk samples of painted building materials that would be expected to be disposed-of via landfill were collected in a form presumed to be representative of waste generated during demolition, each sample containing over 50 g in weight.

Upon receipt and review of paint chip sample analytical results for total lead content, leachate analysis of building materials coated with identified LCPs can be requested. When leachate analysis is completed, it is conducted by EMSL through toxicity characteristic leaching procedure, using US EPA Method SW846, 1311/7420.

3.3.1.3 Assessment of Paint Condition

The criteria for condition evaluation pertaining to LCPs described herein are generally based on the United States Housing and Urban Development (HUD) 2012 *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing*.

When evaluating the condition of LCPs, an attempt should be made to determine whether the deterioration is due to a moisture problem or some other existing building deficiency.

“Poor” surfaces are considered to be a hazard and should be corrected. “**Fair”** surfaces should be repaired but are not yet considered to be a hazard; if not repaired, they should be monitored frequently. “**Good/intact”** surfaces should be monitored to ensure that they remain in a nonhazardous condition.

In addition, the presence of paint debris must be considered in evaluating condition. Given the variety of paint uses, there are many applications that can have a tendency for the paint to “wear” from the surface slowly, over an extended period of time. Conditions where paint has worn from a surface are worth noting for maintenance discussions (i.e., related to re-coating the surface should, for example, the coating provide weather protection), however, in the absence of loose paint chip debris/dust, such conditions would not represent a potential exposure situation related to lead.

The condition evaluation criteria for LCPs are summarized in Table 1, below.

Table 1 Lead-Containing Paint Condition Categories

Type of Building Component[1]	Total Area of Deteriorated Paint on Each Component		
	Good/Intact	Fair[2]	Poor[3]
Exterior components with large surface areas.	Entire surface is intact.	Less than or equal to 10 square feet	More than 10 square feet
Interior components with large surface areas (walls, ceilings, floors, doors).	Entire surface is intact.	Less than or equal to 2 square feet	More than 2 square feet
Interior and exterior components with small surface areas (window sills, baseboards, soffits, trim).	Entire surface is intact.	Less than or equal to 10% of the total surface area of the component.	More than 10% of the total surface area of the component

NOTES:

1 Building component in this table refers to each individual component or side of building, not the combined surface area of all similar components in a room (e.g., a wall with 1 square foot of deteriorated paint is in "fair" condition, even if the other three walls in a room are intact).

2 Surfaces in "fair" condition should be repaired and/or monitored but are not considered to be "lead-containing paint hazards".

3 Surfaces in "poor" condition are considered to be "lead-containing paint hazards" and should be addressed through abatement or interim controls.

3.3.2 Findings

Lead is expected to be present in the following within the subject building:

- Older electrical wiring materials and sheathing
- Solder used on domestic water lines
- Solder used in bell fittings for cast iron pipes and in electrical equipment
- Vent and pipe flashings

3.3.2.1 Lead in Paint

A summary of the LCPs that were identified within the subject building as indicated in the Previous Report reviewed is provided below, complete with notes regarding current observations, where applicable:

- White paint on exterior red masonry block walls (observed by Stantec to remain; verified to be an LCP through sample collected during the current assessment).

Additional information regarding extent and current condition of identified LCPs, including photographs (where available) is provided in Appendix H.

Greater than 600 ppm lead was detected through laboratory analysis of chip samples collected during the current assessment of the following additional paints:

- Black paint on structural steel
- Yellow on concrete walls
- Yellow on concrete floor lines
- Red on metal corrugated walls

Additional information regarding extent and current condition of identified LCPs, including photographs (where available) is provided in Appendix H.

Building Materials—Leachable Lead Content

Although bulk samples of various painted building materials were collected (materials such as wood, which are expected to be disposed of via landfill), analysis was not conducted as the paints on such materials did not contain > 600 ppm lead. Such materials would not be reasonably expected to contain lead in a dispersible form such that their leachates contain greater than 5.0 mg/L lead.

3.3.3 Recommendations

When paints or other lead-containing equipment/materials within the subject building are to be disturbed and/or removed, ensure compliance with the following:

- Exposure protection requirements of the COHSR and BC Reg. 296/97, including the provisions of the Lead Guideline
- Transportation and disposal requirements of BC Reg. 63/88
- Transportation requirements of the Federal Transportation of Dangerous Goods Regulation

Corrective action or remedial work on paint applications containing any concentration of lead should be undertaken in a manner so as to avoid generating fine particulate matter or dust (i.e., avoid sanding). Airborne lead dust or fumes should not exceed the COHSR and BC Reg. 296/97 eight-hour occupational exposure limit (OEL) of 0.05 mg/m^3 during the removal of paints and products containing any concentration of lead. The use of personal protective equipment is recommended to reduce the potential for over-exposure to lead dust. This can be achieved by:

- Providing workers with protective clothing and personal protective equipment or devices as necessary to protect them against the hazards to which the worker may be exposed
- Providing workers with adequate and training in the care and use of clothing, equipment or device before wearing or using such items
- Wetting the surface of the materials to prevent dust emissions
- Providing workers with washing facilities with clean water, soap and individual towels to properly wash prior to exiting the work area

To avoid the inhalation of lead, it is essential to have the following control methods in place:

- Engineering controls
- Work practices and hygiene practices
- Respirators and personal protective equipment
- Training

The work tasks required and the ways in which lead-containing materials (including paints containing any concentration of lead) will be impacted will determine the appropriate respirators, measures and procedures that should be followed to protect workers from lead exposure.

If demolition does not proceed and the building is to be re-occupied, then:

- Lead-containing materials, including paints, can be managed in place, where in good condition.

3.3.3.1 Welding, Burning or Torch Cutting

Any paint coating on a metal surface to be welded, burned or torch-cut must be removed prior to that action being undertaken, unless project-specific or tasks-specific risk assessments and safe work practices are developed by a qualified person. Development of such risk assessments and work practices will involve consideration of information including, but not limited to, the following:

- Composition of the material to be disturbed
- Lead content of the paint coating
- Methods and tools to be used, including exhaust ventilation
- Duration of the work and/or work shift
- Training of the personnel conducting the task
- Respiratory protection program in effect

3.4 POLYCHLORINATED BIPHENYLS

3.4.1 Methodology

A visual review and/or a review of estimated/reported construction dates to assess the potential presence of PCBs in electrical equipment was completed. Equipment that is generally suspected of containing PCBs includes lamp ballasts, transformers, hydraulic systems, compressors, switchgear and capacitors.

No sampling of dielectric fluids was undertaken as part of this assessment.

3.4.2 Findings

No suspected PCB-containing equipment was observed.

3.4.3 Recommendations

Should a material suspected to contain PCBs become uncovered during demolition activities (i.e., dielectric fluids, hydraulic fluids), all work in the areas that may disturb the material should be stopped. Samples of the suspect material should be submitted for laboratory analysis to determine if PCBs are present.

PCB-containing items identified for removal and disposal should be handled, transported, stored and disposed of in accordance with the following:

- Transportation and disposal requirements of BC Reg. 63/88
- Transportation requirements of the Federal Transportation of Dangerous Goods Regulation
- Federal PCB Regulations (SOR/2008-273)

3.5 MOULD

3.5.1 Methodology

The presence of suspect visible mould was assessed through visual observations. Material observed with dark-coloured staining and/or a textured and discoloured appearance is described as “suspected mould”. Mould identified visually is defined as “suspected mould” unless it is confirmed as mould by laboratory analysis.

The scope of work and procedures utilized for the visual assessment were based on the recommendations for such provided in the documents listed below:

- Standard Construction Document CCA 82 *Mould Guidelines for the Canadian Construction Industry*, Canadian Construction Association, 2004 (referred to as CCA 82)
- *Guidelines on Assessment and Remediation of Fungi in Indoor Environment*, New York City Department of Health and Mental Hygiene, November 2008 (referred to as the NYC Guidelines)
- *Fungal Contamination in Public Buildings: Heath Effects and Investigation Methods*, Federal-Provincial Committee on Environmental and Occupational Health, 2004 (referred to as the Health Canada Guide)
- *Indoor Air Quality in Office Buildings: A Technical Guide*, Report of the Federal-Provincial Advisory Committee on Environmental and Occupational Health, 1995 (referred to as the IAQ Guide)
- *Bioaerosols: Assessment and Control*, American Conference of Governmental Industrial Hygienists (ACGIH), 1999 (referred to as the ACGIH Report)
- *Field Guide for the Determination of Biological Contaminants in Environmental Samples*, AIHA, Second Edition 2005

3.5.2 Findings

Suspect mould or moisture-impacted building materials were not observed at the time of the assessment.

3.5.3 Recommendations

As no mould and/or moisture-impacted building materials were observed within the subject building during the assessment, no recommendations have been provided.

3.6 MERCURY

3.6.1 Methodology

An assessment for equipment that is likely to contain mercury (such as thermostats, thermometers and fluorescent light tubes) was completed visually. Information on the type of equipment (i.e., gauges, switches, batteries, thermometers, etc.), model and serial numbers and quantities was recorded, where such information was available.

3.6.2 Findings

Items suspected to contain liquid mercury or mercury vapour were not observed.

3.6.3 Recommendations

As no mercury-containing items were observed within the subject building during the assessment, no recommendations have been provided.

3.7 OZONE DEPLETING SUBSTANCES

3.7.1 Methodology

An assessment for equipment or systems likely to contain ODSs (such as refrigeration/cooling equipment or fire suppression systems) was completed visually. Information on the type of equipment, manufacturer and type and quantity of refrigerants was recorded, where available.

3.7.2 Findings

Building related cooling, refrigeration or fire suppression equipment suspected to be ODS-containing was not observed within the interior of the subject building.

3.7.3 Recommendations

As no suspect ODS-containing equipment was observed within the subject building during the assessment, no recommendations have been provided.

3.8 SILICA

3.8.1 Methodology

An assessment for the presence of silica was conducted visually. The presence of typical silica-containing building materials such as concrete, masonry, stone, terrazzo, refractory brick, gypsum, ceramic tile, ceiling tile and other items, was noted.

3.8.2 Findings

Silica is expected to be present in the following, which were observed in various locations throughout:

- Cement products such as:
  - Concrete—foundations, floors, walls, blocks
  - Brick/masonry units and associated grout and mortar

3.8.3 Recommendations

When silica-containing materials within the subject building are to be disturbed and/or removed (e.g., coring through concrete slabs, demolition of masonry or concrete units), ensure dust control measures are employed such that airborne silica dust concentrations do not exceed the exposure limit as stipulated by the COHSR and BC Reg. 296/97 (cristobalite and quartz—each 0.025 mg/m^3). This would include, but not be limited to, the following:

- Providing workers with respiratory protection
- Wetting the surface of the materials, and use of water or dust suppressing agents to prevent dust emissions
- Providing workers with facilities to properly wash prior to exiting the work area

If the subject building is not demolished, silica-containing materials can be managed in place; therefore, no further action is recommended at this time.

4.0 CLOSURE

This report has been prepared for the sole benefit of the PSPC. Any use which a third party makes of this report, or any reliance on decisions based on it, is the responsibility of such third parties. Stantec Consulting Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The information and conclusions contained in this report are based upon work undertaken by trained professionals and technical staff in accordance with generally accepted engineering, scientific and occupational health and safety practices current at the time the work was performed. Conclusions presented in this report should not be construed as legal advice.

The conclusions presented in this report represent the best technical judgment of Stantec Consulting Ltd. based on the data obtained from the work. The conclusions are based on the site conditions encountered by Stantec Consulting Ltd. at the time the work was performed at the specific assessment and/or sampling locations, and can only be extrapolated to an undefined limited area around these locations. The extent of the limited area depends on building construction and conditions, weather, building usage and other factors. Due to the nature of the investigation and the limited data available, Stantec Consulting Ltd. cannot warrant against undiscovered environmental or health and safety liabilities.

If any conditions become apparent that differ significantly from our understanding of conditions as presented in this report, we request that we be notified immediately to reassess the conclusions provided herein.

We trust that the above is satisfactory for your purposes at this time. Should you have any questions or concerns, or require additional information, please do not hesitate to contact the Stantec Project Manager at your convenience.

Regards,

Stantec Consulting Ltd.

APPENDIX A

Hazardous Building Materials Background Information, Health Effects Information and Regulatory Framework

Appendix A HAZARDOUS BUILDING MATERIALS BACKGROUND INFORMATION, HEALTH EFFECTS INFORMATION AND REGULATORY FRAMEWORK

A.1 ASBESTOS

Asbestos is a naturally occurring form of fibrous silicate that is durable and flexible; has high thermal and tensile strength; is resistant to heat, chemical corrosion and friction; does not conduct electricity; and insulates well against condensation, heat and noise. Due to these properties, asbestos was used in over 3,000 commercial products, and it is estimated that approximately 70% of the asbestos that was used in North America was used in building materials.

In buildings, and among many other potential asbestos-containing materials, asbestos is typically found in plaster, mechanical insulation, gaskets, thermal insulation on pipes, refractory material, roofing felts, floor tiles, ceiling tiles and parging, heat resistant panels, incandescent light fixture reflector plates, and any other material requiring a high degree of durability or thermal resistance.

Asbestos-containing materials are grouped into two classifications, friable and non-friable materials. Friable ACMs are those that can easily be crumbled or broken apart by mere hand pressure. When these materials break apart asbestos fibres are then released into the atmosphere. Non-friable ACMs or “manufactured products” are materials that by the nature of their manufacturing/construction do not readily allow the release of asbestos fibres. These materials should not be cut or shaped with power tools, since this procedure may allow for the release of the asbestos fibres. Some materials or “manufactured products”, such as plaster, drywall and ceiling tiles that are considered to be non-friable in an undisturbed state can become friable when damaged or disturbed.

The common use of friable (breakable by hand) asbestos-containing materials (ACMs) in construction ceased voluntarily in the mid-1970s; however, the spray application of asbestos-containing fireproofing was not prohibited until 1986. A material known as vermiculite, which was commonly used for insulation within attics, floor spaces or within masonry block wall systems and may be contaminated with asbestos due to its production processes, was used into the mid-1990s. In addition, asbestos cement products and roofing products (e.g., sealants) currently used in the construction of buildings may still contain asbestos.

A.1.1 Health Effects

Undisturbed asbestos within building materials poses no health risks. Asbestos poses a risk when building materials containing asbestos are impacted, or disturbed, thereby releasing the asbestos fibres into the air.

Asbestos-related diseases are caused when suspended airborne asbestos fibres are inhaled and the fibres settle into various regions of the lungs and remain for extended periods. Once embedded in the lungs the asbestos fibres cause scarring within the lung tissue, ultimately leading to impaired lung function (asbestosis) and/or various cancers (lung cancer; mesothelioma). These asbestos-related diseases are irreversible and fatal. The risk of lung-related cancers is increased in individuals who smoke.

These asbestos-related diseases most often occur in individuals who have been exposed to high concentrations of airborne asbestos over a long period of time, though mesothelioma has been found in individuals with short-term exposures. Symptoms or the development of these asbestos-related diseases usually occur 10 to 25 years after exposure.

A.1.2 Regulatory Framework

Asbestos is included in the Canada Labour Code, Part II Canada Occupational Health and Safety Regulations (COHSR) and British Columbia's Occupational Health and Safety Regulation (BC Reg. 296/97). Included in both regulatory instruments are provisions for the general duties of employers, requirements for health assessments, training and project notification. There are also sections that will also apply to abatement projects, depending on the work procedures and specific work site hazards.

The COHSR and BC Reg. 296/97 also established an 8-hour occupational exposure limit (OEL) for asbestos (all forms) to be 0.1 fibre/cubic centimetre.

The 2017 WorkSafeBC publication *Safe Work Practices for Handling Asbestos* (Asbestos Guide) is used by Occupational Health and Safety officers as a guide when reviewing abatement work practices and employer codes of practice, and generally meets the requirements of the COHSR.

The Asbestos Guide also provides significant additional background information pertaining to asbestos, along with details on health effects and other applicable legislation within the province of British Columbia (e.g., the federal *Hazardous Products Act*, the BC Building Code and waste disposal regulations).

According to the COHSR, ACM means:

- Any article that is manufactured and contains 1% or more asbestos (by weight) at the time of manufacture, or any material that contains 1% or more asbestos when tested in accordance with accepted methods.

According to the current version of BC Reg. 296/97, asbestos-containing material (ACM) means any material containing at least 0.5% asbestos, or vermiculite insulation with any asbestos.

Disposal of asbestos waste is governed by the British Columbia Hazardous Waste Regulation (BC Reg. 63/88). The Federal Transportation of Dangerous Goods Regulation and BC Reg. 63/88 set out the requirements for the proper transport of asbestos waste in British Columbia. In general, and for transportation and disposal, the waste must be placed in a double sealed container, properly labeled, free of cuts, tears or punctures and disposed of at a licensed waste station which has been properly notified of the presence of asbestos waste.

A.2 LEAD

Lead may be used in its pure metallic form or combined chemically with other elements to form lead compounds. Metallic lead is used to make products such as electric storage batteries, ammunition, lead solder, radiation shields, pipes, and sheaths for electric cables. Metallic lead is sometimes combined with other metals such as copper, tin and antimony as lead alloys for use in the manufacture of a variety of metal products.

Organic lead compounds contain a lead atom covalently bonded to carbon. Common examples of organic lead compounds include lead “soaps” such as lead oleates, high pressure lubricants, and anti-knock agents in gasoline.

Inorganic lead compounds (or lead salts) result when lead is combined with an element other than carbon. Examples are lead oxide, lead chromate, lead carbonate and lead nitrate. Inorganic lead compounds may occur as solids or in solutions, and are used in insecticides, pigments, paints, frits, glasses, plastics, and rubber compounds.

Lead is commonly found in buildings in items such as the solder used on copper domestic pipes; the caulking on bell fittings of cast iron drainage pipes; electrical equipment/wiring; batteries (e.g., emergency exit signage batteries); lead sheeting (e.g., x-ray rooms); vent and pipe flashings; and paints and ceramic tile glazes.

A.2.1 Health Effects

Elemental lead and inorganic lead compounds are absorbed through ingestion or inhalation and can incorporate into the bone marrow, nerve tissue, brain, and kidneys. In children, symptoms of lead poisoning can include headaches, irritability, abdominal pain, vomiting, anemia, weight loss, poor attention span, noticeable learning difficulty, slowed speech development, and hyperactivity. In adults, symptoms of lead poisoning can include pain, numbness or tingling of the extremities, muscular weakness, headache, abdominal pain, memory loss, unsteady gait, pale skin, weight loss, vomiting, irritability, and anemia. Although adults are susceptible to the toxic effects of lead, children are at high risk due to the nature of a child's activities that involve the introduction of non-food items into their bodies.

Excessive airborne lead and surface contamination can be transferred to employees’ hands and may results in lead ingestion. Therefore, work practices intended to minimize surface lead concentrations, such as frequent cleaning of work surfaces should be included in an overall lead exposure control plan.

A.2.2 Regulatory Framework

In the past, the United States Department of Housing and Urban Development (HUD) set a criteria of lead-based paint as 0.5% lead (by weight) or 5,000 parts per million (ppm) for evaluating whether lead is a hazard in a residential setting.

In Canada, the Surface Coating Materials Regulations (SOR/2005-109) under the federal *Hazardous Products Act* provides a concentration of lead that must not be exceeded in surface coatings that are presently sold in this country. This value has recently been reduced from 600 ppm (2005) to 90 ppm (2010). However, it is important to note that this regulation does not comment on the potential occupational exposure if the material is disturbed.

Under the COHSR and BC Reg. 296/97, a regulatory limit has been established for occupational exposure to airborne lead that may be present in a workplace. The OEL for airborne lead dust or fumes per both regulatory instruments should not exceed the TWA value of 0.05 milligram per cubic metre of air (mg/m^3). The OEL represents the time-weighted average concentration for a conventional 8-hour workday and a 40-hour workweek, to which it is believed that nearly all workers may be repeatedly exposed, day after day, without adverse health effects.

With respect to potential lead exposures associated with disturbance to surfaces coated with lead-containing products, the 2011 WorkSafeBC manual titled *Lead-Containing Paint and Coatings: Preventing Exposure in the Construction Industry*, indicates the following:

- Improper removal of lead paint containing 600 mg/kg lead results in airborne lead concentrations that exceed half of the exposure limit
  - This potential for exposure exceeding half of the occupational exposure limit would be the trigger for implementation of an exposure control plan.
- Lead concentrations as low as 90 mg/kg may present a risk to pregnant women and children
  - Any risk assessment should include for the presence of high risk individuals within the workplace.

In addition to the above, the 2017 WorkSafeBC publication *Safe Work Practices for Handling Lead* (Lead Guideline) indicates the following:

> Unlike for asbestos-containing material, WorkSafeBC does not numerically define what would be considered a lead-containing paint or coating. All suspected paints or coatings should be tested for lead because, depending on the nature of the work, even a small amount could pose a risk to workers. In order to determine which controls and personal protective equipment would be required for a particular job, a qualified person must consider this information as part of the risk assessment.

Work procedures that can be used to assist in protecting workers and adjacent work areas from exposure to lead during disturbance activities can also be found in this document.

According to the British Columbia Hazardous Waste Regulation (BC Reg. 63/88), lead waste may be considered a toxic leachate (and require special disposal) if lead is in a dispersible form and its leachate contains greater than 5.0 milligrams per litre (mg/L) lead.

The Federal Transportation of Dangerous Goods Regulation and BC Reg. 63/88 set out the requirements for the proper transport of lead waste in British Columbia.

A.3 POLYCHLORINATED BIPHENYLS (PCBS)

PCBs are man-made toxic chemicals whose physical and chemical properties produce the following attributes: fire resistance, low electrical conductivity, high resistance to thermal breakdown, high chemical stability and resistance to oxidants and other chemical.

PCBs were used widely as coolants and lubricants in transformers, capacitors, and other electrical equipment. In fluorescent fixtures, PCBs were usually found within the small capacitors inside the ballast that controls the lamp. The Federal Chlorobiphenyls Regulation, SOR/91-152, prohibited the use of PCBs in electrical equipment manufactured after July 1, 1980. Stocks of items such as ballasts containing PCBs may have been used into the early or mid-1980s.

A.3.1 Health Effects

PCBs are insoluble in water; however, they readily dissolve in fats and other organic compounds. It is these attributes and fat-solubility that allow PCBs to persist in the environment and bio-accumulate in humans and animals. Exposure to PCBs can affect the immune system, reproductive system, nervous system and endocrine system. In humans, PCBs are potentially cancer-causing.

A.3.2 Regulatory Framework

As of September 5, 2008, under subsection 93(1) of the Canadian *Environmental Protection Act,* (CEPA), Federal PCB regulations were published by the Canada Gazette Part II (SOR/2008-273) that imposed specific deadlines for the elimination of all PCBs in concentrations at or above 50 milligrams/kilogram (mg/kg). This regulation required the elimination of all PCBs and PCB-containing materials currently in-use and in storage and limited the period of time PCB materials could be stored before being eliminated. Other aspects of the regulation govern the labelling and reporting of stored PCB materials and equipment as well as improved practices for the management of PCBs that remain in use (i.e., those with PCB concentrations less than 50 mg/kg) until their eventual elimination.

Under SOR/2008-273, the following end-of-use dates were established:

- December 31, 2009
  - Equipment containing PCBs in a concentration of 500 mg/kg or more
  - Equipment containing PCBs in a concentration of at least 50 mg/kg but less than 500 mg/kg when located in sensitive locations (i.e., drinking-water treatment plant, food or feed processing plant, child care facility, preschool, primary or secondary school, hospital, or senior citizen care facility or the property on which the plant or facility is located, within 100 m of it)
- December 31, 2014
  - Certain specified equipment not replaced by the 2009 deadline due to technical constraints for engineered-to-order equipment or if the facility is scheduled for permanent closure before 2014
- December 31, 2025
  - Equipment containing PCBs in a concentration of at least 50 mg/kg but less than 500 mg/kg when located in non-sensitive locations

In addition to the above, a maximum storage period of one year is allowed for PCBs and products that contain PCBs at each of the following non-sensitive locations:

- Owner's PCB storage site
- PCB storage site of an authorized facility for decontamination or of an authorized transfer site
- PCB storage site of an authorized destruction facility

For British Columbia, according to the British Columbia Hazardous Waste Regulation (BC Reg. 63/88):

- PCB wastes are defined as: PCB liquid, PCB solid, and PCB equipment that have been taken out of service for the purpose of treatment, recycling, reuse, or disposal, or for the purpose of storage prior to treatment, recycling, reuse, or disposal
  - "PCB liquid" means any liquid containing more than 50 parts per million (ppm) by weight of PCB
  - "PCB solid" means any material or substance other than PCB liquid that contains or is contaminated with chlorobiphenyls at a concentration greater than 50 ppm by weight of chlorobiphenyls
  - "PCB Equipment" means any manufactured item that contains or is contaminated with a PCB liquid or PCB solid is PCB equipment. While items of PCB equipment are often electrical components such as transformers or capacitors, the definition includes other items such as contaminated drums and containers.
    - NOTE: An item of equipment from which PCB liquid or PCB solid has been removed is still PCB equipment until it has been decontaminated by an approved protocol. This is because the removal is a treatment process and the equipment, until decontaminated, is a residue from the treatment

In British Columbia, PCB equipment becomes PCB wastes as soon as it is removed from service. This is the case even if the intent is to treat, recycle, or reuse the equipment.

When PCB wastes are stored in British Columbia, the full requirements of BC Reg. 63/88 apply to:

- 1.0 kg or more of pure PCB
- 100 L or more of any liquid containing more than 50 ppm of PCB
- 100 kg or more of any material other than a liquid, contaminated with more than 50 ppm of PCB

These amounts are the total of all amounts at a single location owned or controlled by the same person. They include PCB equipment. BC Reg. 63/88 also provides packaging requirements for storage, labeling requirements, and waste destruction requirements.

The Federal Transportation of Dangerous Goods Regulation sets out the requirements for the proper transport of PCB waste across provincial boundaries.

In British Columbia, a manifest issued by the Ministry of Environment (or equivalent federal document) must be used for hazardous wastes shipped from sites in British Columbia. A manifest must be used to transport:

- 5 kg or more of PCB solids
- 5 L or more of PCB liquids
- An amount of a PCB solid or PCB liquid containing more than 500 g of PCB within BC
- 500 g or more of solids, liquids, or mixtures of these containing 50 mg/kg of PCB outside of BC

A.4 MOULD

Mould can be found everywhere in the outside environment—on plants, in soil and on dead and decaying matter (i.e., dead leaves). Mould requires two main conditions in order to grow—a source of food (a substrate typically comprised of cellulose) and water. Sources of food for mould are plentiful in outdoor and indoor environments; however, it is the presence of water in an indoor environment that will determine mould growth. The source of water can be a result of a water pipe leak or even excess condensation. Thus, the key to controlling mould indoors is to control the presence of water.

The removal of building materials impacted by mould growth may require workers with specific training and experience using work procedures that have been developed to protect workers and work areas from exposure to elevated concentrations of airborne mould.

A.4.1 Health Effects

There are a number of documented cases of health problems related to exposure to indoor fungi. Both high-level, short-term exposures and lower-level, long-term exposures can result in illness. The most common symptoms from exposure to mould in indoor environments are runny nose, eye irritation, cough, congestion, aggravation of asthma, headache, flu-like symptoms, fatigue, and skin rash. People with suppressed immune systems may be susceptible to fungal infections as a result of exposure to indoor moulds.

People who are exposed to mould growth on building materials will not necessarily exhibit adverse health effects. However, the mould must still be removed. Humans are at risk from indoor mould when fungal spores, fragments or metabolites are released into the air and inhaled or physically contacted (dermal exposure).

Not everyone experiences allergic reaction; the susceptibility to exposure varies with the individual's genetic predisposition, age, state of health, and concurrent exposures. For these reasons, and because the measurement of exposure is not standardized and biological markers of exposure to fungi are largely unknown, it is not possible to establish "safe" or "unsafe" levels of exposure. However, federal and provincial policies have been written to minimize mould exposure and the elimination of mould indoors.

A.4.2 Susceptibility to Mould Exposure

People's reaction to mould exposure is quite varied, and although anyone can be affected, some people may be more susceptible and at greater risk, including:

- Infants and children
- Elderly
- Pregnant women
- Individuals with respiratory conditions or allergies and asthma
- Persons with weakened immune system (e.g., chemotherapy patients, organ or bone marrow transplant recipients, and people with HIV infections or autoimmune diseases)

People with specific health concerns should consult their doctor if concerned about mould exposure. Symptoms that may appear to stem from mould exposure may be due to other causes such as bacterial or viral infections or other allergies.

A.4.3 Regulatory Framework

At present, there are no specific laws or regulations governing acceptable levels of mould in buildings. The lack of specific regulatory standards is due in part to an inability to establish exposure-response relationships. Variation in individual susceptibility, limitations in sampling and analytical techniques, and the vast number of fungal agents and their products make it difficult to establish safe levels of exposure for all individuals. With a lack of defined exposure criteria, current Health Canada and other agency guidelines on the assessment and control of mould contamination in public buildings are largely based on prudent avoidance (i.e., remove any indoor growth or amplification site of mould, regardless of the concentration of moulds or their products in the indoor environment).

Although there are currently no regulations in Canada pertaining specifically to mould in buildings, occupational health and safety regulations typically require employers to take every precaution reasonable in the circumstances for the protection of workers. For example, BC Reg. 296/97 indicates the following:

- Section 4.79(1):
  - Employer must ensure that the indoor air quality is investigated when
    a) complaints are reported
- Section 4.79(2):
  - Air quality investigation must include
    c) sampling for airborne contaminants suspected to be present in concentrations associated with the reported complaints

The WorkSafeBC Guideline for Part 4 of BC Reg. 296/97 discusses the application of the Regulation to workplaces with mould showing on exposed or hidden surfaces, or where mould may be a factor in complaints regarding indoor air quality. The guideline provides information for investigating indoor air quality complaints with respect to mould contamination, including information on sampling for the presence of moulds in buildings. Information is also provided on possible health effects and for cleanup personnel involved in the remediation of buildings damaged by water and mould.

Several additional guidelines and other resources describe procedures for the investigation and remediation of mould. The following documents indicate that mould observed in occupied building should be remediated in accordance with these procedures:

- Environmental Abatement Council of Ontario's (EACO) *Mould Abatement Guidelines*, 2010—Edition 2
- *Mould Guidelines for The Canadian Construction Industry*, Canadian Construction Association—82, 2004
- *Guidelines on Assessment and Remediation of Fungi in Indoor Environment*, New York City Department of Health and Mental Hygiene, November 2008
- *Bioaerosols: Assessment and Control,* ACGIH 1999
- *Fungal Contamination in Public Buildings: Health Effects and Investigation Methods*, Federal-Provincial Committee on Environmental and Occupational Health 2004
- *Field Guide for the Determination of Biological Contaminants in Environmental Samples*, AIHA 1996
- *Clean-Up Procedures for Mould in Houses,* Canada Mortgage and Housing Corporation (CMHC) 2004

A.5 MERCURY

Mercury is commonly found in buildings as mercury vapour lighting, thermostats/thermometers with mercury-containing glass ampoules, electrical switches and can also be found in minor amounts in fluorescent lamp tubes and vapour bulbs and may be present in stable forms in adhesives. If mercury is exposed to the air, odourless vapours are formed.

A.5.1 Health Effects

Routes of exposure for mercury and mercury compounds include inhalation, ingestion, skin and/or eye contact. Mercury is hazardous if it is inhaled or absorbed through the skin, therefore exposure controls (including both respiratory protection and skin protection) are important to consider.

Elemental (metallic) mercury most often causes health effects through inhalation of its vapour, which can be absorbed through the lungs. This kind of exposure can result when elemental mercury is spilled (or products that contain elemental mercury break) and the mercury is exposed to the air. Vapour concentrations can vary especially in warm or poorly-ventilated indoor spaces where the airborne concentration can exceed the permissible exposure limit (provincially set).

Chronic mercury "poisoning" can be caused by long-term exposure to low airborne concentrations (or low levels) of mercury. Symptoms or effects of mercury exposure include: tremors, emotional changes (e.g., mood swings, nervousness, irritability, etc.), neuromuscular effects (e.g., muscular weakness, twitching), mental changes/disturbances, digestive disturbances, headaches, insomnia, and changes in nervous response.

Factors that determine the severity of the health effects from mercury exposure include the following:

- Chemical form of mercury (e.g., elemental, methylmercury, inorganic and organic)
- Dose
- Age of individual exposed
- Duration of exposure
- Route of exposure—as listed above
- Health of individual exposed

A.5.2 Regulatory Framework

In Canada, the Surface Coating Materials Regulations (SOR/2005-109) under the federal *Hazardous Products Act* provides a concentration of mercury that must not be exceeded in surface coatings that are presently sold in this country. This value was set at 10 ppm in 2005. However, it is important to note that there is not a direct correlation between the concentration of mercury in a material to the potential occupational exposure if the material is disturbed.

Exposure to mercury is regulated by the COHSR and BC Reg. 296/97. The regulated occupational exposure limit for airborne mercury according to both regulatory instruments is 0.025 mg/m^3 (eight-hour TWA).

Mercury disposal should be through a scrap dealer (elemental mercury), recycling firm for mercury vapour and returned to the manufacturer for light tubes and fixtures. Disposal of mercury waste is governed by BC Reg. 63/88.

The Federal Transportation of Dangerous Goods Regulation and BC Reg. 63/88 set out the requirements for the proper transport of mercury waste in British Columbia.

A.6 OZONE-DEPLETING SUBSTANCES

Ozone-depleting substances (ODSs) are chemical agents known as chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) used in various refrigeration equipment including air-conditioning, heat pump, refrigeration or freezer units. They have also been used in solvents, as aerosol additives in the production of foam insulation and in fire extinguishing equipment.

A.6.1 Health Effects

Health effects are not typically related to exposure to ODSs directly, but to the consequences of ODS release to the atmosphere, subsequent degradation of the earth's ozone layer, and implications associated with increased UVB light exposure.

A.6.2 Regulatory Framework

ODSs are regulated in British Columbia by the British Columbia *Waste Management Act*—Ozone Depleting Substances and Other Halocarbons Regulation (BC Reg. 387/99 as amended by BC Reg. 109/2002).

On federal land, aboriginal land and federal works, buildings and undertakings, the Federal Halocarbon Regulation 2003 (SOR/2003-289, including associated amendments) applies. All other buildings and uses of refrigerants and other agents are under the Ozone-Depleting Substances Regulations 1998 (SOR/99-7), under CEPA. The regulations prohibit the release of halocarbons contained in refrigeration systems, air conditioning systems, fire extinguishers (except to fight a fire that is not a fire caused for training purposes) or containers or equipment used in the re-use, recycling, reclamation or storage of a halocarbon.

The regulations also impose restrictions on the servicing and dismantling, disposing of or decommissioning of any system containing halocarbons and requires the recovery of halocarbons into an appropriate container by a certified individual. The regulation also details an owner's record-keeping obligations.

If ODS-containing materials are to be removed and disposed of, all ODSs must be handled, recycled, stored, and/or disposed of in accordance with the requirements of BC Reg. 63/88.

The Federal Transportation of Dangerous Goods Regulation and BC Reg. 63/88 set out the requirements for the proper transport of ODS waste in British Columbia.

A.7 SILICA

Silica is a scientific name that refers to a mineral group made up of silicon and oxygen. It is the crystalline form of silica that is of concern when considering health effects. Crystalline silica occurs in several forms including quartz, cristobalite and tridymite. Silica's many uses include sand in golf courses and playgrounds, sandblasting abrasives, glass, ceramics, building materials (concrete, grout, bricks, blocks, asphalt, acoustical tiles, floor tiles, and plaster), electronic components.

Dust containing respirable crystalline silica is produced during construction-related activities such as the following:

- Demolition
- Masonry, bricklaying and/or stone setting
- Rock drilling
- Repair and/or finishing of concrete materials
- Abrasive blasting
- Dry sweeping
- Quarrying and mining

A.7.1 Health Effects

Crystalline silica dust particles, which are small enough to be inhaled into the lungs (respirable size), can cause a number of health problems. As with asbestos, silica within building materials poses no threat to human health if left undisturbed.

Exposure to crystalline silica airborne dust my cause scaring of the lungs with coughing and shortness of breath—also known as “silicosis”, a form of disabling, progressive, and sometimes fatal pulmonary fibrosis.

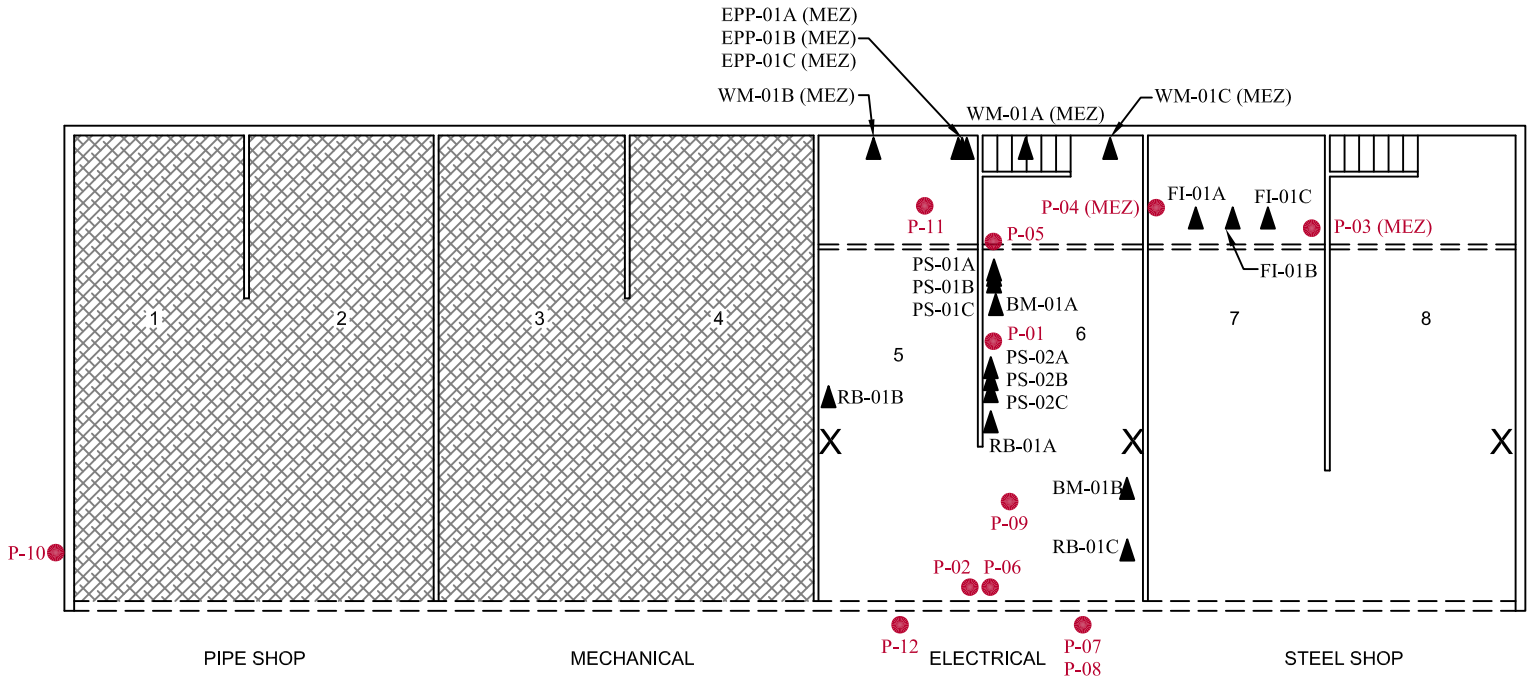
A.7.2 Regulatory Framework

Regulations pertaining to silica are provided in BC Reg. 296/97. Included are general provisions (minimizing release; keeping worksite clear of unnecessary accumulations; ensuring methods for decontamination prevent generation of airborne silica), provisions for “restricted areas” (where there is a reasonable chance that the airborne concentration of silica exceeds or may exceed the occupational exposure limit), provisions for use in abrasive blasting, and provisions for health assessments for workers exposed to silica.

BC Reg. 296/97 and the COHSR also establish the eight-hour OEL for silica to be 0.025 mg/m^3 for each cristobalite and quartz.

APPENDIX B

Floor Plans



BUILDING 1007 - KILN BUILDING

LEGEND

- ▲ BULK SAMPLES FOR ASBESTOS
- ● PAINT CHIP SAMPLES FOR LEAD
- X INTRUSIVE INVESTIGATION FOR VERMICULITE
- NO ACCESS

NOTES:

1. ROOF NOT ACCESSED. PREVIOUS REPORT INDICATES "ROOF TAR" AS ACM. OBSERVATIONS INDICATE THAT THIS IS A "BASE" LAYER. AS SUCH, ALL OVERLYING ROOFING MATERIALS ARE UNLIKELY TO BE REASONABLY SEPARABLE FROM THE "BASE" LAYER, AND ROOFING MATERIALS IN GENERAL SHOULD BE CONSIDERED ACM UNLESS ADDITIONAL ASSESSMENT AND TESTING PROVES OTHERWISE.
2. BLACK FIRESTOP/WALL MASTIC APPLIED TO RED MASONRY BLOCK WALLS THROUGHOUT VARIOUS INTERIOR/EXTERIOR PENETRATIONS IS ASBESTOS-CONTAINING.
3. THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

FLOOR PLAN SHOWING HAZARDOUS BUILDING MATERIALS AND BULK SAMPLE LOCATIONS

ESQUIMALT GRAVING DOCK, 825 ADMIRALS ROAD, VICTORIA, BC

Client:	PUBLIC SERVICES AND PROCUREMENT CANADA
Project No.:	123221425
Scale:	N.T.S.
Date:	19/12/19
Dwn. By:	CD CS SL2019120281
App'd By:	TW
Dwg. No.:	1

Stantec

APPENDIX C

Summary of Results: Analysis of Bulk Samples for Asbestos

Appendix C SUMMARY OF RESULTS: ANALYSIS OF BULK SAMPLES FOR ASBESTOS

Table C-1 Suspected ACM Bulk Sample and Analytical Results Summary Building 1007—Kiln Building, Esquimalt Graving Dock, 825 Admirals Road, Victoria

Material/Homogenous Application Description	Sample Number	Sample Location	Result (% Asbestos)
Brick mortar, grey—applied between bricks (supplemental)	1007-BM-01A	Bay 6, partition wall adjacent to bay 5	None Detected
	1007-BM-01B	Bay 6, partition wall adjacent to bay 7	None Detected
Wall mastic/firestop, black—applied to red masonry block walls throughout various interior/exterior penetrations	**1007-WM-01A**	**Bay 6, rear wall**	**9.3% Chrysotile**
	1007-WM-01B	**Bay 5, rear wall**	**Positive Stop (Not Analyzed)**
	1007-WM-01C	**Bay 6, rear wall**	**Positive Stop (Not Analyzed)**
Electrical penetration putty, grey—applied to conduits and remnants	1007-EPP-01A	Bay 6, upper level wall adjacent to bay 5	None Detected
	1007-EPP-01B	Bay 6, upper level wall adjacent to bay 5	None Detected
	1007-EPP-01C	Bay 6, upper level wall adjacent to bay 5	None Detected
Red brick throughout walls	1007-RB-01A	Bay 6, partition wall adjacent to bay 5	None Detected
	1007-RB-01B	Bay 5, partition wall adjacent to bay 4	None Detected
	1007-RB-01C	Bay 6, partition wall adjacent to bay 7	None Detected
Pipe sealant, blue—applied to threads of fire sprinkler lines	1007-PS-01A	Bay 6, partition wall adjacent to bay 5	None Detected
	1007-PS-01B	Bay 6, partition wall adjacent to bay 5	None Detected
	1007-PS-01C	Bay 6, partition wall adjacent to bay 5	None Detected
Pipe sealant, grey—applied to threads of fire sprinkler lines	1007-PS-02A	Bay 6, partition wall adjacent to bay 5	None Detected
	1007-PS-02B	Bay 6, partition wall adjacent to bay 5	None Detected
	1007-PS-02C	Bay 6, partition wall adjacent to bay 5	None Detected
Foam insulation, yellow—applied between wall seams	1007-FI-01A	Bay 7, rear upper wall	None Detected
	1007-FI-01B	Bay 7, rear upper wall	None Detected
	1007-FI-01C	Bay 7, rear upper wall	None Detected

NOTES:

1. Bold, highlighted text indicates confirmed ACM
2. Discrepancies between sampled material or location descriptions between this table and the laboratory certificate—this table is to be considered correct

APPENDIX D

Laboratory Analytical Report—
Asbestos: Polarized Light Microscopy

EMSL Canada Inc.

4506 Dawson Street Burnaby, BC V5C 4C1
Phone/Fax: (604) 757-3158 / (604) 757-4731
http://www.EMSL.com / vancouverlab@EMSL.com

EMSL Canada Order 691903157
Customer ID: 55JACQ30L
Customer PO: 123221425
Project ID:

Attn: Amanda Bell
Stantec Consulting Ltd.
500 - 4730 Kingsway
Burnaby, BC V5H 0C6

Phone: (604) 412-3004
Fax:
Collected:
Received: 11/29/2019
Analyzed: 12/13/2019

Proj: 123221425 / BUILDING 1007 - KILN BUILDING

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: 1007-BM-01A **Lab Sample ID:** **691903157-0001**
Sample Description: Bay 6, partition wall adjacent to bay 5/Brick mortar, grey -applied between bricks (supplemental)

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	12/12/2019	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 1007-BM-01B **Lab Sample ID:** **691903157-0002**
Sample Description: Bay 6, partition wall adjacent to bay 7/Brick mortar, grey -applied between bricks (supplemental)

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	12/13/2019	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 1007-WM-01A **Lab Sample ID:** **691903157-0003**
Sample Description: Bay 6, rear wall/Wall mastic/penetration, black – applied to brick walls

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	12/13/2019	Black	0.0%	90.7%	**9.3% Chrysotile**	

Client Sample ID: 1007-WM-01B **Lab Sample ID:** **691903157-0004**
Sample Description: Bay 5, rear wall/Wall mastic/penetration, black – applied to brick walls

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	12/13/2019				Positive Stop (Not Analyzed)	

Client Sample ID: 1007-WM-01C **Lab Sample ID:** **691903157-0005**
Sample Description: Bay 6, rear wall/Wall mastic/penetration, black – applied to brick walls

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	12/13/2019				Positive Stop (Not Analyzed)	

Client Sample ID: 1007-EPP-01A **Lab Sample ID:** **691903157-0006**
Sample Description: Bay 6, upper level wall adjacent to bay 5/Electrical penetration putty, grey – applied to conduits and remnants

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	12/13/2019	Gray	0.0%	100%	None Detected	

Client Sample ID: 1007-EPP-01B **Lab Sample ID:** **691903157-0007**
Sample Description: Bay 6, upper level wall adjacent to bay 5/Electrical penetration putty, grey – applied to conduits and remnants

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	12/13/2019	Gray	0.0%	100%	None Detected	

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http://www.EMSL.com / vancouverlab@EMSL.com

EMSL Canada Order 691903157
Customer ID: 55JACQ30L
Customer PO: 123221425
Project ID:

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: 1007-EPP-01C **Lab Sample ID:** **691903157-0008**

Sample Description: Bay 6, upper level wall adjacent to bay 5/Electrical penetration putty, grey – applied to conduits and remnants

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	12/13/2019	Gray	0.0%	100%	None Detected	

Client Sample ID: 1007-RB-01A **Lab Sample ID:** **691903157-0009**

Sample Description: Bay 6, partition wall adjacent to bay 5/Red brick throughout walls

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	12/13/2019	Red	0.0%	100%	None Detected	

Client Sample ID: 1007-RB-01B **Lab Sample ID:** **691903157-0010**

Sample Description: Bay 5, partition wall adjacent to bay 4/Red brick throughout walls

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	12/13/2019	Red	0.0%	100%	None Detected	

Client Sample ID: 1007-RB-01C **Lab Sample ID:** **691903157-0011**

Sample Description: Bay 6, partition wall adjacent to bay 7/Red brick throughout walls

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	12/13/2019	Red	0.0%	100%	None Detected	

Client Sample ID: 1007-PS-01A **Lab Sample ID:** **691903157-0012**

Sample Description: Bay 6, partition wall adjacent to bay 5/Pipe sealant, blue – applied to threads of fire sprinkler lines

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	12/13/2019	Blue	0.0%	100%	None Detected	

Client Sample ID: 1007-PS-01B **Lab Sample ID:** **691903157-0013**

Sample Description: Bay 6, partition wall adjacent to bay 5/Pipe sealant, blue – applied to threads of fire sprinkler lines

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	12/13/2019	Blue	0.0%	100%	None Detected	

Client Sample ID: 1007-PS-01C **Lab Sample ID:** **691903157-0014**

Sample Description: Bay 6, partition wall adjacent to bay 5/Pipe sealant, blue – applied to threads of fire sprinkler lines

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	12/13/2019	Blue	0.0%	100%	None Detected	

Client Sample ID: 1007-PS-02A **Lab Sample ID:** **691903157-0015**

Sample Description: Bay 6, partition wall adjacent to bay 5/Pipe sealant, grey – applied to threads of fire sprinkler lines

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	12/13/2019	Gray	0.0%	100%	None Detected	

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Phone/Fax: (604) 757-3158 / (604) 757-4731
http://www.EMSL.com / vancouverlab@EMSL.com

EMSL Canada Order 691903157
Customer ID: 55JACQ30L
Customer PO: 123221425
Project ID:

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: 1007-PS-02B **Lab Sample ID:** **691903157-0016**

Sample Description: Bay 6, partition wall adjacent to bay 5/Pipe sealant, grey – applied to threads of fire sprinkler lines

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	12/13/2019	Gray	0.0%	100%	None Detected	

Client Sample ID: 1007-PS-02C **Lab Sample ID:** **691903157-0017**

Sample Description: Bay 6, partition wall adjacent to bay 5/Pipe sealant, grey – applied to threads of fire sprinkler lines

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	12/13/2019	Gray	0.0%	100%	None Detected	

Client Sample ID: 1007-FI-01A **Lab Sample ID:** **691903157-0018**

Sample Description: Bay 7, rear upper wall/Foam insulation, yellow – applied between wall seams

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	12/12/2019	Yellow	0.0%	100.0%	None Detected	

Client Sample ID: 1007-FI-01B **Lab Sample ID:** **691903157-0019**

Sample Description: Bay 7, rear upper wall/Foam insulation, yellow – applied between wall seams

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	12/12/2019	Yellow	0.0%	100.0%	None Detected	

Client Sample ID: 1007-FI-01C **Lab Sample ID:** **691903157-0020**

Sample Description: Bay 7, rear upper wall/Foam insulation, yellow – applied between wall seams

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	12/13/2019	Yellow	0.0%	100.0%	None Detected	

Analyst(s):

Michelle Lung	PLM (2) PLM Grav. Reduction (9)
Natalie D'Amico	PLM (3)
Stephanie Achaiya	PLM Grav. Reduction (4)

Reviewed and approved by:

Nicole Yeo, 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 or the U.S. Government

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

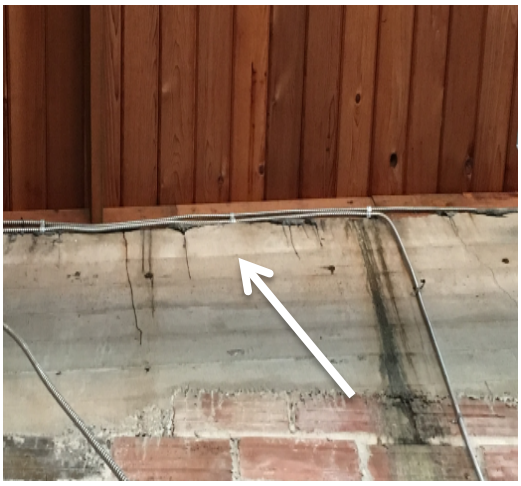
Initial report from: 12/13/201911:41:22

APPENDIX E

Summary of Identified Asbestos-Containing Materials

Appendix E SUMMARY OF IDENTIFIED ASBESTOS-CONTAINING MATERIALS

Table E-1 Summary of Identified Asbestos-Containing Materials Building 1007—Kiln Building, Esquimalt Graving Dock, 825 Admirals Road, Victoria

Identified ACM Description and Condition Information		
Roof tar • **Roof not accessed during the current assessment** • **Previous Report indicates "roof tar" as ACM. Observations indicate that this may be a "base" layer. As such, overlying roofing materials are unlikely to be reasonably separable from the base layer, and roofing materials in general should be considered ACM unless additional assessment and testing proves otherwise.**		
% Type	10% Chrysotile (Previous Report)	
Friability	Non-friable	
Condition	Good	
Black firestop/wall mastic applied to red masonry block walls throughout various interior/exterior penetrations		
% Type	10% Chrysotile (Previous Report) 9.3% Chrysotile (current assessment)	
Friability	Non-friable	
Condition	Good	

APPENDIX F

Summary of Results:
Analysis of Paint Chip Samples for Lead

Appendix F SUMMARY OF RESULTS: ANALYSIS OF PAINT CHIP SAMPLES FOR LEAD

Table F-1 Suspected Lead-Containing Paint Sample and Analytical Results Summary Building 1007—Kiln Building, Esquimalt Graving Dock, 825 Admirals Road, Victoria

Sample Number	Paint Colour/Application	Sample Location	Result (ppm)
1007-P-01	**Black on structural steel**	**Bay 6, central**	**1,500**
1007-P-02	Red on structural steel	Bay 6, front by door	<80
1007-P-03	Dark gray wood floorboards	Bay 7, mezzanine	<80
1007-P-04	Light gray wood floorboards	Bay 7, mezzanine	<80
1007-P-05	Black on wood trims	Bay 6, rear	300
1007-P-06	**Yellow on concrete walls**	**Bay 6, front**	**96,000**
1007-P-07	Off-white on metal bay doors	Bay 6, front	<81
1007-P-08	Pale yellow on metal bay doors	Bay 6, front	<120
1007-P-09	**Yellow on concrete lines**	**Bay 6, floor**	**68,000**
1007-P-10	**White on exterior brick walls**	**Bay 1, exterior**	**690**
1007-P-11	Grey on concrete floors	Bay 5, rear	<80
1007-P-12	**Red on metal corrugated walls**	**Bay 5, exterior**	**22,000**

NOTE:
Bold, highlighted text indicates confirmed LCP

APPENDIX G

Laboratory Analytical Report—Lead: Paint Chip Analysis

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 Or	551914729
CustomerID:	55JACQ30L
CustomerPO:	123221425
ProjectID:	

Attn: **Amanda Bell**
Stantec Consulting Ltd.
500 - 4730 Kingsway
Burnaby, BC V5H 0C6

Phone: (604) 412-3004
Fax:
Received: 12/02/19 12:23 PM
Collected:

Project: **EGD - 123221425**

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

Client SampleDescription	*Collected*	*Analyzed*	*Weight*	*RDL*	*Lead Concentration*
1007-P-01 *551914729-0001*	Site: Bay 6, central Desc: Black on structural steel	12/4/2019	0.2471 g	81 ppm	1500 ppm
1007-P-02 *551914729-0002*	Site: Bay 6, front by door Desc: Red on structural steel	12/4/2019	0.2541 g	80 ppm	<80 ppm
1007-P-03 *551914729-0003*	Site: Bay 7, mezzanine Desc: Dark gray wood floorboards	12/4/2019	0.2496 g	80 ppm	<80 ppm
1007-P-04 *551914729-0004*	Site: Bay 7, mezzanine Desc: Light gray wood floorboards	12/4/2019	0.2492 g	80 ppm	<80 ppm
1007-P-05 *551914729-0005*	Site: Bay 6, rear Desc: Black on wood trims	12/4/2019	0.2436 g	82 ppm	300 ppm
1007-P-06 *551914729-0006*	Site: Bay 6, front Desc: Yellow on concrete walls	12/4/2019	0.2510 g	4000 ppm	96000 ppm
1007-P-07 *551914729-0007*	Site: Bay 6, front Desc: Off-white on metal bay doors	12/4/2019	0.2484 g	81 ppm	<81 ppm
1007-P-08 *551914729-0008*	Site: Bay 6, front Desc: Pale yellow on metal bay doors Insufficient sample to reach reporting limit.	12/4/2019	0.1696 g	120 ppm	<120 ppm

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 0.008 % 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 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 Cert #2845.08; AIHA-LAP, LLC - ELLAP #196142

Initial report from 12/09/2019 09:43:22

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 Or	551914729
CustomerID:	55JACQ30L
CustomerPO:	123221425
ProjectID:	

Attn: **Amanda Bell**
Stantec Consulting Ltd.
500 - 4730 Kingsway
Burnaby, BC V5H 0C6

Phone: (604) 412-3004
Fax:
Received: 12/02/19 12:23 PM
Collected:

Project: **EGD - 123221425**

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

Client SampleDescription	*Collected*	*Analyzed*	*Weight*	*RDL*	*Lead Concentration*
1007-P-09		12/4/2019	0.2531 g	4000 ppm	68000 ppm
551914729-0009	Site: Bay 6, floor Desc: Yellow on concrete lines				
1007-P-10		12/4/2019	0.2500 g	80 ppm	690 ppm
551914729-0010	Site: Bay 1, exterior Desc: White on exterior brick walls				
1007-P-11		12/4/2019	0.2505 g	80 ppm	<80 ppm
551914729-0011	Site: Bay 5, rear Desc: Grey on concrete floors				
1007-P-12		12/4/2019	0.2339 g	860 ppm	22000 ppm
551914729-0012	Site: Bay 5, exterior Desc: Red on metal corrugated 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 0.008 % 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 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 Cert #2845.08; AIHA-LAP, LLC - ELLAP #196142

Initial report from 12/09/2019 09:43:22

APPENDIX H

Summary of Identified LCPS

Appendix H SUMMARY OF IDENTIFIED LCPS

Table H-1 Summary of Identified LCPs
Building 1007—Kiln Building, Esquimalt Graving Dock, 825 Admirals Road, Victoria

LCP Description		Photo
Paint colour	Black	
Substrate	Steel	
Location/approx. extent	Structural steel (typical interior throughout)	
Lead content	1,500 ppm	
Condition	Good	
Paint colour	Yellow	No photo available.
Substrate	Concrete	
Location/approx. extent	Interior wall between Bay 5 and Bay 6	
Lead content	96,000 ppm	
Condition	Good	
Paint colour	Yellow	
Substrate	Concrete	
Location/approx. extent	Floor lines (typical throughout)	
Lead content	68,000 ppm	
Condition	Good	

Table H-1 Summary of Identified LCPs
Building 1007—Kiln Building, Esquimalt Graving Dock,
825 Admirals Road, Victoria

LCP Description		Photo
Paint colour	White	
Substrate	Brick	
Location/approx. extent	Walls (typical exterior throughout)	
Lead content	1,100 ppm (converted from Previous Report) 690 ppm (current assessment)	
Condition	Good	
Paint colour	Red	
Substrate	Metal	
Location/approx. extent	Corrugated walls (typical front exterior)	
Lead content	22,000 ppm	
Condition	Good	

Hazardous Building Material Assessment

Esquimalt Graving Dock – DND Buildings

Prepared for:

Public Service Commission of Canada | Commission de la fonction publique du Canada

Environmental Services

Prepared by

North West Environmental Group Ltd.

210-2950 Douglas Street
Victoria, British Columbia

NWEG Project: 15609

EXECUTIVE SUMMARY

Introduction

North West Environmental Group Ltd. was retained by Public Works and Government Services Canada (PWGSC) Environmental Services to conduct a Hazardous Materials Assessment on the DND owned buildings located at the Esquimalt Graving Dock (EGD), Esquimalt BC.

The surveys were conducted at the Esquimalt Graving Dock on various dates between October 24th - December 13th 2011.

Previous Hazardous Building Materials Assessment reports and documentation were reviewed and additional non-destructive floor-by-floor, room-by-room assessments of all building areas were conducted in order to identify hazardous materials and their condition.
Identification of all sampling locations were made on detailed floor plans, and a summary of remedial recommendations made by priority.

FINDINGS AND RECOMMENDATIONS

Asbestos

Asbestos-containing materials were found in various locations within the building fabric and mechanical systems of the DND buildings.

Asbestos was identified in the following materials:

- Floor tiles (exposed and concealed)
- Sheet flooring (exposed and concealed)
- Roof Tar
- Fire stopping
- Pipe Insulation
- Cementitious Parging
- Transite Board

Table 1: Asbestos Containing Materials Summary-Current Survey

Asbestos containing materials were identified to be in the following materials/locations:			
Sample ID	**Building**	**Material**	**Recommendation**
15609-01	Bldg 4 - DND Property - EDC Office - Bathroom	Sheet Flooring – 20% Chrysotile Asbestos Content	Routine Surveillance: Institute routine surveillance of the ACM.
15609-04	Bldg 4 - DND Property - EDC Office	Floor Tile - 12"x12" White –	Routine Surveillance: Institute routine surveillance of the ACM.

Warning: in the event any additional suspect materials are encountered during renovation/repair activities, work on those materials should stop immediately and remain undisturbed until testing confirms the presence or absence of asbestos or other hazardous material

Asbestos containing materials were identified to be in the following materials/locations:			
		<1% Chrysotile Asbestos Content	
15609-08	Bldg 8 - DND Property - Kiln Building - Electrical - Kiln Bay #6	Roof-Tar – 10% Chrysotile Asbestos Content	Routine Surveillance: Institute routine surveillance of the ACM.
15609-10	Bldg 8 - DND Property - Kiln Building - Steel Shop - Kiln Bay #8	Firestopping 10% Chrysotile Asbestos Content	Proactive removal or patch and repair of ACM.
15609-12	Bldg 5 - DND Property - Jenkins Marine - Office	Sheet Flooring - Orange/Brown Mosaic 15% Chrysotile Asbestos Content	Proactive Removal or Routine Surveillance: Institute routine surveillance
15609-14	Bldg 5 - DND Property - Jenkins Marine - Office	Sheet Flooring (Bottom Layer) – 25% Chrysotile Asbestos Content	Proactive Removal or Routine Surveillance: Institute routine surveillance
15609-20	DND Property - N4 - NIS - Commissionaire Front Security Desk	Parged Pipe Insulation (T-Section above Ceiling) 50% Chrysotile Asbestos Content	Routine Surveillance: Institute routine surveillance of the ACM.
15609-24	DND Property - N4 - NIS - Entrance	Floor Tile - Greyish Green 12"x12" – <1% Chrysotile Asbestos Content	Routine Surveillance: Institute routine surveillance of the ACM.
15609-26	D N D Property - N4 - NIS - Room 112	Parged Piping (Elbow above Ceiling) – 50% Chrysotile Asbestos Content	Immediate clean up of debris. Repair ACM and institute routine surveillance of the ACM.
15609-43	DND Property - N12 - Library - Crawl Space	Mechanical Piping Insulation (Aircell on Straights) – 60% Chrysotile Asbestos Content	Immediate clean up of debris. Repair ACM and institute routine surveillance of the ACM.

Lead

Table 3: Paint Chip Sampling Results

Sample	Description	Lead (%)	Condition
15609-05	DND Property – EDC Office Exterior – Blue	0.017	Fair
15609-06	DND Property – EDC Office Exterior – Cream	3.100	Poor
15609-11	DND Property – Kiln Building – Exterior - White	0.110	Good
15609-15	DND Property – Jenkins Marine - Exterior	5.300	Fair

Paint

Analysis of paint samples indicated that lead is present in concentrations ranging from 5.3% to a low of 0.017%. Samples were found to have lead concentrations in excess

of the threshold specified in the federal *Surface Coatings Material Regulation SCMR* of 90 mg/kg for new paint acceptable for use in residential applications.

Overall, paint coatings were found to be in fair to good condition. Parts of the exterior of Building 4 - EDC office is in poor condition and should be removed. Where damaged and deteriorating, paint should be removed following procedures designed to protect the workers from heavy metal exposure and to avoid the spread of contamination. Lead content of painted materials should not increase their disposal costs however; concentrated paint chips would need to be disposed as hazardous waste. Routine removal of lead paint is not recommended; rather it should be managed in place and removed on an "as needed" basis.

Polychlorinated Biphenyls (PCB) in Electrical Equipment

Fluorescent light fixtures were observed and appeared to be of a vintage often found to contain ballasts which Environment Canada (EC) has developed a guideline called - *Identification of Lamp Ballasts Containing PCBs –Environment Canada 1991*.

Manufacturers of ballasts and capacitors use distinct catalogue and date codes to identify their product, its date of manufacture, and, for some capacitors, its dielectric fluid. Fluorescent lamp ballasts are usually mounted between the fluorescent tubes on the light fixture and are shielded with a metal protective device which reduces heat radiation. Due to the fact the covers are easily broken and the risk of electrical shock when accessing the ballast, it is standard practice to make the observation that there is a potential for PCBs to be present and have the ballasts inspected prior to disposal.

The hazardous building material materials assessment report from NWEG in 2000 mentioned that many of these ballasts have already been removed.

Inspect all light ballasts for the presence of PCB prior to disposal. PCB containing ballasts must be disposed as hazardous waste.

Mould

No mould or significant moisture issues were observed during the survey.

Hantavirus-Animal Droppings

Materials suspected of containing Hantavirus were not observed during the survey.

Workers accessing areas where rodent or other animal droppings are present must be informed of the potential risk of Hantavirus exposure and employ suitable precautions for personal protection and control of the spread of contamination.

Ozone Depleting Substances

Several pieces of equipment including refrigerators and air conditioners containing ozone depleting substances (ODS) were observed during this investigation. PWGSC maintains an active halocarbon inventory.

Crystalline Silica

Testing for crystalline silica in dust was not completed/conducted as part of this survey however it is known to be a component of concrete dust. All concrete, plaster and stucco is suspected of containing silica in crystalline and non-crystalline forms. Many of the removal techniques (grinding, cutting, chipping etc) for these materials can generate high levels of crystalline silica in the air.

Use wetting techniques and/or HEPA equipped extraction systems attached to drills and other power equipment where possible in order to decrease dust levels.

As per the clients request, non-invasive investigative techniques were used. Even with the most invasive survey techniques, however, it should be noted that the possibility remains for other concealed materials to be found during a renovation or demolition.

Warning: in the event any additional suspect materials are encountered during demolition or renovation activities, work on those materials must stop immediately and remain undisturbed until testing confirms the presence or absence of asbestos or other hazardous material. If this any materials suspected of containing asbestos or another hazardous material are disturbed during the work, all work shall stop until the area is contained, the hazard evaluated by a qualified professional and the hazardous materials, if indeed present, is safely managed by a qualified contractor.

TABLE OF CONTENTS

Warning: in the event any additional suspect materials are encountered during renovation/repair activities, work on those materials should stop immediately and remain undisturbed until testing confirms the presence or absence of asbestos or other hazardous material

LIST OF ACRONYMS

ACM ..... asbestos-containing materials
ALARA …… …… As Low As Reasonably Achievable
AMP……Asbestos Management Program
CFCs ..... chlorofluorocarbons
EC ..... Environment Canada
EGD……Esquimalt Graving Dock
EMA ..... Environmental Management Act
HCFCs ..... hydrochlorofluorocarbons
HFCs ..... hydrofluorocarbons
HPA..... Hazardous Products Act
HWR..... Hazardous Waste Regulation
NWEG……..North West Environmental Group
ODS ..... ozone-depleting substances
PCBs ..... Polychlorinated biphenyls (PCBs
PWGSC..... Public Works and Government Services Canada
SCMR..... Surface Coating Materials Regulation
SOW..... Statement of Work
WMO ..... United Nations World Meteorological Organization

1.0 INTRODUCTION

North West Environmental Group Ltd. was retained by Public Works and Government Services Canada (PWGSC) Environmental Services to conduct a Hazardous Materials Assessment Survey on the DND owned Buildings administered by PWGSC located at the Esquimalt Graving Dock, Esquimalt BC. The facility is referred to as the "subject site" or "site" throughout this document. The site location is shown on Drawing 1.

The surveys were conducted between October 24th and December 13th 2011 by Julie Scott-Moncrieff, Jason Smit and Kris White, Industrial Hygienists from North West Environmental Group.

Note: this document is detailed review of hazardous materials found within the building fabric of the site; however, it cannot be considered an absolute listing of all hazardous materials present within the structure. Occupant supplies and processes were not generally considered except where they may have contaminated the building fabric and some materials may have been concealed within enclosed areas of the building structure and not visible to the inspectors at the time of the survey. In the event that materials suspected of containing asbestos, heavy metals or other hazardous components are uncovered or impacted during operations, maintenance, renovation, construction or demolition activities, all work must stop until such time as the materials can be evaluated by a qualified person and appropriate precautions are employed to protect workers and building occupants.

2.0 SCOPE OF WORK

The scope of work for this hazardous material assessment survey was based on the *Scope of Work* (SOW) outlined by PWGSC-Environmental Services and included the following tasks:

- Previous Hazardous Building Materials Assessment reports and documentation were reviewed, incorporating the pertinent and confirmed information into the current assessment. These included:
    - Hazardous Materials Report: Esquimalt Graving Dock: Rob Christie, NWEG (March 2000)
- Non-destructive floor-by-floor, room-by-room assessment of all building areas, identifying the location, accessibility to personnel, type of material (e.g. vinyl floor tiles, wall paint, thermostat) and condition of all asbestos-containing materials (including vermiculite insulation), lead materials, mercury containing equipment, ozone depleting substances and PCBs.

  The following buildings were assessed:
    - Building 4 EDC Office Building
    - Building 3 Back Gate Guard House
    - Building 8 Kiln Building
    - Building 5 Jenkins Marine
    - Naden 66 N12 Base Library
    - Naden 64 N4 National Investigative Services (NIS)
- Sampling and subsequent analysis to ascertain the amount of hazardous materials within the buildings using a laboratory accredited by the National Voluntary Laboratory Accreditation Program (NVLAP), as per PWGSC Departmental Directive 057.
- Identification of all sampling locations on detailed floor plans, distinguishing between those that are confirmed to be hazardous and those that are not.
- A summary of remedial recommendations sorted by priority. Preparation of a separate summary of costs for repair, encapsulation or removal of the asbestos containing materials and other hazardous materials, presented as remedial options and report detailing the results, conclusions and recommendations as well as an abatement cost estimate, if necessary.

3.0 SITE DESCRIPTION

3.1 Site Location

The Esquimalt Graving Dock (EGD) is located in Esquimalt, BC, near the city of Victoria, on the southern tip of Vancouver Island. The site is located as shown in Appendix A. EGD is owned by PWGSC and private shipyard companies lease space at the EGD for ship maintenance and buildings operations. This survey assessed buildings on site owned by DND.

See Appendix A for map of Site Location and Plan.

4.0 REGULATORY FRAMEWORK, GUIDELINES AND CODES

4.1 Federal Occupational Health and Safety

In Federal jurisdictions, asbestos-containing materials (ACM) are regulated under the *Canada Labour Code, Part II.* Specifically, *Part X, Hazardous Substances,* provides the direction for the control of exposure to potentially toxic substances in the workplace. Under this regulation, employers are required to:

- Maintain a record of all hazardous materials;
- Undertake a hazard investigation by competent persons;
- Ensure materials are properly stored and handled;
- Post warning signs;
- Inform and educate employees regarding hazards; and
- Control exposure through substitution, engineering or protective equipment.

4.2 BC Occupational Health and Safety Regulation

Most of the employees working in the PWGSC buildings are Federal employees and are subject to the federal OHSA. However the majority of contractors and some site tenants Workplace health and safety is regulated in British Columbia by WorkSafeBC under the *Workers' Compensation Act* (effective April 15, 1998), as amended by *Workers' Compensation (Occupational Health and Safety) Amendment Act* (effective October 1, 1999). The Act defines the general duties and obligations of the employer, employees and others at the work site.

Under this regulation, employers are required to:

- Maintain a record of all hazardous materials;
- Undertake a hazard investigation by competent persons;
- Ensure materials are properly stored and handled;
- Post warning signs;
- Inform and educate employees regarding hazards; and
- Control exposure through substitution, engineering or protective equipment

WorkSafeBC Regulations apply to the handling of materials containing designated substances and the prevention of possible worker exposures. Permissible exposure limits to these designated substances, which include asbestos, lead, mercury and arsenic, are established by the American Conference of Governmental Industrial Hygienists (ACGIH) and adopted by WorkSafeBC.

4.3 Environmental Management Act

The *Environmental Management Act* (EMA), brought into force in July 2004, is the principle environmental statute in British Columbia. The EMA prohibits the introduction of waste into the environment in such a manner or quantity as to cause pollution, except in accordance with a regulation, permit, approval or code of practice issued under the Act. The Hazardous Waste Regulation (HWR) addresses the proper handling, transport and disposal of hazardous wastes, under provisions of the EMA. While the Provincial Regulations do not apply directly to the sites operated by the Federal Government, they do apply when the materials are removed from the site for disposal.

4.4 BC Occupational Health and Safety Regulation

WorkSafeBC Regulations apply to the handling of materials containing designated substances and the prevention of possible worker exposures. These designated substances, which include lead, mercury and arsenic, are established by the American Conference of Governmental Industrial Hygienists (ACGIH) and adopted by WorkSafeBC.

Where worker exposure to a designated substance may exceed 50% of the threshold limit value for a substance, WorkSafeBC requires that the employer establish an exposure control plan. All routes of entry must be considered when establishing the extent of worker exposure. Exposure limits are summarized in Table 4.4.1.

Table 4.4.1: ACGIH / WorkSafeBC Exposure Limits

Substance [CAS No.]	*Time Weighted Average (TWA)*
Asbestos - All forms [1332-21-4]	0.1 f/cc (F)
Lead - elemental and inorganic compounds, as Pb [7439-92-1]	0.05 mg/m3
Silica, Crystalline - alpha quartz [14808-60-7; 1317-95-9] and Cristobalite, Respirable [14464-46-1] Revised 2006	0.025 mg/m3

4.5 Hazardous Products Act, Surface Coating Materials Regulation

The *Hazardous Products Act (HPA), Surface Coating Materials Regulation (SOR/2005-109) (SCMR)* permits the advertising, sale and labeling of surface coatings (including paint) that meet the following criteria set out below. Quantities of lead and mercury are specifically limited. Other heavy metals are not addressed in this regulation.

There has been confusion in the past regarding the limits for lead and mercury in paint and how that relates to worker safety and disposal. An explanation of the SCMR limits for paint and mercury are included in this report to help alleviate this confusion. Although a given paint sample may have concentrations of lead and mercury lower than the limits specified within the SCMR, worker exposure may still occur if sufficient quantities of lead and/or mercury are inhaled, ingested or absorbed through the skin. The risk to workers posed by heavy metal containing coatings is proportional to the

work undertaken. Heavy metal laden coatings that are not disturbed pose little risk to non-pre-school aged building occupants.

Lead

Paints containing lead may be advertised, sold or imported into Canada when under standardized testing conducted on a dried sample of the coating indicates that lead concentrations do not exceed 600 mg/kg.

In 2005 the *Federal Surface Coating Materials Regulation* was amended to reduce this threshold from 5,000 mg/kg to 600 mg/kg. As paints under this concentration of lead are acceptable for use in residential settings today, such coatings do not pose a significant hazardous material issue unless rendered airborne within a worker's breathing zone by fine dust generating processes.

Paints that exceed this concentration threshold are prohibited to be advertised, sold or imported into Canada unless they meet certain conditions of use and labeling. Permitted uses include:

- 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;
- 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;
- as a touch-up coating for metal surfaces;
- on traffic signs;
- for graphic art on billboards or similar displays;
- for identification marks in industrial buildings; or
- as material for the purposes of arts, crafts or hobbies, other than material for use by children.

Polychlorinated Biphenyls

Polychlorinated biphenyls (PCBs) are regulated under both Federal (*Canadian Environmental Protection Act*) and Provincial (*BC Hazardous Waste Regulation*) legislation and must be treated as PCB waste and be stored and disposed of accordingly.

Each fluorescent light fixture removed during facility renovation or demolition should have the ballast checked to determine if it contains PCBs. Ballasts containing PCBs must be removed, sorted and transported to a licensed facility. Although rare, paints have been known to contain PCBs.

Ozone-depleting Substances (CFCs/ODS)

Chlorofluorocarbons (CFCs) are ozone-depleting substances (ODS) and a type of halocarbon. ODS are regulated by the *Canadian Environmental Protection Act* under the *Ozone-Depleting Substances Regulations 1998 SOR/99-7* and the *Federal*

Halocarbon Regulations (FHR) SOR/99-225. Compounds that contain only chlorine, fluorine and carbon are called CFCs. These materials are used in refrigeration systems and in fire suppression systems. The other main refrigerants are hydrochlorofluorocarbons (HCFCs), hydrofluorocarbons (HFCs) and blends of fluorocarbons (designated by "R").

In BC these substances are regulated under the BC Ozone Depleting Substances and Other Halocarbons Regulation.

While the regulations allow the continued use of halocarbon refrigerants, they strictly prohibit any person from releasing any halocarbons into the environment.

In the case of demolition, ODS will require proper recovery and disposal. The BC Ozone-Depleting Substances Regulations would also apply to any CFC/ODS abatement procedures. These regulations require that all ODS be collected, stored and recycled, or collected and disposed of accordingly.

Crystalline Silica

Crystalline silica is a substance which is considered hazardous by inhalation and can result in serious and sometimes fatal lung disease. The ACGIH and WorkSafeBC, under the Occupational Health and Safety Regulation and the Canada Labour Code specify an exposure limit of 0.025 mg/m^3.

Paint

Paints often contain heavy metals as pigments and/or preservatives. Common heavy metal additives to paints are lead, mercury, and arsenic. Under specific circumstances, persons may be exposed to these metals by ingestion, skin absorption and/or inhalation.

Other than during the application process, the primary mechanism of exposure for workers would be the inhalation of dusts through activities such as sanding, scraping, drilling, crushing, heating, burning or other processes likely to damage the coatings themselves. Paints containing heavy metals pose little risk to workers when in good condition and when undisturbed.

Although limits are currently imposed in the quantities of lead permitted in paints intended for specific uses, lead content below these limits may still pose a health hazard if rendered airborne and inhaled, ingested or absorbed through the skin. The same applies to mercury. The Hazardous Products Act, Surface Coating Materials Regulation (SOR/2005-109) (SCMR) permits the advertising, sale and labeling of surface coatings (including paint) that meet the following criteria set out below. Quantities of lead and mercury are specifically limited. Other heavy metals are not addressed in this regulation.

In 1976, the amount of lead that could be added to interior paints was limited by law, but exterior paints could still contain higher amounts of lead, provided they carried a warning label. Under the Surface Coating Materials Regulations, which came into effect in 2005, the lead limit was further reduced (from Health Canada). The 600 mg/kg

maximum total lead standard is the same as that proposed for paints and other liquid coating materials used for furniture, household products, children's products, and exterior and interior surfaces of any building frequented by children, under the recent amendment to the Hazardous Products Act Liquid Coating Materials Regulations. It is also the same standard prescribed by the U.S. Consumer Product Safety Commission Regulation 16 CFR Part 1303, for paint and other liquid coatings for residential use, toys and furniture (97). This limit was determined by a risk assessment which calculated that 600 mg/kg of lead in paint was the threshold level, at or below which there would be no significant lead exposure if a child consumed a one square inch paint chip each day.

When lead is present in paint, there is a potential for airborne exposure of lead to workers. Airborne exposure can occur if the material is disturbed (especially if the lead containing materials are hand sanded); hand demolished and/or any other disturbances are made to the coating. An exposure control plan is necessary if workers are, or may be, exposed to lead in excess of 50 % of the exposure limit established by the Workers' Compensation Board (WorkSafeBC) for an 8 hours total weighted average exposure, or if exposure through any route of entry could cause elevated levels of lead in the blood. Lead precautions during demolition or renovation may be required, including the use of personal protective equipment for workers and/or dust suppression methods.

5.0 METHODOLOGY

The methodology of the survey is summarized in the following sections. Prior to all site work, a *Site Specific Health and Safety Plan* was developed and forwarded to PWGSC Environmental Services.

Asbestos

The asbestos survey methodology and sampling procedure are outlined in the following sections.

Survey Methodology

The survey was designed to determine the type and extent of asbestos containing material (ACM) presence within the subject site. The survey was non-destructive and therefore did not include areas that were inaccessible at the time of the survey. Where practicable, sample volumes were minimized to avoid unnecessary damage to building systems. Specific building material components were examined within the building and include, where applicable:

- Structural – all visible structural components including walls, roofs and supporting members
- Mechanical systems - insulation, domestic hot and cold water, and caulks.
- Architectural – systems including: texture coats, sheet flooring, vinyl floor tile, ceiling tile, wall board, drywall joint compound, asbestos sheet products.

Where materials were observed that were suspected of containing asbestos, representative samples were collected. Fifty one (51) samples of materials suspected of containing asbestos were collected and submitted with a chain of custody to the contract laboratory.

A complete listing of all materials suspected of containing asbestos that were sampled, including the results of analysis is found in Section 6 of this report.

Sampling Procedures

Bulk Samples

Sampling procedures for various building materials vary somewhat depending on the exact conditions at each site. In all cases standardized protocols are used for collecting samples for asbestos analysis. All accessible suspect materials that were visually unique were sampled. Visually similar materials were only sampled once unless known to be heterogeneous such as drywall joint compound.

Sampled materials were cut down to the base substrate to ensure that a representative sample was collected.

Paint

Painted surfaces were scraped down to the base substrate to ensure that all layers of paint were included. Paint samples were tested using the following analytical method:

- Lead: EMSL (SW 846 3050B*/7000B) Lead in Paint Chips by Flame Atomic Absorption Spectrophotometer

A total of five paint chips were submitted to EMSL Analytical for analysis. The sample locations are shown on the floor plans

Polychlorinated Biphenyls (PCB)

The Site was surveyed for the presence of PCBs in electrical equipment. The primary source of PCBs was identified in fluorescent light ballasts which were evaluated according to the guideline developed by Environment Canada (EC) - *Identification of Lamp Ballasts Containing PCBs –Environment Canada 1991*.

Manufacturers of ballasts and capacitors use distinct catalogue and date codes to identify their product, its date of manufacture, and, for some capacitors, its dielectric fluid. Fluorescent lamp ballasts are usually mounted between the fluorescent tubes on the light fixture and are shielded with a metal protective device which reduces heat radiation. In order to determine if fluorescent light ballasts contain PCB's the metal protective cover is removed while the power is off to the fixture. With the ballast exposed the date code is visible and can be referenced in the EC guideline.

For ballasts not stamped "no PCB", in most cases, fluorescent light ballasts need to be removed from the fixture before the date of manufacture can be determined. The date of manufacture is critical in establishing whether PCB may be present in the ballast capacitor.

Ozone Depleting Substances (ODS) and Other Halocarbons

The subject building was inspected for the presence of devices that are known or suspected of containing to contain ODS or other halocarbons. Devices suspected of containing these materials were documented so that any hazardous materials can be removed prior to demolition or disposal of the equipment. These devices typically include refrigeration and air conditioning equipment.

Crystalline Silica

Testing for crystalline silica in dust was not completed/conducted as part of this survey however it is known to be a component of concrete dust. All concrete, plaster and stucco is suspected of containing silica in crystalline and non-crystalline forms. Many of the removal techniques (grinding, cutting, chipping etc) for these materials can generate high levels of crystalline silica in the air.

Mould

Within the BC Occupational Health and Safety Regulations, there are no established permissible exposure levels for mould spores in air. This means that there are no published concentrations above which worker exposure is deemed to be hazardous

and under which workers would not need respiratory protection. WorkSafeBC does, however, provide guidance on protocols for protecting workers from the hazards of airborne mould and bacteria within the section(s) of the Regulation guidelines addressing Indoor Air Quality.

Various other guidelines are provided for addressing mould in Canada including:

- The Institute of Inspection, Cleaning and Restoration and Certification (IICRC) standard S500 governing both water damage restoration and entitled: Standard for Professional Water Damage Restoration – S500. This document is approved by the American National Standards Institute (ANSI)
- Health Canada: Fungal contamination in public buildings: A guide to recognition and management, 1995
- Health Canada. Fungal Contamination in Public Buildings: Health Effects and Investigation Methods, 2004

These guidelines also state that any non-porous (metal, glass and hard plastics) and semi-porous (wood and concrete) materials that are structurally sound and visibly mouldy can be cleaned and re-used. However, porous materials such as ceiling tiles, wallpaper, insulation, drywall, and sometimes carpets with more than a small area of contamination should be removed and discarded.

6.0 FINDINGS AND RISK ASSESSMENT

The findings of the survey are discussed in the following sections. Photographs of sample locations are provided in Section 7.0. The asbestos risk assessment and indicative cost estimates are provided in this section. The analytical reports are provided in Appendix A.

6.1 Asbestos in Bulk Building Material Samples

A total of fifty one (51) samples of suspected asbestos containing materials were collected and submitted for analysis to the contract laboratory. The analytical results are provided both as an Excel Spreadsheet provided to the PWGSC-Environmental Services and attached as a pdf report in Appendix A.

Asbestos-containing materials were found in various locations within the building fabric and mechanical systems of the DND buildings.

Asbestos was identified in the following materials:

- Floor tiles (exposed and concealed)
- Sheet flooring (exposed and concealed)
- Roof Tar
- Fire stopping
- Pipe Insulation
- Cementitious Parging
- Transite Board

The roof structures, in most buildings, were not tested for the presence of asbestos so as not to disrupt the building envelope. Sampling will need to be undertaken prior to the commencement of any work and may require the presence of a qualified roofer to make good any damage to the roof membrane.

Recommendations are based on Public Works and Government Services Canada Departmental Policy 057 – Asbestos Management (DP 057).

Asbestos Containing Materials must be managed under the PWGSC Asbestos Management Plan (AMP). The AMP should conform to PWGSC Departmental Policy 057. The purpose of the AMP is to assist the organization in managing ACM in a systematic fashion to ensure identified ACM are managed in a safe manner which complies with the Canada Labour Code and WorkSafeBC guidelines.

ACM in good condition may be managed in place in accordance with the implementation of the Asbestos Management Plan (AMP). Institute routine surveillance of the ACM. Trained workers or contractors must use appropriate asbestos precautions (Type 1, Type 2 or Type 3) during disturbance of the remaining ACM.

Inspect all identified asbestos containing materials annually to identify any damage and ensure proper labeling is present.

Any damaged ACM found during future inspections, as well as ACM that could be impacted by any demolition or renovation activity, should be removed following procedures outlined in the AMP.

Throughout any abatement activities, appropriate air monitoring and inspection should be conducted by qualified personnel to ensure all contamination is contained and ACM are disposed of appropriately. It is recommended that a proper scope of work and asbestos removal specifications be written to ensure the complete and proper removal of all ACM.

Table 1: Asbestos Containing Materials Summary-Current Survey

Asbestos containing materials were identified to be in the following materials/locations:

Sample ID	Building	Material	Access-ibility	Friability (F or N)	Condition (G/F/P)	Action Code
15609-01	Bldg 4 - DND Property - EDC Office - Bathroom	Sheet Flooring – 20% Chrysotile Asbestos Content	A	N	G	ACTION 7
15609-04	Bldg 4 - DND Property - EDC Office	Floor Tile - 12"x12" White – <1% Chrysotile Asbestos Content	A	N	G	ACTION 7
15609-08	Bldg 8 - DND Property - Kiln Building - Electrical - Kiln Bay #6	Roof-Tar – 10% Chrysotile Asbestos Content	B	N	G	ACTION 7
15609-10	Bldg 8 - DND Property - Kiln Building - Steel Shop - Kiln Bay #8	Firestopping 10% Chrysotile Asbestos Content	A	F	F	ACTION 5/6
15609-12	Bldg 5 - DND Property - Jenkins Marine - Office	Sheet Flooring - Orange/Brown Mosaic 15% Chrysotile Asbestos Content	A	F	G	ACTION 5/7
15609-14	Bldg 5 - DND Property - Jenkins Marine - Office	Sheet Flooring (Bottom Layer) – 25% Chrysotile Asbestos Content	A	F	G	ACTION 5/7
15609-20	DND Property - N4 - NIS - Commissionaire Front Security Desk	Parged Pipe Insulation (T-Section above Ceiling) 50% Chrysotile Asbestos Content	B	F	G	ACTION 7
15609-24	DND Property - N4 - NIS - Entrance	Floor Tile - Greyish Green 12"x12" – <1% Chrysotile Asbestos Content	A	N	F	ACTION 5/7
15609-26	D N D Property - N4 - NIS - Room 112	Parged Piping (Elbow above Ceiling) – 50% Chrysotile Asbestos Content	B	F	P-Debris G-Main	ACTION 1 ACTION 6/7

Asbestos containing materials were identified to be in the following materials/locations:						
Previously identified	DND Property- N$ -NIS Boiler Room	Mechanical Pipe and Boiler Insulation	B	F	G	ACTION 7
15609-43	DND Property - N12 - Library - Crawl Space	Mechanical Piping Insulation (Aircell on Straights) – 60% Chrysotile Asbestos Content	B	F	P-Debris G-Main	ACTION 1 ACTION 7

Evaluation of asbestos containing materials is based on the condition of the material and its accessibility. Following are the guidelines used to evaluate ACMs and the action, if any, required to safely manage them.

Figure 1: Action Matrix from DP 057

	CONDITION			
ACCESS	GOOD	FAIR	POOR	DEBRIS
(A)	ACTION 5/7	ACTION 5/6	ACTION 3	ACTION 1
(B)	ACTION 7	ACTION 6/5	ACTION 3	ACTION 1
(C) exposed	ACTION 7	ACTION 6	ACTION 4	ACTION 2
(C) concealed	ACTION 7	ACTION 7	ACTION 4	ACTION 2
(D)	ACTION 7	ACTION 7	ACTION 7	ACTION 7

The following is excerpted from Public Works and Government Services Canada Departmental Policy 057 – Asbestos Management (DP 057).

Condition

Spray Applied Fireproofing, Insulation and Texture Finishes

In evaluating the condition of ACM spray applied as fireproofing, thermal insulation or texture, decorative or acoustic finishes, the following criteria apply;

GOOD	Surface of material shows no significant signs of damage, deterioration or delamination. Up to one percent visible damage to surface is allowed within range of GOOD. Evaluation of sprayed fireproofing requires the surveyor to be familiar with the irregular surface texture typical of sprayed asbestos products. GOOD condition includes unencapsulated or unpainted fireproofing or texture finishes, where no delamination or damage is observed, and encapsulated fireproofing or texture finishes where the encapsulation has been applied after the damage or fallout occurred.
POOR	Sprayed materials show signs of damage, delamination or deterioration. More than one percent damage to surface of ACM spray.

Mechanical Insulation

In evaluating the condition of mechanical insulation (on boilers, breeching, ductwork, piping, tanks, equipment etc.) the following criteria are used:

GOOD	Insulation is completely covered in jacketing and exhibits no evidence of damage or deterioration. No insulation is exposed. Includes conditions where the jacketing has minor surface damage (i.e., scuffs or stains), but the jacketing is not penetrated.
FAIR	Minor penetration damage to jacketed insulation (cuts, tears, nicks, deterioration or delamination) or undamaged insulation that has never been jacketed. Insulation is

	exposed but not showing surface disintegration. The extent of missing insulation ranges should be minor to none.
POOR	Original insulation jacket is missing, damaged, deteriorated or delaminated. Insulation is exposed and significant areas have been dislodged. Damage cannot be readily repaired.

Non-Friable and Potentially Friable Materials

Non-friable materials generally have little potential to release airborne fibres, even when damaged by mechanical breakage. However, some non-friable materials, i.e., exterior asbestos Concrete products, may have deteriorated so that the binder no longer effectively contains the asbestos fibres. In such cases of significantly deteriorated non-friable material, the material will be treated as a friable product.

Accessibility

The accessibility of building materials known or suspected of being ACM is rated according to the following criteria:

Access (A)	Areas of the building within reach (from floor level) of all building users. Includes areas such as gymnasiums, workshops, and storage areas where activities of the building users may results in disturbance of ACM not normally within reach from floor level.
Access (B)	Frequently entered maintenance areas within reach of maintenance staff, without need for a ladder. Includes: frequently entered pipe chases, tunnels and service areas or areas within reach from a fixed ladder or catwalk, i.e., tops of equipment, mezzanines.
Access (C) Exposed	Areas of the building above 8'0" where use of a ladder is required to reach the ACM. Only refers to ACM materials that are exposed to view, from the floor or ladder, without removing or opening other building components such as ceiling tiles, or service access doors or hatches. Does not include infrequently accessed service areas of the building.
Access (C) Concealed	Areas of the building which require removal of a building component including lay-in ceilings and access panels into solid ceiling systems. Includes rarely entered crawl spaces, attic spaces etc. Observations are limited to the extent visible from the access points.
Access (D)	Areas of the building behind inaccessible solid ceiling systems, walls, or mechanical equipment, etc., where demolition or the ceiling, wall or equipment etc., is required to reach the ACM. Evaluation of condition and extent of ACM is limited or impossible, depending on the surveyor's ability to visually examine the materials in Access D.

Warning: in the event any additional suspect materials are encountered during renovation/repair activities, work on those materials should stop immediately and remain undisturbed until testing confirms the presence or absence of asbestos or other hazardous material

Figure 2: Action Key

Action 1	**Immediate Clean Up of Debris That is Likely to be Disturbed** Restrict access that is likely to cause a disturbance of the ACM DEBRIS and clean up ACM DEBRIS immediately. Utilize correct asbestos procedures. This action is required for compliance with regulatory requirements.
Action 2	**Entry Into Areas with ACM Debris** At locations where ACM DEBRIS can be isolated in lieu of removal or clean up, use appropriate means to limit entry to the area. Restrict access to the area to persons utilizing Type 2 asbestos-work precautions. The precautions will be required until the ACM DEBRIS has been cleaned up, and the source of the DEBRIS has been stabilized or removed.
Action 3	**ACM Removal Required for Compliance** Remove ACM for compliance with regulatory requirements. Utilize asbestos procedures appropriate to the scope of the removal work.
Action 4	**Access into Areas Where ACM is Present and Likely to be Disturbed by Access** Use asbestos precautions when entry or access into an area likely to disturb the ACM. ACTION 4 must be used until the ACM is removed (Use ACTION 1 or 2 if DEBRIS is present).
Action 5	**Proactive ACM Removal** Remove ACM in lieu of repair, or at locations where the presence of asbestos in GOOD condition is not desirable.
Action 6	**ACM Repair** Repair ACM found in FAIR condition, and not likely to be damaged again or disturbed by normal use of the area or room. Upon completion of the repair work, treat ACM as material in GOOD condition and implement ACTION 7. If ACM is likely to be damaged or disturbed during normal use of the area or room, implement ACTION 5.
Action 7	**Routine Surveillance** Institute routine surveillance of the ACM. Trained workers or contractors must use appropriate asbestos precaution during disturbance of the remaining ACM.

Note: any additional suspect materials encountered during renovation or demolitions activities must be left undisturbed until testing determines the presence or absence of asbestos or other hazardous material. In the event they are damaged or otherwise impacted, all work shall stop until appropriate control can be put in place to protect workers and the public.

6.2 Lead

Lead Paint

Analysis of paint samples indicated that lead is present in concentrations ranging from 5.3% to a low of 0.017%. All samples were confirmed to exceed the concentration of lead permissible in new paint (0.009% - SCMR) threshold to be sold without notifying the consumer of its lead content.

Table 3: Paint Chip Sampling Results

Sample	Description	Lead (%)	Condition
15609-05	DND Property – EDC Office Exterior – Blue	0.017	Fair
15609-06	DND Property – EDC Office Exterior – Cream	3.100	Poor
15609-11	DND Property – Kiln Building – Exterior - White	0.110	Good
15609-15	DND Property – Jenkins Marine - Exterior	5.300	Fair

Overall, paint coatings were found to be in fair to good condition. Parts of the exterior of Building 4 - EDC office is in poor condition and should be removed. Where damaged and deteriorating, paint should be removed following procedures designed to protect the workers from heavy metal exposure and to avoid the spread of contamination. Lead content of painted materials should not increase their disposal costs however; concentrated paint chips would need to be disposed as hazardous waste. Routine removal of lead paint is not recommended, rather it should be managed in place and removed on an "as needed" basis.

Elemental Lead

Lead within the copper water pipes/fittings was not tested for lead content however lead content in solder, especially from buildings of this vintage, is known to reach levels up to 98% lead.

If lead materials are found they are typically recognized as having significant salvage value, disposal therefore should not be a major concern. Workers should exercise caution if heat is to be used to melt any lead found as means of facilitating its extraction. Molten lead can produce significant quantities of inhalable lead fume which can pose a severe health hazard. The BC Occupational Health and Safety Regulation requires that worker exposure to airborne lead be kept below 0.05 mg/m^3.

Polychlorinated Biphenyls (PCB) in Electrical Equipment

Fluorescent light fixtures were observed and appeared to be of a vintage often found to contain ballasts which Environment Canada (EC) has developed a guideline called - *Identification of Lamp Ballasts Containing PCBs –Environment Canada 1991*.

Manufacturers of ballasts and capacitors use distinct catalogue and date codes to identify their product, its date of manufacture, and, for some capacitors, its dielectric fluid. Fluorescent lamp ballasts are usually mounted between the fluorescent tubes on the light fixture and are shielded with a metal protective device which reduces heat radiation. Due to the fact the covers are easily broken and the risk of electrical shock when accessing the ballast, it is standard practice to make the observation that there is a potential for PCBs to be present and have the ballasts inspected prior to disposal.

The Hazardous materials report from NWEG in 2000 mentioned that many of these ballasts have already been removed.

Inspect all light ballasts for the presence of PCB prior to disposal. PCB containing ballasts must be disposed of as hazardous waste.

6.3 Mould

No mould or significant moisture issues were observed during the survey.

6.4 Hantavirus-Animal Droppings

Materials suspected of containing Hantavirus were not observed during the survey.

Workers accessing areas where rodent or other animal droppings are present must be informed of the potential risk of Hantavirus exposure and employ suitable precautions for personal protection and control of the spread of contamination.

6.5 Ozone Depleting Substances

Several pieces of equipment containing ozone depleting substances (ODS) were observed during this investigation. PWGSC maintains an active halocarbon inventory.

6.6 Crystalline Silica

Testing for crystalline silica in dust was not completed/conducted as part of this survey however it is known to be a component of concrete dust. All concrete, plaster and stucco is suspected of containing silica in crystalline and non-crystalline forms. Many of the removal techniques (grinding, cutting, chipping etc) for these materials can generate high levels of crystalline silica in the air.

Use wetting techniques and/or HEPA equipped extraction systems attached to drills and other power equipment where possible in order to decrease dust levels.

As per the clients request, non-invasive investigative techniques were used. Even with the most invasive survey techniques, however, it should be noted that the possibility remains for other concealed materials to be found during a renovation or demolition.

Warning: in the event any additional suspect materials are encountered during demolition or renovation activities, work on those materials must stop immediately and remain undisturbed until testing confirms the presence or absence of asbestos or other hazardous material. If this any materials suspected of containing asbestos or another hazardous material are disturbed during the work, all work shall stop until the area is contained, the hazard evaluated by a qualified professional and the hazardous materials, if indeed present, is safely managed by a qualified contractor.

7.0 ABATEMENT COST ESTIMATE

1) Clean up debris above Building N4 - NIS - Room 112 using Type 2 (moderate risk procedures). Note: More debris may be present in other locations-recommend inspection above t-bar ceiling by trained personnel.

   Cost for the removal of this debris (approximately 2 m^2):
   (including labor, materials, air sampling and inspection) is estimated at
   $ 2,000.00

2) Clean up debris and ACM pipe repair in crawl space N12 - Library using Type 2 (moderate risk procedures).

   Cost for the removal of this debris (approximately 2 m^2) plus HEPA vacuuming and repair:
   (including labor, materials, air sampling and inspection) is estimated at
   $ 3,000.00

3) Patching and repair to ACM firestopping in Kiln Bay #8 using Type 2 (moderate risk procedures).

   Cost for the repair of this ACM (approximately 2 m^2) plus HEPA vacuuming and repair:
   (including labor, materials, air sampling and inspection) is estimated at
   $ 3,000.00

4) Sheet flooring as identified in the office and reception areas of building 7 (Jenkins Marine) may be managed in place or be proactively removed using Type 3 (high risk procedures).

   Cost for the removal of approximately 15 m^2 of flooring:
   (including labor, materials, air sampling and inspection) is estimated at
   $ 20,000.00

8.0 BULK SAMPLES

The following photoplate is a summary of the room by room assessment including samples collected.

Building: 4 DND Property – EDC Office

Area: EDC Office

Details:

- Construction Date: 1970
- Ceiling: Drywall and wood panels
- Walls: Drywall and wood panels
- Flooring: Floor tiles and sheet flooring on wood substrate
- Roof: Asphalt shingles

Area: Office and Bathroom

Hazardous Materials Observed:

- Lead: Lead based paint on walls and trim
- Mercury containing equipment:
- Fluorescent light fixtures present
- Mercury containing Thermostat present
- Ozone depleting substances: Fridge present
- PCB's: [potential] Fluorescent light ballasts present
- Mould: None observed

Samples:

15609-01: Sheet Flooring (Lt. Grey Mosaic)
Bathroom
20% Chrysotile Asbestos Content

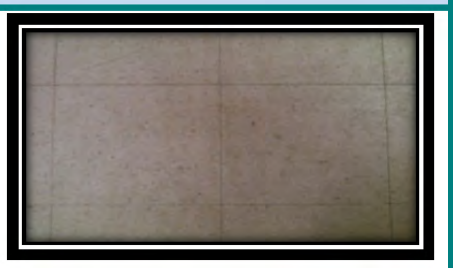
15609-02: Insulation (Window Frame)
Exterior
No Asbestos Detected

15609-03: Roofing Material (3 Layers)
Roof
No Asbestos Detected

15609-04 : Floor Tile (White 12"x12")
Office Area
<1% Chrysotile Asbestos Content

No access to attic space.

Building: 4 DND Property – EDC Office



Area: Exterior and Office

Samples:

15609-05: Blue Paint
Exterior Door & Window Trim
Lead Concentration 0.017 % w.t.

15609-06: Cream Paint
Exterior Wall Paint
Lead Concentration 5.3% w.t.

Asbestos-containing wall panel was identified by an asbestos warning sign and was not sampled.

Warning: in the event any additional suspect materials are encountered during renovation/repair activities, work on those materials should stop immediately and remain undisturbed until testing confirms the presence or absence of asbestos or other hazardous material

Building: 8 DND Property – Kiln Building

Area: Kiln Building

Details:

- Construction Date: Unknown
- Ceiling: Wood
- Walls: Brick, Mortar & Concrete
- Flooring: Concrete
- Roof: Metal Sheeting

Area: Kiln Bays and Shops

Hazardous Materials Observed:

- Lead: Lead based paint on walls and trim
- Mercury containing equipment: Fluorescent light fixtures present
- Ozone depleting substances: Fridge(s) present
- PCB's: [potential] Fluorescent ballasts present
- Mould: None Observed

Samples:

15609-07: Mastic (Exhaust Duct Joint)
Pipe Shop - Kiln Bay #1
No Asbestos Detected

15609-08: Tar – Roof
Electrical – Kiln Bay #6
10% Chrysotile Asbestos Content

15609-09: Mortar (Brick Wall)
Steel Shop – Kiln Bay #7
No Asbestos Detected

15609-10: Firestopping
Steel Shop – Kiln Bay #8
10% Chrysotile Asbestos Content

15609-11: White Paint
Exterior Walls
Lead Concentration 0.11% w.t.

Warning: in the event any additional suspect materials are encountered during renovation/repair activities, work on those materials should stop immediately and remain undisturbed until testing confirms the presence or absence of asbestos or other hazardous material

Building: 5 DND Property – Jenkins Marine

Area: Office Trailer and Warehouse

Details:

Office Trailer:

- Construction Date: Unknown
- Ceiling: Wood Fiber Ceiling Tiles
- Walls: Wall Panels
- Flooring: Sheet Flooring
- Roof: Roof Membrane

Warehouse:

- Construction Date: 1940
- Ceiling: Wood Structure
- Walls: Wood Paneling
- Flooring: Concrete
- Roof: Not Accessible

Area: Office Trailer and Warehouse

Hazardous Materials Observed:

- Lead: Lead based paint on walls and trim
- Mercury containing equipment: Fluorescent light fixtures present
- Ozone depleting substances: Fridge(s) present
- PCB's: [potential] Fluorescent light ballasts present
- Mould: None Observed

Samples:

15609-12: Sheet Flooring (Orange/Brown Mosaic)
Office Area
15% Chrysotile Asbestos Content

15609-13: Sheet Flooring (Beige – Top Layer)
Office Area
No Asbestos Detected

15609-14: Sheet Flooring (Bottom Layer)
Office Area
25% Chrysotile Asbestos Content

Warning: in the event any additional suspect materials are encountered during renovation/repair activities, work on those materials should stop immediately and remain undisturbed until testing confirms the presence or absence of asbestos or other hazardous material

Building: 5 DND Property – Jenkins Marine

15609-15: Blue Paint
Exterior of Jenkins Marine Warehouse
Lead Concentration 5.3% w.t.

Building: 3 DND Property – PWGSC Guard House (Back Gate)

Area: Guard House

Details:

- Construction Date: 1940
- Ceiling: Drywall
- Walls: Drywall & Wood Panel
- Flooring: Floor Tiles on Concrete Substrate
- Roof: Roofing Materials

Area: Guard House

Hazardous Materials Observed:

- Lead: [potential] Lead based paint on walls and trim
- Mercury containing equipment: Fluorescent light fixtures present
- Ozone depleting substances: Fridge present
- PCB's: [potential] Fluorescent light ballasts present
- Mould: None Observed

Samples:

15609-16: Drywall Joint Compound
Interior Office Wall
No Asbestos Detected

15609-17: Floor Tile – White 12"x12"
Office Flooring
No Asbestos Detected

15609-18: Floor Mastic
Mastic beneath Floor Tile on Concrete Substrate
No Asbestos Detected

Window and door trim paint (blue) and exterior wall paint (cream) visually similar as Building 4 DND Property – EDC Office.

Building: N4 DND Property – National Investigation Services

Area: NIS Building

Details:

Construction Date: 1943
Ceiling: Wood Planks
Walls: Brick, Mortar & Drywall
Flooring: Floor Tiles, Sheet Flooring on Concrete Substrate
Roof: Roof Membrane (Not Accessible)

Area: Office Areas

Hazardous Materials Observed:

- Lead: [potential] Lead based paint on walls and equipment
- Mercury containing equipment: Fluorescent light fixtures present
- Ozone depleting substances: Fridge(s) present
- PCB's: [potential] Fluorescent light ballasts present
- Mould: None Observed

Samples:

15609-19: Acoustic Ceiling Tile
Random Small Fissure & Small Pinhole (2'x4')
Commissionaire Front Security Desk
No Asbestos Detected

15609-20: Parged Pipe Insulation
T-Section Above Ceiling Tiles
Commissionaire Front Security Desk
50% Chrysotile Asbestos Content

15609-21: Drywall Joint Compound
Commissionaire Front Security Security Desk
No Asbestos Detected

15609-22: Acoustic Ceiling Tile
Long Horizontal Fissure & Random Pinhole (2'x4')
Room 101
No Asbestos Detected

Warning: in the event any additional suspect materials are encountered during renovation/repair activities, work on those materials should stop immediately and remain undisturbed until testing confirms the presence or absence of asbestos or other hazardous material

Building: N4 DND Property – National Investigation Services

Area: Main Floor - Office Areas

Samples:

15609-23: Drywall Joint Compound
Room 102
No Asbestos Detected

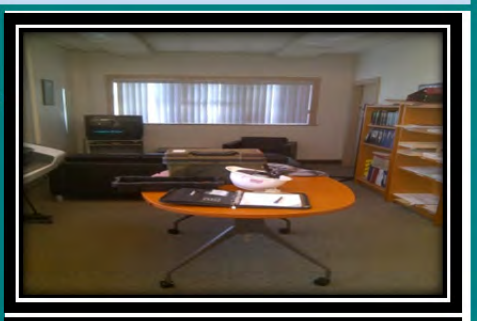
15609-24: Floor Tile – Greyish Green 12”x12”
Entrance
<1% Chrysotile Asbestos Content

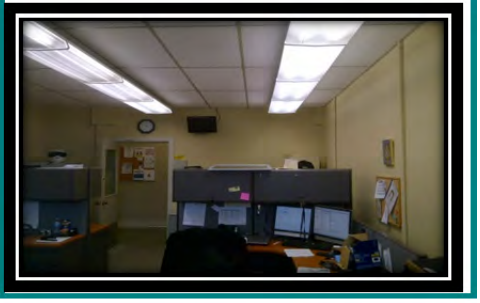
15609-25: Drywall Joint Compound
Room 112
No Asbestos Detected

15609-26: Parged Piping
Elbow above Ceiling Tiles
Room 112
50% Chrysotile Asbestos Content

15609-27: Drywall Joint Compound
Room 110
No Asbestos Detected

Sample 15609-26 was observed to be damaged in very poor condition. A moderate risk clean-up of this damaged asbestos material by a qualified contractor is required.





Warning: in the event any additional suspect materials are encountered during renovation/repair activities, work on those materials should stop immediately and remain undisturbed until testing confirms the presence or absence of asbestos or other hazardous material

Area: Main Floor - Office Areas

Samples:

15609-28: Floor Tile – Lt. Grey 12”x12”
Room 109 (Layer 1)
No Asbestos Detected

15609-28: Mastic
Room 109 (Layer 2)
No Asbestos Detected

15609-29: Floor Tile – Dark Grey 12”x12”
Entrance (Layer 1)
No Asbestos Detected

15609-29: Mastic
Entrance (Layer 2)
No Asbestos Detected

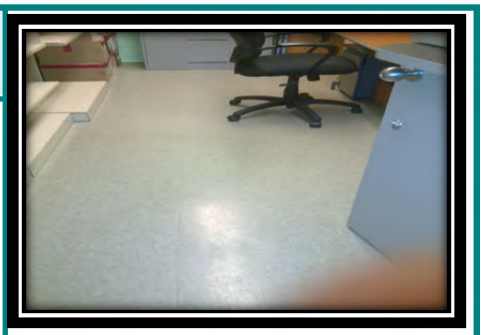
15609-30: Plaster (Layer 1)
Room 105 – Electrical Room
No Asbestos Detected

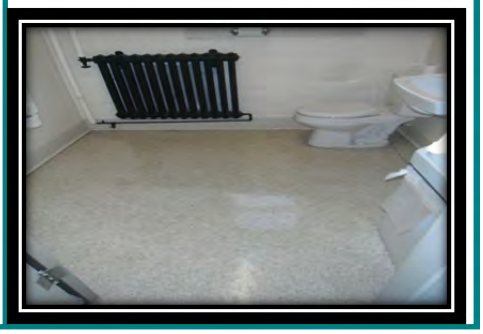
15609-30: Plaster (Layer 2)
Room 105 – Electrical Room
No Asbestos Detected

15609-31: Brick Mortar
Room 105 – Electrical Room
No Asbestos Detected

15609-32: Sheet Flooring – Lt Grey/White (Layer 1)
Room 107 – Washroom
No Asbestos Detected

15609-32: Mastic (Layer 2)
Room 107 – Washroom
No Asbestos Detected





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Area: 2nd Floor – Office Areas

Samples:

15609-33: Drywall Joint Compound
2nd Floor Lobby
No Asbestos Detected

15609-34: Drywall Joint Compound
Room 200 – Boardroom
No Asbestos Detected

15609-35: Carpet Mastic
Room 200 – Boardroom
No Asbestos Detected

15609-36: Sheet Flooring – Lt. Grey (Layer 1)
Room 203 – 2nd Floor Washroom
No Asbestos Detected

15609-36: Mastic (Layer 2)
Room 203 – 2nd Floor Washroom
No Asbestos Detected

15609-37: Drywall Joint Compound
Room 203 – 2nd Floor Washroom
No Asbestos Detected

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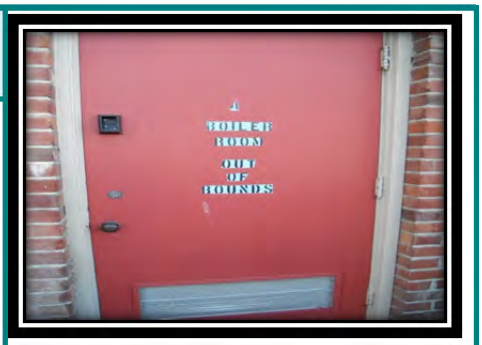
Area: Boiler Room

- Boiler Room mechanical piping insulation identified as asbestos containing by warning sign and was not sampled.
- Boiler mechanical insulation identified as asbestos-containing by warning sign and was not sampled.
- Black duct expansion material was not sampled and suspected of containing asbestos.



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Building: N12 DND Property – Base Library

Area: Base Library

Details:

- Construction Date: 1940
- Ceiling: Wood Panel
- Walls: Wood Panel/Drywall
- Flooring: Sheet Flooring on Wood Substrate
- Roof: Wood Frame & Roofing Materials

Area: Building: N12 DND Property – Base Library

Hazardous Materials Observed:

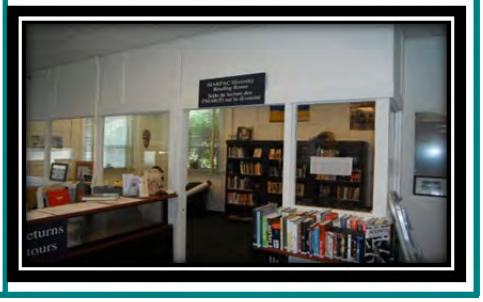
- Lead: [potential] Lead based paint on walls and equipment
- Mercury containing equipment: Fluorescent light fixtures present
- Ozone depleting substances: Fridge observed.
- PCB's: [potential] Fluorescent light ballasts present
- Mould: None Observed

Samples:

15609-38: Tar Paper
Boiler Room
No Asbestos Detected

15609-39: Brick Mortar
Boiler Room – Chimney
No Asbestos Detected

15609-40: Acoustic Ceiling Tile
Large Horizontal Fissure & Random Pinhole (2'x4')
No Asbestos Detected



15609-41: Drywall Joint Compound
Library North Wall
No Asbestos Detected

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Area: Base Library

Samples:

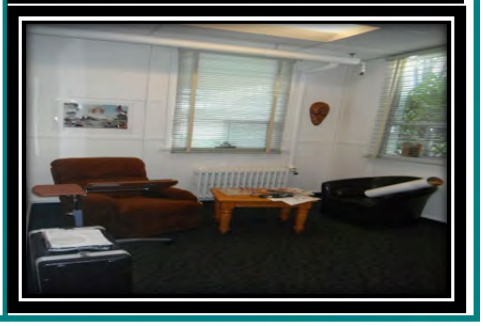
15609-42: Caulking
Exterior Window
No Asbestos Detected

15609-43: Mechanical Piping Insulation
Crawl Space
60% Chrysotile Asbestos Content

15609-44: Sheet Flooring – Lt. Orange
Library Staff Room
Non Asbestos Detected

15609-45: Sheet Flooring – Brown
Hot Water Tank Room
No Asbestos Detected

15609-46: Carpet Mastic
Library
No Asbestos Detected



Area: Base Library

Samples:

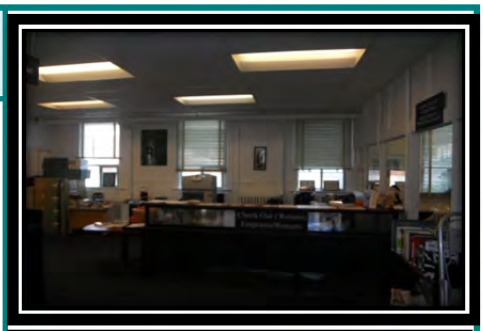
15609-47: Sheet Flooring – Red
Library Floor under Carpet
No Asbestos Detected

15609-48: Acoustic Ceiling Tile
Large Horizontal Fissure & Random Pinhole (2'x4')
No Asbestos Detected

15609-49: Duct Mastic
Attic
Non Asbestos Detected

15609-50: Drywall Joint Compound
Library South Wall
No Asbestos Detected

15609-51: Sheet Flooring
Entrance
No Asbestos Detected



9.0 Limitation of Survey

This document details the methodology, findings and conclusions of this survey and assessment conducted on the subject site in October – December 2011.

Analytical results included in the report reflect the sampled materials at the specific sample locations. Visually similar materials were referenced to specific analyzed samples.

The survey of the building did not include destructive sampling which would permit an intrusive investigation of inaccessible wall and ceiling cavities. Limited access into interior and perimeter walls, voids, crawlspaces, and mechanical shafts was obtained for the investigation of insulation materials. It is possible that hazardous materials are present in these areas but were not identified. If materials suspected of containing asbestos or other hazardous materials are encountered during future renovations or demolition, they should be treated as hazardous proven otherwise. Locations and building materials that have not been surveyed should be considered potentially hazardous materials-containing until such time as they can be evaluated by a qualified person. Until such time as the material can be appropriately evaluated, all work that could impact the suspect materials shall cease in the affected areas until such time as appropriate precautions can be implemented to protect workers and others at the subject site.

Roofing materials may contain asbestos, however, due to the potential for damage to the building and its contents, full depth roofing core samples were not obtained from the roofing systems. Roofing materials should be sampled and analyzed for asbestos prior to disturbance in the event that roof repairs or replacement is required.

All vermiculite insulation should be considered as asbestos containing until such time as a comprehensive destructive testing sampling program is carried out within the building or structure. Asbestos containing vermiculite should be considered present within all concrete block walls, voids, and spaces including attics, walls, ceiling and floor voids.

Some materials cannot be reasonably surveyed without causing significant damage to the building structure or envelope systems. These materials should be assessed for risk specific to any planned renovations or demolition activities. Materials suspected of containing asbestos may be located in concealed locations on this site include:

- Materials inside double wall metal chimney sections,
- Fire doors and frames,
- Concealed roofing, caulk and felts,
- Internal parts of appliances and white goods,
- Vermiculite in walls that do not have existing penetrations,
- Buried cement pipes, and
- Gaskets in pipe flanges and valves.

Other materials were not sampled for fear of causing damage to building systems including vibration dampeners and electrical wiring.

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An asbestos risk assessment must be completed prior to any removal and/or alteration work in or on a building. Removal and/or alteration work requires control measures to be implemented in accordance with WorkSafeBC. Regulations. Protective personal equipment is required during any work or major alteration that may disturb synthetic or asbestos insulation and/or dust that may be present.

Yours very truly,

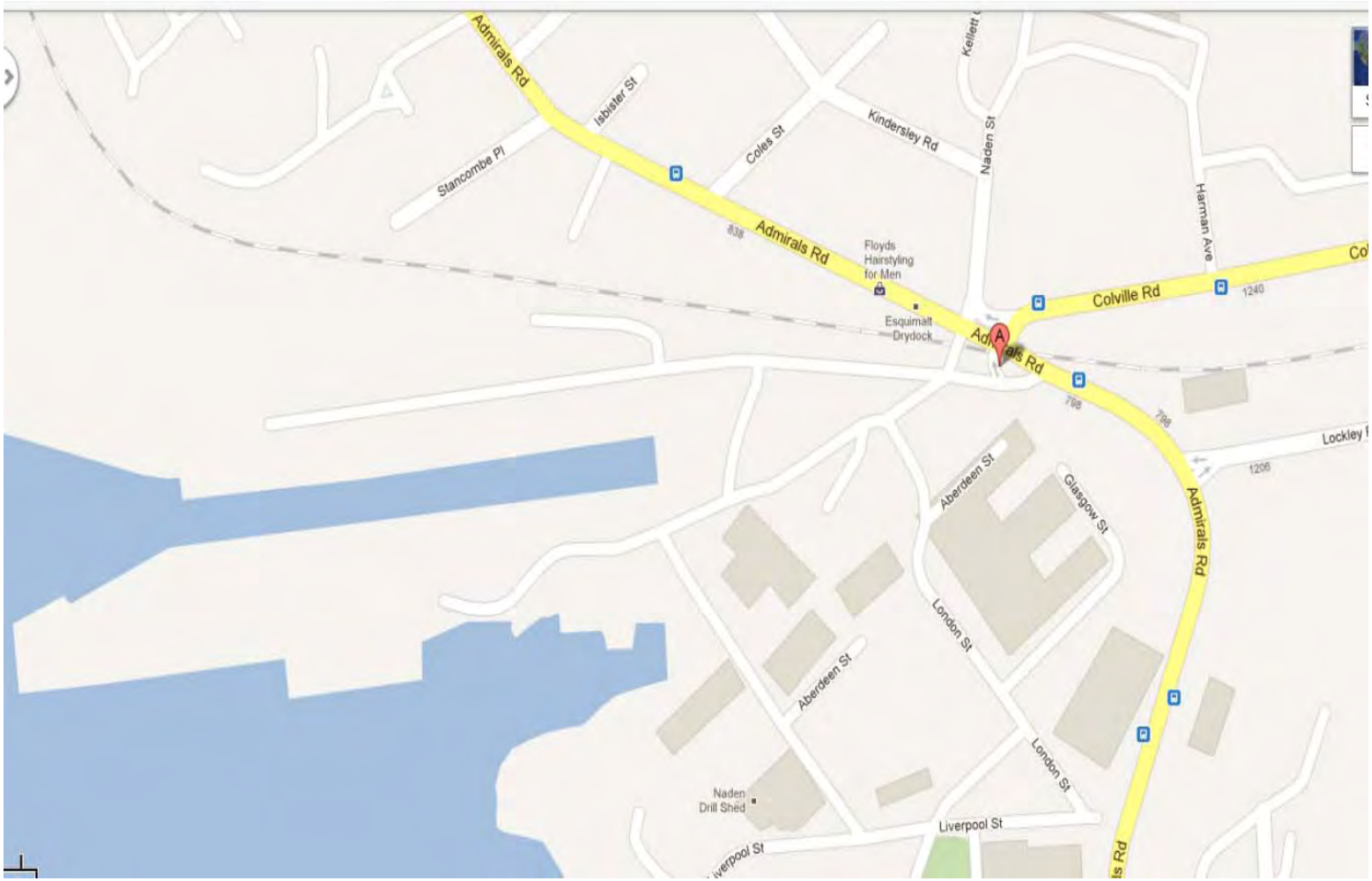
North West Environmental Group Ltd.

Julie Scott-Moncrieff, B.Sc.,
Senior Occupational Hygienist

APPENDICES

APPENDIX A – SITE LOCATION AND SITE PLAN

Drawing 1: Site Location (Google maps)



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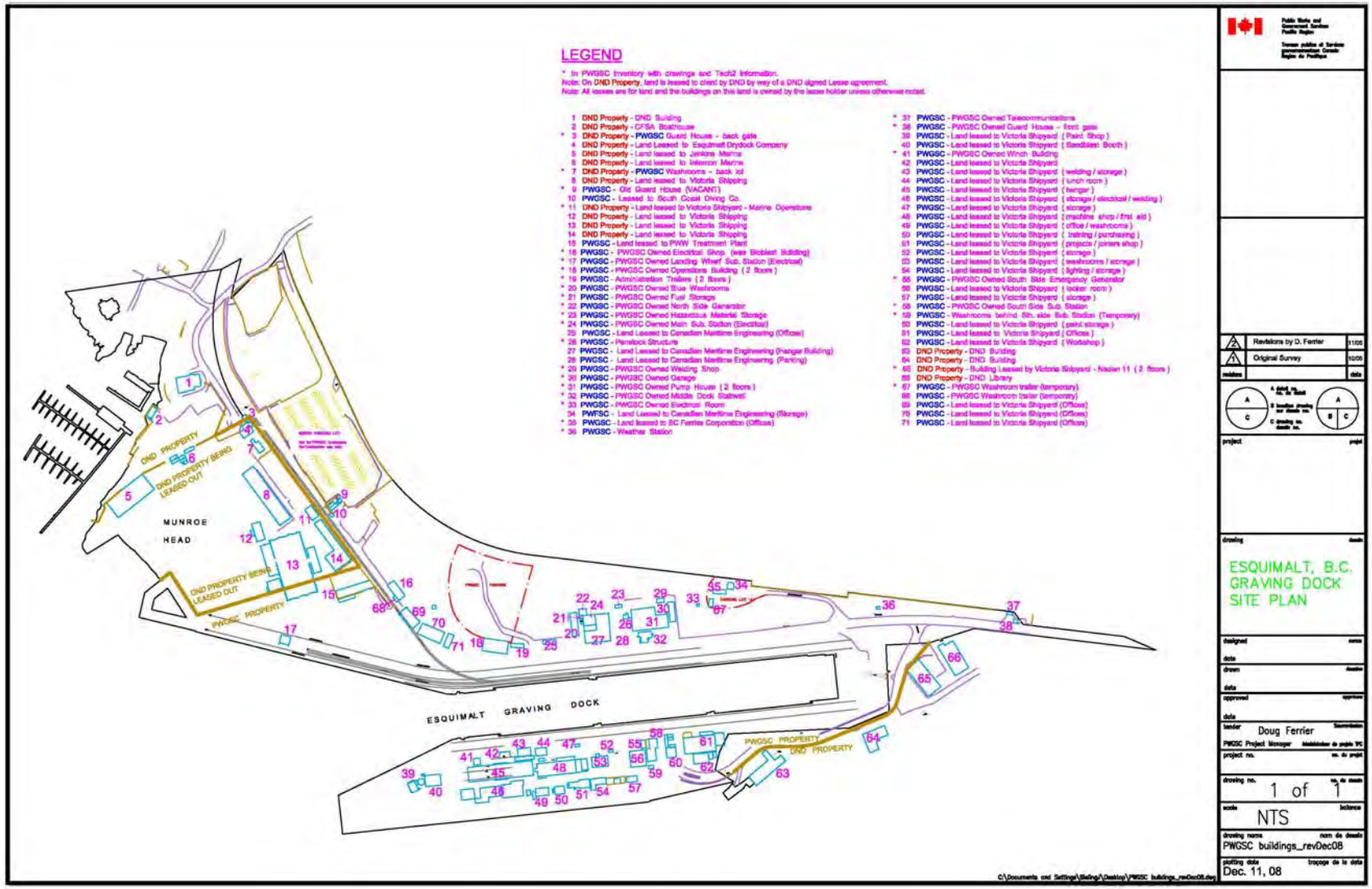
Drawing 2: Site Plan



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North West
Environmental Group Ltd.

Unit 210 - 2950 Douglas Street
Victoria, B.C. V8T 4N4

Tel:250-384-9695
Fax:250-384-9865
e-mail:northwest@nwest.bc.ca

Asbestos Analysis of Bulk Materials using Polarized Light Microscopy

Client: **PWGSC**

Site: **Esquimalt Graving Dock Hazmat**

December 16, 2011

Sampled by:/Client Job or PO #	**KW**
Project Number	**15609**

Sample Number	Location	Date Analysed	Analyst	Description	Phase	%	Asbestos	%	Other Materials	%
15609-01	Bldg 4 - DND Property - EDC Office - Bathroom	12/05/11	EM	Sheet Flooring - Lt. Grey Mosaic	Grey Fibrous Heterogeneous	100	**Chrysotile**	**20**	Non-Fibrous Cellulose	50 30
15609-02	Bldg 4 - DND Property - EDC Office - Exterior	12/05/11	EM	Insulation - Window Frame	Brown/Blue Non-Fibrous Heterogeneous	100	None Detected	0	Non-Fibrous	100
15609-03 Layer 1	Bldg 4 - DND Property - EDC Office - Exterior	12/05/11	EM	Roofing Material - Shingle	Black Fibrous Heterogeneous	33	None Detected	0	Non-Fibrous Cellulose	80 20
15609-03 Layer 2	Bldg 4 - DND Property - EDC Office - Exterior	12/05/11	EM	Roofing Material - Roofing	Black Non-Fibrous Heterogeneous	33	None Detected	0	Non-Fibrous	100
15609-03 Layer 3	Bldg 4 - DND Property - EDC Office - Exterior	12/05/11	EM	Roofing Material - Felt	Black Fibrous Heterogeneous	34	None Detected	0	Cellulose Non-Fibrous	90 10
15609-04	Bldg 4 - DND Property - EDC Office	12/05/11	EM	Floor Tile - 12"x12" White	White Non-Fibrous Heterogeneous	100	**Chrysotile**	**< 1**	Non-Fibrous	100
15609-07	Bldg 8 - DND Property - Kiln Building - Pipe Shop - Kiln Bay #1	12/05/11	EM	Mastic - Exhuast Duct Joint	Grey Non-Fibrous Heterogeneous	100	None Detected	0	Non-Fibrous	100
15609-08	Bldg 8 - DND Property - Kiln Building - Electrical - Kiln Bay #6	12/05/11	EM	Tar - Ceiling	Black Fibrous Heterogeneous	100	**Chrysotile**	**10**	Non-Fibrous	90
15609-09	Bldg 8 - DND Property - Kiln Building - Steel Shop - Kiln Bay #7	12/05/11	EM	Mortar - Brick Wall	Grey Non-Fibrous Heterogeneous	100	None Detected	0	Non-Fibrous	100

AIHA Proficiency Analytical Testing Programs, LLC

Note: Samples were analyzed by method: EPA/600/R- 93/116 "Bulk Asbestos Analysis by Polarized Light Microscopy". For heterogeneous materials the concentrations may vary.

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Sample Number	Location	Date Analysed	Analyst	Description	Phase	%	Asbestos	%	Other Materials	%
15609-10	Bldg 8 - DND Property - Kiln Building - Steel Shop - Kiln Bay #8	12/05/11	EM	Firestopping	Grey/Black Non-Fibrous Heterogeneous	100	**Chrysotile**	**10**	Non-Fibrous	90
15609-12	Bldg 5 - DND Property - Jenkins Marine - Office	12/05/11	EM	Sheet Flooring - Orange/Brown Mosaic	Brown/Orange Fibrous Heterogeneous	100	**Chrysotile**	**15**	Non-Fibrous Cellulose	55 30
15609-13	Bldg 5 - DND Property - Jenkins Marine - Office	12/05/11	EM	Sheet Flooring - Beige (Top Layer)	Beige Fibrous Heterogeneous	100	None Detected	0	Non-Fibrous Glass	98 2
15609-14	Bldg 5 - DND Property - Jenkins Marine - Office	12/05/11	EM	Sheet Flooring (Bottom Layer)	Brown Fibrous Heterogeneous	100	**Chrysotile**	**25**	Non-Fibrous	75
15609-16	Bldg 3 - DND Property - PWGSC Guard House (Back Gate)	11/29/11	EM	Drywall Joint Compound	White Non-Fibrous Homogeneous	100	None Detected	0	Non-Fibrous	100
15609-17 Layer 1	Bldg 3 - DND Property - PWGSC Guard House (Back Gate)	11/29/11	EM	Floor Tile - White 12" x 12"	White Non-Fibrous Heterogeneous	50	None Detected	0	Non-Fibrous	100
15609-18 Layer 2	Bldg 3 - DND Property - PWGSC Guard House (Back Gate)	11/29/11	EM	Mastic	Black Non-Fibrous Heterogeneous	50	None Detected	0	Non-Fibrous	100
15609-19	DND Property - N4 - NIS - Commissionaire Front Security Desk	12/16/11	EM	Acoustic Ceiling Tile - Random Small Fissure/Pinhole (2'x4')	Grey/White Fibrous Heterogeneous	100	None Detected	0	Non-Fibrous Min. Wool Cellulose	25 30 45
15609-20	DND Property - N4 - NIS - Commissionaire Front Security Desk	12/16/11	EM	Parged Pipe Insulation (T-Section above Ceiling)	Grey Fibrous Heterogeneous	100	**Chrysotile**	**50**	Non-Fibrous	50

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Sample Number	Location	Date Analysed	Analyst	Description	Phase	%	Asbestos	%	Other Materials	%
15609-21	DND Property - N4 - NIS - Commissionaire Front Security Desk	12/16/11	EM	Drywall Joint Compound	White Non-Fibrous Heterogeneous	100	None Detected	0	Non-Fibrous	100
15609-22	DND Property - N4 - NIS - Room 101	12/16/11	EM	Acoustic Ceiling Tile - Long Horizontal Fissure	Grey/White Fibrous Heterogeneous	100	None Detected	0	Non-Fibrous Min. Wool Cellulose	25 30 45
15609-23	DND Property - N4 - NIS - Room 102	12/16/11	EM	Drywall Joint Compound	White Non-Fibrous Heterogeneous	100	None Detected	0	Non-Fibrous	100
15609-24	DND Property - N4 - NIS - Entrance	12/16/11	EM	Floor Tile - Greyish Green 12"x12"	Grey/Green Non-Fibrous Heterogeneous	100	**Chrysotile**	**< 1**	Non-Fibrous	100
15609-25	DND Property - N4 - NIS - Room 112	12/16/11	EM	Drywall Joint Compound	White Non-Fibrous Heterogeneous	100	None Detected	0	Non-Fibrous	100
15609-26	DND Property - N4 - NIS - Room 112	12/16/11	EM	Parged Piping (Elbow above Ceiling)	Grey Fibrous Heterogeneous	100	**Chrysotile**	**50**	Non-Fibrous	50
15609-27	DND Property - N4 - NIS - Room 110	12/16/11	EM	Drywall Joint Compound	White Non-Fibrous Heterogeneous	100	None Detected	0	Non-Fibrous	100
15609-28 Layer 1	DND Property - N4 - NIS - Room 109	12/16/11	EM	Floor Tile - Lt. Grey 12"x12"	Grey Non-Fibrous Heterogeneous	50	None Detected	0	Non-Fibrous	100
15609-28 Layer 2	DND Property - N4 - NIS - Room 109	12/16/11	EM	Floor Tile - Lt. Grey 12"x12"	Black Non-Fibrous Heterogeneous	50	None Detected	0	Non-Fibrous	100

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Project Number	**15609**

Sample Number	Location	Date Analysed	Analyst	Description	Phase	%	Asbestos	%	Other Materials	%
15609-29 Layer 1	DND Property - N4 - NIS - Entrance	12/16/11	EM	Floor Tile - Dark Grey 12"x12"	Grey Non-Fibrous Heterogeneous	50	None Detected	0	Non-Fibrous	100
15609-29 Layer 2	DND Property - N4 - NIS - Entrance	12/16/11	EM	Floor Tile - Dark Grey 12"x12"	Black/Yellow Non-Fibrous Heterogeneous	50	None Detected	0	Non-Fibrous	100
15609-30 Layer 1	DND Property - N4 - NIS - Room 105 (Electrical Room)	12/16/11	EM	Plaster - Skim Coat	White Non-Fibrous Heterogeneous	50	None Detected	0	Non-Fibrous	100
15609-30 Layer 2	DND Property - N4 - NIS - Room 105 (Electrical Room)	12/16/11	EM	Plaster - Base Coat	Grey Non-Fibrous Heterogeneous	50	None Detected	0	Non-Fibrous	100
15609-31	DND Property - N4 - NIS - Room 105 (Electrical Room)	12/16/11	EM	Brick Mortar	Grey/White Non-Fibrous Heterogeneous	100	None Detected	0	Non-Fibrous	100
15609-32 Layer 1	DND Property - N4 - NIS - Room 107 (Washroom)	12/16/11	EM	Sheet Flooring - Lt. Grey/White - Linoleum	Grey/Tan Fibrous Heterogeneous	50	None Detected	0	Synthetic Cellulose Non-Fibrous	10 25 65
15609-32 Layer 2	DND Property - N4 - NIS - Room 107 (Washroom)	12/16/11	EM	Sheet Flooring - Lt. Grey/White - Mastic	Yellow Non-Fibrous Heterogeneous	50	None Detected	0	Non-Fibrous	100
15609-33	DND Property - N4 - NIS - 2nd Floor Lobby	12/16/11	EM	Drywall Joint Compound	White Non-Fibrous Heterogeneous	100	None Detected	0	Non-Fibrous	100
15609-34	DND Property - N4 - NIS - Room 200 (Boardroom)	12/16/11	EM	Drywall Joint Compound	White Non-Fibrous Heterogeneous	100	None Detected	0	Non-Fibrous	100

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Project Number	**15609**

Sample Number	Location	Date Analysed	Analyst	Description	Phase	%	Asbestos	%	Other Materials	%
15609-35	DND Property - N4 - NIS - Room 200 (Boardroom)	12/16/11	EM	Carpety Mastic	Yellow Non-Fibrous Heterogeneous	100	None Detected	0	Non-Fibrous	100
15609-36 Layer 1	DND Property - N4 - NIS - Room 203 (2nd Floor Washroom)	12/16/11	EM	Sheet Flooring - Lt Grey	Grey/White Fibrous Heterogeneous	50	None Detected	0	Cellulose Non-Fibrous	30 70
15609-36 Layer 2	DND Property - N4 - NIS - Room 203 (2nd Floor Washroom)	12/16/11	EM	Sheet Flooring - Lt Grey	Yellow Non-Fibrous Heterogeneous	50	None Detected	0	Non-Fibrous	100
15609-37	DND Property - N4 - NIS - Room 203 (2nd Floor Washroom)	12/16/11	EM	Drywall Joint Compound	White Non-Fibrous Heterogeneous	100	None Detected	0	Non-Fibrous	100
15609-38	DND Property - N12 - Library - Boiler Room - Perimeter Wall	12/16/11	EM	Tar Paper	Black Fibrous Heterogeneous	100	None Detected	0	Non-Fibrous Cellulose	30 70
15609-39	DND Property - N12 - Library - Boiler Room - Chimney	12/16/11	EM	Brick Mortar	Brown/Grey Non-Fibrous Heterogeneous	100	None Detected	0	Non-Fibrous	100
15609-40	DND Property - N12 - Library	12/16/11	EM	Acoustic Ceiling Tile - Large Horizontal Fissure, Random Pinhole	Grey/White Fibrous Heterogeneous	100	None Detected	0	Non-Fibrous Cellulose Min. Wool	20 40 40
15609-41	DND Property - N12 - Library - North Wall	12/16/11	EM	Drywall Joint Compound	White Non-Fibrous Heterogeneous	100	None Detected	0	Non-Fibrous	100
15609-42	DND Property - N12 - Library - Window Exterior	12/16/11	EM	Caulking	White Non-Fibrous Heterogeneous	100	None Detected	0	Non-Fibrous	100

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Client: **PWGSC**

Site: **Esquimalt Graving Dock Hazmat**

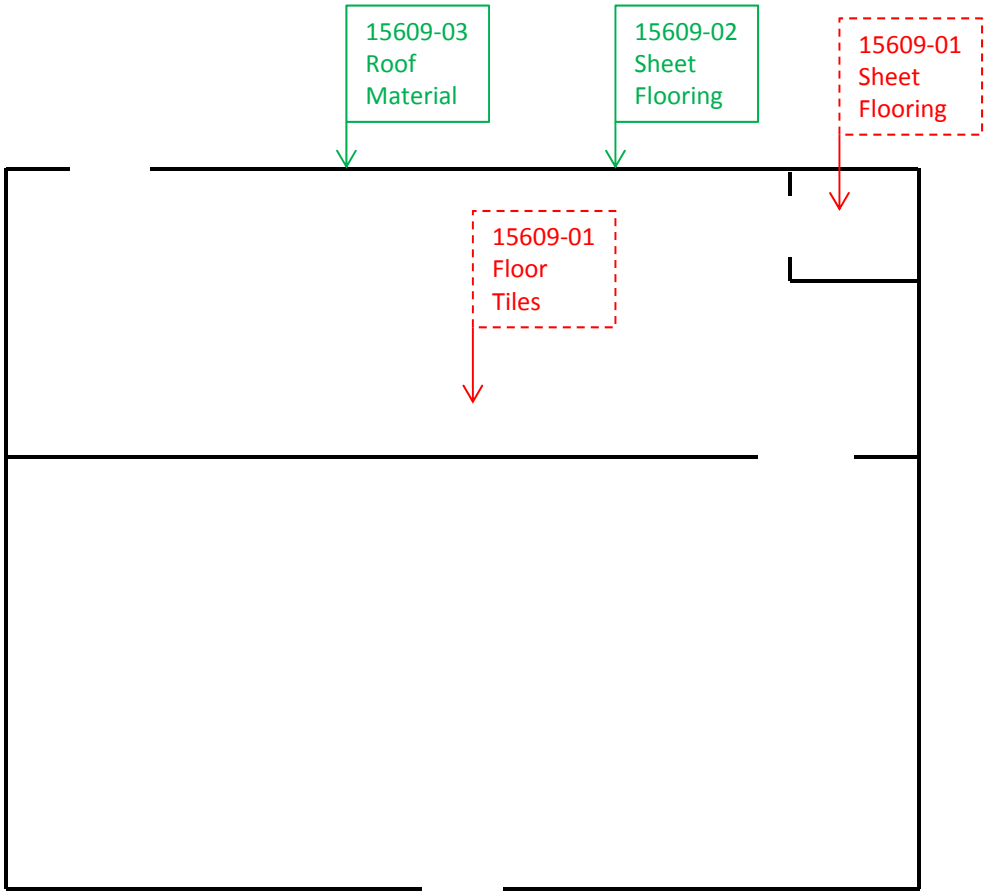
December 16, 2011

Sampled by:/Client Job or PO #	**KW**
Project Number	**15609**

Sample Number	Location	Date Analysed	Analyst	Description	Phase	%	Asbestos	%	Other Materials	%
15609-43	DND Property - N12 - Library - Crawl Space	12/16/11	EM	Mechanical Piping Insulation (Aircell on Straights)	White Fibrous Heterogeneous	100	**Chrysotile**	**60**	Cellulose Non-Fibrous	10 30
15609-44	DND Property - N12 - Library - Staff Room	12/16/11	EM	Sheet Flooring - Lt. Orange	Orange Fibrous Heterogeneous	100	None Detected	0	Cellulose Non-Fibrous	15 85
15609-45	DND Property - N12 - Library - Hot Water Tank/Storage Room	12/16/11	EM	Sheet Flooring - Brown	Brown Fibrous Heterogeneous	100	None Detected	0	Cellulose Non-Fibrous	25 75
15609-46	DND Property - N12 - Library	12/16/11	EM	Carpet Mastic	Yellow Non-Fibrous Heterogeneous	100	None Detected	0	Non-Fibrous	100
15609-47	DND Property - N12 - Library	12/16/11	EM	Sheet Flooring - Red	Red Fibrous Heterogeneous	100	None Detected	0	Cellulose Non-Fibrous	15 85
15609-48	DND Property - N12 - Library	12/16/11	EM	Acoustic Ceiling Tile - Large Horizontal Fissure, Random Pinhole (NEW)	Grey/White Fibrous Heterogeneous	100	None Detected	0	Non-Fibrous Cellulose Min. Wool	20 40 40
15609-49	DND Property - N12 - Library - Attic	12/16/11	EM	Duct Mastic	Grey Non-Fibrous Heterogeneous	100	None Detected	0	Non-Fibrous	100
15609-50	DND Property - N12 - Library - South Wall	12/16/11	EM	Drywall Joint Compound	White Non-Fibrous Heterogeneous	100	None Detected	0	Non-Fibrous	100
15609-51	DND Property - N12 - Library - Entrance	12/16/11	EM	Sheet Flooring	Grey/White Fibrous Heterogeneous	100	None Detected	0	Glass Cellulose Non-Fibrous	10 15 75

AIHA Proficiency Analytical Testing Programs, LLC

Note: Samples were analyzed by method: EPA/600/R- 93/116 "Bulk Asbestos Analysis by Polarized Light Microscopy". For heterogeneous materials the concentrations may vary.



LEGEND

DWJC = Drywall Joint Compound

DRAWING NOT TO SCALE

LEGEND	**ASBESTOS**
123	None Detected
123	Material Contains Asbestos

ADDRESS/LOCATION:

Bldg 4 – DND Property – EDC Office

DRAWING TITLE: EDC Office

PROJECT NO.: 15609

DATE: 12/20/2011

SURVEYED BY: KW

DRAWING NO.: 001

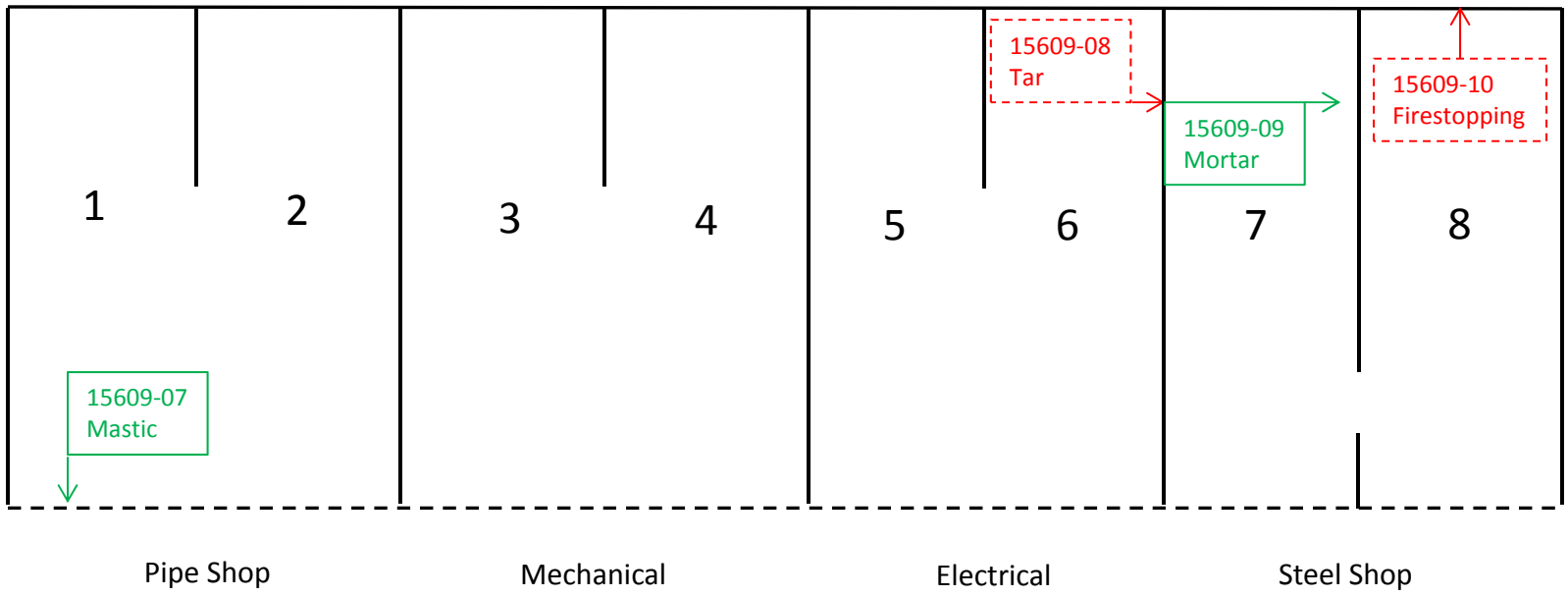
North West Environmental Group Ltd.

#210 – 2950 Douglas St.

Victoria, BC V8T 4N4

LEGEND

DWJC = Drywall Joint Compound



DRAWING NOT TO SCALE

LEGEND	ASBESTOS
123	None Detected
123	Material Contains Asbestos

ADDRESS/LOCATION:

Bldg 8 – DND Property – Kiln Building

DRAWING TITLE: Kiln Building

PROJECT NO.: 15609

DATE: 12/20/2011

SURVEYED BY: KW

DRAWING NO.: 002

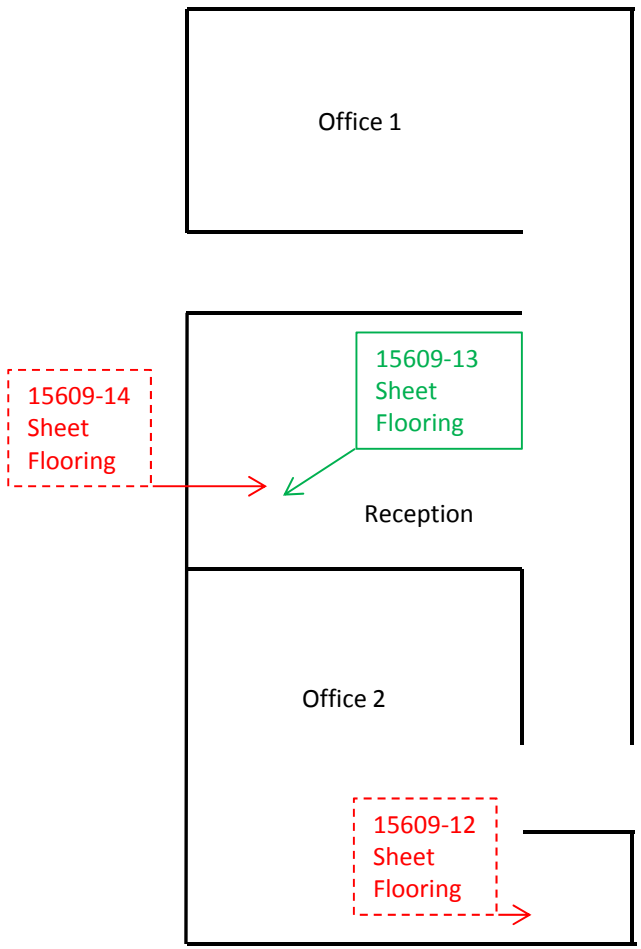
North West Environmental Group Ltd.

#210 – 2950 Douglas St.

Victoria, BC V8T 4N4

LEGEND

DWJC = Drywall Joint Compound

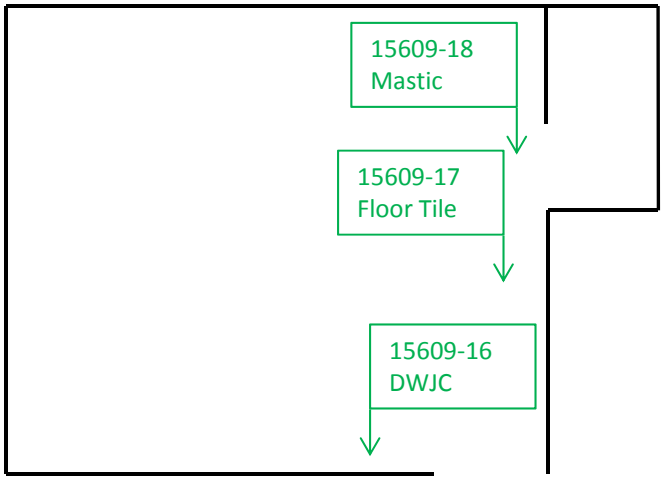


DRAWING NOT TO SCALE

LEGEND	ASBESTOS			
123	None Detected	ADDRESS/LOCATION:	**PROJECT NO.: 15609**	North West Environmental Group Ltd.
123	Material Contains Asbestos	Bldg 5 – DND Property – Jenkins	DATE: 12/20/2011	#210 – 2950 Douglas St.
		DRAWING TITLE: 2nd Floor Trailor	SURVEYED BY: KW	Victoria, BC V8T 4N4
			DRAWING NO.: 003	

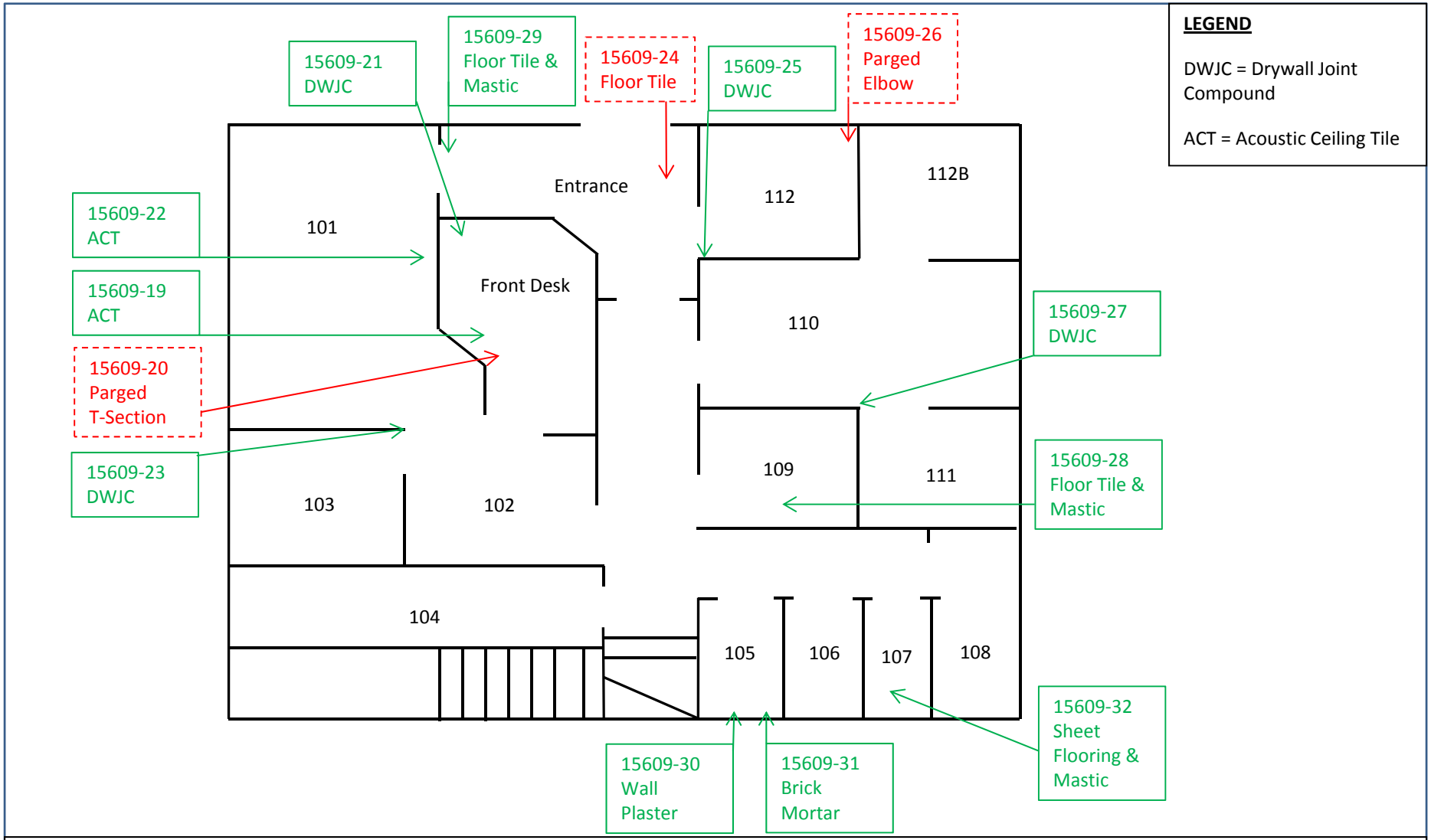
LEGEND

DWJC = Drywall Joint Compound



DRAWING NOT TO SCALE

LEGEND	ASBESTOS			
123	None Detected	ADDRESS/LOCATION: Bldg 3 – DND Property – Guard House Back Gate DRAWING TITLE: Old Guard House	**PROJECT NO.: 15609** DATE: 12/20/2011 SURVEYED BY: KW DRAWING NO.: 004	North West Environmental Group Ltd. #210 – 2950 Douglas St. Victoria, BC V8T 4N4
123	Material Contains Asbestos			



LEGEND

DWJC = Drywall Joint Compound

ACT = Acoustic Ceiling Tile

DRAWING NOT TO SCALE

LEGEND **ASBESTOS**

123 — None Detected

123 — Material Contains Asbestos

ADDRESS/LOCATION:

DND Property – N4 – National Investigation Service

DRAWING TITLE: Main Floor

PROJECT NO.: 15609

DATE: 12/20/2011

SURVEYED BY: KW

DRAWING NO.: 005

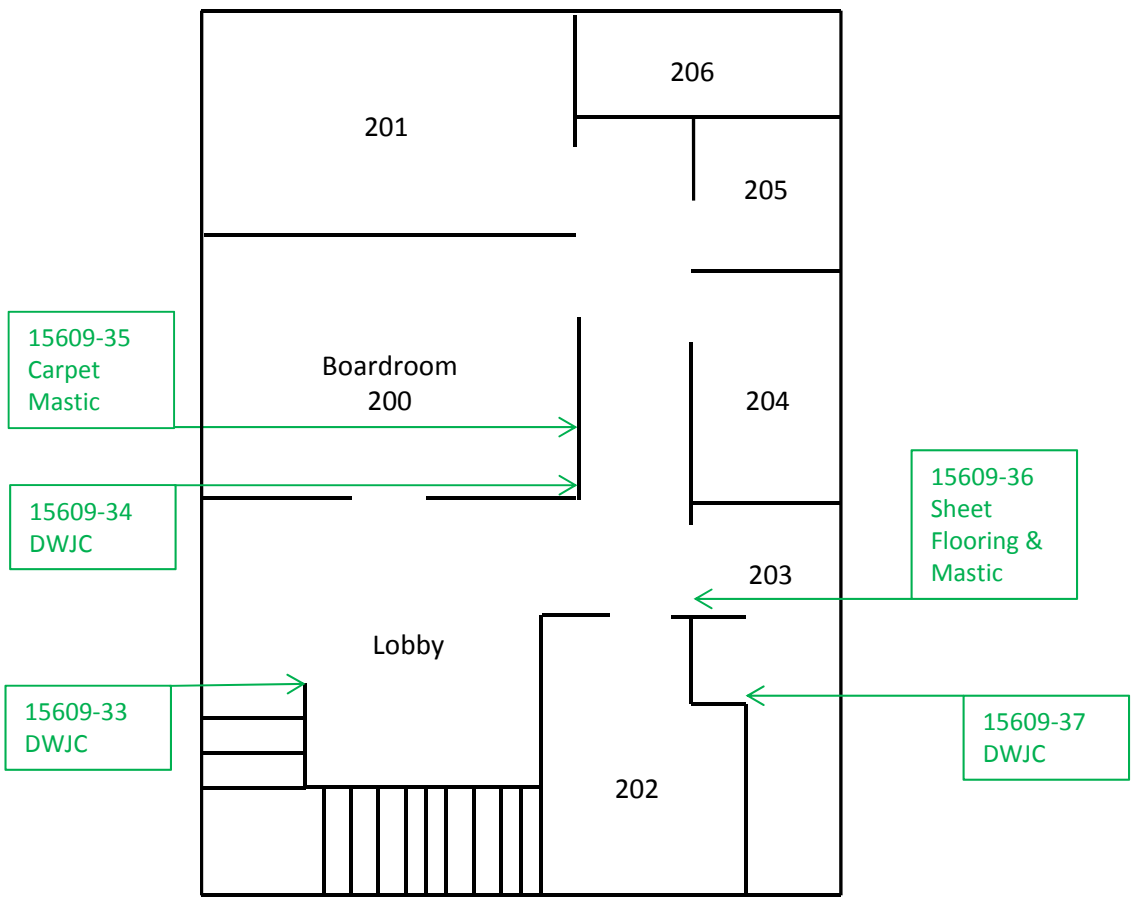
North West Environmental Group Ltd.

#210 – 2950 Douglas St.

Victoria, BC V8T 4N4

LEGEND

DWJC = Drywall Joint Compound



DRAWING NOT TO SCALE

LEGEND **ASBESTOS**

123 None Detected

123 Material Contains Asbestos

ADDRESS/LOCATION:

DND Property – N4 – National Investigation Service

DRAWING TITLE: 2nd Floor

PROJECT NO.: 15609

DATE: 12/20/2011

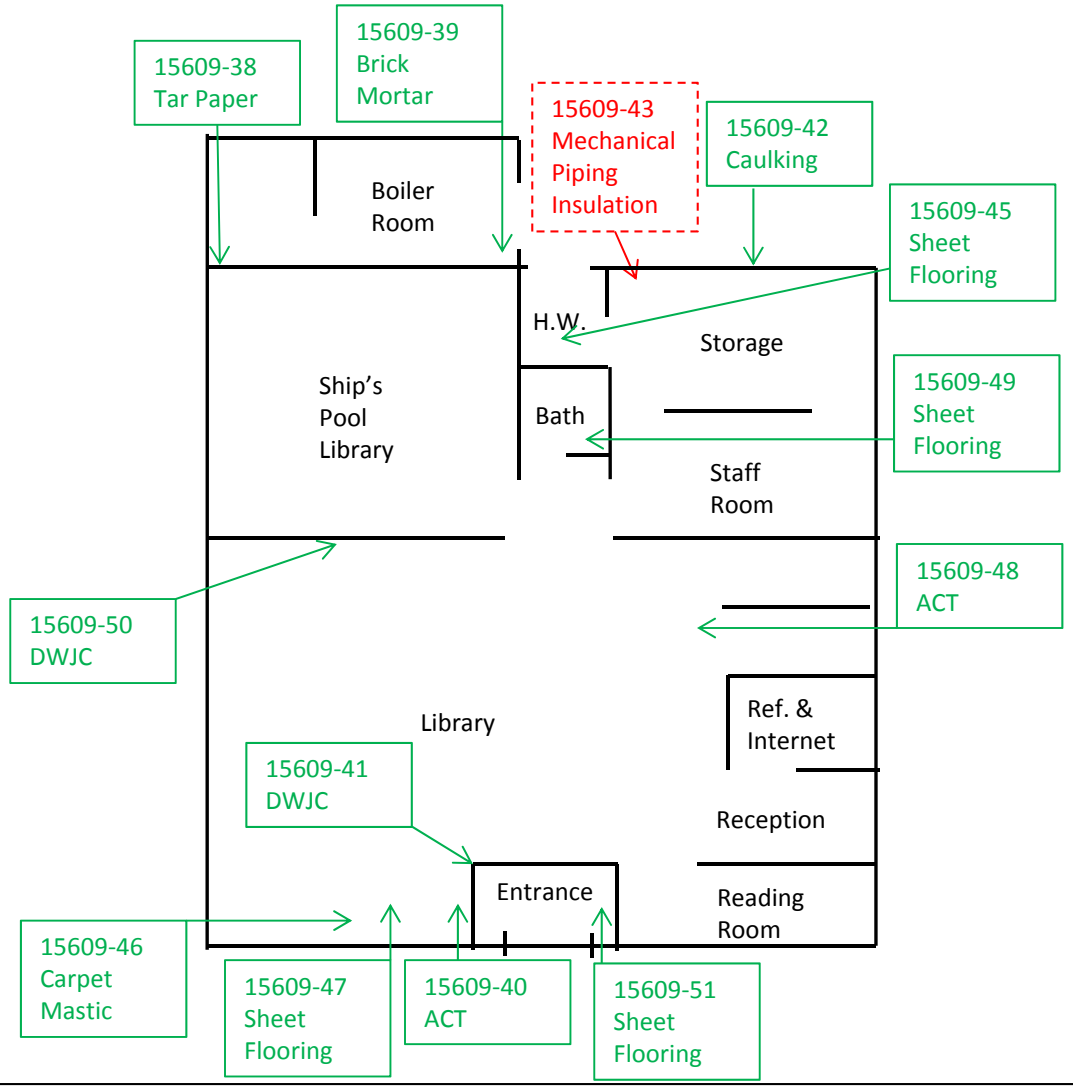
SURVEYED BY: KW

DRAWING NO.: 006

North West Environmental Group Ltd.

#210 – 2950 Douglas St.

Victoria, BC V8T 4N4



LEGEND

DWJC = Drywall Joint Compound

H.W. = Hot Water Tank

ACT = Acoustic Ceiling Tile

DRAWING NOT TO SCALE

LEGEND **ASBESTOS**

123 None Detected

123 Material Contains Asbestos

ADDRESS/LOCATION:

DND Property – N12 – Base Library

DRAWING TITLE: Main Floor

PROJECT NO.: 15609

DATE: 12/20/2011

SURVEYED BY: KW

DRAWING NO.: 007

North West Environmental Group Ltd.

#210 – 2950 Douglas St.

Victoria, BC V8T 4N4

APPENDIX B – FORMS

1. PWGSC Preliminary Hazard Assessment.

PRELIMINARY HAZARD ASSESSMENT FORM

Project Number:	R.118910.001
Location:	Esquimalt Graving Dock
Date:	November 2, 2021
Name of Departmental Representative:	Jon Siska
Name of Client:	PWGSC
Name of Client Project Co-ordinator	

Site Specific Orientation Provided at Project Location **Yes** **X** **No** ☐

Notice of Project Required **Yes** **X** **No** ☐

NOTE:
PWGSC requires "**A Notice of Project"** for all construction work related activities.

NOTE:
OHS law is made up of many municipal, provincial, and federal acts, regulations, bylaws and codes. There are also many other pieces of legislation in British Columbia that impose OHS obligations.

Important Notice: This hazard assessment has been prepared by PWGSC for its own project planning process, and to inform the service provider of actual and potential hazards that may be encountered in performance of the work. PWGSC does not warrant the completeness or adequacy of this hazard assessment for the project and the paramount responsibility for project hazard assessment rests with the service provider.

TYPES OF HAZARDS TO CONSIDER	Potential Risk for:				COMMENTS
Examples: Chemical, Biological, Natural, Physical, and Ergonomic Listed below are common construction related hazards. Your project may include pre-existing hazards that are not listed. Contact the Regional Construction Safety Coordinator for assistance should this issue arise.	**PWGSC, OGD's, or tenants**		**General Public or other contractors**		Note: When thinking about this pre-construction hazard assessment, remember a **hazard** is anything that may cause harm, such as chemicals, electricity, working from heights, etc; the **risk** is the chance, high or low, that somebody could be harmed by these and other hazards, together with an indication of how serious the harm could be.
	Yes	**No**	**Yes**	**No**	
Typical Construction Hazards					
Concealed/Buried Services (electrical, gas, water, sewer etc)	**X**		**X**		No natural gas services on site
Slip Hazards or Unsound Footing	**X**		**X**		
Working at Heights	**X**		**X**		
Working Over or Around Water		**X**		**X**	
Heavy overhead lifting operations, mobile cranes etc.	**X**		**X**		

Marine and/or Vehicular Traffic (site vehicles, public vehicles, etc.	X		X		
Fire and Explosion Hazards	X		X		
High Noise Levels	X		X		
Excavations	X		X		Active construction sites
Blasting	X		X		Active construction sites
Construction Equipment	X		X		
Pedestrian Traffic (site personnel, tenants, visitors, public)	X		X		
Multiple Employer Worksite	X		X		

Electrical Hazards					**Comments**
Contact With Overhead Wires		X		X	
Live Electrical Systems or Equipment	X		X		Tenant operations adjacent to project site.
Other:					
Physical Hazards					
Equipment Slippage Due To Slopes/Ground Conditions		X		X	
Earthquake	X		X		
Tsunami	X		X		
Avalanche		X		X	
Forest Fires		X		X	
Fire and Explosion Hazards	X		X		
Working in Isolation		X		X	None allowed on site.
Working Alone	X		X		
Violence in the Workplace	X		X		
High Noise Levels	X		X		
Inclement weather	X		X		
High Pressure Systems	X		X		
Other:					
Hazardous Work Environments					
Confined Spaces / Restricted Spaces		X		X	No access to confined spaces
Suspended / Mobile Work Platforms	X		X		
Other:					
Biological Hazards					
Mould Proliferations		X		X	
Accumulation of Bird or Bat Guano		X		X	
Bacteria / Legionella in Cooling Towers / Process Water		X		X	
Rodent / Insect Infestation		X		X	
Poisonous Plants		X		X	
Sharp or Potentially Infectious Objects in Wastes	X		X		Multiple employer workplace

Wildlife	X		X		Resident deer population
Chemical Hazards					
Asbestos Materials on Site	X		X		Refer to HAZMAT report.
Designated Substance Present		X		X	
Chemicals Used in work	X		X		Active ship repair facility
Lead in paint	X		X		Refer to HAZMAT report.
Mercury in Thermostats or Switches		X		X	
Application of Chemicals or Pesticides		X		X	
PCB Liquids in Electrical Equipment		X		X	
Radioactive Materials in Equipment		X		X	
Other:					
Contaminated Sites Hazards					
Hazardous Waste		X		X	
Hydrocarbons		X		X	
Metals		X		X	
Other:					

Security Hazards					**Comments**
Risk of Assault	X		X		Multiple employer workplace
Other:	X		X		Unauthorized entry to site
Other Hazards					

Other Compliance and Permit Requirements[1]	**YES**	**NO**	**Notes / Comments[2]**
Is a Building Permit required?		X	P.Eng sealed demolition plan req'd
Is a Electrical permit required?	X		**Obtain from Technical Safety BC**
Is a Plumbing Permit required?			**N/A**
Is a Sewage Permit required?			**N/A**
Is a Dumping Permit required?			**N/A**
Is a Hot Work Permit required?	X		**Obtain from EGD.**
Is a Permit to Work required?	X		**Hazardous materials present**
Is a Confined Space Entry Permit required?		X	
Is a Confined Space Entry Log required?		X	
Discharge Approval for treated water required?			**N/A**

Notes:

(1) Does not relieve Service Provider from complying with all applicable federal, provincial, and municipal laws and regulations.

(2) TBD means To Be Determined by Service Provider.

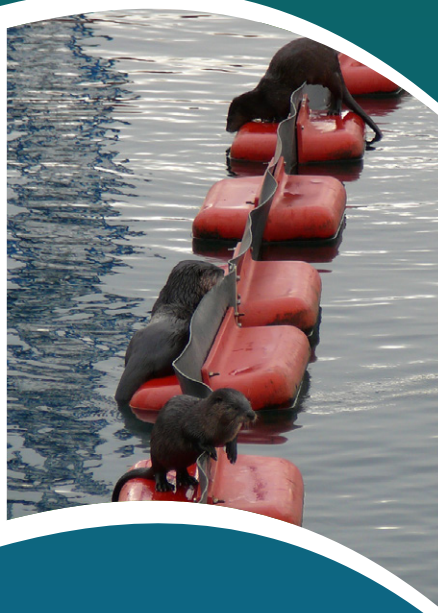
Service Provider Acknowledgement: We confirm receipt and review of this Pre-Project Hazard Assessment and acknowledge our responsibility for conducting our own assessment of project hazards, and taking all necessary protective measures (which may exceed those cited herein) for performance of the work.			
Service Provider Name			
Signatory for Service Provider		**Date Signed**	
RETURN EXECUTED DOCUMENT TO PWGSC DEPARTMENTAL REPRESENTATIVE PRIOR TO ANY WORK COMMENCING			

APPENDIX C – OTHER DOCUMENTS

1. Esquimalt Graving Dock Environmental Best Management Practices.

EGD
Esquimalt Graving Dock

Environmental Best Management Practices



Prepared by:
Public Services and Procurement Canada
Environmental Services

October 2016
Version: 05

INDEX

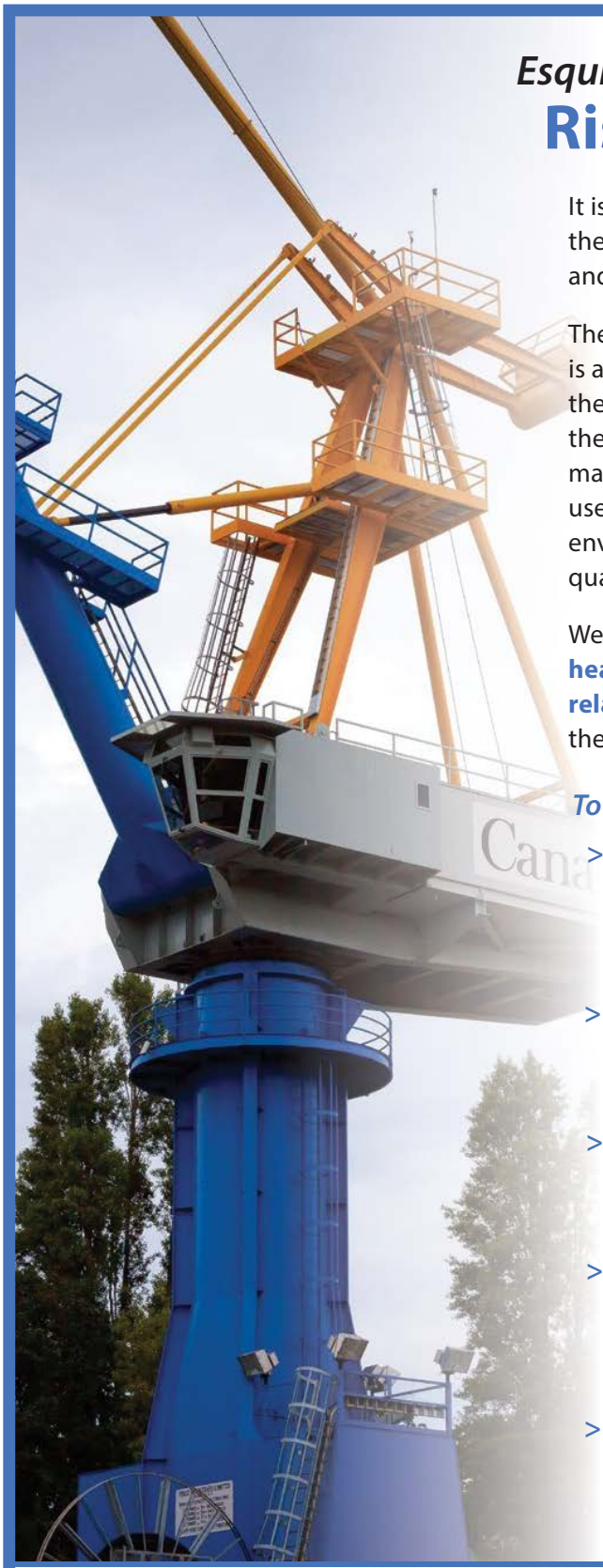
OVERVIEW

The **Esquimalt Graving Dock** (*EGD*) is a federal government owned and operated, multi-user ship repair and maintenance facility located in Esquimalt, British Columbia. The facility has been in operation since 1925, and provides service to local, Federal, and international vessels. The vessel repair and maintenance work at the EGD is carried out by privately owned shipyard repair contractors that rent the required sections of the drydock, lease upland work space from the government, and pay a fee for services such as cranes, compressed air, water, sewer and power.

The EGD is committed to managing the actual and potential health and safety, environmental, security, financial and public relations risks, while ensuring quality operations and services. In order to identify and manage these risks, the EGD has implemented an **Environmental Management System** (*EMS*) and a Risk Management Framework (*in conformance with the internationally recognized standards ISO 14001 and ISO 31000*). The EMS provides the framework for identifying environmental impacts, and ensures adequate controls are in place to effectively manage them.

This manual contains a series of **Environmental Best Management Practices** (*EBMPs*) developed to reduce impact to the environment related to common activities and operations at the Esquimalt Graving Dock. The manual contains guidance and recommendations for those operating at the EGD, and is intended to complement existing environmental legislation. It does not remove the responsibility of all contractors and companies operating at the EGD to abide by all applicable regulatory requirements and industry standards. All users of the facility are expected to follow the EBMPs.

For additional information contact the EGD Environmental Services Department.



Esquimalt Graving Dock

Risk Management Policy

It is the goal of the Esquimalt Graving Dock, in partnership with the ship repair industry, to be the premier ship repair, construction and maintenance facility on the west coast of North America.

The Esquimalt Graving Dock acknowledges that risk management is an integral part of attaining this goal. We recognize that risk is the effect of uncertainty on our operations and is inherent within the ship repair industry. Our objective is to identify, monitor and manage risk in order to prevent the harm of our employees, site users, contractors, neighbours, other stakeholders, the environment and our facility, while ensuring and maintaining quality operations and services.

We are committed to managing the actual and potential **health & safety, environmental, security, financial and public relation risks** pertaining to strategies, policies and practices at the Esquimalt Graving Dock.

To meet our commitment we will:

> *Implement systems and processes to consistently identify, measure, mitigate, minimize and report on risks, while continuing to uphold and adapt the established Environmental Management System and other relevant Management Frameworks.*

> *Meet or exceed applicable federal, provincial and municipal legislation and regulations, departmental policies, industry standards, practices and other requirements.*

> *Communicate openly with our employees to ensure they are aware of and understand our Risk Management Framework, the nature of our operations and their roles and responsibilities in managing risk.*

> *Monitor and review our Risk Management Framework to ensure we are meeting our goals. Ongoing oversight of the effectiveness of our Risk Management Framework is the responsibility of the Esquimalt Graving Dock Risk Management Team.*

> *Provide the necessary resources to effectively implement our Risk Management Framework, while continuing to improve our programs, procedures and operations.*

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

Jim Milne
Director
Esquimalt Graving Dock
Engineering Assets
Strategy Sector

David Latoski
Operations Manager
Esquimalt Graving Dock
Engineering Assets
Strategy Sector

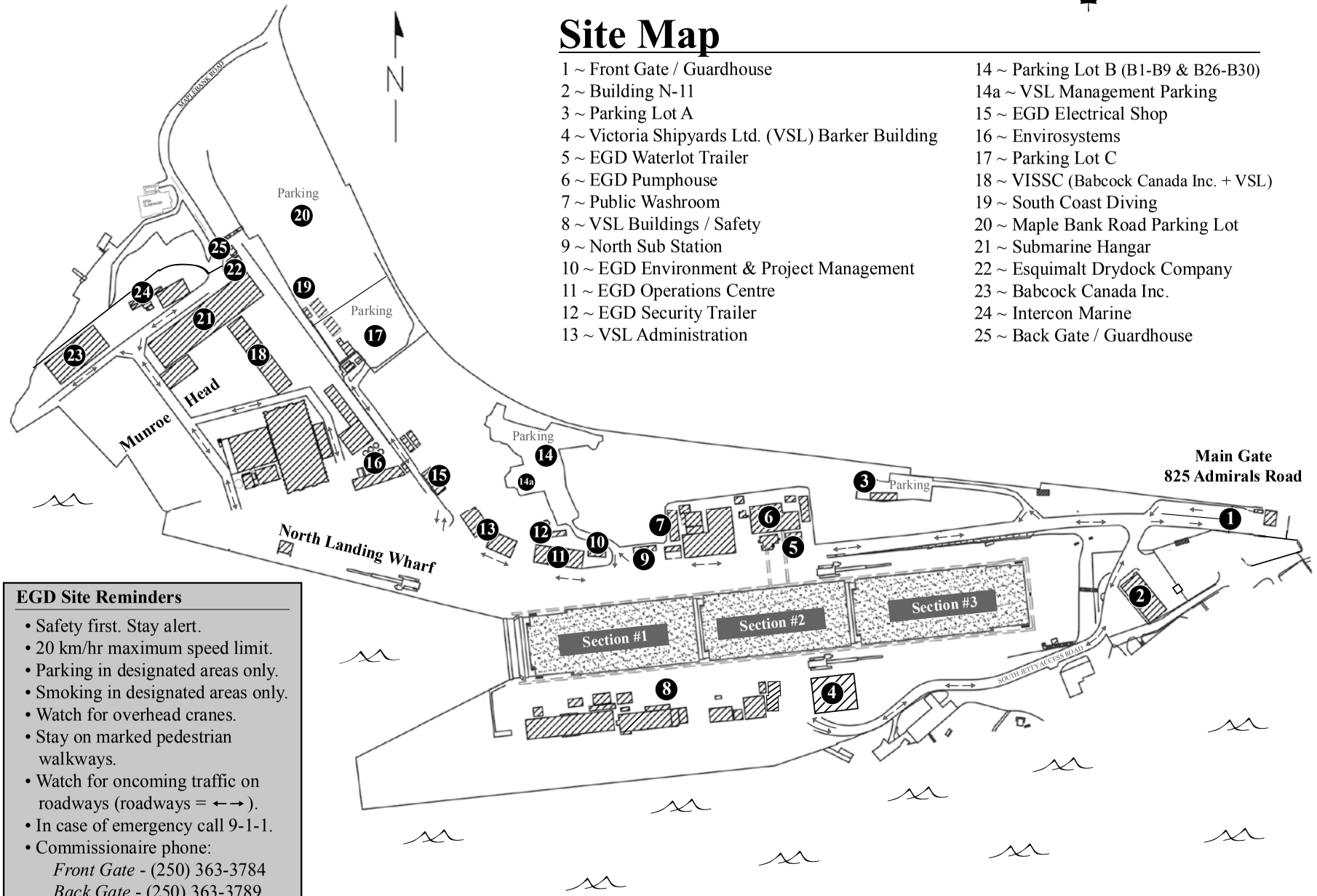
Canada

August 2015

EGD
Esquimalt Graving Dock

Site Map

1 ~ Front Gate / Guardhouse
2 ~ Building N-11
3 ~ Parking Lot A
4 ~ Victoria Shipyards Ltd. (VSL) Barker Building
5 ~ EGD Waterlot Trailer
6 ~ EGD Pumphouse
7 ~ Public Washroom
8 ~ VSL Buildings / Safety
9 ~ North Sub Station
10 ~ EGD Environment & Project Management
11 ~ EGD Operations Centre
12 ~ EGD Security Trailer
13 ~ VSL Administration
14 ~ Parking Lot B (B1-B9 & B26-B30)
14a ~ VSL Management Parking
15 ~ EGD Electrical Shop
16 ~ Envirosystems
17 ~ Parking Lot C
18 ~ VISSC (Babcock Canada Inc. + VSL)
19 ~ South Coast Diving
20 ~ Maple Bank Road Parking Lot
21 ~ Submarine Hangar
22 ~ Esquimalt Drydock Company
23 ~ Babcock Canada Inc.
24 ~ Intercon Marine
25 ~ Back Gate / Guardhouse



EGD Site Reminders

- Safety first. Stay alert.
- 20 km/hr maximum speed limit.
- Parking in designated areas only.
- Smoking in designated areas only.
- Watch for overhead cranes.
- Stay on marked pedestrian walkways.
- Watch for oncoming traffic on roadways (roadways = ←→).
- In case of emergency call 9-1-1.
- Commissionaire phone:
  Front Gate - (250) 363-3784
  Back Gate - (250) 363-3789

Environmental Best Management Practices

EBMP #1: Pressure Washing (High and Ultra High)

One of the first activities to occur on a drydocked vessel is pressure washing of the hull to remove salts, marine growth and residual paint, prior to surface preparation or painting. This typically involves pressure washing the underwater hull and/or super structure with water at 2,000 – 3,500 psi. This activity produces large volumes of paint contaminated wastewater (*e.g. washwater*). Ship repair contractors may also use an Ultra High Pressure (*UHP)* washing process (*from 40,000 – 55,000 psi*) to completely remove all paints, often eliminating the need for further surface preparation (*e.g. sandblasting*) prior to painting. UHP generates even larger volumes of wastewater and slurry solids. All wastewater created from pressure washing and UHP requires management (*i.e. assessment, collection, handling, treatment and disposal*).

Management of Wastewater on the Graving Dock Floor

- Ensure all wastes and wastewater discharges, resulting from hull and anchor chain washing, as well as dock bottom clean-up activities, are collected and disposed of properly.
- Close all sump well valves in the drydock floor collection system prior to and during pressure washing operations.
- Manage pumps to ensure they are handling the volume of washwater sufficiently.
- Manage washwater storage containers to ensure they are not overfilled.
- Divert contaminated wastewater, that falls outside of the drydock floor collection system, away from the tunnel drains.
- Direct non-contaminated water (*e.g. ballast water, cooling water, dock wall/moon pool leakage water*) away from contaminants on the drydock floor.
- Collect and dispose of stormwater that comes into contact with contaminants.
- Do not use detergents or additives in washwater.

Opening Sump Well Valves

Sump well valves in the drydock floor can be opened to manage rainwater under the following conditions ONLY:

- Dock floor has been pre-cleaned, prior to the completion of the work period.
- A filter cloth has been installed to reduce the migration of debris.

All wastewater containing paint contaminants must be directed to the collection trench drains and sump wells on the drydock floor, collected, and sent for proper treatment.

Antifoulant contaminated washwater entering the collection system (trench drains and sump wells) on the drydock floor.

The sill diversion pump removes clean seawater from the pool at the front of Section 1 (moon pool) and discharges into the tunnel drains through a hard pipe on the graving dock wall.

Sediment from the harbour often settles on dock bottom after dewatering. If this becomes contaminated with paint, etc., it must be disposed of.

The hull of a cruise ship being ultra high pressure washed.

Section 1 Considerations:
Caisson and Dock Wall Leakage & Drydock Floor Sediment

Managing Caisson and Dock Wall Leakage:

- Divert caisson leakage water away from pressure washing areas.
- Water leakage from the caisson can be diverted by using a sump pump connected to the PVC diversion pipe installed on the north wall of the drydock Section 1.
- Divert water leakage from the graving dock walls, during high tide, directly into the drainage tunnel.

Managing Entrained Sediment:

Harbour sediment may accumulate in the corners, trenches, keel blocks and sumps of the drydock Section 1 during normal docking procedure. Users of the section will need to consider management of this sediment and are responsible for removal and proper disposal if it becomes contaminated from their operations and activities on dock floor (*e.g. pressure washing wastewater, sandblast grit, paint chips, paint overspray, and other contaminants*).

Ultra High Pressure (UHP) Washing

Ultra high-pressure washing generates significant volumes of wastewater and sludge that may pose a challenge for collection and disposal.

- Prepare in advance for the management of UHP waste.
- Remove all water, sludge and debris, generated from UHP washing, from the drydock.
- Ensure the washwater and sludge is disposed of at an appropriately permitted facility.
- Disposal certificates may be requested, by EGD Management, to ensure washwater is being properly managed.

Management of Pressure Wastewater in Upland Areas/Dockside

- Perform pressure washing of small vessels and parts, in designated areas only, where wastewater management can be effectively achieved.
- Approval for pressure washing in upland areas (*including the use of a stormwater trench for water collection*) is required from EGD Management
- Wash vessel parts in a suitable contained area (*e.g. enclosed skip*).
- Completely block all drains in the area where pressure washing will occur (*e.g. cover nearby trench drains with filter cloth, place a foam bung in the trench drain to prevent migration of wash water should an incident occur*).
- Ensure sufficient equipment (*e.g. pumps, totes, tanks, foam blocks and sandbags*) is available for the timely collection, control and removal of washwater.
- Contaminated washwater requires proper treatment for disposal. Label containers.

A small vessel is power washed on the North Landing Wharf (NLW).

The trench drain is blocked and a sump pump is installed to collect wash water into a tote.

Example of high density styrofoam blocks used as a drain blocker on the NLW.

Large tank dockside with an attendant.

EBMP #2: Abrasive Blasting

Abrasive blasting is a common operation performed at the Esquimalt Graving Dock (*EGD*) to prepare vessel surfaces for painting. However, this operation creates challenges with respect to controlling air emissions and the waste materials generated.

The dust emissions generated from abrasive blasting operations can contain harmful environmental pollutants and have the potential to negatively effect employees, facility users, neighbours, equipment and infrastructure if it is not properly managed. Fugitive dust may also impact the local marine environment by entering the Esquimalt Harbour directly, or via stormwater runoff, and through direct deposit to uplands soil.

Waste grit may be highly contaminated with antifouling paint and other metals, which also poses a risk to the environment if not handled and disposed of properly.

Dust Control

- Establish dust suppression controls in advance of starting any work.
- Do not abrasive blast during conditions that render containment ineffective *(e.g. during windy conditions)*.
- No abrasive blasting of vessels shall be performed while vessels are docked alongside the North Landing Wharf or South Jetty.
- Minimize dust emissions by ensuring blast nozzles are angled perpendicular to the vessel and aimed slightly downward during blasting.
- Properly manage (*contained, covered and secure*) all sandblast product and wastes during transport.

ADEQUATE containment.

Hoarding (*Physical Containment*)

- Use containment such as tarps, shrouds or portable structures to prevent airborne particles from entering the atmosphere and surface waters.
- Containment should be large enough to adequately enclose or segregate the working area and reach the dock floor or walls.
- Ensure containment is properly installed (*connected and overlapped*) so there are no gaps.
- Used tarps with tears and holes should be replaced, repaired or doubled with additional layers.

INADEQUATE containment.

Water Use (*Fugitive Dust Suppression*)

- Where physical containment techniques are not sufficient to prevent fugitive dust emissions, water may be used to mitigate dust.
- Users may requisition use of Dust Suppression Units (*e.g. Dust Boss*) from the EGD. The units are highly effective at mitigating dust.
- Monitor areas where dust escapes physical containment and adjust dust suppression unit water spray accordingly.
- Do not allow water from the dust suppression units to enter other sections of the dock, especially in the case where another user occupies it.
- Do not allow water from the dust suppression units to come in contact with contaminants on the drydock floor or other work areas. Adjust water spray and relocate contaminants to mitigate impacts.
- Fire nozzle "water curtains" may only be used to control dust emissions when approved by EGD Management in advance. The dust suppression units generates a more effective water mist and uses significantly less fresh water during operation.

Waste Grit Management

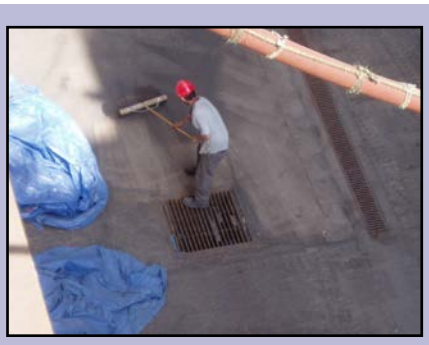
- Cover trench drains and tunnel grates in work areas with filter cloth. Replace the cloth as required.
- Manage waste grit by sweeping it into central areas, away from trenches, tunnel grates and dock floor traffic.
- Remove waste grit from work areas as soon as possible.
- Store all waste grit in appropriate containers to prevent leakage.
- Cover all skips, storage bins, tanks, and hoppers to prevent dust emissions and spills.
- Characterize and dispose of waste grit in accordance with applicable provincial regulations.

Dust suppression unit in operation.

Store all waste grit away from drains, to prevent contaminates migrating into the marine environment.

INADEQUATE waste grit storage.

ADEQUATE waste grit storage.



Clean up waste grit to prevent it from being washed into the drainage system by clean water (e.g. cooling water discharge, stormwater, dust suppression unit spray).

Store waste grit in appropriate containers.

Remove waste grit from work areas as soon as possible to prevent migration of contaminates throughout the drydock floor.

Keel / Bilge Blocks

Keel and bilge blocks on dock bottom present a challenge for the clean up of spent waste grit.

Waste grit must be removed from areas around excess blocks stored in the dock bottom. To prevent grit from collecting between the blocks, they can be relocated or covered prior to sandblasting.

Power washing at the base of the blocks can be effective in removing contaminants.

EBMP #3: Painting and Coating

Ship repair and maintenance often requires the painting and coating of vessel surfaces to protect them from corrosion or to inhibit the growth of marine life. The industrial nature of marine paints and solvents, in particular antifouling paints, may result in negative impacts to the environment and surrounding infrastructure, if not properly managed.

Spray Painting

Paint overspray has the potential to impact the marine environment, soils, neighbouring residences, and nearby equipment and infrastructure.

- Use containment such as tarps, shrouds or portable structures to prevent airborne particles from entering the atmosphere and surface waters.
    - Containment should be large enough to adequately enclose or segregate the working area.
    - Ensure containment is secured so there are no gaps.
    - Ensure that containment reaches the dock floor or walls.
    - Do not use keel blocks, dock floor or dock walls to test paint sprayers.
- Do not spray paint during conditions that render containment ineffective (*e.g. windy*).
- Place containment beneath and around structures being painted on dock floor and in work areas to ensure overspray does not reach the surrounding area (*e.g. during painting of anchor chains, or grates*).
- Manage overspray on the drydock floor to prevent safety hazards (*e.g. slippage*).
- When spray painting materials inside the stabilizer pockets, ensure the area is sealed and that the walls and floors are covered.
- For vessels docked in Section 1, ensure that overspray does not reach the caisson sill/moon pool water. Avoid docking vessels so they extend over sill area.

Spray Painting

ADEQUATE containment.

INADEQUATE containment.

INADEQUATE containment. Ensure tarps are in place to prevent overspray impacting the surrounding work area.

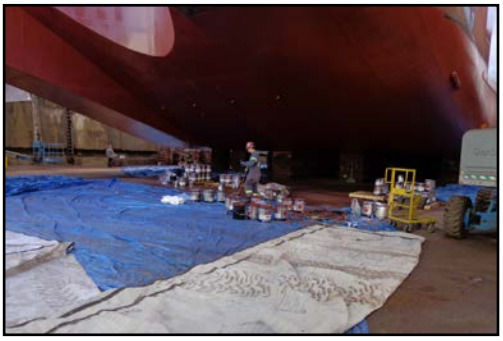
ADEQUATE containment on stablizer pocket doors.

Paint overspray due to INADEQUATE containment stablizer pocket doors.

Manual Painting

Painting by hand (*roller, brush*) can be conducted without shrouding the work area; however, the potential remains for product to migrate into the environment. Work spaces and product handling must be managed with care, similar to dockside painting.

- Containment should be large enough to adequately cover the work area and provide a barrier between the work and the environment (*e.g. dock floor, ocean and soil*).
- Ensure containment is secured so there are no gaps.
- Product container lids are to be secured.



ADEQUATE containment.

Painting Dockside

- Do not spray paint vessels docked alongside the wharves or jetties *(e.g. North Landing Wharf)*.
- Use rollers and brushes to paint vessels dockside.
- Ensure tarps are in place below work areas, as well as in between the vessel and the dock, to prevent spills and drips from entering the water.
- Ensure paint cans are stored securely when working alongside vessel edges.
- Ensure floor grates of manlifts are covered to prevent spills from going into the marine environment.
- Waste generated from painting and other activities such as grinding, hand tooling and welding, must be prevented from entering the marine environment.

While painting vessels docked alongside the wharves or jetties, do not spray paint. Take sufficient measures to prevent paint from entering the marine environment.

Environmental Best Management Practices

Empty paint cans must be properly stored on dock bottom and dock side.

Temporary Paint Storage/Mixing Areas

- Must be under cover to protect from inclement weather.
- Only in designated areas.
- Must be on secondary containment (*a tarp at minimum*).
- Ensure empty paint cans and other associated wastes from painting are stored properly, protected from the weather, and removed from dock bottom as soon as possible.
- Ensure empty paint containers being dried for disposal are protected from rain.
- Do not dispose of used paint containers that still contain wet paint.

IMPORTANT!

In rare situations (*e.g. shape of the vessel, combined with ideal weather conditions*) containment may not be necessary to prevent overspray from escaping the area.

In this situation, the User must notify EGD Management prior to beginning the work, and obtain approval (*in writing*) to paint without completely enclosing the vessel.

Restrictions and monitoring requirements will be applied.

To this date this has only been allowed in three situations:

- Painting underneath a flat bottom barge.
- Painting the underwater hull portion of the midsection of a cruise ship.
- Painting of a C-class ferry underwater hull area, during calm wind conditions.

Environmental Best Management Practices

EBMP #4: Dry Dock Floor Management and Clean Up

Drain Management

- All sump well valves must be closed prior to and during power washing operations.
- Cover all tunnel drains and net cages during sandblasting, painting and power washing to prevent contaminants from entering the marine environment.
- In the case of a spill or release on dock bottom all sump well valves must be closed and all contaminated material contained and removed from dock bottom.
- Direct all contaminated water to the trench drain system, to avoid entering the tunnel drains.
- Collect and properly dispose of all contaminated water. Ensure sufficient equipment is available for contaminated water collection.
- Ensure all non-contaminated water is directed away from work areas and into the tunnel drain system (*e.g. ballast water, cooling water, caisson sill water*).

Hazardous Materials Managementt

- Store hazardous materials (*e.g. fuel, paint, waste oils*) away from the drains on dock bottom.
- Store hazardous materials to the inside of the trench drains so that any spills or releases can be captured.
- Store hazardous materials in areas protected from the weather, water curtains and other water sources.
- Ensure adequate spill response equipment is in close proximity to hazardous material transfer operations. At a minimum one spill kit is required per section of the graving dock.

Collect and properly dispose of all contaminated water.

Sediment Management

- Segregate any marine sediment, that may enter the dock during vessel transfer, from the waste generated during vessel repair. This is to reduce the amount of wastes requiring disposal.
- Collect and properly dispose of marine sediment that becomes contaminated with waste generated from vessel repair.
- Remove all contaminants and residues from the trench drains and sump wells prior to flooding at the end of work period.

Housekeeping

- Remove waste sandblast grit from the work area as soon as possible to prevent migration of grit contaminants into tunnel drain system.
- Store wastes collected from the dock floor in appropriate secondary containment and remove from dock bottom as soon as possible.

Residual paint in the cans may drip out of the skip and enter the marine environment through the drain systems.

Leaving garbage around the work site attracts wildlife such as seagulls, racoons and rats.

When cleaning dock bottom, skips of waste sandblast grit may leak contaminated water and should be removed as soon as possible.

All hazardous materials must be stored in appropriate containment and away from tunnel drain system.

Inspection and Cleanliness

- Prior to flooding, the drydock must be cleaned to meet the Esquimalt Graving Dock (*EGD*) *Standard of Cleanliness (see below),* as determined by the EGD undocking supervisor.
- Users must ensure that the dock floor is free of deleterious substances prior to flooding.
- Water may be used to clean the dock floor; however, any wastewater generated must be collected and disposed of properly.
- If a vessel occupies a shared portion of a dock section each User must clean the trench drains up to and including the section sump well.

ADEQUATE:
Example of a dock floor that would pass inspection.

INADEQUATE:
Example of a dock floor that would not pass inspection.

EGD Standards of Cleanliness

Due to the importance of drydock cleanliness prior to flooding, and since quantitative testing is impractical due to time and cost restrictions, the following guidelines will be used to assess cleanliness of drydock surfaces.

- All drydock surfaces, including stairwells and sills must meet the standard for "**residue free**" prior to flooding of the drydock. "**Residue free**" is considered met when a person of normal visual acuity, while standing, is unable to detect visible accumulations of potential pollutants.
- This includes, but is not restricted to:
    - the removal of abrasive grit,
    - paint residues or paint chips,
    - cutting and grinding wastes,
    - oil and grease,
    - food and drink containers,
    - ear plugs,
    - dust masks,
    - rope,
    - cigarette butts, or
    - any other refuse that may have been deposited during the work period.
- Debris of natural origin that may have been deposited during the previous flooding of the drydock, such as wood, sand, silt, seaweed, or marine life may be exempt from these requirements, as long as it will not contaminate the environment upon reintroduction.

AREAS IN NEED OF *SPECIAL ATTENTION*

ACCEPTABLE		NOT ACCEPTABLE
	**RAMPS**	
	**SILLS**	
	**KEEL BLOCKS**	
	**TRENCH DRAINS**	
	**SUMP WELLS**	

Environmental Best Management Practices

EBMP #5: Hazardous Materials Handling and Storage

A variety of hazardous materials are used, stored and transported by Users at the Esquimalt Graving Dock (*EGD*). If not handled appropriately, these materials have the potential to negatively impact worker health and safety, infrastructure and the environment. Hazardous materials commonly used at the EGD include: antifoulant paint, fuels and oils, antifreeze.

Storage

Users must have designated storage areas suitable for the materials they use on site. Where applicable, these areas must:

- Have appropriate secondary containment suitable to the quantity and nature of the material in that area.
- Ensure materials are stored in accordance with compatibility requirements.
- Be protected from the weather (*covered, lids secured, valves closed*).
- Have placards and proper ventilation.
- Have controlled access.
- Be located away from pathways to the marine environment.
- Be located on impervious surfaces (*e.g. concrete*).

Handling

All hazardous materials must be:

- Labelled appropriately with the owner name, product name, first aid information, and PPE requirements.
- Secured appropriately during transport.
- Transported by equipment that can sufficiently handle its weight and size.
- Transported in containers that are stable and not in need of repair (*e.g. totes with broken feet, excessive rust, faulty valves*).

ADEQUATE storage.

ADEQUATE storage.

INADEQUATE storage.

Any container holding hazardous materials must be clearly and properly labelled.

Areas to Avoid Storing Hazardous Materials

Trench Storm Drains
Any containers placed directly over top or beside a trench drain have the potential to spill to the drain leading directly to the ocean.

Storm Drains
Any containers placed directly over top or beside a storm drain have the potential to spill to the drain leading directly to the ocean.

Alongside Wharves and Jetties
Any containers placed alongside the edge of the wharves and jetties at the EGD have the potential to spill directly to the ocean, as there are no berms or secondary containment available.

Dock Floor Trench Drains
If a tote or drum is placed directly over or beside a trench drain, hazardous materials have the potential to flow down the drain and into the marine environment. Although the drains are designed for rapid containment and recovery, there is no guarantee that workers will be present to close drain valves during an incident.

Dock Floor Sump Wells
When the sump well valve is open the sump drains directly into the marine environment. Any containers placed on top of or adjacent to the sump well have the potential to enter the ocean if a spill were to occur.

Dock Floor Tunnel Grate Drains
Tunnel grate drains lead directly to the marine environment. Any containers placed directly over top of or beside a tunnel grate have the potential to impact the marine environment, should a spill occur.

Environmental Best Management Practices

Safety Data Sheet *(formerly Material Data Safety Sheet)*

A Safety Data Sheet (SDS) is a document that contains information on the potential hazards (*health, fire, reactivity and environmental*) and how to work safely with the product. SDSs also contains information on the use, storage, handling and emergency procedures all related to the hazards of the material. SDSs must be available (*electronically or hardcopy*) for all products stored on site and be readily available to all employees.

Storage Tanks and Totes

Storage tanks and totes are used for a variety of materials at the EGD, including: washwater, fuel products, bilge water, waste oil/fuel and other waste liquids. Storage tanks and totes may be considered portable/mobile, temporary or permanent. The regulatory requirements for proper use of these tanks vary and is dependent on a variety of factors.

Federal Regulation for Fuel Storage Tanks

The EGD is a Federal facility; therefore, storage tanks onsite need to comply with the Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations. Users may be required to register their tanks with Environment Canada. **Contact EGD Environmental Services for information.**

There are four different fuel tanks at the Esquimalt Graving Dock.

National Fire Code

The National Fire Code outlines the requirements for containment, labelling and location of flammable liquid storage.

Environmental Best Management Practices

EBMP #6: Waste Management and Recycling

Operations at the Esquimalt Graving Dock (*EGD*) generate a variety of waste streams including hazardous waste, controlled waste, biological waste, international waste, and general refuse and recyclables.

Hazardous Waste

Hazardous wastes generated at the EGD may include waste oil and oil filters, antifreeze, batteries, paint and solvents, oily rags and absorbent materials, spent grit, solids generated during power washing, mercury, PCB containing equipment and asbestos. Appropriate management of hazardous waste will reduce environmental liability associated with inappropriate disposal and storage as well as reduce the risk of human injury and environmental impact.

Hazardous waste storage should be segregated from new product storage.

- Ensure designated storage areas are away from active work areas.
- Ensure areas are covered to reduce exposure to environment and wildlife.
- Ensure that waste accumulation areas are organized.

Hazardous waste should be segregated into separate containers.

- Ensure containers used are appropriate for the type of waste (*e.g. separate drums for waste oil, oil filters, antifreeze, batteries, paint and solvents, oily rags and absorbent material, spent grit*).
- Store batteries in a manner that prevents leakage of acid to the environment.
- Properly dispose of contaminated clean-up materials (*e.g. absorbents, rags, etc.*).
- Do not dilute or mix hazardous waste, other hazardous or non-hazardous wastes.
- Cover waste containers to prevent exposure to weather (*e.g. rain*).

All hazardous waste must be carefully stored and disposed of.

Asbestos

All asbestos containers and asbestos-containing materials must be identified by signage and labelling in accordance with applicable legislation.

Companies that engage in asbestos related work at the EGD must be qualified to do so.

Clearly label all hazardous waste containers.

- Labels should include: type of waste, generator/company name, and contact information.

Controlled Waste

Controlled waste such as animal feces, sewage, contaminated grit, stormwater catch basin waste, creosote wood and dead animals can be disposed of at the **Capital Regional District (*CRD*) Hartland Landfill.**

Controlled waste disposal at requires a permit.

For more information about Controlled Waste disposal contact the CRD Hotline at (250) 360-3030.

Large scale food waste bin.

An example of a Waste Management Area at the EGD.

Food Waste

During normal activity at the EGD, food waste is collected in conveniently located and accessible receptacles onsite and disposed of at the landfill. During larger projects, however, alternative measures are taken to account for the increase in generated wastes.

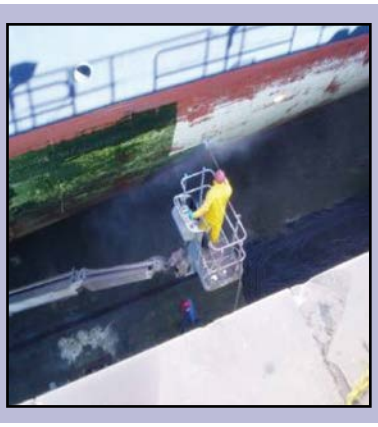
General Refuse

General refuse should be separated into categories to enable easy disposal. Users are responsible for properly disposing of refuse and recyclable materials. There are many containers throughout the site for disposal of common refuse materials (*e.g. steel, wood, glass, cardboard etc.*).

Biological Waste

Marine life removed from vessel hulls and sea chests may contain paint contaminants. This waste may be considered a controlled or hazardous waste and would need to be handled and disposed of accordingly.

Biological waste should be stored out of the sun, covered and removed from the facility quickly to prevent any odours from emanating.



Recycling

All Users of the EGD are responsible for collecting and disposing of the solid waste they generate from their activities, properties and vessels they are responsible for.

- Recycle solid waste such as plastic, glass, aluminum, mixed paper and cardboard. Recycling areas should be conveniently located and easily identifiable.
- Segregate other solid waste, such as scrap metal, wood, electronics, polystyrene foam and soft plastics for recycling at an approved facility.
- Leaf and yard waste collected on property should be composted or disposed of appropriately.
- Construction and demolition waste should be reused or recycled wherever cost effective and technically feasible.
- Encourage the use of recyclable products to reduce the solid waste impact on the environment.

International Waste

Like hazardous waste, International Wastes may pose a threat to human health and the environment.

Dunnage from vessels has been known to carry invasive species to local areas. Foreign dunnage must be identified, stored, and disposed of at an approved facility without delay.

Food wastes may carry pathogenic organisms that could cause illness to those handling it. Food wastes shall be kept in separate, closed containers. The **Canadian Food Inspection Agency *(CFIA)*** will inspect foreign vessels and issue directions on disposal.

EBMP #7:
Fuelling and Oil Transfer

The transfer of fuel and oil is a common activity at the Esquimalt Graving Dock (*EGD*). Transfer may be from ship to shore (*e.g. removal of waste fuel/oil*), from shore to ship (*e.g. refuelling a vessel from a truck)* or land based.

An accidental release during these operations has the potential to negatively impact the environment and health and safety of those at the facility.

- Prior to any fuelling or oil transfer operations:
    - the ***EGD Oil Transfer Checklist*** must be complete;
    - an emergency plan must be in place and readily available;
    - adequate spill response equipment must be available; and
    - personnel must be aware of spill response procedures.
- All transfer and storage equipment must be in good condition, tested, and properly connected.
- Do not place storage and transfer equipment near pathways to the marine environment (*e.g. storm drains, trench drains, edge of the dock*) without effective mitigation measures in place.

Vessel Fuelling and Bulk Oil Transfer
Definition of Oil: as described in the Canada Shipping Act **oil** is considered petroleum in any form, including: crude oil, fuel oil, sludge, oil refuse, gasoline, lube oil and refined products.

Berthed Vessels

- ALL berthed vessels receiving fuel from a truck or a barge require a containment boom.
- Transfers of fuel and oil to and from ALL berthed vessels require a containment boom.
- An ***EGD Oil Transfer Checklist*** must be filled out and signed by representatives from the truck and the vessel and submitted to EGD representatives in the Pumphouse prior to fuelling or oil transfer operations.
- Transfer operations must comply with the *Canada Shipping Act, Regulations for the Prevention of Pollution from Ships and for Dangerous Chemicals Subdivision 5*.

Vessels in Drydock

- ALL fuel and oil transfers occurring in the drydock require spill kits to be placed nearby and are not to be completed next to drainage pathways to the marine environment (*e.g. trench drains, sump wells, tunnel grate drains*).

On Land Transfers

- ALL fuel and oil transfers occurring on land require spill kits to be placed nearby and are not to be completed next to drainage pathways to the marine environment (*e.g. storm drains, edge of dock*).

Containment Boom Requisition

The Esquimalt Graving Dock has containment boom and deployment equipment available for requisition. To arrange for booking or rental, contact the EGD Operations Manager.

An orange inshore containment boom fully surrounds the vessel while being fuelled.

The hydraulic powered deployment reel with inshore containment boom available for requisition.

EXAMPLE SCENARIO REQUIREMENTS

Scenario 1: FUELLING A BERTHED VESSEL

- Completed and signed ***EGD Oil Transfer Checklist*** submitted to EGD Pumphouse.
- Containment boom deployed and effectively secured at both ends.
- Emergency response plan in place.
- Adequate spill response equipment and qualified personnel available.

EXAMPLE SCENARIO REQUIREMENTS (*Continued*)

Scenario 2: BULK OIL TRANSFER FROM A BERTHED VESSEL

- Completed and signed ***EGD Oil Transfer Checklist*** submitted to EGD Pumphouse.
- Containment boom deployed and adequately secured at both ends.
- Receiving containers located away from pathways to the harbour (*e.g. storm drains, edge of dock*).
- Receiving containers in secondary containment and in good condition.
- Emergency response plan in place.
- Adequate spill response equipment and qualified personnel available.

Scenario 3: FUELLING A VESSEL OR BULK OIL TRANSFER IN THE DRYDOCK

- Pumphouse operation on site prepared to shut down auxiliary pumps in case of an emergency.
- Receiving containers located away from pathways to the harbour (*e.g. trench drains, sump wells, tunnel grate drains*).
- Receiving containers in secondary containment and in good condition.
- Emergency response plan in place.
- Adequate spill response equipment and qualified personnel available.

Scenario 4: ONSHORE OIL TRANSFER BETWEEN CONTAINERS

- All containers located away from pathways to the harbour (*e.g. storm drains, edge of dock)*.
- Receiving containers in secondary containment and in good condition.
- Emergency response plan in place.
- Adequate spill response equipment and qualified personnel available.

Environmental Best Management Practices

EBMP #8: Invasive Species

Invasive species are a significant threat to the marine ecosystems of British Columbia. The Esquimalt Harbour is known to have a disproportionately high number of non-indigenous species. It has been widely recognized that the primary source of non indigenous marine species in local waters are the ballast tanks and hull surfaces of transoceanic vessels. Ship repair contractors are encouraged to report unusual species observed during hull cleaning activities.

Ballast Water

- Vessels must follow *Transport Canada Ballast Water Control and Management Regulations*

Ballast Tank Sediment

- Shipyards must follow *Transport Canada Ballast Water Control and Management Regulations*
- Sediments removed from the ballast tanks at the EGD must be contained, collected and disposed of at an authorized facility.
- Sediments must not be allowed to enter the harbour.

Anchor chain-growth

- All biological material removed from anchor chains must be contained, collected and disposed of appropriately.

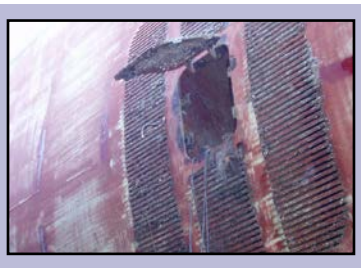
Sea chests

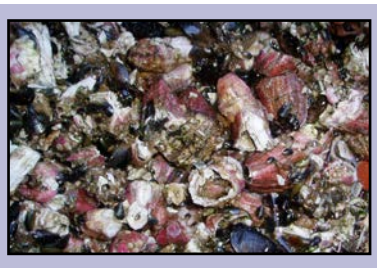
- All biological material removed from sea chests must be contained, covered and disposed of appropriately.
- Material must be stored away from direct sunlight/heat and disposed of as soon as possible, to avoid nuisance odour pollution.

Marine growth removed from vessel hulls must not be allowed to enter the harbour through the drydock drainage system.

INADEQUATE containment: Biological waste on drydock floor near drains.

INADEQUATE containment: Biological growth mixed with paint waste on drydock floor.





Sea chests, such as this one from a cruise ship docked at the EGD, often contain a significant amount of marine life.

If not managed appropriately, this marine life has the potential to negatively impact the local ecosystem of the harbour.

EBMP #9: Fish and Wildlife Management

The daily operations and activities of the Esquimalt Graving Dock (*EGD*) have the potential to negatively impact wildlife that frequents the property. The *EGD Wildlife Management Plan* has been developed to assist EGD employees and Users to properly manage interaction with fish and wildlife that are common to the facility.

Fish

Fish and other marine life have the potential to become stranded in the drydock during normal vessel docking/undocking operations. This may include, but is not limited to: salmon and other fish species, seals and octopus.

- The bubble curtain must be employed during vessel transfer into and out of the drydock.
- EGD employees must monitor the drydock for stranded fish and/or other marine life during dewatering and report cases to EGD Environmental Services.
- Whenever possible, EGD employees must retrieve fish and marine life and safely return them to the Esquimalt Harbour.
- Users are prohibited from removing fish and marine life from the drydock.

Report all cases of fish and marine life interaction with the drydock to EGD Environmental Services.

Wildlife

A variety of wildlife is known to occupy areas of the EGD property. In some cases wildlife may use the facility as a nesting/breeding ground, while others are present for short periods of time during migration or to feed. Activities and operations at the EGD have the potential to impact the well being of wildlife at the facility.

Such wildlife includes: deer, raccoon, mink, river otter, great blue heron, osprey, raven, Canada goose and a variety of other common waterfowl, nesting and songbirds and pollinators *(e.g. bats, native bees)*.

Bubble curtain employed during vessel transfer.

Stranded marine life must be carefully returned back to the Harbour.

Fisheries Act - Destruction of Fish

The EGD has received authorization for the destruction of fish associated with normal operation of the drydock from the Department of Fisheries and Oceans (*DFO*).

Conditions of the Authorization:

- Take all reasonable precautions to prevent the trapping and mortality of fish.
- Monitor the success of preventative measures and retrieval success.
- Report to the DFO annually.

Environmental Best Management Practices

- ALL wildlife must be left alone. Do not approach or handle newborn or juvenile wildlife.
- Injured or orphaned wildlife must not be handled without proper experience and equipment.
- Dispose of dead wildlife appropriately.
- Report observations of injured or deceased animals to EGD Environmental Services.
- Prior approval from EGD Environmental Services is required for the relocation or removal of nesting wildlife; a Migratory Bird Damage or Danger Permit is required to remove nests and retrieve eggs of migratory birds (*e.g. seagulls*).
- Never mistreat, remove or destroy any areas that could provide habitat for wildlife without prior approval and receipt of appropriate permits from the relevant authority.

Contact EGD Environmental Services for wildlife related information, incidents and interactions.
Contact the Front Gate Commissionaires for afterhours assistance.

A variety of wildlife is known to occupy areas of the Esquimalt Graving Dock property.

Incidents with wildlife are managed on a case by case basis.
Direction and/or assistance must be taken from the appropriate authority when required.

EBMP #10: Water Use

The Esquimalt Graving Dock (*EGD*) is considered a major consumer of fresh water. Water is provided to the facility by the Capital Regional District (*CRD*) distribution system, on a fee for use basis. Inefficient use of water may result in a negative economic and environmental impact. Water consumption and the quality of water are both considerations of the environmental management systems at the EGD.

Water Consumption

Large volumes of water are used during normal operations at the facility; because of this, the EGD is considered a high volume user of fresh water in the CRD. Users must be conscious of activities that consume high volumes of water and work to mitigate any water waste.

In order to reduce the amount of water consumed onsite:

- Mitigate dust in problem areas using high efficiency Dust Suppression Units, when physical containment techniques are not sufficient to prevent fugitive dust emissions.
- Use fire nozzle water curtains only when all other attempts to contain particulate emissions from sandblasting have failed. Water curtain use must be approved by EGD Management in advance.
- Avoid use of freshwater to clean work areas, where possible.
- Maintain fittings in buildings and on equipment to prevent leakages.

Water Consuming Activities

Activities associated with vessel surface preparation and dust control use significant amounts of water.

Conventional pressure washing and ultra high pressure (UHP) washing use large amounts of water at high pressure to scour paint and biological material from the hulls of ships.

Dust Suppression Units

Dust Suppression Units are used to mitigate the escape of dust from sandblasting operations in the drydock.

Water Quality

The water distribution system at the EGD was originally designed as a fire suppression system; therefore, the water in certain areas of the system may not be considered potable.

- Potable water is not available throughout the facility (*this includes intake to vessels moored alongside or in the drydock*).
- Users of the facility are responsible for ensuring that the water they use meets the guidelines for the purpose intended.
- Users must use backflow prevention when accessing the water distribution system.

The EGD maintains the fresh water distribution system.

- Flushing of the entire system is conducted on an annual basis.
- Collection and analysis of water, in comparison to drinking water quality guidelines, is conducted on an annual basis.

Metered Water Use at the Esquimalt Graving Dock

- Users of the facility must ensure that water is accessed from a metered line when connecting to the water distribution system.
- Portable meters are to be used when required.
- The EGD Pumphouse must be contacted for proper access to the water distribution system.

EBMP #11: Energy Conservation

The Esquimalt Graving Dock (*EGD*), as an industrial facility, is a major consumer of energy. Inefficient energy use may result in negative economic and environmental impacts. Economic impacts are associated with inefficient electrical usage (e.g. cost), while environmental impacts include those associated with the consumption of fuel (*e.g. air emissions*).

Energy consumption also results in the production and release of greenhouse gas emissions through the combustion of fossil fuels. Every aspect of work at the EGD results in the release of greenhouse gases, whether it is operating the cranes or printing a report. It is important to minimize energy consumption wherever possible to reduce the release of harmful greenhouse gases and conserve energy.

Electrical Consumption

There are a number of opportunities to increase the efficiency of electrical usage at the EGD:

- Turn off lights and equipment when not in use (*e.g. flood lights, office buildings*).
- Install energy efficient devices in buildings (*e.g. sensor switches, efficient light bulbs*).
- Use energy efficient equipment whenever possible and consider energy efficient options when purchasing new equipment.
- Stagger equipment start-up to decrease load on electrical system.

Environmental Best Management Practices

Fuel Consumption and Emissions

Opportunities to decrease the amount of fuel consumed by day to day activities include:

- Using energy efficient vehicles.
- Using alternative fuels where possible (*e.g. Biofuels*).
- Using alternative energy sources where possible (*e.g. LED, solar, rechargeable*).
- Avoid idling vehicles (*e.g. delivery vehicles*).
- Use shore power where possible.
- Encourage staff to try alternative means for commuting to work (*e.g. carpool, public transit, cycling*).

Be aware of the potential impacts of emmissions on neighours near the EGD.

Idling Vehicles

- Do not idle vehicles near building doorways or air intakes
- Vehicles must be turned off if idling for more than 3 minutes in a 60-minute period.

Idling vehicles produce unnecessary air emissions and noise.

Shore Power

For vessels moored alongside at the North Landing Wharf and in the drydock it is important that they utilize shore power when possible. With shore power, the auxiliary generator can be turned off, thereby saving fuel and preventing the release of harmful air pollutants.

Did You Know?

Shore Power may be accessed at the EGD:

- 208V and 480V available on the North Landing Wharf and drydock.

EBMP #12:
Nuisance Pollution (Noise/Odour/Light)

The daily operations of the Esquimalt Graving Dock (*EGD*) Users have the potential to negatively impact neighbouring residents and businesses, as well as the immediate work area. Nuisance pollution is often created by noise, odour and light.

Noise

- Noise pollution can be generated and recognized in decibel levels, pitch, oscillation and duration.
- The main sources of noise at the EGD include sandblasting, drilling, hammering, compressors, generators and the crane warning bell. Even general shop repair activities generate large amounts of noise.
- Sound carries. Operational noise, vehicle noise and loud voices can be heard in nearby areas. Site Users must be aware of the potential impacts of all activities taking place at EGD and be respectful of neighbours.
- Schedule noisy activities for daytime hours 0700 hrs to 2300 hrs on weekdays, weekends and holidays. Through worker education and good practice the generation of high-level intermittent or non-continuous noises can be minimized.
- Personal vehicles, including motorcycles, can disturb neighbouring residents. Your vigilance is appreciated especially during quiet hours. Warning signs are posted at parking areas to remind personnel to be respectful of neighbours when arriving and departing the EGD.
- The EGD recognizes applicable municipal laws and regulations. Operations will consider the requirements of the *Municipality of Esquimalt Bylaw 2826 Maintenance of Property, Unsightly Properties and Nuisance Bylaw Part III Nuisances Noise Contro*l.

The EGD is located in close proximity to residential areas.

Personal vehicles with loud engines can disturb neighbouring residents.

Warning signs in parking areas act as a reminder to minimize noise at EGD.

Responses to nuisance pollution complaints will be taken on a concern-by-concern basis.

To submit a nuisance complaint contact the Esquimalt Graving Dock Information Line at (250) 363-0227.

Environmental Best Management Practices

Odour

- Daily dock operations often create strong and unpleasant odours whether from the release of VOCs, H2S, organic materials, or chemicals. An offensive smell can reduce the quality of the work environment for neighbouring tenants and residents. Biological material removed from bilges, sea chests and hulls must be contained, covered and disposed of appropriately. Be proactive in planning for timely transport and proper disposal of material; a permit may be required for disposal.
- Material must be stored away from direct sunlight/heat and disposed of in a timely manner, to avoid nuisance odour pollution.
- Odour mitigating measures may be required, if odours are negatively affecting neighbouring properties or onsite personnel.
- The EGD recognizes applicable municipal laws and regulations. Operations will consider the requirements of the *Municipality of Esquimalt Bylaw 2826 Maintenance of Property, Unsightly Properties and Nuisance Bylaw Part III Odour and Disturbances*.

ADEQUATE containment of odorous waste.

INADEQUATE containment of odorous waste.

Light

- Night time dock operations require spotlights to provide a safe work environment. Be aware that strong spotlights can be a significant intrusion for residential neighbours.
- Only utilize spotlights when absolutely necessary. This will help prevent disturbing the neighbours, as well as to ensure a more energy efficient work environment.
- Changing the direction of stationary and portable lights in the workplace may reduce the effect they have on the neighbours.
- Turn off any unnecessary lights.
- The EGD recognizes applicable municipal laws and regulations. Operations will consider the requirements of the *Municipality of Esquimalt Bylaw 2826 Maintenance of Property, Unsightly Properties and Nuisance Bylaw Part III Odour and Disturbances.*

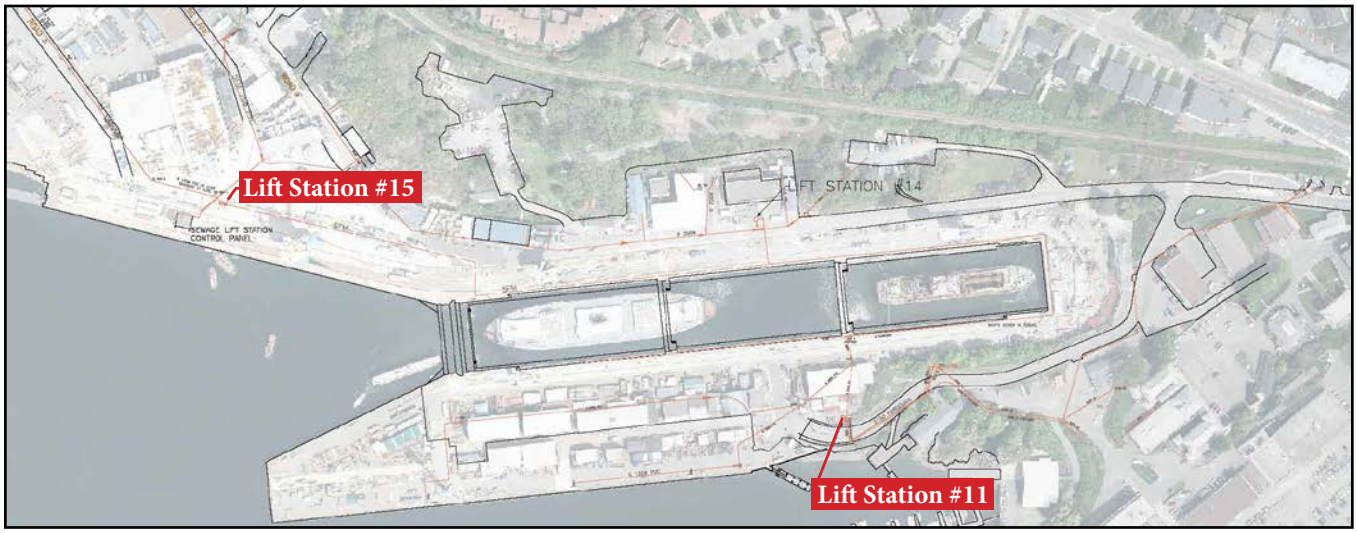
Only utilize spotlights when necessary.

Changing the direction of spotlights can reduce light impact on neighbours.

EBMP #13:
Sanitary Waste Management and Sewer Use

The Esquimalt Graving Dock (*EGD*) is authorized by the Capital Regional District (*CRD*) as a ship and boat waste disposal facility. The authorization allows for the proper discharge of sanitary waste, grey water and superchlorinated water at designated locations at the EGD, and stipulates the requirements that must be met prior to discharge.

Discharge to the sanitary sewer at any location other than at LS#15, LS#11 or at vessel connections located in the services tunnels of the drydock is prohibited.



Lift Station #11.

Lift Station Maintenance.

The EGD is authorized to discharge to the sanitary sewer at:

- Lift Station #15 (*LS#15*),
- Lift Station #11 (*LS#11*), and
- Vessel connections in the drydock.

Permitted wastes include:

- Sanitary waste, *
- Grey water, and
- Treated superchlorinated water.**

Sanitary Waste: *must contain <50,000 ppm total solids.*

***Superchlorinated Water:** must not be discharged to the sanitary sewer unless it has been de-chlorinated to less than 5 ppm chlorine.*

Prohibited wastes include:

- Bilge and ballast water,
- Wastewater sludge, and
- Fuel and oil, paint, paint thinner, solvents, and products containing toxic chemicals.

Other Wastes

Other wastes may be considered for discharge to the sanitary sewer on a case-by-case basis; approval *must be* requested from EGD Management prior to discharge.

Discharge to the sanitary sewer at locations other than those authorized may be considered on a case-by-case basis; approval *must be* requested from EGD Management prior to discharge.

Waste Discharge Notification

Envirosystems Inc. will, as a standard operating procedure, notify the EGD Pumphouse prior to large volume discharges to the sewer system (*e.g. any "batch discharge" in excess of 20,000 litres*). Coordination of discharge may be required depending on usage of the sanitary sewer system at the time.

Envirosystems Inc. will contact the Pumphouse on a regular work day if Envirosystems Inc. is planning to discharge large volumes during times other than Monday to Friday, day shift (*0730 hrs to 1600 hrs*) or on statutory holidays.

Envirosystems Inc. must contact EGD Management if there is a change in normal discharge operations (*e.g. increase in daily volume*).

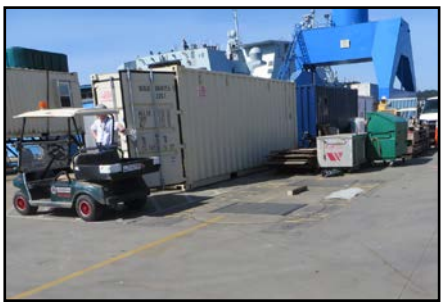
Access to the Sanitary Sewer

- Users must notify the Pumphouse before conducting any discharges to the sanitary sewer. Typical methods of discharge include: large (*direct connection and discharge from a vessel*), and small (*portable discharges from totes and tanks*).
- Users must complete a ***Sanitary Sewage Discharge Form*** and provide it to the Pumphouse prior to discharging to the sanitary sewer.
    - Pumphouse Operators will ensure that sanitary sewer discharges are in accordance with applicable regulations and authorizations.
    - Pumphouse Operators will provide all completed ***Sanitary Sewer Discharge Forms*** to EGD Environmental Services.
- Users must ensure a sample collection point is accessible at the point of discharge.
- Users must request approval from EGD Management to connect directly to the sanitary sewer for regular domestic waste (*e.g. washrooms, sinks, toilets*). Any other waste is prohibited from being discharged of through these lines.

Lift Station Maintenance

- Commissionaires will contact the Pumphouse on radio Channel 4 when DND sewer maintenance personnel enter the facility.
- Pumphouse staff will supervise DND personnel work on the lift stations where required.

AUTHORIZED Sanitary Sewer Discharge point, Lift Station #11.



AUTHORIZED Sanitary Sewer Discharge point, Lift Station #15.

UNAUTHORIZED Sanitary Sewer Discharge point (i.e. storm drain).

UNAUTHORIZED Sanitary Sewer Discharge point (i.e. trench drains).

UNAUTHORIZED Sanitary Sewer Discharge point (i.e. sewer manhole).

EBMP #14: Spill Preparedness and Response

The Esquimalt Graving Dock (*EGD*) is committed to the protection of human health and the environment. Safety and environmental management programs have been implemented at the EGD to reduce the potential for accidents and spills. Emphasis is placed on the prevention of spills, and although the potential for spills can be reduced through these programs, spills do still happen.

All Users operating at the EGD must have the capability to effectively manage spills resulting from their activities and operations.

- User employees must have adequate training in spill response.
- User employees must have access to spill response equipment and materials appropriate to the work they are performing.
- Users must have plans and procedures in place to respond to spills.

For spills which are beyond the capability of the User or are not being effectively responded to by the User, the EGD will provide assistance. The EGD has additional resources available, including:

- Spill kits and response materials for land and water based spills.
- Containment boom, deployment reels and boat.
- Pneumatic skimmer with drum and brush recovery modules, deployment and retrieval services.
- Staff trained to deal with land and water based spills.

For spills beyond the capability of the facility to manage, contact *Emergency Management* (EM*BC*). Additional resources will be coordinated for response to land and water based spills.

ALL Spills at the Facility
MUST BE REPORTED to EGD Management.
Details are to be provided in an *Incident or Spill Report*.

Spill response training at EGD.

Spill response training at EGD.

Spill response equipment: Skimmer.

Spill response equipment: Spill Kit.

Environmental Best Management Practices

Assess the situation.

Stop product flow.

Secure the area.

Steps to Spill Response

Assess the Situation

- Never rush in. Warn others in the immediate area.
- Stay upwind of the spill and avoid low lying areas.
- Quickly and accurately gather details that may need to be communicated to spill response personnel and the authorities including:
    - What equipment or work activity is involved?
    - What hazards are associated with the spilled product?
    - How large is the spill?
    - Is the situation under control or is it escalating?
    - What areas are or could be affected?
    - Proposed strategy to contain/control the spill.
    - Notify others in the area of the spill.

Stop Product Flow

- Act quickly to stop product flow, ONLY IF SAFE TO DO SO.
- Activate emergency shutdowns (*if applicable*).
- Close delivery truck manifold valves, etc. (*if applicable*).

Secure the Area

- Clear the area of public and untrained personnel.
- Ensure those onsite are wearing appropriate PPE.
- If spill is indoors, ensure the building is evacuated.
- Isolate large spills in all directions.
- Limit or prevent access to the site.
- Enforce safety procedures.

Contain the Spill

- Approach the spill from an upwind direction and avoid low lying areas.
- Use appropriate PPE (*e.g. gloves, eye protection, respirator*).
- Follow safe work procedures.
- Block drains, culverts, and ditches to prevent entry into waterways, sewers or confined areas.
- Contain spill with absorbent materials (*from spill kits*), earth, sand, or other non-combustible materials.

Notify the Authorities

- Contact your Supervisor immediately.
- Report the spill to EGD Management.
- For spills greater than 100L on land, or any spill of any size that enters the marine environment, contact: Emergency Management (*EMBC*) Reporting Line: 1-800-663-3456.
- Additional reporting requirements may be required depending on the spilled material.

Recovery and Clean Up

- Use appropriate materials to recover spilled product (*e.g. loose absorbent, pads, booms, socks*).
- Place waste in labelled 6mm plastic bags or leak proof containers.
- Store waste in secure, dry, well-ventilated location, away from heat and ignition sources.
- Consult with authorities before removing waste from site.
- Arrange for waste disposal at an approved facility by a qualified contractor.

Investigation & Reporting

- Investigate the spill or incident and complete and submit required reports to the authority having jurisdiction.

Contain the spill.

Environmental Emergency Contacts (24 Hours):

EGD Commissionaires
250-363-3784

Emergency Management (*BC*) Reporting Line
1-800-663-3456

DND QHM
250-363-2160
or
VHF Channel 10

Recovery and clean up.

EBMP #15:
In-Water Hull Cleaning and Maintenance

The cleaning, maintenance and repair of the underwater hull and associated appendages in water has the potential to release harmful contaminants into the marine environment.

In-water Hull Cleaning

- In-water hull cleaning of vessel hulls, that are coated with antifouling paint, is **prohibited** at the Esquimalt Graving Dock.
- In-water hull cleaning of vessels coated in non-biocide containing paints (*such as silicone based*), **may be considered** on a case-by-case basis and must be approved by EGD Management prior to the commencement of work. This applies to in-water hull cleaning to remove organic growth only, NOT to coating removal.

In-water Maintenance

- In-water maintenance may be considered on a case by case basis and must be approved by EGD Management prior to the commencement of work. In-water maintenance may include but is not limited to:
    - Cleaning of anodes, inlets, props, and transducers for operational and inspection purposes only.

All vessels approved for in-water hull cleaning or maintenance must have a containment boom in place prior to work starting.

Additional requirements may be required on a case by case basis depending on the scope of work involved.

NOTE: Cleaning of the above water hull while berthed alongside the dock is PROHIBITED.

Did You Know?

Antifouling paints and their residues contain heavy metals, such as copper, which are toxic to aquatic organisms, including salmon and shellfish.

Wash water and solid residues from the washing, scraping, sanding and blasting of antifouling paints from boat hulls are considered "*deleterious substances*" under the *Fisheries Act*. Releasing these wastes to fish bearing waters is a violation of the Act.

Environmental Best Management Practices

EBMP #16: Housekeeping

An organized, clean facility provides an environment that reduces the potential for pollutants to enter surface and ground water through spills and accidents. General cleanliness will lead to more organized and consistent handling of hazardous materials and waste products. Good housekeeping programs will identify and assign responsibilities for shift clean up, day-to-day cleanup, proper waste disposal, removal of unused material, and regular inspection.

Clean-Up

- Clean debris from work areas immediately after any maintenance activity. Dispose of collected material appropriately.
- Ensure garbage and recycling containers are available in all leased areas and are emptied regularly.
- Do not use running water to clean the work areas where potentially contaminated water could enter the stormwater system.
- Ensure trench and storm drains within designated leased areas are kept clean and free of debris.
- Sweep and/or clean active working areas on a regular basis.

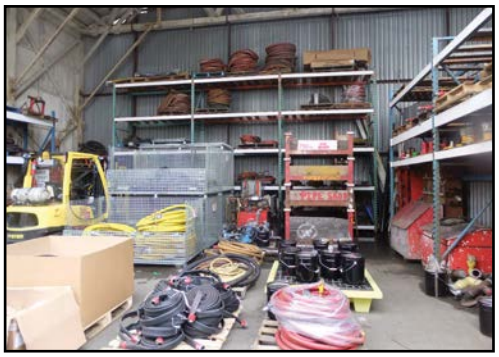
Storage

- Do not store materials or equipment outside of leased areas.
- Regularly inspect lease areas for unidentified or improperly stored materials.
- Ensure all stored products and wastes are clearly labelled and identifiable.
- Place a drip pan underneath vehicles and equipment when performing maintenance. Promptly transfer used fluids to the proper waste or recycling drums.
- Ensure all containers (*e.g. drums, totes, pails*) are in good condition and have a clean exterior at all times. Ensure containers are not left open; secure lids or cover containers when not in use.

INADEQUATE: Keep work areas neat & orderly.

INADEQUATE:
Keep trench and storm drains free of debris.

INADEQUATE:
Ensure storage containers are not left open.



ADEQUATE: Keep work spaces organized and clear of debris to prevent accidents.

EBMP #17: Stormwater Management

Stormwater has been identified as one of the primary pathways of contaminant loading to the local harbour associated with Esquimalt Graving Dock (*EGD*) operations. Common contaminants found in stormwater samples include metals, extractable petroleum hydrocarbons (*LEPH/HEPH)*, and total suspended solids (*TSS*). Five upland stormwater catchment areas terminate into the Esquimalt Harbour from the EGD property. The drydock floor tunnel drainage system leads directly to the Esquimalt Harbour. Any material entering the tunnel drainage system, either through tunnel grate drains or open sump well valves, will end up in the harbour. Deleterious materials must not be allowed to enter the storm or tunnel drain system.

Uplands Stormwater Management

- Store hazardous materials away from storm drains and trenches on the dock floor and in upland areas.
- Ensure totes, drums, pails and skips containing hazardous materials are protected from the weather (*e.g. lids secure, tarps in place*).
- Place filter cloth over storm and trench drains when working with deleterious substances that are in close proximity to, and that could pose a hazard to the marine environment.
- Divert and contain stormwater runoff containing contaminants and sediment with proper materials and filtration, prior to entering the drains (*e.g. use filter cloth, hay bales, sand bags*).
- During heavy stormwater events, ensure storm drains and trenches are kept clear of debris to prevent flooding.
- Conduct regular inspections of storm and trench drains in lease areas to ensure they are kept clear of debris.
- When using trench drains for secondary containment, ensure the containment system is monitored and removed in a stormwater event. A blocked trench drain may cause flooding of the area.

Prevent deleterious substances entering marine environment by placing filter cloth in the trench drains.

Sand bags used on dock bottom to divert and filter excess water.

Do not allow trench drains to build up with debris. This helps to prevent flooding during heavy stormwater events.

Drydock Floor Stormwater Management

- Stormwater has the potential to mix with washwater and other contaminants on the drydock floor during normal operations. Users of the drydock must plan in advance for stormwater management during their work period.
- To reduce the amount of washwater requiring treatment, stop power washing operations until stormwater can be controlled.
- To prevent contamination of stormwater with washwater, waste sandblast grit and other hazardous materials and wastes, cleanup work areas as soon as possible.
- Sump well valves may be opened to allow stormwater to drain into the tunnel drains when the trench drains, sump wells and dock floor area is clear of contaminants and debris. In the case where washwater collection is completed, but the trench drains, sump wells and dock floor have not been cleaned, a filter cloth may be secured over an open sump well valve to allow stormwater flow. This procedure prevents contaminants and debris from entering the drainage system. This method requires dedicated personnel management of the process and regular filter cloth replacement. Do not poke holes in the filter cloth.
- Tunnel grate drains on the drydock floor in Section 2 and 3 may be uncovered enough to allow stormwater to flow into the drains. Ensure the area is clear of contaminants and debris.
- Sump well valves must be closed in sumps containing visibly contaminated material. Sump wells must be pumped out and cleaned prior to opening the valves.
- Ensure there is capacity in the trench drain/sump well collection system to manage expected stormwater volume. This will allow for continued collection and will prevent flooding of the dock floor.
- Prior to flooding and dewatering of the drydock, ensure all sump well valves are open.

Uplands storm drain with filter cloth. Avoid storing hazardous materials near storm drains, which are directly linked to the marine environment.

Filter cloth secured over sump well valve to allow stormwater flow.

EBMP #18:
Property and Infrastructure Maintenance, Modifications and Construction

Significant environmental issues and potential impacts are known to be related to the management of Esquimalt Graving Dock (*EGD*) property and infrastructure. Any new property and infrastructure construction or modification projects at the EGD must consider environmental issues in project planning and implementation. Common environmental aspects that require consideration and management when planning and implementing projects include: dust emissions, hazardous materials and wastes, storm water runoff, noise, and prevention and response to accidental spills and releases. Requirements for the operational aspects are identified in specific sections of the EGD EBMPs.

Infrastructure Maintenance & Repair

Maintenance and repair of existing facility property and infrastructure often results in waste generation and other environmental aspect considerations to be addressed.

Minor Concrete Work

- Contain dust emissions from cutting and drilling.
- Prevent concrete slurry runoff from entering storm drains.
- Prevent debris from mixing concrete from entering storm drains or the marine environment.
- Prevent concrete slurry runoff from entering the trench and tunnel drains and the "moonpool" on the drydock floor.

Use of Preserved Wood

- Avoid use of creosote preserved wood products where possible.
- Follow applicable guideline for use of preserved wood products.
- Creosote wood waste may be considered a hazardous, restricted or controlled waste, and must be handled and disposed of accordingly.

Demolition/Renovation

- Ensure structures are assessed for the presence of hazardous materials prior to demolition or renovation (*e.g. asbestos, lead based paint, PCB and mercury containing ballasts, mould*).
- Hazardous materials and waste must be handled and disposed of according to applicable regulatory requirements.
- Halocarbon containing equipment must be managed in accordance with the Federal Halocarbon Regulations.

Land Use Application

The EGD Land Use Application (*EGD LUA*) contains sections specific to potential environmental aspects related to the project. These sections must be completed with all relevant information.

EGD Management will respond with additional environmental protection and mitigation measures if required.

Infrastructure Modification & Construction

All modification and construction projects at the EGD must be assessed for environmental impacts, and plans put in place to mitigate the identified impacts. Projects managed by the EGD will be completed in accordance with the national project management system and site specific requirements.

For projects managed by Users:

- Any changes to infrastructure, changes to an existing lease or application for a new lease, must be approved by EGD Management.
- Prior to the approval of a property or infrastructure project, the EGD Land Use Application must be completed in full and submitted to EGD Management for review.

Green Space and Vegetation

The EGD property includes areas of vegetation that provides many benefits, including important habitat for wildlife and sensitive native plant species, and act as a buffer between the industrial operations of the facility and the neighbouring residential area.

All projects which have the potential to impact green space, vegetation and wildlife habitat must be reviewed and approved by EGD Management.

Tree and Vegetation Compensation Policy

To facilitate the EGD wildlife management plan and reduce the likelihood of habitat loss at the facility, property and infrastructure projects that require the removal of vegetation must provide compensation in the form of appropriate vegetation replacement. Additional supplies are also required when compensation vegetation is purchased to ensure that new plantings will be successful (*e.g. soil, mulch, tree protection, and water bags*). Consult with EGD Management prior to work to determine what compensation is required.

Soil Management

The EGD has undergone significant capital and operation and maintenance projects in recent years. Extensive investigations into the soil conditions (*e.g. contamination and structure*), utility mapping and identification of archaeological conditions have taken place. The industrial history of the facility has resulted in known contamination of the soil and in-fill material used on site. The primary contaminants commonly found at levels exceeding industrial soil standards include: arsenic, cadmium, copper, lead, mercury, zinc, and polycyclic aromatic hydrocarbons (*PAH*).

Requirements for Excavation

Planning Excavation

1. Consult with EGD Management prior to excavation to identify:

- Project area and excavation boundaries.
- Known utilities, structures, and historical information regarding the proposed excavation area.
- Known contaminated soil locations and the nature and level of contaminants potentially in the soils to be excavated.
- Archaeologically significant areas, requirements for mitigation of archaeological impacts, and dealing with unanticipated archaeological finds.

2. Prepare a plan for soil management: stockpiling and sampling of soils to be excavated. Key issues to be considered include:

- Turnaround times for sample results may take up to 2 weeks.
- Parameters to be sampled may vary depending on the area of excavation. Common parameters include total metals, leachable metals, PAHs, and hydrocarbons (*LEPH, HEPH*).
- EGD Management must approve stockpile areas.
- Soils which exceed the CCME Industrial Levels or BC CSR Industrial Levels: must be disposed of off site at an approved disposal facility.
- Soils which are below industrial standards: may remain on site if geotechnically suitable, if there is an identified use for the soil, and when approved by EGD Management.

3. Ensure contractors and employees are aware of the health and environmental risks associated with the suspected contaminated soils and have procedures in place to mitigate the risks. This includes adequate Personal Protective Equipment (PPE) and hygiene practices (e.g. no smoking, wear gloves).

ADEQUATE soil stockpile management. Soils placed on poly and covered.

INADEQUATE stockpile of contaminated soil. Soil should be covered to prevent exposure to elements, runoff and people.

Conducting Excavation

- Ensure appropriate PPE and hygienic precautions are in place to prevent exposure to contaminants in the soils.
- Monitor all excavations for visible soil contamination or archaeologically significant material.
- Ensure soil is stockpiled, sampled and analyzed in accordance with the Environmental Management Act and Contaminated Sites Regulation, and BC Ministry of Environment Technical Guidance Document 1, Site Characterization BC Government Technical Guidance on Contaminated Sites (*January 2009*).
- Ensure soils suspected of contamination are stockpiled on an impervious surface (*e.g. 6 mil PVC or plastic poly liner*) and adequately covered to prevent exposure to wind, storm water runoff or people. Stockpiles must not exceed 50m^3 in size.
- Imported fill material used for surfacing, backfilling or any other use must meet CCME Residential/Parkland (*RL/PL)* Land Usage Soil Quality Guidelines. Fill material information must be provided to and approved by EGD Management before being used on site.

After Excavation

- Ensure all soil is disposed of at a facility that is permitted to accept that material.
- Obtain all disposal records, including: waste manifests, weigh bills and disposal certificates from the receiver.
- Report the volume, analysis results, excavation details and dimensions and disposal records to EGD Management.
- Provide all as-builts and project drawings to EGD Management in the format compatible with the EGD drawing standards.

Archaeological Considerations

The EGD property and surrounding area has a rich First Nations history. There are Provincially Registered Archaeological Sites listed within the property boundaries of the EGD.

- All excavation projects must be reviewed and approved by EGD Management prior to work beginning.
- Depending on the scope of the project a detailed Archaeological Impact Assessment may be required.
- All Users, including contractors and employees working on excavation projects, must be made aware of the potential for archaeological chance finds. In the case where suspect archaeological material is discovered during excavation, work must stop in that area and EGD Management must be notified immediately.

Archaeological Overview Assessment

An Archaeological Overview Assessment was conducted for the EGD which outlines the archaeologically sensitive areas on the property and identifies areas of high archaeological potential.

Archaeological significant materials found during excavation projects at the facility include shell midden, artifacts, faunal and human remains.

Many archaeologically sensitive areas exist on the EGD Property.

First Nations archaeologists examine materials unearthed during excavations at EGD.

APPENDIX D – PHOTOGRAPHIC LOG

1. Photographic Log (19 pages).

Stantec

Photographic Log

Client:	**PWGSC**	**Project:**	**Building 1007 Demolition**
Site Name:	**Esquimalt Graving Dock**	**Site Location:**	**825 Admirals Road, Esquimalt BC**

Photograph ID: 1 **Photo Location:** Interior bay **Direction:** Looking northeast **Survey Date:** 10/18/2021 **Comments:** Typical brick and concrete walls with plywood inserts	
Photograph ID: 2 **Photo Location:** Interior bay **Direction:** Looking northeast **Survey Date:** 10/18/2021 **Comments:** Typical concrete walls with plywood inserts	

Client:	**PWGSC**	**Project:**	**Building 1007 Demolition**
Site Name:	**Esquimalt Graving Dock**	**Site Location:**	**825 Admirals Road, Esquimalt BC**

Photograph ID: 3 **Photo Location:** Northeast corner **Direction:** Looking southwest **Survey Date:** 10/18/2021 **Comments:** Exterior brick wall of west elevation	
Photograph ID: 4 **Photo Location:** Interior bay **Direction:** Looking northwest **Survey Date:** 10/22/2021 **Comments:** Interior side of typical bay door	

Client:	**PWGSC**	**Project:**	**Building 1007 Demolition**
Site Name:	**Esquimalt Graving Dock**	**Site Location:**	**825 Admirals Road, Esquimalt BC**

Photograph ID: 5 **Photo Location:** Interior between bays **Direction:** Looking northeast **Survey Date:** 10/18/2021 **Comments:** Typical brick interior partition wall	
Photograph ID: 6 **Photo Location:** Southwest exterior **Direction:** Looking north **Survey Date:** 10/22/2021 **Comments:** Typical concrete column, spandrel beam, brick wall and corrugated metal panel at bay door - southwest corner	

Client:	**PWGSC**	**Project:**	**Building 1007 Demolition**
Site Name:	**Esquimalt Graving Dock**	**Site Location:**	**825 Admirals Road, Esquimalt BC**

Photograph ID: 7 **Photo Location:** West exterior (central) **Direction:** Looking southeast **Survey Date:** 10/22/2021 **Comments:** beams and garage doors of west elevation	
Photograph ID: 8 **Photo Location:** Interior bay **Direction:** Looking east **Survey Date:** 10/22/2021 **Comments:** Wood ceiling and wood beams	

Client:	**PWGSC**	**Project:**	**Building 1007 Demolition**
Site Name:	**Esquimalt Graving Dock**	**Site Location:**	**825 Admirals Road, Esquimalt BC**

Photograph ID: 9 **Photo Location:** Interior bay **Direction:** Looking northwest **Survey Date:** 10/18/2021 **Comments:** Typical brick walls with concrete cap and wood beams/ceiling. Steel hoist support also shown.	
Photograph ID: 10 **Photo Location:** Exterior south side **Direction:** Looking northwest **Survey Date:** 10/22/2021 **Comments:** Brick wall	

Client:	**PWGSC**	**Project:**	**Building 1007 Demolition**
Site Name:	**Esquimalt Graving Dock**	**Site Location:**	**825 Admirals Road, Esquimalt BC**

Photograph ID: 11 **Photo Location:** Interior bay **Direction:** Looking east **Survey Date:** 10/22/2021 **Comments:** Steel hoist and wood beams at ceiling level	
Photograph ID: 12 **Photo Location:** Exterior - west side **Direction:** Looking northeast **Survey Date:** 10/18/2021 **Comments:** Typical fascia and soffit	

Client:	**PWGSC**	**Project:**	**Building 1007 Demolition**
Site Name:	**Esquimalt Graving Dock**	**Site Location:**	**825 Admirals Road, Esquimalt BC**

Photograph ID: 13 **Photo Location:** Exterior - west side, north area **Direction:** Looking south **Survey Date:** 10/22/2021 **Comments:** Typical exterior wall components of west elevation. Shrink-wrapped shelter at north end of building has been removed.	
Photograph ID: 14 **Photo Location:** Exterior garage doors **Direction:** Looking north **Survey Date:** 10/22/2021 **Comments:** Typical garage door and wall components of west elevation. Shrink-wrapped shelter at north end of building has been removed.	

Client:	**PWGSC**	**Project:**	**Building 1007 Demolition**
Site Name:	**Esquimalt Graving Dock**	**Site Location:**	**825 Admirals Road, Esquimalt BC**

Photograph ID: 15

Photo Location:
Interior bay

Direction:
Looking northeast

Survey Date:
10/22/2021

Comments:
Typical wood-framed mezzanine

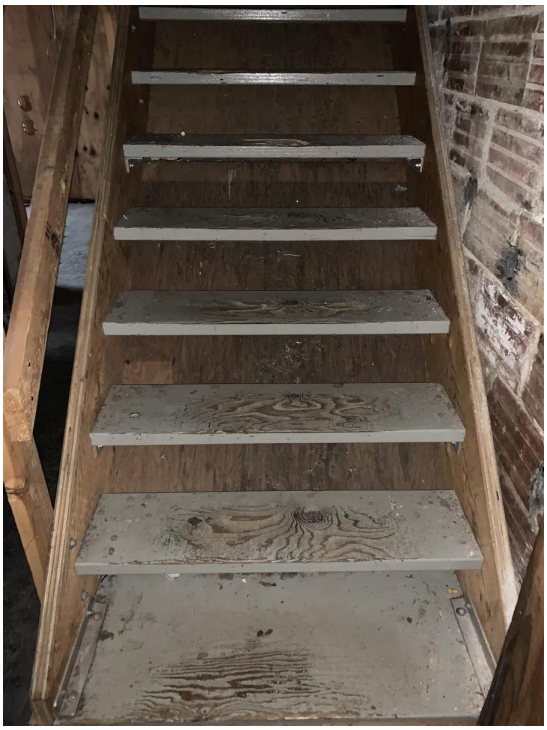
Photograph ID: 16

Photo Location:
Interior bay

Direction:
Looking northwest

Survey Date:
10/22/2021

Comments:
Typical wood-framed stairs to mezzanine



Client:	**PWGSC**	**Project:**	**Building 1007 Demolition**
Site Name:	**Esquimalt Graving Dock**	**Site Location:**	**825 Admirals Road, Esquimalt BC**

Photograph ID: 17 **Photo Location:** Exterior - southwest corner **Direction:** Looking north **Survey Date:** 10/29/2021 **Comments:** Typical exterior brick/concrete walls of south elevation	
Photograph ID: 18 **Photo Location:** Exterior - southwest corner **Direction:** Looking north **Survey Date:** 10/29/2021 **Comments:** Typical exterior brick wall and concrete column of south elevation	

Client:	**PWGSC**	**Project:**	**Building 1007 Demolition**
Site Name:	**Esquimalt Graving Dock**	**Site Location:**	**825 Admirals Road, Esquimalt BC**

Photograph ID: 19 **Photo Location:** Exterior north end of building **Direction:** Looking northeast **Survey Date:** 10/29/2021 **Comments:** North exterior wall and roof soffit. Spacing between Building 1007 and adjacent (north) building is also shown	
Photograph ID: 20 **Photo Location:** Exterior southeast corner **Direction:** Looking northeast **Survey Date:** 10/29/2021 **Comments:** Typical brick walls and wood soffit	

Client:	**PWGSC**	**Project:**	**Building 1007 Demolition**
Site Name:	**Esquimalt Graving Dock**	**Site Location:**	**825 Admirals Road, Esquimalt BC**

Photograph ID: 21 **Photo Location:** South end of building - exterior **Direction:** Looking northwest **Survey Date:** 10/22/2021 **Comments:** Typical brick and concrete comprising wall of south elevation	
Photograph ID: 22 **Photo Location:** South end of building **Direction:** Looking southeast **Survey Date:** 10/22/2021 **Comments:** Typical foundation wall of south elevation	

Client:	**PWGSC**	**Project:**	**Building 1007 Demolition**
Site Name:	**Esquimalt Graving Dock**	**Site Location:**	**825 Admirals Road, Esquimalt BC**

Photograph ID: 23 **Photo Location:** North end of building - exterior **Direction:** Looking southeast **Survey Date:** 10/22/2021 **Comments:** Brick walls and wood soffit	
Photograph ID: 24 **Photo Location:** Northeast corner of building - exterior **Direction:** Looking south **Survey Date:** 10/22/2021 **Comments:** Typical components of exterior walls and roof overhang on east elevation	

Client:	**PWGSC**	**Project:**	**Building 1007 Demolition**
Site Name:	**Esquimalt Graving Dock**	**Site Location:**	**825 Admirals Road, Esquimalt BC**

Photograph ID: 25 **Photo Location:** Interior bay **Direction:** Looking south **Survey Date:** 10/22/2021 **Comments:** Steel column for support	

Photograph ID: 26 **Photo Location:** Interior bay **Direction:** Looking northeast **Survey Date:** 10/22/2021 **Comments:** Concrete walls with plywood inserts, and divider curtain (polyethylene)	

Client:	**PWGSC**	**Project:**	**Building 1007 Demolition**
Site Name:	**Esquimalt Graving Dock**	**Site Location:**	**825 Admirals Road, Esquimalt BC**

Photograph ID: 27 **Photo Location:** West exterior **Direction:** Looking east **Survey Date:** 10/22/2021 **Comments:** Roof overhang and concrete spandrel beam of west elevation. Shrink-wrapped shelter at north end of building has been removed.	
Photograph ID: 28 **Photo Location:** Interior **Direction:** Looking southwest **Survey Date:** 10/22/2021 **Comments:** Typical man door and frame	

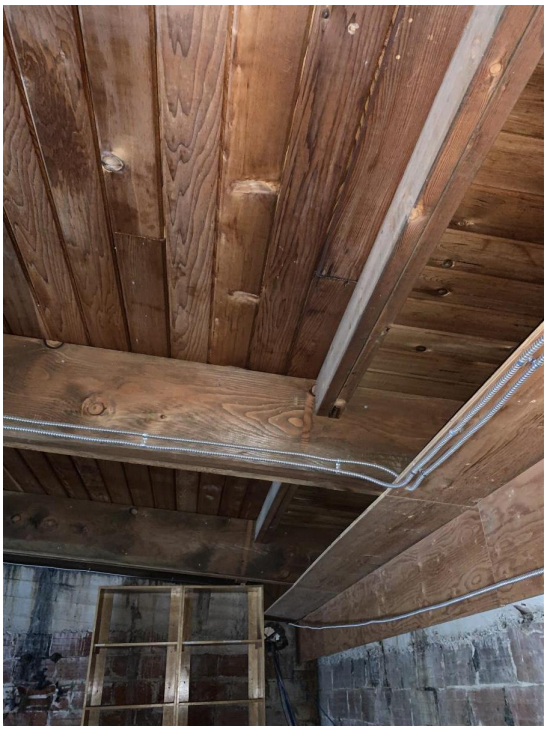
Client:	**PWGSC**	**Project:**	**Building 1007 Demolition**
Site Name:	**Esquimalt Graving Dock**	**Site Location:**	**825 Admirals Road, Esquimalt BC**

Photograph ID: 29 **Photo Location:** Interior bay **Direction:** Looking southeast **Survey Date:** 10/22/2021 **Comments:** Typical brick walls and plywood covering	
Photograph ID: 30 **Photo Location:** Interior bay **Direction:** Looking northwest **Survey Date:** 10/22/2021 **Comments:** Typical brick walls and metal shelving	

Client:	**PWGSC**	**Project:**	**Building 1007 Demolition**
Site Name:	**Esquimalt Graving Dock**	**Site Location:**	**825 Admirals Road, Esquimalt BC**

Photograph ID: 31 **Photo Location:** Interior bay **Direction:** Looking east **Survey Date:** 10/22/2021 **Comments:** Typical wood mezzanine construction. Roof support including steel i-beam also shown.	
Photograph ID: 32 **Photo Location:** Interior bay **Direction:** Looking east **Survey Date:** 10/22/2021 **Comments:** Typical wood mezzanine construction	

Client:	**PWGSC**	**Project:**	**Building 1007 Demolition**
Site Name:	**Esquimalt Graving Dock**	**Site Location:**	**825 Admirals Road, Esquimalt BC**

Photograph ID: 33 **Photo Location:** Mezzanine **Direction:** Looking north **Survey Date:** 10/22/2021 **Comments:** Top-side of wood mezzanine	
Photograph ID: 34 **Photo Location:** Interior bay **Direction:** Looking north **Survey Date:** 10/22/2021 **Comments:** Typical wood roof structural support and roof underside (ceiling) components	

Client:	**PWGSC**	**Project:**	**Building 1007 Demolition**
Site Name:	**Esquimalt Graving Dock**	**Site Location:**	**825 Admirals Road, Esquimalt BC**

Photograph ID: 35 **Photo Location:** Interior bay **Direction:** Looking north **Survey Date:** 10/22/2021 **Comments:** Typical wood roof structural support and roof underside (ceiling) components	
Photograph ID: 36 **Photo Location:** Interior bay **Direction:** Looking east **Survey Date:** 10/22/2021 **Comments:** Typical wood mezzanine construction	

Client:	**PWGSC**	**Project:**	**Building 1007 Demolition**
Site Name:	**Esquimalt Graving Dock**	**Site Location:**	**825 Admirals Road, Esquimalt BC**

Photograph ID: 37 **Photo Location:** Interior bay **Direction:** Looking east **Survey Date:** 10/22/2021 **Comments:** Typical roof support including steel i-beam	
Photograph ID: 38 **Photo Location:** Interior bay **Direction:** Looking northwest **Survey Date:** 10/18/2021 **Comments:** Brick walls with asbestos-containing putty