Project Title: PRESCOTT CCG BASE
401 King Street West, Prescott, ON K0E 1T0
PRESCOTT CCG BASE HEATED STORAGE BUILDING ROOF REPLACEMENT AND MAIN BUILDING UPGRADES

Project Number: R.066414.001

Project Date: 2017-09-29

Consultant for Building Code Review:

Andrew Todd, Architect, OAA
DFS Inc.

Building Code Designation Number (BCDN):

Consultant: Architecture

Andrew Todd, Architect, OAA
DFS Inc.

Mechanical Engineer:

Greg Santyr P.Eng
CIMA+

DRAWINGS AND SCHEDULE

ARCHITECTURAL:

MECHANICAL:

APPENDICES

Part 1 GENERAL

1.1 SECTION INCLUDES

.1 Title and description of Work.

.2 Contract Method.

.3 Work by others.

.5 Work sequence.

.6 Contractor use of premises.

.7 Owner occupancy.

.11 Alterations to existing building.

1.2 PRECEDENCE

.1 For Federal Government projects, Division 01 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

.1 Work of this Contract comprises
.1 Roofing replacement of Building E
.2 Handrails upgrade to stairs and Ramps in Building A
.3 Fire stopping upgrade in Building A
.4 Video survey of main plumbing system of Building A
of CCG - Prescott Base located at 401 King Street West, Prescott, On, Canada K0E 1T0, Canada.

1.4 COST BREAKDOWN

.1 Within 48 hours of notification of acceptance of bid furnish a cost breakdown by Section aggregating contract Amount.

.2 Show separately cost of equipment purchased exempt from Ontario Retail Sales Tax under your Ontario Sales Tax licence number.

.3 Within 48 hours of acceptance of bid submit a list of subcontractors.

1.5 WORK BY OTHERS

.1 The Contractor shall for the purpose of the Ontario Occupational Health and Safety Act and Regulations for Construction Projects, and for the duration of the Work of the Contract:
.1 Assume the role of Constructor in accordance with the Authority Having Jurisdictions.

1.6 WORK SEQUENCE

.1 Construct Work in stages to accommodate Owner's continued use of premises during construction.

.2 Coordinate Progress Schedule and coordinate with Owner Occupancy during construction.

.3 Required stages:
.1 Roofing replacement
.2 Others

.4 Maintain fire access/control.

1.7 CONTRACTOR USE OF PREMISES

.1 Contractor shall limit use of premises for Work, for storage and for access to allow;
.1 Owner occupancy.
.2 Work by other contractors.

.2 Coordinate use of premises under direction of Owner

.3 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.

1.8 OWNER OCCUPANCY

.1 Owner will occupy premises during entire construction period for execution of normal operations.

.2 Cooperate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage.

.3 Coordinate with Section 01 14 00 Work Restriction requirements

1.9 ALTERATIONS TO EXISTING BUILDING

.1 Remove and recycle, compost, anaerobically digest, sell material for reuse or dispose of:
.1 Existing removed handrail and accessories
.2 Removed Roofing system from Building E

.1 In accordance with Section 01- requirements.

.2 Provide new openings required in existing construction.

.3 Block in openings where items removed with material and finish to match existing adjoining construction.

Part 2 PRODUCTS

2.1 NOT USED

.1 Not used.

Part 3 EXECUTION

3.1 NOT USED

.1 Not used.

Part 1 GENERAL

1.1 ACCESS AND EGRESS

.1 Design, construct and maintain temporary "access to" and "egress from" work areas, including stairs, runways, ramps or ladders and scaffolding, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.

1.2 USE OF SITE AND FACILITIES

.1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Departmental Representative to facilitate work as stated.

.2 Maintain existing services to building and provide for personnel and vehicle access.

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

.4 Departmental Representative will assign sanitary facilities for use by Contractor's personnel. Keep facilities clean.

.5 Use only elevator existing in building for moving workers and material.
.1 Protect walls of passenger elevators, to approval of Departmental Representative prior to use.
.2 Accept liability for damage, safety of equipment and overloading of existing equipment.

.6 Closures: protect work temporarily until permanent enclosures are completed.

1.3 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

.1 Execute work with least possible interference or disturbance to building operations, occupants, and normal use of premises. Arrange with Departmental Representative to facilitate execution of work.

1.4 EXISTING

.1 Notify, Departmental Representative utility companies

SERVICES

of intended interruption of services and obtain required permission.

.2 Where Work involves breaking into or connecting to existing services, give Departmental Representative 48 hours of notice for necessary interruption of mechanical or electrical service throughout course of work. Keep duration of interruptions to a minimum. Carry out interruptions after normal working hours of occupants, preferably on weekends.

.3 Provide for personnel and vehicular traffic.

.4 Construct barriers in accordance with Section 01 56 00.

1.5 SPECIAL REQUIREMENTS

.1 Normal operating hours are from 8:00 to 16:00.

.2 Paint Departmental Representative occupied areas Monday to Friday from 16:00 to 07:00 hours only and on Saturdays, Sundays, and statutory holidays.

.3 Carry out noise generating Work Monday to Friday from 16:00 to 07:00 hours and on Saturdays, Sundays, and statutory holidays.

.4 Submit schedule in accordance with Section 01 32 16.07.

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

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

.7 Deliver materials: Coordinate material delivery timing within Owner unless otherwise approved by Departmental Representative.

.8 Prior to cutting or drilling horizontal or vertical surfaces including concrete, concrete block or other structural substrate, determine location of reinforcing, service lines, pipes, conduits or other items by x-ray, ground penetrating radar or other appropriate method. Submit findings to Departmental Representative prior to cutting or drilling.

1.6 SECURITY

.1 Sign in at Commissionaire’s Desk. Contractor attendance LOG required

.2 Security escort:

.1 Personnel employed on this project must be escorted when executing work in non-public areas during normal working hours. Personnel must be escorted in all areas after normal working hours.

.2 Submit an escort request to Departmental Representative at least 14 days before service is needed. For requests submitted within time noted above, costs of security escort will be paid for by Departmental Representative. Cost incurred by late request will be Contractor's responsibility.

.3 Any escort request may be cancelled free of charge if notification of cancellation is given at least 4 hours before scheduled time of escort. Cost incurred by late request will be Contractor's responsibility.

.4 Calculation of costs will be based on average hourly rate of security officer for minimum of 8 hours per day for late service request and of 4 hours for late cancellations.

1.7 BUILDING SMOKING ENVIRONMENT

.1 Comply with smoking restrictions. Smoking is not permitted.

Part 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

Part 3 EXECUTION

3.1 NOT USED

.1 Not Used.

Part 1 GENERAL

1.1 DEFINITIONS

.1 Activity: element of Work performed during course of Project. Activity normally has expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.

.2 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management system.

.3 Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.

.4 Construction Work Week: Monday to Friday, inclusive, will provide five day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.

.5 Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project element. Usually expressed as workdays or workweeks.

.6 Master Plan: summary-level schedule that identifies major activities and key milestones.

.7 Milestone: significant event in project, usually completion of major deliverable.

.8 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.

.9 Project Planning, Monitoring and Control System: overall system operated by Departmental Representative to enable monitoring of project work in relation to established milestones.

1.2 REQUIREMENTS

.1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.

.2 Plan to complete Work in accordance with prescribed milestones and time frame.

.3 Limit activity durations to maximum of approximately 10 working days, to allow for progress reporting.

.4 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Certificate of Substantial Performance and Certificate of Completion as defined times of completion are of essence of this contract.

1.3 SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00.

.2 Submit to Departmental Representative within 5 working days of Award of Contract Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.

.3 Submit Project Schedule to Departmental Representative within 5 working days of receipt of acceptance of Master Plan.

1.4 PROJECT MILESTONES

.1 Project milestones form interim targets for Project Schedule.
.1 Certificate of Substantial Performance within 50 working days of Award of Contract date.

1.5 MASTER PLAN

.1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).

.2 Departmental Representative will review and return revised schedules within 5 working days.

.3 Revise impractical schedule and resubmit within 5 working days.

.4 Accepted revised schedule will become Master Plan and be used as baseline for updates.

1.6 PROJECT SCHEDULE

.1 Develop detailed Project Schedule derived from Master Plan.

.2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:

.1 Award.
.2 Shop Drawings, Samples.
.3 Permits.
.4 Mobilization.
.5 Building A Accessibility Work Roofing.
.6 Building A Fire Stopping-Mezzanine Level
.7 Building A Fire Stopping-Administrative Level
.11 Building E Roofing Removal
.12 Building E New Roof (Detailed sequence)
.13 Building E New Roof Flood Testing

1.7 PROJECT SCHEDULE REPORTING

.1 Update Project Schedule on weekly basis reflecting activity changes and completions, as well as activities in progress.

.2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

1.8 PROJECT MEETINGS

.1 Discuss Project Schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.

.2 Weather related delays with their remedial measures will be discussed and negotiated.

Part 2 PRODUCTS

2.1 NOT USED .1 Not used.

Part 3 EXECUTION

3.1 NOT USED .1 Not used.

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 Present shop drawings, product data, and samples in SI Metric units.

.4 Where items or information is not produced in SI Metric units converted values are acceptable.

.5 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.

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

.7 Verify field measurements and affected adjacent Work are co-ordinated.

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

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

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

.11 Submit in electronic format as pdf files. Forward pdf, NMSEdit Professional spp, MS Word, MS Excel, MS Project and Autocad dwg files on USB compatible with PWGSC encryption requirements or through email or alternate electronic file sharing service such as ftp, as directed by Departmental Representative.

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.

.2 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario of Canada.

.3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.4 Allow 5 working days for Departmental Representative's review of each submission.

.5 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.

.6 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.

.7 Accompany submissions with transmittal letter, in duplicate, containing:
- .1 Date.
- .2 Project title and number.
- .3 Contractor's name and address.
- .4 Identification and quantity of each shop drawing, product data and sample.
- .5 Other pertinent data.

.8 Submissions shall include:
- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and address of:
  - .1 Subcontractor.
  - .2 Supplier.
  - .3 Manufacturer.
- .4 Contractor's stamp, signed by Contractor's

authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
.5 Details of appropriate portions of Work as applicable:
.1 Fabrication.
.2 Layout, showing dimensions, including identified field dimensions, and clearances.
.3 Setting or erection details.
.4 Capacities.
.5 Performance characteristics.
.6 Standards.
.7 Operating weight.
.8 Relationship to adjacent work.

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

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

.11 Submit one electronic copy of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.

.12 Submit one electronic copy of test reports for requirements requested in specification Sections and as requested by Departmental Representative.
.1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
.2 Testing must have been within 3 years of date of contract award for project.

.13 Submit one electronic copy of certificates for requirements requested in specification Sections and as requested by Departmental Representative.
.1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
.2 Certificates must be dated after award of project contract complete with project name.

.14 Submit one electronic copy of manufacturer’s instructions for requirements requested in specification Sections and as requested by Departmental Representative.
.1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances,

hazards and safety precautions.

.15 Submit one electronic copy of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative.

.16 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

.17 Submit three hard copies and one electronic copy of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental Representative.

.18 Delete information not applicable to project.

.19 Supplement standard information to provide details applicable to project.

.20 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, transparency copies will be returned and fabrication 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 fabrication and installation of Work may proceed.

.21 The review of shop drawings by Public Works and Government Services Canada (PWGSC) is for sole purpose of ascertaining conformance with general concept.
.1 This review shall not mean that PWGSC approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.
.2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

1.3 SAMPLES

.1 Submit for review samples in duplicate as requested in respective specification Sections. Label samples with origin and intended use.

.2 Deliver samples prepaid to Departmental Representative's site office.

.3 Notify Departmental Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.

.4 Where colour, pattern or texture is criterion, submit full range of samples.

.5 Adjustments made on samples by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.

.6 Make changes in samples which Departmental Representative may require, consistent with Contract Documents.

.7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.5 PHOTOGRAPHIC DOCUMENTATION

.1 Submit electronic copy of colour digital photography in jpg format, fine resolution monthly with progress statement and as directed by Departmental Representative.

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

.3 Number of viewpoints: 2 locations.
.1 Viewpoints and their location as determined by Departmental Representative.

.4 Frequency of photographic documentation: weekly and as directed by Departmental Representative.
.1 Upon completion of: Existing roof assembly removal, reconstruction of parapet and Gypsum board sheating, membrane installation, filter fabric installation and completion of Work, as directed by Departmental Representative.

1.6 CERTIFICATES AND TRANSCRIPTS

.1 Immediately after award of Contract, submit Workers' Safety and Insurance Board Experience Report.

1.7 FEES, PERMITS AND CERTIFICATES

.1 Provide authorities having jurisdiction with information requested, including Notice of Project

.2 Pay fees and obtain certificates and permits required.

.3 Furnish certificates and permits.

.4 Submit acceptable certificate stating that suspended ceiling systems provide adequate support for electrical fixtures, as required by current bulletin of Electrical Safety Authority (ESA).

Part 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

Part 3 EXECUTION

3.1 NOT USED

.1 Not Used.

Part 1 GENERAL

1.1 REFERENCES

.1 Canadian Standards Association (CSA): Canada
.1 CSA S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures.

.2 National Building Code 2015 (NBC):
.1 NBC 2015, Division B, Part 8 Safety Measures at Construction and Demolition Sites.

.3 National Fire Code 2015 (NFC):
.1 NFC 2015, Division B, Part 5 Hazardous Processes and Operations, subsection 5.6.1.3 Fire Safety Plan.

.4 Province of Ontario:
.1 Occupational Health and Safety Act Revised Statutes of Ontario 1990, Chapter O.1 as amended, and Regulations for Construction Projects, O. Reg. 213/91 as amended.
.2 O. Reg. 490/09, Designated Substances.
.3 Workplace Safety and Insurance Act, 1997.
.4 Municipal statutes and authorities.

.5 Treasury Board of Canada Secretariat (TBS):
.1 Treasury Board, Fire Protection Standard April 1, 2010 www.tbs-sct.gc.ca/pol/doc-eng.aspx ?id=17316&section=text.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00.

.2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
.1 Results of site specific safety hazard assessment.
.2 Results of safety and health risk or hazard analysis for site tasks and operation.
.3 Measures and controls to be implemented to address identified safety hazards and risks.

.3 Provide a Fire Safety Plan, specific to the work location, in accordance with NBC, Division B, Article 8.1.1.3 prior to commencement of work. The plan shall be coordinated with, and integrated into, the existing Building, Facility, Tenant's Emergency Procedures and Evacuation Plan in place at the site. Departmental Representative will provide Building, Facility, Tenant's Emergency Procedures and Evacuation Plan.

Deliver two copies of the Fire Safety Plan to the Departmental Representative not later than 14 days before commencing work.

.4 Contractor's and Sub-contractors' Safety Communication Plan.

.5 Contingency and Emergency Response Plan addressing standard operating procedures specific to the project site to be implemented during emergency situations. Coordinate plan with existing Building, Facility, Tenant's Emergency Response requirements and procedures provided by Departmental Representative.

.6 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 5 days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within 5 days after receipt of comments from Departmental Representative.

.7 Departmental Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.

.8 Submit names of personnel and alternates responsible for site safety and health.

.9 Submit records of Contractor's Health and Safety meetings when requested.

.10 Submit electronic copy of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative and authority having jurisdiction weekly.

.11 Submit electronic copy of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative, weekly.

.12 Submit copies of orders, directions or reports issued by health and safety inspectors of the authorities having jurisdiction.

.13 Submit copies of incident and accident reports.

.14 Submit Material Safety Data Sheets (MSDS).

.15 Submit Workplace Safety and Insurance Board (WSIB)-Experience Rating Report.

1.3 FILING OF NOTICE

.1 File Notice of Project with Provincial authorities prior to commencement of Work.

1.4 WORK PERMIT

.1 Obtain building permits related to project prior to commencement of Work.

.2 Obtain 'Permit to Work Form' from AFD Contractor.

.3 Obtain Hot Work Permit from Property Manager.

1.5 SAFETY ASSESSMENT

.1 Perform site specific safety hazard assessment related to project.

1.6 MEETINGS

.1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.

1.7 REGULATORY REQUIREMENTS

.1 Comply with the Acts and regulations of the Province of Ontario.

.2 Comply with specified standards and regulations to ensure safe operations at site.

1.8 PROJECT/SITE CONDITIONS

.1 Refer to Appendix 1: Designated Substance and Hazardous Material Survey

1.9 GENERAL REQUIREMENTS

.1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.

.2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may

request re-submission with correction of deficiencies or concerns either accepting or requesting improvements.

.3 Relief from or substitution for any portion or provision of minimum Health and Safety standards specified herein or reviewed site-specific Health and Safety Plan shall be submitted to Departmental Representative in writing.

1.10 COMPLIANCE REQUIREMENTS

.1 Comply with Ontario Occupational Health and Safety Act, R.S.O. 1990 Chapter 0.1, as amended.

1.11 RESPONSIBILITY

.1 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.

.2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

.3 Where applicable the Contractor shall be designated "Constructor", as defined by Occupational Health and Safety Act and Regulations for Construction Projects for the Province of Ontario.

1.12 UNFORSEEN HAZARDS

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

.2 Follow procedures in place for Employees Right to Refuse Work as specified in the Occupational Health and Safety Act for the Province of Ontario.

1.14 POSTING OF DOCUMENTS

.1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province of Ontario, and in consultation with Departmental Representative.

.1 Contractor's Safety Policy.
.2 Constructor's Name.
.3 Notice of Project.
.4 Name, trade, and employer of Health and Safety Representative or Joint Health and Safety Committee members (if applicable).
.5 Ministry of Labour Orders and reports.
.6 Occupational Health and Safety Act and Regulations for Construction Projects for Province of Ontario.
.7 Address and phone number of nearest Ministry of Labour office.
.8 Material Safety Data Sheets.
.9 Written Emergency Response Plan.
.10 Site Specific Safety Plan.
.11 Valid certificate of first aider on duty.
.12 WSIB "In Case of Injury At Work" poster.

1.15 CORRECTION OF NON-COMPLIANCE

.1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.

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

.3 Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.

1.16 BLASTING

.1 Blasting or other use of explosives is not permitted.

1.17 POWDER ACTUATED DEVICES

.1 Use powder actuated devices only after receipt of written permission from Departmental Representative.

1.18 WORK STOPPAGE

.1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

.2 Assign responsibility and obligation to Competent Supervisor to stop or start Work when, at Competent Supervisor's discretion, it is necessary or advisable for reasons of health or safety. Departmental Representative may also stop Work for health and safety considerations.

Part 2 PRODUCTS

2.1 NOT USED .1 Not used.

Part 3 EXECUTION

3.1 NOT USED .1 Not used.

Part 1 GENERAL

1.1 RELATED SECTIONS

.1 Section 01 35 29: Health and Safety Requirements

1.2 GENERAL

.1 This section specifies general requirements and procedures for fire safety. Additional requirements may be specified in individual sections elsewhere in specifications.

1.3 REPORTING FIRES

.1 The Departmental Representative will co-ordinate arrangements for the Contractor to be briefed at the pre-construction meeting concerning Building's fire safety protocol.

.2 Building Manager will supply a copy of "Fire Safety Emergency Evacuation Plan" in effect for this building and site. Contractor shall comply with outlined fire safety requirements.

.3 Know location of nearest fire alarm box and telephone, including emergency phone number.

.4 Report immediately all fire incidents to Fire Department as follows:
- .1 activate nearest fire alarm box; or
- .2 telephone.

.5 Person activating fire alarm box will remain at box to direct Fire Department to scene of fire.

.6 When reporting fire by telephone, give location of fire, name or number of building and be prepared to verify the location.

1.4 FIRE WATCH

.1 Appoint a Fire Watch at locations where welding and soldering, torching or roofing is to take place.

.2 A dedicated Fire Watch is not required. A competent person from the workforce on site may be assigned as Fire Watch for duration of work.

.3 Assign a person who is knowledgeable in the correct use of fire extinguishers on the project.

.4 Have work inspected by the Fire Watch up to 1.5 hours after work stoppage for each work period.

1.5 INTERIOR AND EXTERIOR FIRE PROTECTION AND ALARM SYSTEMS

.1 Fire protection and alarm system will not be:
.1 obstructed;
.2 shut-off; or
.3 left inactive at end of working day or shift.

.2 Fire hydrants, standpipes and hose systems will not be used for other than fire-fighting purposes unless authorized by Departmental Representative.

.3 Provide and maintain free access to fire extinguishing equipment. Maintain exit facilities. Keep means of egress free from materials, equipment and obstructing.

1.6 FIRE EXTINGUISHERS

.1 Supply fire extinguishers, as necessary to protect work in progress and contractor's physical plant on site.

1.8 BLOCKAGE OF ROADWAYS

.1 Advise Departmental Representative of any work that would impede fire apparatus response. This includes violation of minimum required overhead clearance.

1.9 SMOKING PRECAUTIONS

.1 Smoking is not permitted within areas of work or site storage.

1.10 RUBBISH AND WASTE MATERIALS

.1 Rubbish and waste materials are to be kept to a minimum.

.2 Burning of rubbish is prohibited.

.3 Remove all rubbish from work site at end of work day or shift or as directed.

.4 Storage:
.1 Store oily waste in approved receptacles to ensure maximum cleanliness and safety.
.2 Deposit greasy or oily rags and materials subject to spontaneous combustion in approved receptacles and remove from site daily or at the end of each shift.

1.11 FLAMMABLE AND

.1 Handling, storage and use of flammable and combustible

COMBUSTIBLE LIQUIDS

liquids are to be governed by the current National Fire Code of Canada.

.2 Flammable and combustible liquids such as gasoline, kerosene and naphtha will be kept for ready use in quantities not exceeding 45 litres provided they are stored in approved safety cans bearing Underwriters' Laboratory of Canada or Factory Mutual seal of approval. Storage of quantities of flammable and combustible liquids exceeding 45 litres for work purposes requires permission of local Building Manager.

.3 Transfer of flammable and combustible liquids is prohibited within buildings or jetties.

.4 Transfer of flammable and combustible liquids will not be carried out in vicinity of open flames or any type of heat-producing devices.

.5 Flammable liquids having a flash point below 38°C such as naphtha or gasoline will not be used as solvents or cleaning agents.

.6 Flammable and combustible waste liquids, for disposal, will be stored in approved containers located in a safe ventilated area. Quantities are to be kept to a minimum and Fire Department is to be notified when disposal is required.

1.12 HAZARDOUS SUBSTANCES

.1 Work entailing use of toxic or hazardous materials, chemicals and/or explosives, or otherwise creating hazard to life, safety or health, will be in accordance with National Fire Code of Canada.

.2 Obtain from local Building Manager a "Hot Work" permit for work involving welding, burning or use of blow torches and salamanders, in buildings or facilities.

.3 When Work is carried out in dangerous or hazardous areas involving use of heat, provide fire watchers equipped with sufficient fire extinguishers. Determination of dangerous or hazardous areas along with level of protection necessary for Fire Watch is at discretion of the local Building Manager. Contractors are responsible for providing fire watch service for work on a scale established and in conjunction with Building Manager at pre-construction meeting.

.4 Where flammable liquids, such as lacquers or urethanes are to be used, proper ventilation will be assured and all sources of ignition are to be eliminated. Building Manager is to be informed prior to and at cessation of

such work.

1.13 WELDING, BURNING AND CUTTING

.1 Contractor performing work of this section must notify Departmental Representative in advance of commencing work.

.2 Use non-combustible shields for electric and gas welding or cutting executed within 3 m of combustible material or in occupied spaces.

.3 Place cylinders supplying gases as close to work as possible. Secure cylinders in upright position, free from exposure to sun or high temperature.

.4 Locate fire extinguishing equipment near all welding, cutting and soldering operations.

.5 Contractor's mechanics shall be properly equipped with required protective clothing, including goggles or welding hood or face mask, gloves, etc.

.6 Contractor is responsible for the protection of his work and the Departmental Representative's property.

.7 Provide Fire Watch on standby with approved fire extinguisher while burning or welding is in progress.

1.14 QUESTIONS AND/OR CLARIFICATIONS

.1 Direct any questions or clarification on Fire Safety in addition to above requirements to local Building Manager.

1.15 FIRE INSPECTION

.1 Site inspections by Building Manager will be coordinated through Departmental Representative.

.2 Allow local Building Manager unrestricted access to work site.

.3 Co-operate with Building Manager during routine fire safety inspection of work site.

.4 Immediately remedy all unsafe fire situations observed by Building Manager.

Part 2 PRODUCTS

2.1 NOT USED

.1 Not used.

Part 3 EXECUTION

3.1 NOT USED

.1 Not used.

Part 1 GENERAL

1.1 REFERENCES AND CODES

.1 Perform Work in accordance with National Building Code of Canada (NBC) 2015, National Fire Code of Canada (NFC) 2015 and Ontario Building Code (OBC) 2012, including all amendments up to bid closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply as directed by the Departmental Representative.

.2 Meet or exceed requirements of:
.1 Contract documents.
.2 Specified standards, codes and referenced documents.

1.2 HAZARDOUS MATERIAL DISCOVERY

.1 Stop work immediately and notify Departmental Representative if materials which may contain designated substances or PCB's, other than those identified in Appendix 1 – Designated Substance and Hazardous material Survey are discovered in course of work.

1.3 BUILDING SMOKING ENVIRONMENT

.1 Comply with smoking restrictions.

1.6 IAQ - INDOOR AIR QUALITY

.1 Comply with CSA-Z204-94(R1999), Guideline for Managing Indoor Air Quality in Office Buildings and CSA B651-12 (R2017).

1.7 ACCESSIBLE DESIGN

.1 Comply with CSA B651-12 (R2017), Accessible Design for the Built Environment, unless specified otherwise. In any case of conflict or discrepancy between the building codes and CSA B651, the requirements of CSA B651 shall apply.

1.9 TAXES

.1 Pay applicable Federal, Provincial and Municipal taxes.

1.10 EXAMINATION

.1 Examine existing conditions and determine conditions affecting work.

Part 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

Part 3 EXECUTION

3.1 NOT USED

.1 Not Used.

Part 1 GENERAL

1.1 SECTION INCLUDES

.1 Inspection and testing, administrative and enforcement requirements.

1.2 RELATED SECTIONS

.1 Section 07 84 00 Fire Stopping.

.2 Section 07 55 52 Protected Membrane Roofing 2 ply SBS modified Bitumen.

1.3 INSPECTION

.1 Allow Departmental Representative access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.

.2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or law of Place of Work.

.3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.

.4 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. If such Work is found in accordance with Contract Documents, Departmental Representative shall pay cost of examination and replacement.

1.4 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies will be engaged by Departmental Representative for purpose of inspecting and/or testing portions of Work, above and beyond those required of the Contractor. Cost of such services will be borne by Departmental Representative.

.2 Provide equipment required for executing inspection and testing by appointed agencies.

.3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.

.4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no cost to Departmental Representative. Pay costs for retesting and reinspection.

1.5 ACCESS TO WORK

.1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.

.2 Co-operate to provide reasonable facilities for such access.

1.6 PROCEDURES

.1 Notify appropriate agency and Departmental Representative in advance of requirement for tests, in order that attendance arrangements can be made.

.2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in Work.

.3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.7 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.

.2 Make good other Contractor's work damaged by such removals or replacements promptly.

.3 If in opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents,

Departmental Representative may deduct from Contract Amount difference in value between Work performed and that called for by Contract Documents, amount of which shall be determined by Departmental Representative.

1.8 REPORTS

.1 Submit Electronic copy of inspection and test reports to Departmental Representative.

.2 Provide copies to Subcontractor of work being inspected or tested, manufacturer or fabricator of material being inspected or tested.

1.9 TESTS AND MIX DESIGNS

.1 Furnish test results and mix designs as may be requested.

.2 The cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work shall be appraised by Departmental Representative and may be authorized as recoverable.

Part 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

Part 3 EXECUTION

3.1 NOT USED

.1 Not Used.

Part 1 GENERAL

1.1 SECTION INCLUDES

.1 Temporary utilities.

1.2 RELATED SECTIONS

.1 Section 01 56 00 - Temporary Barriers and Enclosures.

1.3 REFERENCES

.1 U.S. Environmental Protection Agency (EPA) / Office of Water

.1 EPA 833-R-06-004, May 2007, Developing Your Stormwater Pollution Prevention Plan - A Guide for Construction Sites.

1.4 SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00.

1.5 INSTALLATION AND REMOVAL

.1 Provide temporary utilities controls in order to execute work expeditiously.

.2 Remove from site all such work after use.

1.6 WATER SUPPLY

.1 Departmental Representative will provide continuous supply of potable water for construction use.

.2 Arrange for connection with appropriate utility company and pay all costs for installation, maintenance and removal.

.3 Departmental Representative will pay for utility charges at prevailing rates.

1.7 TEMPORARY HEATING AND VENTILATION

.1 Provide temporary heating required 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 Maintain temperatures of minimum 10°C in areas where construction is in progress.

.5 Ventilating:
.1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
.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.

.6 Permanent heating system of building may be used when available. Be responsible for damage to heating system if use is permitted.

.7 Departmental Representative will pay utility charges when temporary heat source is existing building equipment.

.8 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
.1 Conform with applicable codes and standards.
.2 Enforce safe practices.
.3 Prevent abuse of services.
.4 Prevent damage to finishes.
.5 Vent direct-fired combustion units to outside.

.9 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

1.8 TEMPORARY POWER AND LIGHT

.1 Departmental Representative will pay for temporary power during construction for temporary lighting and operating of power tools, to a maximum supply of 120 volts 15 amps.

.2 Arrange for connection with appropriate utility company. Departmental Representative will pay all costs for installation, maintenance and removal.

.3 Temporary power for electric cranes and other equipment requiring in excess of above is responsibility of Contractor.

.4 Provide and maintain temporary lighting throughout project. Ensure level of illumination on all floors and stairs is not less than 162 lx.

.5 Electrical power and lighting systems installed under this Contract may be used for construction requirements only with prior approval of Departmental Representative provided that guarantees are not affected. Make good damage to electrical system caused by use under this Contract. Replace lamps which have been used for more than 3 months.

1.9 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.

Part 3 EXECUTION

3.1 NOT USED .1 Not used

Part 1 GENERAL

1.1 SECTION INCLUDES

.1 Barriers.

.2 Environmental Controls.

.3 Traffic Controls.

.4 Fire Routes.

1.2 RELATED SECTIONS

.1 Section 01 51 00 - Temporary Utilities.

1.3 REFERENCES

.1 Canadian General Standards Board (CGSB):
.1 CAN/CGSB-1.189-2000, Exterior Alkyd Primer for Wood.
.2 CAN/CGSB-1.59-97, Alkyd Exterior Gloss Enamel.

.2 Canadian Standards Association (CSA):
.1 CSA O121-08(R2017), Douglas Fir Plywood.

1.4 INSTALLATION AND REMOVAL

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

.2 Remove from site all such work after use.

1.5 HOARDING

.1 For exterior work : Erect temporary site enclosure using modular freestanding fencing: galvanized, minimum 1.8 m high, welded steel mesh. Provide [one] lockable truck entrance [gate] and at least one pedestrian door as directed and conforming to applicable traffic restrictions on adjacent streets. Equip gates with locks and keys. Maintain fence in good repair.

1.6 GUARD RAILS AND BARRICADES

.1 Provide secure, rigid guard rails and barricades around open edges roofs.

.2 Provide as required by governing authorities.

1.7 WEATHER ENCLOSURES

.1 Provide weather tight closures to openings in roofs.

.2 Design enclosures to withstand wind pressure and snow loading if required.

1.8 DUST TIGHT SCREENS

.1 Provide dust tight screens or [insulated] partitions to localize dust generating activities, and for protection of workers, finished areas of Work and public. Coordinate with Department Representative fo requirements and locations.

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

1.9 ACCESS TO SITE

.1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.

1.10 PUBLIC TRAFFIC FLOW

.1 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect the public.

1.11 FIRE ROUTES

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

1.12 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.

1.13 PROTECTION OF BUILDING FINISHES

.1 Provide protection for finished and partially finished building finishes and equipment during performance of Work.

.2 Provide necessary screens, covers, and hoardings.

.3 Confirm with Departmental Representative locations and installation schedule 3 days prior to installation.

.4 Be responsible for damage incurred due to lack of or improper protection.

Part 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

Part 3 EXECUTION

3.1 NOT USED

.1 Not Used.

Part 1 GENERAL

1.1 SECTION INCLUDES

.1 Product quality, availability, storage, handling, protection, and transportation.

.2 Manufacturer's instructions.

.3 Quality of Work, coordination and fastenings.

.4 Existing facilities.

1.2 RELATED SECTIONS

.1 Section 01 45 00 - Quality Control.

1.3 REFERENCES

.1 Within text of specifications, reference may be made to reference standards.

.2 Conform to these standards, in whole or in part as specifically requested in specifications.

.3 If there is question as to whether any product or system is in conformance with applicable standards, Departmental Representative reserves right to have such products or systems tested to prove or disprove conformance.

.4 The cost for such testing will be born by Departmental Representative in event of conformance with Contract Documents or by Contractor in event of non-conformance.

.5 Conform to latest date of issue of referenced standards in effect on date of submission of Bids, except where specific date or issue is specifically noted.

.6 OPSS Ontario Provincial Standard Specifications and OPSD Ontario Provincial Standard Drawings quoted in these specifications are available online at http://www.raqsa.mto.gov.on.ca/techpubs/ops.nsf/OPSHomepage.

1.4 QUALITY

.1 Products, materials, equipment and articles (referred to as products throughout specifications) incorporated in Work shall be new, not damaged or defective, and of best quality (compatible with specifications) for purpose intended. If requested, furnish evidence as to

type, source and quality of Products provided.

.2 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.

.3 Should any dispute arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.

.4 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.

.5 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.5 AVAILABILITY

.1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for any items. If delays in supply of products are foreseeable, notify Departmental Representative of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.

.2 In event of failure to notify Departmental Representative at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Departmental Representative reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.6 METRIC SIZED MATERIALS

.1 SI metric units of measurement are used exclusively on the drawings and in the specifications for this project.

.2 The Contractor is required to provide metric products in the sizes called for in the Contract Documents except where a valid claim can be made that a particular product is not available on the Canadian market.

.3 Claims for exemptions from use of metric sized products shall be in writing and fully substantiated with

supportive documentation. Promptly submit application to Departmental Representative for consideration and ruling. Non-metric sized products may not be used unless Contractor's application has been approved in writing by the Departmental Representative.

.4 Difficulties caused by the Contractor's lack of planning and effort to obtain modular metric sized products which are available on the Canadian market will not be considered sufficient reasons for claiming that they cannot be provided.

.5 Claims for additional costs due to provision of specified modular metric sized products will not be considered.

1.7 STORAGE, HANDLING AND PROTECTION

.1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.

.2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.

.3 Store products subject to damage from weather in weatherproof enclosures.

.4 Store cementitious products clear of earth or concrete floors, and away from walls.

.5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.

.6 Store sheet materials, lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.

.7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.

.8 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.

.9 Touch-up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.8 TRANSPORTATION

.1 Pay costs of transportation of products required in performance of Work.

1.9 MANUFACTURER'S INSTRUCTIONS

.1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.

.2 Notify Departmental Representative in writing, of conflicts between specifications and manufacturer's instructions, so that Departmental Representative may establish course of action.

.3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Departmental Representative to require removal and re-installation at no increase in Contract Amount or Contract Time.

1.10 QUALITY OF WORK

.1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Departmental Representative if required Work is such as to make it impractical to produce required results.

.2 Do not employ anyone unskilled in their required duties. Departmental Representative reserves right to require dismissal from site, workers deemed incompetent or careless.

.3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Departmental Representative, whose decision is final.

1.11 CO-ORDINATION

.1 Ensure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.

.2 Be responsible for coordination and placement of openings, sleeves and accessories.

1.12 CONCEALMENT

.1 In finished areas, conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.

.2 Before installation, inform Departmental Representative if there is interference. Install as directed by Departmental Representative.

1.13 REMEDIAL WORK

.1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Coordinate adjacent affected Work as required.

.2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.14 LOCATION OF FIXTURES

.1 Consider location of fixtures, outlets, Handrail bracket shown on drawings and mechanical and electrical items indicated as approximate.

.2 Inform Departmental Representative of conflicting installation. Install as directed.

1.15 FASTENINGS

.1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.

.2 Prevent electrolytic action between dissimilar metals and materials.

.3 Use non-corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification Section.

.4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.

.5 Keep exposed fastenings to a minimum, space evenly and install neatly.

.6 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

1.16 FASTENINGS - EQUIPMENT

.1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.

.2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use No.304 stainless steel for exterior areas.

.3 Bolts may not project more than one diameter beyond nuts.

.4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

1.17 PROTECTION OF WORK IN PROGRESS

.1 Prevent overloading of any part of building. Do not cut, drill or sleeve any load bearing structural member, unless specifically indicated without written approval of Departmental Representative.

1.18 EXISTING UTILITIES

.1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, and/or building occupants.

.2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

Part 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

Part 3 EXECUTION

3.1 NOT USED

.1 Not Used.

Part 1 GENERAL

1.1 SUBMITTALS

.1 Submittals: in accordance with Section 01 33 00.

.2 Submit written request in advance of cutting or alteration which affects:
- .1 Structural integrity of elements of project.
- .2 Integrity of weather-exposed or moisture-resistant elements.
- .3 Efficiency, maintenance, or safety of operational elements.
- .4 Visual qualities of sight-exposed elements.
- .5 Work of Owner or separate contractor.

.3 Include in request:
- .1 Identification of project.
- .2 Location and description of affected Work.
- .3 Statement on necessity for cutting or alteration.
- .4 Description of proposed Work, and products to be used.
- .5 Alternatives to cutting and patching.
- .6 Effect on Work of Owner or separate contractor.
- .7 Written permission of affected separate contractor.
- .8 Date and time work will be executed.

1.2 MATERIALS

.1 Required for original installation.

.2 Change in Materials: Submit request for substitution in accordance with Section 01 33 00.

1.3 PREPARATION

.1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.

.2 After uncovering, inspect conditions affecting performance of Work.

.3 Beginning of cutting or patching means acceptance of existing conditions.

.4 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect

other portions of project from damage.

.5 Provide protection from elements for areas which are to be exposed by uncovering work;

1.4 EXECUTION

.1 Execute cutting, fitting, and patching to complete Work.

.2 Fit several parts together, to integrate with other Work.

.3 Uncover Work to install ill-timed Work.

.4 Remove and replace defective and non-conforming Work.

.5 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.

.6 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.

.7 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry work without prior approval.

.8 Restore work with new products in accordance with requirements of Contract Documents.

.9 Submit proposed materials, finishes and installation method for patching to Departmental Representative for approval, prior to patching.

.10 Refinish surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.

.11 Fit Work to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

.12 At penetration of fire rated wall, ceiling, or floor construction, completely seal voids with firestopping material in accordance with Section 07 84 00, full thickness of the construction element.

.13 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials in accordance with Section 01 74 20.

Part 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

Part 3 EXECUTION

3.1 NOT USED

.1 Not Used.

Part 1 GENERAL

1.1 SECTION INCLUDES

.1 Progressive cleaning.

.2 Final cleaning.

1.2 PROJECT CLEANLINESS

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by Owner or other Contractors.

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

.3 Clear snow and ice from access to building, bank/pile snow in designated areas only.

.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 clearly marked separate bins for recycling. Refer to Section 01 74 20.

.7 Remove waste material and debris from site and deposit in waste container at end of each working day.

.8 Dispose of waste materials and debris off site.

.9 Clean interior areas prior to start of finish work, and maintain areas free of dust and other contaminants during finishing operations.

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

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

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

.13 Schedule cleaning operations so that resulting dust,

debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

1.3 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 waste products and debris other than that caused by Owner or other Contractors.

.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 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.

.8 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, and floors.

.9 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.

.10 Remove dirt and other disfiguration from exterior surfaces.

.11 Clean and sweep roofs, gutters, areaways, and sunken wells.

.12 Sweep and wash clean paved areas.

.13 Clean equipment and fixtures to a sanitary condition;

.14 Clean roofs, downspouts, and drainage systems.

.15 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.

.16 Remove snow and ice from access to building.

Part 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

Part 3 EXECUTION

3.1 NOT USED

.1 Not Used.

Part 1 GENERAL

1.1 CONSTRUCTION & DEMOLITION WASTE

.1 Carefully deconstruct and source separate materials/equipment and divert, from D&C waste destined for landfill to maximum extent possible. Target for this project is 75% diversion from landfill. Reuse, recycle, compost, anaerobic digest or sell material for reuse except where indicated otherwise. On site sales are not permitted.

.2 Source separate waste and maintain waste audits in accordance with the Environmental Protection Act, Ontario Regulation 102/94 and Ontario Regulation 103/94.

.1 Provide facilities for collection, handling and storage of source separated wastes.

.2 Source separate the following waste:

.1

.2 Corrugated cardboard.

.3 Wood, not including painted or treated wood or laminated wood.

.4 Gypsum board, unpainted.

.5 Steel, Brass stainless steel

.6 Sheet metal

.3 Submit a waste reduction workplan indicating the materials and quantities of material that will be recycled and diverted from landfill.

.1 Indicate how material being removed from the site will be reused, recycled, composted or anaerobically digested.

.4 Submit proof that all waste is being disposed of at a licensed land fill site or waste transfer site. A copy of the disposal/waste transfer site's license and a letter verifying that said landfill site will accept the waste must be supplied to Departmental Representative prior to removal of waste from the demolition site.

1.2 WASTE PROCESSING SITES

.1 Province of: Ontario.

.1 Ministry of Environment and Energy, 135 St. Clair Avenue West, Toronto, ON, M4V 1P5.

.2 Telephone: 800-565-4923 or 416-323-4321.

.3 Fax: 416-323-4682.

.2 Recycling Council of Ontario: 215 Spadina Avenue, #225, Toronto, ON, M5T 2C7.

.1 Telephone: 416-657-2797.
.2 Fax: 416-960-8053.
.3 Email: rco@rco.on.ca.
.4 Internet: http://www.rco.on.ca/.

Part 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

Part 3 EXECUTION

3.1 CANADIAN GOVERNMENTAL DEPARTMENTS CHIEF RESPONSIBILITY FOR THE ENVIRONMENT

.1 Government Chief Responsibility for the Environment.

Province	Address	General	Fax	Inquiries
Ontario	Ministry of Environment and Energy 135 St Clair Avenue West Toronto, ON M4V 1P5	(416) 323-4321 (800) 565-4923	(416) 323-4682	
	Environment Canada Toronto, ON	(416) 734-4494		

Part 1 GENERAL

1.1 INSPECTION AND DECLARATION

.1 Contractor's Inspection: Contractor and all Subcontractors shall conduct an 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 that corrections have been made.
.2 Request Departmental Representative's Inspection.

.2 Departmental Representative's Inspection: Departmental Representative and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Contractor to correct Work accordingly.

.3 Completion: submit written certificate that 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 Equipment and systems have been tested, adjusted and are fully operational.
.4 Work is complete and ready for final inspection.

.4 Final Inspection: when items noted above are completed, request final inspection of Work by Departmental Representative and Contractor. If Work is deemed incomplete by Departmental Representative, complete outstanding items and request reinspection.

1.2 CLEANING

.1 In accordance with Section 01 74 11.

.2 Remove waste and surplus materials, rubbish and construction facilities from the site in accordance with Section 01 74 20.

Part 2 PRODUCTS

2.1 NOT USED .1 Not Used.

Part 3 EXECUTION

3.1 NOT USED .1 Not Used.

Part 1 GENERAL

1.1 SECTION INCLUDES

.1 As-built, samples, and specifications.

.2 Equipment and systems.

.3 Product data, materials and finishes, and related information.

.4 Operation and maintenance data.

.5 Spare parts, special tools and maintenance materials.

.6 Warranties and bonds.

.7 Final site survey.

1.2 RELATED SECTIONS

.1 Section 05 50 00 Metal fabrication for Brass Handrail maintenance

1.3 SUBMISSION

.1 Prepare instructions and data using personnel experienced in maintenance and operation of described products.

.2 Copy will be returned after final inspection, with Departmental Representative's comments.

.3 Revise content of documents as required prior to final submittal.

.4 One weeks prior to Substantial Performance of the Work, submit to the Departmental Representative, electronic final copies of maintenance manuals in English.

.5 Ensure spare parts, maintenance materials and special tools provided are new, undamaged or defective, and of same quality and manufacture as products provided in Work.

.6 If requested, furnish evidence as to type, source and quality of products provided.

.7 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.

.8 Pay costs of transportation.

1.4 FORMAT

.1 Organize data in the form of an instructional manual.

.2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.

.3 When multiple binders are used, correlate data into related consistent groupings. Identify contents of each binder on spine.

.4 Cover: Identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.

.5 Arrange content by systems under Section numbers and sequence of Table of Contents.

.6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.

.7 Text: Manufacturer's printed data, or typewritten data.

.8 Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

1.5 CONTENTS - EACH VOLUME

.1 Table of Contents: provide title of project;
.1 Date of submission; names,
.2 Addresses, and telephone numbers of Contractor with name of responsible parties;
.3 Schedule of products and systems, indexed to content of volume.

.2 For each product or system:
.1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

.3 Product Data: mark each sheet to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information.

.4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.

.5 Typewritten Text: as required to supplement product

data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00.

1.6 AS-BUILTS AND SAMPLES

.1 In addition to requirements in General Conditions, maintain at the site for Departmental Representative one record copy of:
.1 Contract Drawings.
.2 Specifications.
.3 Amendments and addenda.
.4 Change Orders and other modifications to the Contract.
.5 Reviewed shop drawings, product data, and samples.
.6 Field test records.
.7 Inspection certificates.
.8 Manufacturer's certificates.

.2 Store record documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.

.3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.

.4 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.

.5 Keep record documents and samples available for inspection by Departmental Representative.

.6 Turn one set, paper copy and electronic copy, of AS-BUILT drawings and specifications over to Departmental Representative on completion of work. Submit files on USB compatible with PWGSC encryption requirements or through email or alternate electronic file sharing service such as ftp, as directed by Departmental Representative.

.7 If project is completed without significant deviations from Contract drawings and specifications submit to Departmental Representative one set of drawings and specifications marked "AS-BUILT".

1.7 RECORDING ACTUAL SITE CONDITIONS

.1 Record information on set of black line opaque drawings, provided by Departmental Representative.

.2 Provide felt tip marking pens, maintaining separate

colours for each major system, for recording information.

.3 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.

.4 Contract Drawings and shop drawings: legibly mark each item to record actual construction, including:
.1 Measured depths of elements of foundation in relation to finish first floor datum.
.2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
.3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
.4 Field changes of dimension and detail.
.5 Changes made by change orders.
.6 Details not on original Contract Drawings.
.7 References to related shop drawings and modifications.

.5 Specifications: legibly mark each item to record actual construction, including:
.1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
.2 Changes made by Amendments and change orders.

.6 Other Documents: maintain inspection certifications, field test records, required by individual specifications sections.

1.8 MATERIALS AND FINISHES

.1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations.

.2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.3 Additional Requirements: as specified in individual specifications sections.

1.9 WARRANTIES AND BONDS

.1 Separate each warranty with index tab sheets keyed to Table of Contents listing.

.2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible

principal.

.3 Obtain warranties, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of work.

.4 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Certificate of Substantial Performance is determined.

.5 Verify that documents are in proper form, contain full information.

.6 Co-execute submittals when required.

.7 Retain warranties until time specified for submittal.

Part 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

Part 3 EXECUTION

3.1 NOT USED

.1 Not Used.

Part 1 GENERAL

1.1 REFERENCES

.1 American Society for Testing and Materials International, (ASTM):

- .1 ASTM A269/A269M-15a, Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service. Bars, Flats, and Shapes for Detention and Correctional Facilities.
- .2 ASTM A666-15, Standard Specification for Annealed or Cold Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
- .3 ASTM B36/B36M-13, Standard Specification for Brass Plate, Sheet, Strip, And Rolled Bar.
- .4 ASTM B135M-10, Standard Specification for Seamless Brass Tube, Metric.
- .5 ASTM F593-17, Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
- .6 ASTM F1267-15, Standard Specification for Metal, Expanded, Steel.

.2 Canadian Standards Association (CSA):

- .1 CSA B651-12 (R2017), Accessible Design for the Built Environment.
- .2 CSA G40.20-13/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- .3 CSA W59-13, Welded Steel Construction (Metal Arc Welding).

.3 The Master Painters Institute (MPI) / Architectural Painting Specification Manual - September 2012.

- .1 MPI #79 - Primer, Alkyd, Anti-Corrosive for Metal.

.4 National Association of Architectural Metal Manufacturers (NAAMM):

- .1 NAAMM AMP-92, Metal Stair Manual.

1.2 DESIGN REQUIREMENTS

.1 Design steel, Stainless steel and brass handrails, handrail extensions in accordance with CSA B651.

1.3 SUBMITTALS

.1 Submit shop drawings and product data of each item specified in accordance with Section 01 33 00 and 01 78 00.

- .1 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details and accessories.
- .2 Indicate each item's conformance with CSA B651.
- .3 Each shop drawing submission shall bear signature and stamp of qualified professional engineer registered or licensed in province of Ontario.

.2 Submit 300 mm long sample of each Steel, stainless steel and brass finish.

Part 2 PRODUCTS

2.1 MATERIALS

.1 Stainless steel sheet, strip, plate and flat bar: to ASTM A666, type 316, AISI No. 4 finish, minimum 75% recycled content.

.2 Stainless steel tubing: to ASTM A269/A269 M, Type 316, minimum 75% recycled content, seamless or welded with AISI No. 4 finish.

.3 SS bolts, nuts and washers: stainless steel to ASTM F593, minimum 75% recycled content.

.4 Steel: to CSA G40.20/G40.21, Grade 300W, minimum 30% recycled content. To be painted

.5 Alkyd primer: to MPI #79, E3 environmental rating.

.6 Brass tube: to ASTM B135M, red brass Alloy C23000, 85% copper/15% zinc, tensile strength minimum 305 MPa, temper designation H58 formerly drawn general purpose, tensile strength minimum 275 MPa, polished and sealed.

- .1 Finish to match existing original railings where hand wear is not present. The original base building red brass finish specified was "statuary bronze, satin finish, similar to US No. 10, protected by means of a colourless methyl methacrylate ethyl copolymer". Verify on site if this finish was installed.
- .2 Handrails: 38 mm outside diameter tube.

.7 Thread lock adhesive: general purpose for threaded fasteners requiring disassembly with standard hand tools, one component acrylic, medium strength, dimethacrylate ester adhesive for fasteneres subjected to medium shock/ vibration loads/medium levels of stress.

- .1 Breakaway torque: 20 N.m to ISO 10964.
- .2 Prevail torque: 7 N.m to ISO 10964.
- .3 Breakloose torque: 24 N.m to DIN 54454.
- .4 Maximum prevail torque: 24 N.m to DIN 54454.
- .5 Acceptable material: "Loctite 243" manufactured by Loctite Corporation, www.loctite.us, distributed by Trane Parts Centre 416-499-1616.

.8 Brass sealer: 'Wenol', 'Flitz'.

.9 Security fasteners:

- .1 Provide security screws, security nuts, rivets, spanner screws or other equally secure approved devices for affixing various items, ie torx pin head, socket pin head, phillips pin head, hex pin head or equivalent.
- .2 Spanner screws to have slots that require a special

spanner tool to remove screws.

.3 Round head screws not acceptable except at locations approved where material is not thick enough to permit counter-sinking.

.4 Standard screws not acceptable.

2.2 FABRICATION

.1 Fit joints in true planes and securely fasten.

.2 Weld to CSA W59. File or grind welds smooth and flush with adjoining surface.

.3 Shop assemble work.

Part 3 EXECUTION

3.1 INSTALLATION

.1 Supply other sections with templates, instructions and built-in items.

.2 Install work straight, plumb and level to a tolerance of 1:600.

.3 Provide required reinforcing and anchorage.

.4 Touch-up burnt, scratched or chipped primer.

.5 Paint steel handrail and post.

3.2 STEEL HANDRAILS Stairs 2 and 5, interior ramp)

.1 Supply and install new steel pipe handrails and ramp edge protection in accordance with CSA B651.

.1 Stair handrails as indicated.

.2 Ramp handrails as indicated.

.3 Ramp edge protection as indicated

.2 Apply alkyd primer to interior handrails and railings.

.3 Secure brackets to wall when wall mounted

.4 Secure railing post to concrete slab where indicated.

.5 Paint handrail, bracket and post to MPI No 79. Color to be selected by Departmental representative.

3.3 STAINLESS STEEL HANDRAILS (EXTERIOR RAMP)

.1 Supply and install stainless steel pipe handrails and ramp edge protection in accordance with CSA B651

.1 Ramp handrails as indicated.

.2 Ramp edge protection as indicated.

.2 Secure handrail posts to concrete curb insert (to be poured on site). See drawings.

3.4 BRASS HANDRAILS (Stairs 1, 3 and 4)

.1 Supply and install new brass pipe handrails to existing handrails and railings in accordance with CSA B651-12 (R2017).

.1 Stair handrails as indicated.

.2 Polished interior handrails

.3 Secure brackets to wall when wall mounted

.4 Secure brackets to railing when mounted on existing railing. Refer to drawings for details.

Part 1 GENERAL

1.1 REFERENCES

.1 American Society for Testing and Materials International, (ASTM):
- .1 ASTM C726-17, Standard Specification for Mineral Wool Roof Insulation Board.
- .2 ASTM C728-17a, Standard Specification for Perlite Thermal Insulation Board.
- .3 ASTM C1177/C1177M-13, Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
- .4 ASTM D448-12, Standard Classification for Sizes of Aggregate for Road and Bridge Construction.
- .5 ASTM D6164/D6164M-16, Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.

.2 Canadian General Standards Board (CGSB:
- .1 CGSB 37-GP-9Ma-83, Primer, Asphalt, Unfilled, for Asphalt Roofing, Damp proofing and Waterproofing.
- .2 CGSB 37-GP-56M-85, Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing.

.3 Canadian Roofing Contractors Association (CRCA):
- .1 CRCA Roofing Specifications Manual-2017.

.4 Canadian Standards Association (CSA International):
- .1 CSA A123.21-14, Standard Test Method for the Dynamic Wind Uplift Resistance of Membrane Roofing Systems
- .2 CSA O121-17 Douglas Fir Plywood.
- .3 CSA O151-17, Canadian Softwood Plywood.

.5 Factory Mutual (FM Global):
- .1 FM Approvals - Roofing Products.

.6 Health Canada/Workplace Hazardous Materials Information System (WHMIS):
- .1 Material Safety Data Sheets (MSDS).

.7 Underwriters Laboratories' of Canada (ULC):
- .1 CAN/ULC-S701-11, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

1.2 ADMINISTRATIVE REQUIREMENTS

.1 Convene pre-installation meeting one week prior to beginning waterproofing Work, with roofing contractor's representative and Departmental Representative in accordance with Section 01 32 16.06 to:
- .1 Verify project requirements.
- .2 Review installation and substrate conditions.
- .3 Co-ordination with other building sub-trades.
- .4 Review manufacturer's installation instructions and warranty requirements.

1.3 SUBMITTALS

.1 Provide submittals in accordance with Section01 33 00.
  .1 Provide two copies of most recent technical roofing components data sheets describing materials' physical properties and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Provide two copies of WHMIS MSDS, and indicate VOC content for:
  .1 Primers.
  .2 Asphalt.
  .3 Sealers.
  .4 Filter fabric.

.3 Provide shop drawings:
  .1 Submit in accordance with section 01 33 00
  .2 Indicate flashing, control joints, details.
  .3 Provide installation plan and fixation.

.4 Samples: submit two (2) sample 2.2 kg containers of roofing aggregate 304.8 mm (12") long pieces of XPS insulation.

.5 Manufacturer's Certificate: certify that products meet or exceed specified requirements.

.6 Test and Evaluation Reports: submit laboratory test reports certifying compliance of bitumen and membrane with specification requirements.

.7 Manufacturer's Installation Instructions: indicate special precautions required for seaming the membrane.

.8 Manufacturer's field report: in accordance with Section 01 45 00.

.9 Reports: indicate procedures followed, ambient temperatures and wind velocity during application

1.4 QUALITY ASSURANCE

.1 Installer qualifications: company or person specializing in application of modified bituminous roofing systems approved by manufacturer.

1.5 FIRE PROTECTION

.1 Fire Extinguishers:
  .1 Maintain one cartridge operated type or stored pressure rechargeable type with hose and shut-off nozzle,
  .2 ULC labelled for A, B and C class protection.
  .3 Size 4.5 kg on roof per torch applicator, within 6 m of torch applicator.

.2 Maintain fire watch for 1.5 hour after each day's roofing operations cease.

.3 Refer to Section 01 35 36 Fire Safety Requirements for Roofing.

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions and Section 01 61 00.

.2 Storage and Handling Requirements:

- .1 Safety: comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of asphalt, sealing compounds, primers and caulking materials.
- .2 Provide and maintain dry, off-ground weatherproof storage.
- .3 Store rolls of felt and membrane in upright position. Store membrane rolls with salvage edge up.
- .4 Remove only in quantities required for same day use.
- .5 Place plywood runways over completed Work to enable movement of material and other traffic.
- .6 Store sealants at +5 degrees C minimum.
- .7 Store insulation protected from daylight and weather and deleterious materials.

.3 Packaging Waste Management: in accordance with Section 01 74 20.

- .1 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.
- .2 Fold up metal banding, flatten and place in designated area for recycling.

1.7 FIELD CONDITIONS

.1 Ambient Conditions:

- .1 Do not install roofing when temperature remains below -18°C for torch application, or to manufacturers' recommendations
- .2 Minimum temperature for solvent-based adhesive is -5 degrees C.

.2 Substrate and materials temperature are to be:

- .1 above +10°C for torch grade membrane
- .2 above +5°C for self-adhesive grade membrane
- .3 above +5°C for solvent based adhesive

.3 Install roofing on dry deck, free of snow and ice, use only dry materials and apply only during weather that will not introduce moisture into roofing system

1.8 WARRANTY

.1 For the work of this Section 07 55 51 the 12 month warranty period prescribed in GC3.13 of General Conditions is extended to two years.

.2 Repair leaks in roofing assembly and membrane flashing within 48 hours of notification.

.3 Inspect roof 30 days before expiry of warranty period and correct defects within 15 days of inspection.

1.9 GUARANTEE

.1 Provide a manufacturer's written material guarantee stating that the roofing membrane and membrane flashing will remain free of manufacturing defects and deterioration for a period of ten years from the date of Certificate of Completion.

1.10 FIELD QUALITY CONTROL

.1 Pre-installation Meeting: After the demolition of the existing roofing system, repair of the deck substrate, and installing new roofing system, conduct meeting at Project site. Notify participants at least 5 working days before meeting.

- .1 Meet with Engineer; Consultant; roofing Installer and foreman; roofing system manufacturer's representative; and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
- .2 Review methods and procedures related to roofing installation, including manufacturer's written instructions.
- .3 Examine deck substrate conditions and finishes for compliance with requirements, including flatness and attachment to structural members.
- .4 Review loading limitations of deck during and after roofing.
- .5 Review flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing.
- .6 Review governing regulations and requirements for insurance, certifications, and inspection and testing, if applicable.
- .7 Review temporary protection requirements for roofing system during and after installation.
- .8 Review roof visual inspection and repair procedures after roofing installation.
- .9 Review mock-up
- .10 Document proceedings, including corrective measures or actions required, and furnish copy of record to each participant

.2 48 hours before commencing work, provide Departmental Representative with date each phase of work will begin.

.3 For every roof basin, upon demolition of the existing roof composition, conduct an inspection of the deck substrate with the contractor in the presence of and under the direction of the Departmental Representative.

.4 On completion of each portion of the roof, conduct, in the presence of and under the direction of the Departmental Representative, a flood test of that portion. Ensure that the entire roof area has been subjected to a flood test when the installation is complete.

Part 2 PRODUCTS

2.1 PERFORMANCE CRITERIA

. 1 Compatibility between components of roofing system is essential. Provide written declaration to Departmental Representative stating that materials and components, as assembled in system, meet this requirement.

.2 Roofing System: to CSA A123.21 for wind uplift resistance

2.2 DECK COVERINGS

.1 Glass Mat, Gypsum Board: to ASTM C1177/C1177M, Type-X 13 mm thick.

.2 Plywood:
- .1 Douglass Fir plywood, exterior grade To CSA O121 thickness as indicated.

2.3 DRAINAGE BOARD

.1 Description: High impact three dimensional polystyrene waffled panels with a factory laminated woven geotextile filter fabric. Drainage board shall be 10 mm thick.
- .1 Core:
  - .1 Compressive strength: 862 kPa.
  - .2 Maximum flow rate: 334 L/min/m
- .2 Fabric:
  - .1 Apparent opening size: 0,42 mm.
  - .2 Water flow rate: 3304 L/min/m2.
  - .3 Puncture resistance: 0,47 Kn.

2.4 DECK PRIMER

.1 Asphalt primer: to CGSB 37-GP-9Ma. Made of bitumen, volatile solvents and adhesive resins. Used to improve adhesion of torch applied waterproofing membranes. As recommended by membrane Manufacturer.

.2 Apply primer to all surfaces to be covered by membrane.

2.5 MEMBRANE

.1 Base and Cap sheet (2 ply): to CGSB 37-GP-56M.
- .1 Styrene-Butadiene-Styrene (SBS) elastomeric polymer prefabricated sheet, nonwoven polyester reinforcement, having nominal weight of 180g/m2.
- .2 Type 2, fully adhered.

.3 Class C - plain surfaced.
.4 Grade 1 - standard service.
.5 Top and bottom surfaces:
.1 sanded/polyethylene.

.6 Base sheet membrane properties: to CGSB 37-GP-56M.
.1 Strain energy (longitudinal/transversal): 9.0/7.0 kN/m.
.2 Breaking strength (longitudinal/transversal): 17.0/12.5 N/5 cm.
.3 Ultimate elongation (longitudinal/transversal): 60/65 %.
.4 Tear resistance: 60 N.
.5 Cold bending at -30°C : no cracking.
.6 Softening point: 110°C.
.7 Static puncture resistance: >400.
.8 Dimensional Stability: -0.4/0.3 %.
.7 ULC certification: Class A

.2 Self adhered membrane: consisting of an SBS rubberized asphalt compound which is integrally laminated to a blue cross-laminated polyethylene film. The membrane shall be specifically designed to be self-adhered to a prepared substrate, and is to have the following characteristics:

.1	Thickness:		1.0 mm
.2	Application temperature:		minimum +5°C
.3	Service Temperature:		-40°C à +70°C
.4	Elongation:	ASTM D412-modified	200%min.
.5	Tensile strength (membrane):	ASTM D412-mod.	3.4 MPa min.
.6	Tensile strength (film):	ASTM D882	40 MPa min.
.7	Minimum puncture resistance(membrane): ASTM E154	178 N	
.8	Low temperature flexibility at -30°C: CAN/CGSB-37.56	Pass	
.9	Water vapour transmission:	ASTM E96	2.8 ng/Pa.s.m^2
.10	Lap peel strength:	ASTM D903, 180°bend	1750 N/m width at 4°C
.11	Moisture absorption:	ASTM D570	0.1%
.12	Air leakage at 75 Pa:	ASTM E283	<0.01 L/s.m^2
.13	Air leakage after 3000 Pa test: ASTM E330	no change	

2.6 POLYSTYRENE INSULATION

.1 Extruded polystyrene (XPS) insulation to CAN/ULC-S701, Type 4, thickness 100 mm, ship lapped edges.

2.7 MINERAL WOOL INSULATION (Stone wool)

.1 Batt insulation: mineral fibre thermal insulation made of stone to CAN/ULC-S702 standard.

2.8 SHEET METAL:

.1 Prefinished steel: 0.6 mm core nominal thickness, minimum 25% recycled content, Z275 zinc coating designation to ASTM A653/A653M or AZ150 aluminum-zinc alloy coating to CSSBI 201M.

.1 Prefinished to CAN/CGSB-93, Class F1S.
.2 Prefinished with 0.200 mm thick polyvinylchloride paint on exposed side and 0.005 mm thick epoxy primer on concealed side.
.3 Prefinished with Barrier Series (100microns) paint system to CSSBI Fact Sheet Prefinished Steel sheet for Canadian Climate-2006.
.4 Color to be selected by Departmental Representative from manufacturer's standard range

2.9 CARPENTRY

.1 Douglas fir plywood: to CSA 0121, urea formaldehyde free.

.2 Parapet sheathing: SHG Sheathing Grade. Nominal thickness 19 mm., surfaces to Tables E-1 and E-2.

2.10 FASTENERS

.1 Fastening strip: Galvanized sheet steel, 0.8mm core nominal thickness, Z275 zinc coating designation to ASTM A653/A653M, 75mm wide.

.2 Covering to steel deck: No. 10 flat head, self-tapping, Type A or AB, cadmium plated screws. Must meet FM 4470 Approved screw and plate assemblies for wind uplift and corrosion resistance.

.3 Fasteners: only screw type fasteners having acceptable coating for corrosion resistance is permitted.

.4 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, recommended for purpose by manufacturer.

.5 Roofing nails: use of roofing nails is not permitted.

.6 Fasteners to be compatible with materials being fastened.

.7 Fasteners for aluminum and where indicated: Stainless steel Type 304.

2.11 FILTER FABRIC

.1 UV resistant, black woven water pervious polyolefin fabric, 1mm thick for installation between insulation and stone ballast in protected membrane system. Fabric to meet approval of insulation manufacturer. To CAN/CGSB-148.1 and CAN/CGSB-4.2 standards.
.1 Product weight 93.5 gm/m2.

2.12 BALLAST

.1 Stone: 19 to 32 mm size, well graded crushed stone opaque, non-porous, washed, free from fines, long splinters, moisture, ice and snow.

2.13 COMPLIMENTARY WATERPROOFING PRODUCTS

.1 Waterproofing mastic as recommended by manufacturer.

.2 Pitch pocket: prefabricated polyurethane curb system, interlocking pocket, size indicated.

.1 Sealant: single component elastomeric polyurethane, isocyanate free.

.2 Mastic: fast setting, solvent free.

.3 Sealing compound as recommended by manufacturer.

2.14 ROOF ACCESSORIES

.1 Compliance with CSA B272-93 Prefabricated Self-sealing Roof vent Flashing.

.2 Roof Drain: Copper retrofit drain with vandal-proof cast aluminium screened dome with access hatch and stainless steel heavy duty ballast retainer.

.1 Copper flange 445 mm diameter.

.2 Downpipe 1.651 mm thick copper x diameter to suit existing drain.

.3 Cast aluminium clamping ring.

.4 Proprietary compressible connectors to ensure waterproof seal with existing drain pipe

Part 3 EXECUTION

3.1 REMOVALS

.1 Start demolition of each roof basin assembly at theroof drain. Cut an opening in the roofing assembly 1 metre x 1 metre, centred over the roof drain. Remove existing drain assembly and install a temporary roof drain assembly at the deck level. Install a temporary roofing membrane, centred on drain, sealing the roof drain flange to the deck to ensure a watertight seal. Start demolition of the basin roofing assembly after the temporary roof drain assembly work has been completed.

.2 On steel roof structures, remove roofing material assembly to expose existing metal deck. Remove existing gypsum board panels, fasteners, adhesive and other foreign matter from the substrate, upper and lower flutes. Take care to minimize damage to the substrate surface.

3.2 QUALITY OF WORK

.1 Do examination, preparation and roofing Work in accordance with Roofing Manufacturer's Specification Manual and CRCA

Roofing Specification Manual, particularly for fire safety precautions, and to FM.

.2 Do priming in accordance with manufacturers written recommendations.

.3 The interface of the walls and roof assemblies will be fitted with durable rigid material plywood providing connection point for continuity of air barrier.

.4 Assembly, component and material connections will be made in consideration of appropriate design loads.

.5 Whenever membranes are torch applied, a continuous and even bead of molten bitumen must be visible as the membrane is unrolled and torched.

3.3 EXAMINATION OF ROOF DECKS

.1 Verification of Conditions:

.1 Inspect with Departmental Representative deck conditions including parapets, construction joints, roof drains, plumbing vents and ventilation outlets to determine readiness to proceed.

.2 Evaluation and Assessment:

.1 Prior to beginning of work ensure:

.1 Decks are firm, straight, smooth, dry, free of snow, ice or frost, and swept clean of dust and debris. Do not use calcium or salt for ice or snow removal.

.2 Curbs have been built.

.3 Roof drains have been installed at proper elevations relative to finished roof surface.

.4 Plywood and lumber nailer plates have been installed to deck, walls and parapets as indicated.

.3 Do not install roofing materials during rain or snowfall.

3.4 PROTECTION OF IN-PLACE CONDITIONS

.1 Cover walls, walks, and adjacent work where materials hoisted or used.

.2 Use warning signs and barriers. Maintain in good order until completion of Work.

.3 Clean off drips and smears of bituminous material immediately.

.4 Dispose of rain water off roof and away from face of building until roof drains or hoppers installed and connected.

.5 Protect roof from traffic and damage. Comply with precautions deemed necessary by Departmental Representative.

.6 At end of each day's work or when stoppage occurs due to

inclement weather, provide protection for completed Work and materials out of storage.

.7 Metal connectors and decking will be treated with rust proofing or galvanization.

3.5 PREPARATION OF STEEL DECK (CHANNEL TYPE)

.1 Steel decking will be treated with rust proofing or galvanization.

3.6 DECK SHEATHING

.1 Mechanically fasten to steel deck Glass Mat Gypsum Board with screws to steel deck's upper rib surfaces, spaced as prescribed by Manufacturer Installation instruction, in accordance with CSA A123.21-10.

.2 Place with long axis of each sheet transverse to steel deck ribs, with end joints staggered and fully supported on ribs.

.3 Where slopes change directions, cut boards cleanly. Avoid breaking boards to acquire deck form. Place boards perpendicular to deck ribs for continuous support at extremities.

3.7 PROTECTED MEMBRANE ROOFING (PMR) APPLICATION

.1 Primer:

.1 Apply primer to glass mat gypsum board deck at rate specified on label

.2 Roofing substrates of gypsum board surfaces will receive a coat of asphalt primer applied according to manufacturer’s instructions. Avoid excess application so as to minimize removal of excess. All surfaces to be primed must be free of rust, dust or any residue that may hinder adherence. Protect primed surfaces. Cover primed surfaces with roofing membrane as soon as possible. Reclean and reprime contaminated surfaces, as well as surfaces where working time of primer has been exceeded before application of sealant.

.2 Base sheet application:

.1 Starting at low point of roof, perpendicular to slope, unroll base sheet, align and reroll from both ends.

.2 Unroll and torch base sheet onto substrate taking care not to burn membrane or its reinforcement or substrate.

.3 Lap sheets 75 mm for side and 150 mm for end laps.

.4 Application to be free of blisters, wrinkles and fishmouths.

.3 Cap sheet application (Same as base sheet):

.1 Starting at low point on roof, perpendicular to slope, unroll cap sheet, align and reroll from both ends.

.2 Unroll and torch cap sheet onto base sheet taking care not to burn membrane or its reinforcement.

.3 Lap sheets 75 mm minimum for side laps and 150 mm minimum for end laps. Offset joints in cap sheet 300 mm from those in base sheet.

.4 Application to be free of blisters, fishmouths and wrinkles.

.5 Do membrane application in accordance with manufacturer's recommendations.

.4 Flashings:
- .1 Complete installation of flashing base sheet stripping prior to installing membrane cap sheet.
- .2 torch base and cap sheet onto substrate in 1 metre wide strips.
- .3 Lap flashing base sheet to membrane base sheet minimum 100 mm and seal by mopping or torch welding.
- .4 Lap flashing cap sheet to membrane cap sheet 150 mm and torch weld.
- .5 Provide 75 mm side lap and seal.
- .6 Properly secure flashings to their support, without sags, blisters, fishmouths or wrinkles.
- .7 Do Work in accordance with manufacturer's recommendations.

.5 Waterproofing at roof drains: Drains with compressible connectors:
- .1 Install base sheet centred on drain. Cut opening of same diameter as downpipe for required water drainage.
- .2 Install drain on base sheet in a layer of adhesive. Mechanically fastened to support.
- .3 Torch weld roofing sheet reinforcement band (1 metre x 1 metre) in a diagonal position to base sheet and previously primed drain flange. Apply manual pressure at drain connectors.
- .4 Install cap sheet to edge of opening.
- .5 Fasten dome to drain.

.6 Roof penetration:
- .1 Install roof drain, vent stack covers and other roof penetration flashings and seal to membrane in accordance with the manufacturer's recommendations and details.

.7 Drainage Board application:
- .1 Install the drainage layer directly on the waterproofing membrane with the filter fabric up. Abut the drainage board panels and overlap shiplap filter fabric over the adjacent board. Cut along the edges to fit the surface ensure the waterproofing membrane is not damaged.

.8 Insulation application:
- .1 Place insulation, loose laid in parallel rows with ends staggered.

.9 Filter fabric application:
- .1 Apply fabric unbonded over installed insulation.
- .2 Overlap edges 300 mm minimum.
- .3 Cut fabric around roof drains, vents and other penetrations and extend under metal flashings

3.8 BALLAST AND PROTECTIVE COVERING

.1 Apply stone ballast, dry, as soon as possible after placement of fabric, at minimum rate of 60 kg/m^2, follows insulation manufacturer's recommendations.

.2 Spread stone ballast to an even thickness over entire roof area.

.3 Spread additional stone ballast around perimeter of roof for width of 1200 mm to increase ballast weight to minimum of 100 kg/m2.

.4 Minimum rate of application to be confirmed by Roofing System Manufacturer in accordance to wind lift requirements at Project location.

3.9 METAL FLASHING

.1 Install sheet metal work as detailed. Minimum overlap of 100mm.

.2 Use concealed fastenings except where approved before installation.

.3 Provide underlay under sheet metal. Secure in place and lap joints 100 mm.

.4 Counterflash bituminous flashings at intersections of roof with vertical surfaces and curbs. Flash joints using S-lock forming tight fit over hook strips.

.5 Lock end joints and caulk with sealant.

.6 Install surface mounted reglets true and level, and caulk top of reglet with sealant.

.7 Insert metal flashing into reglets and under cap flashing to form weather tight junction.

.8 Turn top edge of flashing into recessed reglet or mortar joint minimum of 25 mm. Lead wedge flashing securely into joint.

.9 Caulk flashing at reglet and cap flashing with sealant.

.10 For work piercing membranes, no fasteners are to be removed unless holes are sealed immediately with appropriate membrane sealer.

3.10 FIELD QUALITY CONTROL

.1 Inspections:

.1 Inspection and testing of roofing application will be carried out by testing laboratory designated by Departmental Representative.

.2 Departmental Representative will pay for tests as specified in Section 01 45 00.

.3 Inspection should also be carried by Roofing system manufacturer. Submit report as per 01 33 00 and 01 45 00.

.2 Testing:
.1 Flood testing: Do not conceal waterproofing until inspection and testing are completed to satisfaction of Engineer
.2 Temporarily plug drains and dam horizontal surface areas to be tested and flood with water to minimum depth of 80 mm.
.3 Maintain flooded depth for 24 hours.
.4 If leaks occur repair and retest.

3.11 CLEANING

.1 Remove bituminous markings from finished surfaces.

.2 In areas where finished surfaces are soiled caused by work of this section, consult manufacturer of surfaces for cleaning advice and complying with their documented instructions.

.3 Repair or replace defaced or disfigured finishes caused by work of this section.

.4 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 20.
.1 Place materials defined as hazardous or toxic in designated containers.
.2 Clearly label location of salvaged material's storage areas and provide barriers and security devices.
.3 Ensure emptied containers are sealed and stored safely.
.4 Divert unused aggregate materials from landfill to local quarry/facility for reuse as reviewed by Departmental Representative.
.5 Unused paint coating material must be disposed of at official hazardous material collections site as reviewed by Departmental Representative.
.6 Unused adhesive, sealant and asphalt materials must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.
.7 Dispose of unused adhesive material at official hazardous material collections site approved by Departmental Representative.
.8 Dispose of unused sealant material at official hazardous material collections site approved by Departmental Representative.
.9 Dispose of unused asphalt material at official hazardous material collections site approved by Departmental Representative.
.10 Divert unused gypsum materials from landfill to recycling facility as reviewed by Departmental Representative.

Part 1 GENERAL

1.1 RELATED SECTIONS

.1 Section 07 92 00 Sealant.

1.2 REFERENCES

.1 Health Canada/Workplace Hazardous Materials Information System (WHMIS).

.1 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.2 Underwriter's Laboratories of Canada (ULC)

.1 CAN/ULC-S115-16 Fire Tests of Fire stop Systems.

.3 National Building Code of Canada (2015 edition).

.4 National Fire Code of Canada (2015 edition).

1.3 DEFINITIONS

.1 Fire Stop Material: device intended to close off opening or penetration during fire or materials that fill openings in wall or floor assembly where penetration is by cables, cable trays, conduits, ducts and pipes and poke-through termination devices, including electrical outlet boxes along with their means of support through wall or floor openings.

.2 Single Component Fire Stop System: fire stop material that has Listed Systems Design and is used individually without use of high temperature insulation or other materials to create fire stop system.

.3 Multiple Component Fire Stop System: exact group of fire stop materials that are identified within Listed Systems Design to create on site fire stop system.

.4 Tightly Fitted; (ref: NBC Division B Part 3.1.9.1.1 and 9.10.9.6.1): penetrating items that are cast in place in buildings of noncombustible construction or have "0" annular space in buildings of combustible construction.

.1 Words "tightly fitted" should ensure that integrity of fire separation is such that it prevents passage of smoke and hot gases to unexposed side of fire separation.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00.

.2 Product Data:
- .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
- .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00

.3 Shop Drawings:
- .1 Submit shop drawings to show location, proposed material, reinforcement, anchorage, fastenings and method of installation.
- .3 Construction details should accurately reflect actual job conditions

.4 Samples:
- .1 Submit duplicate 300 x 300 mm samples showing actual fire stop material proposed for project

.5 Quality assurance submittals: submit following in accordance with Section 01 45 00 - Quality Control.
- .1 Test reports: in accordance with CAN/ULC-S101 for fire endurance and CAN/ULC-S102 for surface burning characteristics.
  - .1 Submit certified test reports from approved independent testing laboratories, indicating compliance of applied fire stopping with specifications for specified performance characteristics and physical properties.
- .2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .3 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures.
- .4 Manufacturer's Field Reports: submit to manufacturer's written reports within 3 days of review, verifying compliance of Work, as described in PART 3 - FIELD QUALITY CONTROL

1.5 QUALITY ASSURANCE

.1 Qualifications:

.1 Installer: company specializing in fire stopping installations approved by manufacturer.

.2 Pre-Installation Meetings: convene pre-installation meeting one week prior to beginning work of this Section, with contractor's representative, Departmental Representative] in accordance with Section 01 32 16.07:

.1 Verify project requirements.
.2 Review installation and substrate conditions.
.3 Co-ordination with other building subtrades.
.4 Review manufacturer's installation instructions and warranty requirements.

.3 Site Meetings: as part of Manufacturer's Services described in PART 3 - FIELD QUALITY CONTROL, schedule site visits, to review Work, at stages listed.

.1 After delivery and storage of products, and when preparatory Work is complete, but before installation begins.
.2 Twice during progress of Work at 25% and 60% complete.
.3 Upon completion of Work, after cleaning is carried out.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Packing, shipping, handling and unloading:

.1 Deliver, store and handle materials in accordance with Section 01 61 00.
.2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
.3 Deliver materials to the site in undamaged condition and in original unopened containers, marked to indicate brand name, manufacturer, ULC markings.

.2 Storage and Protection:

.1 Store materials indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
.2 Replace defective or damaged materials with new.

.3 Waste Management and Disposal:

.3 Separate waste materials for recycling in accordance with Section 01 74 20.

Part 2 Products

2.1 MATERIALS .1 Fire stopping and smoke seal systems: in accordance with CAN/ULC-S115.

.1 Asbestos-free materials and systems capable of maintaining effective barrier against flame, smoke and gases in compliance with requirements of CAN/ULC-S115 and not to exceed opening sizes for which they are intended and conforming to specified special requirements described in PART 3.

.2 Fire stop system rating: 1 hour.

.1 Fire Stopping and smoke seal systems to have following characteristic for Pipe, cables, ductwork penetration

.1 Acrylic based firestop sealant

.2 Paintable

.3 STC 56

.4 Movement capability: 12%

.5 Approximate density: 99.9 lb/ft^3

.6 Mold and Mildew performance: Class 0 (ASTM G21-96) and Class 0 (EN ISO 846)

.7 Mold and Mildew resistance: Yes

.8 Surface burning characteristic UL 723 (ASTM E84): Flame spread: 10; Smoke development: 0

.2 Fire stopping and smoke seal system for Cable trays and opening not covered above

.1 fire stop putty of intumescent material, 2 hour rating, density 1.36 grams/cubic centimetre

.3 Service penetration assemblies: systems tested to CAN/ULC-S115.

.4 Service penetration fire stop components: certified by test laboratory to CAN/ULC-S115.

.5 Primers: to manufacturer's recommendation for specific material, substrate, and end use.

.4 Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.

.5 Damming and backup materials, supports and anchoring devices: to manufacturer's recommendations, and in accordance with tested assembly being installed as acceptable to authorities having jurisdiction.

.6 Sealants for vertical joints: non-sagging.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 PREPARATION

.1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials.

.3 Ensure that substrates and surfaces are clean, dry and frost free.

.2 Prepare surfaces in contact with fire stopping materials and smoke seals to manufacturer's instructions.

.3 Maintain insulation around pipes and ducts penetrating fire separation [without interruption to vapour barrier].

.4 Mask where necessary to avoid spillage and over coating onto adjoining surfaces; remove stains on adjacent surfaces.

3.3 INSTALLATION

.1 Install fire stopping and smoke seal material and components in accordance with manufacturer's certified tested system listing.

.2 Seal holes or voids made by through penetrations, poke-through termination devices, and unpenetrated openings or joints to ensure continuity and integrity of fire separation are maintained.

.4 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.

.5 Tool or trowel exposed surfaces to neat finish.

.6 Remove excess compound promptly as work progresses and upon completion.

3.4 SPECIAL REQUIREMENTS

.1 Location of special requirements for fire stopping and smoke seal materials at openings and penetrations in fire resistant rated assemblies are as follows:

.1 Non dust generation: at Administrative level and Office area of Mezzanine level.

.2 Designed for re-entry, removable at: All existing cable tray penetration.

.3 0 hr rating except at designated perimeter as shown on drawings, mainly around main

3.5 FIELD QUALITY CONTROL

.1 Inspections: notify Departmental Representative when ready for inspection and prior to concealing or enclosing fire stopping materials and service penetration assemblies.

.2 Manufacturer's Field Services:

.1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - SUBMITTALS.

.2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

.3 Schedule site visits, to review Work, as directed in PART 1 - QUALITY ASSURANCE.

3.6 CLEANING

.1 Proceed in accordance with Section 01 74 11.

.2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

.3 Remove temporary dams after initial set of fire stopping and smoke seal materials.

3.7 SCHEDULE

.1 Fire stop and smoke seal at:

.1 Penetrations through fire-resistance rated masonry, concrete, and gypsum board partitions and walls.

.2 Top of fire-resistance rated masonry and gypsum board partitions.

.3 Intersection of fire-resistance rated masonry and gypsum board partitions.

.4 Penetrations through fire-resistance rated floor slabs, ceilings and roofs.

.5 Openings and sleeves installed for future use through fire separations.

.6 Around mechanical and electrical assemblies penetrating fire separations.

.7 Rigid ducts: greater than 129 cm2 : fire stopping to consist of bead of fire stopping material between retaining angle and fire separation and between retaining angle and duct, on each side of fire separation.

Part 1 GENERAL

1.2 RELATED SECTIONS

.1 Section 07 55 52: Sealing metal flashing

.2 Section 07 84 00: Fire Stopping

1.3 ENVIRONMENTAL CHOICE PROGRAM

.1 Provide sealant products bearing the 'Ecologo' of the Environmental Choice Program, Department of the Environment, Canadian Environmental Protection Act, Environmental Choice Product Guidelines ECP/PCE-45-92 for Sealants and Caulking Compounds, except maximum VOC 60 g/L during application and curing.

.2 For primers and sealants, indicate VOC in g/L during application and curing.

1.4 PRODUCT DATA

.1 Submit manufacturer's literature indicating recommended surface preparation, sealant selection and primer for each substrate in accordance with Section 01 33 00 and 01 78 00.

Part 2 PRODUCTS

2.1 SEALANTS

.1 Provide sealant products bearing Ecologo to ECP/PCE-45-92 VOC 60 g/L.

2.2 SEALANT MATERIAL DESIGNATIONS

.1 Silicones One Part '3'.

.1 To ASTM C920-14, primerless, Type S, Grade NS, Class 50 SWRI validated.

.3 Preformed compressible and non-compressible back-up materials '10', CFC free.

.1 Polyethylene, urethane, neoprene or vinyl foam. Extruded closed cell foam backer rod. Size: oversize 30 to 50%.

.2 Neoprene or butyl rubber. Round solid rod, Shore A hardness 70.

.3 High density foam. Extruded closed cell polyvinyl chloride (PVC) or extruded polethylene, closed cell, Shore A hardness 20, tensile strength 140 to 200 kPa, extruded polyolefin foam, 32 kg/mü density, or neoprene foam backer, size as recommended by manufacturer.

.4 Bond breaker tape. Polyethylene bond breaker tape which will not bond to sealant.

2.3 SEALANT SELECTION

.1 Perimeters of exterior openings where frames meet exterior facade of building (ie. brick, block, precast masonry): Designations 1B, 1D, 2B, 2D, 3, 4.

.3 Roof metal flashing

2.4 JOINT CLEANER

.1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant recommended by sealant manufacturer.

.2 Primer: to manufacturer's recommendations.

.3

Part 3 EXECUTION

3.2 PREPARATION OF JOINT SURFACES

.1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.

.2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair work.

.3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

.4 Ensure joint surfaces are dry and frost free.

.5 Prepare surfaces in accordance with manufacturer's directions.

3.3 BACKUP MATERIAL

.1 Apply bond breaker tape where required to manufacturer's instructions.

.2 Install joint filler to achieve correct joint depth and shape with approximately 30% compression.

3.4 APPLICATION

.1 Sealant:

.1 Protect installed work of other trades from staining or contamination.

.2 Apply sealant in accordance with manufacturer's application manual and written instructions.

.3 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint. remove tape after sealant applied.

.4 Apply sealant in continuous beads.

.5 Apply sealant using gun with proper size nozzle.

.6 Use sufficient pressure to fill voids and joints solid.

.7 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.

.8 Tool exposed surfaces before skinning begins to give slightly concave shape.

.4 Curing.

.1 Cure sealants in accordance with sealant manufacturer's instructions.

.2 Do not cover up sealants until proper curing has taken place.

.5 Cleanup.

.1 Clean adjacent surfaces immediately and leave work neat and clean.

.2 Remove excess and droppings, using recommended cleaners as work progresses.

.3 Remove masking tape after initial set of sealant.

PART 1 - GENERAL

1.1 REFERENCE STANDARDS

.1 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
.1 Material Safety Data Sheets (MSDS).

1.2 ACTION and INFORMAL SUBMITTALS

.1 Product Data:
.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00. Include product characteristics, performance criteria, and limitations.

.2 Quality assurance submittals: submit following in accordance with Section 01 33 00.

1.3 QUALITY ASSURANCE

.1 Health and Safety:
.1 Do construction occupational health and safety in accordance with Section 01 35 29.

1.4 DELIVERY, STORAGE and HANDLING

.1 Packing, shipping, handling and unloading:
.1 Deliver, store and handle in accordance with manufacturer's written instructions and Section 01 61 00.

.2 Waste Management and Disposal:
.1 Construction/Demolition Waste Management and Disposal: separate waste materials for reuse and recycling in accordance with Section 01 74 20.

PART 2 - PRODUCTS

2.1 GENERAL

.1 Definitions:
.1 Air Gap Method means a clear vertical separation between the pressurized potable water supply and a non-pressurized, non-potable water receiving vessel.

2.1 GENERAL (Cont'd)

.1 (Cont'd)

.2 Backflow Prevention means a device used to protect potable water supplies from contamination or pollution due to backflow

.3 Cleaning means suction and vacuuming removal of debris within pipe sewers, catch basins, maintenance holes, ditch inlets, and oil-grit separators

.4 Combination Hydro-Jet Cleaner means a service vehicle or equipment capable of pressure washing, suction vacuum cleaning of debris

.5 Debris means sludge, dirt, sand, gravel, rocks, bricks, other solid and semi-solid materials, and roots, grease, and encrustations and other materials that may cause restriction to flow in pipe sewers, catch basins, maintenance holes, ditch inlets, and oil-grit separators.

.6 Flushing means hydraulic pressure washing using various nozzles, pressure and flow rates to flush debris within pipe sewer systems downstream.

2.2 WATER SOURCE

.1 Water source shall be as specified in the Contract Documents. When the source is not specified, water shall be clean and free from oil, acid, alkali, organic matter, or other deleterious substances.

.2 Backflow prevention and air gap methods shall be used when water is taken from potable water systems.

2.3 EQUIPMENT

.1 Combination Hydro-Jet Cleaner:

.1 A combination hydro-jet cleaner specifically designed for the purpose of cleaning pipe sewers, catch basins, maintenance holes, ditch inlets, oil-grit separators, and similar facilities, using a selection of nozzles and attachments to permit reaming and root cutting as required, shall be used for the work. The equipment shall be sufficient to clear blockages and remove debris from pipe sewer systems with varied sizes and downstream constraints.

2.4 CLEANING SOLUTIONS

.1 Tri-sodium phosphate: 0.40 kg per 100 L water in system.

.2 Sodium carbonate: 0.40 kg per 100 L water in system.

.3 Low-foaming detergent: 0.01 kg per 100 L water in system.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and data sheet.

3.2 CLEANING and FLUSHING SANITARY and STORM SYSTEMS

.1 Timing: systems operational, hydrostatically tested and with safety devices functional, before cleaning is carried out.

.2 Cleaning Agency:
.1 Retain qualified specialist to perform system cleaning.

.3 Cleaning procedures:
.1 Provide detailed report outlining proposed cleaning procedures at least 2 weeks prior to proposed starting date. Report to include:
.1 Flushing/cleaning procedures, flow rates, elapsed time.
.2 Chemicals and concentrations used.
.3 Specific requirements for completion of work.
.4 Special precautions for protecting piping system materials and components.

.4 Report on Completion of Cleaning:
.1 When cleaning is completed, submit written report

3.3 GENERAL

.1 The work shall commence at the upstream end of pipe sewer systems and progress to the downstream end.

.2 The conditions of the site and the pipe sewer system shall be thoroughly assessed, including the degree of pipe blockage and types of debris. The equipment, nozzles, flow rates, and pressures necessary to complete the work shall be determined. Refer to the Drawings for any supplemental information regarding the sewer network.

.3 Prior to using any mechanical equipment, verify with CCTV inspections if any utility clearance is required.

.4 Water flow volumes and pressures shall not cause damage to the pipe sewer system or flooding of property. Water flow volumes and pressures shall be appropriate for the age and condition of the pipe sewer system.

.5 Debris that cannot be removed by flushing shall be loosened and broken up using reamers and root cutters as required.

.6 No blockage to service connections shall occur as a result of the cleaning and flushing or clean out operation.

.7 Protect water bodies and water body banks against any impact caused by cleaning and flushing.

3.4 PIPE SEWER CLEANING and FLUSHING

.1 Flushing shall be used to transport debris from each section of pipe sewer to the downstream maintenance hole or catch basin. Each section of pipe sewer between maintenance holes, catch basins, ditch inlets shall be cleaned and flushed before cleaning and flushing the next downstream section. Debris shall be continuously cleaned from the downstream maintenance hole or catch basin as flushing occur.

3.4 PIPE SEWER CLEANING and FLUSHING (Cont'd)

.2 The passage of debris from one section of pipe sewer to another shall not be permitted. A weir or sediment trap shall be placed in the maintenance hole to prevent passage of debris from the upstream pipes. When cleaning and flushing is completed for each section, the weir or sediment trap shall be removed.

.3 Cleaning and flushing shall continue for each section of pipe sewer until no further debris is flushed from the pipe, and the pipe sewer section is free of impediments to flow. A minimum of 90% of the pipe sewer circumference shall be free of debris.

.4 If clean out cannot be completed due to damaged or broken pipe sewer, catch basin, maintenance hole, or ditch inlet, the Departmental Representative shall be immediately notified.

3.5 CATCHBASINS MANHOLES and DITCH INLET CLEANOUT

.1 A combination hydro-jet cleaner shall remove debris from catch basins,manholes, maintenance holes, and ditch inlets separately.

3.6 OIL GRIT SEPARATORS CLEANOUT

.1 Oil-grit separators shall be cleaned out by closing or blocking off the inlet and outlet pipes, dewatering the system, removal of debris by vacuum or other mechanical means, and cleaning and flushing to remove sediment. The inlet and outlet pipes shall not be reopened or unblocked until after the separator has been inspected by the Departmental Representative.

3.7 CLOSED CIRCUIT TELEVISION INSPECTION

.1 Pipe sewers shall be inspected after cleaning by closed-circuit television (CCTV). The Departmental Representative shall be notified a minimum 24 hours prior to the inspection.

.1 Submit 2(two) sets of digital record of CCTV inspection.

3.8 MANAGEMENT of EXCESS MATERIALS

.1 Debris removed from pipe sewers, catch basins, maintenance holes, ditch inlets, and oil-grit separators shall be removed from site and disposed.

.1 Submit documentation of compliance with all regulations related to debris disposal.

.2 Liquid shall be decanted or filtered and returned to the sewer of origin. The decanted or filtered liquid shall comply with Provincial Water Quality Objectives and local municipal bylaws.

3.9 CLEANING

.1 Proceed in accordance with Section 01 74 11.

.2 Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

Public Works and Government Services Canada

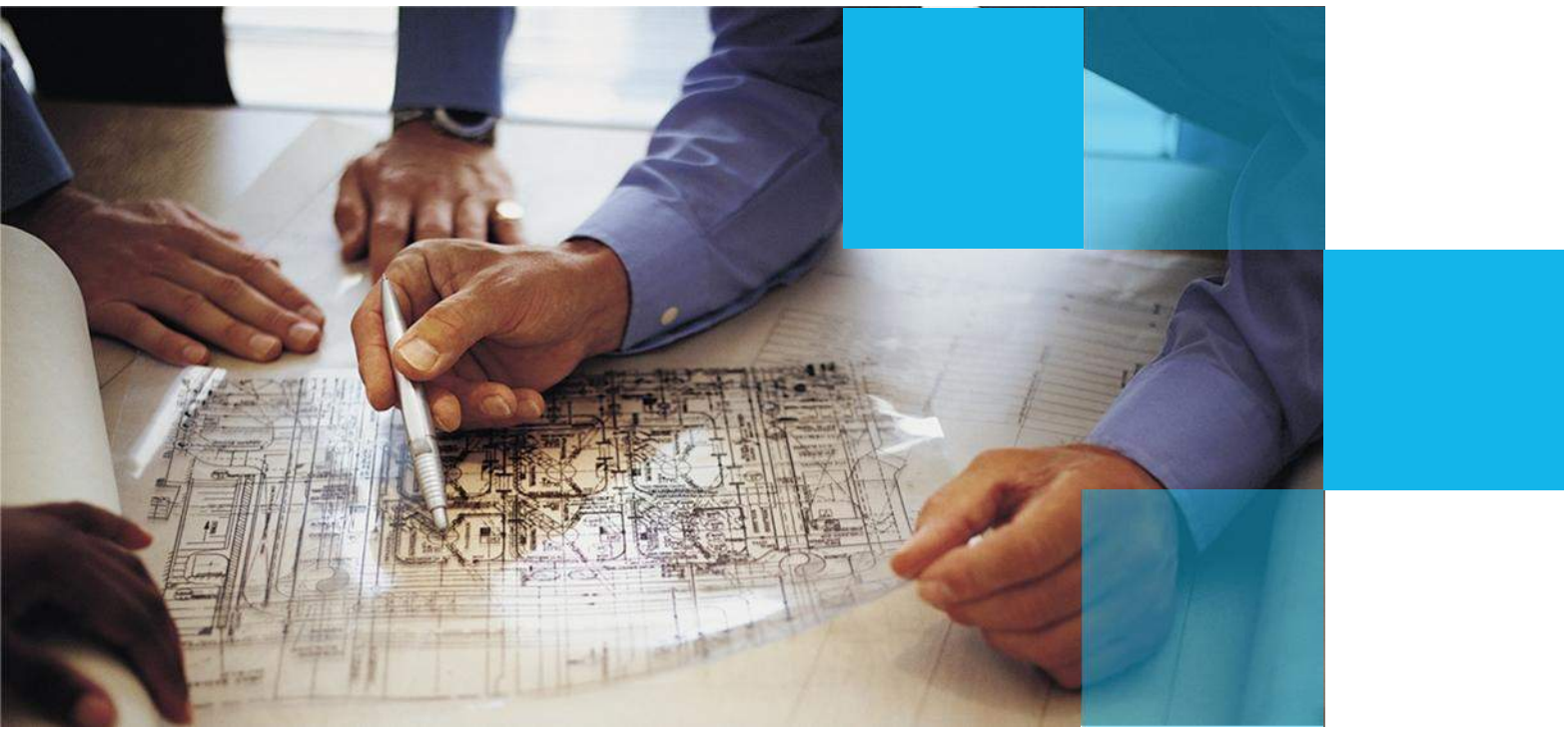
Travaux publics et Services gouvernementaux Canada

Designated Substances Hazardous Materials Survey

Canada Coast Guard Base Prescott, Ontario

PWGSC Project R.066414.001

141-14670-00



SURVEY REPORT

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WSP

PWGSC Project R.066414.001
WSP Project 141-14670-00

November 28, 2014

Ms. Selina Chowdhury
Senior Environmental Specialist
Environmental Services
Public Works & Government Services Canada
4900 Yonge Street, 11th Floor
Toronto, Ontario M2N 6A6

Re: Report for the Designated Substances and Hazardous Materials Survey (DSHMS) for the Refurbishment of Canada's Coast Guard Base in Prescott, ON

Dear Ms. Chowdhury:

This report documents relevant background information, methodologies utilized, work undertaken and the findings of the Designated Substances and Hazardous Materials Survey (DSHMS) of the building structures at the Canada Coast Guard Base located in Prescott, ON, conducted by WSP in March 2014.

Please do not hesitate to contact the undersigned if you have any questions.

Yours truly,

WSP Canada Inc.

Marc St. Germain, P. Eng.
Environmental Engineer

[Designated Substances and Hazardous Materials Survey Report for the Refurbishment of Canada's Coast Guard Base, Department of Fisheries and Oceans, Prescott, ON]

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Executive Summary

WSP Canada Inc. (previously GENIVAR Inc.) was retained by Public Works and Government Services Canada (PWGSC) on behalf of the Department of Fisheries and Oceans (DFO) to conduct a Designated Substances and Hazardous Materials Survey (DSHMS) of the buildings and structures (the buildings) at the Canada Coast Guard Base located in Prescott (CCGB Prescott), Ontario.

The objectives of this survey were as follows:

1) To identify Designated Substances and/or hazardous materials that may be present in the buildings at CCGB Prescott;

2) To prepare a report documenting the identities, usages and locations of any Designated Substances and hazardous materials identified at CCGB Prescott; and,

3) To provide PWGSC and DFO with applicable management considerations in support of the upcoming refurbishment project at CCGB Prescott.

The primary findings of this survey are summarized below:

Designated Substance/ Hazardous Material	**Survey Findings**
Asbestos	Bulk samples were collected from a number of suspect building materials observed in several buildings at CCGB Prescott. The following building materials were those identified as asbestos-containing material (ACM): • *Vinyl Floor Tiles (and Mastic)*
Lead	Bulk paint samples were collected from each distinct colour of paint observed at CCGB Prescott and submitted for analysis of lead content. A number of the paints observed/sampled were identified as "lead-containing" paints in accordance with the federal *Hazardous Products Act* (*Surface Coating Materials Regulation*). Twenty five (25) of the sampled paints at CCGB Prescott were confirmed to contain greater than 90ppm of lead.
Silica	Building/construction materials known to contain silica such as glass, concrete, masonry, stone and mortar were observed at CCGB Prescott.
Mercury	Mercury vapour is assumed to be present within fluorescent light tubes observed at the subject property. Liquid mercury-containing thermostats were also observed at CCGB Prescott.
PCBs	Polychlorinated Biphenyls (PCBs) may be present in some of the fluorescent light ballasts located throughout the buildings at CCGB Prescott.
ODSs	Refrigerators and air conditioning equipment were observed at CCGB Prescott. This cooling equipment may contain ozone-depleting substances (ODS).
Mould	Although visible mould was not observed, conditions conducive to mould growth, including water staining/damage, were observed during the survey.
Benzene/Fuel Tanks	Benzene is likely a component of the Diesel and Jet Fuel A-1 present in the tanks/barrels observed at the facility.

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1. Introduction

1.1 Site Description

WSP Canada Inc. (previously GENIVAR Inc.) was retained by Public Works and Government Services Canada (PWGSC) on behalf of the Department of Fisheries and Oceans (DFO) to conduct a Designated Substances and Hazardous Materials Survey (DSHMS) of the buildings and structures (the buildings) at the Canada Coast Guard Base located in Prescott (CCGB Prescott), Ontario.

CCGB Prescott is mainly comprised of six (6) buildings, including the: Main Building, Buoy Maintenance Building, Boat House, Helicopter Hangar, Heated Storage Building, and Metal-Clad Storage Building. The facility is located on a 2.8 hectare site of irregular shape on the shores of the St. Lawrence River, and has been used as a marine base for over a century.

1.2 Survey Objectives

The DSHMS was completed in advance of a planned refurbishment project for CCGB Prescott. The objectives of this survey were as follows:

1) To identify Designated Substances and/or hazardous materials that may be present in the buildings at CCGB Prescott.

2) To prepare a report documenting the identities, usages and locations of any Designated Substances and hazardous materials identified at CCGB Prescott.

3) To provide PWGSC and DFO with applicable management considerations in consideration of the planned construction/renovation and demolition activities at the CCGB Prescott.

1.3 Scope of Work

The areas and components inspected as part of this project were in accordance with those specified in the Statement of Work (PWGSC Project R.066414.001) for the project dated January 21, 2014.

The six (6) CCGB Prescott buildings and structures surveyed by WSP included:

Table 1-1 List of Surveyed Buildings at CCGB Prescott

Building ID / Name	Description
Building A – Main Building (Offices and Workshops)	2-storey structure (with a mezzanine floor in-between) housing the facility's main offices, shipping/receiving areas, storage areas and various workshops
Building B – Buoy Maintenance Building	1-storey structure used for the repair/maintenance and re-painting of the buoys
Building C – Boat House	1 ½ - storey structure used for storage and boat repairs
Building D – Helicopter Hangar	2-storey structure used for general storage and mail operation (Helicopters are no longer stationed at the base)
Building E – Heated Storage Building	1-storey structure used for the storage of various materials and equipment, including an area used for environmental response
Building F – Metal-Clad Storage Building	1-storey structure with steel framing (Butler type) for storing miscellaneous materials and used equipment

A thorough intrusive, but not destructive, survey was undertaken of the following:

- Building construction materials
- Components, fixtures, and fixed equipment/furniture

- Fuel, oil and/or waste oil storage
- Accessible rooms, areas and building spaces

The DSHMS consisted of the following tasks:

- A systematic (room-by-room) survey of each building or structure
- Collection of bulk samples from suspect materials
- Submission of samples to an accredited independent laboratory for analysis
- Data analysis and identification of Designated Substances and hazardous materials

1.4 Regulatory Context

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

The term "Designated Substance" refers to the eleven chemical or physical agents specifically identified within the Act. Each of these substances is governed by its own respective regulation that defines the minimum health and safety requirements for assuring safe worker-substance interaction as well as the obligations of employers and workers in workplaces containing said substances. These regulations further stipulate the maximum concentrations of the respective substance to which a worker may be exposed, according to short-term exposure values and time-weighted average exposure values. Table 1-2 lists the eleven chemical/physical agents identified in the act as well as their respective regulations and corresponding amendments.

Table 1-2 Ontario Occupational Health & Safety Regulations for Designated Substances

Designated Substance	Applicable Regulation	Most Recent Amendment
Acrylonitrile	O. Reg. 490/09	O. Reg. 148/12
Arsenic	O. Reg. 490/09	O. Reg. 148/12
Asbestos	O. Reg. 490/09	O. Reg. 148/12
Asbestos *(on Construction Projects and in Buildings and Repair Operations)*	O. Reg. 278/05	O. Reg. 479/10
Benzene	O. Reg. 490/09	O. Reg. 148/12
Coke Oven Emissions	O. Reg. 490/09	O. Reg. 148/12
Ethylene Oxide	O. Reg. 490/09	O. Reg. 148/12
Isocyanates	O. Reg. 490/09	O. Reg. 148/12
Lead	O. Reg. 490/09	O. Reg. 148/12
Mercury	O. Reg. 490/09	O. Reg. 148/12
Silica	O. Reg. 490/09	O. Reg. 148/12
Vinyl Chloride	O. Reg. 490/09	O. Reg. 148/12

1.5 Additional Regulatory Requirements for Asbestos

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

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

O. Reg. 278/05 introduces significant changes to how asbestos management is regulated in Ontario. Many of the regulatory changes adopted by O. Reg. 278/05 were already in wide use in industry as part of best management practices. Noteworthy regulatory changes include modifications to asbestos survey requirements, the management of asbestos on-site, abatement operations and procedures (i.e. Type 1, 2 and 3), the use of personal protective equipment (PPE) and air monitoring requirements.

1.6 Additional Regulatory Requirements for Lead

In April 2005, the Federal *Surface Coating Materials Regulation (SOR/2005-109)* limited the allowable concentration of total lead present in a surface coating material (with some exceptions) to 600 mg/kg (600 ppm).

In December 2010, the Federal Government lowered the total lead limit in surface coating materials from 600 mg/kg to 90 mg/kg under subsections 4(1) and 5(1) and section 8 of the *Surface Coatings Materials Regulations (SOR/2005-109)*. The lowering of this limit aligns Canada with the United States in respect of total lead levels in surface coating materials and certain products with surface coating materials applied to them.

Therefore using this revised threshold limit, those surface coating materials with lead concentrations that exceed 90 ppm (0.009% by weight) are considered to be lead-containing for the purposes of this assignment.

1.7 Additional Regulatory Requirements for Waste Management

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

In addition to the EPA waste management requirements, the *Canada Wide Standards on Fluorescent Lamps Containing Mercury* requires that quantities of fluorescent light tubes destined for waste in excess of 25 tubes are to be considered hazardous waste and thus must be disposed of in a manner that is compliant with Regulation 347.

2. Methodology

2.1 General DSHMS Survey Methodology

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

The surveyor performed a systematic survey of each building for the purposes of identifying Designated Substances and hazardous materials and documenting observations made about their locations, estimated quantities and respective conditions. These observations form the basis of management considerations and remedial actions provided in Section 4 of this report.

Bulk samples were collected from suspect building materials (materials known as having the potential to be asbestos-containing) for analysis of their asbestos content. Paint chip samples were also collected from paint applications for analysis of their lead content. Survey procedures specific to asbestos-containing materials and lead are documented in Sections 2.2 and 2.3 of this report, respectively.

2.2 Asbestos Survey Methodology

The surveyor inspected each building for the presence of friable and non-friable asbestos-containing materials (ACM). Examples of ACM commonly found in buildings include:

- Sprayed insulation
- Acoustic/texture plaster
- Drywall joint compound
- Mechanical insulation
- Asbestos cement
- Piping
- Acoustic ceiling tiles
- Vinyl floor tiles and vinyl sheet flooring
- Plaster

It should be noted that not all the above listed materials were necessarily observed during this survey.

Bulk samples were collected from suspect materials and analyzed to confirm the presence/absence of asbestos. The collection of bulk material samples was performed according to the procedures documented in the Ontario Ministry of Labour's (MOL) publication *Designated Substances in the Workplace: A Guide to the Asbestos Regulation for Construction Projects, Buildings and Repair Operations.*

O. Reg. 278/05 stipulates the minimum number of samples that must have asbestos concentrations less than 0.5% in order for an area of homogenous material to be not considered asbestos-containing, as given in Table 2-1. A homogeneous sampling area is defined by the USEPA as containing material that is uniform in texture and appearance, was installed at one time and is unlikely to consist of more than one type or formulation of material. The O. Reg. 278/05 sampling requirements are summarized in greater detail in Table 2-1 below.

In addition to meeting the provincial survey requirements, survey guidelines specified in *PWGSC's Departmental Policy 057 – Asbestos Management* was also adhered to.

Table 2-1 Minimum Number of Bulk Samples to be Collected Under O. Reg. 278/05 According to Material Area, Application and Friability

Type of Material	Size of Homogenous Material	Minimum Number of Bulk Samples
Surfacing material, including without limitation material that is applied to surfaces by spraying, by trowelling or otherwise, such as acoustical plaster on ceilings, fireproofing materials on structural members and plaster	Less than 90 m^2	3
	90m^2 or more, but less than 450m^2	5
	450m^2 or more	7
Thermal insulation, except as described below	Any size	3
Thermal insulation patch	Less than 2m or 0.5m^2	1
Other material	Any size	3

Samples were collected from discrete locations with every attempt to minimize damage. The following procedures for collection of samples were followed:

- The surface of the material was wetted with amended water using a spray bottle. In situations where the material could not be wetted, a plastic bag or other containment device was placed around the sampling device.
- A sample was obtained by one of two methods;
    1) A sampling device was slowly pushed into the material with a twisting motion until the entire thickness was penetrated, followed by extraction of the sampling device, or;
    2) A knife was cleaned and then used to excise a piece of the material.
- Each sample was placed in a clear bag with a tight closure, labelled appropriately and placed in a second, similar bag. Debris was cleaned with wet paper towels and discarded into a plastic bag.
- Damage to the material sampled was repaired with duct tape and/or filler material as needed.
- A chain of custody form was completed for all samples collected on-site and accompanied samples in transit. Asbestos bulk samples were couriered to EMSL Analytical of Mississauga, Ontario.

A total of one hundred and thirty five (135) bulk samples were collected from suspect building/construction materials and submitted to EMSL Analytical (accredited by NVLAP) for analysis. The number of homogenous samples collected from each suspect building material was done so in accordance with Table 1 of O. Reg. 278/05.

2.3 Lead Survey Methodology

A total of thirty eight (38) paint chip samples collected from distinct paint colours observed within the six (6) building structures were submitted for lead content analysis. Samples were collected with the aid of a thin-bladed knife, which was cleaned prior to each sampling event. The site surveyor selected sample locations where it appeared that the paint application was most representative of all areas on which it was applied. Each paint chip sample was placed in a clear bag with a tight closure, labelled appropriately and placed in a second, similar bag. A chain of custody form was completed and accompanied the bulk samples, sent via courier, to EMSL Analytical of Mississauga, Ontario.

Lead analysis was performed following ASTM Method, ASTM D3335-85A "*Standard Method to test for Low Concentrations of Lead in Paint by Atomic Absorption Spectrophotometry*".

2.4 Silica

The surveyors inspected CCGB Prescott for the presence of materials known to contain silica. Silica is present in materials such as such as glass, concrete, masonry, stone and mortar which are prevalent materials in construction.

2.5 Mercury

The surveyors inspected CCGB Prescott for equipment which is likely to contain mercury. Information on the type of equipment, model and serial numbers and quantities were recorded, where available.

2.6 Polychlorinated Biphenyls (PCBs)

The surveyors inspected CCGB Prescott for equipment which may contain PCBs. Equipment that is generally suspected of containing PCBs includes lamp ballasts, transformers, hydraulic fluid, compressors, switchgears and capacitors.

2.7 Ozone-Depleting Substances (ODS)

The surveyors inspected CCGB Prescott for equipment which may contain ODS. Information on the type of equipment, manufacturer, and type and quantity of refrigerants used was recorded, where available.

2.8 Mould

The surveyors inspected CCGB Prescott for the presence of mould. This included a non-intrusive visual assessment of exterior and interior surfaces for evidence of visible mould and/or moisture and water damage.

3. Observations and Results

Laboratory Certificates of Analysis are provided in **Appendix A** of this report. Relevant site photographs taken during the survey are presented in **Appendix B** of this report.

It should be noted that asbestos-containing materials (ACM), Designated Substances or hazardous materials may be concealed by existing building finishes, components or fixtures. If demolition or construction activities uncover materials suspected to be ACM, Designated Substances or hazardous materials, all work must stop and the materials should either be sampled by a qualified person, or presumed to contain the suspected substance. If the material is confirmed, or presumed to be ACM, Designated Substances or hazardous materials it must be handled and disposed of in accordance with the appropriate and applicable guidelines and regulations including, but not limited to: O. Reg. 278/05, O. Reg. 490/09 and R.R.O. 1990, Regulation 347.

3.1 Asbestos

3.1.1 Building A – Main Building

A total of fifty-six (56) bulk material samples were collected from suspected asbestos-containing materials observed in the Main Building. Table 3-1 summarizes only those materials identified to be asbestos-containing materials along with recommended remedial actions for each respective material. In accordance with the requirements of O. Reg. 278/05, homogenous materials (i.e. materials uniform in color and texture) must be considered ACM if any sample is identified to have an asbestos concentration of 0.5% or greater.

Table 3-1 Asbestos-Containing Materials – Main Building

Material	Location	Description	Assessment[1]	Action[2]	Photo[3]
Vinyl Floor Tile (VFT-1) (including mastic)	<u>Bottom Floor</u> Telecom Room, Stores Room, South Shop, Electronics Shop, Office #31, Foreman Store Room	Approximately 3650 square feet (340 square metres) of VFT-1 (12"x12"; blue with white streak) and underlying mastic	- ***Sample ID***: MB-12-VFT1-A to C - ***Concentration***: *19.9% Chrysotile* - ***Material:*** Non-Friable - ***Accessibility***: A *(Areas of the building within reach, from ground level, of all building users. Activities of the building users may result in disturbance of ACM.)* - ***Condition***: Good	**Action 7** **Routine surveillance of ACM in good condition.** Prior to demolition/construction activities, remove these materials following **Type 1** abatement procedures – if the material is wetted and the work is done using non-powered hand tools and the mastic is removed using an appropriate solvent. Follow **Type 3** abatement procedures – if mastic is removed via sanding or grinding with power tools.	4

1. For sample ID and concentration levels refer to **Appendix A** – Laboratory Certificates of Analysis.
2. Actions recommended are in accordance with O. Reg. 278/05 and with PWGSC Departmental Policy DP 057 Regarding Asbestos Management. Refer to **Appendix C** for Action definitions. Refer to O. Reg. 278/05 for Type 1, 2 & 3 procedures.
3. For photographs taken during the survey refer to **Appendix B** – Project Photographs.

Roof sampling was limited strictly to non-destructive investigation, i.e., the collection of surface roofing materials which would not damage the weather/water-proofing integrity of the roof, including roof ballast filter fabric/cloth and caulking on roof-top HVAC equipment (refer section 3.2 for details). Based on the date of the original building construction there is the potential for some of the roofing materials to contain asbestos. Although no sampled materials returned asbestos containing results, WSP cannot confirm the absence of asbestos in all the roofing materials as no roof-core samples were able to be collected as part of this survey. It is recommended that roof cores (full depth roof membrane samples) be collected and analyzed for asbestos immediately prior to the timing of the roof replacement.

3.1.2 Building B – Buoy Maintenance Building

A total of twenty-four (24) bulk material samples were collected from suspected asbestos-containing materials observed in the Buoy Maintenance Building. Table 3-2 summarizes only those materials identified to be asbestos-containing materials along with recommended remedial actions for each respective material. In accordance with the requirements of O. Reg. 278/05, homogenous materials (i.e. materials uniform in color and texture) must be considered ACM if any sample is identified to have an asbestos concentration of 0.5% or greater.

Table 3-2 Asbestos-Containing Materials – Buoy Maintenance Building

Material	Location	Description	Assessment[1]	Action[2]	Photo[3]
Vinyl Floor Tile (VFT-1) (including mastic)	Hall Between Shower and Work Area	Approximately 50 square feet (5 square metres) of VFT-1 (12"x12"; blue with white streak, covered by lots of dust/dirt) and underlying mastic	- ***Sample ID***: BMR-VFT1-A to C - ***Concentration***: *14.2% Chrysotile* - ***Material:*** Non-Friable - ***Accessibility***: A *(Areas of the building within reach, from ground level, of all building users. Activities of the building users may result in disturbance of ACM.)* - ***Condition***: Good	**Action 7** **Routine surveillance of ACM in good condition.** Prior to demolition/construction activities, remove these materials following **Type 1** abatement procedures – if the material is wetted and the work is done using non-powered hand tools and the mastic is removed using an appropriate solvent. Follow **Type 3** abatement procedures – if mastic is removed via sanding or grinding with power tools.	36
Vinyl Floor Tile (VFT-3) (including mastic)	Side Entrance (To Locker Area) Immediately To the right of Door	Approximately 50 square feet (5 square metres) of VFT-1 (12"x12"; blue with white streak) and underlying mastic	- ***Sample ID***: MB-12-VFT3-A to C - ***Concentration***: *19.9% Chrysotile* - ***Material:*** Non-Friable - ***Accessibility***: A *(Areas of the building within reach, from ground level, of all building users. Activities of the building users may result in disturbance of ACM.)* - ***Condition***: Good	**Action 7** **Routine surveillance of ACM in good condition.** Prior to demolition/construction activities, remove these materials following **Type 1** abatement procedures – if the material is wetted and the work is done using non-powered hand tools and the mastic is removed using an appropriate solvent. Follow **Type 3** abatement procedures – if mastic is removed via sanding or grinding with power tools.	34

1. For sample ID and concentration levels refer to **Appendix A** – Laboratory Certificates of Analysis.
2. Actions recommended are in accordance with O. Reg. 278/05 and with PWGSC Departmental Policy DP 057 Regarding Asbestos Management. Refer to **Appendix C** for Action definitions. Refer to O. Reg. 278/05 for Type 1, 2 & 3 procedures.
3. For photographs taken during the survey refer to **Appendix B** – Project Photographs.

It is WSP's understanding that the roof of the buoy maintenance building is not scheduled for replacement. Therefore, no roof samples were collected as part of the survey, so to not damage the roof integrity and create a potential water infiltration point. Based on the date of the original building construction there is the potential for some of the roofing materials to contain asbestos. It is recommended that prior to any future roof renovation projects, roof cores (full depth roof membrane samples) be collected and analyzed in order to confirm the absence of asbestos.

3.1.3 Building C – Boat House

A total of ten (10) bulk material samples were collected from suspected asbestos-containing materials observed in the Boat House. Laboratory analysis of these materials did not identify any asbestos content. The roof of the Boat House was reportedly replaced (in its entirety) within the last 10 years and is therefore presumed to not contain asbestos, therefore, roofing material samples were not collected.

3.1.4 Building D – Helicopter Hangar

A total of twenty-nine (29) bulk material samples were collected from suspected asbestos-containing materials observed in the Helicopter Hangar. Table 3-3 summarizes only those materials identified to be asbestos-containing materials along with recommended remedial actions for each respective material. In accordance with the requirements of O. Reg. 278/05, homogenous materials (i.e. materials uniform in color and texture) must be considered ACM if any sample is identified to have an asbestos concentration of 0.5% or greater.

Table 3-3 Asbestos-Containing Materials – Helicopter Hanger

Material	Location[1]	Description	Assessment[1]	Action[2]	Photo[3]
Vinyl Floor Tile (VFT-1) (including mastic)	Mechanical Area on West Side of Building	Approximately 200 square feet (19 square metres) of VFT-1 (12"x12"; red) and underlying mastic	- ***Sample ID***: HH-VFT1-A to C - ***Concentration***: *29.3% Chrysotile* - ***Material:*** Non-Friable - ***Accessibility***: A *(Areas of the building within reach, from ground level, of all building users.* *Activities of the building users may result in disturbance of ACM.)* - ***Condition***: Poor	**Action 3** **ACM removal required for compliance.** Prior to demolition/construction activities, remove these materials following **Type 1** abatement procedures – if the material is wetted and the work is done using non-powered hand tools and the mastic is removed using an appropriate solvent. Follow **Type 3** abatement procedures – if mastic is removed via sanding or grinding with power tools.	22

1. For sample ID and concentration levels refer to **Appendix A** – Laboratory Certificates of Analysis.
2. Actions recommended are in accordance with O. Reg. 278/05 and with PWGSC Departmental Policy DP 057 Regarding Asbestos Management. Refer to **Appendix C** for Action definitions. Refer to O. Reg. 278/05 for Type 1, 2 & 3 procedures.
3. For photographs taken during the survey refer to **Appendix B** – Project Photographs.

3.1.5 Building E – Heated Storage Building

A total of sixteen (16) bulk material samples were collected from suspected asbestos-containing materials observed in the Heated Storage Building. Laboratory analysis of these materials did not identify any asbestos content.

WSP's surveyors were informed that access to the roof of the Heated Storage Building is only possible through the use of a large mechanical lift, which was not available on site. Therefore the roof was inaccessible, and roofing materials were not sampled during this assessment. Based on the date of the original building construction there is the potential for some of the roofing materials to contain asbestos. WSP cannot confirm the absence of asbestos in all the roofing materials as no roof-core samples were able to be collected as part of this survey. It is recommended that roof cores (full depth roof membrane samples) be collected and analyzed for asbestos immediately prior to the timing of the roof replacement.

3.1.6 Building F – Metal-Clad Storage Building

No suspect asbestos-containing materials were observed within the Metal Clad Storage Building.

3.2 Non-Asbestos Bulk Sample Summary

Table 3-4 summarizes the results of bulk material samples which had either no detectable concentrations of asbestos, or had asbestos concentrations less than the regulated threshold (0.5%) and therefore can be considered as "non-asbestos" in accordance with O. Reg. 278/05.

Table 3-4 Summary of Bulk Samples Identified as "Non-Asbestos" at CCGB Prescott

Building	Material	Description	Sample ID[1]
Main Building	Drywall Joint Compound	Drywall Joint Compound from Walls	MB-DWJC-A to G
	Fire Stop	Fire Stop Material at Pipe Penetrations	MB-2-FS1-A to C
	Acoustic Ceiling Tile 1	2'X4' Ceiling Tile with Small Fissures and Pinholes	MB-2-ACT1-A to C
	Pipe Fitting Insulation 1	Mechanical Insulation on Pipe Elbows	MB-9-FIT-A to C
	Vinyl Floor Tile 2	Beige 12"X12" Vinyl Floor Tile	MB-12-VFT2-A to C
	Vinyl Floor Tile 3	Grey 12"X12" Vinyl Floor Tile	MB-13-VFT3-A to C
	Vinyl Floor Tile 4	Blue With White Fleck 12"X12" Vinyl Floor Tile	MB-13-VFT4-A to C
	Acoustic Ceiling Tile 3	2'X4' Ceiling Tile with Dense Pinholes	MB-16-ACT3-A to C
	Acoustic Ceiling Tile 2	2'X2' Ceiling Tile	MB-18-ACT1-A to C
	Acoustic Ceiling Tile 4	2'X4' Ceiling Tile with Fissures	MB-22-ACT4-A to C
	Valve Insulation	Mechanical Valve Insulation	MB-29-V1-A to C
	Pipe Fitting Insulation 2	Mechanical Insulation on Pipe Elbows	MB-9-FIT2-A to C
	Vinyl Floor Tile 5	White with Fleck 12"X12" Vinyl Floor Tile	MB-31-VFT5-A to C
	Acoustic Ceiling Tile 5	2'X4' Ceiling Tile with Pinholes and Fissures	MB-200-ACT5-A to C
	Mechanical Caulking	Caulking on Mechanical Equipment on Roof	MB-EXT-CAULK-A to C
	Roofing fabric	Roof Ballast Filter Fabric/Cloth	MB-EXT-RM-A to C
	Fire Stop 2	Fire Stop Material at Pipe Penetrations	MB-2-FS2-A to C
Buoy Maintenance Building	Exterior Caulking	Caulking on Exterior Windows and Doors	BMR-CAULK-A to C
	Equipment Insulation	Insulation on Large Paint Equipment	BMR-EQUINS-A to C
	Vinyl Floor Tile 2	Blue with White Fleck 12"X12" Vinyl Floor Tile	BMR-VFT2-A to C
	Drywall Joint Compound	Drywall Joint Compound from Walls	BMR-DWJC-A to G
	Acoustic Ceiling Tile 1	2'X4' Ceiling Tile with Pinholes	BMR-ACT1-A to C
Boat House	Exterior Caulking	Caulking on Exterior Windows and Doors	BH-CAULK-A to C

Building	Material	Description	Sample ID[1]
	Drywall Joint Compound	Drywall Joint Compound from Walls	BH-DWJC-A to G
Helicopter Hangar	Drywall Joint Compound	Drywall Joint Compound from Walls	HH-DWJC-A to G
	Linoleum	Linoleum Flooring in Washroom	HH-LIN-A to C
	Acoustic Ceiling Tile 1	2'X2' Ceiling Tile	HH-ACT1-A to C
	Acoustic Ceiling Tile 2	1'X1' Ceiling Tile	HH-ACT2-A to C
	Vinyl Floor Tile 1	Blue 12"X12" Vinyl Floor Tile	HH-VFT1-A to C
	Vinyl Floor Tile 2	Grey Blue 12"X12" Vinyl Floor Tile	HH-VFT2-A to C
	Vinyl Floor Tile 3	Aqua 12"X12" Vinyl Floor Tile	HH-VFT3-A to C
	Vinyl Floor Tile 4	Black12"X12" Vinyl Floor Tile	HH-VFT4-A to C
Heated Storage Building	Acoustic Ceiling Tile 1	2'X4' Ceiling Tile	HS-ACT1-A to C
	Acoustic Ceiling Tile 2	1'X1' Ceiling Tile	HS-ACT2-A to C
	Vinyl Floor Tile 1	Blue 12"X12" Vinyl Floor Tile	HS-VFT1-A to C
	Drywall Joint Compound	Drywall Joint Compound from Walls	HS-DWJC-A to G

1. For sample ID and concentration levels refer to **Appendix A** – Laboratory Certificates of Analysis.

3.3 Lead-Containing Paints

A total of thirty eight (38) bulk paint (paint chip) samples were collected from distinct paint colours/applications observed within the six (6) building structures surveyed. For the purposes of this assignment, paint applications with lead concentrations greater than or equal to 90ppm (0.009% by wt) are considered to be "lead-containing" in accordance with the Federal *Surface Coating Materials Regulation (SOR/2005-109)*.

Table 3-5 summarizes only those paints identified with lead concentrations greater than or equal to 90ppm.

Table 3-5 Summary of Paints with Lead Concentrations Greater than 90ppm

Building	Material	Location	Description	Assessment[1]	Action[2]
Main Building	Cream Paint	Primary Undercoat Throughout Entire Building	Cream colour paint on most walls throughout building	- ***Sample ID***: MB-Pb2 - ***Concentration***: *160 ppm* - ***Condition***: Good	Institute routine surveillance of the paint. It is recommended that areas of lead-containing paints observed to be in fair condition (minor cracking/chipping/flaking), be encapsulated with a fresh coat of paint in order to reduce the likelihood of inhalation,
	Beige Paint	Primary Undercoat Throughout Entire Building	Beige colour paint on most walls throughout building	- ***Sample ID***: MB-Pb3 - ***Concentration***: *130 ppm* - ***Condition***: Good	
	Yellow Paint	Exterior Bollards Throughout Site	Yellow Bollard Paint	- ***Sample ID***: MB-Pb7 - ***Concentration***: *42,000 ppm* - ***Condition***: Poor	
	Brown Paint	Exterior Paint	Exterior of building	- ***Sample ID***: MB-Pb8 - ***Concentration***: *100 ppm* - ***Condition***: Fair	
Buoy Maintenance Building	Cream Paint	Primary Undercoat Throughout Entire Building	Cream colour paint on most walls throughout building	- ***Sample ID***: BMR-Pb1 - ***Concentration***: *130 ppm* - ***Condition***: Fair	
	Brown Paint	Exterior Paint	Exterior of building	- ***Sample ID***: MB-Pb3 - ***Concentration***: *2600 ppm* - ***Condition***: Good	

Building	Material	Location	Description	Assessment[1]	Action[2]
Boat House	Cream Paint	Interior Paint	Interior Walls of Main Floor	- ***Sample ID***: BH-Pb1 - ***Concentration***: *100 ppm* - ***Condition***: Fair	ingestion, and dermal absorption of lead. It is recommended that areas of lead-containing paints observed to be in poor condition (severe cracking/chipping/flaking and debris), be removed by a professional environmental contractor. In general, the following procedures are recommended when removing lead-containing materials, coatings and paint applications: - Follow ***Type 1*** – if the coating is to be removed with a chemical gel or paste; - Follow ***Type 2a*** – if the coating is to be removed by scraping or sanding using non-powered hand tools, or manual demolition of lead-painted building components by striking with sledgehammer or similar tool; - Follow ***Type 3a*** – if the coating is to be removed using power tools; or, - Follow ***Type 3b*** – if the coating is to be removed by abrasive blasting.
	Grey Paint	Interior Paint	Floor Paint of Main Area	- ***Sample ID***: BH-Pb2 - ***Concentration***: *140 ppm* - ***Condition***: Fair	
	Red Paint	Interior Paint	Floor Paint of Boat Area	- ***Sample ID***: BH-Pb3 - ***Concentration***: *3,300 ppm* - ***Condition***: Fair	
	Beige Paint	Exterior	Exterior Walls	- ***Sample ID***: BH-Pb4 - ***Concentration***: *18,000 ppm* - ***Condition***: Good	
	Green Paint	Exterior	Exterior Windows	- ***Sample ID***: BH-Pb5 - ***Concentration***: *320,000 ppm* - ***Condition***: Good	
	Blue Paint	Interior	Interior Windows	- ***Sample ID***: BH-Pb6 - ***Concentration***: *13,000 ppm* - ***Condition***: Good	
Helicopter Hangar	Cream Paint	Interior Hangar	Interior Walls	- ***Sample ID***: HH-Pb1 - ***Concentration***: *1,000 ppm* - ***Condition***: Good	
	Dark Green Paint	Interior Hangar	Floor Paint of Hangar	- ***Sample ID***: HH-Pb3 - ***Concentration***: *8,000 ppm* - ***Condition***: Good	
	Light Brown Paint	Exterior	Exterior Walls	- ***Sample ID***: HH-Pb6 - ***Concentration***: *940 ppm* - ***Condition***: Good	
	Brown Floor Paint	Interior North Section of Building	Floor Paint of Mechanical Room	- ***Sample ID***: HH-Pb8 - ***Concentration***: *2,300 ppm* - ***Condition***: Good	
Heated Storage Building	Red Paint	Exterior	Exterior Doors and Windows	- ***Sample ID***: HS-EXT-Pb1 - ***Concentration***: *32,000 ppm* - ***Condition***: Good	
	Blue Paint	Interior	Ceiling, Walls, and Pillars	- ***Sample ID***: HS-Pb2 - ***Concentration***: *2,100 ppm* - ***Condition***: Good	
	Brown Paint	Interior	Doors and Windows	- ***Sample ID***: HS-Pb3 - ***Concentration***: *2,000 ppm* - ***Condition***: Good	
	White Paint	Interior	Office Walls and Ceilings	- ***Sample ID***: HS-Pb4 - ***Concentration***: *600 ppm* - ***Condition***: Good	
Metal-clad Storage Building	Red Paint	Exterior	Doors	- ***Sample ID***: MC-Pb1 - ***Concentration***: *3,100 ppm* - ***Condition***: Fair	

Building	Material	Location	Description	Assessment[1]	Action[2]
	White Paint	Interior	Office Walls and Ceiling	- ***Sample ID***: MC-Pb2 - ***Concentration***: *1,100 ppm* - ***Condition***: Fair	
	Light Green Paint	Interior	Bay Walls	- ***Sample ID***: MC-Pb3 - ***Concentration***: *5,800 ppm* - ***Condition***: Fair	
	Dark Green Paint	Interior	Bay Walls	- ***Sample ID***: MC-Pb4 - ***Concentration***: *38,000 ppm* - ***Condition***: Fair	
	Grey Paint	Interior	Bay Walls	- ***Sample ID***: MC-Pb5 - ***Concentration***: *190 ppm* - ***Condition***: Fair	

1. For sample ID and concentration levels refer to **Appendix A** – Laboratory Certificates of Analysis.
2. Actions recommended are in compliance with Ontario and federal regulations.

3.4 Lead Bulk Sample Summary

Table 3-6 summarizes bulk paint samples which had no detectable lead concentrations, or had lead concentrations less than 90ppm (0.009% by wt) and are therefore not classified as "lead-containing" in accordance with the *Surface Coatings Materials Regulations (SOR/2005-109)*.

Table 3-6 Summary of Non Lead-Containing Materials

Building	Material	Location/Description	Content	Sample ID[1]
Main Building	Beige Paint	Basement Mechanical Room	<90 ppm	MB-Pb1
	Blue Paint	Telecommunications Storage Walls	<90 ppm	MB-Pb4
	White Paint	White Wall Paint Throughout Building	<90 ppm	MB-Pb5
	Grey Paint	Top Floor Wall Paint	<90 ppm	MB-Pb6
Buoy Maintenance Building	Beige Paint	Beige Wall Paint in Locker Area	<90 ppm	BMR-Pb2
Helicopter Hangar	Lime Green Paint	Hangar Floor Paint	<90 ppm	HH-Pb2
	White Paint	Office Area Wall Paint	<90 ppm	HH-Pb4
	Dark Brown Paint	Exterior Door and Window Paint	<90 ppm	HH-Pb5
	Beige Wall Paint	North Section Main Floor Wall Paint	<90 ppm	HH-Pb7
	Light Blue Paint	North Section 2nd Floor Wall Paint	<90 ppm	HH-Pb9
	Grey Paint	North Section 2nd Floor Wall Paint	<90 ppm	HH-Pb10
	Aqua Paint	North Section 2nd Floor Wall Paint	<90 ppm	HH-Pb11
	Black Paint	North Section 2nd Floor Wall Paint	<90 ppm	HH-Pb12

1. For sample ID and concentration levels refer to **Appendix A** – Laboratory Certificates of Analysis.

3.5 Ozone-Depleting Substances (ODS)

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

Fire extinguishers, refrigerators, freezers, and air conditioning units were observed throughout the facility. These pieces of equipment have the potential to contain ozone-depleting substances. Decommissioning and/or removal and disposal of any equipment suspected or confirmed to contain ODS must comply with Federal (FHR 2003), Provincial (O. Reg. 189/94) and Waste Management Regulations (R.R.O. 1990, Regulation 347).

3.6 Fuel Storage

A visual inspection of the facility revealed the presence of a number of storage tanks/barrels containing diesel and Jet A-1 fuel. It is our understanding that these tanks and barrels are used to supply mechanical equipment and vehicles with the appropriate fuel. It appears unlikely that any of these fuel storage containers will be impacted by any of the planned work.

3.7 Other Designated Substances and Hazardous Materials

Table 3-7 summarizes the remaining Designated Substances and hazardous materials included in the DSHMS, and provides observations and appropriate actions if identified at CCGB Prescott.

Table 3-7 Other Designated Substances and Hazardous Materials identified at CCGB Prescott

Material	Description	Action
Mercury	Mercury vapour may be present within fluorescent light tubes observed during the survey. Mercury-containing thermostats were confirmed to be present in the Main Building, Buoy Maintenance Building, Boat House, Helicopter Hangar, and Heated Storage Building.	Removal and disposal of mercury-containing equipment is required prior to demolition activities that may disturb the equipment. The handling, transport, and disposal of mercury containing equipment must follow all applicable provincial and federal regulations and guidelines pertaining to Mercury, including the requirements of O. Reg. 490/09 and the requirements of *Reg. 347 – General – Waste Management*.
PCBs	Fluorescent light fixtures were observed during the survey. The majority of the light ballasts were observed to be the T12 style and as such have the potential to contain PCB's.	When decommissioned, verify the PCB content of each fluorescent light ballast as per the *Environment Canada* publication "Identification of Lamp Ballasts Containing PCBs", 1991. Handle, store and dispose of PCB-containing ballasts in accordance with *Federal PCB Regulation SOR/92-507* and *R.R.O*. 1990 – Reg. 347.
Silica	Building components containing silica such as concrete floor slabs and walls were observed during the survey.	Work that may disturb silica-containing materials should follow all applicable provincial and federal regulations and guidelines pertaining to Silica including the requirements of *O. Reg. 490/09.*
Mould	Although no visible mould was observed during the survey, areas of slight water staining/damage were observed in various areas. While, none of this water damage was significant: If left uncorrected, water damage could result in more significant concerns.	It is recommended that the cause of the water damage/staining in these areas be determined and rectified as soon as possible, as these conditions are conducive to mould growth.

Material	Description	Action
Benzene	Benzene is likely a component in diesel, fuel, and oil in tanks, drums, and storage containers observed at CCGB Prescott.	Storage containers, tanks and drums were observed to be in good condition with no visible signs of damage or leakage. It is recommended that these containers be routinely maintained and monitored for any evidence of possible release. Work that may result in exposure to Benzene should follow all applicable provincial and federal regulations and guidelines pertaining to Benzene including the requirements of *O. Reg. 490/09.*
Acrylonitrile	Acrylonitrile was not observed in the area of work during the time of the survey.	No action required.
Arsenic	Arsenic was not observed in the area of work during the time of the survey.	No action required.
Coke Oven Emissions	Coke oven emissions were not observed in the area of work during the time of the survey.	No action required.
Ethylene Oxide	Ethylene oxide was not observed in the area of work during the time of the survey.	No action required.
Isocyanates	Isocyanates were not observed in the area of work during the time of the survey.	No action required.
Vinyl Chloride	Vinyl chloride was not observed in the area of work during the time of the survey.	No action required.

4. Limitations

This report describes the asbestos-containing materials, Designated Substances and hazardous materials observed by the surveyors at CCGB Prescott. The survey assessed only those structures, finishes and permanent equipment identified in this report. The assessment does not define contaminants that may or may not be present in the soil or air around the site.

The field observations and laboratory analyses presented herein are considered sufficient in detail and scope to form a general inventory of Designated Substances on the site. The findings and conclusions contained herein have been prepared in accordance with generally accepted methods. It is possible that Designated Substances or hazardous materials may exist which could not be reasonably identified within the scope of the assessment or which were not apparent during the site visit. WSP Canada Inc. cannot warrant or guarantee that the information provided herein is absolutely complete or accurate beyond the observations and findings reported during the site visit.

Appendix A

Laboratory Certificates of Analysis

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Proj: 141-14670-00 PRESCOTT

Phone: (514) 386-1481
Fax: (905) 475-5994
Collected:
Received: 3/14/2014
Analyzed: 3/17/2014

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

Client Sample ID: MB-DWJC-A **Lab Sample ID:** **551401752-0001**
Sample Description: DRYWALL JOINT COMPOUND

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DWJC-B **Lab Sample ID:** **551401752-0002**
Sample Description: DRYWALL JOINT COMPOUND

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DWJC-C **Lab Sample ID:** **551401752-0003**
Sample Description: DRYWALL JOINT COMPOUND

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DWJC-D **Lab Sample ID:** **551401752-0004**
Sample Description: DRYWALL JOINT COMPOUND

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DWJC-E **Lab Sample ID:** **551401752-0005**
Sample Description: DRYWALL JOINT COMPOUND

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DWJC-F **Lab Sample ID:** **551401752-0006**
Sample Description: DRYWALL JOINT COMPOUND

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DWJC-G **Lab Sample ID:** **551401752-0007**
Sample Description: DRYWALL JOINT COMPOUND

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	White	0%	100%	None Detected	

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

Client Sample ID: MB-2-FS1-A **Lab Sample ID:** **551401752-0008**
Sample Description: FIRE STOP #1

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray/Yellow	70%	30%	None Detected	

Client Sample ID: MB-2-FS1-B **Lab Sample ID:** **551401752-0009**
Sample Description: FIRE STOP #1

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray	75%	25%	None Detected	

Client Sample ID: MB-2-FS1-C **Lab Sample ID:** **551401752-0010**
Sample Description: FIRE STOP #1

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	White	80%	20%	None Detected	

Client Sample ID: MB-2-ACT1-A **Lab Sample ID:** **551401752-0011**
Sample Description: ACOUST CEILING TILE #1

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray/White	80%	20%	None Detected	

Client Sample ID: MB-2-ACT1-B **Lab Sample ID:** **551401752-0012**
Sample Description: ACOUST CEILING TILE #1

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray/White	80%	20%	None Detected	

Client Sample ID: MB-2-ACT1-C **Lab Sample ID:** **551401752-0013**
Sample Description: ACOUST CEILING TILE #1

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray/White/Various	70%	30%	None Detected	

Client Sample ID: MB-9-FIT-A **Lab Sample ID:** **551401752-0014**
Sample Description: FITTING

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Brown/Various	25%	75%	None Detected	Vermiculite present in sample

Client Sample ID: MB-9-FIT-B **Lab Sample ID:** **551401752-0015**
Sample Description: FITTING

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray/Various	45%	55%	None Detected	

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Client Sample ID: MB-9-FIT-C **Lab Sample ID:** **551401752-0016**
Sample Description: FITTING

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray/Tan/Various	35%	65%	None Detected	

Client Sample ID: MB-12-VFT1-A **Lab Sample ID:** **551401752-0017**
Sample Description: VFT1-BLUE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	Blue	0.0%	80.1%	**19.9% Chrysotile**	

Client Sample ID: MB-12-VFT1-B **Lab Sample ID:** **551401752-0018**
Sample Description: VFT1-BLUE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014				Positive Stop (Not Analyzed)	

Client Sample ID: MB-12-VFT1-C **Lab Sample ID:** **551401752-0019**
Sample Description: VFT1-BLUE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014				Positive Stop (Not Analyzed)	

Client Sample ID: MB-12-VFT2-A **Lab Sample ID:** **551401752-0020**
Sample Description: VFT2-BEIGE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	Beige	0.0%	100%	None Detected	

Client Sample ID: MB-12-VFT2-B **Lab Sample ID:** **551401752-0021**
Sample Description: VFT2-BEIGE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	Beige	0.0%	100%	None Detected	

Client Sample ID: MB-12-VFT2-C **Lab Sample ID:** **551401752-0022**
Sample Description: VFT2-BEIGE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	Beige	0.0%	100%	None Detected	

Client Sample ID: MB-13-VFT3-A **Lab Sample ID:** **551401752-0023**
Sample Description: VFT3-GREY

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	Beige	0.0%	100%	None Detected	

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

Client Sample ID: MB-13-VFT3-B **Lab Sample ID:** **551401752-0024**
Sample Description: VFT3-GREY

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	Beige	0.0%	100%	None Detected	

Client Sample ID: MB-13-VFT3-C **Lab Sample ID:** **551401752-0025**
Sample Description: VFT3-GREY

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	Beige	0.0%	100%	None Detected	

Client Sample ID: MB-14-VFT4-A **Lab Sample ID:** **551401752-0026**
Sample Description: VFT4-BLUE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	Blue	0.0%	100%	None Detected	

Client Sample ID: MB-14-VFT4-B **Lab Sample ID:** **551401752-0027**
Sample Description: VFT4-BLUE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	Blue	0.0%	100%	None Detected	

Client Sample ID: MB-14-VFT4-C **Lab Sample ID:** **551401752-0028**
Sample Description: VFT4-BLUE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	Blue	0.0%	100%	None Detected	

Client Sample ID: MB-16-ACT3-A **Lab Sample ID:** **551401752-0029**
Sample Description: ACOUST CEILING TILE #3

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray/White	80%	20%	None Detected	

Client Sample ID: MB-16-ACT3-B **Lab Sample ID:** **551401752-0030**
Sample Description: ACOUST CEILING TILE #3

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray/White	80%	20%	None Detected	

Client Sample ID: MB-16-ACT3-C **Lab Sample ID:** **551401752-0031**
Sample Description: ACOUST CEILING TILE #3

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray/White/Various	70%	30%	None Detected	

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Client Sample ID: MB-18-ACT2-A **Lab Sample ID:** **551401752-0032**
Sample Description: ACOUST CEILING TILE #2

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray/White	80%	20%	None Detected	

Client Sample ID: MB-18-ACT2-B **Lab Sample ID:** **551401752-0033**
Sample Description: ACOUST CEILING TILE #2

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray/White	80%	20%	None Detected	

Client Sample ID: MB-18-ACT2-C **Lab Sample ID:** **551401752-0034**
Sample Description: ACOUST CEILING TILE #2

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray/White/Various	70%	30%	None Detected	

Client Sample ID: MB-22-ACT4-A **Lab Sample ID:** **551401752-0035**
Sample Description: ACOUST CEILING TILE #4

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray/White	80%	20%	None Detected	

Client Sample ID: MB-22-ACT4-B **Lab Sample ID:** **551401752-0036**
Sample Description: ACOUST CEILING TILE #4

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray/White	80%	20%	None Detected	

Client Sample ID: MB-22-ACT4-C **Lab Sample ID:** **551401752-0037**
Sample Description: ACOUST CEILING TILE #4

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray/White/Various	70%	30%	None Detected	

Client Sample ID: MB-29-VI-A **Lab Sample ID:** **551401752-0038**
Sample Description: VALUE INSULATION

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
400 PLM Pt Ct	3/17/2014	Gray	0%	100%	**<0.25% Chrysotile**	

Client Sample ID: MB-29-VI-B **Lab Sample ID:** **551401752-0039**
Sample Description: VALUE INSULATION

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
400 PLM Pt Ct	3/17/2014	Gray	0%	100%	**<0.25% Chrysotile**	

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

Client Sample ID: MB-29-VI-C **Lab Sample ID:** **551401752-0040**
Sample Description: VALUE INSULATION

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray/Tan/Various	15%	85%	None Detected	Vermiculite Present

Client Sample ID: MB-29-FIT2-A **Lab Sample ID:** **551401752-0041**
Sample Description: FITTING INSULATION

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
400 PLM Pt Ct	3/17/2014	Gray	0%	100%	**<0.25% Chrysotile**	

Client Sample ID: MB-29-FIT2-B **Lab Sample ID:** **551401752-0042**
Sample Description: FITTING INSULATION

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
400 PLM Pt Ct	3/17/2014	Gray	0%	99.75%	**0.25% Chrysotile**	

Client Sample ID: MB-29-FIT2-C **Lab Sample ID:** **551401752-0043**
Sample Description: FITTING INSULATION

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Tan/White/Various	15%	85%	None Detected	Vermiculite Present

Client Sample ID: MB-31-VFT5-A **Lab Sample ID:** **551401752-0044**
Sample Description: VFT5-WHITE WITH FLECK

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	White	0.0%	100%	None Detected	

Client Sample ID: MB-31-VFT5-B **Lab Sample ID:** **551401752-0045**
Sample Description: VFT5-WHITE WITH FLECK

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	White	0.0%	100%	None Detected	

Client Sample ID: MB-31-VFT5-C **Lab Sample ID:** **551401752-0046**
Sample Description: VFT5-WHITE WITH FLECK

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	White	0.0%	100%	None Detected	

Client Sample ID: MB-200-ACT5-A **Lab Sample ID:** **551401752-0047**
Sample Description: ACOUST CEILING TILE #5

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray/White	80%	20%	None Detected	

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Customer ID: 55MACV62
Customer PO: 141-14670-00
Project ID:

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Client Sample ID: MB-200-ACT5-B ***Lab Sample ID:*** **551401752-0048**
Sample Description: ACOUST CEILING TILE #5

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray/White	80%	20%	None Detected	

Client Sample ID: MB-200-ACT5-C ***Lab Sample ID:*** **551401752-0049**
Sample Description: ACOUST CEILING TILE #5

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray/White/Various	70%	30%	None Detected	

Client Sample ID: MB-EXT-CAULK-A ***Lab Sample ID:*** **551401752-0050**
Sample Description: CAULKING

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray	0%	100%	None Detected	

Client Sample ID: MB-EXT-CAULK-B ***Lab Sample ID:*** **551401752-0051**
Sample Description: CAULKING

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray	0%	100%	None Detected	

Client Sample ID: MB-EXT-CAULK-C ***Lab Sample ID:*** **551401752-0052**
Sample Description: CAULKING

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray	0%	100%	None Detected	

Client Sample ID: MB-EXT-RM-A ***Lab Sample ID:*** **551401752-0053**
Sample Description: ROOF MEMBRANE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Black	70%	30%	None Detected	

Client Sample ID: MB-EXT-RM-B ***Lab Sample ID:*** **551401752-0054**
Sample Description: ROOF MEMBRANE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Black	75%	25%	None Detected	

Client Sample ID: MB-EXT-RM-C ***Lab Sample ID:*** **551401752-0055**
Sample Description: ROOF MEMBRANE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Various/Black	85%	15%	None Detected	

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Client Sample ID: MB-201-FS2-A ***Lab Sample ID:*** **551401752-0056**

Sample Description: FIRE STOP 2

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray	0%	100%	None Detected	

Client Sample ID: MB-201-FS2-B ***Lab Sample ID:*** **551401752-0057**

Sample Description: FIRE STOP 2

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray	0%	100%	None Detected	

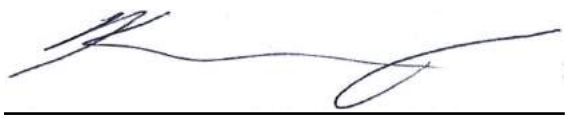
Client Sample ID: MB-201-FS2-C ***Lab Sample ID:*** **551401752-0058**

Sample Description: FIRE STOP 2

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray	0%	100%	None Detected	

Analyst(s)

Arabee Sathiaseelan	PLM	(24)
	400 PLM Pt Ct	(4)
Kevin Pang	PLM	(15)
Matthew Davis	TEM Grav. Reduction	(13)



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Any questions please contact Kevin Pang.

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Collected:
Received: 3/14/2014
Analyzed: 3/17/2014

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Client Sample ID: BMR-CAULK-A **Lab Sample ID:** **551401755-0001**
Sample Description: EXTERIOR CAULKING

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	White	0%	100%	None Detected	

Client Sample ID: BMR-CAULK-B **Lab Sample ID:** **551401755-0002**
Sample Description: EXTERIOR CAULKING

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	White	2%	98%	None Detected	

Client Sample ID: BMR-CAULK-C **Lab Sample ID:** **551401755-0003**
Sample Description: EXTERIOR CAULKING

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	White	1%	99%	None Detected	

Client Sample ID: BMR-EQUINS-A **Lab Sample ID:** **551401755-0004**
Sample Description: EQUIPMENT INSULATION

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Red/Various/Black	0%	100%	None Detected	

Client Sample ID: BMR-EQUINS-B **Lab Sample ID:** **551401755-0005**
Sample Description: EQUIPMENT INSULATION

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Red/Various/Black	0%	100%	None Detected	

Client Sample ID: BMR-EQUINS-C **Lab Sample ID:** **551401755-0006**
Sample Description: EQUIPMENT INSULATION

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Red/Various/Black	0%	100%	None Detected	

Client Sample ID: BMR-VFT1-A **Lab Sample ID:** **551401755-0007**
Sample Description: GREY VFT

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	Gray	0.0%	100%	None Detected	

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Client Sample ID: BMR-VFT1-B **Lab Sample ID:** **551401755-0008**
Sample Description: GREY VFT

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	Gray	0.0%	100%	None Detected	

Client Sample ID: BMR-VFT1-C **Lab Sample ID:** **551401755-0009**
Sample Description: GREY VFT

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	Gray	0.0%	85.8%	**14.2% Chrysotile**	

Client Sample ID: BMR-VFT2-A **Lab Sample ID:** **551401755-0010**
Sample Description: BLUE VFT

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	Blue	0.0%	100%	None Detected	

Client Sample ID: BMR-VFT2-B **Lab Sample ID:** **551401755-0011**
Sample Description: BLUE VFT

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	Blue	0.0%	100%	None Detected	

Client Sample ID: BMR-VFT2-C **Lab Sample ID:** **551401755-0012**
Sample Description: BLUE VFT

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	Blue	0.0%	100%	None Detected	

Client Sample ID: BMR-VFT3-A **Lab Sample ID:** **551401755-0013**
Sample Description: BLUE WITH FLECK VFT

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	Blue	0.0%	100%	None Detected	

Client Sample ID: BMR-VFT3-B **Lab Sample ID:** **551401755-0014**
Sample Description: BLUE WITH FLECK VFT

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	Blue	0.0%	81.6%	**18.4% Chrysotile**	

Client Sample ID: BMR-VFT3-C **Lab Sample ID:** **551401755-0015**
Sample Description: BLUE WITH FLECK VFT

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014				Positive Stop (Not Analyzed)	

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

Client Sample ID: BMR-DWJC-A **Lab Sample ID:** **551401755-0016**
Sample Description: DRYWALL JOINT COMPOUND

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray	0%	100%	None Detected	

Client Sample ID: BMR-DWJC-B **Lab Sample ID:** **551401755-0017**
Sample Description: DRYWALL JOINT COMPOUND

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray	0%	100%	None Detected	

Client Sample ID: BMR-DWJC-C **Lab Sample ID:** **551401755-0018**
Sample Description: DRYWALL JOINT COMPOUND

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray	0%	100%	None Detected	

Client Sample ID: BMR-DWJC-D **Lab Sample ID:** **551401755-0019**
Sample Description: DRYWALL JOINT COMPOUND

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray	0%	100%	None Detected	

Client Sample ID: BMR-DWJC-E **Lab Sample ID:** **551401755-0020**
Sample Description: DRYWALL JOINT COMPOUND

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray	0%	100%	None Detected	

Client Sample ID: BMR-DWJC-F **Lab Sample ID:** **551401755-0021**
Sample Description: DRYWALL JOINT COMPOUND

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray	0%	100%	None Detected	

Client Sample ID: BMR-DWJC-G **Lab Sample ID:** **551401755-0022**
Sample Description: DRYWALL JOINT COMPOUND

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray	0%	100%	None Detected	

Client Sample ID: BMR-ACT1-A **Lab Sample ID:** **551401755-0023**
Sample Description: 2X4 PINHOLES CT

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray/White/Various	75%	25%	None Detected	

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Client Sample ID: BMR-ACT1-B ***Lab Sample ID:*** **551401755-0024**

Sample Description: 2X4 PINHOLES CT

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray/White/Various	80%	20%	None Detected	

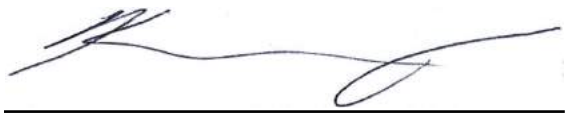
Client Sample ID: BMR-ACT1-C ***Lab Sample ID:*** **551401755-0025**

Sample Description: 2X4 PINHOLES CT

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray/White	80%	20%	None Detected	

Analyst(s)

Arabee Sathiaseelan	PLM	(6)
Kevin Pang	PLM	(10)
Matthew Davis	TEM Grav. Reduction	(8)



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Any questions please contact Kevin Pang.

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Collected:
Received: 3/14/2014
Analyzed: 3/17/2014

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

Client Sample ID: BH-CAULK-A ***Lab Sample ID:*** **551401757-0001**
Sample Description: EXTERIOR CAULKING

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Brown	0%	100%	None Detected	

Client Sample ID: BH-CAULK-B ***Lab Sample ID:*** **551401757-0002**
Sample Description: EXTERIOR CAULKING

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Brown	0%	100%	None Detected	

Client Sample ID: BH-CAULK-C ***Lab Sample ID:*** **551401757-0003**
Sample Description: EXTERIOR CAULKING

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Brown	0%	100%	None Detected	

Client Sample ID: BH-DWJC-A ***Lab Sample ID:*** **551401757-0004**
Sample Description: DRYWALL JOINT COMPOUND

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	White	0%	100%	None Detected	

Client Sample ID: BH-DWJC-B ***Lab Sample ID:*** **551401757-0005**
Sample Description: DRYWALL JOINT COMPOUND

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	White	0%	100%	None Detected	

Client Sample ID: BH-DWJC-C ***Lab Sample ID:*** **551401757-0006**
Sample Description: DRYWALL JOINT COMPOUND

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	White	0%	100%	None Detected	

Client Sample ID: BH-DWJC-D ***Lab Sample ID:*** **551401757-0007**
Sample Description: DRYWALL JOINT COMPOUND

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	White	0%	100%	None Detected	

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Client Sample ID: BH-DWJC-E ***Lab Sample ID:*** **551401757-0008**

Sample Description: DRYWALL JOINT COMPOUND

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	White	0%	100%	None Detected	

Client Sample ID: BH-DWJC-F ***Lab Sample ID:*** **551401757-0009**

Sample Description: DRYWALL JOINT COMPOUND

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	White	0%	100%	None Detected	

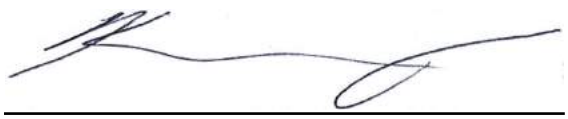
Client Sample ID: BH-DWJC-G ***Lab Sample ID:*** **551401757-0010**

Sample Description: DRYWALL JOINT COMPOUND

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	White	0%	100%	None Detected	

Analyst(s)

Arabee Sathiaseelan	PLM	(4)
Matthew Davis	PLM	(6)



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Fax: (905) 475-5994
Collected:
Received: 3/14/2014
Analyzed: 3/17/2014

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

Client Sample ID: HH-DWJC-A **Lab Sample ID:** **551401753-0001**
Sample Description: DRYWALL JOINT COMPOUND

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray	0%	100%	None Detected	

Client Sample ID: HH-DWJC-B **Lab Sample ID:** **551401753-0002**
Sample Description: DRYWALL JOINT COMPOUND

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray	0%	100%	None Detected	

Client Sample ID: HH-DWJC-C **Lab Sample ID:** **551401753-0003**
Sample Description: DRYWALL JOINT COMPOUND

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray	0%	100%	None Detected	

Client Sample ID: HH-DWJC-D **Lab Sample ID:** **551401753-0004**
Sample Description: DRYWALL JOINT COMPOUND

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray	0%	100%	None Detected	

Client Sample ID: HH-DWJC-E **Lab Sample ID:** **551401753-0005**
Sample Description: DRYWALL JOINT COMPOUND

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray	0%	100%	None Detected	

Client Sample ID: HH-DWJC-F **Lab Sample ID:** **551401753-0006**
Sample Description: DRYWALL JOINT COMPOUND

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray	0%	100%	None Detected	

Client Sample ID: HH-DWJC-G **Lab Sample ID:** **551401753-0007**
Sample Description: DRYWALL JOINT COMPOUND

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray	0%	100%	None Detected	

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Client Sample ID: HH-LIN-A **Lab Sample ID:** **551401753-0008**
Sample Description: LINOLEUM

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray/Tan	35%	65%	None Detected	

Client Sample ID: HH-LIN-B **Lab Sample ID:** **551401753-0009**
Sample Description: LINOLEUM

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray/Tan/Various	35%	65%	None Detected	

Client Sample ID: HH-LIN-C **Lab Sample ID:** **551401753-0010**
Sample Description: LINOLEUM

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray/Various	23%	77%	None Detected	

Client Sample ID: HH-ACT1-A **Lab Sample ID:** **551401753-0011**
Sample Description: 2X2 PINHOLES CT

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray/White/Various	70%	30%	None Detected	

Client Sample ID: HH-ACT1-B **Lab Sample ID:** **551401753-0012**
Sample Description: 2X2 PINHOLES CT

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray/White/Various	80%	20%	None Detected	

Client Sample ID: HH-ACT1-C **Lab Sample ID:** **551401753-0013**
Sample Description: 2X2 PINHOLES CT

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray/White	80%	20%	None Detected	

Client Sample ID: HH-ACT2-A **Lab Sample ID:** **551401753-0014**
Sample Description: 1X1 WASHROOM CT

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Tan/White	80%	20%	None Detected	

Client Sample ID: HH-ACT2-B **Lab Sample ID:** **551401753-0015**
Sample Description: 1X1 WASHROOM CT

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Tan/White	85%	15%	None Detected	

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EMSL Canada Order 551401753
Customer ID: 55MACV62
Customer PO: 141-14670-00
Project ID:

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

Client Sample ID: HH-ACT2-C ***Lab Sample ID:*** **551401753-0016**
Sample Description: 1X1 WASHROOM CT

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Tan/White	90%	10%	None Detected	

Client Sample ID: HH-VFT1-A ***Lab Sample ID:*** **551401753-0017**
Sample Description: RED MECH ROOM FLOOR TILE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	Red	0.0%	70.7%	**29.3% Chrysotile**	

Client Sample ID: HH-VFT1-B ***Lab Sample ID:*** **551401753-0018**
Sample Description: RED MECH ROOM FLOOR TILE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014				Positive Stop (Not Analyzed)	

Client Sample ID: HH-VFT1-C ***Lab Sample ID:*** **551401753-0019**
Sample Description: RED MECH ROOM FLOOR TILE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014				Positive Stop (Not Analyzed)	

Client Sample ID: HH-VFT2-A ***Lab Sample ID:*** **551401753-0020**
Sample Description: BLUE 12X12 FLOOR TILE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	Blue	0.0%	100%	**<0.25% Chrysotile**	

Client Sample ID: HH-VFT2-B ***Lab Sample ID:*** **551401753-0021**
Sample Description: BLUE 12X12 FLOOR TILE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	Blue	0.0%	100%	None Detected	

Client Sample ID: HH-VFT2-C ***Lab Sample ID:*** **551401753-0022**
Sample Description: BLUE 12X12 FLOOR TILE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	Blue	0.0%	100%	None Detected	

Client Sample ID: HH-VFT3-A ***Lab Sample ID:*** **551401753-0023**
Sample Description: GREY 12X12 FLOOR TILE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	Gray	0.0%	100%	None Detected	

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Project ID:

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

Client Sample ID: HH-VFT3-B **Lab Sample ID:** **551401753-0024**
Sample Description: GREY 12X12 FLOOR TILE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	Gray	0.0%	100%	None Detected	

Client Sample ID: HH-VFT3-C **Lab Sample ID:** **551401753-0025**
Sample Description: GREY 12X12 FLOOR TILE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	Gray	0.0%	100%	None Detected	

Client Sample ID: HH-VFT4-A **Lab Sample ID:** **551401753-0026**
Sample Description: AQUA 12X12 FLOOR TILE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	Blue	0.0%	100%	None Detected	

Client Sample ID: HH-VFT4-B **Lab Sample ID:** **551401753-0027**
Sample Description: AQUA 12X12 FLOOR TILE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	Blue	0.0%	100%	None Detected	

Client Sample ID: HH-VFT4-C **Lab Sample ID:** **551401753-0028**
Sample Description: AQUA 12X12 FLOOR TILE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	Blue	0.0%	100%	None Detected	

Client Sample ID: HH-VFT5-A **Lab Sample ID:** **551401753-0029**
Sample Description: BLACK 12X12 FLOOR TILE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	Black	0.0%	100%	None Detected	

Client Sample ID: HH-VFT5-B **Lab Sample ID:** **551401753-0030**
Sample Description: BLACK 12X12 FLOOR TILE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	Black	0.0%	100%	None Detected	

Client Sample ID: HH-VFT5-C **Lab Sample ID:** **551401753-0031**
Sample Description: BLACK 12X12 FLOOR TILE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	Black	0.0%	100%	None Detected	

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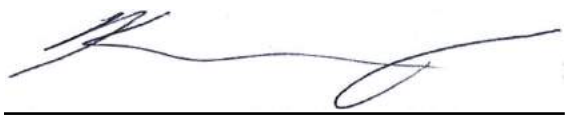
Project ID:

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

Analyst(s)

Arabee Sathiaseelan	PLM	(6)
Kevin Pang	PLM	(10)
Matthew Davis	TEM Grav. Reduction	(13)



Kevin Pang
or other Approved Signatory

Any questions please contact Kevin Pang.

Initial report from: 03/17/201416:38:44

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Customer PO: 141-14670-00
Project ID:

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Proj: 141-14670-00 PRESCOTT

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Fax: (905) 475-5994
Collected:
Received: 3/14/2014
Analyzed: 3/17/2014

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

Client Sample ID: HS-ACT1-A **Lab Sample ID:** 551401748-0001
Sample Description: 2X4 PINHOLES CT

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray/White	80%	20%	None Detected	

Client Sample ID: HS-ACT1-B **Lab Sample ID:** 551401748-0002
Sample Description: 2X4 PINHOLES CT

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray/White	80%	20%	None Detected	

Client Sample ID: HS-ACT1-C **Lab Sample ID:** 551401748-0003
Sample Description: 2X4 PINHOLES CT

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Gray/White/Various	70%	30%	None Detected	

Client Sample ID: HS-VFT1-A **Lab Sample ID:** 551401748-0004
Sample Description: BLUE VFT

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	Blue	0.0%	100%	None Detected	

Client Sample ID: HS-VFT1-B **Lab Sample ID:** 551401748-0005
Sample Description: BLUE VFT

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	Blue	0.0%	100%	None Detected	

Client Sample ID: HS-VFT1-C **Lab Sample ID:** 551401748-0006
Sample Description: BLUE VFT

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
TEM Grav. Reduction	3/17/2014	Blue	0.0%	100%	None Detected	

Client Sample ID: HS-ACT2-A **Lab Sample ID:** 551401748-0007
Sample Description: 1X1 OFFICE CT

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Brown/White	90%	10%	None Detected	

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Client Sample ID: HS-ACT2-B ***Lab Sample ID:*** **551401748-0008**
Sample Description: 1X1 OFFICE CT

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Brown/White	90%	10%	None Detected	

Client Sample ID: HS-ACT2-C ***Lab Sample ID:*** **551401748-0009**
Sample Description: 1X1 OFFICE CT

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	Brown/White	80%	20%	None Detected	

Client Sample ID: HS-DWJC-A ***Lab Sample ID:*** **551401748-0010**
Sample Description: DRYWALL JOINT COMPOUND

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	White	0%	100%	None Detected	

Client Sample ID: HS-DWJC-B ***Lab Sample ID:*** **551401748-0011**
Sample Description: DRYWALL JOINT COMPOUND

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	White	0%	100%	None Detected	

Client Sample ID: HS-DWJC-C ***Lab Sample ID:*** **551401748-0012**
Sample Description: DRYWALL JOINT COMPOUND

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	White	0%	100%	None Detected	

Client Sample ID: HS-DWJC-D ***Lab Sample ID:*** **551401748-0013**
Sample Description: DRYWALL JOINT COMPOUND

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	White	0%	100%	None Detected	

Client Sample ID: HS-DWJC-E ***Lab Sample ID:*** **551401748-0014**
Sample Description: DRYWALL JOINT COMPOUND

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	White	0%	100%	None Detected	

Client Sample ID: HS-DWJC-F ***Lab Sample ID:*** **551401748-0015**
Sample Description: DRYWALL JOINT COMPOUND

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	White	0%	100%	None Detected	

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

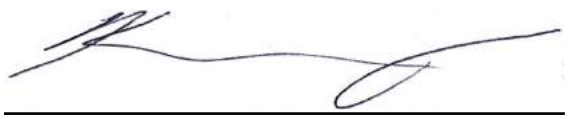
Client Sample ID: HS-DWJC-G ***Lab Sample ID:*** **551401748-0016**

Sample Description: DRYWALL JOINT COMPOUND

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	3/17/2014	White	0%	100%	None Detected	

Analyst(s)

Arabee Sathiaseelan	PLM	(8)
Kevin Pang	PLM	(5)
Matthew Davis	TEM Grav. Reduction	(3)



Kevin Pang
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Any questions please contact Kevin Pang.

Initial report from: 03/17/201415:46:46

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Received:	03/14/14 4:25 PM
Collected:	

Project: **141-14670-00**

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

Client Sample Description	*Lab ID*	*Collected*	*Analyzed*	*Lead Concentration*
MB-4-Pb1	*0001*		3/18/2014	<90 ppm
	Site: BEIGE PAINT			
MB-4-Pb2	*0002*		3/18/2014	160 ppm
	Site: CREAM PAINT			
MB-4-Pb3	*0003*		3/18/2014	130 ppm
	Site: BEIGE PAINT			
MB-4-Pb4	*0004*		3/18/2014	<90 ppm
	Site: BLUE PAINT			
MB-4-Pb5	*0005*		3/18/2014	<90 ppm
	Site: WHITE PAINT			
MB-4-Pb6	*0006*		3/18/2014	<90 ppm
	Site: GREY PAINT			
MB-4-Pb7	*0007*		3/18/2014	42000 ppm
	Site: YELLOW PAINT			
MB-4-Pb8	*0008*		3/18/2014	100 ppm
	Site: BROWN PAINT			

Kevin Pang
or other approved signatory

*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.010 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. EMSL bears no responsibility for sample collection activities. Samples received in good condition unless otherwise noted. * slight modifications to methods applied. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements established by the AIHA-LAP, unless specifically indicated otherwise

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

Initial report from 03/18/2014 11:58:08

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Received: 03/14/14 4:19 PM
Collected:

Project: **PRESCOTT COAST GUARD BASE - 141-14607-00**

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

Client Sample Description	*Lab ID*	*Collected*	*Analyzed*	*Lead Concentration*
BMR-Pb1	*0001*		3/18/2014	130 ppm
	Site: CREAM PAINT			
BMR-Pb2	*0002*		3/18/2014	<90 ppm
	Site: BEIGE PAINT			
BMR-Pb3	*0003*		3/18/2014	2600 ppm
	Site: BROWN PAINT			

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*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.010 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. EMSL bears no responsibility for sample collection activities. Samples received in good condition unless otherwise noted. * slight modifications to methods applied. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements established by the AIHA-LAP, unless specifically indicated otherwise

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Initial report from 03/18/2014 13:58:35

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Collected:

Project: **PRESCOTT COAST GUARD BASE - 141-14670-00**

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

Client Sample Description	*Lab ID*	*Collected*	*Analyzed*	*Lead Concentration*
BH-Pb1	*0001*		3/17/2014	100 ppm
	Site: CREAM PAINT			
BH-Pb2	*0002*		3/17/2014	140 ppm
	Site: GREY PAINT			
BH-Pb3	*0003*		3/17/2014	3300 ppm
	Site: RED PAINT			
BH-Pb4	*0004*		3/17/2014	18000 ppm
	Site: EXT BEIGE PAINT			
BH-Pb5	*0005*		3/17/2014	320000 ppm
	Site: EXT GREEN PAINT			
BH-Pb6	*0006*		3/17/2014	13000 ppm
	Site: BLUE PAINT			

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*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.010 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. EMSL bears no responsibility for sample collection activities. Samples received in good condition unless otherwise noted. * slight modifications to methods applied. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements established by the AIHA-LAP, unless specifically indicated otherwise

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

Initial report from 03/18/2014 09:58:08

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Received: 03/14/14 4:15 PM
Collected:

Project: **PRESCOTT COAST GUARD BASE - 141-14670-00**

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

Client Sample Description	*Lab ID*	*Collected*	*Analyzed*	*Lead Concentration*
HS-EXT-Pb1	*0001*		3/18/2014	32000 ppm
	Site: RED PAINT			
HS-Pb2	*0002*		3/18/2014	2100 ppm
	Site: BLUE PAINT			
HS-Pb3	*0003*		3/18/2014	2000 ppm
	Site: BROWN PAINT			
HS-Pb4	*0004*		3/18/2014	600 ppm
	Site: WHITE PAINT			

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*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.010 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. EMSL bears no responsibility for sample collection activities. Samples received in good condition unless otherwise noted. * slight modifications to methods applied. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements established by the AIHA-LAP, unless specifically indicated otherwise

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

Initial report from 03/18/2014 13:59:05

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Received: 03/14/14 4:21 PM
Collected:

Project: **PRESCOTT COAST GUARD BASE 141-14670-00**

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

Client Sample Description	*Lab ID*	*Collected*	*Analyzed*	*Lead Concentration*
HH-Pb1	*0001*		3/17/2014	1000 ppm
	Site: CREAM PAINT			
HH-Pb2	*0002*		3/17/2014	<90 ppm
	Site: LIME GREEN PAINT			
HH-Pb3	*0003*		3/17/2014	8000 ppm
	Site: DARK GREEN PAINT			
HH-Pb4	*0004*		3/17/2014	<90 ppm
	Site: WHITE PAINT			
HH-Pb5	*0005*		3/17/2014	<90 ppm
	Site: DARK BROWN PAINT			
HH-Pb6	*0006*		3/17/2014	940 ppm
	Site: LIGHT BROWN PAINT			
HH-Pb7	*0007*		3/17/2014	<90 ppm
	Site: BEIGE WALL PAINT			
HH-Pb8	*0008*		3/17/2014	2300 ppm
	Site: BROWN FLOOR PAINT			
HH-Pb9	*0009*		3/17/2014	<90 ppm
	Site: LIGHT BLUE PAINT			
HH-Pb10	*0010*		3/17/2014	<90 ppm
	Site: GREY PAINT			
HH-Pb11	*0011*		3/17/2014	<90 ppm
	Site: AQUA PAINT			
HH-Pb12	*0012*		3/17/2014	<90 ppm
	Site: BLACK PAINT			

Kevin Pang
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*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.010 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. EMSL bears no responsibility for sample collection activities. Samples received in good condition unless otherwise noted. * slight modifications to methods applied. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements established by the AIHA-LAP, unless specifically indicated otherwise

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

Initial report from 03/18/2014 10:00:42

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Received:	03/14/14 4:28 PM
Collected:	

Project: **PRESCOTT COAST GUARD BASE**

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

Client Sample Description	*Lab ID*	*Collected*	*Analyzed*	*Lead Concentration*
MC-Pb1	*0001*		3/18/2014	3100 ppm
	Site: RED PAINT			
MC-Pb2	*0002*		3/18/2014	1100 ppm
	Site: WHITE PAINT			
MC-Pb3	*0003*		3/18/2014	5800 ppm
	Site: LIGHT GREEN PAINT			
MC-Pb4	*0004*		3/18/2014	38000 ppm
	Site: DARK GREEN PAINT			
MC-Pb5	*0005*		3/18/2014	190 ppm
	Site: GREY PAINT			

Kevin Pang
or other approved signatory

*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.010 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. EMSL bears no responsibility for sample collection activities. Samples received in good condition unless otherwise noted. * slight modifications to methods applied. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements established by the AIHA-LAP, unless specifically indicated otherwise

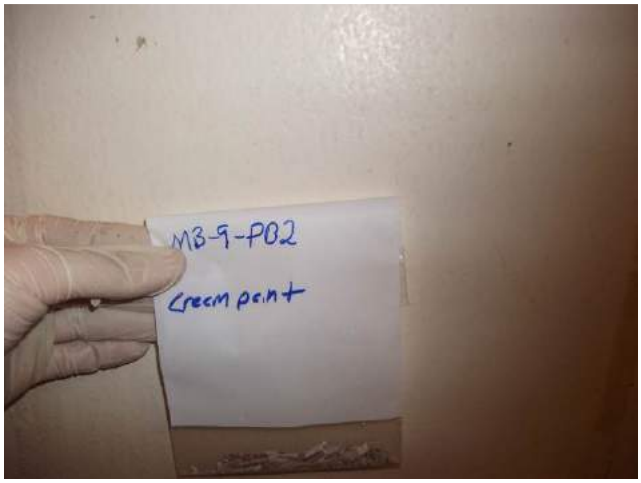
Samples analyzed by EMSL Canada Inc. Mississauga, ON A2LA Accredited Environmental Testing Cert #2845.08

Initial report from 03/18/2014 11:55:16

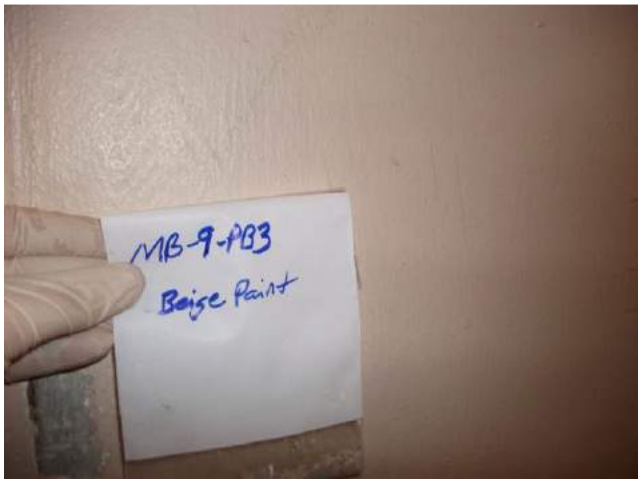
Appendix B

Project Photographs

Photograph 1: Main Building at CCGB Prescott



Photograph 2: Main Building- PB2 – Lead-Based Cream Paint Undercoat Throughout Main Building



Photograph 3: Main Building- PB3 – Lead-Based Beige Paint Undercoat Throughout Main Building

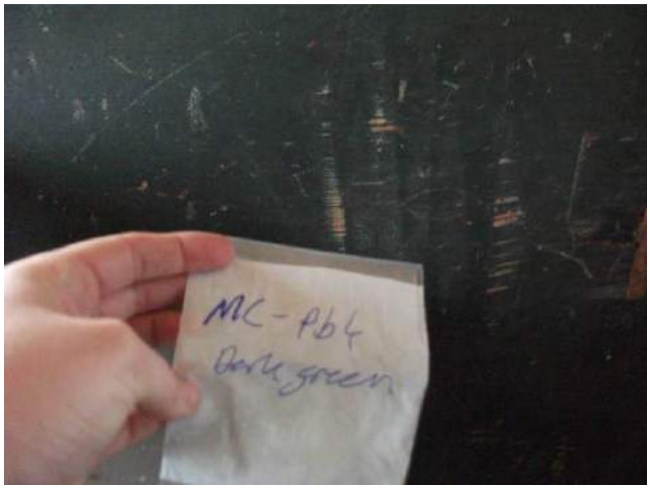
Photograph 4: Main Building – ACM (VFT1) Blue With White Streak 12” X 12” Vinyl Floor Tile

Photograph 5: Typical Refrigerator Unit Observed in Buildings as CCGB Prescott

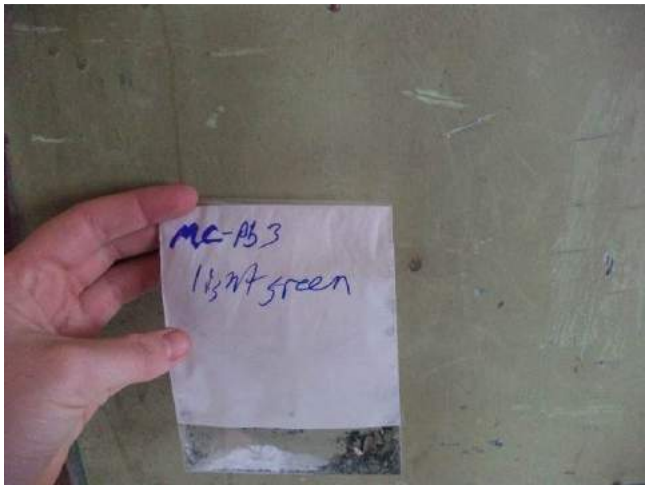
Photograph 6: Main Building – Roof Mounted Air Conditioning Unit

Photograph 7: Roof Ballast Filter Fabric/Cloth on the Roof of the Main Building at CCGB Prescott

Photograph 8: Metal Clad Storage Building at CCGB Prescott



Photograph 9: Metal Clad Storage Building – Lead-Based Dark Green Wall Paint



Photograph 10: Metal Clad Storage Building – Lead-Based Light Green Wall Paint

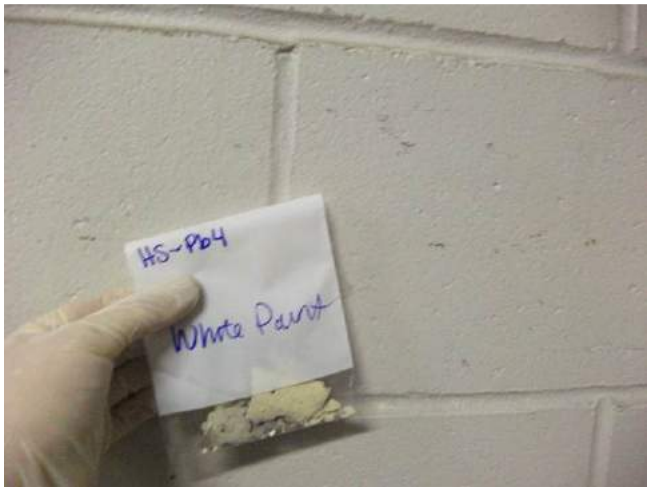
Photograph 11: Metal Clad Storage Building – Lead-Based White Wall Paint

Photograph 12: Metal Clad Storage Building – Lead-Based Red Door Paint

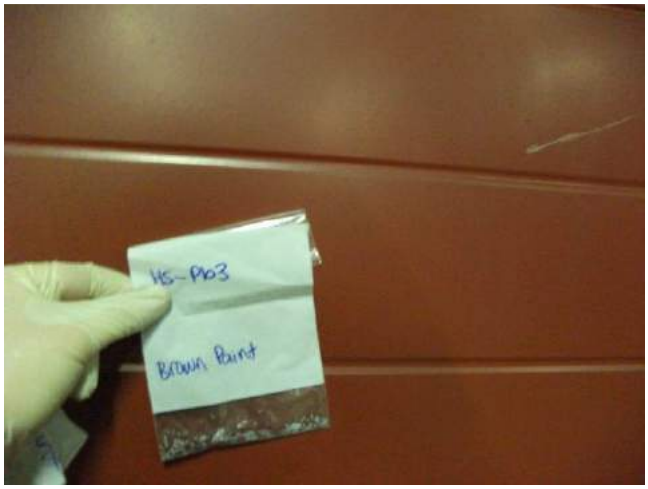
Photograph 13: Metal Clad Storage Building – Lead-Based Grey Wall Paint

Photograph 14: Heated Storage Building at CCGB Prescott

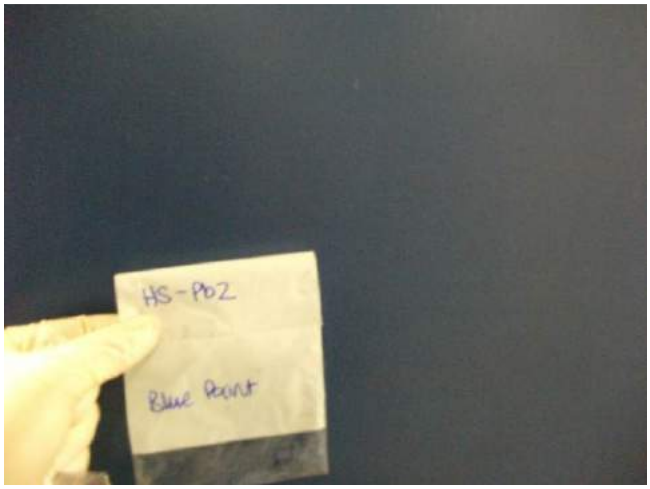
Photograph 15: Heated Storage Building – Lead-Based Red Door Paint



Photograph 16: Heated Storage Building – Lead-Based White Wall Paint

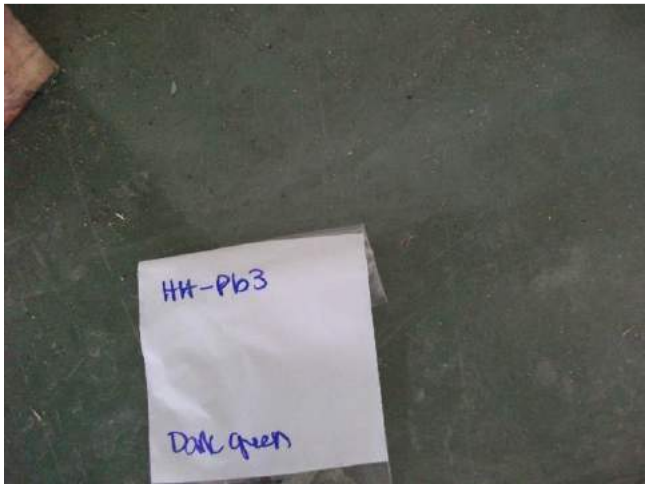


Photograph 17: Heated Storage Building – Lead-Based Brown Door Paint

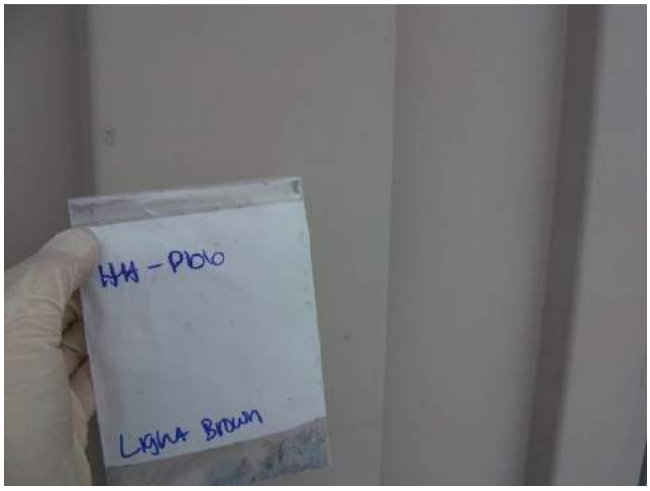


Photograph 18: Heated Storage Building – Lead-Based Blue Wall Paint

Photograph 19: Helicopter Hangar Building at CCGB Prescott



Photograph 20: Helicopter Hangar Building – Lead-Based Dark Green Floor Paint

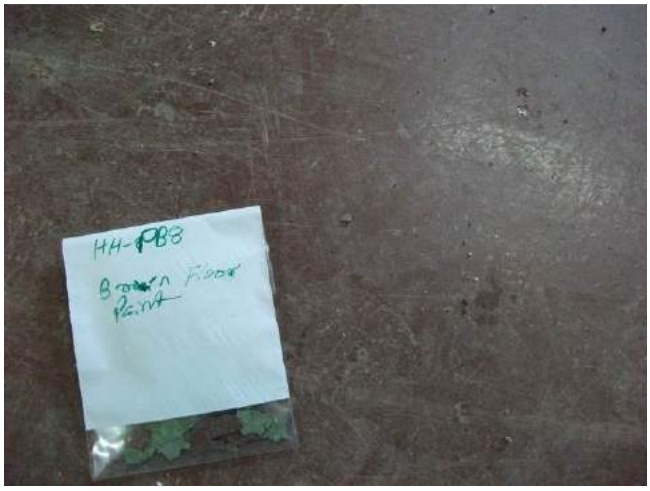


Photograph 21: Helicopter Hangar Building – Lead-Based Light Brown Exterior Wall Paint

Photograph 22: Helicopter Hangar Building – ACM (VFT1) 12” X 12” Red Vinyl Floor Tile

Photograph 23: Helicopter Hangar Building – Diesel Fuel Storage Tank

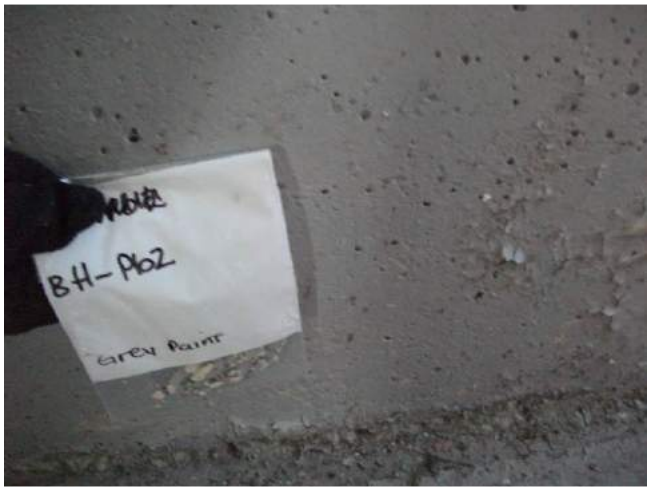
Photograph 24: Helicopter Hangar Building – Jet Fuel A-1 Fuel Storage Barrel



Photograph 25: Helicopter Hangar Building – Lead-Based Brown Floor Paint

Photograph 26: Boat House Building at CCGB Prescott

Photograph 27: Boat House Building – Lead-Based Cream Wall Paint



Photograph 28: – Boat House Building – Lead-Based Grey Floor Paint

Photograph 29: Boat House Building – Lead-Based Red Floor Paint

Photograph 30: Boat House Building – Lead-Based Blue Wall Paint

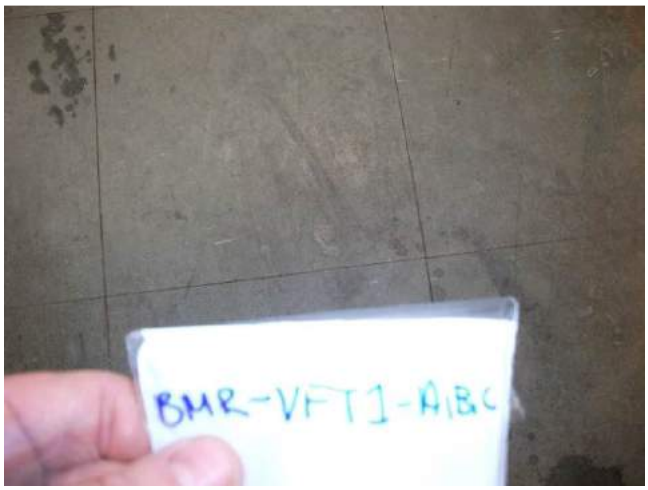
Photograph 31: Boat House Building – Lead-Based Beige Exterior Wall

Photograph 32: Boat House Building – Lead-Based Green Exterior Window Paint

Photograph 33: Buoy Maintenance Building at CCGB Prescott

Photograph 34: Buoy Maintenance Building – ACM (VFT3) Blue With White Streak 12” X 12” Vinyl Floor Tile

Photograph 35: Buoy Maintenance Building – Lead-Based Brown Exterior Paint



Photograph 36: Buoy Maintenance Building – ACM (VFT1) Blue With White Streak 12” X 12” Vinyl Floor Tile

Photograph 37: Buoy Maintenance Building – Lead-Based Beige Undercoat Paint

Photograph 38: Typical Mercury Containing Thermostat Observed in Buildings at CCGB Prescott

Appendix C

PWGSC Deputy Minister Directive 057 (DIR 057) Asbestos Management

P 0
199 12 03

e o o te t

1

1. Public Works and Government Services Canada shall comply with all federal, provincial, territorial and municipal regulations, statutes and requirements with regard to asbestos containing materials (ACM) in government owned or leased buildings and facilities.

2. This departmental policy and code of practice are established in response to the requirement for a comprehensive approach to departmental asbestos management. This will ensure that the responsibilities of the department, as building owner, tenant, landlord and employer, with respect to safety and health issues and environmental control issues, are fully addressed.

3. This departmental policy and code of practice specify the role

and responsibilities of the Regional Asbestos Coordinator and provide standard methods and procedures to address the following:

1. identification, assessment and inventory of ACM in buildings and facilities;

2. notification to employees, client departments and contractors regarding the presence of friable asbestos;

3. reassessment of friable ACM on an annual basis;

4. maintenance of departmental information regarding ACM;

5. training modules for PWGSC personnel, based on the responsibilities and duties to be undertaken in relation to asbestos management;

6. identification, classification, monitoring, inspection and control of asbestos-related work undertaken by departmental personnel or contractors.

2 P

Public Works and Government Services Canada shall ensure the control of asbestos containing materials (ACM). The responsibilities of the department, as building owner, tenant, landlord and employer, with respect to safety and health issues and environmental control issues, shall be fully addressed and in accordance with the *Canada Labour Code, Part II*, the *Canada Occupational Safety and Health Regulations, Part X - Hazardous Substances*, and applicable provincial and territorial occupational health and safety and environmental protection legislation.

3 P

This departmental policy and code of practice apply to all managers, supervisors and employees where the duties required to be undertaken involve the removal, repair or maintenance of ACM. This departmental policy and code of practice apply to any building or facility in which friable material, that may contain asbestos, has been used, and all repairs, alterations or maintenance of any building or facility where ACM may exist.

See Annex A.

P

See Annex B.

1. **p e e t t o**

The Director, Corporate Environment, Safety and Health shall provide the framework for departmental asbestos management through the provision of approved departmental training modules to meet requirements, and the issue of standard methods and procedures. Training requirements shall be reviewed on an annual basis.

The Regional Asbestos Coordinator shall implement the departmental methods and standards within the region and shall ensure that initial surveys for asbestos are conducted, inventories are developed and properly maintained, and that training requirements for departmental employees are identified and that the training is provided.

2. **o tor**

The Director, Corporate Environment, Safety and Health shall monitor asbestos management to ensure that requirements are met, and that procedures are established and implemented as required throughout the department.

The Regional Asbestos Coordinator and the Regional Manager responsible for Safety and Health shall review the progress of asbestos surveys and training, and the overall implementation of asbestos management and subsequent safety and health issues, on a quarterly basis.

Training requirements, notifications, records, procedures and other safety and health issues related to asbestos management shall be reviewed on a quarterly basis by the network of Workplace Safety and Health Committees and Representatives.

Issues related to asbestos management that cannot be resolved at the workplace level shall be reported to the Regional Safety and Health Committee. Issues that cannot be resolved at the regional level shall be reported to the National Safety and Health Committee.

P

Annex C - Code of Practice.

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Compliance with this departmental policy is mandatory and in accordance with all existing safety and health legislation. The refusal of an employee at any level to comply with this departmental policy or with the provisions of the prescribed codes, standards, regulations, and/or departmental policies will be considered as misconduct.

9

t e t o

- Canada Labour Code, Part II:
  - *Part II of the Canada Occupational Safety and Health Regulations, (COSH), Building Safety*,

- *Part X of the Canada Occupational Safety and Health Regulations, (COSH), Hazardous Substances*,
- *Part XIV of the Canada Occupational Safety and Health Regulations, (COSH), Materials Handling*.

re ry or P to

- *Occupational Health Evaluation Standard*;
- *Procedures for occupational exposure to asbestos*;
- Canadian National Master Specifications, Sections 13280, 13281 and 13282.

P P to

- *DP 007 - Health and Safety Policy*;
- *DP 017 - Personal Protective Equipment for Employees*;
- *DP 018 - Hazardous Occurrence Investigating, Reporting and Recording*.

t er P to

- Provincial and Territorial Occupational Health and Safety Legislation;
- Provincial and Territorial Environmental Protection Legislation.

10

ep rt e t

Director
Corporate Environment, Safety and Health

e o

Regional Managers responsible for Safety and Health

R. A. Quail
Deputy Minister and
Deputy Receiver General for Canada

e e to

e to o t ter (Matériau contenant de l'amiante (MCA)) means any material found to contain asbestos that is at or above the limit defined by provincial standards, as determined by the standard Polarized Light Microscopy (PLM) method for the analysis of bulk samples.

ep rt e t (ministère) means Public Works and Government Services Canada (PWGSC).

p oyee (employé) means a person employed by the department.

p oyer (employeur) means a supervisor who is responsible for the work of one or more employees at the workplace.

r e e to pro t (produit friable à base d'amiante) means ACM, that when dry, can be crumbled, pulverized or powdered by hand pressure. This definition also includes dust or debris arising from non-friable materials that are, or will become, crumbled, pulverized or powdered, i.e., asbestos containing plaster disturbed by demolition. Friable asbestos-suspect products include: Sprayed asbestos products, (fireproofing, thermal insulation, acoustic insulation or decorative products), applied in 1974 or earlier; Acoustic or texture plaster applied in 1983 or earlier; Mechanical insulation installed in 1983 or earlier, (jacketed or not); Compressed mineral fibre ceiling tiles installed in 1983 or earlier.

H r o o rre e (situation dangereuse) means an event occurring at a PWGSC managed building or worksite, or through the course of an employee's work that results in, or has the potential to result in, a fatality, injury, property damage or an escapement of a hazardous material. For the purpose of investigating, recording and reporting of hazardous occurrences, the following are included under this term: Critical Incidents; Disabling Injuries; Non-Disabling Injuries; Minor Injuries; Minor Occurrences and Near-Misses.

er r e o or te (gestionnaire responsable du lieu de travail) means the person to whom the supervisor reports directly.

Per o r e (personne responsable) means a qualified person, appointed by management, to ensure the safe and proper conduct of an operation, or the work of employees.

Per o prote t e e p e t (équipement de protection individuelle) means any clothing, equipment or device worn or used by a person to protect that person from injury or illness.

e per o (personne qualifiée) means, with respect to a specified duty, an individual who, because of knowledge, training and experience, is qualified to safely and properly perform the duty.

e o or e o , (région ou régional) when utilized in Safety and Health Departmental Policies and Codes of Practice, refers to all Regions and includes the National Capital Area.

e or e p oyer repre e t t e (représentant supérieur de l'employeur) means the individual with the delegated authority to make and carry out decisions of an operational nature, on behalf of the department, for the workplace.

per or (superviseur) means the person at the workplace to whom the employee(s) report(s) directly.

or p e (lieu de travail) means any place where an employee is engaged in work for the department.

e o e e po t e

1. **r / e y He** are accountable for the implementation of this departmental policy within their areas of responsibility. This accountability is further referenced in *DP 007, Annex A - Accountability Framework for the Health and Safety Function*.

   In addition, Regional Directors General are responsible for appointing a qualified person as the Regional Asbestos Coordinator.

2. **e or p oyer epre e t t e** are responsible for ensuring that all workplaces within their area of responsibility implement the requirements of this departmental policy and code of practice.

3. The **re tor orpor te ro e t ety He t** is responsible for:

   1. monitoring the departmental program to ensure that requirements for asbestos management are met, and that procedures are established and implemented as required throughout the department;

   2. approving training modules prior to implementation, and ensuring that an annual review of training requirements is undertaken;

   3. liaising, on behalf of the department, with regulatory bodies, central agencies, and provincial bodies on matters related to asbestos management.

4. The **H e o r e r** , is responsible for ensuring that the appropriate procedures are implemented so that Asbestos-Related Work Records are maintained on employee files for a period of thirty (30) years.

5. The **e o e to oor tor** is responsible for:

   1. implementing the requirements for departmental asbestos management within the region;

   2. arranging for initial asbestos surveys and the reassessments of buildings and facilities;

   3. preparing standard notification letters regarding the existence of friable asbestos, for issue by Property, Facility or Project Managers;

   4. maintaining a data base of survey and reassessment

information relating to the existence of ACM;

5. issuing copies of asbestos inventory and assessment reports and updates to Property and Facility Managers;

6. classifying asbestos-related project work on behalf of Project Managers, and arranging for the preparation of specifications when required;

7. ensuring that Property and Facility Managers are aware of the requirements of asbestos management, and ensuring that standard procedures are implemented for asbestos work, required training is provided, current information relating to ACM is available and records are properly maintained;

8. coordinating training requirements for departmental employees and maintaining records of training;

9. maintaining all records relating to asbestos management within the region and asbestos work undertaken in the region, i.e., asbestos inventory and assessment reports, training records, notification letters and work records;

10. reviewing all work requirements that have been classified as Type 3, and undertaking the direction of the work when required;

11. assisting in the identification of circumstances where an employee is, or may be, exposed to airborne asbestos during work not subject to the precautions required by the Asbestos Management Code of Practice and ensuring that any required hazard assessments are undertaken;

12. ensuring that the Regional Manager responsible for Safety and Health has been notified in situations where an employee has been exposed to a hazardous occurrence where an investigation may be required;

13. reviewing asbestos-related work requirements, at random, to ensure that work has been properly classified, and that all required specifications have been addressed;

14. reviewing, on a quarterly basis, the progress of asbestos surveys and training, and implementation of asbestos management, and safety and health issues with the Regional Manager responsible for Safety and Health.

6. **Property er ty er Pro e t er** shall implement this departmental policy and code of practice as required, based on the nature of their function and the duties for which they are responsible, by:

    1. ensuring that the requirements for departmental asbestos management are fully implemented within their area of

responsibility;

2. reviewing all maintenance work requirements against survey information to determine the possibility of friable asbestos being disturbed, and classifying the work based on the approved criteria;

3. notifying, in writing, Workplace Safety and Health Committees and Representatives, (tenant departments and PWGSC), and employees and contractors of the existence of friable ACM, and providing updates on conditions as modifications or changes are made;

4. maintaining asbestos inventory, assessment and reassessment reports and ensuring that a copy of this information is maintained in a location that is accessible to maintenance staff and contractors;

5. obtaining the approval of the Regional Asbestos Coordinator prior to arranging for the removal or repair of damaged or deteriorated friable ACM;

6. submitting all Type 3 work requirements to the Regional Asbestos Coordinator for review prior to arranging for the work to be undertaken;

7. consulting the Regional Asbestos Coordinator, when necessary, to determine the impact of a specific project with regards to ACM;

8. maintaining a stock of required equipment for work classified as Type 1 and Type 2;

9. identifying and providing a suitable storage area for waste resulting from asbestos work, and arranging for periodic waste removal.

7. **er r e o or te per or** shall implement this departmental policy and code of practice as required by the nature of the tasks for which they are responsible, by:

1. ensuring that employees have been provided with the required training to undertake the work;

2. ensuring that the appropriate personal protective equipment, tools and clothing required for the work are provided;

3. ensuring that testing, maintenance and storage routines are established and implemented for all personal protective equipment and tools;

4. identifying a qualified person to undertake the duties of the "Person in Charge";

5. ensuring that an Asbestos-Related Work Record Form (PWGSC-TPSGC 55) is completed for each period of work, and that a copy of this record is submitted to Human Resources Branch to be placed on employee files, and a copy is submitted to the Regional Asbestos Coordinator;

6. ensuring that all employees required to perform work classified as Type 2 or Type 3 undertake health evaluations as per the requirements of *DP 059 - Health Evaluations - Safety and Health, PWGSC*;

7. notifying the Asbestos Coordinator of any hazardous occurrence that has taken place or when their has been a requirement to undertake emergency asbestos-related work for a particular situation.

8. The **Per o r e** is responsible for:

   1. ensuring that workers on site have been provided with the required training for the work to be undertaken;

   2. ensuring that all required equipment is on site before commencement of the work;

   3. ensuring that the appropriate personal protective equipment, tools and clothing required for the work are worn and/or utilized;

   4. ensuring that the appropriate procedures for the work are implemented and that all workers are aware of, and comply with, established procedures;

   5. ensuring that all procedures for inspection and air monitoring are implemented based on the classification of the work and the specified requirements;

   6. immediately informing the Manager in Charge of the Worksite or the Supervisor of a hazardous occurrence involving asbestos-related work.

9. **e o er re po e or ety He t** are responsible for:

   1. monitoring worksites periodically to ensure that standard procedures are implemented for asbestos work, required training is provided, current information relating to ACM is available and records are properly maintained;

   2. investigating specific workplace complaints concerning asbestos and asbestos-related work and taking appropriate action;

   3. providing assistance and advising the Asbestos Coordinator of specific safety and health issues and requirements related to asbestos management;

4. reviewing, on a quarterly basis, with the Regional Asbestos Coordinator the implementation of asbestos management and safety and health issues.

10. **or p e ety He t o ttee epre e t t e** are responsible for:

1. participating in hazard investigations to determine the risks and hazards associated with asbestos-related work requirements;

2. monitoring workplaces to ensure that the requirements for asbestos-related work have been addressed, i.e., training has been provided; personal protective equipment is provided and properly utilized; records are maintained and procedures are implemented;

3. reporting immediately, specific workplace complaints related to asbestos management, to the Regional Manager responsible for Safety and Health;

4. undertaking a review of training requirements for asbestos-related work on an annual basis.

11. **p oyee** are responsible for:

1. applying the appropriate practices, procedures and equipment for the type of asbestos-related work;

2. wearing and/or utilizing and maintaining the required personal protective equipment, clothing and tools;

3. reporting immediately, to the Person in Charge, the Manager in Charge of the Worksite, or the Supervisor, all known or suspected conditions or activities that are in violation of approved practices and procedures and that may cause a hazardous occurrence.

e o e o Pr t e

1. **e to r ey e e t e tor e**

To ensure that a complete inventory of ACM that includes friable ACM and the principal types of non-friable ACM is developed, it is necessary to undertake a thorough survey of all government-owned or leased facilities. Once ACMs are identified through surveys and assessments of the materials are made, inventories shall then be established and maintained.

Leasing Space and Friable Asbestos

When space is considered for lease in a building that was constructed before 1983, PWGSC shall request and obtain from

the lessor, an asbestos survey that identifies all friable asbestos materials located within the structure.

This survey shall be signed by and conducted under the direction of a qualified person, competent in asbestos control, i.e., a Professional Engineer, a Certified Industrial Hygienist, or a Registered Occupational Hygienist.

If friable asbestos is present the following rules shall be applied in considering the space:

1. the department shall not lease space when there is friable asbestos material located directly within the space to be occupied;

2. the department may lease space when friable asbestos is present elsewhere in the building, provided that there is an asbestos management program in place that meets the basic requirements of the department, as described herein by the departmental policy and code of practice for asbestos management.

Asbestos Surveys

The Regional Asbestos Coordinator shall undertake the planning and coordination of all asbestos surveys. A detailed survey of each location within the region shall be undertaken initially, in order to determine the presence of ACM, including all friable asbestos materials, applications of floor finishes and asbestos reinforced cement products, i.e., asbestos cement sheeting and piping. This survey shall be conducted on a floor-by-floor and room-by-room basis.

The Regional Asbestos Coordinator shall ensure that all surveys are conducted under the direction of a qualified person competent in asbestos control, i.e., Professional Engineer, Certified Industrial Hygienist, or Registered Occupational Hygienist.

The Regional Asbestos Coordinator shall ensure that each survey is signed off by the qualified person who directed the survey.

Assessment of Asbestos Materials

ACM that is identified during the survey shall be assessed, and recommendations regarding the action to be taken shall be determined as per the specifications provided in *Appendix 1 - Evaluation of Asbestos Containing Materials (ACM) and Recommendations for Control*.

Appendix 1 provides specific criteria for the assessment of materials based on condition and accessibility, and provides an Action Matrix, which is utilized in determining the recommended action to control ACM based on the particular circumstances. Detailed information regarding the requirements to properly

undertake each action are also provided.

: Analysis of materials to determine asbestos content shall be performed by Health Canada, or by private laboratories accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) of the U.S. National Institute of Science and Technology (NIST), in the use of the Polarized Light Microscopy method. The analysis of bulk samples shall be performed to the detection limits as indicated in Appendix 1 - Detection Limit of Bulk Analysis.

Asbestos Inventories

Once surveys have been completed and assessment of materials has been made, the Asbestos Coordinator shall ensure that this inventory information is entered into the PWGSC Asbestos Management Database. The Asbestos Coordinator shall update this information as changes are made at the various locations, or where new information identifies the existence of ACM not previously identified.

The Asbestos Coordinator shall ensure that Completed Asbestos Inventory, Assessment Reports and Reassessment Reports are forwarded to the respective Property or Facility Manager, and that current copies of these documents are made available at a location in each building or facility that is accessible to maintenance staff, contractors and workplace safety and health committee members and representatives.

: Property and Facility Managers shall notify the Regional Asbestos Coordinator prior to arranging for, or undertaking, removal or repair of damaged or deteriorated friable asbestos materials identified by the Asbestos Inventory and Assessment.

2. **ot t o o r e e to**

The Regional Asbestos Coordinator shall provide written notice to Property and Facility Managers concerning the presence of friable ACM, as per the findings of surveys and assessments.

For those locations where a survey and assessment are pending, and the presence of friable ACM is known, the Regional Asbestos Coordinator shall provide interim written notice to the Property or Facility Manager.

Upon receipt of Asbestos Inventory and Assessment reports, the Regional Asbestos Coordinator shall provide updated written notification to Property and Facility Managers.

Property and Facility Managers shall ensure that written notice is provided to the following groups:

- Workplace Safety and Health Committees and Representatives;
- Maintenance Employees;
- Contractors, Inspectors. (Those who may enter parts of

the building or facility where friable ACM may be present, i.e., telecommunications firms, boiler maintenance contractors, inspectors, etc.) See *Appendix 2 - Contractor Notification and Acknowledgement*.

Copies of all notices issued to Property and Facility Managers shall be maintained by the Regional Asbestos Coordinator.

3. **e e e to r e e to**

The Regional Asbestos Coordinator shall arrange for an annual reassessment of all friable ACM present in exposed locations.

Copies of reassessment reports shall be distributed to Property and Facility Managers. Property and Facility Managers shall provide updated information to the following groups:

- Workplace Safety and Health Committees and Representatives;
- Maintenance Employees;
- Contractors, Inspectors. (Those who may enter parts of the building or facility where friable ACM may be present, i.e., telecommunications firms, boiler maintenance contractors, etc.) See *Appendix 2 - Contractor Notification and Acknowledgement*.

Property and Facility Managers shall notify the Regional Asbestos Coordinator prior to arranging for, or undertaking, removal or repair of damaged or deteriorated friable ACM.

4. **r**

Training shall be provided to PWGSC personnel, as required, based on their roles and responsibilities related to asbestos management. Training shall be delivered in modules in order to target specific requirements and related duties, and to avoid duplication.

The duration of training and mode of delivery shall be determined by the Director, Corporate Environment, Safety and Health, in consultation with the National Safety and Health Committee.

The Regional Asbestos Coordinator and the Human Resources Branch, shall maintain records of training.

Training requirements shall be reviewed annually by the network of Workplace Safety and Health Committees and Representatives.

Asbestos Management Training

Asbestos management training shall be provided to the Regional Asbestos Coordinators, Property and Facility Managers, and Project Managers. This training will include an introduction to the asbestos inventory and assessment reports, health hazards of

asbestos exposure, regulations, the Asbestos Management Code of Practice, classification of asbestos work, asbestos project control, and emergency procedures.

Asbestos Procedures Training

Training shall be provided to maintenance workers who will perform Type 1 or Type 2 work. The training will include an introduction to the asbestos inventory and assessment reports, health hazards of asbestos exposure, regulations, the Asbestos Management Code of Practice, Type 1 and Type 2 work practices, and disposal procedures. Upon completion of the training, workers shall sign a form acknowledging the training received. See Appendix 3 - *Certificate of Training for Asbestos-Related Work*.

Respirator Training

Respirator training shall be provided to all those who will perform Type 2 work, and to employees who will perform Type 1 work and request a respirator. The training will cover limitations of use, fitting, and maintenance of respirators. Persons provided with a respirator will be fit-tested with the assigned respirator, using the CSA irritant smoke method. See Appendix 6 - *Respirator Fitting, Inspection, Cleaning and Disinfecting* for procedures and related information regarding respirators.

Employees who will utilize a respirator shall be required to undertake a medical evaluation as per the requirements of *DP 059 - Health Evaluations - Safety and Health, PWGSC*.

Asbestos Awareness Training

Training shall be provided to all maintenance and operations personnel who may work near asbestos materials.

This training shall also be required for those who supervise workers or contractors who may work near asbestos materials.

The module will introduce the asbestos inventory and assessment reports, health hazards of asbestos exposure, the Asbestos Management Code of Practice, and emergency procedures.

This training shall also be made available to Workplace Safety and Health Committee Members and Representatives.

5. **e t t o t o o tro o e to e te or**

Maintenance Work

Property and Facility Managers, or their designates, are responsible to review all maintenance work for the possibility of the disturbance of ACM when required work is undertaken.

When there are friable or non-friable ACMs in the area, and this material will be disturbed by the work, then the work shall be determined as asbestos-related work and classified as Type 1, Type 2, or Type 3. Appropriate procedures shall be implemented based on the classification of the work. See Appendix 5 - *Classification of Asbestos-Related Work*, and Appendix 6 - *Work Procedures*.

If there are friable or non-friable ACMs in the area of maintenance, that will be disturbed by the intended work, the Property or Facility Manager or designate shall classify the work as Type 1, Type 2, or Type 3. Work determined to be a Type 3 classification shall be forwarded to the Asbestos Coordinator for review.

The Regional Asbestos Coordinator shall review all work that is classified as Type 3 asbestos work. The Regional Asbestos Coordinator shall determine, based on the requirements and specific circumstances of the work, the degree of his/her personal involvement in the direction of the work.

If there are friable ACMs in the area of maintenance, and it has been determined that these materials will not likely be disturbed by the maintenance work, the Property or Facility Manager shall inform maintenance staff and/or the contractor of the presence of friable ACMs prior to the commencement of work.

On completion of any maintenance work which involves asbestos removal or repair, a report will be provided to the Regional Asbestos Coordinator which indicates the asbestos-related work that has been completed. See Appendix 4 - Asbestos-Related Work Record. The Regional Asbestos Coordinator will then update the information in the inventory as required, and ensure that this information is distributed as required.

- Property and Facility Managers shall maintain a stock of the approved equipment required for Type 1 and Type 2 asbestos work, where PWGSC staff perform asbestos work.
- When asbestos work is performed by PWGSC staff, asbestos debris shall be packaged in double-bagged containers or other suitable containers, by those completing the project. These containers shall be held at a pre-determined, secure location in the building.
- The Property or Facility Manager shall arrange for periodic collection of asbestos waste containers from this location.

Renovation and Construction Work

Project Managers shall consult the Regional Asbestos Coordinator prior to undertaking renovation or construction work. The Regional Asbestos Coordinator shall review the asbestos survey reports for the possible impact on asbestos materials, prior to all renovation and construction work.

Prior to commencement of projects that include the demolition of plaster installed prior to December 1983, testing of the plaster for asbestos shall be undertaken, unless previous comprehensive testing in the building has shown this plaster to be free of asbestos. Records of plaster test results shall be maintained by the Asbestos Coordinator and the Property or Facility Manager along with the asbestos surveys of the building.

The Regional Asbestos Coordinator, on behalf of the Project Manager, shall classify the work as Type 1, Type 2, or Type 3.

In Ontario, the Project Manager, through the Regional Asbestos Coordinator, shall obtain a Designated Substance Report (a prescribed listing of asbestos, lead, silica, and other hazardous materials) prior to tendering the work.

The Regional Asbestos Coordinator, on behalf of the Project Manager, shall arrange for specifications to be prepared for asbestos work, following the National Master Specification. Alterations to specifications, in order to accommodate specific provincial requirements, shall be determined when required.

Services related to the design and preparation of specifications shall be performed by Consultants or Engineers with the appropriate training, experience and insurance for asbestos-related work. Insurance shall specifically include professional liability with pollution coverage.

When there are friable asbestos materials in the renovation area, and the Regional Asbestos Coordinator has determined that these materials are not likely to be disturbed by the work, the maintenance staff or the contractor must be notified of the presence of friable asbestos materials. The contractor shall be required to sign the Contractor Notification and Acknowledgement Form prior to commencement of the work. See Appendix 2 - *Contractor Notification and Acknowledgement*.

At the completion of any project work which alters the amount or condition of friable ACM, a report will be provided to the Regional Asbestos Coordinator which indicates the work that has been completed. See Appendix 4 - *Asbestos-Related Work Record*. The Regional Asbestos Coordinator will then update information in the inventory, and ensure that this information is distributed as required.

6. **e to or e or e r e e**

Managers in Charge of Worksites and Supervisors shall ensure that an Asbestos-Related Work Record is completed for employees performing Type 2 or Type 3 work, or entering a Type 2 or Type 3 work area. A work record shall be completed for each period of work.

Managers in Charge of Worksites and Supervisors shall ensure that a copy of each work record is forwarded to Human Resources Branch and to the Regional Asbestos Coordinator.

See Appendix 4, for a sample of the Asbestos-Related Work Record.

Human Resources Branch shall maintain Asbestos-Related Work Reports on employee files for a period of thirty (30) years. Asbestos-Related Work Reports shall be maintained by the Office of the Regional Asbestos Coordinator for a period of thirty (30) years.

All PWGSC employees who will perform Type 2 or Type 3 work shall undertake a medical evaluation as per the requirements of *DP 059 - Health Evaluations - Safety and Health, PWGSC*.

7. **e to or Pro e re**

Type 1, Type 2, and Glove Bag Procedures

Standard procedures for performing Type 1, Type 2, and Glove Bag asbestos work are provided in Appendix 6 - *Work Procedures*.

Type 3 Procedures

Type 3 procedures are not included in the standard procedures provided in Appendix 6 - *Work Procedures*.

Procedures for Type 3 work are developed for the particular work to be undertaken, and the specific circumstances and worksite. These procedures shall be developed in compliance with the National Master Specification, Section 13282, Asbestos Abatement (maximum precautions).

Emergency Procedures

Procedures for asbestos work, required on an emergency basis, as an immediate response to floods, pipe breaks, ceiling collapses, or other emergencies that affect asbestos materials, are provided in Appendix 6 - *Work Procedures*. These procedures shall be implemented to protect those undertaking the work, and to protect all others from, or limit exposure to, airborne asbestos.

Emergency procedures, indicated in Appendix 6 - *Work Procedures*, shall be followed as closely as possible, in the event of an emergency situation.

Emergency Plans

An Emergency Plan that corresponds with the emergency procedures for the specific site shall be developed and implemented, to ensure that safety and health requirements are addressed in the event of emergency situations that require work shut-down and evacuation.

8. **e to or pe t o r o tor**

Type 1 and Type 2 Work

Type 1 and Type 2 work shall be subject to the standard maintenance or project inspection requirements for non-asbestos work. Asbestos-specific air monitoring or inspection is not mandatory.

Type 3 Work

The Regional Asbestos Coordinator, on behalf of the Project Manager, may arrange for the inspection and air monitoring during Type 3 asbestos projects. These services shall be provided by consultants or engineers with the appropriate training, experience and insurance for asbestos-related work.

When Type 3 work is to be undertaken in an occupied building, or in a building in use, daily inspection and air monitoring shall be required. If the building is not occupied, inspection shall be at critical stages of the work, unless provincial standards require daily inspection, as necessary in Quebec and British Columbia.

All Type 3 removal projects shall be subject to final clearance air testing. The clearance criteria shall be a maximum fibre concentration of 0.01 fibre/ml of air, as determined by the standard Phase Contrast Microscope (PCM) method.

9. **r o tor y**

Air Monitoring for Hazard Assessment

When the Regional Asbestos Coordinator is requested to, and has determined the requirement for, air monitoring under normal conditions of building use (i.e., away from asbestos work), the measurements shall be made by the Transmission Electron Microscopy (TEM) analytical method.

Air monitoring shall not be used as the primary method for the assessment of hazard from asbestos materials.

Air Monitoring During Asbestos Work

The Regional Asbestos Coordinator shall arrange for air monitoring during Type 3 work, as required, to confirm the safety of work practices and the effectiveness of work area isolation. These measurements shall be made by the Phase Contrast Microscope (PCM) method recognized by Human Resources Development Canada (HRDC) - Labour Programs and provincial occupational health and safety authorities.

PCM measurements shall be made by National Institute of Occupational Safety and Health (NIOSH) method 7400, except work in British Columbia and Quebec, where provincial analytical methods are in place.

Analysis of PCM samples shall be performed by Health Canada

or individuals or organizations successfully participating in a recognized external quality control program.

Bulk Sample Collection and Analysis

Procedures for collection and labeling of bulk samples for asbestos analysis are detailed in Appendix 6 - *Work Procedures*.

Analysis of materials to determine asbestos content shall be performed by Health Canada or by private laboratories accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) of the U.S. National Institute of Science and Technology (NIST). The laboratories shall report to the limits of detection as indicated in Appendix 1 - *Detection Limit of Bulk Analysis*.

Maintenance of Records

The Regional Asbestos Coordinator shall maintain copies of all reports and records relating to testing, sampling and analysis undertaken for buildings and facilities within the region.

10. **H r e t to**

When an employee is or may be exposed to airborne asbestos as a result of direct disturbance of asbestos materials during maintenance, renovation or construction work not subject to the appropriate precautions required by the Asbestos Code of Practice, or by similar inadvertent direct contact not subject to the appropriate precautions, the Regional Asbestos Coordinator shall appoint a qualified person to conduct a hazard assessment. This assessment must consider the potential hazard, and must conclude as to whether the hazardous material could be present.

The Regional Asbestos Coordinator shall notify, in writing, the Workplace Safety and Health Committee or Representatives of this assessment.

The assessment shall determine the potential hazard, and must conclude as to whether the hazardous material could be present as an airborne hazard, at a level of at least 50% of the exposure limit. When it has been determined that the hazardous material could be present at a level of at least 50% of the exposure limit, a control plan must be instituted.

Control Plans for Asbestos

When an assessment has determined that asbestos could be present as an airborne hazard, at a level of at least 50% of the exposure limit, a control plan must be established and implemented to address the following requirements:

- a record of where asbestos materials are located;
- written procedures for control;
- medical surveillance, when applicable;

- training of employees.

The control plan must be reviewed at least once per year, or as new information is received that changes the requirements of the plan.

e ppe 1 to o e to o t ter e o e to or o tro

1. **e e to o to**

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:

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.

P 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 survey or reassessment 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 buildings with ACM, regardless of the reported condition.

Mechanical Insulation

In evaluating the condition of mechanical insulation (on boilers, breeching, ductwork, piping, tanks, equipment etc.) the following criteria are used:

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.

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.

P 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.

2. **t o o e ty**

The accessibility of building materials known or suspected of being ACM is rated according to the following criteria:

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 result in disturbance of ACM not normally within reach from floor level.

Frequently entered maintenance areas within reach of maintenance staff, without the 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.

P

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.

Areas of the building which require the 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.

Areas of the building behind inaccessible solid ceiling systems, walls, or mechanical equipment, etc., where demolition of 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.

3. **e r**

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.

The identification of the exact location or presence of DEBRIS on the top of ceiling tiles is limited by the number of observations made and the presence of building components such as ducts or full height walls that obstruct observations. Workers are advised to be watchful for the presence of DEBRIS prior to accessing, or working in proximity to, mechanical insulation or above ceiling areas of buildings with ACM, regardless of the reported presence or absence of DEBRIS.

4. **t o tr t o e r pt o**

The Asbestos Management Program requires the following responses:

- Immediate clean-up of DEBRIS that is likely to be disturbed;
- The removal, repair or enclosure of friable ACM in POOR or FAIR condition where continued deterioration will result in DEBRIS that is likely to be disturbed.

The following factors shall be considered in making site-specific recommendations for compliance with the regulation, and for the practical implementation of asbestos management:

1. ACM in POOR condition is not routinely repairable.

   If an abatement action is necessary, removal is the recommended action (enclosure is a viable option in unusual circumstances).

2. Mechanical insulation in FAIR condition will be repaired or removed based on the following general recommendations, applied on a case by case basis.

   Repair ACM mechanical insulation found in FAIR condition in ACCESS (B) or ACCESS (C) EXPOSED areas.

   Remove ACM mechanical insulation found in FAIR condition in ACCESS (B) and ACCESS (C) EXPOSED areas, where future damage to the ACM is likely to occur.

3. ACM in GOOD condition present in ACCESS (A) can be managed by surveillance, as long as it is not disturbed by future renovation, maintenance or demolition. Proactive removal of the ACM in ACCESS (A) will be considered where damage is possible by ongoing occupant activity (accidental or intentional).

4. Non-friable or manufactured products are considered in the action matrix as follows:

   - Non-friable and manufactured products reported in POOR condition, or friable DEBRIS resulting from the deterioration of non-friable ACM, are treated as friable materials and the appropriate Action, depending on accessibility, is determined from the Action Matrix for friable ACM.
   - For non-friable or manufactured products reported in GOOD condition, Action 7 (surveillance) is recommended regardless of Accessibility.

5. Remove all ACM from a particular area where small quantities of asbestos are present and removal will negate the need for the use of the Asbestos Management

Program in that area.

The Action Matrix provided below establishes the recommended asbestos control action. The ACTIONS are described in full following the matrix.

			P	
(A)	ACTION 5/7[1]	ACTION 5/6[2]	ACTION 3	ACTION 1
(B)	ACTION 7	ACTION 6/5[3]	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

[1]If material in / condition is not removed is required.
[2]If material in / condition is not removed is required.
[3]Remove in / condition if is likely to be disturbed.

1 e te e po er t ey to e tre

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. The surveyor should immediately notify the Regional Asbestos Coordinator of this condition.

2 try to re t er ype 2 Pre t o

At locations where ACM DEBRIS can be isolated in lieu of removal or cleaned 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.

3 e o e re or o p e

Remove ACM for compliance with regulatory requirements. Utilize asbestos procedures appropriate to the scope of the removal work.

e to re ere Pre e t e y to e t r e y e ype 2 Pre t o

Use Type 2 asbestos precautions when entry or access into an area is likely to disturb the ACM. ACTION 4 must be used until the ACM is removed (Use ACTION 1 or 2 if DEBRIS is present).

Pro t e e o

Remove ACM in lieu of repair, or at locations where the presence of asbestos in GOOD condition is not desirable.

ep r

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.

o t e r e e

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.

5. **ete t o t o y**

Asbestos containing material, (ACM), is defined as any material found to contain asbestos at or above the limit for an asbestos containing material, (ACM), set provincially, as determined by the standard Polarized Light Microscopy method for the analysis of bulk samples. The provincially regulated limits, or generally accepted guidelines, to consider a material as an asbestos containing material, (ACM), subject to asbestos in buildings regulation, is provided as follows:

P

P /

NEWFOUNDLAND NOVA SCOTIA PRINCE EDWARD ISLAND NEW BRUNSWICK ALBERTA BRITISH COLUMBIA	1.0%
ONTARIO (includes part of National Capital Region) SASKATCHEWAN (no published concentration)	0.5%
QUEBEC (includes part of National Capital Region) MANITOBA	0.1%

e ppe 2 o tr tor ot t o o e e e t

Click here to view the Adobe Acrobat (also known as PDF) version of the Form PWGSC-TPSGC 16.

e ppe 3 ert te o r or e to e te or

Click here to view the Adobe Acrobat (also known as PDF) version of the Form PWGSC-TPSGC 15.

e ppe e to e te or e or

Click here to view the Adobe Acrobat (also known as PDF) version of the Form PWGSC-TPSGC 55.

e ppe t o o e to e te or

The following criteria shall be utilized in determining the classification of asbestos work.

P 1

- Installation or removal of a non-friable ACM with a hand tool.
- Disturbance of a non-friable ACM with a powered tool equipped with a HEPA dust collection device.
- Removal of drywall materials where joint filling materials contain asbestos.
- Removal or replacement of ten or less asbestos-containing

compressed mineral fibre type ceiling tiles.
- Collecting samples of asbestos-suspect friable materials.
- Working close to friable sprayed asbestos, where the material may be affected by the work activities.

P 2

- Removal or replacement of more than ten asbestos-containing compressed mineral fibre type ceiling tiles.
- Entry into ceiling spaces, crawlspaces, pipe tunnels, etc., where friable asbestos debris is present.
- In British Columbia, removal of drywall installed before 1980.
- Minor removal of friable ACM. Type 2 removal is limited to a maximum per work period of:
  - In British Columbia - 0.1 m^2 surface area, or 3 lineal metres of pipe insulation;
  - In Quebec - 0.03 m^2 of Debris;
  - All Others - 1 m^2 of surface area.
- Repair of asbestos mechanical insulation. (No limit is imposed as to the amount of repair permitted under Type 2 conditions.)

P 3

- More than minor removal or disturbance of friable ACM.
- Use of a power tool on non-friable ACM without HEPA exhausted dust collection.
- The spray application of an encapsulant or sealer to friable asbestos surfacing materials.
- Disturbance of the ductwork and air handling equipment serving or passing through areas of buildings with sprayed asbestos fireproofing or insulation.
- Repair, alteration or demolition of a boiler, furnace, kiln, or similar equipment with asbestos-containing refractory.

e ppe or Pro e re

P 1 or Pro e re

For locations of non-friable ACM, refer to the current version of the Asbestos Inventory and Assessment Report.

These Type 1 procedures assume the non-friable material can be removed with relatively little loose dry dust released. Generation of debris is permissible as long as the debris can be well wetted before being removed. If the work will release more than a trivial amount of dry loose dust, do not proceed. The Regional Asbestos Coordinator will determine which of Type 1, 2 or 3 procedures are appropriate.

1. **p e t**

All equipment must be on site before proceeding.

1. *Vacuum*

Use of a vacuum is optional. Wet cleaning methods may be used in place of a vacuum. If a vacuum is used it must be equipped with a high efficiency particulate (HEPA) filter and all brushes, fittings, etc. The vacuum must only be opened in an enclosure, following Type 2 procedures, or in a laboratory exhaust hood. The vacuum exterior should be carefully wet cleaned after emptying. A HEPA filter is at least 99.97% efficient in collecting a 0.3 micrometre particle.

2. *Respirators*

Use of a respirator is optional for Type 1 work. However, a respirator is strongly advised for work on sheet flooring, any type of ceiling tile, any other work performed overhead. Respirators shall be supplied by the employer upon request. The type of respirator supplied shall be a half-face respirator with HEPA filter. Training in the proper use of the respirator and qualitative fit testing shall also be provided. Respirators must be NIOSH approved and acceptable to the Provincial Authorities having jurisdiction. Respirators shall be used according to the written procedures for use, provided to the worker during training sessions. Filters must be changed after 24 hours of wear, or sooner if breathing resistance increases.

Employees are required to undertake a medical evaluation as specified by *DP 059 - Health Evaluations - Safety and Health, PWGSC* prior to being trained in the proper use of respirators.

3. *Protective Clothing*

Reusable or disposable clothing may be used. Non-disposable clothing with visible asbestos contamination shall be cleaned with a HEPA vacuum and laundered as asbestos contaminated. Disposable clothing and respirator filters will be disposed of as asbestos waste.

4. *Other Equipment*

- plastic sheet (0.15 mm (6 mil) polyethylene) - to serve as a drop sheet;
- pump sprayer with mister nozzle, or alternate method to wet material;
- labelled, yellow asbestos waste bags, 0.15 mm (6 mil) - for all asbestos waste, disposable equipment, plastic, etc.;
- small tools and cleaning supplies - e.g., scouring pads, sponges, brushes, buckets, etc.

2. **t er Prote t e e re**

1. Do not eat, drink or smoke in the work area.

2. On leaving work area, proceed to washroom and wash all

exposed skin on hands and face.

3. **Prep r t o**

    1. Before disturbing non-friable asbestos materials, (wherever practical) cover floor and surfaces below work with polyethylene sheeting to catch debris.

    2. Wherever dust on a surface is likely to be disturbed, remove with HEPA vacuum or damp cloth.

4. **e t o**

    1. Removal of Vinyl Asbestos Floor Tile

        1. Do not use electric powered scrapers.
        2. Start removal by wedging a heavy duty scraper in seam of two adjoining tiles and gradually force edge of one tile up and away from floor. Do not break off pieces of tile, but continue to force balance of tile up.
        3. Continue removal of tiles using hand tools, removing tiles intact wherever possible. When adhesive is spread heavily or is quite hard, it may prove easier to force scraper through tightly adhered areas by striking scraper handle with a hammer using blows of moderate force while maintaining scraper at 25° to 30° angle to floor. When this technique does not loosen tile, removal can be simplified by heating tile thoroughly with a hot air gun until heat penetrates through tile and softens the adhesive.
        4. As each tile is removed, place into asbestos waste receptor. Do not break into smaller pieces.
        5. After removal of a small area, scrape up adhesive remaining on floor with a hand scraper until only a thin smooth film remains. Where deposits are heavy or difficult to scrape, a hot air gun may be used. Deposit scrapings in the asbestos waste disposal bag. Do not dry scrape surface pieces of tile that remain adhered. Do not use powered electric scrapers.
        6. On completion of the area, vacuum clean floor with HEPA vacuum or wet mop. Dispose of the mop head as contaminated waste.

    2. Removal of Asbestos-Containing Sheet Flooring

        1. Remove binding strips or other restrictive mouldings. Workers shall wear air purifying respirator fitted with high efficiency filter, and coveralls, at all times.
        2. Make series of cuts 100 mm to 200 mm (4" to 8") apart through top layers and about halfway through felt backing, parallel to wall.
        3. Start at end of room furthest from door and pry up corner of strip, separating top sheet from backing layer. Pull top layer back upon itself slowly and evenly, and half backing and top layers should pull

free. After it is removed, roll up strip face out into tight roll, tape or tie securely, and place into asbestos waste receptor. Wet the asbestos felt underlay remaining on floor as soon as exposed.
4. Continue with successive strips. Avoid walking on exposed asbestos felt. Seal asbestos waste receptors when filled. Remove maximum of three strips before wet scraping exposed felt underlay.
5. Remove remaining adhered underlay by wet scraping. Soak area with water applied by sprayer. Allow water to penetrate felt. Scrape off remaining material. Maintain material wet by applying more water. Place scrapings in asbestos waste receptor.
6. Continue this procedure alternately removing top sheets and then wet scraping felt, three strips at a time. Be careful not to walk on stripped floor.
7. When whole floor has been cleaned of asbestos felt, allow it to dry and vacuum up any dirt with a HEPA vacuum or wet mop. Do *not* dry sweep. Dispose of the mop head as contaminated waste.
8. Thoroughly clean tools and equipment with a damp cloth before returning to regular service. Dispose of cloth as contaminated waste.

3. Installing, Cutting or Drilling Non-Friable Asbestos Materials

    1. Work using power tools not fitted with HEPA filter dust collectors, must not be performed as Type 1 work.
    2. Where possible wet all materials to be disturbed.
    3. Immediately place waste in asbestos waste receptor. Clean area frequently during work with HEPA vacuum or by wet methods.
    4. At completion of work, drop sheets that will be reused must be cleaned with HEPA vacuum or by wet methods.
    5. Drop sheets that will not be reused must be disposed of as asbestos waste.

4. Removal of Other Non-Friable Asbestos Materials

    1. Type 1 procedures apply only to materials which can be removed intact, or in sections, without producing a pulverized or powdered waste. This method is most applicable to asbestos-cement board products, acoustic ceiling tiles, gaskets, etc.
    2. Where possible wet all material to be disturbed.
    3. Undo fasteners necessary to remove material. Whenever possible remove asbestos cement panels intact. Break only if unavoidable. If broken, wet freshly exposed edges.
    4. Where sections are adhered to the substrate, wet material and use hand scraping to remove adhering material.
    5. Place removed material into asbestos waste receptor. Clean surrounding surfaces and asbestos work area frequently with HEPA vacuum or with wet methods (i.e., damp cloth that is disposed of as

asbestos waste after cleaning).

6. Drop sheets shall be disposed of as asbestos waste.

5. **te r port po**

1. Place waste into asbestos labelled disposal bag, seal with tape, clean the exterior of the bag with a clean cloth, and place into a second clean bag, also to be sealed with tape. Use a barrel, fibre drum, or cardboard or wooden box in place of the second bag when the asbestos waste material is likely to tear the inner bag. Seal the outer container.

2. Place waste containers in storage area for holding asbestos waste. Containers shall be labelled and assigned exclusively for asbestos waste.

3. Prepare waste for disposal in compliance with provincial regulations. The Property Manager will arrange for disposal.

P 2 or Pro e re

For locations of asbestos materials, refer to the current version of the Asbestos Inventory and Assessment Report.

1. **p e t**

Equipment required for the work must be on-site before proceeding.

1. *Vacuum*

An asbestos-approved vacuum (HEPA filtered), equipped with brushes, fittings, etc. Vacuum must not be opened except by a fully protected worker within a Type 2 enclosure. The vacuum exterior shall be carefully wet cleaned after emptying. A HEPA filter is at least 99.97% efficient in collecting a 0.3 micrometre particle.

2. *Respirators*

Workers within the work area shall wear approved respirator. Respirators and filters will be provided by the employer, and individually assigned to workers. Respirator shall be a half-facepiece respirator with high efficiency filters. Respirators must be NIOSH approved and acceptable to the Provincial Authorities having jurisdiction. Respirators shall be kept in position throughout the entire time the worker is in the area of the work, from first disturbance of a ceiling tile or asbestos material, until the final cleaning of the area and bagging of waste is complete. Change filters after 24 hours of wear or sooner if breathing resistance increases.

3. *Protective Clothing*

All workers shall wear disposable coveralls with attached elasticized hood. Coveralls should be worn with the hood in place at all times. Coveralls may be vacuumed or wet wiped clean for reuse, for a maximum of 8 hours cumulative wear. Suit and head cover shall remain in place until worker leaves work area or the enclosure is dismantled. Boot covers or dedicated boots are recommended.

4. *Other Equipment*

   - plastic sheet (0.15 mm (6 mil) polyethylene) - to erect a total enclosure or to serve as drop sheet;
   - wood framing or clips to support polyethylene sheeting, as appropriate to work area;
   - tape - to fasten plastic enclosure to ceiling or to tape drop sheet to floor; ¾" double-sided tape recommended for attaching polyethylene to T-bar ceiling;
   - labelled asbestos waste bag 0.15 mm (6 mil) - for all asbestos waste, disposable suit, plastic for disposal, etc.;
   - pump sprayer containing water with wetting agent to wet asbestos as necessary (dilute wetting agent as per manufacturer's recommendations);
   - asbestos warning signs;
   - cleaning supplies - e.g., scouring pads, sponges, brushes, buckets, etc.;
   - insulation repair supplies (lagging compound, cloth, PVC covers);
   - encapsulating sealer, for brush or airless spray application.

2. **t er Prote t e e re**

   1. Do not eat, drink or smoke in the work area.

   2. On leaving work area, proceed to washroom and wash all exposed skin on hands and face.

3. **e o or**

   1. Schedule work when occupants are absent. If persons are present, do not start work.

   2. If work above ceiling is required on an emergency basis, and the area is occupied, ensure that client department(s) advise occupants to vacate area until work is complete and clearance is given to return.

4. **Prep r t o**

   1. Shut down ventilation systems to and from the work area. Seal over all ventilation openings, diffusers, grilles, etc., with plastic and tape.

2. Where practical, clear areas of movable furnishings or equipment. This should include anything that occupants may wish to use during work period. Any furnishings or equipment not removed shall be adequately covered and sealed using 0.15 mm (6 mil) polyethylene and tape. The intent of the protection is to provide an airtight envelope to protect the articles from airborne dust or splashed debris.

3. Post signs or barrier tape, appropriate to the work area, to indicate asbestos hazard and requirement for protective clothing for anyone entering the space.

4. For small rooms, cover walls with plastic such that the complete room becomes the work area. For larger rooms, erect enclosure of 0.15 mm (6 mil) polyethylene, of suitable dimensions to enclose the work area, and scaffolds and ladders required to gain access. If a suspended ceiling is present, the enclosure shall extend to the ceiling line. The enclosure shall be as airtight as conditions permit, and will include the provision of a double overlapping flap at the entrance. The floor of the work area shall be a layer of 0.15 mm (6 mil) polyethylene sealed to the plastic walls of the enclosure.

5. Don protective clothing and respirator prior to removing ceiling tile or disturbing pipe jacketing or sprayed fireproofing.

5. **e t o**

1. To remove fireproofing or texture plaster, saturate with amended water solution, using a pump sprayer. Do not remove the asbestos material until the material is thoroughly wetted to the substrate. Do not use water where electrical hazard exists.

2. To remove pipe insulation, first wet any area of damage, then carefully cut jacket. Keep insulation surface wetted by mist of water with wetting agent. Remove insulation in large sections and place immediately in disposal bag. After large pieces have been removed, saturate debris on mechanical equipment and clean all exposed surfaces with abrasive pads, sponges, cloths, etc.

3. To repair pipe insulation, use drop sheet under area of work to aid clean-up of any dislodged material. Plastic enclosure is not required. Mist any exposed insulation to wet surface and apply lagging paint and canvas or PVC jacketing as required.

4. For removal of suspended ceiling tiles (where asbestos debris is present on top of tiles or equipment to be accessed), remove the first tile carefully and vacuum all surfaces. Vacuum the upper surface of each subsequent tile prior to removal. Store tiles in the work area.

5. Remove dust and loose friable material likely to be disturbed in the process of doing the work, with a HEPA vacuum or by damp wiping.

6. When asbestos material is removed, all pieces should be placed directly into 0.15 mm (6 mil) polyethylene bags as they are removed. Avoid dropping material to floor wherever possible. After bulk removal is complete, wet wash the exposed surface.

7. Frequently, and at regular intervals during the work, clean up dust and waste in the work area by wet mopping, placing in disposal bags, or by HEPA vacuuming.

8. After completion of removal, seal exposed ends of fireproofing, texture plaster, or mechanical insulation with heavy layer of encapsulating sealer. Apply sealer coat to surfaces from which asbestos material was removed.

9. At completion of work, decontaminate equipment, tools and materials used in the work area by wet cleaning or HEPA vacuum.

10. Dispose of drop sheets and enclosures by wetting the polyethylene, then folding into disposal bags. Do not reuse drop sheets or enclosures.

11. Before leaving work area, decontaminate shoes and protective clothing by using HEPA vacuum or damp wiping. When protective clothing is to be disposed of, it shall be decontaminated as above and placed in labelled disposal bags. Workers shall vacuum all exposed skin, suit and respirator, and proceed to nearest washroom to wash hands and face.

6. **te r port po**

1. Place waste into asbestos labelled disposal bag, seal with tape, clean the bag, and place into a second clean bag, also to be sealed with tape. Use a barrel, fibre drum, or cardboard or wooden box in place of the second bag when the asbestos waste material is likely to tear the inner bag. Seal the rigid outer container.

2. Place waste containers in storage area for holding asbestos waste. Containers shall be labelled and assigned exclusively for asbestos waste.

3. Prepare for waste disposal in compliance with provincial regulations. The Property Manager will arrange for disposal.

P 3 or Pro e re

Type 3 procedures are not included in the standard work procedures

due to the requirement for the development of specific procedures for the site and for the particular circumstances.

o e or Pro e re

1. **p e t**

All equipment must be on site before proceeding with the work. Note that these procedures are primarily based on the use of Safe-T-Strip polyvinyl chloride movable glove bags. (Only the Safe-T-Strip glove bag is permitted for use in Ontario.) If the single use polyethylene glove bags permitted in some other jurisdictions are used, it should be understood that they are for use at one location only, and cannot be moved or used elsewhere.

If single use polyethelene glove bag is used Section 5 - Execution, shall be replaced by manufacturer's recommended procedures.

1. *Glove Bag*

Prefabricated, 0.25 mm (10 mil) minimum thickness polyvinyl-chloride bag with integral 0.25 mm (10 mil) thick polyvinyl-chloride gloves and elasticized port. Bag shall be equipped with reversible double-pull double throw zipper on top. Bag must incorporate internal closure strip if it is to be removed from pipe for reuse elsewhere. Provide size and configuration appropriate for insulation to be removed. The bag must be disposed of once filled. Bag shall not be emptied and reused.

2. *Securing Straps*

Reusable nylon straps at least 25 mm (1") wide with metal buckle for sealing ends of bags around pipe and/or insulation.

3. *Water Sprayer*

Garden reservoir type, low velocity, capable of producing mist or fine spray with water-containing wetting agent. Wetting agent shall be diluted as per manufacturer's recommendations.

4. *Respirators*

Workers using glove bag must wear approved respiratory protection. Respirators and filters must be provided by the employer, and individually assigned to workers. Respiratory protection must be equal to, or exceed, protection of half-face respirator with high efficiency filters. Respirators must be NIOSH approved and acceptable to the Provincial Authorities having jurisdiction. Respirators shall be kept in position from the time the worker is attaching bag to pipe until final cleaning of the pipe and bagging of waste is

completed. Filters shall be changed after 24 hours of wear or sooner if breathing resistance increases.

5. *Protective Clothing*

   Workers shall wear disposable coveralls with attached elasticized hood. Coveralls and hood shall remain in place until worker completes cleaning of pipe. Suit may be cleaned for reuse or disposed of as asbestos waste.

6. *Other Equipment*

   - labelled asbestos waste bags 0.15 mm (6 mil) - for all asbestos waste in glove bag, disposable suit, cleaning materials, etc.;
   - asbestos warning signs;
   - wire saw - saw with flexible serrated wire blade and handles to allow use inside glove bag;
   - knife with fully retractable blade for use inside glove bag;
   - plastic sheet (4 mil polyethylene) to cover exposed or damaged section of pipe prior to attaching glove bag;
   - tape-to fasten plastic to pipe if required;
   - cleaning supplies e.g., scouring pads, sponges, brushes, buckets, etc.;
   - HEPA vacuum, for evacuating air from bag prior to removing bag from pipe. A HEPA filter is at least 99.97% efficient in collecting a 0.3 micrometre particle.

2. **t er Prote t e e re**

   1. Do not eat, drink or smoke in the work area.

   2. On completing clean-up of work area, use HEPA vacuum or wet cloth to clean hands, face, respirator and boots. Remove protective equipment and proceed to nearest washroom to wash all exposed skin on hands and face.

3. **e o or**

   1. Schedule work when occupants are absent. If persons are present, do not start work.

4. **Prep r t o**

   1. Where practical, clear area below pipe of moveable furnishings or equipment. Provide scaffold as required to reach pipe.

   2. Post an asbestos warning sign at all entrances to room in which the procedure is being used. If necessary use rope or tape barriers to separate work area.

3. Segregate the area of asbestos work, from other parts of the building required to remain in use by using polyethylene walls or barrier tape.

4. Shut off and seal all diffusers, vents and other openings to ventilation and exhaust systems in the room with polyethylene secured with tape.

5. Cover all items or equipment located in the designated work area with polyethylene when items or equipment cannot be cleaned in the case of a spill. Tape the polyethylene in place. The polyethylene should cover a width equal to the height of the pipe from the floor, with a minimum width of 3.6 m (12 feet), where required.

6. Seal all openings and voids in the vicinity of the glove bag operation with one layer of polyethylene secured with tape.

7. Check condition of pipe insulation where work will be performed. If the pipe insulation has minor isolated damage, mist surface and patch with tape. If damage is more extensive, wrap pipe with plastic and "candy stripe" it with duct tape first. If pipe insulation is severely damaged and cannot be simply repaired, glove bag is not appropriate. (Use Type 2 Procedures.)

8. Pre-clean with HEPA vacuum or wet methods any loose material on surface of pipe or any material on the floor. If significant amount of material is on floor, Type 2 procedures may be required for clean-up. (See Type 2 Procedures.)

9. Place necessary tools in bottom of glove bag.

5. **e t o**

1. Zip the bag onto the pipe and seal each end to the pipe with the securing straps. Do not pull the bag tightly to the ends - a small amount of slack allows better room to work within the bag. If a vertical bag is in use, ensure lower strap passes through plastic grommet and cloth tab on zipper.

2. Place hands into gloves and use necessary tools (wire saw, utility knife, wire cutters) to remove insulation from pipe. Arrange insulation in bottom of bag to obtain full capacity of bag. Roll metal jacketing carefully to minimize ripping or puncturing of the bag.

3. Insert nozzle of spray pump into bag through valve and wash pipe and interior of upper section of bag thoroughly. Use one hand to aid washing process. Wet surface of insulation in lower section of bag and any exposed ends of asbestos insulation remaining on pipe.

4. Prior to removing bag from the pipe, wash the top section of the bag and tools thoroughly. Insert nozzle of HEPA filtered

vacuum into bag through the elasticized valve and evacuate air from bag. Seal the closure strip, remove the vacuum nozzle and straps, and remove the bag. Re-install and seal in new location before reopening closure.

5. If bag is to be moved along the same pipe, loosen securing straps, move bag, re-seal to pipe using double-pull zipper to pass hangers. Repeat insulation removal operation.

6. If during use the glove bag is ripped, cut or opened in any way, cease work and repair opening before continuing work. All spilled material must be cleaned up and removed with a HEPA vacuum or wet cleaning.

7. To remove bag after completion of insulation removal, thoroughly wash top section of bag and tools and seal internal zip-lock closure. Place tools in one glove, pull hand out inverted, twist to create a separate pouch, tape inside-out glove at two separate locations 1" apart to seal pouch. Remove inside-out glove and tools by cutting between the tape seals.

8. Place glove pouch and tools into the next clean glove bag to be used. Alternately, place the tool pouch into water bucket, open pouch underwater and clean tools, then allow to dry.

9. Prior to disposal of bag, evacuate the bag with a HEPA vacuum. Pull a 0.15 mm (6 mil) polyethylene bag over glove bag before removing from pipe. Remove securing straps. Unfasten zipper. Seal glove bag and seal 0.15 mm (6 mil) polyethylene bag.

10. After removal of bag ensure pipe is clean of all residue. If necessary, after removal of each section of asbestos, vacuum all surfaces of pipe, using HEPA filtered vacuum equipment, or wipe with wet cloth.

11. Seal all surfaces of freshly-exposed pipe with encapsulating sealer to tack-down any residual dust. Cover exposed ends of any remaining asbestos insulation with lagging cloth or tape.

12. Before leaving work area, a worker shall decontaminate shoes and protective clothing by using HEPA vacuum or damp wiping. When protective clothing is to be disposed of, it shall be decontaminated as above and placed in labelled disposal bags. Workers shall vacuum all exposed skin, suit, respirator and hair (after removing hood) and proceed to nearest washroom to wash hands and face.

6. **te r port po**

1. Place waste containers in storage area for holding asbestos waste. Containers shall be labelled and assigned exclusively for asbestos waste.

2. Prepare waste for disposal in compliance with provincial regulations. The Property Manager will arrange for disposal.

e to or Pro e re

er e y e to or Pro e re

Emergency asbestos procedures shall be implemented when required in order to protect those undertaking the work, as well as to protect all others from, or limit exposure to, airborne asbestos. Procedures indicated shall be followed as closely as possible, in the event of an emergency situation.

Procedures for asbestos work, required as an immediate response to floods, pipe breaks, ceiling collapses, or other emergencies that affect asbestos materials, are as follows:

1. Clear area of all occupants.

2. Construct enclosure around area if time permits.

3. Shut down ventilation system serving area.

4. Worker performing repair shall wear protective respirator and disposable suit. If normal work clothes are worn they must be disposed of if visibly contaminated.

5. Use drop sheet under work, if possible, to minimize clean-up.

6. Perform emergency repair with minimum disturbance of asbestos.

7. Obtain asbestos equipment and perform clean-up of visible material. Use HEPA filtered vacuum or wet cleaning. Dispose of all cleaning supplies as contaminated waste.

8. The worker should wipe off or vacuum disposable clothing and footwear. Proceed to washroom to wash face and hands.

9. Notify the Property Manager regarding the asbestos disturbance, before allowing unprotected persons to enter the area. The Property Manager will contact the Regional Asbestos Coordinator to determine if additional precautionary measures are to be implemented. The Regional Asbestos Coordinator will arrange for removal, clean-up or repair of the asbestos material.

10. The Regional Asbestos Coordinator shall investigate the extent of asbestos disturbance, will determine additional actions to be undertaken and will determine if a hazard investigation under the *Canada Occupational Safety and Health Regulation* is appropriate.

p e o e t o Pro e re

1. Sample the material when the area is not in use. Only those persons needed for sampling should be present in the immediate area.

2. Spray the material with a light mist of water to prevent fibre release during sampling. Do not disturb the material any more than necessary.

3. Materials of different appearance should be sampled separately. Mechanical insulation must be sampled separately on all systems, tanks, vessels, etc. Sample both the straight sections of pre-formed insulation and the insulating cement typically present at elbows, fittings, etc. (unless visually identified as fibreglass).

4. Collect the sample by penetrating the entire depth of the material, as the insulation may have been applied in more than one layer or covered with paint or other protective coating.

5. The use of a respirator is recommended for all sampling. Depending on the condition of the material, significant amounts of airborne fibres can be generated during sampling.

6. If pieces of material break off during sampling, the contaminated area must be cleaned up with a HEPA vacuum cleaner or by wet cleaning. Any debris generated must be placed in plastic bags, labelled, sealed and disposed of as asbestos waste.

7. Place samples in labelled plastic bags with a zip-lock closure or in sealed plastic vials. Samples shall be identified with the following information:

    - Sample Number;
    - Building;
    - Room Number;
    - Date of Sampling;
    - Name of Sampler;
    - Source of sample, e.g., Cold Water Pipe, Cold Water Fitting, etc.

8. Temporarily seal any openings created to collect the sample, (for example, with tape, paint or metal foil tape wrapped completely around the pipe). Advise the Property Manager or Regional Asbestos Coordinator.

9. Analysis must be performed by the Health Canada Laboratory or by a laboratory accredited by the National Voluntary Laboratory Accreditation Program (NVLAP). Contact the Regional Asbestos Coordinator for a list of acceptable laboratories.

e p r tor tt pe t o e e t

ote or r P r y H ep e e e p r tor

This respirator does not supply oxygen. It must not be used in or for: oxygen deficient atmospheres (less than 19.5%); poorly ventilated areas or enclosed spaces such as tanks or small rooms;

abrasive blasting or firefighting; or for protection against contaminants excluded or not covered by the applicable Approval Label.

Respirators must be approved for protection against asbestos. Check for NIOSH certification.

1. **e p r tor tt**

Persons required to wear respirators must first pass a qualitative fit-test administered according to the current version of CSA standard Z-94.4. The fit-test should be repeated yearly.

2. **pe t o te Pr or to e**

1. Examine facepiece for:

- dirt;
- cracks, tears or holes;
- distortion and inflexibility;
- cracks or breaks in filter holders, worn threads and missing gaskets.

2. Examine head straps for:

- breaks or tears;
- loss of elasticity;
- broken or malfunctioning buckles and attachments.

3. Examine valves for:

- detergent residue, dust or other material on valves or valve seats;
- cracks, tears or distortion in the valve material;
- missing or defective valves or valve covers.

4. Examine filter for:

- proper filter for protection against asbestos (High Efficiency Particulate);
- incorrect installation, loose connections, missing or worn gaskets or cross threading;
- cracks or dents in filter housing.

5. Leak-checks:

Perform the following tests on each donning:

- *negative pressure test:* cover inlets to filters, breathe in and hold breath; respirator should be drawn to face for minimum of ten seconds (if not, check exhalation valve and fit);
- *positive pressure test:* cover exhalation valve cover and puff out slightly and hold breath; respirator should slightly pressurize and still hold seal (if not, check inhalation valves and fit).

3. **e p r tor e e t**

    1. Remove filters and disassemble facepiece. Discard or repair defective parts.

    2. Wash components in warm water (50°C - 60°C) with mild detergent, using a brush. Cleaning and disinfectant solutions are available from respirator manufacturers.

    3. Thoroughly rinse components in clean, warm water.

    4. Air dry or hand dry components with a clean, lint-free cloth.

    5. Reassemble respirator and test to ensure that all components are working properly (see above). Be careful to check that valves are not lost in the cleaning.

4. **ter rtr e H ep e e t**

    1. Filters can be reused until an increase in breathing resistance is noted. Under typical Type 2 conditions, filter cartridges should last a minimum of 24 hours. Inlet side of filter cartridge to be reused shall be sealed on the inlet side with tape for storage.

    2. When no longer usable, filter cartridges will be sealed on the inlet side with tape, and disposed of as contaminated waste.

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Important Notices