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Appendix A

Tetra Tech, March 2022, Hazardous Building Materials Assessment, 113B McDermot Avenue, Fort Chipewyan, Alberta

Part 1 General

1.1 WORK COVERED BY CONTRACT DOCUMENTS

- .1 Work of this Contract comprises hazardous materials abatement and demolition of 113B McDermont Avenue, Fort Chipewyan, Alberta, hereinafter referred to as the “subject building”
- .2 Background Information
 - .1 Supporting documentation pertaining to the site buildings are included as Appendix A. This includes a Hazardous Building Material Assessment (HBMA) that was carried out for the subject building in 2022.
- .3 The subject building has not been disconnected from utilities.

1.2 SITE HAZARDS

- .1 Site Hazards may include, but are not limited to the following:
 - .1 Hazardous building materials, including asbestos-containing materials (grey vinyl floor tile [VFT], and drywall joint compound [DWJC], lead in pipe solder, polychlorinated biphenyls in light ballast (PCBs), radioactive materials (one smoke detector), and elemental mercury (two fluorescent lightbulbs).
 - .2 Scattered debris during and after the building demolition.

1.3 DESCRIPTION OF WORK

- .1 Work of this Contract comprises the abatement and demolition of subject building including, but not limited to, the following:
 - .1 Mobilization and demobilization of all personnel, equipment, support facilities and materials required to complete the Work.
 - .2 Safely locating, draining, terminating, and capping all existing underground services that are connected to the subject building, as specified in Section 02 41 16 – Structure Demolition.
 - .3 Checking for potential hidden hazardous building materials unidentified in the subject building, prior to completing any demolition work.
 - .4 Checking for potential hidden hazardous building materials unidentified in the subject building, prior to completing any demolition work.
 - .5 Abatement of identified hazardous building materials on-site in the subject building, including but not limited to asbestos-containing material, lead, PCBs, radioactive materials, and elemental mercury by Alberta Asbestos Worker Certified personnel.
 - .6 Asbestos abatement activities will require up to moderate risk abatement (intermediate precautions) for the identified asbestos-containing material.
 - .7 Daily air monitoring throughout the abatement work, including obtaining final air clearance prior to taking down any abatement containments areas, to be

completed by a Certified third party (ie possesses Alberta Asbestos Worker Certification), as arranged by the Contractor.

- .8 Obtaining clearance that the subject building is clear of all hazardous building materials prior to proceeding with demolition work. PCA Project Authority to be provided with the abatement clearance documentation and provide approvals for demolition stage.
 - .9 Off-site transport and disposal of Hazardous Waste at the Contractor's Designated Hazardous Waste Disposal Facility.
 - .10 Dismantling and demolition of all components of the subject building; segregating hazardous and non-hazardous for recycling or disposal.
 - .11 Documentation and record keeping of non-hazardous waste and hazardous waste manifests, bills of lading, copies of Transportation of Dangerous Goods (TDG) documentation, final disposal location acceptance. The documents to be provided to the PCA project authority upon request.
- .2 The identified asbestos containing materials to be abated following all applicable federal and provincial asbestos abatement standards, include the following:
- .1 To be abated following the requirements of Section 02 82 00.02 - Asbestos Abatement Intermediate Precautions, or to a more stringent standard:
 - .1 Grey VFT, with an approximate quantity of 18.5 m², located in the main floor closets and one of the bedrooms.
 - .2 DWJC, with an approximate quantity of 365 m², located throughout the interior walls and some of the ceilings.
- .3 The other identified hazardous building materials include the following:
- .1 One (1) potentially PCB-containing light ballast.
 - .2 One (1) radioactive smoke detector.
 - .3 Two (2) fluorescent light bulbs containing mercury.
 - .4 Lead solder in piping

1.4 POTENTIAL ADDITIONAL WORK

- .1 Hazardous building materials may exist within the subject building that may not be uncovered until demolition begin. The Contractor shall inspect for the subject building for potential hidden hazardous building materials unidentified, prior to completing any demolition work.
- .2 Notify the Owner of suspect material discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material pending instructions from the Owner.

1.5 SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit Project construction progress schedule.
- .3 Alberta Occupational health and safety (OHS) Notification of Project.

1.6 WORK SEQUENCE AND SCHEDULE

- .1 Provide and maintain Work Schedule.

- .2 Required stages:
 - .1 Submittal of Plans and notifications.
 - .2 Abatement hazardous building materials in the subject building.
 - .3 Obtaining clearance that the subject building is clear of all hazardous building materials.
 - .4 Demolition of subject building.
 - .5 Site clearance and grading.
- .3 Work to occur at times governed by local bylaws and OHS, Provincial, and Federal requirements.

1.7 CONTRACTOR USE OF PREMISES

- .1 Contractor use of site is restricted to the terms and conditions of the issued permits, and all applicable guidelines and regulations.
- .2 Coordinate use of premises under direction of the Owner's Representative.
- .3 Do not unreasonably encumber sites with materials or equipment.
- .4 Use of the site will comply with the environmental requirements of Section 01 35 43 – Environmental Procedures.

1.8 EXISTING SERVICES

- .1 Before commencing work, coordinate with the PCA project authority, municipal authorities, utility companies for utility service locate, service disruptions, disconnection, or relocation.
- .2 Establish location and extent of service lines in area of work before starting Work, notify the Owner of findings.
- .3 Where work involves breaking into or connecting or disconnecting to from existing services, carry out work at times directed by governing authorities, with minimum of disturbance to users.
- .4 Where unknown services are encountered, immediately notify the Owner and confirm findings in writing.
- .5 Protect all existing services from damage. Repair services damaged by construction at no additional cost to the Owner.
- .6 Protect, relocate, or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.
- .7 Record locations of maintained, re-routed, and abandoned service lines and provide to the Owner.

1.9 DOCUMENTS REQUIRED

- .1 Maintain at job site, one copy of each document as follows:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Requests for Clarification and responses.
 - .4 Addenda.

- .5 Change Orders.
- .6 Contractor's proposal.
- .7 Reviewed Shop Drawings.
- .8 Other Modifications to Contract.
- .9 Field Test Reports.
- .10 Copy of Approved Work Schedule.
- .11 Copies of any test results.
- .12 Other Modifications to Contract.
- .13 Material and Safety Data Sheets.
- .14 Copies of manifests and bills of loading.
- .15 Demolition Plan.
- .16 Health and Safety Plan and Other Safety Related Documents.
- .17 OHS Notification of Project.
- .18 Worker training program and records.
- .19 HBMA report completed for the subject building (included in Appendix A).
- .20 Other documents as specified.

END OF SECTION

Part 2 General

2.1 RELATED REQUIREMENTS

- .1 Section 02 41 16 - Structure Deconstruction and Demolition.
- .2 Section 02 42 00 - Removal and Salvage of Construction Material.
- .3 Section 02 81 00 - Hazardous Materials.
- .4 Section 02 82 00.01 - Asbestos Abatement – Minimum Precautions.
- .5 Section 02 82 00.02 - Asbestos Abatement – Intermediate Precautions.
- .6 Section 02 84 00 - PCB Remediation

2.2 ACCESS AND EGRESS

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

2.3 USE OF SITE AND FACILITIES

- .1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Owner to facilitate work as stated.
- .2 Maintain existing services to building until the abatement is completed. Following completion of the abatement, the Contractor will disconnect existing services to the main

service lines to the requirements of the Utility Authority. Contractor is required to provide temporary site services as required for demolition works.

- .3 Where security is required by work provide temporary means to maintain security.
- .4 Closures: protect work temporarily until permanent enclosures are completed.

2.4 EXISTING SERVICES

- .1 Contractor required to provide temporary site services as required for demolition works.
- .2 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

2.5 SPECIAL REQUIREMENTS

- .1 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic, and security regulations.
- .2 Keep within limits of work and avenues of ingress and egress.
- .3 Deliver materials outside of peak traffic hours and unless otherwise approved by Owner.

2.6 BUILDING SMOKING ENVIRONMENT

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

END OF SECTION

Part 3 General

3.1 ADMINISTRATIVE

- .1 Schedule start-up and periodic project meetings throughout the progress of the work at the Request of the Owner.
- .2 Prepare agenda for meetings.
- .3 Distribute written notice of each meeting four days in advance of meeting date to the Owner.
- .4 Preside at meetings.
- .5 Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.
- .6 Reproduce and distribute copies of minutes within three days after meetings and transmit to meeting participants and affected parties not in attendance.
- .7 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

3.2 PRECONSTRUCTION MEETING

- .1 Within 15 days after award of Contract, arrange a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.

- .2 The Owner, Contractor, major Subcontractors, field inspectors and supervisors will be in attendance.
- .3 Establish time and location of meeting and notify parties concerned minimum five days before meeting.
- .4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.
- .5 Agenda to include:
 - .1 Appointment of official representative of participants in the Work.
 - .2 Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.
 - .3 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, and administrative requirements.
 - .4 Record drawings in accordance with Section 01 33 00 - Submittal Procedures.
 - .5 Monthly progress claims, administrative procedures, photographs, hold backs.
 - .6 Appointment of inspection and testing agencies or firms.
 - .7 Insurances, transcript of policies.

3.3 PROGRESS MEETINGS

- .1 During course of Work and, schedule progress meetings weekly.
- .2 Contractor, major Subcontractors involved in Work and the Owner are to be in attendance.
- .3 Notify parties minimum four days prior to meetings.
- .4 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within three days after meeting.
- .5 Agenda to include the following:
 - .1 Review, approval of minutes of previous meeting.
 - .2 Review of Work progress since previous meeting.
 - .3 Field observations, problems, conflicts.
 - .4 Problems which impede construction schedule.
 - .5 Corrective measures and procedures to regain projected schedule.
 - .6 Revision to construction schedule.
 - .7 Progress schedule, during succeeding work period.
 - .8 Review submittal schedules: expedite as required.
 - .9 Maintenance of quality standards.
 - .10 Review proposed changes for affect on construction schedule and on completion date.
 - .11 Health and safety.
 - .12 Other business.

END OF SECTION

Part 4 General

4.1 RELATED REQUIREMENTS

- .1 Section 01 33 00 - Submittal Procedures

4.2 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 in a format acceptable to the owner.
- .3 Baseline: Original approved plan (for project, work package, or activity), plus or minus the 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. Weekend work may be permitted subject to approval from the local municipality and PCA project authority.
- .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 the Owner to enable monitoring of project work in relation to established milestones.

4.3 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, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.

4.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit to the Owner within five working days of Award of Contract Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.

4.5 PROJECT MILESTONES

- .1 Project milestones form interim targets for Project Schedule.
 - .1 Health and Safety Plan submission.
 - .2 Hazardous material abatement.
 - .3 Utility capping, disconnection, de-energizing.
 - .4 Structure demolition.
 - .5 Miscellaneous site Works.
 - .6 Site cleanup.

4.6 MASTER PLAN

- .1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).
- .2 The Owner will review and return revised schedules within ten working days.
- .3 Revise impractical schedule and resubmit within five working days.
- .4 Accepted revised schedule will become Master Plan and be used as baseline for updates.

4.7 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 Permits, including those related to:
 - .1 Occupational health and safety (OHS).
 - .2 Health and Safety Plan submission.
 - .3 Mobilization.
 - .4 Site activities, including but not limited to:
 - .1 Hazardous material abatement.
 - .2 Utility capping, disconnection, de-energizing.
 - .3 Structure demolition.
 - .4 Miscellaneous site Works.
 - .5 Site cleanup.
 - .5 Interim Certificate of Completion.
 - .6 Demobilization.
 - .7 Closeout submittals.
 - .8 Final Certificate of Completion.

- .3 Update Project Schedule on a weekly basis reflecting activity changes and completions, as well as activities in progress.
- .4 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.

4.8 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.

END OF SECTION

Part 5 General

5.1 ADMINISTRATIVE

- .1 Submit to the Owner 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, samples and mock-ups 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 the Owner. 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 the Owner, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .7 Verify field that measurements and affected adjacent Work are co-ordinated.
- .8 Contractor's responsibility for errors and omissions in submission is not relieved by the Owner review of submittals.
- .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by the Owner review.
- .10 Keep one reviewed copy of each submission on site.

5.2 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 Shop Drawings requiring design by an Engineer must bear the seal of a Professional Engineer licenced to practice in Alberta.
- .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 14 days for the Owner to review of each submission.
- .5 Adjustments made on shop drawings by the Owner are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to the Owner prior to proceeding with Work.
- .6 Make changes in shop drawings as the Owner may require, consistent with Contract Documents. When resubmitting, the Owner in writing of revisions other than those requested.

5.3 SAMPLES

- .1 Provide daily air sample results to the Owner throughout the project.
- .2 Details on air sampling requirements are described in Section 02 82 00.02.

5.4 PHOTOGRAPHIC DOCUMENTATION

- .1 Take record photos of a general nature at regular intervals (daily) and all areas where hazardous materials have been removed as the Work progresses, including each major stage of the Work. These photographs to be kept on site for examination with the Record Drawings, turned over to the Owner at Interim Completion.
- .2 Submit electronic copies of colour digital photography in jpg format, standard resolution monthly with progress statements as directed by the Owner.
- .3 Each photo shall be tagged with project, date, and location descriptions.

5.5 CERTIFICATES AND TRANSCRIPTS

- .1 Immediately after award of Contract, submit Occupational health and safety (OHS) status.
- .2 Submit transcription of insurance immediately after award of Contract.
- .3 Submit qualifications and training certificates for all Contractor's personnel and associated additional documentation.

5.6 HEALTH AND SAFETY PLAN

- .1 Submit Health and Safety Plan and associated additional documentation as described in Section 01 35 29.13 - Health, Safety and Emergency Response Procedures for Contaminated Sites.

5.7

WASTE MANIFESTS TEMPORARY FACILITIES PLAN

- .1 Submit Manifests for all General Waste disposed of at a permitted and regulated Landfill. Submit Manifests for all Hazardous Materials disposed of at a permitted and regulated Landfill. No payments for these materials shall be recommended until these Manifests have been provided, reviewed and accepted by the Owner. Manifest to include quantity and types of materials, date of disposal, and location of disposal.

Table 1: Submittal List

Section	Submittal Name	Date Required
01 11 00	OHS Letter of Good Standing	Within five days of Notice to Proceed.
01 11 00	OHS Notice of Project	One week prior to start of site Work.
01 11 00	Project Construction Progress Schedule	Updated alongside progress meetings and requests for payment
01 31 19	Meeting Minutes	Within three days after project meetings
01 33 00	Photographic Documentation	On a monthly basis
01 33 00	Temporary Facilities Plan	One week prior to start of site Work.
01 35 13.43	Plan Detailing Management of Hazardous Wastes	One week prior to start of site Work. on-site
01 35 13.43	Site Layout	Within five days of Notice to Proceed and prior to mobilization to site
01 35 29.13	Health and Safety Plan	Within seven days of Notice to Proceed.
01 35 29.13	Proof of Training Certificates and Respirator Fit Testing	Within seven days of Notice to Proceed.
01 35 29.13	Contingency and Emergency Response Plans	Within seven days of Notice to Proceed.
01 74 19	Contingency and Emergency Response Plans	Within seven days of Notice to Proceed.
01 74 19	Draft Construction Waste Management Plan	One week prior to start of site Work.
01 77 00	Certificate of Interim Completion	Once site Work is completed.
01 78 00	Project Records Documents	Within seven days of completion of Work.
02 41 16	Demolition Plan	Within seven days of Notice to Proceed.
02 41 16	Proposed Noise Control and Dust Control Measures	Within seven days of Notice to Proceed.
02 81 00	Hazardous Materials Management Plan	Within seven days of Notice to Proceed.
02 81 00	Waste Manifests	On a monthly basis
02 81 00	WHMIS Safety Data Sheets	One week prior to start of site Work.
02 82 00 02	Air Sample Results	Within one day of sample collection.

END OF SECTION

Part 6 General

6.1 REFERENCE STANDARDS

- .1 Department of Justice Canada (Jus)
 - .1 SOR/2018-196 Prohibition of Asbestos and Products Containing Asbestos Regulations.
- .2 Canadian General Standards Board (CGSB)
 - .1 CGSB 51-GP-51M-81, Polyethylene Sheet for Use in Building Construction.
- .3 Transportation and Dangerous Goods Act (1999)
- .4 Canadian Council of Ministers of the Environment (CCME) Documentation

6.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit, prior to start of work, plan detailing management of hazardous wastes.
- .3 Submittals for Progress Meetings: make submittals at least 24 hours prior to scheduled progress meetings as follows:

- .1 Updated progress schedule detailing activities. Include review of progress with respect to previously established dates for starting and stopping various stages of Work, major problems and action taken, injury reports, equipment breakdown, and material removal.
 - .2 Copies of air sampling results.
 - .3 Copies of transport manifests, trip tickets, and disposal receipts for waste materials removed from work area.
 - .4 Weekly copies of site entry and work area logbooks with information on worker and visitor access.
 - .5 Weekly logs documenting filter changes on HEPA vacuums, and other engineering controls.
 - .6 Weekly results of collected air sampling data, including compliance air monitoring results.
 - .7 Other information required the Owner or relevant to agenda for upcoming progress meeting.
- .4 Site Layout: within seven days after date of Notice to Proceed and prior to mobilization to site, submit site layout drawings showing existing conditions and facilities, construction facilities and temporary controls provided by Contractor including following:
- .1 Equipment and personnel decontamination areas.
 - .2 Means of ingress, egress and temporary traffic control facilities. Refer to Section 01 56 00 - Temporary Barriers and Enclosures for traffic control.
 - .3 Equipment and material staging areas.
 - .4 Demolition debris stockpile areas and soil stockpile areas.
 - .5 Zones specified in Contractor's site-specific Health and Safety Plan.
 - .6 Grading, including contours, required to construct temporary facilities, if any.
- .5 Submit documentation verifying that hazardous materials employees have been trained, tested, and certified to safely and effectively carry out their assigned duties in accordance with Section 01 35 29.13 - Health, Safety, and Emergency Response Procedures For Contaminated Sites.

6.3 REGULATORY REQUIREMENTS

- .1 Comply with federal, provincial, and local anti-pollution laws, ordinances, codes, and regulations when disposing of waste materials, debris, and rubbish.
- .2 Work to meet or exceed minimum requirements established by federal, provincial, and local laws and regulations which are applicable.
 - .1 Contractor: responsible for complying with amendments as they become effective.
- .3 In event that compliance exceeds scope of work or conflicts with specific requirements of contract notify the Owner immediately.

6.4 SEQUENCING AND SCHEDULING

- .1 Do not commence Work involving contact with potentially contaminated materials until decontamination facilities are operational and approved by the Owner.

6.5 DRUM STAGING PAD

- .1 Provide, maintain, and operate drum staging pad as required.
- .2 Construct drum staging pad with sump capable of collecting leachate and rain runoff. Place polyethylene sheeting such that sheeting contours over top of berm, and leachate and runoff from staging pad is directed solely to sump on staging pad.

6.6 DRUMS

- .1 Storage of Liquid Waste: 200 L steel drums meeting Transportation and Dangerous Goods Act, closable lids, complete with labels for marking contents and date filled.
- .2 Storage of Solid Waste: 200 L steel drums meeting Transportation and Dangerous Goods Act, closable lids, complete with labels for marking contents and date filled.

6.7 VEHICULAR ACCESS AND PARKING

- .1 Coordinate access and parking with the Owner.

6.8 DUST AND PARTICULATE CONTROL

- .1 Execute Work by methods to minimize dust from construction operations.
- .2 Implement and maintain dust and particulate control measures as determined necessary by the Owner during construction and in accordance with applicable regulations.
- .3 Provide positive means to prevent airborne dust from dispersing into atmosphere. Use potable water for a water misting system for dust and particulate control.
- .4 Use chemical means for water misting system for dust and particulate control only with the Owner's prior written approval.
- .5 As minimum, use appropriate covers on trucks hauling fine or dusty material. Use watertight vehicles to haul wet materials.
- .6 Prevent dust from spreading to adjacent property sites.
- .7 The Owner will stop work at any time when Contractor's control of dusts and particulates is inadequate for wind conditions present at site, or when air quality monitoring indicates that release of fugitive dusts and particulates into atmosphere equals or exceeds specified levels.
- .8 If Contractor's dust and particulate control is not sufficient for controlling dusts and particulates into atmosphere, stop work. Contractor must discuss procedures that Contractor proposes to resolve problem. Make necessary changes to operations prior to resuming excavation, handling, processing, or other work that may cause release of dusts or particulates.

6.9 POLLUTION CONTROL

- .1 Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious toxic substances and pollutants produced by construction operations.
- .2 Be prepared to intercept, clean up, and dispose of spills or releases that may occur whether on land or water. Maintain materials and equipment required for cleanup of spills or releases readily accessible on site.

- .3 Promptly report spills and releases potentially causing damage to environment to:
 - .1 Authority having jurisdiction or interest in spill or release including conservation authority, water supply authorities, drainage authority, road authority, and fire department.
 - .2 Owner of pollutant, if known.
 - .3 Person having control over pollutant, if known.
 - .4 The Owner.
- .4 Contact manufacturer of pollutant if known and ascertain hazards involved, precautions required, and measures used in cleanup or mitigating action.
- .5 Take immediate action using available resources to contain and mitigate effects on environment and persons from spill or release.
- .6 Provide spill response materials including, containers, adsorbent, shovels, and personal protective equipment. Make spill response materials available at all times in which hazardous materials or wastes are being handled or transported. Spill response materials: compatible with type of material being handled.

6.10

WATER CONTROL

- .1 Maintain excavations free of water.
- .2 Protect site from puddling or running water. Grade site to drain. Provide water barriers as necessary to protect site from soil erosion.
- .3 Prevent surface water runoff from leaving work areas.
- .4 Do not discharge decontaminated water, or surface water runoff, or groundwater which may have come in contact with potentially contaminated material, off site or to municipal sewers.
- .5 Prevent precipitation from infiltrating or from directly running off stockpiled waste materials. Cover stockpiled waste materials with an impermeable liner during periods of work stoppage including at end of each working day and as directed by the Owner.
- .6 Direct surface waters that have not contacted potentially contaminated materials to existing surface drainage systems.
- .7 Control surface drainage including ensuring that gutters are kept open, water is not directed across or over pavements or sidewalks except through approved pipes or properly constructed troughs, and runoff from unstable areas is intercepted and diverted to suitable outlet.
- .8 Dispose of water in manner not injurious to public health or safety, to property, or to any part of Work completed or under construction.
- .9 Provide, operate, and maintain necessary equipment appropriately sized to keep excavations, staging pads, and other work areas free from water.
- .10 Contain water from stockpiled waste materials. Transfer potentially contaminated surface waters to wastewater storage tanks separate from wastewater from Personnel Hygiene/Decontamination Facility.
- .11 Have on hand sufficient pumping equipment, machinery, and tankage in good working condition for ordinary emergencies, including power outage, and competent workers for operation of pumping equipment.

- .12 Contain and collect wastewaters and transfer such collected wastewaters to Contractor - supplied drums.

6.11 PROGRESS CLEANING

- .1 Maintain cleanliness of Work and surrounding site to comply with federal, provincial, and local fire and safety laws, ordinances, codes, and regulations.
- .2 Co-ordinate cleaning operations with disposal operations to prevent accumulation of dust, dirt, debris, rubbish, and waste materials.

6.12 FINAL DECONTAMINATION

- .1 Perform final decontamination of construction facilities, equipment, and materials which may have come in contact with potentially contaminated materials prior to removal from site.
- .2 Perform decontamination as specified to satisfaction of the Owner. The Owner will direct Contractor to perform additional decontamination if required.

6.13 REMOVAL AND DISPOSAL

- .1 Remove surplus materials and temporary facilities from site.
- .2 Dispose of non-contaminated waste materials, litter, debris, and rubbish off site.
- .3 Do not burn or bury rubbish and waste materials on site.
- .4 Do not dispose of volatile or hazardous wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
- .5 Do not discharge wastes into streams or waterways.
- .6 Dispose of following materials at appropriate off-site facility identified by Contractor and approved by the Owner:
 - .1 Debris including excess construction material.
 - .2 Non-contaminated litter and rubbish.
 - .3 Disposable PPE worn during final cleaning.
 - .4 Wastewater removed from wastewater storage tank.
 - .5 Wastewater generated from final decontamination operations including wastewater storage tank cleaning.
 - .6 Lumber from decontamination pads.
- .7 Dispose of materials as directed by the Owner.
- .8 Minimize generation of hazardous waste to maximum extent practicable. Take necessary precautions to avoid mixing clean and contaminated wastes.
- .9 Identify and evaluate recycling and reclamation options as alternatives to land disposal.

6.14 RECORD KEEPING

- .1 Maintain adequate records to support information provided to the Owner regarding exception reports, annual reports, and biennial reports.
- .2 Maintain asbestos waste shipment records for minimum of three years from date of shipment or longer period required by applicable law or regulation.

- .3 Maintain bills of lading for minimum of 375 days from date of shipment or longer period required by applicable law or regulation.

END OF SECTION

Part 7 General

7.1 REFERENCE STANDARDS

- .1 Canada Labour Code, Canada Occupational Safety and Health Regulations, SOR/86-304 2017.

7.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit site-specific Health and Safety Plan, within seven days after date of Notice to Proceed and prior to mobilization to site. Address following items:
 - .3 Safety and health risk or hazard analysis for each site task and operation.
 - .4 Develop checklist for items to be inspected on a daily basis. Document actions taken.
 - .5 Personnel training requirements including:
 - .1 Names of personnel and alternates responsible for site safety and health, hazards present on site, and use of personal protective equipment.
 - .2 Work practices by which personnel can minimize risks from hazards, safe use of engineering controls and equipment on site, medical surveillance requirements, including recognition of symptoms and signs which might indicate overexposure to hazards, and elements of site-specific Health and Safety Plan.
 - .6 Personal protective equipment (PPE) program addressing:
 - .1 Donning and doffing procedures.
 - .2 PPE selection based upon site hazards.
 - .3 PPE use and limitations of equipment.
 - .4 Work mission duration, PPE maintenance and storage.
 - .5 PPE decontamination and disposal.
 - .6 PPE inspection procedures prior to, during, and after use.
 - .7 Evaluation of effectiveness of PPE program, and limitations during temperature extremes, and other appropriate medical considerations.
 - .8 Medical surveillance requirements for personnel assigned to work at site.
 - .9 Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used, including methods of maintenance and calibration of monitoring and sampling equipment.
 - .10 Site control measures employed at site including site map, site work zones, use of 'buddy system', site communications including site security, alerting means for emergencies, standard operating procedures or safe work practices, and identification of nearest medical assistance.
 - .11 Decontamination procedures for both personnel and equipment.

- .12 Emergency response requirements addressing: pre-emergency planning, personnel roles, lines of authority and communication, emergency recognition and prevention, safe distances and places of refuge, site security and control, evacuation routes and procedures, decontamination procedures not covered under decontamination section, emergency medical treatment and first aid, emergency alerting and response procedures, critique of response and follow-up, PPE and emergency equipment, site topography, layout, prevailing weather conditions, and procedures for reporting incidents to local, provincial, or federal agencies.
- .13 Written respiratory protection program for project activities.
- .14 Procedures dealing with heat and/or cold stress.
- .15 Confined space entry procedures.
- .16 Spill containment program if drummed waste material is generated, excavated, stored, or managed on site.
- .7 The Owner will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within five days after receipt of plan. Revise plan as appropriate and resubmit plan to the Owner within five days after receipt of comments from the Owner.
- .8 Medical Surveillance: submit certification of medical surveillance for site personnel, within seven days after date of Notice to Proceed and prior to mobilization to site. Submit additional certifications as personnel are sent to site.
- .9 Respirator Fit Testing: submit proof of respirator fit testing for site personnel, within seven days after date of Notice to Proceed and prior to mobilization to site.
- .10 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.
- .11 Off-site Contingency and Emergency Response Plan:
 - .1 Prior to commencing Work involving handling of hazardous materials, develop off-site Contingency and Emergency Response Plan.
 - .2 Plan must provide immediate response to serious site occurrence such as explosion, fire, or migration of significant quantities of toxic or hazardous material from site.

7.3 REGULATORY REQUIREMENTS

- .1 Comply with specified standards and regulations to ensure safe operations at site containing hazardous or toxic materials.

7.4 SITE CONDITIONS

- .1 Work at site will involve contact with:
 - .1 Asbestos-containing materials.
 - .2 Mercury-containing materials.
 - .3 PCBs.

7.5 GENERAL REQUIREMENTS

- .1 Develop written site-specific Health and Safety Plan prior to commencing site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .2 Ensure Health and Safety guidelines provide for safe and minimal risk working environment for site personnel and minimize impact of activities involving contact with hazardous materials or hazardous wastes on general public and surrounding environment.
- .3 Relief from or substitution for portion or provision of minimum Health and Safety Guidelines specified or reviewed site-specific Health and Safety Plan must submitted to the Owner in writing. The Owner will respond in writing, either accepting or requesting improvements.
- .4 Note that there is no hospital or fire department located in Sachs Harbour, this must be considered for the Health and Safety Plan.

7.6 RESPONSIBILITY

- .1 Be responsible for safety of persons and property on site and for protection of persons off 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, and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

7.7 HAZARD COMMUNICATION REQUIREMENTS

- .1 Comply with Workplace Hazardous Materials Information System (WHMIS) Regulation, R.R.O.
- .2 Comply with Information on Controlled Products Regulation, O.C.
- .3 Comply with Occupational Health and Safety Regulations, Part XXII Controlled Products - Workplace Hazardous Materials Information System.
- .4 Comply with WHMIS Regulations, O.I.C.
- .5 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations, Part X - Hazardous Substances.
- .6 Provide the Owner with WHMIS Safety Data Sheets (SDS) and documentation on any "hazardous" chemical that Contractor or Contractor Representatives plan to bring onto site.

7.8 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 Health and Safety Officer where required to stop or start Work when, at Health and Safety Officer's discretion, it is necessary or advisable for reasons of health or safety. The Owner may also stop Work for health and safety considerations.

7.9 UNFORESEEN HAZARDS

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

7.10 HEALTH AND SAFETY OFFICER

- .1 Employ and assign to Work competent and authorized representative as Health and Safety Adviser. Health and Safety Adviser shall:
 - .1 Have minimum two years' site-related working experience specific to activities associated with hazardous materials.
 - .2 Have basic working knowledge of specified occupational safety and health regulations.
 - .3 Be responsible for completing Health and Safety Training Session and ensuring that personnel not successfully completing the required training are not permitted to enter site to perform Work in Exclusion Zone or Contaminant Reduction Zone.
 - .4 Be responsible for implementing, enforcing daily and monitoring site-specific Health and Safety Plan.
 - .5 Be on site during execution of Work.

7.11 PERSONNEL HEALTH, SAFETY, AND HYGIENE

- .1 Medical Surveillance:
 - .1 Conduct medical surveillance of personnel as required by specified regulations.
- .2 Training: ensure personnel entering site are trained in accordance with specified personnel training requirements. Training session must be completed by Health and Safety Officer.
- .3 Levels of Protection: establish levels of protection for each Work area based on planned activity and location of activity.
- .4 Personal Protective Equipment:
 - .1 Furnish site personnel with appropriate PPE. Ensure that safety equipment and protective clothing is kept clean and maintained.
- .5 Develop protective equipment usage procedures and ensure that procedures are strictly followed by site personnel; include following procedures as minimum:
 - .1 Hard Hats with appropriate accessories – liners, ear protection, etc.
 - .2 Ensure prescription eyeglasses worn are safety glasses and do not permit contact lenses on site within work zones.
 - .3 Proper Hand Protection – Leather gloves, insulated gloves, chemical resistant gloves, etc.
 - .4 Ensure footwear is steel-toed safety shoes or boots and is covered by rubber overshoes when entering or working in potentially contaminated work areas.
 - .5 Dispose of or decontaminate PPE worn on site at end of each workday.
 - .6 Decontaminate reusable PPE before reissuing.
 - .7 Ensure site personnel have passed respirator fit test prior to entering potentially contaminated work areas.

- .8 Ensure facial hair does not interfere with proper respirator fit.
- .6 Respiratory Protection:
 - .1 Provide site personnel with extensive training in usage and limitations of, and qualitative fit testing for, air purifying and supplied-air respirators in accordance with specified regulations.
 - .2 Develop, implement, and maintain respirator program.
 - .3 Monitor, evaluate, and provide respiratory protection for site personnel.
 - .4 Ensure levels of protection as listed have been chosen consistent with site-specific potential airborne hazards associated with major contaminants identified on site.
 - .5 Immediately notify the Owner if level of respiratory protection required increases.
 - .6 Ensure appropriate respiratory protection during work activities. As minimum requirement, ensure that persons entering potentially contaminated work areas are supplied with and use appropriate respiratory protection.
 - .7 Assess ability for site personnel to wear respiratory protection.
 - .8 Ensure site personnel are able to pass respirator fit test prior to entering potentially contaminated work areas.
- .7 Heat Stress/Cold Stress: implement cold stress and heat stress monitoring program as applicable and include in site-specific Health and Safety Plan.
- .8 Personnel Hygiene and Personnel Decontamination Procedures. Provide minimum as follows:
 - .1 Suitable containers for storage and disposal of used disposable PPE.
 - .2 Potable water and suitable sanitation facility.
- .9 Emergency and First-Aid Equipment:
 - .1 Locate and maintain emergency and first-aid equipment in appropriate location on site including first-aid kit/equipment to accommodate number of site personnel; portable emergency eye wash; two 9 kg ABC type dry chemical fire extinguishers.
 - .2 Two self-contained breathing apparatus units; blankets and towels; stretcher; and one hand-held emergency siren.
 - .3 Provide the appropriate number of certified staff, as required by the project, to ensure proper medical aid is available on site at all times when work activities are in progress.
- .10 Site Communications:
 - .1 Post emergency numbers near site telephones.
 - .2 Ensure personnel use of "buddy" system and develop hand signal system appropriate for site activities.
 - .3 Provide employee alarm system to notify employees of site emergency situations or to stop Work activities if necessary.
 - .4 Furnish selected personnel with two-way radios.
 - .5 Safety Meetings: conduct mandatory daily safety meetings for personnel, and additionally as required by special or work-related conditions; include refresher

training for existing equipment and protocols, review ongoing safety issues and protocols, and examine new site conditions as encountered. Hold additional safety meetings on as-needed basis.

- .11 Custodian: employ and assign to Work Custodian to report directly to Health and Safety Officer and who is responsible for keeping safety equipment and facilities clean, properly equipped, and maintained. Custodian may perform other duties for Contractor but Custodian's first priority is maintenance of protective equipment and personnel decontamination area.

7.12 AIR MONITORING

- .1 Air Monitoring Program:
 - .1 Develop air monitoring program meeting specified requirements.
 - .2 During progress of work activities, monitor air quality in and around work zones. Conduct monitoring on regular periodic basis, and additionally as required by special or work-related conditions. Report departures from general background to the Owner who will, in conjunction with Health and Safety Officer, determine when operations should be shut down and restarted.
 - .3 Operate air monitoring equipment with personnel trained in equipment provided and under control of Health and Safety Officer.
 - .4 Conduct air monitoring on routine basis around active work locations.
- .2 Air Monitoring Reporting: report air monitoring results daily to the Owner on separate form.

7.13 CONTINGENCY AND EMERGENCY RESPONSE

- .1 Arrange and attend co-ordination meeting held with appropriate authorities; meeting will identify off-site Emergency Response Co-ordinator through whom information and co-ordination will occur in event of incident.
- .2 Promptly report spills and releases potentially causing damage to environment to:
 - .1 Authority having jurisdiction or interest in spill or release including conservation authority, water supply authorities, drainage authority, road authority, and fire department.
 - .2 Owner of pollutant, if known.
 - .3 Person having control over pollutant, if known.
 - .4 The Owner.
 - .5 The 24-Hour Spill Report Line: 867 920 8130
- .3 Provide spill response handling materials and equipment including, containers, adsorbents, shovels, and personal protective equipment. Make spill response materials available at all times in which hazardous materials or wastes are being handled or transported. Spill response materials: compatible with type of material being handled.
- .4 Provide all fire prevention, fire protection and fire fighting services at the Project site. Implement a fire safety program that includes fire prevention, fire protection and fire fighting requirements. Submit details of the fire safety program in writing to the Owner for review. Such review does not relieve Contractor from any obligations or responsibilities required by the Contract.

- .5 Fire safety program to include procedures, safety protocols, procedures for hot work permitting, emergency response procedures, and other relevant details related to burning of non-hazardous wood debris.
- .6 Respirator Fit Testing: submit proof of respirator fit testing for site personnel, within seven days after date of Notice to Proceed and prior to mobilization to site.

7.14 SITE CONTROL

- .1 Before work involving handling of drums and other containers begins, submit procedures for safe handling of drums and other containers. Implement and enforce drum handling program during activities involving drummed waste characterization including but not limited to handling, opening, sampling, staging, and consolidating.
- .2 Confined Space Entry Program: meet requirements of:
 - .1 Occupational Health and Safety Act, Regulations for construction projects, O. Reg., Part II - General Construction.
 - .2 Occupational Health and Safety Act, Health Care and Residential Facilities Regulation, O. Reg., Confined Spaces.
 - .3 Occupational Health and Safety Act, Industrial and Commercial Establishments Regulation, R.R.Q., Division IX - Maintenance and Repair Works and Hazardous Works, 9.3 Work in a closed space.
 - .4 Occupational Health and Safety Act, Safety Code For The Construction Industry, R.R.Q., Division III - Construction Sites, 3.21. Work in confined space.
 - .5 Occupational Health and Safety Act, Occupational Health and Safety Regulations, Confined Space Entry.
 - .6 Occupational Health and Safety Act, General Safety Regulations, O.I.C.
 - .7 Canada Labour Code, Canada Occupational Safety and Health Regulations, Part XI - Confined Spaces.

END OF SECTION

Part 8 General

8.1 DEFINITIONS

- .1 Environmental Pollution and Damage: Presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humans; or degrade environment aesthetically, culturally and/or historically.
- .2 Environmental Protection: Prevention/control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

8.2 REGULATORY OVERVIEW

- .1 Comply with all applicable environmental laws, regulations, and requirements of Federal, Provincial and other regional authorities, and acquire and comply with such permits, approvals and authorizations as may be required.

8.3 SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit all required Contractor submittals to satisfy environmental requirements directly to the Owner.
- .3 Submit one (1) complete copy of all submittals and agency approvals to the Owner.

8.4 SITE MAINTANCE

- .1 Keep the site free from the accumulation of waste materials and debris.
- .2 Upon completion of the Work, clean away and dispose of all surplus material, supplies, rubbish and temporary works leaving the site neat and tidy to the requirements of the Owner.

8.5 FIRES

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

8.6 DISPOSAL OF WASTES

- .1 Do not bury rubbish and waste materials on site.
- .2 Do not dispose of waste or volatile materials, such as mineral spirits, oil, or paint thinner into waterways.

8.7 FUEL STORAGE

- .1 Comply with CEPA Petroleum Products Regulations, Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations (2008), CCME Codes of Practice and any regulations obtained from Provincial and other regional authorities, for setting up and operating temporary fuel tanks. Provide the Owner with copies of permits prior to the start of construction in accordance to Section 01 33 00 - Submittal Procedures.

8.8 WATER MANAGEMENT

- .1 Provide potable water for drinking.
- .2 Provide potable water for abatement decontamination procedures. Contractor to arrange bulk supply other source.

8.9 WASTEWATER MANAGEMENT

- .1 Provide details for sewage and disposal system, if required after Contract Award.

8.10 DRAINAGE

- .1 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.

- .2 Do not pump water containing suspended materials into waterways or drainage systems.
- .3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

8.11 SITE CLEARING AND PLANT PROTECTION

- .1 Protect plants on site and adjacent properties in accordance with the Canadian Landscape Standard -First Edition, Section 03 - Site Preparation and Protection of Existing Site Elements.
- .2 Minimize stripping of topsoil and vegetation.

8.12 POLLUTION CONTROL

- .1 Maintain temporary erosion and pollution control features installed under this contract.
- .2 Control emissions from equipment to local authority's emission requirements.
- .3 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area.
- .4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

8.13 NOTIFICATION

- .1 The Owner will notify Contractor in writing of observed noncompliance with Federal, Provincial environmental laws and regulations or Municipal environmental bylaws, permits, etc.
- .2 Contractor after receipt of such notice, shall inform the Owner of proposed corrective action and take such action to obtain the approval of the Owner.
 - .1 Take action only after receipt of written approval by the Owner.
- .3 The Owner will issue stop order of work until satisfactory corrective action has been taken.
- .4 No time extensions granted, or equitable adjustments allowed to Contractor for such suspensions.

Part 9 Execution

9.1 CLEANING

- .1 Keep site clean as clean as possible and control debris continuously.
- .2 Leave Work area clean at end of each day.
- .3 Burying rubbish and waste materials on site is not permitted unless approved in writing by the Owner.
- .4 Ensure public waterways, storm and sanitary sewers remain free of waste and volatile materials disposal.
- .5 Proceed with final cleaning upon completion and removal of surplus materials, rubbish, tools and equipment.

END OF SECTION

Part 10 General

10.1 SUMMARY

- .1 This Section references to laws, by laws, ordinances, rules, regulations, codes, orders of Authority Having Jurisdiction, and other legally enforceable requirements applicable to Work and that are; or become, in force during performance of Work.

10.2 REFERENCES TO REGULATORY REQUIREMENTS

- .1 Complete Work in accordance with all approvals, permits and licenses acquired for this Project. If there is a conflict or discrepancy, the more stringent requirements apply.
- .2 Meet or exceed requirements of:
 - .1 Contract documents.
 - .2 Specified standards, codes and referenced documents.
 - .3 Authorities Having Jurisdiction.
- .3 Complete Work in accordance with the Specifications and meet or exceed all codes, standards, and regulations applicable to the Work and issued under the authority of the Government of Canada and the Alberta Government. Advise the Owner of any discrepancies in the codes, standards, and regulations applicable to the Work.
- .4 Meet or exceed the most current issue of governing codes, standards and guidelines, and regulations applicable to Work and issued under the authority of the Government of Canada including, but not limited to the following:
 - .1 Canada Labour Code Part II-Occupational Health and Safety (R.S. 1985, c.L-2).
 - .2 Canada Labour Code, COHSR Part X, Hazardous Substances (SOR/86-304, 2017-06-20);
 - .3 Canada Occupational Health and Safety Regulations (SOR/86-304).
 - .4 Canadian Environmental Protection Act, PCB Regulations (SOR/2008-273).
 - .5 Controlled Products Regulations (SOR/88-66) a.SOR/2001-254.
 - .6 Public Services and Procurement Canada Asbestos Management Standard (June 2017)
 - .7 Export and Import of Import of Hazardous Waste and Hazardous Recyclable Material Regulations (EIHWHRMR) (SOR/2005-149).
 - .8 Inter-Provincial Movement of Hazardous Waste Regulations (SOR/2002-301).
 - .9 National Fire Code of Canada, 2015.
 - .10 National Building Code of Canada, 2015.
 - .11 Ozone Depleting Substances Regulations, 1998 (SOR/99-7).
 - .12 Halocarbon Regulations, 2003 (SOR/2003-289, SOR/2009-221).
 - .13 Transportation of Dangerous Goods Act, 1992 (S.C. 1992, c.34) a.1999, c.31.
 - .14 Transportation of Dangerous Goods Regulations (SOR/2001-286) a.SOR/2011-60.
 - .15 Storage Tank System for Petroleum Products & Allied Petroleum Products Regulations (SOR / 2008-197).

- .16 Migratory Birds Convention Act.
 - .17 Risk Management Guidance Document (INAC, 2006).
 - .18 Treasury Board Policy on Management of Real Property (TB, 2007).
 - .19 Risk Management Tool & Reporting Tool User Guide (INAC, 2007).
 - .20 Environment, Health & Safety Management System Manual (INAC, 2008).
 - .21 Environment, Health & Safety Standard Operating Procedures Manual (INAC, 2008).
 - .22 Environment, Health & Safety Audit Program Guide (INAC, 2008).
 - .23 Construction Project Safety Management Guide, 5th Edition (Public Works and Government Services Canada; PWGSC, 2008).
 - .24 National Joint Council Occupational Health and Safety Directive (NJC OHS), Part XI – Hazardous Substances, 11.6 Asbestos Management
- .5 Meet or exceed the governing codes, standards and guidelines, and regulations applicable to Work and issued under the authority of the Alberta Government.

10.3 HAZARDOUS MATERIAL DISCOVERY

- .1 Asbestos: demolition of spray or trowel-applied asbestos is hazardous to health. Stop work immediately when material resembling spray or trowel-applied asbestos is encountered during demolition work. Notify the Owner. Refer to Section 02 82 00.02 - Asbestos Abatement - Intermediate Precautions
- .2 Stop Work immediately and notify the Owner upon discovery of following materials during course of Work:
 - .1 Designated substances such as polychlorinated biphenyls (PCBs), asbestos, and mercury.
 - .2 Unknown and/or potentially hazardous substances.
- .3 Work at site will involve contact with:
 - .1 Asbestos-containing materials.
 - .2 Mercury-containing materials.
 - .3 PCBs.

10.4 WHMIS

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of material safety data sheets acceptable to Labour Canada and Health and Welfare Canada.

10.5 BUILDING SMOKING ENVIRONMENT

Comply with smoking restrictions.

10.6 SUBMITTALS

- .1 All submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit copies of Safety Data Sheet (SDS) to Departmental Representative upon delivery of materials to site.

10.7 QUALITY ASSURANCE

- .1 Regulatory Requirements: Except as otherwise specified, Contractor shall apply for, obtain, and pay fees associated with, permits, licenses, certificates, and approvals required by regulatory requirements and Contract Documents, based on the General Conditions of Contract and the following:
 - .1 Regulatory requirements and fees in force on date of Bid submission, and
 - .2 A change in regulatory requirements or fees scheduled to become effective after date of tender submission and of which public notice has been given before date of tender submission

END OF SECTION

Part 11 General

11.1 INSPECTION

- .1 Allow the Owner 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 Owner 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 The Owner will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction.

11.2 INDEPENDENT INSPECTION AGENCIES

- .1 Independent Inspection/Testing Agencies will be engaged by the Owner for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by the Owner.
- .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 the Owner at no cost to the Owner. Pay costs for retesting and reinspection.

11.3 ACCESS TO WORK

- .1 Allow inspection/testing agencies access to Work.
- .2 Co-operate to provide reasonable facilities for such access.

11.4 PROCEDURES

- .1 Notify appropriate agencies and the Owner in advance of requirement for tests, in order that attendance arrangements can be made.

11.5 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 the Owner 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 the Owner it is not practical to correct defective Work or Work not performed in accordance with Contract Documents, the Owner will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by the Owner.

11.6 REPORTS

- .1 Submit four copies of inspection and test reports to the Owner.

END OF SECTION

Part 12 General

12.1 ACTION AND INFORMATIONAL SUBMITTALS

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

12.2 INSTALLATION AND REMOVAL

- .1 Provide temporary utilities controls in order to execute work expeditiously.
- .2 Remove from site all such work after use.

12.3 DEWATERING

- .1 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.

12.4 WATER SUPPLY

- .1 Contractor arrange for water supply and pay costs for installation, maintenance and removal.

12.5 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 flameless (vent free) type. Solid fuel heaters (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 Provide adequate ventilation to meet health regulations for safe working environment.
- .4 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.

12.6 TEMPORARY POWER AND LIGHT

- .1 Pay for temporary power for temporary lighting and operating of power tools throughout project.
- .2 Arrange for connection with appropriate utility company. Pay costs for installation, maintenance and removal.
- .3 Provide and maintain temporary lighting throughout project.

12.7 TEMPORARY COMMUNICATION FACILITIES

- .1 Provide and pay for temporary telephone, fax, and data hook up lines and equipment necessary for own use.

12.8 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.

12.9 SIGNS AND NOTICES

- .1 Signs and notices for safety and instruction to be in both official languages.
- .2 Maintain approved signs and notices in good condition for duration of Project, and dispose of off-site on completion of Project, or earlier if directed by the Owner.

12.10 CONTRACTOR'S SITE OFFICE

- .1 Provide office (trailer or secure space) of sufficient size to accommodate site meetings and Contractor's operations.
- .2 Provide a clearly marked and fully stocked first-aid facility in a readily available location.

12.11 EQUIPMENT, TOOLS, AND STORAGE

- .1 All construction personnel must remain accountable for their tools and equipment at all times. At no time should tools and equipment be left unattended when within reach of the travelling public.

- .2 Provide and maintain, in a clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
- .3 Locate materials not required to be stored in weatherproof sheds on-site in a safe and secure manner

END OF SECTION

Part 13 General

13.1 REFERENCE STANDARDS

- .1 CSA Group (CSA)
 - .1 CAN/CSA-S269.2 -16, Access Scaffolding for Construction Purposes.
 - .2 CAN/CSA-Z321-96 (R2006), Signs and Symbols for the Occupational Environment.

13.2 ACTION AND INFORMATIONAL SUBMITTALS

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

13.3 INSTALLATION AND REMOVAL

- .1 Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.
- .2 Indicate use of supplemental or other staging area.
- .3 Provide construction facilities in order to execute work expeditiously.
- .4 Remove from site all such work after use.

13.4 SCAFFOLDING

- .1 Scaffolding in accordance with CAN/CSA-S269.2.
- .2 Provide and maintain ladders, swing staging, temporary stairs, scaffolding, ramps, and platforms, as necessary.

13.5 HOISTING

- .1 Provide, operate and maintain hoists required for moving materials and equipment. Make arrangements with Subcontractors for their use of hoists.
- .2 Hoists to be operated by qualified operator.

13.6 SITE STORAGE/LOADING

- .1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.
- .2 Do not load or permit to load any part of Work with weight or force that will endanger Work.

13.7 CONSTRUCTION PARKING

- .1 Parking will be permitted on site provided it does not disrupt performance of Work or normal operation of the facility.
- .2 Provide and maintain adequate access to project site.
- .3 Clean roadways where used by Contractor's equipment.

13.8 SECURITY

- .1 Provide and pay for responsible security personnel to guard site and contents after working hours and during holidays.

13.9 OFFICES

- .1 Provide office heated to 22 degrees C, lighted and ventilated, of sufficient size to accommodate site meetings and furnished with drawing laydown table.
- .2 Provide marked and fully stocked first-aid kit in a readily accessible location.
- .3 Subcontractors to provide their own office(s) as necessary. Coordinate location of these offices.

13.10 EQUIPMENT, TOOL AND MATERIALS STORAGE

- .1 Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
- .2 Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities.

13.11 SANITARY FACILITIES

- .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
- .2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

13.12 CONSTRUCTION SIGNAGE

- .1 Provide and erect project sign, within one week of signing Contract, in a location designated by the Owner.
- .2 No other signs or advertisements, other than warning signs, are permitted on site.
- .3 Signs and notices for safety and instruction in official languages Graphic symbols to CAN/CSA-Z321.
- .4 Maintain approved signs and notices in good condition for duration of project and dispose of off site on completion of project or earlier if directed by the Owner.

13.13 PROTECTION AND MAINTENANCE OF TRAFFIC

- .1 Provide access as necessary to maintain traffic.
- .2 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by the Owner.

- .3 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs as needed.
- .4 Protect public from damage to person and property.
- .5 Contractor's traffic on roads selected for hauling material to and from site to not to interfere with public traffic.
- .6 Verify adequacy of existing roads and allowable load limits. Contractor: responsible for repair of damage to roads caused by construction.
- .7 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.
- .8 Dust control: adequate to ensure safe operation at all times.
- .9 Provide snow removal during period of Work.

13.14 CLEAN-UP

- .1 Keep site clean as clean as possible and control debris continuously.
- .2 Remove construction debris, waste materials, packaging material from work site.
- .3 Clean dirt or mud tracked onto paved or surfaced roadways.
- .4 Segregate and store materials resulting from demolition activities that are salvageable.

Part 14 Execution

14.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

END OF SECTION

Part 15 General

15.1 MOBILIZATION AND DEMOBILIZATION

- .1 Provide all labour, transportation, equipment and materials, and performance of all Work necessary for mobilization to, and demobilization from site.
- .2 Mobilization to include transportation to site of Contractor's labour, equipment, materials, and assembling, erecting, and preparing site and office(s) in readiness to start Work, in accordance with Contractor's Schedule.

- .3 Demobilization to include dismantling and removal from site, of all Contractor's equipment, waste resulting from clean-up of site and transportation of personnel from site.

END OF SECTION

Part 16 General

16.1 REFERENCE STANDARDS

- .1 CSA Group (CSA)
 - .1 CSA-O121-17 Douglas Fir Plywood (DFP).
 - .2 CSA O151-17. Canadian Softwood Plywood (CSP)

16.2 INSTALLATION AND REMOVAL

- .1 Provide temporary controls in order to execute Work expeditiously.
- .2 Remove from site all such work after use.

16.3 HOARDING

- .1 Erect temporary site enclosures using construction grade lumber framing to CSA O121.
- .2 Erect temporary site enclosure using new 1.2 m high snow fence wired to rolled steel "T" bar fence posts spaced at 2.4 m on centre. Provide at least one lockable truck gate. Maintain fence in good repair.

16.4 GUARD RAILS AND BARRICADES

- .1 Provide as indicated and as required by the Owner and governing authorities.

16.5 ACCESS TO SITE

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

16.6 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 public.

16.7 FIRE ROUTES

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

16.8 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.

END OF SECTION

Part 17 General

17.1 PROJECT CLEANLINESS

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, including that caused by Owner or other Contractors.
- .2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by the Owner. Do not burn or bury waste materials on site.
- .3 Clear snow and ice from access to building, as needed.
- .4 Arrange and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 Provide on-site containers for collection of waste materials and debris.
- .6 Provide and use marked separate bins for recycling, as needed.
- .7 Dispose of waste materials and debris off site.
- .8 Store volatile waste in covered metal containers and remove from premises at end of each working day.
- .9 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
- .10 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

17.2 FINAL CLEANING

- .1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 Remove waste products and debris other than that caused by others and leave Work clean and suitable for occupancy.
- .3 Prior to final review remove surplus products, tools, construction machinery and equipment.
- .4 Remove waste products and debris including that caused by Owner or other Contractors.
- .5 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by the Owner. Do not burn waste materials on site.
- .6 Arrange with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .7 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
- .8 Clear snow and ice from access to building, as needed.

END OF SECTION

Part 18 General

18.1 SUMMARY

- .1 This Section includes requirements for management of construction waste and disposal, which forms the Contractor's commitment to reduce and divert waste materials from landfill and includes the following:
 - .1 Preparation of a Draft Construction Waste Management Plan that will be used to track the success of the Construction Waste Management Plan against actual waste diversion from landfill.
 - .2 Preparation of a Construction Waste Management Plan that provides guidance on a logical progression of tasks and procedures to be followed in a pollution prevention program to reduce or eliminate the generation of waste, the loss of natural resources, and process emissions through source reduction, reuse, recycling, and reclamation.
 - .3 Preparation of monthly progress reports indicating cumulative totals representing progress towards achieving diversion and reduction goals of waste materials away from landfill and identifying any special programs, landfill options or alternatives to landfill used during construction.
 - .4 Preparation of a Construction Waste Management Report containing detailed information indicating total waste produced by the project, types of waste material and quantity of each material, and total waste diverted and diversion rates indicated as a percentage of the total waste produced.

18.2 DEFINITIONS

- .1 Clean Waste: Untreated and unpainted; not contaminated with oils, solvents, sealants or similar materials.
- .2 Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, repair, and demolition.
- .3 Hazardous: Exhibiting the characteristics of hazardous substances including properties such as ignitability, corrosiveness, toxicity or reactivity.
- .4 Non hazardous: Exhibiting none of the characteristics of hazardous substances, including properties such as ignitability, corrosiveness, toxicity, or reactivity.
- .5 Non toxic: Not poisonous to humans either immediately or after a long period of exposure.
- .6 Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.
- .7 Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.
- .8 Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form; recycling does not include burning, incinerating, or thermally destroying waste.
- .9 Return: To give back reusable items or unused products to vendors for credit.
- .10 Reuse: To reuse a construction waste material in some manner on the project site.

- .11 Salvage: To remove a waste material from the project site to another site for resale or reuse by others.
- .12 Sediment: Soil and other debris that has been eroded and transported by storm or well production run off water.
- .13 Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.
- .14 Toxic: Poisonous to humans either immediately or after a long period of exposure.
- .15 Trash: Any product or material unable to be reused, returned, recycled, or salvaged.
- .16 Volatile Organic Compounds (VOC's): Chemical compounds common in and emitted by many building products over time through outgassing:
 - .1 Solvents in paints and other coatings;
 - .2 Wood preservatives; strippers and household cleaners;
 - .3 Adhesives in particleboard, fiberboard, and some plywood; and foam insulation.
 - .4 When released, VOC's can contribute to the formation of smog and can cause respiratory tract problems, headaches, eye irritations, nausea, damage to the liver, kidneys, and central nervous system, and possibly cancer.
- .17 Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.
- .18 Construction Waste Management Plan: A project related plan for the collection, transportation, and disposal of the waste generated at the construction site; the purpose of the plan is to ultimately reduce the amount of material being landfilled.

18.3 ADMINISTRATIVE AND DOCUMENT REQUIREMENTS

- .1 Coordination: Coordinate waste management requirements with all Divisions of the Work for the project, and ensure that requirements of the Construction Waste Management Plan are followed.
- .2 Maintain at job site, one copy of the latest version of the following documents:
 - .1 Waste Reduction and Recovery Act.
 - .2 Beverage Container Regulations.
 - .3 Electronic Recycling Regulations.
 - .4 Guidelines for Hazardous Waste Management.
 - .5 All other applicable Provincial and local codes and regulations.
 - .6 Construction Waste Management Plan and waste disposal waybills and other applicable bills of lading.

18.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide required information in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Provide the following submittals before starting any work of this Section:
 - .1 Draft Construction Waste Management Plan: Submit to the Owner a preliminary analysis of anticipated site generated waste by listing a minimum of five (5) construction or demolition waste streams that have potential to generate the most

volume of material indicating methods that will be used to divert construction waste from landfill and source reduction strategies.

- .3 Submit monthly progress reports indicating cumulative totals representing progress towards achieving diversion and reduction goals.
- .4 Submit a Construction Waste Management Report containing detailed information indicating total waste produced by the project, types of waste material and quantity of each material, and total waste diverted and diversion rates indicated as a percentage of the total waste produced.
- .5 Contractor shall provide adequate documentation to verify the quantity, type and destination of materials being removed from the site, using the attached Construction Waste Management Forms, or similar.

18.5 QUALITY ASSURANCE

- .1 Provide proof of the following during the progress of the Work:
 - .1 Compliance Certification: Provide proof that recycling center is third party verified and is listed as a Certified Facility through the registration and certification requirements of the Recycling Certification Institute.

18.6 WASTE PROCESSING AND DISPOSAL

- .1 Process all deconstruction debris at an approved facility off site that meets Provincial and Municipal legislation.
- .2 Dispose of construction debris (unable to be reduced, reused, or recycled) in separated waste streams as outlined by the local waste management program.
- .3 Burying of rubbish and waste materials on site is prohibited.
- .4 Disposal of waste, volatile materials, mineral spirits, oil, paint thinner, into waterways, storm, or sanitary sewers is prohibited.

18.7 DELIVERY, STORAGE AND HANDLING

- .1 Storage Requirements: Implement a recycling/reuse program that includes separate collection of waste materials as appropriate to the project waste and the available recycling and reuse programs in the project area.
- .2 Handling Requirements: Clean materials that are contaminated before placing in collection containers and ensure that waste destined for landfill does not get mixed in with recycled materials:
 - .1 Deliver materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to recycling process.
 - .2 Arrange for collection by or delivery to the appropriate recycling or reuse facility.
- .3 Hazardous Waste and Hazardous Materials: Handle in accordance with applicable regulations.

Part 19 Execution

19.1 CONSTRUCTION WASTE MANAGEMENT PLAN IMPLEMENTATION

- .1 Manager: Contractor is responsible for designating an on site party or parties responsible for instructing workers and overseeing and documenting results of the Construction Waste Management Plan for the project.
- .2 Distribution: Distribute copies of the Construction Waste Management Plan to the job site foreman, each Subcontractor, the Owner, and other site personnel as required to maintain Construction Waste Management Plan.
- .3 Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, composting and return methods being used for the project to Subcontractor's at appropriate stages of the project.
- .4 Separation Facilities: Lay out and label a specific area to facilitate separation of materials for potential recycling, salvage, reuse, composting and return:
 - .1 Recycling and waste bin areas are to be kept neat and clean and clearly marked in order to avoid contamination of materials.
 - .2 Hazardous wastes shall be separated, stored, and disposed of in accordance with local regulations.
- .5 Progressive Documentation: Submit a monthly summary of waste generated by the project to ensure that waste diversion goals are on track with project requirements:
 - .1 Submission of waste summary can coincide with application for progress payment, or similar milestone event as agreed upon between the Owner and Contractor.
 - .2 Monthly waste summary shall contain the following information:
 - .1 The amount in tonnes or m³ and location of material landfilled,
 - .2 The amount in tonnes or m³ and location of materials diverted from landfill, and
 - .3 Indication of progress based on total waste generated by the project with materials diverted from landfill as a percentage.

19.2 SUBCONTRACTOR'S RESPONSIBILITY

- .1 Subcontractor's shall cooperate fully with the Contractor to implement the Construction Waste Management Plan.
- .2 Failure to cooperate may result in the Owner not achieving their environmental goals, and may result in penalties being assessed by the Contractor to the responsible Subcontractor(s).

19.3 SAMPLE CONSTRUCTION WASTE MANAGEMENT FORMS

- .1 Sample waste tracking form below, or similar, can be used by the Contractor to establish their own forms for recording management of construction waste:

Diverted Waste by Report Date							
Material Streams Contributing to Credit							
Material Stream	Sept	Oct	Nov	Dec		Total	Units
Total Waste						200	m³
Percent Diverted						67.5	%

END OF SECTION

Part 20 General

20.1 CLOSEOUT PROCEDURES

- .1 Notify the Owner when Work is considered ready for Interim Completion inspection.
- .2 Accompany the Owner on preliminary inspection to determine items that require completion or correction.
- .3 Comply with the Owner's instructions for correction of items of Work listed in executed Certificate of Interim Completion.
- .4 Notify the Owner of actions taken for completion of items of Work determined in the Owner's final inspection. Notify owner of any outstanding items, or issues affecting completion of the project.

20.2 INSPECTION AND DECLARATION

- .1 Contractor's Inspection: Contractor and all Sub-Contractors to conduct an inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
 - .1 Notify the Owner in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.
 - .2 Request the Owner's Inspection.
- .2 The Owner's Inspection: the Owner and Contractor will perform an 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 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 the Owner, complete outstanding items and request reinspection.
- .5 Post-Demobilization Inspection: once demobilization is completed; the Owner will request a Post-Demobilization inspection of Work by the Owner and Contractor. If Work is deemed incomplete by the Owner, complete outstanding items and request reinspection.

20.3 FINAL PAYMENT

- .1 When the Owner considers final deficiencies and defects corrected and requirements of Contract met, make application of Final Payment.

20.4 CLOSEOUT SUBMITTALS

- .1 Prior to Interim Completion, submit the following to the Owner for review (consolidate the required submittals in one document):
 - .1 Organized and catalogued Photographic Records as per Section 01 33 00 – Submittal Procedures.
 - .2 Copies of notifications, documents, procedures, and permit applications sent to the Authorities Having Jurisdiction.
 - .3 Copies of all permits, certificates, and documents obtained by the Contractor.
 - .4 Proof of documents confirming that the removed hazardous materials have been disposed of in an approved landfill and/or disposal facility.
 - .5 Results of all testing carried out by the Contractor.
 - .6 Copies of all shipping documents identifying the shipper, receiver, and all carriers involved in the transport of hazardous materials.
 - .7 Information as required by the Authorities Having Jurisdiction.

END OF SECTION

Part 21 General

21.1 ACTION AND INFORMATIONAL SUBMITTALS

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

21.2 FORMAT

- .1 Organize data in an electronic (PDF) form.

21.3 PROJECT RECORD DOCUMENTS CONTENTS

- .1 The Project Record Documents include:
 - .1 Provide title of project;
 - .2 Date of submission; names.

- .3 Addresses and telephone numbers of Contractor with name of responsible parties.
- .4 Summary of Health and Safety issues, Environmental issues and performance indicators.
- .5 Copies of all permits and documents obtained by the Contractor.
- .6 Consolidated results of all testing carried out by the Contractor.
- .7 Summary table showing amounts of each type of waste.
- .8 Waste acceptance certificates (hazardous and non-hazardous).
- .9 All Project Submittals.
- .10 Photographs as per Section 01 33 00 – Submittal Procedures.
- .11 All Meeting Minutes.
- .12 Information on the state of temporary facilities used in this Contract.
- .13 Any other pertinent information.

21.4 AS -BUILT DOCUMENTS AND SAMPLES

- .1 Maintain, in addition to requirements in General Conditions, at site for the Owner one record copy of:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Change Orders and other modifications to 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.
 - .1 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.
 - .1 Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition.
 - .1 Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by the Owner.

21.5 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

- .1 Record information on set of opaque drawings.
- .2 Use felt tip marking pens, maintaining separate colours for each major system, for recording information.
- .3 Record information concurrently with construction progress.
 - .1 Do not conceal Work until required information is recorded.

- .4 Contract Drawings and shop drawings: mark each item to record actual construction, including:
 - .1 Field changes of dimension and detail.
 - .2 Changes made by change orders.
 - .3 Details not on original Contract Drawings.
- .5 Other Documents: maintain field test records, inspection certifications, required by individual specifications sections.
- .6 Provide digital photos, if requested, for site records.

END OF SECTION

Part 22 General

22.1 SUMMARY

- .1 This Section includes requirements for the following:
 - .1 Demolition and removal of buildings and structures.
 - .2 Demolition and removal of concrete foundations and piles, if any.
 - .3 Removing below grade construction, if any.
 - .4 Disconnecting, capping or sealing, and removing site utilities.
- .2 This section does not include for the removal of Hazardous Substances or asbestos abatement, or selective demolition of interior building components and finishes. This is covered in other sections.

22.2 REFERENCE STANDARDS

- .1 CSA Group (CSA)
 - .1 CSA S350-M1980 (R2003), Code of Practice for Safety in Demolition of Structures.
- .2 Department of Justice Canada
 - .1 Canadian Environmental Assessment Act (CEAA), 2012.
 - .2 Canadian Environmental Protection Act (CEPA), 2012.
 - .1 SOR/2003-2, On-Road Vehicle and Engine Emission Regulations.
 - .2 SOR/2006-268, Regulations Amending the On-Road Vehicle and Engine Emission Regulations.
 - .3 Transportation of Dangerous Goods Act (TDG Act), 1992, c. 34.
 - .4 Motor Vehicle Safety Act (MVSA), 1995
 - .5 Hazardous Substances Information Review Act, 1985
 - .3 Canada Labour Code, 1985 – Part II
- .3 National Fire Protection Association (NFPA)
 - .1 NFPA 241-13, Standard for Safeguarding Construction, Alteration, and Demolition Operations

- .4 National Research Council Canada (NRC)
 - .1 National Building Code of Canada (NBC).
- .5 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S660-08, Standard for Nonmetallic Underground Piping for Flammable and Combustible Liquids.
 - .2 ULC/ORD-C58.15-1992, Overfill Protection Devices for Flammable Liquid Storage Tanks.
 - .3 ULC/ORD-C58.19-1992, Spill Containment Devices for Underground Flammable Liquid Storage Tanks.
- .6 National Institute for Occupational Safety and Health
 - .1 Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities: NIOSH Publication No. 85-115.
- .7 Canadian Laborers' International Union of North America Contractors Training Council
 - .1 Hazardous Waste Worker Training Manual, 1992
- .8 Where the referenced codes and standards are found to be at variance with these specifications, the most stringent regulations shall apply.

22.3 DEFINITIONS

- .1 Demolition: Rapid destruction of building following removal of Hazardous Substances.
- .2 Hazardous Substances: Dangerous substances, dangerous goods, hazardous commodities and hazardous products, may include but not limited to: asbestos, mercury, lead (Pb), lead based paints (LBP), PCB's, CFC's, HCFC's poisons, corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or other material that can endanger human health or wellbeing or environment if handled improperly as defined by the Federal Hazardous Products Act (RSC 1985) including latest amendments.

22.4 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination: Coordinate with the Owner for the material ownership as follows:
 - .1 Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain the Owner's property, demolished materials shall become the Contractor's property and shall be removed from Project site.
 - .2 Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to the Owner that may be encountered during demolition remain the Owner's property:
 - .1 Carefully remove and salvage each item or object in a manner to prevent damage and deliver promptly to the Owner.
- .2 Pre-Demolition Meetings:
 - .1 Hold pre-installation meeting one (1) week prior to beginning work of this Section, with the Owner to:
 - .1 Verify project requirements.
 - .2 Verify existing site conditions adjacent to demolition work.
 - .2 Ensure key personnel attend and document proceedings.

22.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Action Submittals: Provide the following submittals before starting any work of this Section:
 - .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Schedule of Demolition Activities: indicate the following:
 - .1 Detailed sequence of demolition and removal work, with starting and ending dates for each activity
 - .2 Interruption of utility services
 - .3 Coordination for shutoff and capping of utility services
 - .4 Locations of temporary partitions and means of egress
 - .3 Demolition Plan: Submit a plan of demolition area indicating extent of temporary facilities and supports, methods of removal and demolition, equipment, health and safety protocols and other details pertinent to the work prepared by a professional engineer registered or licensed in Alberta in accordance with requirements of Authority Having Jurisdiction.
 - .4 Proposed Noise Control and Dust Control Measures: Submit statement or drawing that indicates the measures proposed for use, proposed locations, and proposed time frame for their operation.
 - .5 Inventory: Submit a list of items that have been removed and salvaged after demolition is complete.
 - .1 Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.
 - .2 Pre-demolition Photographs: Submit photographs indicating existing conditions of the site prior to starting Work.

22.6 QUALITY ASSURANCE

- .1 Regulatory Requirements: Ensure Work is performed in compliance with CEPA, applicable provincial and municipal regulations, CEAA, and the TDG Act.
 - .1 Comply with hauling and disposal regulations of Authority Having Jurisdiction.
 - .2 Standards: Comply with ANSI A10.6 and NFPA 241
- .2 Regulatory Requirements: Perform work of this Section in accordance with the following:
 - .1 Occupational health and safety (OHS)
 - .2 Provincial Occupational Health and Safety Standards and Programs.

22.7 SITE CONDITIONS

- .1 Environmental protection:
 - .1 Ensure Work is done in accordance with Section 01 35 43 - Environmental Procedures, and all other applicable standards and licenses.
 - .2 Protect the environment from fugitive waste materials resulting from demolition activities
 - .3 Ensure Work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.

- .4 Fires and burning of waste or materials is not permitted on site.
- .5 Do not bury rubbish waste materials.
- .6 Do not dispose of waste or volatile materials including but not limited to: mineral spirits, oil, petroleum-based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers.
- .7 Ensure proper disposal procedures are maintained throughout project.
- .8 Do not track out mud or debris on to public roads, clean off vehicles and equipment prior to leaving site as required.
- .9 Protect permafrost on-site and around site, do not damage undisturbed permafrost.
- .2 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers, or onto adjacent properties.
- .3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with authorities having jurisdiction as directed by the Owner.
- .4 Prevent damage and minimize stripping of natural terrain, features and vegetation. Make good all damage.
- .5 Protect foliage on site and adjacent properties.
- .6 Prevent materials from contaminating air, by providing temporary enclosures during demolition work.
- .7 Cover or wet down dry materials and waste to prevent blowing dust and debris. Control dust on all temporary roads.
- .8 Maintain access to existing walkways, exits, and other adjacent occupied or used facilities:
 - .1 Do not close or obstruct walkways, exits, or other occupied or used facilities.
- .9 The Owner assumes no responsibility for buildings and structures being demolished:
 - .1 Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
 - .2 Remove, protect and store salvaged items as directed by the Owner before structure demolition.
 - .3 Salvage items as identified by the Owner.
 - .4 Deliver to the Owner as directed.

22.8 EXISTING CONDITIONS

- .1 Take over structure to be demolished based on its condition at date and time of bid closing.
- .2 Existing Hazardous Substances: a hazardous substances assessment and identified materials requiring abatement as follows:
 - .1 Hazardous substances are as defined in the Hazardous Products Act.
 - .2 Hazardous substances will be removed by the Contractor as a part of the Contract before starting Work in accordance with work results described in Related Requirements listed above.

- .3 Discovery of Hazardous Substances: Immediately notify the Owner if materials suspected of containing hazardous substances are encountered and perform the following activities:
 - .1 Hazardous substances will be as defined in the Hazardous Products Act.
 - .2 Stop work in the area of the suspected hazardous substances.
 - .3 Take preventative measures to limit users' and workers' exposure, provide barriers and other safety devices and do not disturb.
 - .4 Hazardous substances will be removed under a separate contract or as a change to the Work.
 - .5 Proceed only after written instructions have been received from the Owner.
- .4 When unidentified subsurface structures, tanks or services are encountered during the work, immediately cease operations, notify the Owner and wait for instruction.

Part 23 Products

23.1 EQUIPMENT

- .1 Equipment and heavy machinery:
 - .1 On-road vehicles to: CEPA-SOR/2003-2, On-Road Vehicle and Engine Emission Regulations and CEPA-SOR/2006-268, Regulations Amending the On-Road Vehicle and Engine Emission Regulations.
 - .2 Off-road vehicles to: EPA CFR 86.098-11 and EPA CFR 86.098-10.
 - .3 Leave machinery running only while in use, except where extreme temperatures prohibit shutting machinery down.

23.2 TEMPORARY SUPPORT STRUCTURES

- .1 Design temporary support structures required for demolition work and underpinning, and other foundation supports necessary for the project using a Qualified Professional Engineer registered or licensed in Alberta.

Part 24 Execution

24.1 EXAMINATION

- .1 Survey existing conditions and correlate with requirements indicated to determine extent of structure demolition required.
- .2 Review Project Record Documents of existing construction provided by the Owner.
- .3 The Owner does not guaranty that existing conditions are the same as those indicated in Project Record Documents.
- .4 Inventory and record the condition of items being removed and salvaged.
- .5 When unanticipated mechanical, electrical, or structural elements are encountered, investigate and measure the nature and extent of the element.
- .6 Promptly submit a written report to the Owner.
- .7 Engage a Licenced Professional Engineer to perform an engineering survey of condition of building to determine whether removing any element might result in structural

deficiency or unplanned collapse of any portion of structure or adjacent structures during structure demolition operations.

- .8 Verify that Hazardous Substances have been remediated before proceeding with structure demolition operations.

24.2 PREPARATION

- .1 Temporary Erosion and Sedimentation Control:
 - .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways..
 - .2 Inspect, repair, and maintain erosion and sedimentation control measures during demolition.
 - .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal after completion of demolition work.
- .2 Protection of in-place conditions:
 - .1 Prevent movement, settlement or damage of adjacent landscaping, adjacent grades, structures, walks, properties, paving, services, and trees.
 - .1 Provide bracing, shoring and underpinning as required.
 - .2 Repair damage caused by demolition as directed by the Owner.
 - .2 Support affected structures and, if safety of structure being demolished adjacent structures or services appears to be endangered, take preventative measures, stop Work and immediately notify the Owner.
 - .3 Prevent debris from blocking surface drainage system, and any other adjacent systems which must remain in operation.
- .3 Surface Preparation:
 - .1 Confirm and mark all utilities and services supplied to the building prior to commencing demolition. Contractor is responsible to arrange for the disconnect of all utilities and services supplied to the building which is to be demolished.
 - .2 Post warning signs on electrical lines and equipment which must remain energized, and active gas line, for any reason, during period of demolition.
 - .3 Disconnect electrical and telephone service lines entering buildings to be demolished.
 - .4 Disconnect and cap mechanical services.
 - .1 Propane or natural gas supply lines: remove in accordance with gas company requirements.
 - .2 Sewer and water lines: remove in accordance with authority having jurisdiction.
 - .3 Other underground services: remove and dispose.
 - .5 Do not disrupt active or energized utilities traversing premises.
 - .6 Do not disrupt active or energized utilities traversing premises.
 - .7 Remove rodent and vermin as required, if observed.
 - .8 Ensure that affected buildings are unoccupied and discontinued in use prior to start of demolition and clearing.

- .9 Verify that existing services in areas affected by demolition work are disconnected, capped, removed or relocated, prior to start of work.
- .10

24.3 DEMOLITION

- .1 Blasting operations not permitted during demolition.
- .2 Remove contaminated or dangerous materials as defined by authorities having jurisdiction, relating to environmental protection, from site and dispose of in safe manner to minimize danger at site or during disposal.
- .3 Prior to start of Work remove contaminated or hazardous materials listed as hazardous from site and dispose of at designated disposal facilities in safe manner and in accordance with TDG Act, Section 02 81 00 - Hazardous Materials and other applicable requirements.
- .4 The Contractor shall not proceed with hazardous material abatement or demolition until:
 - .1 OHS Notification of Work has been submitted to and approved by OHS.
 - .2 A demolition plan has been submitted bearing stamp of qualified professional engineer.
- .5 Demolish the existing buildings completely including foundations, utility service connections.
- .6 Ensure that structural components are safely secured prior to removal of load bearing walls or partitions.
- .7 Demolish work in a safe and systematic manner, from top to bottom.
- .8 Do not throw or drop demolished materials from heights. Use chutes, conveyors, or hoisting equipment to lower materials.
- .9 Demolish in a manner to minimize dusting. Keep dusty materials wetted but prevent flooding or contaminated runoff.
- .10 Demolish masonry and concrete elements in small sections. Remove and lower structural framing and other heavy or large objects in a safe manner.
- .11 Carefully remove and lower in controlled manner structural framing members and other heavy or large objects.
- .12 At all times leave work in safe condition, so that no part is in danger of uncontrolled toppling or falling.
- .13 Crush concrete generated due to demolition of foundations to size as directed by the Owner.
- .14 Drill 25 mm diameter holes in concrete wall at 1 m intervals to prevent accumulation of water, which are not to be removed, to prevent accumulation of water.
- .15 Remove existing equipment, services, and obstacles where required for refinishing or making good of existing surfaces, and replace as work progresses.
- .16 At end of each day's work, leave Work in safe and stable condition.
- .17 Contain fibrous materials to minimize release of airborne fibres while being transported within facility.
- .18 Protect permafrost on-site and around site, do not damage undisturbed permafrost.

.19 Mechanical Demolition

- .1 Disconnect all mechanical utility services for the subject building in a safe manner, to the satisfaction of local municipal offices and utility companies.
- .2 Disconnect the boilers from the electrical system, oil system, propane gas system, heating system, fluid make-up system, and breeching.
- .3 Drain domestic water system.
- .4 Ensure that all mechanical equipment has been safely disconnected from the electrical system.
- .5 Ensure that plumbing system, heating system, ventilation system, and control system are left in a condition that they can safely be removed by workers.
- .6 Ensure that all mechanical material is disposed of as required by Municipal and Provincial regulations.

.20 Electrical Demolition

- .1 Contractor to comply with requirements of the Authorities Having Jurisdiction, the Electrical Inspection Safety Division and the Canadian Electrical Code.
- .2 Investigate site and existing building to determine dismantling and disconnection procedures for the safe removal of all electrical components prior to commencement of work.
- .3 Coordinate with local power utility and disconnect the main electrical service(s) to the building. Ensure that the main service disconnect is in the "Off" position prior to commencing any work on the electrical system. Test the system to ensure that no parts of the system remain energized. Electrical lock-out procedures shall apply if any work is carried out prior to disconnecting the main electrical service.
- .4 Coordinate with the local telephone and television service providers regarding the disconnection of the incoming telephone and television services. Any utility owned equipment is to be salvaged and returned to the utility as per their requirements.
- .5 Ensure that all mechanical equipment has been safely disconnected from the electrical system prior to demolition and removal.
- .6 Contractor to identify the presence of any lighting ballasts containing PCB's. Light fixtures and ballasts to be visually inspected for any leaks prior to disconnecting and removing the ballast. Proper safety procedures to be adhered to and personal protective equipment worn for the removal of hazardous materials. These items are to be abated before demolition.
- .7 Contractor to safely remove fluorescent lamps and other mercury-containing bulbs. Lamps containing mercury are to be disposed of following regulatory procedures (e.g. sealed in plastic bags, sent to recycling facilities). Contractor to take care not to break lamps during removal. If a lamp breaks, proper safety procedures are to be adhered to and personal protective equipment worn for the removal of hazardous materials. These items are to be abated before demolition.

24.4 SITE RESTORATION

- .1 Refer to Section 31 23 33.01 - Excavating, Trenching and Backfilling
- .2 Below Grade Areas: Completely fill below grade areas and voids resulting from structure demolition operations with satisfactory soil materials. Provide materials to fill any holes,

voids, or depressions that were made on the site during the demolition of the building, excavation of the tanks, and/or the foundation.

- .1 Do not backfill basement areas until inspected by the Owner.
- .3 Site Grading: Uniformly rough grade area of demolished construction to a smooth surface, free from irregular surface changes.
- .4 Provide a smooth transition between adjacent existing grades and new grades.
- .5 Install topsoil providing positive drainage away from the lot.
- .6 Upon completion of work, the Contractor will leave the site in a neat and tidy condition. All rutting and depressions to be filled and bladed to ensure positive drainage away from lot.

24.5 REPAIRS

- .1 General: Promptly repair damage to adjacent construction caused by structure demolition operations.
- .2 Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.

24.6 DISPOSALS AND CLEAN-UP

- .1 Designate appropriate security resources/measures to prevent vandalism, damage and theft.
- .2 All materials, rubbish and debris resulting from demolition work shall become the Contractor's property and shall be removed from site and legally disposed of unless specifically indicated otherwise.
- .3 Do not allow demolish materials to accumulate on site. Promptly, as work progresses, remove and legally dispose of materials away from site. Contractor shall bear all costs for ultimate disposal at an approved disposal facility.
- .4 Selling, burning, and burying of materials on site is not permitted.
- .5 Separate recyclable/reusable materials from general waste stream to maximum extent possible and transport to recycling/reuse location.
- .6 Upon completion of work, trim surfaces and leave work site clean.
- .7 Reinstate areas and existing works outside area of demolition to conditions that were existing prior to commencement of work.

END OF SECTION

Part 25 General

25.1 SUMMARY

- .1 This Section includes requirements for careful removal and salvage, and recycling of building components.

- .2 The Owner has not identified building components that are to be salvaged, however, the Owner reserves the rights to salvaged building components for reuse or resale.
- .3 If the Contractor is able to safely remove and salvage non-hazardous building components, the building components will be property of the Contractor for reuse or resale.

25.2 RELATED REQUIREMENTS

- .1 Section – 01 74 19 – Waste Management and Disposal
- .2 Section – 02 41 16 – Structure Demolition

25.3 DEFINITIONS

- .1 Remove and Salvage: Detach items from existing construction.

25.4 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination Existing Salvaged Work: Coordinate with the Owner for confirmation of materials, components, and items of equipment that are suitable for removal and salvage from their present existing locations.

Part 26 Products

26.1 SALVAGED ITEMS

- .1 Wood, metals, or other building components that can be recycled or reused.
- .2 Windows and doors to be preserved and segregated prior to demolition and stored for reuse by PCA or available to local users. PCA project authority to remove from property.

Part 27 Execution

27.1 SALVAGE

- .1 Clean, decontaminate, or remediate hazardous substances (asbestos dust, PCB residue, and similar substances) from salvaged materials so they are safe for reuse or resale.
- .2 Remove and handle salvageable items from site to minimize damage and to ensure that usability is maintained.
- .3 Place materials in a separate designated area and protect so that salvaged items remain as complete units and are not a hazard to personnel or the environment.
- .4 Clean items of construction or building debris, or materials not part of salvaged work.

END OF SECTION

Part 28 General

28.1 RELATED REQUIREMENTS

- .1 Section 01 33 00 Submittal Procedures
- .2 Section 01 35 29.13 Health, Safety and Emergency Response Procedures for Contaminated Sites
- .3 Section 01 35 43 Environmental Procedures
- .4 Section 01 51 00 Temporary Utilities
- .5 Section 01 52 00 Construction Facilities
- .6 Section 02 41 16 Structure Demolition
- .7 Section 02 82 00.01 Asbestos Abatement – Minimum Precautions
- .8 Section 02 82 00.02 Asbestos Abatement – Intermediate Precautions

28.2 REFERENCE STANDARDS

- .1 Health Canada / Workplace Hazardous Materials Information System (WHMIS):
 - .1 WHMIS Safety Data Sheets (SDS).
- .2 National Research Council Canada (NRC):
 - .1 National Fire Code of Canada, 2015.
- .3 Canadian Environmental Protection Act, 1999 (CEPA 1999):
 - .1 Export and Import of Hazardous Materials and Hazardous Recyclable Material Regulations (SOR/2005-149).
- .4 Nuclear Safety and Control Act, S.C. 1997, c. 9.
- .5 Nuclear Substances and Radiation Devices Regulations, SOR/2000-207, amended 2015.
- .6 Canadian Council of Ministers of the Environment. 2001. Canada-Wide Standard for Mercury-Containing Lamps. (CCME 2001)
- .7 Transport Canada (TC):
 - .1 Transportation of Dangerous Goods Act, 1992 (TDG Act) 1999, (c. 34).
 - .2 Transportation of Dangerous Goods Regulations (SOR/2012-245).
- .8 Environment Canada:
 - .1 Environmental Code of Practice on Halons (1996).
 - .2 Environmental Code of Practice for Elimination of Fluorocarbon. Emissions from Refrigeration and Air Conditioning Systems (1996).
- .9 Alberta Occupational Health and Safety Regulations.

28.3 DEFINITIONS

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

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

28.4 SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 Submittal Procedures.
- .2 Product Data:
 - .1 Submit two (2) copies of WHMIS SDS in accordance with this section.
 - .2 Provide Hazardous Materials Management Plan to the Owner that identifies hazardous materials, personal protective equipment requirements, disposal procedures and arrangements.
 - .3 Submit qualifications and training certificates for all Contractor's personnel performing Work as described under this Section prior to commencing Work.
 - .4 Submit waste transport manifests and chains of custody to the Owner, as required, in accordance with applicable regulations.
 - .5 In the event of an environmental incident or damage to waste containers, notify the Owner and applicable Authority Having Jurisdiction.

28.5 QUALIFICATIONS AND PERSONAL PROTECTION

- .1 Contractor's workers must be thoroughly familiar with and knowledgeable about existing site conditions, scope of work, and requirements of the Specification.
- .2 Only Contractor's workers able to provide a history of satisfactory experience in the area of hazardous materials management and can satisfy Federal and Provincial requirements will be permitted to supervise and conduct the work of this Section. Contractor's personnel responsible for the work of this Section is to have a minimum of five (5) years of experience in the area of hazardous materials management.
- .3 Follow guidelines such as those established in Section 1.2 References.
- .4 Contractor's personnel, who have been trained as described in this Section, are to instruct and direct all workers with respect to the waste management procedures and labour and safety practices to be followed in carrying out the work.
- .5 Provide all workers with protection appropriate to the potential type and level of exposure. Establish specific safety protocols prior to commencing clean-up activities.
- .6 Provide suitable personal protective clothing and equipment as required during the course of the work. Supply sufficient quantities and various sizes of personal protective equipment (PPE) to fit all site personnel including site visitors.
- .7 Trained and certified personnel are required to complete all TDG Act documentation and recording requirements.

Part 29 Products

29.1 MATERIALS

- .1 Description:

- .1 Bring on site only quantities of hazardous material required to perform Work, if any.
- .2 Maintain WHMIS Safety Data Sheets (SDS) in proximity to where materials are being used. Communicate this location to personnel who may have contact with hazardous materials.
- .3 Spill Response Materials: provide spill response materials which can be used for absorbing/shoveling and containing hazardous materials.
- .4 Provide appropriate PPE for all personnel.

29.2 HAZARDOUS MATERIALS CONTAINERS

- .1 Hazardous Materials Containers:
 - .1 Containers must satisfy the requirements of the most recent edition of the TDG Act and Regulations, and in particular, the requirements for intermediate bulk containers for marine/air/ground transport of hazardous materials.
 - .2 Submit specifications of the containers to the Owner for review prior to beginning work. These details are to include written confirmation from Transport Canada that Contractor's proposed containers satisfy TDG Act regulatory requirements for marine/air/ground transport.
 - .3 Containers are to include all necessary liners to satisfy the TDG Act requirements for marine/air/ground transport.
- .2 With respect to packaging and containerization requirements of hazardous materials, all requirements of the TDG Act and Regulations and CEPA Interprovincial Movement of Hazardous Waste must be met.

Part 30 Execution

30.1 CLEANING

- .1 Keep work area clean on a continuous basis.
- .2 Leave Work area clean at end of each day.
- .3 Upon completion, remove surplus materials, rubbish, tools and equipment.

30.2 GENERAL REQUIREMENTS

- .1 Scope of Abatement Activities (other than asbestos-containing materials and lead – specified elsewhere)
 - .1 Abatement shall be conducted to handle, alter, remove and/or dispose of hazardous building materials as identified in Appendix A in accordance with applicable regulations, guidelines, standards and/or best practices for such work, to the extent that such identified hazardous building materials will be impacted (handled, altered, damaged, removed) by the Work.
 - .2 Removal and disposal of hazardous building materials associated with the interior and exterior of the building.
- .2 Contractor is responsible for reviewing plans, specifications and reports such that they understand the locations and amounts of hazardous building materials that will be

impacted by their Work, and such that appropriate plans and budgets can be included in their overall bids.

- .3 The listing below is a summary of the identified hazardous building materials (other than asbestos-containing materials specified elsewhere) and associated considerations and/or removal and disposal requirements including regulations, guidelines and/or standards.
 - .1 Polychlorinated Biphenyls (PCBs)
 - .1 Refer to Section 02 84 00 PCB Remediation.
 - .2 When fluorescent fixtures are decommissioned, verify the PCB content of fluorescent lamp ballasts as per the PCB Guide.
 - .3 Should a material suspected to contain PCBs become uncovered during demolition activities (i.e., dielectric fluids, hydraulic fluids), all work in the areas that may disturb the material should be stopped. Samples of the suspect material should be submitted for laboratory analysis to determine if PCBs are present.
 - .4 If PCB-containing items (including lamp ballasts) are identified for removal and disposal, these should be handled, transported, stored and disposed of in accordance with the following:
 - .1 TDG Act.
 - .2 CEPA, 1999.
 - .2 Radioactive Materials
 - .1 Complete removal of mercury-containing equipment is required prior to demolition activities that may disturb the equipment.
 - .2 When radioactive material-containing items are removed, ensure all radioactive waste is handled, stored, and disposed of in accordance with the requirements the following:
 - .1 Nuclear Safety and Control Act.
 - .2 Nuclear Substances and Radiation Devices Regulations.
 - .3 TDG Act.
 - .3 Mercury
 - .1 Complete removal of mercury-containing equipment is required prior to demolition activities that may disturb the equipment.
 - .2 When mercury-containing items are removed, ensure all mercury waste is handled, stored and disposed of in accordance with the requirements the following:
 - .1 TDG Act.
 - .2 Canadian-Wide Standard for Mercury Containing Lamps (CCME 2001).

END OF SECTION

Part 31 General

31.1 SUMMARY

- .1 Comply with requirements of this Section when performing following work:
 - .1 Removing non-friable asbestos-containing materials, other than ceiling tiles, if the material is installed or removed without being broken, cut, drilled, abraded, ground, sanded or vibrated.
 - .2 Removing, break-up, cut, grind, sand, drill, scrape, vibrate or abrade non-friable asbestos containing materials using non-powered hand tools, and ensure the material is wetted to prevent the spread of dust or fibres.
 - .3 Removing less than one square metre of drywall in which joint-filling compounds that are asbestos containing materials have been used.

31.2 REFERENCE STANDARDS

- .1 Department of Justice Canada (DoJ)
 - .1 Canadian Environmental Protection Act, 1999 (CEPA).
 - .2 SOR/2018-196 Prohibition of Asbestos and Products Containing Asbestos Regulations.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.205-2003, Sealer for Application of Asbestos Fibre Releasing Materials
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 WHMIS Safety Data Sheets (SDS)
- .4 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDG Act).
 - .2 Transportation of Dangerous Goods Regulations (SOR/2012-245)

31.3 DEFINITIONS

- .1 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.
- .2 Amended Water: Water with non-ionic surfactant wetting agent added to reduce water tension to allow thorough wetting of fibres.
- .3 Asbestos-Containing Materials (ACMs): Materials that contain one (1) per cent or more asbestos by dry weight and are identified under Existing Conditions including fallen materials and settled dust.
- .4 Asbestos Work Area: Area where work takes place which will, or may, disturb ACMs.
- .5 Authorized Visitors: Consultant or designated representative, and representative of regulatory agencies.
- .6 Competent worker: In relation to specific work, means a worker who:
 - .1 Is qualified because of knowledge, training and experience to perform the work.

- .2 Is familiar with the provincial laws and with the provisions of the regulations that apply to the work.
- .3 Has knowledge of all potential or actual danger to health or safety in the work.
- .7 Friable material: Means material that:
 - .1 When dry, can be crumbled, pulverized or powdered by hand pressure, or
 - .2 is crumbled, pulverized or powdered.
- .8 Non-Friable Material: Material that when dry cannot be crumbled, pulverized or powdered by hand pressure.
- .9 Occupied Area: Any area of the building or work site that is outside Asbestos Work Area.
- .10 Polyethylene: Polyethylene sheeting or rip-proof polyethylene sheeting with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide protection and isolation.
- .11 Sprayer: Garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must have appropriate capacity for work.
- .12 Supervisor: Contractor's worker able to provide a history of satisfactory experience in the area of asbestos abatement that can satisfy Federal and Provincial requirements and will be permitted to supervise the work of this Section. The supervisor responsible for the work of this Section is to have a minimum of five (5) years of experience in the area of asbestos abatement.

31.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit proof satisfactory to the Owner that suitable arrangements have been made to dispose of asbestos-containing waste in accordance with requirements of authority having jurisdiction.
- .3 Submit Occupational Health and Safety (OHS) Notification of Project at least 5 working days before workers may be exposed to airborne fibres.
- .4 Submit proof of Contractor's Asbestos Liability Insurance.
- .5 Submit to the Owner necessary permits for transportation and disposal of asbestos-containing waste and proof that asbestos-containing waste has been received and properly disposed.
- .6 Submit proof that all asbestos workers and/or supervisor have received appropriate training and education by a competent person in the hazards of asbestos exposure, good personal hygiene and work practices while working in Asbestos Work Areas, and the use, cleaning and disposal of respirators and protective clothing.
- .7 Submit proof satisfactory to the Owner that employees have respirator fitting and testing. Workers must be fit tested (irritant smoke test) with respirator that is personally issued.

31.5 QUALITY ASSURANCE

- .1 Regulatory Requirements: comply with Federal, Provincial, and local requirements pertaining to asbestos, provided that in case of conflict among these requirements or with these specifications, more stringent requirement applies. Comply with regulations in effect at time Work is performed.
- .2 Health and Safety:

- .1 Safety Requirements: worker protection.
 - .1 Protective equipment and clothing to be worn by workers while in Asbestos Work Area include:
 - .1 Air purifying half-mask respirator with N-100, R-100 or P-100 particulate filter, personally issued to worker and marked as to efficiency and purpose, suitable for protection against asbestos and acceptable to Provincial Authority having jurisdiction. The respirator to be fitted so that there is an effective seal between the respirator and the worker's face, unless the respirator is equipped with a hood or helmet. The respirator to be cleaned, disinfected and inspected after use on each shift, or more often if necessary, when issued for the exclusive use of one worker, or after each use when used by more than one worker. The respirator to have damaged or deteriorated parts replaced prior to being used by a worker; and, when not in use, to be stored in a convenient, clean and sanitary location. The employer to establish written procedures regarding the selection, use and care of respirators, and a copy of the procedures to be provided to and reviewed with each worker who is required to wear a respirator. A worker not to be assigned to an operation requiring the use of a respirator unless he or she is physically able to perform the operation while using the respirator.
 - .2 Disposable-type protective clothing that does not readily retain or permit penetration of asbestos fibres. Protective clothing to be provided by the employer and worn by every worker who enters the work area, and the protective clothing shall consist of a head covering and full body covering that fits snugly at the ankles, wrists and neck, in order to prevent asbestos fibres from reaching the garments and skin under the protective clothing to include suitable footwear, and to be repaired or replaced if torn.
 - .2 Eating, drinking, chewing, and smoking are not permitted in Asbestos Work Area.
 - .3 Before leaving Asbestos Work Area, the worker can decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing, or, if the protective clothing will not be reused, place it in a container for dust and waste. The container to be dust tight, suitable for asbestos waste, impervious to asbestos, identified as asbestos waste, cleaned with a damp cloth or a vacuum equipped with a HEPA filter immediately before removal from the work area, and removed from the work area frequently and at regular intervals.
 - .4 Facilities for washing hands and face shall be provided within or close to the Asbestos Work Area.
 - .5 Ensure workers wash hands and face when leaving Asbestos Work Area.
 - .6 Ensure that no person required to enter an Asbestos Work Area has facial hair that affects seal between respirator and face.

31.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

- .2 Collect and separate for disposal polystyrene, paper, plastic, corrugated cardboard, packaging material for recycling.
- .3 Separate for recycling and reuse and place in designated containers.
- .4 Place materials defined as hazardous or toxic in designated containers.
- .5 Handle and dispose of hazardous materials in accordance with the CEPA, TDG Act, Regional and Municipal regulations.
- .6 Fold up metal banding, flatten and place in designated area for recycling.
- .7 Disposal of asbestos waste generated by removal activities must comply with Federal, Provincial and Municipal regulations. Dispose of asbestos waste in sealed double thickness 6 mils bags or leak proof drums. Label containers with appropriate warning labels.
- .8 Provide manifests describing and listing waste created. Transport containers by approved means to licensed landfill for burial.

31.7 EXISTING CONDITIONS

- .1 Reports and information pertaining to ACMs to be handled, removed, or otherwise disturbed and disposed of during this project are attached as Appendix A. These are for general information only and are not necessarily representative of asbestos containing materials covered within scope of this Project.
- .2 Notify the Owner of suspect material discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material pending instructions from the Owner.

31.8 SCHEDULING

- .1 Not later than ten (10) days before beginning Work on this Project notify following in writing:
 - .1 The Owner.
 - .2 OHS.
 - .3 Disposal Authority.
- .2 Inform sub-trades of presence of asbestos containing materials identified in Existing Conditions.
- .3 Submit to the Owner copy of notifications before start of Work.

31.9 PERSONNEL TRAINING

- .1 Before beginning Work, provide the Owner satisfactory proof that every worker has successfully completed an Occupational Health and safety Training for the Asbestos Worker, which covers instruction and training in hazards of asbestos exposure, in personal hygiene and work practices, and in use, cleaning, and disposal of respirators and protective clothing.
- .2 Instruction and training related to respirators includes, following minimum requirements:
 - .1 Fitting of equipment.
 - .2 Inspection and maintenance of equipment.
 - .3 Disinfecting of equipment.

- .4 Limitations of equipment.
- .3 Instruction and training must be provided by a competent, qualified person.
- .4 Supervisory personnel to complete required training as outlined in this section.

Part 32 Products

32.1 MATERIALS

- .1 Drop Sheets:
 - .1 Polyethylene: 6 mil thick.
 - .2 FR polyethylene: 6 mil thick woven fibre reinforced fabric bonded both sides with polyethylene.
- .2 Wetting Agent: 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with water in a concentration to provide thorough wetting of asbestos-containing material.
- .3 Waste Containers: contain waste in two separate containers.
 - .1 Inner container: 6 mil thick sealable polyethylene waste bag.
 - .2 Outer container: sealable metal or fibre type where there are sharp objects included in waste material; otherwise, outer container may be sealable metal or fibre type or second 6 mil thick sealable polyethylene bag.
 - .3 Labelling requirements: affix preprinted cautionary asbestos warning, in both official languages, that is visible when ready for removal to disposal site. Label containers in accordance with OHS requirements. Label in both official languages.
- .4 Slow - drying sealer: non-staining, clear, water - dispersible type that remains tacky on surface for at least 8 hours and designed for purpose of trapping residual asbestos fibres.
- .5 Tape: fibreglass - reinforced duct tape suitable for sealing polyethylene under both dry conditions and wet conditions using amended water.
- .6 Encapsulant: surface film forming or penetrating type conforming to CAN/CGSB-1.205.
- .7 Provide 24-volt safety lighting and ground fault interrupter (GFI) circuits on power source for electrical tools, in accordance with applicable CSA Standard. Ensure safe installation of electrical cables and equipment.

Part 33 Execution

33.1 SUPERVISION

- .1 Minimum of one (1) Supervisor for every ten (10) workers is required.
- .2 Approved Supervisor must remain within Asbestos Work Area during disturbance, removal, or other handling of asbestos-containing materials.

33.2 PRE-JOB PLANNING

- .1 Establish the Work procedures to be followed and assemble the equipment required to perform the job.

- .2 Submit a completed Asbestos Project Notification form to Prevention Services to OHS.
- .3 Ensure workers are adequately trained in the hazards and proper methods of working with asbestos.
- .4 Procedures to deal with emergencies such as fire or injury must be developed and in place prior to work starting.

33.3 SITE PREPARATION

- .1 Barriers and warning signs should be positioned in areas where access needs to be restricted until the work is completed.

33.4 PROCEDURES

- .1 Before beginning Work, isolate Asbestos Work Area using, minimum, preprinted cautionary asbestos warning signs in both official languages that are visible at access routes to Asbestos Work Area.
 - .1 Remove visible dust from surfaces in the work area where dust is likely to be disturbed during course of work.
 - .2 Use HEPA vacuum or damp cloths where damp cleaning does not create a hazard and is otherwise appropriate.
 - .3 Do not use compressed air to clean up or remove dust from any surface.
- .2 Prevent spread of dust from Asbestos Work Area using measures appropriate to work to be done.
 - .1 Use FR polyethylene drop sheets over flooring such as carpeting that absorbs dust and over flooring in Asbestos Work Area where dust and contamination cannot otherwise be safely contained. Drop sheets are not to be reused.
- .3 Wet materials containing asbestos to be cut, ground, abraded, scraped, drilled, or otherwise disturbed unless wetting creates hazard or causes damage.
 - .1 Use garden reservoir type low - velocity fine - mist sprayer.
 - .2 Perform Work to reduce dust creation to lowest levels practicable.
- .4 Frequently and at regular intervals during Work and immediately on completion of work:
 - .1 Dust and waste to be cleaned up and removed using a vacuum equipped with a HEPA filter, or by damp mopping or wet sweeping, and placed in a waste container, and
 - .2 Drop sheets to be wetted and placed in a waste container as soon as practicable.
- .5 Cleanup:
 - .1 Place dust and asbestos containing waste in sealed dust-tight waste bags. Treat drop sheets and disposable protective clothing as asbestos waste; wet and fold these items to contain dust, and then place in plastic bags.
 - .2 Clean exterior of each waste-filled bag using damp cloths or HEPA vacuum and place in second clean waste bag immediately prior to removal from Asbestos Work Area.

- .3 Seal waste bags and remove from site. Dispose of in accordance with requirements of Provincial and Federal Authority having jurisdiction. Supervise dumping and ensure that dump operator is fully aware of hazardous nature of material to be dumped and that the appropriate guidelines and regulations for asbestos disposal are followed.
- .4 Perform final thorough clean-up of Work areas and adjacent areas affected by Work using HEPA vacuum.

33.5 INSPECTION

- .1 The Owner, or a representative of the Owner, will perform an inspection of the Asbestos Work Area to confirm compliance with specification and governing authority requirements. Deviations from these requirements that have not been approved in writing by the Owner may result in Work stoppage, at no cost to Owner.
- .2 The Owner will inspect Work for:
 - .1 Adherence to specific procedures and materials.
 - .2 Final cleanliness and completion.
 - .3 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.
- .3 When asbestos leakage from Asbestos Work Area has occurred or is likely to occur the Owner may order Work shutdown.
 - .1 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

END OF SECTION

Part 34 General

34.1 SUMMARY

- .1 Comply with requirements of this Section when performing following Work:
 - .1 Removing all or part of a false ceiling to obtain access to a work area, if asbestos containing material is likely lying on the surface of the false ceiling.
 - .2 Removing asbestos containing suspended ceiling tiles.
 - .3 Removal or disturbance of one square metre or less of friable asbestos containing material during the repair, alteration, maintenance or demolition of all or part of machinery or equipment, or of a building.
 - .4 Enclosure of friable asbestos containing material.
 - .5 Application of tape or sealant or other covering to boilers or pipe insulation containing asbestos.
 - .6 Removal all or part of a false ceiling to obtain access to a work area if asbestos containing is likely to be lying on the surface of the false ceiling.
 - .7 Removing non-friable asbestos containing materials by breaking, cutting, drilling, abrading, grounding, sanding, or vibrating if:
 - .1 The material is not wetted to control the spread of dust or fibres, and

- .2 The work is done only by means of non-powered hand-held tools.
- .8 Removing non-friable asbestos containing materials by breaking, cutting, drilling, abrading, grinding, sanding, or vibrating if the work is done by means of power tools that are attached to dust-collecting devices equipped with HEPA filters.
- .9 Removing more than one square metre of drywall in which joint-filling compounds that are asbestos containing materials have been used.
- .10 Removing of asbestos containing material from a pipe, duct or similar structure using a glove bag.
- .11 Removing filters used in an air handling unit in a building that has sprayed-on asbestos containing fireproofing.
- .12 Removal of 9.3 m² (100 ft²) or less of contiguous ceiling tile containing asbestos or sheet vinyl flooring/vinyl floor tiles having an asbestos backing.
- .13 Dry buffing and stripping of vinyl asbestos tile.
- .14 Renovation or hand demolition involving drywall joint compound, block mortar, stucco, or brick mortar products containing asbestos.

34.2 REFERENCE STANDARDS

- .1 Department of Justice Canada (DoJ)
 - .1 Canadian Environmental Protection Act, 1999 (CEPA).
 - .2 SOR/2018-196 Prohibition of Asbestos and Products Containing Asbestos Regulations.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.205-2003, Sealer for Application of Asbestos Fibre Releasing Materials
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 WHMIS Safety Data Sheets (SDS)
- .4 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDG Act).
 - .2 Transportation of Dangerous Goods Regulations (SOR/2012-245)
- .5 Underwriters' Laboratories of Canada (ULC)

34.3 DEFINITIONS

- .1 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.
- .2 Amended Water: Water with non-ionic surfactant wetting agent added to reduce water tension to allow thorough wetting of fibres.
- .3 Asbestos-Containing Materials (ACMs): Materials that contain one (1) per cent or more asbestos by dry weight and are identified under Existing Conditions including fallen materials and settled dust.
- .4 Asbestos Work Area: Area where work takes place which will, or may, disturb ACMs.

- .5 Authorized Visitors: Engineer, Consultant or designated representative, and representative of regulatory agencies.
- .6 Competent worker: In relation to specific work, means a worker who:
 - .1 Is qualified because of knowledge, training, and experience to perform the work.
 - .2 Is familiar with the Provincial laws and with the provisions of the regulations that apply to the work.
 - .3 Has knowledge of all potential or actual danger to health or safety in the work.
- .7 Friable material: Means material that:
 - .1 When dry, can be crumbled, pulverized, or powdered by hand pressure, or
 - .2 is crumbled, pulverized or powdered.
- .8 Non-Friable Material: Material that when dry cannot be crumbled, pulverized, or powdered by hand pressure.
- .9 Occupied Area: Any area of the building or work site that is outside Asbestos Work Area.
- .10 Polyethylene: Polyethylene sheeting or rip-proof polyethylene sheeting with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide protection and isolation.
- .11 Sprayer: Garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must have appropriate capacity for work.
- .12 Supervisor: Contractor's worker able to provide a history of satisfactory experience in the area of asbestos abatement that can satisfy Federal and Provincial requirements and will be permitted to supervise the work of this Section. The supervisor responsible for the work of this Section is to have a minimum of five (5) years of experience in the area of asbestos abatement.
- .13 Glove Bag: Prefabricated glove bag as follows:
 - .1 Minimum thickness 0.25 mm (10 mil) polyvinyl-chloride bag.
 - .2 Integral 0.25 mm (10 mil) thick polyvinyl-chloride gloves and elastic ports.
 - .3 Equipped with reversible double pull double throw zipper on top and at approximately mid-section of the bag.
 - .4 Straps for sealing ends around pipe.

34.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit proof satisfactory to the Owner that suitable arrangements have been made to dispose of asbestos-containing waste in accordance with requirements of authority having jurisdiction.
- .3 Submit Occupational Health and Safety (OHS) Notification of Project at least 5 working days before workers may be exposed to airborne fibres.
- .4 Submit proof of Contractor's Asbestos Liability Insurance.
- .5 Submit to the Owner necessary permits for transportation and disposal of asbestos-containing waste and proof that asbestos-containing waste has been received and properly disposed.

- .6 Submit proof that all asbestos workers and/or supervisor have received appropriate training and education by a competent person in the hazards of asbestos exposure, good personal hygiene and work practices while working in Asbestos Work Areas, and the use, cleaning and disposal of respirators and protective clothing.
- .7 Submit proof satisfactory to the Owner that employees have respirator fitting and testing. Workers must be fit tested (irritant smoke test) with respirator that is personally issued.
- .8 Submit OHS status and transcription of insurance.
- .9 Submit documentation including test results, fire and flammability data, and WHMIS Safety Data Sheets (SDS) for chemicals or materials including:
 - .1 Encapsulants;
 - .2 Amended water;
 - .3 Slow drying sealer.

34.5 QUALITY ASSURANCE

- .1 Regulatory Requirements: comply with Federal, Provincial, and local requirements pertaining to asbestos, provided that in case of conflict among these requirements or with these specifications, more stringent requirement applies. Comply with regulations in effect at time Work is performed.
- .2 Health and Safety:
 - .1 Safety Requirements: worker and visitor protection.
 - .1 Protective equipment and clothing to be worn by workers while in Asbestos Work Area include:
 - .1 Air purifying half-mask respirator with N-100, R-100 or P-100 particulate filter, personally issued to worker and marked as to efficiency and purpose, suitable for protection against asbestos and acceptable to Provincial Authority having jurisdiction. The respirator to be fitted so that there is an effective seal between the respirator and the worker's face, unless the respirator is equipped with a hood or helmet. The respirator to be cleaned, disinfected and inspected after use on each shift, or more often if necessary, when issued for the exclusive use of one worker, or after each use when used by more than one worker. The respirator to have damaged or deteriorated parts replaced prior to being used by a worker; and, when not in use, to be stored in a convenient, clean, and sanitary location. The employer to establish written procedures regarding the selection, use and care of respirators, and a copy of the procedures to be provided to and reviewed with each worker who is required to wear a respirator. A worker not to be assigned to an operation requiring the use of a respirator unless he or she is physically able to perform the operation while using the respirator.

- .2 Disposable type protective clothing that does not readily retain or permit penetration of asbestos fibres. Protective clothing to be provided by the employer and worn by every worker who enters the work area, and the protective clothing to consist of a head covering and full body covering that fits snugly at the ankles, wrists and neck, in order to prevent asbestos fibres from reaching the garments and skin under the protective clothing. It includes suitable footwear, and it to be repaired or replaced if torn.
- .2 Eating, drinking, chewing, and smoking are not permitted in Asbestos Work Area.
- .3 Before leaving Asbestos Work Area, the worker can decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing, or, if the protective clothing will not be reused, place it in a container for dust and waste. The container to be dust tight, suitable for asbestos waste, impervious to asbestos, identified as asbestos waste, cleaned with a damp cloth or a vacuum equipped with a HEPA filter immediately before removal from the work area, and removed from the work area frequently and at regular intervals.
- .4 Facilities for washing hands and face shall be provided within or close to the Asbestos Work Area.
- .5 Ensure workers wash hands and face when leaving Asbestos Work Area.
- .6 Ensure that no person required to enter an Asbestos Work Area has facial hair that affects seal between respirator and face.
- .7 Visitor Protection:
 - .1 Provide protective clothing and approved respirators to Authorized Visitors to work areas.
 - .2 Instruct Authorized Visitors in the use of protective clothing, respirators, and procedures.
 - .3 Instruct Authorized Visitors in proper procedures to be followed in entering into and exiting from Asbestos Work Area.

34.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .2 Collect and separate for disposal polystyrene, paper, plastic, corrugated cardboard, packaging material for recycling.
- .3 Separate for recycling and reuse and place in designated containers.
- .4 Place materials defined as hazardous or toxic in designated containers.
- .5 Handle and dispose of hazardous materials in accordance with the CEPA, TDG Act, Regional and Municipal regulations.
- .6 Fold up metal banding, flatten and place in designated area for recycling.
- .7 Disposal of asbestos waste generated by removal activities must comply with Federal, Provincial and Municipal regulations. Dispose of asbestos waste in sealed double thickness 6 mils bags or leak proof drums. Label containers with appropriate warning labels.

- .8 Provide manifests describing and listing waste created. Transport containers by approved means to licensed landfill for burial.

34.7 EXISTING CONDITIONS

- .1 Reports and information pertaining to ACMs to be handled, removed, or otherwise disturbed and disposed of during this project are attached as Appendix A. These are for general information only and are not necessarily representative of asbestos containing materials covered within scope of this Project.
- .2 Notify the Owner of suspect material discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material pending instructions from the Owner.

34.8 SCHEDULING

- .1 Not later than ten (10) days before beginning Work on this Project notify following in writing:
 - .1 The Owner.
 - .2 OHS.
 - .3 Disposal Authority.
- .2 Inform sub-trades of presence of asbestos containing materials identified in Existing Conditions.
- .3 Submit to the Owner copy of notifications before start of Work.

34.9 PERSONNEL TRAINING

- .1 Before beginning Work, provide the Owner satisfactory proof that every worker has had instruction and training in hazards of asbestos exposure, in personal hygiene and work practices, and in use, cleaning, and disposal of respirators and protective clothing.
- .2 Instruction and training related to respirators includes, following minimum requirements:
 - .1 Fitting of equipment.
 - .2 Inspection and maintenance of equipment.
 - .3 Disinfecting of equipment.
 - .4 Limitations of equipment.
- .3 Instruction and training must be provided by a competent, qualified person.
- .4 Supervisory personnel to complete required training as outlined in this section.

Part 35 Products

35.1 MATERIALS

- .1 Drop and Enclosure Sheets:
 - .1 Polyethylene: 6 mil thick.
 - .2 FR polyethylene: 6 mil thick woven fibre reinforced fabric bonded both sides with polyethylene.

- .2 Wetting Agent: 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with water in concentration to provide thorough wetting of asbestos containing material.
- .3 Waste Containers: contain waste in two separate containers.
 - .1 Inner container: 6 mil thick sealable polyethylene waste bag.
 - .2 Outer container: sealable metal or fibre type where there are sharp objects included in waste material; otherwise, outer container may be sealable metal or fibre type or second 6 mil thick sealable polyethylene bag.
 - .3 Labelling requirements: affix preprinted cautionary asbestos warning, in both official languages, that is visible when ready for removal to disposal site. Label containers in accordance with OHS requirements. Label in both official languages.
- .4 Glove bag:
 - .1 Acceptable materials: safe-T-Strip products in configuration suitable for Work, or Alternative material approved by addendum during tendering period in accordance with Instructions to Tenderers.
 - .2 The glove bag to be equipped with:
 - .1 Sleeves and gloves that are permanently sealed to the body of the bag to allow the worker to access and deal with the insulation and maintain a sealed enclosure throughout the work period.
 - .2 Valves or openings to allow insertion of a vacuum hose and the nozzle of a water sprayer while maintaining the seal to the pipe, duct, or similar structure.
 - .3 A tool pouch with a drain.
 - .4 A seamless bottom and a means of sealing off the lower portion of the bag.
 - .5 A high strength double throw zipper and removable straps if the bag is to be moved during the removal operation.
- .5 Slow - drying sealer: non-staining, clear, water - dispersible type that remains tacky on surface for at least 8 hours and designed for purpose of trapping residual asbestos fibres.
- .6 Tape: fibreglass - reinforced duct tape suitable for sealing polyethylene under both dry conditions and wet conditions using amended water.
- .7 Encapsulant: surface film forming or penetrating type conforming to CAN/CGSB-1.205.
- .8 Provide 24-volt safety lighting and ground fault interrupter (GFI) circuits on power source for electrical tools, in accordance with applicable CSA Standard. Ensure safe installation of electrical cables and equipment.

Part 36 Execution

36.1 SUPERVISION

- .1 Minimum of one (1) Supervisor for every ten (10) workers is required.
- .2 Approved Supervisor must remain within Asbestos Work Area during disturbance, removal, or other handling of asbestos-containing materials.

36.2 PRE-JOB PLANNING

- .1 Establish the Work procedures to be followed and assemble the equipment required to perform the job.
- .2 Submit a completed Asbestos Project Notification form to Prevention Services to OHS.
- .3 Ensure all equipment fitted with HEPA filters has been tested before the job commences.
- .4 Ensure workers are adequately trained in the hazards and proper methods of working with asbestos.
- .5 Procedures to deal with emergencies such as fire or injury must be developed and in place prior to work starting. Where a containment is used, a worker should be stationed outside the containment to respond to emergencies and contact rescue personnel, if required.

36.3 SITE PREPARATION

- .1 Barriers and warning signs should be positioned in areas where access needs to be restricted until the work is completed. Details of the warning sign are listed in this Section in Part 3.4.1.
- .2 Clearly mark the boundary of the work area by placing barricades, fencing or similar structures around it.
- .3 Prior to starting any Work that is likely to disturb friable asbestos-containing materials, the materials must be cleaned by damp wiping or vacuuming with a vacuum cleaner fitted with a HEPA filter.
- .4 All air handling and ventilation systems that could cause asbestos fibres to be distributed, disturbed or become airborne as a result of the work should be shut down before work begins.
- .5 Lock-out and isolate all electrical and mechanical equipment within the work area.
- .6 Electrical power for abatement work should be supplied through a GFI.
- .7 If required, a containment should be constructed using 6 mil thick polyethylene sheeting. The containment should be less than 9.3 m² (100 ft²) in size. A HEPA filtered exhaust unit should be connected to the containment to provide negative pressure for the duration of the project.
- .8 A worker decontamination room should be attached to the containment.

36.4 PROCEDURES

- .1 Before beginning Work, at each access to Asbestos Work Area, install warning signs in both official languages in upper case 'Helvetica Medium' letters reading as follows, where number in parentheses indicates font size to be used: 'CAUTION ASBESTOS HAZARD AREA (25 mm)/NO UNAUTHORIZED ENTRY (19 mm)/WEAR ASSIGNED PROTECTIVE EQUIPMENT (19 mm)/BREATHING ASBESTOS DUST MAY CAUSE SERIOUS BODILY HARM (7 mm)'.
 - .1 Use HEPA vacuum or damp cloths where damp cleaning does not create hazard and is otherwise appropriate.
- .2 Before beginning Work remove visible dust from surfaces in work area where dust is likely to be disturbed during course of work.

- .2 Do not use compressed air to clean up or remove dust from any surface.
- .3 Prevent spread of dust from Asbestos Work Area using measures appropriate to work to be done.
 - .1 Use FR polyethylene drop sheets over flooring such as carpeting that absorbs dust and over flooring in work areas where dust or contamination cannot otherwise be safely contained.
 - .2 When removing suspended ceilings and walls themselves do not enclose work area and when removing asbestos containing material from piping or equipment and "glove bag" method is not used, erect enclosure of polyethylene sheeting around work area, shut off mechanical ventilation system serving work area and seal ventilation ducts to and from work area.
- .4 Before removing suspended ceilings, remove friable material on upper surfaces using HEPA vacuum equipment.
 - .1 Remove and clean surfaces of ceiling panels using HEPA vacuum, wrap clean panels in 0.10 mm thick polyethylene, and store in building as directed by the Owner.
 - .2 Clean "T" grid suspension system, disconnect, wrap in 0.10 mm thick polyethylene.
- .5 Remove loose material by HEPA vacuum; thoroughly wet friable material containing asbestos to be removed or disturbed before and during Work unless wetting creates hazard or causes damage.
 - .1 Use garden reservoir type low - velocity sprayer or airless spray equipment capable of producing mist or fine spray.
 - .2 Perform Work in a manner to reduce dust creation to lowest levels practicable.
- .6 Pipe Insulation Removal Using Glove Bag:
 - .1 A glove bag not to be used to remove insulation from a pipe, duct, or similar structure if:
 - .1 It may not be possible to maintain a proper seal for any reason including, without limitation:
 - .1 The condition of the insulation.
 - .2 The temperature of the pipe, duct, or similar structure.
 - .2 The bag could become damaged for any reason including, without limitation.
 - .1 The type of jacketing.
 - .2 The temperature of the pipe, duct, or similar structure.
 - .2 Upon installation of the glove bag, inspect bag for any damage or defects. If any damage or defects are found, the glove bag is to be repaired or replaced. The glove bag to be inspected at regular intervals for damage and defects, and repair or replaced, as appropriately. The asbestos containing contents of the damaged or defective glove bag found during removal are to be wetted and the glove bag and its contents are to be removed and disposed of in an appropriate waste disposal container. Any damaged or defective glove bags are not to be reused.
 - .3 Place tools necessary to remove insulation in tool pouch. Wrap bag around pipe and close zippers. Seal bag to pipe with cloth straps.

- .4 Place hands in gloves and use necessary tools to remove insulation. Arrange insulation in bag to obtain full capacity of bag.
- .5 Insert nozzle of garden reservoir type sprayer into bag through valve and wash down pipe and interior of bag thoroughly. Wet surface of insulation in lower section of bag.
- .6 To remove bag after completion of stripping, wash top section and tools thoroughly. Remove air from top section through elasticized valve using a HEPA vacuum. Pull polyethylene waste container over glove bag before removing from pipe. Release one strap and remove freshly washed tools. Place tools in water. Remove second strap and zipper. Fold over into waste container and seal.
- .7 After removal of bag ensure that pipe is free of residue. Remove residue using HEPA vacuum or wet cloths. Ensure that surfaces are free of sludge which after drying could release asbestos dust into atmosphere. Seal exposed surfaces of pipe and ends of insulation with slow drying sealer to seal in any residual fibres.
- .8 Upon completion of Work shift, cover exposed ends of remaining pipe insulation with polyethylene taped in place.
- .7 Work is subject to visual inspection and air monitoring. Contamination of surrounding areas indicated by visual inspection or air monitoring will require complete enclosure and clean-up of affected areas.
- .8 Cleanup:
 - .1 Frequently during Work and immediately after completion of work, clean up dust and asbestos containing waste using HEPA vacuum or by damp mopping.
 - .2 Place dust and asbestos containing waste in sealed dust tight waste bags. Treat drop sheets and disposable protective clothing as asbestos waste and wet and fold to contain dust and then place in waste bags.
 - .3 Immediately before their removal from Asbestos Work Area and disposal, clean each filled waste bag using damp cloths or HEPA vacuum and place in second clean waste bag.
 - .4 Seal and remove double bagged waste from site. Dispose of in accordance with requirements of Provincial and Federal authority having jurisdiction. Supervise dumping and ensure that dump operator is fully aware of hazardous nature of material to be dumped and that guidelines and regulations for asbestos disposal are followed.
 - .5 Perform final thorough clean-up of Asbestos Work Areas and adjacent areas affected by Work using HEPA vacuum.

36.5

AIR MONITORING

- .1 From beginning of Work until completion of cleaning operations, the Contractor shall arrange for air samples to be collected by a third party on a daily basis, including occupational air samples and air samples outside of Asbestos Work Area enclosure(s) in accordance with Provincial Occupational Health and Safety Regulations.
 - .1 Contractor will be responsible for monitoring inside enclosure in accordance with applicable Provincial Occupational Health and Safety Regulations.
- .2 If air monitoring shows that areas outside Asbestos Work Area enclosure(s) are contaminated, enclose, maintain, and clean these areas in same manner as that applicable to Asbestos Work Area.
- .3 Ensure that respiratory safety factors are not exceeded.

.4 During the course of Work, measure fibre content of air outside Work areas by means of air samples analyzed by Phase Contrast Microscopy (PCM).

.1 Stop Work when PCM measurements exceed 0.01 f/cc and correct procedures.

36.6 INSPECTION

.1 The Owner, or a representative of the Owner, will perform an inspection of the Asbestos Work Area to confirm compliance with specification and governing authority requirements. Deviations from these requirements that have not been approved in writing by the Owner may result in Work stoppage, at no cost to Owner.

.2 The Owner will inspect Work for:

.1 Adherence to specific procedures and materials.

.2 Final cleanliness and completion.

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

.3 When asbestos leakage from Asbestos Work Area has occurred or is likely to occur the Owner may order Work shutdown.

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

END OF SECTION

Part 37 General

37.1 RELATED REQUIREMENTS

.1 Section 02 81 00 – Hazardous Materials

.2 Section 02 82 00.01 – Asbestos Abatement – Minimum Precautions

.3 Section 02 82 00.02 – Asbestos Abatement – Intermediate Precautions

37.2 REFERENCE STANDARDS

.1 American Board of Industrial Hygiene (ABIH)

.2 Canadian Council of Ministers of the Environment (CCME)

.1 PN1205-1995, PCB Transformer Decontamination: Standards and Protocols.

.3 Department of Justice Canada (Jus)/CEPA SOR/92-507-SOR/2000-102, Storage of PCB Material Regulations

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

.4 Environment Canada

.1 Manual for Spills of Hazardous Materials-1985.

.5 National Research Council Canada (NRC)

.1 National Fire Code of Canada 2015 (NFC).

.6 Transport Canada (TC)

- .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
- .7 Chlorobiphenyls Regulations (SOR/91-152; Amended SOR/2000-102)
 - .1 Regulations Respecting Mobile System for the Destruction and Treatment of Chlorobiphenyls that are Operated by or Under Contract with Federal Institutions (SOR/90-5; amended SOR/93-231 and SOR/2000-105).
 - .2 Regulations Respecting the Storage of Material Containing Chlorobiphenyls (PCBs) SOR/92-507, Amended SOR/2000-102).
 - .3 Regulations Respecting the Import and Export of Hazardous Wastes (SOR/92-637; Amended 94-459; SOR 94-684; SOR/2000-103).
 - .4 Waste Management - PCBs, R.R.O. Regulation 362/90.
 - .5 Mobile PCB Destruction Facilities, R.R.O. Regulation 352/90.
 - .6 Regulation 347, General Waste Management, as Amended.

37.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prior to starting work, Contractor performing work of this section to provide:
 - .1 Workplace Safety and Insurance Board Clearance Certificate.
 - .2 Insurance certificates.
 - .3 Company Health and Safety Policy.
 - .4 Certificate of Approval for Transportation of PCB Waste and Location of Destruction Facility.
 - .5 WHMIS Training Certificates for Personnel.
 - .6 Safety Data Sheets for chemicals or material to be used.

37.4 CONTROL SUBMITTALS

- .1 Co-ordinate procedural requirements with Section 01 45 00 - Quality Control.
- .2 Record keeping: maintain and make available for review by the Owner.
 - .1 Receipt of waste showing:
 - .1 Date of receipt of waste.
 - .2 Description of PCB waste including nameplate description, serial number, PCB registration number and quantity.
 - .3 Condition of PCB waste.
 - .4 Source of PCB waste.
 - .5 Name of carrier of PCB waste.
 - .6 Name of individual who accepted receipt of PCB waste.
 - .2 Removal of waste showing:
 - .1 Date of removal of PCB waste.
 - .2 Description of PCB waste including nameplate description, serial number, PCB registration number and quantity.
 - .3 Condition of PCB waste.
 - .4 Name of carrier of PCB waste.
 - .5 Destination of PCB waste.

- .6 Name of individual authorizing transport of PCB waste.
- .3 Monthly inspection, repair and replacement reports.
- .4 Submit records to the Owners as requested.

37.5 QUALITY ASSURANCE

- .1 Co-ordinate with Section 01 45 00 - Quality Control.
- .2 Instruct personnel on dangers of PCB exposure, respirator use, decontamination and applicable Federal, Provincial and Municipal Regulations.
- .3 Complete work so that at no time do PCB's contaminate the site environment.

37.6 SUPERVISION

- .1 Provide on site, a supervisor, with authority to oversee health and safety, remediation methods, scheduling, labour and equipment requirements.
- .2 One supervisor for every 10 workers is required.

37.7 DELIVERY, STORAGE AND HANDLING

- .1 Place materials defined as hazardous or toxic in designated containers.
- .2 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.
- .3 Disposal of PCB waste generated by removal activities must comply with Federal, Provincial, and Municipal regulations.
 - .1 Dispose of PCB waste in leak proof drums.
 - .2 Containers must be labelled with appropriate warning labels.
- .4 Create manifests describing and listing waste created and transport containers by approved means to licenced facility for storage.
 - .1 For each bulk load of PCBs: identity PCB waste, earliest date of removal from service for disposal, and weight in kilograms of the PCB waste.
 - .2 For each PCB Article Container or PCB Container: unique identifying number, type of PCB waste (i.e., soil, debris, small capacitors), earliest date of removal from service for disposal, and weight in kilograms of PCB waste contained.
 - .3 For each PCB Article not in PCB Container or PCB Article Container: serial number if available, or other identification if there is no serial number, date of removal from service for disposal, and weight in kilograms of PCB waste in each PCB Article.

Part 38 Products

38.1 STORAGE GENERAL

- .1 Storage of PCB materials in accordance with CEPA SOR/92-507 and the authority having jurisdiction.

38.2 STORAGE CONTAINERS

- .1 Exterior containers:

- .1 Structurally-sound and weather-sealed to hold PCB solids, PCB light ballasts, drained PCB containers or drained PCB equipment.
- .2 PCB storage.
 - .1 Drums and containers:
 - .1 Designed with sufficient durability and strength to prevent PCB from being released into environment, affected by weather, or contaminated by external sources.
 - .2 Steel, other material approved by the Owner.
 - .2 Drums:
 - .1 Capacity no greater than 205 litres.
 - .2 Steel of minimum 1.52 mm for liquids and 1.2 mm for solids.
 - .3 Ensure closed-head double-bung steel drum with removable steel lid securely attached and complete with PCB-resistant gasket for solids.
 - .4 Paint or treat to prevent rusting.
 - .3 Drum Liners:
 - .1 6 mil clear polyethylene bag, 914 mm x 1524 mm, with opening at 914 mm end.

38.3 WARNING SIGNS AND LABELS

- .1 Label capacitors containing 0.5 kilogram or more of chlorobiphenyls with black and white serialized label, measuring 76 x 76 mm, as approved by the Owner in accordance with Manual of Spills of Hazardous Materials.
- .2 Label container with a capacitor containing 0.5 kg or more of chlorobiphenyls with black and white serialized, "ATTENTION PCB" label, measuring 150 x 150 mm, as approved by the Owner in accordance with Manual of Spills of Hazardous Materials.
- .3 Label doors to storage sites, fencing and other security barriers enclosing storage sites with non-serialized, black and white, "ATTENTION PCB" label, measuring 150 x 150 mm the Owner.
- .4 Maintain signs and labels in clear and legible condition.

Part 39 Execution

39.1 GENERAL

- .1 Store PCB waste materials to CEPA SOR/92-507.
- .2 Select PCB removal procedure to minimize contamination of work areas with PCB or other PCB-contaminated debris/waste. Handle PCBs such that no skin contact occurs.
- .3 As feasible, do not carry out PCB handling operations in confined spaces. Confined space means space having limited means of egress and inadequate cross ventilation.
- .4 Ensure that work operations or processes involving PCB or PCB-contaminated materials are conducted in accordance with Federal, Provincial and Municipal Regulations and applicable requirements of this Section, including but not limited to:
 - .1 Obtaining advance approval of PCB storage sites.

- .2 Notify the Owner prior to beginning operations.
- .3 Report leaks and spills to the Owner.
- .4 Maintain access log of employees working in PCB control area and provide copy to the Owner upon completion of operations.
- .5 Inspect PCB and PCB-contaminated items and waste containers for leaks and forward copies of inspection reports to the Owner.
- .6 Maintain spill kit for emergency spills entitled "PCB Spill Kit".
- .7 Maintain inspection, inventory and spill records.

39.2 ACCESS TO STORAGE SITE

- .1 Keep entrance to site locked or guarded.
- .2 Maintain register at site containing name, address, telephone number and place of business of each person who enters or is authorized to enter site.
- .3 Permit only authorized personnel to enter site.

39.3 ACCESS TO STORED MATERIAL

- .1 Store materials and equipment to permit easy access for inspection.

39.4 STORAGE PRACTICES

- .1 Stack containers only if designed for stacking.
- .2 Stack liquid containers or drums no higher than 2 containers.
- .3 Separate stacked drums from each other with pallets.
- .4 Store material to prevent it catching fire.
- .5 Store material to prevent it being released.
- .6 Store PCB material together, and away from other stored materials.
- .7 Exterior:
 - .1 Cover PCB liquid containers with waterproof roof or cover extending beyond curbing or sides of container.
 - .2 Elevate PCB waste containers and PCB equipment on pallets or other suitable devices to reduce corrosion.
 - .3 Store transformers on skids.
- .8 Interior:
 - .1 Place on skids or pallets PCB equipment and containers of PCB material not permanently secured to floor or surface.

39.5 SANITATION

- .1 Promptly wash liquid-contaminated skin with soap or mild detergent and water.

39.6 FIELD QUALITY CONTROL

- .1 Owners or Operators of Storage Sites:

- .1 Inspect storage site monthly and repair or replace, if necessary, PCB equipment, floors, drains, drainage systems, waterproof roofs or barriers, fire prevention apparatus, personnel protection equipment, security fences and materials used for clean-up at site.
- .2 Immediately repair or replace drum, container or equipment found to be leaking PCBs.
- .3 Immediately clean up contaminated area.
- .4 Ensure controlled access to storage site to prevent entry by unauthorized persons.

END OF SECTION

Part 40 General

40.1 RELATED REQUIREMENTS

- .1 Section 02 41 16 Structure Demolition.

40.2 REFERENCE STANDARDS

- .1 ASTM International (ASTM)
 - .1 ASTM D698-00ae1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m³).
 - .2 Underwriters' Laboratories of Canada (ULC)
 - .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
 - .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

40.3 DEFINITIONS

- .1 Unclassified excavation: excavation of deposits of whatever character encountered in Work.
- .2 Topsoil:
 - .1 Material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.
 - .2 Material reasonably free from subsoil, clay lumps, brush, objectionable weeds, and other litter, and free from cobbles, stumps, roots, and other objectionable material larger than 25 millimeters in any dimension.
- .3 Waste material: excavated material unsuitable for use in Work or surplus to requirements.
- .4 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.
- .5 Recycled fill material: material, considered inert, obtained from alternate sources and engineered to meet requirements of fill areas.
- .6 Unsuitable materials:
 - .1 Weak, chemically unstable, and compressible materials.

- .2 Frost susceptible materials.
- .7 Unshrinkable fill: very weak mixture of cement, concrete aggregates and water that resists settlement when placed in utility trenches, and capable of being readily excavated.

40.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Quality Control: in accordance with Section 01 45 00 - Quality Control.
- .3 Preconstruction Submittals:
 - .1 Submit construction equipment list for major equipment to be used in this section prior to start of Work.
- .4 Samples:
 - .1 Inform the Owner at least four (4) weeks prior to beginning Work, of proposed source of fill materials.

40.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for recycling or reuse in accordance with Section 01 74 19 - Waste Management and Disposal.

40.6 EXISTING CONDITIONS

- .1 Protect permafrost on-site and around site, do not damage undisturbed permafrost.
- .2 Buried services:
 - .1 Before commencing work verify location of buried services on and adjacent to site, if any.
 - .2 Arrange with appropriate authority for relocation of buried services that interfere with execution of work: pay costs of relocating services.
 - .3 Remove obsolete buried services: cap cut-offs.
 - .4 Prior to beginning excavation Work, notify the Owner the location and state of use of buried utilities and structures.
 - .5 Confirm locations of buried utilities by careful soil hydrovac methods.
 - .6 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered.
 - .7 Record location of maintained, re-routed and abandoned underground lines.
 - .8 Confirm locations of recent excavations adjacent to area of excavation.
- .3 Existing buildings and surface features:
 - .1 Conduct, with the Owner, condition survey of existing buildings, plants, fencing, service poles, wires, rail tracks, pavement, survey benchmarks and monuments which may be affected by Work.
 - .2 Protect existing buildings and surface features from damage while Work is in progress. In event of damage, immediately make repair as directed by the Owner.

Part 41 Products

41.1 MATERIALS

- .1 Type 2 Granular fill:
 - .1 Clean, well-graded, free draining, non-frost susceptible granular material, free of organics, lumps of clay, etc. - crushed, pit run or screened stone, gravel or sand.
 - .2 Gradations to be within limits specified when tested to ASTM C136. Sieve sizes to CAN/CGSB-8.1.

.3 Table

Sieve Designation	% Passing
75 mm	100
4.75 mm	22-85
0.425 mm	5-30
0.075 mm	0-10

Part 42 Execution

42.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

42.2 SITE PREPARATION

- .1 Remove obstructions, ice and snow, from surfaces to be excavated, if any.

42.3 PREPARATION/PROTECTION

- .1 Protect existing features in accordance with Section 01 56 00 - Temporary Barriers and Enclosures and applicable local regulations.
- .2 Keep excavations clean, free of standing water, and loose soil.
- .3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to the Owner's approval.
- .4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction.
- .5 Protect buried services that are required to remain undisturbed.

42.4 STOCKPILING

- .1 Stockpile fill materials in areas designated by the Owner.
 - .1 Stockpile granular materials in manner to prevent segregation.
- .2 Protect fill materials from contamination.
- .3 Implement sufficient erosion and sediment control measures to prevent sediment release off construction boundaries and into water bodies.

42.5 DEWATERING AND HEAVE PREVENTION

- .1 Keep excavations free of water while Work is in progress.

42.6 BEDDING AND SURROUND OF UNDERGROUND SERVICES

- .1 Place and compact granular material for bedding and surround of underground services as required.
- .2 Place bedding and surround material in unfrozen condition.

42.7 BACKFILLING

- .1 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
- .2 Do not use backfill material which is frozen or contains ice, snow or debris.
- .3 Proof roll and place backfill material in uniform layers not exceeding 150 mm compacted. Compact each layer to a minimum of 95% of Maximum Dry Density determined in accordance with ASTM D698 before placing succeeding layer.

42.8 RESTORATION

- .1 Upon completion of Work, remove waste materials and debris in accordance to Section 01 74 19 - Waste Management and Disposal, trim slopes, and correct defects as directed by the Owner.
- .2 Replace topsoil as indicated the Owner.
- .3 Reinstate pavements and sidewalks disturbed by excavation to thickness, structure and elevation which existed before excavation.
- .4 Clean and reinstate areas affected by Work as directed by the Owner.
- .5 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

END OF SECTION



Hazardous Building Materials Assessment Revision 01 113B McDermot Avenue Fort Chipewyan, Alberta



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EXECUTIVE SUMMARY

Introduction

Parks Canada Agency (Parks Canada) retained Tetra Tech Canada Inc. (Tetra Tech) to conduct a Hazardous Building Materials Assessment (HBMA) for a residential building located at 113B McDermot Avenue in Fort Chipewyan, Alberta (AB), hereinafter referred to as the “subject building”.

Tetra Tech understands that Parks Canada required this HBMA to identify potential liabilities and risks associated with environmental and public health considerations (if any) prior to demolition and/or renovations of the subject building.

Asbestos Containing Materials

Based on the analytical results from the 54 suspected asbestos containing material (ACM) samples submitted for analysis, two (2) building materials were determined to have an asbestos content greater than 1%. The ACMs identified were the grey vinyl floor tiles (VFT01) identified throughout the main floor of the subject building, including beneath the engineered wood floor of Bedroom 2, and the drywall joint compound (DWJC).

Prior to demolition of the subject building, the VFT and DWJC should be removed following moderate-risk abatement activities outlined in Section 5.3 of the *Alberta Asbestos Abatement Manual* (Government of Alberta 2019).

All materials encountered in the subject building suspected to be potential ACMs were sampled (i.e. no encountered materials were left unsampled). If any material identified during (potential) demolition activities that was not assessed within this report, Tetra Tech recommends that the material be left in place until a competent individual conducts sampling of the material with submission to an accredited laboratory for analysis. Upon confirmation the material is an ACM, a risk assessment should then be conducted to determine safe work procedures for abatement.

Lead Surface Coatings

One (1) suspect lead-based paint (LBP) colour was encountered in the subject building, and it was sampled. Tetra Tech submitted one (1) paint sample for analysis of total lead concentration. Based on the analytical results, no paints were determined to be lead-based. The total lead concentration for paint sample P001 was less than the referenced guideline of 90.0 mg/kg.

Other Hazardous Building Materials

The following table summarizes the other hazardous building materials observed in the subject building:

Hazardous Building Material Removal and Disposal Recommendations

Hazardous Building Material	Observation During Assessment	Recommendations
Lead in pipe solder	Misc. copper pipes in the basement	Tetra Tech recommends that any copper piping and lead solder be removed within the subject building and recycled. If it is not recycled, solder associated with piping should be removed, segregated, and disposed of as hazardous waste in accordance with the requirements of the Alberta <i>Environmental Protection and Enhancement Act</i> [EPEA], the Alberta <i>Occupational Health and Safety (OH&S) Code</i> , and the <i>Transportation of Dangerous Goods (TDG) Act</i> (GC 1992),
Polychlorinated Biphenyls (PCBs)	One (1) fluorescent light ballast assumed to be PCB-containing	Tetra Tech recommends that any light ballasts be checked in accordance with the <i>Identification of Lamp Ballasts Containing PCBs</i> (Environment Canada [EC] 1991) and if they are identified as PCB-containing, disposed of, or recycled in accordance with the Alberta <i>EPEA</i> , the Alberta <i>OH&S Code</i> , and the <i>TDG Act</i> .
Radioactive Materials	One (1) smoke detector	Tetra Tech recommends that any smoke detectors be inspected and if they contain more than 70 kBq/kg, they should be removed and disposed of in accordance with the <i>Nuclear Safety and Control Act</i> (GC 1997), the <i>Nuclear Substances and Radiation Devices Regulations</i> (GC 2000, amended 2015), and the <i>TDG Act</i> .
Mercury-Containing Equipment	Two (2) fluorescent tube bulbs	Tetra Tech recommends that any fluorescent bulbs be recycled or disposed of in accordance with the Alberta <i>EPEA</i> , the Alberta <i>OH&S Code</i> , and the <i>TDG Act</i> .

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Appendix B	Photo Pages
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ACRONYMS & ABBREVIATIONS

AB	Alberta
ACM	Asbestos Containing Material
AEP	Alberta Environment and Parks
ASME	American Society of Engineers
AST	Aboveground Storage Tank
CCOHS	Canadian Centre for Occupational Health and Safety
CEPA	Canadian Environmental Protection Act
CFC	Chlorofluorocarbons
CSA	Canadian Standards Association
CT	Ceiling Tile
CTEX	Ceiling Texture (stucco)
DWJC	Drywall Joint Compound
EPA	Environmental Protection Agency
EPEA	Alberta Environmental Protection and Enhancement Act
FLHA	Field Level Hazard Assessment
GC	Government of Canada
HBMA	Hazardous Building Materials Abatement
HCFC	Hydrochlorofluorocarbons
HPA	Hazardous Products Act
HRSDC	Human Resources Skills Development Canada
INSUL	Insulation
kBq	Kilobecquerel
km	Kilometre
LBP	Lead-based Paint
mg	Milligram
NPC	National Plumbing Code
ODS	Ozone-Depleting Substances
OEL	Occupational Exposure Limits
OH&S	Occupational Health and Safety
PCB	Polychlorinated Biphenyls
PPE	Personal Protective Equipment
TCLP	Toxicity Characteristic Leachate Properties
TDG	Transportation of Dangerous Goods
Tetra Tech	Tetra Tech Canada Inc.
TP	Tar Paper
UFFI	Urea Formaldehyde Foam Insulation
UST	Underground Storage Tank
VFT	Vinyl Floor Tile

LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Parks Canada Agency and their agents. Tetra Tech Canada Inc. (Tetra Tech) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Parks Canada Agency or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this report is subject to the terms and conditions stated in the Services Agreement. Tetra Tech's Limitations on the Use of this Document are provided in Appendix A of this report.

1.0 INTRODUCTION

Parks Canada Agency (Parks Canada) retained Tetra Tech Canada Inc. (Tetra Tech) to conduct a Hazardous Building Materials Assessment (HBMA) for a residential building located at 113B McDermot Avenue in Fort Chipewyan, Alberta (AB), hereinafter referred to as the “subject building”.

Tetra Tech understands that Parks Canada required this HBMA to identify potential liabilities and risks associated with environmental and public health considerations (if any) prior to demolition and/or renovations of the subject building.

1.1 SCOPE OF WORK

The scope of services for the HBMA is outlined below.:

- Review of previous reports provided to Tetra Tech to determine data gaps, thus preparing a sampling plan.
- Prepared a Field Level Hazard Assessment (FLHA) for the work including provisions for COVID-19.
- Intrusive (destructive) assessment of select areas of the subject building (where possible) for the collection of the following suspect hazardous building materials:
 - Asbestos-containing materials (ACMs)
 - Surface coatings analyzed for leachable lead
- Completed visual assessments for items listed as “hazardous waste” as follows:
 - Equipment containing polychlorinated biphenyl (PCB)
 - Mercury-containing equipment
 - Urea Formaldehyde Foam Insulation (UFFI)
 - Ozone depleting substances (ODS)
 - Aboveground Storage Tanks (ASTs)
 - Evidence of Underground Storage Tanks (USTs)
 - Radioactive equipment
 - Glycol in heating units
 - Biological hazards, including mould and rodent droppings
 - Miscellaneous chemicals
 - Silica
- Interpretation of analytical data and prepared this report detailing the findings of the assessment outlining hazardous building materials identified within the subject building.

Abatement specifications and abatement cost estimate were completed under a separate header.

2.0 REGULATIONS AND GUIDELINES

Where applicable, Tetra Tech utilized the reference documents and regulatory guidance for the completion of this work listed in this section.

2.1 FEDERAL OCCUPATIONAL HEALTH AND SAFETY REGULATIONS

Within federal jurisdictions, Occupational Health and Safety (OH&S) is regulated by Human Resources Skills Development Canada (HRSDC), under the Canada Labour Code, Part II – Occupational Health and Safety. The Canada Labour Code defines the general duties and obligations of the employer, employees, and others at federally regulated workplaces.

The Government of Canada (GC) Employment and Social Development Canada published the *Technical Guideline to Asbestos Exposure Management Programs* which applies to workplaces governed by the federal government. The technical guideline's mandate is to help safety professionals, employees, and employers to identify and evaluate airborne asbestos fibre exposures in the workplace.

2.2 PROVINCIAL OCCUPATIONAL HEALTH AND SAFETY REGULATIONS

The regulations, guidelines, and codes relevant to the management and abatement of hazardous materials include the *Alberta Occupational Health and Safety (OH&S) Act, Code, and Regulations*, the “*Alberta Asbestos Abatement Manual*”, (Government of Alberta 2019), and the *Alberta Environmental Protection and Enhancement Act*.

The *Alberta Occupational Health and Safety Code* (the OH&S Code) is a law which was passed to protect the health and safety of workers on the job. The *Alberta OH&S Code* and the sections under the *Alberta OH&S Code* are enforceable by law. The *Alberta OH&S Code* places the onus on both the employer and the employees to ensure a safe working environment.

Part 4 of the OH&S Code (Chemical Hazards, Biological Hazards, and Harmful Substances) represents minimum requirements and specifies, among many other things, the general requirements for working with and around harmful substances. Control of worker exposure to airborne contaminants is detailed, and the occupational exposure limits are specified in Schedule 1 of the *Alberta Occupational Health and Safety Regulations* (2021 Edition).

2.3 ENVIRONMENTAL REGULATIONS

In Alberta, environmental matters pertaining to waste generally fall under the jurisdiction of Alberta Environment and Parks (AEP). The waste legislation under AEP relating to the disposal of hazardous building materials is the *Alberta EPEA*, Subsection 191.

The *Alberta EPEA* refers to the handling, storage, transportation, treatment, recycling, and disposal of special wastes in the province. The *Alberta EPEA* outlines the materials and criteria to be used to characterize waste as hazardous.

2.4 TRANSPORTATION REGULATIONS

The transportation of hazardous wastes is governed under the 1992 *Federal Transportation of Dangerous Goods (TDG) Act and Regulations* which outline the requirements for storage, handling, and transportation of such waste (GC 1992).

2.5 HAZARDOUS MATERIALS REGULATIONS

2.5.1 Asbestos-Containing Materials

Part 4 and Schedule 1 – Table 2 in the *Alberta OH&S Code* outlines the general requirements to be followed when working with asbestos. It also defines occupational exposure limits (OEL) for a variety of airborne contaminants.

The OEL for a particular contaminant represents conditions to which it is believed that nearly all workers may be exposed, day after day, without suffering adverse health effects. Due to individual susceptibility, a small percentage of workers may experience discomfort at concentrations below the applicable OEL. An eight-hour OEL refers to the average concentration of a substance over an eight-hour period.

Sections 30 through 40 in Part 4 of the *Alberta OH&S Code* outline the requirements related to asbestos in facilities. Sections 32 through 35 specifically outline the limitations on the use of asbestos in buildings. The requirements of Sections 32 through 35 are summarized below:

- Asbestos products that have the potential for releasing fibres are considered to be in an unsafe condition.
- All materials containing crocidolite are banned from use.
- Spray-applied asbestos products are banned from use.
- Asbestos products, in general, must not be in a form or location where they could release airborne fibres and allow them to enter a ventilation system.
- Buildings to be demolished are to have all materials with the potential of releasing asbestos fibres removed.
- Buildings to be altered or renovated are to have all material that could release asbestos fibres encapsulated, enclosed, or removed.

The Government of Alberta, Employment and Immigration published the “*Alberta Asbestos Abatement Manual*” (Government of Alberta 2019). This manual outlines the best practices to be followed during asbestos abatement. It also presents basic information on asbestos and asbestos products, health hazards, requirements for worker protection, safe work procedures, inspection criteria, applicable legislation, and competency profiles for those persons involved in abatement activities. This document provides a guide to current practices that are to be followed in the Province of Alberta.

Under the *TDG Act* (GC 1992), ACMs are under Class 9: Miscellaneous Products, Substances or Organisms.

2.5.2 Lead-Based Paint

In 1976, the lead content in certain interior and exterior paint was limited to 0.5% by weight [5,000 parts per million (ppm)] under the federal *Hazardous Products Act* (HPA). In April 2005, the Governor General in Council, on the recommendation of the Minister of Health, and pursuant to Section 5 of the HPA, annexed the Surface Coating Materials Regulation 2005-109 and the previous acceptable level of lead in paint was amended from 0.5% by weight to 600 mg/kg (600 ppm).

In October 2010, further corrective action was taken on consumer paints that contain more lead than is allowed by law and the Government amended the Surface Coating Materials Regulations to include “Consumer Products Containing Lead (Contact with Mouth) and Surface Coating Materials Regulation.” The amended Surface Coating Materials Regulation identifies that previously considered “safe” lead levels pose a significant risk to the public, especially to children and pregnant women, and significantly lowered the level of total lead allowed in paints and other surface coating materials from 600 mg/kg to 90 mg/kg which is equivalent to a total lead concentration of 0.009% (90 ppm). This new lead limit is among the most stringent in the world.

Under the HPA, identified lead-based paint must undergo Toxicity Characteristic Leachate Properties (TCLP) analysis to determine disposal procedures if paint scrapings are to be disposed within a landfill. The acceptable TCLP limit for disposal of lead-based paint is less than 5 mg/L (5 ppm). If an identified lead-based paint exhibits a TCLP result of less than 5 ppm, the paint is not considered a hazardous material and may be disposed of as general construction waste if the substrate is not considered a hazardous material. However, if lead based surface coatings are present within a building to be demolished, a safe work procedure should be established prior to handling the paint or substrate.

Under the *TDG Act* (GC 1992), lead in sheeting products is under Class 9: Miscellaneous Products, Substances or Organisms.

2.5.3 Lead Soldering

The National Plumbing Code of Canada (NPC 2020) allowed lead as an acceptable material for pipes until 1975. In 1986, the American Society of Engineers (ASME)/Canadian Standards Association (CSA) standard ASME 112.18.1/CSA B125.1 for plumbing supply fittings also limited the standard of lead content of solder to 0.2%. The NPC officially prohibited the use of lead solder in new plumbing or in repairs to plumbing for drinking water supplies in 1990.

2.5.4 Ozone-Depleting Substances

The provincial regulatory framework providing the requirements for ODS, which contain Chlorofluorocarbons (CFCs), Chlorocarbons or Hydrochlorofluorocarbons (HCFCs), is described under the *Alberta EPEA* and written in the Alberta Regulation 181/2000. Under the Alberta Regulation 181/2000:

“No person shall release or permit the release of an ozone-depleting substance or halocarbon into the environment. No person shall release or permit the release of more than 0.1 kilogram of an ozone depleting substance or halocarbons per kilogram of air from an air purge system for purging non condensable gases from a low pressure centrifugal chiller on or used on a refrigeration system or air conditioning system (AR 181/2000).”

In 1994, the federal government filed the ODS regulations to amend controls on the production and consumption of CFCs, tetrachloride, and methyl chloroform. The Federal Halocarbon Regulations (SOR/2003-289), effective July 1, 1999, were replaced with the Regulations Amending the Federal Halocarbon Regulations, 2003 (SOR/2009 221). It ensures uniformity with respect to the release, recovery, and recycling of ODSs and their halocarbon alternatives in refrigeration and air conditioning equipment throughout the provinces of Canada. *The Code of Practice for the Reduction of CFC Emissions from Refrigeration and Air Conditioning Systems* (1989) provides Best Practice recommendations for the handling, storage, and disposal of such materials.

Under the *TDG Act* (GC 1992), ODSs are under Class 9: Miscellaneous Products, Substances or Organisms.

2.5.5 Polychlorinated Biphenyls

Fluorescent lamp ballasts containing PCB capacitors automatically qualify as PCB waste according to the Environment Canada publication: “Identification of Lamp Ballasts Containing PCBs, report EPS 2/CC/2” (Environment Canada [EC] 1991). Disposal of PCB waste falls under the Alberta EPEA, Waste Control Regulations Part I, Section 12. PCB waste may also fall under the *Canadian Environmental Protection Act* (CEPA) (GC 1999), Federal Mobile PCB Treatment and Destruction Regulations (SOR/90 5) and the Regulations Amending the PCB Regulations (SOR/2010-57).

The manufacture and import of PCBs was banned in North America in 1977. The handling, storage, and disposal of PCBs that were in use at the time of the ban is strictly regulated by the federal government under the CEPA (GC 1999). The Chlorobiphenyls Regulations (1977, revised 1980, 1985, consolidated 1991) restrict the use and releases of PCBs and prohibit the manufacture, process, import, and sale of PCBs and equipment containing a liquid with a PCB concentration greater than 50 mg/kg (50 ppm).

In 2008, Environment Canada introduced new PCB Regulations which seek to phase out the use and storage of PCBs, and to eliminate remaining PCB-containing electrical equipment by the end of 2025.

Under the *TDG Act* (GC 1992), PCBs are under Class 9: Miscellaneous Products, Substances or Organisms.

2.5.6 Radioactive Components

Substances with a specific radioactivity greater than 70 kBq/kg are included under Class 7, Radioactive Materials within the *TDG Act* and must be transported in accordance with the provisions under *the Act* (GC 1992). The Nuclear Safety and Control Act (1997, c.9), Nuclear Substances and Radiation Devices Regulations (SOR/2000-207, current to 2014-06-12 and last amended on 2010-05-13.) states that radioactive substances that do not contain more than 185 kBq of americium 241 or where it is in a commercial or industrial facility, more than 740 kBq of americium 241 is considered an acceptable radioactive source under *the Act*.

Under the *TDG Act* (GC 1992), radioactive components are classed as a radioactive material under Class 7.

2.5.7 Mercury-Containing Equipment

Mercury-containing building materials are regulated by the *Alberta User Guide for Waste Managers* (January 2008), which requires a TCLP test to be conducted on all hazardous materials before disposal into a landfill. The maximum allowable leachable concentration of mercury allowed in a landfill is 0.2 mg/L [Waste Control Regulations Schedule 1 Section 1(g)(ii)]. Mercury-containing components are regarded as a disposal issue. Therefore, disposal of all mercury components should be undertaken by a qualified hazardous materials contractor and disposed of in a certified hazardous materials landfill.

Under the *TDG Act* (GC 1992), mercury waste can be classed as a toxic substance under Class 6.1, or as a corrosive substance under Class 8.

2.5.8 Urea Formaldehyde Foam Insulation

As per the *Hazardous Products Act* (GC 1985, amended 2010), all UFFI was banned from use in 1980. In the insulating process, a slight excess of formaldehyde was often added to ensure complete "curing" with the urea to produce the urea-formaldehyde foam. That excess was off gassed during the curing, almost entirely within a day or two of injection. The criteria states that any UFFI containing insulation or surface coverings must be disposed in a registered waste facility.

2.5.9 Biological Hazards

Hantavirus infection is caused by a virus that is found in rodents, predominantly in deer mice or white-footed mice. Hantavirus: Information for Employers and Workers (2010) states that rural areas, previously occupied buildings, commercial buildings, and industrial buildings are some of the areas that the rodents can be encountered.

Histoplasmosis is an often-chronic lung infection that is caused by breathing in fungal spores often associated with bat or bird droppings. According to the Canadian Centre for Occupational Health and Safety (CCOHS) and the Public Health Agency of Canada, histoplasmosis is the most common infection caused by fungi and cases of histoplasmosis have been reported in Alberta.

OH&S Regulation and Code states "...biological substances that could be hazardous to workers during demolition should be removed from structures to be demolished."

3.0 HEALTH AND SAFETY

Tetra Tech completed a Field Level Hazard Assessment (FLHA) specific to this project prior to project commencement of work. The FLHA included but was not limited to:

- On-site hazards and associated risks.

- Project specific personal protective equipment (PPE).
- Safety training required.
- Location of nearest medical station to the subject building.
- Emergency contact information for on-site Tetra Tech employees.
- During the HBMA, Tetra Tech employees always had the FLHA available. At the start of the day, Tetra Tech reviewed the scope of services, job hazards/risks, safe work practices, and emergency procedures. Tetra Tech's work was completed in compliance with the appropriate general requirements of applicable Occupational Health and Safety Acts and Regulations.

4.0 METHODOLOGY

The assessment included an intrusive (destructive) assessment (where possible) to identify the potential presence of ACMs and lead-based paints (LBPs), and a visual assessment for the presence of PCB-containing equipment, elemental mercury, UFFI, ODS, radioactive components, biological hazards, miscellaneous chemicals, and silica. All areas of the subject building were accessible during the HBMA.

Sampling was carried out by Tetra Tech personnel on January 18, 2022. The building was vacant and there was no heat source connected to the building at the time of the HBMA.

4.1 ASBESTOS-CONTAINING MATERIALS

Tetra Tech assessed suspect ACMs systematically through intrusive sample collection procedures. Prior to sampling, Tetra Tech conducted a site walk-through of the subject building to identify suspected ACMs and testing sites. This included, but was not limited to, identifying different types of drywall, ceiling tiles, flooring materials, insulation, mastics, adhesives, and caulking. ACM samples were submitted to EMSL Analytical Inc. in Calgary, Alberta for analysis.

Samples were collected in accordance with the guidelines of the Alberta Asbestos Abatement Manual. A minimum number of building materials were sampled from each functional space and a 'positive stop' was requested for analysis. For example, if three samples were obtained and submitted for analysis, the lab will analyze all three samples if they are found to be negative for asbestos; however, they will stop analyzing if one of the samples is found to be asbestos containing. It is then assumed that all of the samples within the same functional space are considered asbestos containing for that material.

Samples were labeled 'material type – number/letter' (indicating how many samples of that material were obtained from that functional space). Therefore, a sample labeled 'MAS01A' would be the first in a series of mastic samples obtained from the subject building.

4.2 LEAD-BASED PAINT

An assessment of painted surfaces suspected of containing lead was conducted in the subject building. One (1) suspect LBP colour was encountered in the subject building, and it was sampled. The sample was analyzed for total lead and leachable lead (if the paint sample exceeded 90 mg/kg for total lead) in accordance with the requirements of the Environmental Protection Agency (EPA) analytical method 200.2/6010B – Lead in Paint by ICPOES and TCLP SW 846 -1311/6020-ICPMS on TCLP Leachate – Leachable Lead. The paint sample was submitted to ALS Environmental in Vancouver, British Columbia for analysis.

4.3 HAZARDOUS WASTE

During the assessment, the subject building was visually assessed for the potential presence of ODS, PCBs, radioactive components, mercury-containing equipment, and silica. These materials were assessed for potential health and safety risks based on their observed physical condition.

A visual assessment for evidence of biological hazards, such as mould, rodent droppings, insect intrusions and bird infestations, was completed throughout the subject building to determine the potential health and safety risks associated with bacteria and viruses.

4.4 MISCELLANEOUS CHEMICALS

Tetra Tech visually reviewed any containers holding chemicals, when present, during the HBMA. The review was to determine if any identified chemicals could be disposed of as general construction waste, required special handling and disposal, or potentially could be reused or recycled.

4.5 FIELD QUALITY ASSURANCE/QUALITY CONTROL

Field quality assurance/quality control procedures undertaken by Tetra Tech field staff included the cleaning of sampling equipment, sample collection, and handling and management procedures as summarized below:

- New, clean, disposable nitrile gloves were worn when handling samples or sampling equipment;
- Sampling equipment was cleaned before and between samples by washing the equipment in water and wiping clean with a wet paper towel; and
- Samples submitted for laboratory analyses were identified on the outside of the laboratory-supplied sample bags and the laboratory supplied chain-of-custody form.

5.0 ASSESSMENT RESULTS AND DISCUSSION

The results of the HBMA are provided in the following sections. The sample location plans are provided on Figures 1 and 2. Photographs of the identified ACMs are included in Appendix B. The laboratory analytical results are included in Appendix C. Analytical results and sample descriptions for all materials assessed are summarized in Tables 1 and 2.

5.1 BUILDING CONSTRUCTION DETAILS

The subject building is a 5-bedroom, one-storey residential building with a full concrete basement. The simple gabled roof is constructed using black/grey asphalt shingles atop plywood sheeting and a conventional lumber truss support system. The eaves overhang contains no insulating materials and is capped with black metal soffit panels. The exterior 2x6 lumber walls are finished with white manufactured vertical wooden siding atop tar paper (TP), and plywood, and are insulated with pink fibreglass throughout. The foundation of the subject building is a full concrete basement supporting a raised lumber joist floor. The interior walls throughout the subject building are finished with drywall, painted white (P001), with exception of the west wall of the living and dining rooms, and the east wall of bedroom 1 which are finished with dark colored wooden panels. Additionally, portions of the kitchen walls are finished with yellow wallpaper. Portions of the interior walls of the basement common room were removed by others prior to the HBMA.

The attic space is insulated with a combination of fibreglass insulation batts and loose grey blown-in insulation (INSUL). The ceiling throughout the main floor is finished with white textured wooden panels (CT), with exception of the two (2) bathrooms, which are finished with smooth drywall painted white (P001). The ceiling of the two (2) bedrooms in the basement are finished with textured drywall (CTEX), whereas the ceiling in the basement common area is unfinished. The main floor of the subject building is primarily finished with engineered wood flooring atop a plywood subfloor, either black (FLOORING02) on the south entrance landing, or brown (FLOORING01) in the living and dining areas, kitchen, hallway, and all three bedrooms on the main floor. The floor of bathroom 1 is finished with a grey-white vinyl floor tile (VFT02), and all closets on the main floor are finished with a grey vinyl floor tile (VFT01). Additionally, the grey vinyl floor tile was observed below the wooden flooring of bedroom 2. The floor of the basement common area is unpainted concrete, with both bedrooms additionally finished with carpet.

5.2 ASBESTOS-CONTAINING MATERIALS

Tetra Tech collected and submitted 54 suspected ACMs samples from the subject building. Table 1 lists the samples collected, the quantity and location of the materials found in the subject building, the apparent condition of the materials (poor, moderate, good), and the analytical results.

The suspected ACM samples were grouped as materials that appeared to be homogenous and were analyzed utilizing a positive stop method. The following table summarizes the ACM analytical results:

Table 5.2-1: Asbestos Containing Materials Summary

Sample ID	Lab ID	Asbestos Concentration (% or Point Count)	Description/Type	Sample Location	Approximate Quantity (m ²)
VFT01 A	652200656-0006	2% Chrysotile	Vinyl Floor Tile, greys	Main floor closets, Bedroom 2	18.5
VFT01 B	652200656-0007	Positive stop, assumed identical to VFT01 A	Vinyl Floor Tile, greys	Main floor closets, Bedroom 2	
VFT01 C	652200656-0008		Vinyl Floor Tile, greys	Main floor closets, Bedroom 2	
VFT01 D	652200656-0009		Vinyl Floor Tile, greys	Main floor closets, Bedroom 2	
VFT01 E	652200656-0010		Vinyl Floor Tile, greys	Main floor closets, Bedroom 2	
DWJC A	652200656-0032	3% Chrysotile	Drywall joint compound	Main floor and basement throughout	365
DWJC B	652200656-0033	Positive stop, assumed identical to DWJC A	Drywall joint compound	Main floor and basement throughout	
DWJC C	652200656-0034		Drywall joint compound	Main floor and basement throughout	
DWJC D	652200656-0035		Drywall joint compound	Main floor and basement throughout	
DWJC E	652200656-0036		Drywall joint compound	Main floor and basement throughout	
DWJC F	652200656-0037		Drywall joint compound	Main floor and basement throughout	
DWJC G	652200656-0038		Drywall joint compound	Main floor and basement throughout	

5.3 LEAD-BASED SURFACE COATINGS

One (1) suspect LBP colour was encountered in the subject building, and it was sampled. Tetra Tech submitted one (1) paint sample for analysis of total lead concentration. Based on the analytical results, the paint sample was not determined to be lead-based. The total lead concentration for P001 was less than the referenced guideline of 90 mg/kg.

5.4 OZONE-DEPLETING SUBSTANCES

Tetra Tech visually assessed the subject building for potential ODSs. There was no equipment potentially containing ODSs identified within the subject building.

5.5 POLYCHLORINATED BIPHENYLS

Tetra Tech visually assessed the subject building for potential PCB-containing equipment.

There was one (1) fluorescent light ballast observed within the subject building at the time of the site visit. The ballast was visually inspected and found to contain a potentially “PCB-containing” label.

There were no pedestal-mounted transformers identified within the subject building at the time of the HBMA. No other equipment potentially containing PCBs was identified at the time of the HBMA.

5.6 RADIOACTIVE MATERIALS

Tetra Tech visually assessed the subject building for potential radioactive material within equipment such as smoke and heat detectors. There was one (1) smoke detector identified in the subject building at the time of the HBMA.

5.7 MERCURY-CONTAINING EQUIPMENT

Tetra Tech visually assessed the subject building for potential mercury-containing equipment. There were two (2) fluorescent tube bulbs observed in the subject building at the time of the HBMA.

5.8 UREA FORMALDEHYDE FOAM INSULATION

Tetra Tech visually assessed the subject building for potential UFFI. UFFI was not observed within the subject building at the time of the HBMA.

5.9 SILICA

Tetra Tech observed that the basement foundation of the subject building was constructed using concrete, which may be a source of silica dust during building demolition.

5.10 MISCELLANEOUS CHEMICALS

Tetra Tech did not observe any miscellaneous chemicals stockpiled within the subject building at the time of the HBMA. The building contents had been removed prior to the HBMA.

5.11 BIOLOGICAL HAZARDS

Tetra Tech observed no evidence of mould, rodent droppings, insect intrusions, or bird infestations within the subject building at the time of the HBMA.

6.0 RECOMMENDATIONS

Based on the HBMA, analytical results, and regulatory requirements, Tetra Tech has the following recommendations for each of the hazardous material identified.

6.1 ASBESTOS CONTAINING MATERIAL

Based on the analytical results, two (2) building materials were determined to have an asbestos content greater than 1%. The ACMs identified within the subject building were the grey vinyl floor tile (VFT01, with an area of approximately 18.5 m²) identified in the closets and Bedroom 2 of the main floor, and the drywall joint compound (DWJC, with an area of approximately 365 m²) throughout the subject building.

Prior to demolition of the subject building, the VFT and DWJC should be removed following moderate-risk abatement activities outlined in Section 5.3 of the *Alberta Asbestos Abatement Manual* (Government of Alberta 2019).

If any material identified during renovation or (potential) demolition activities that was not assessed within this report (including the roof materials), Tetra Tech recommends that the material be left in place until a competent individual conducts sampling of the material with submission on an accredited laboratory for analysis. Upon confirmation the material is an ACM, a risk assessment should then be conducted to determine safe work procedures for abatement.

6.2 POLYCHLORINATED BIPHENYLS

Tetra Tech observed one (1) fluorescent light ballast in the subject building at the time of the HBMA.

Tetra Tech recommends that any light ballasts be checked in accordance with the *Identification of Lamp Ballasts containing PCBs* (EC 1991) and if they are identified as PCB-containing, disposed of or recycled in accordance with *CEPA* (GC 1999) and the *TDG Act* (GC 1992).

6.3 RADIOACTIVE MATERIALS

Tetra Tech observed one (1) smoke detector in the subject building at the time of the HBMA.

Tetra Tech recommends that any smoke detectors be inspected and if they contain more than 70 kBq/kg, they should be removed and disposed of in accordance with the *Nuclear Safety and Control Act* (GC 1997), the *Nuclear Substances and Radiation Devices Regulations* (GC 2000, amended 2015), and the *TDG Act* (GC 1992).

6.4 MERCURY-CONTAINING EQUIPMENT

Tetra Tech observed two (2) fluorescent light tubes throughout the subject building at the time of the HBMA.

Tetra Tech recommends that any mercury containing items be recycled or disposed of in accordance with *CEPA* (GC 1999) and the *TDG Act* (GC 1992).

6.5 SEGREGATION REQUIREMENTS FOR WASTES AND HAZARDOUS MATERIALS

Tetra Tech recommends that waste produced from renovations or demolition activities should be segregated into material-specific waste streams for the following reasons:

- Scrap cost savings are possible by recycling copper wiring and steel; and
- Solid and liquid wastes are not to be mixed as some landfills will not accept liquid-saturated waste.

6.6 THIRD-PARTY CONSULTATION

Tetra Tech recommends during the removal of identified hazardous building materials that a third-party consultant is retained to provide environmental health and safety consultation. The consultation would include, but not be limited to, pre-contamination assessment of abatement enclosures (if applicable); daily review of contractor activities to ensure compliance with applicable regulations; daily air monitoring where required by safe work procedures and applicable regulations; final visual assessments to ensure completion of abatement; and final reporting to provide project closure are recommended.

7.0 CLOSURE

We trust this report meets your present requirements. Should you have any questions or comments, please contact the undersigned at your convenience.

Respectfully submitted,
Tetra Tech Canada Inc.



FILE: ENW.GENV03105-01
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FILE: ENW.GENV03105-01

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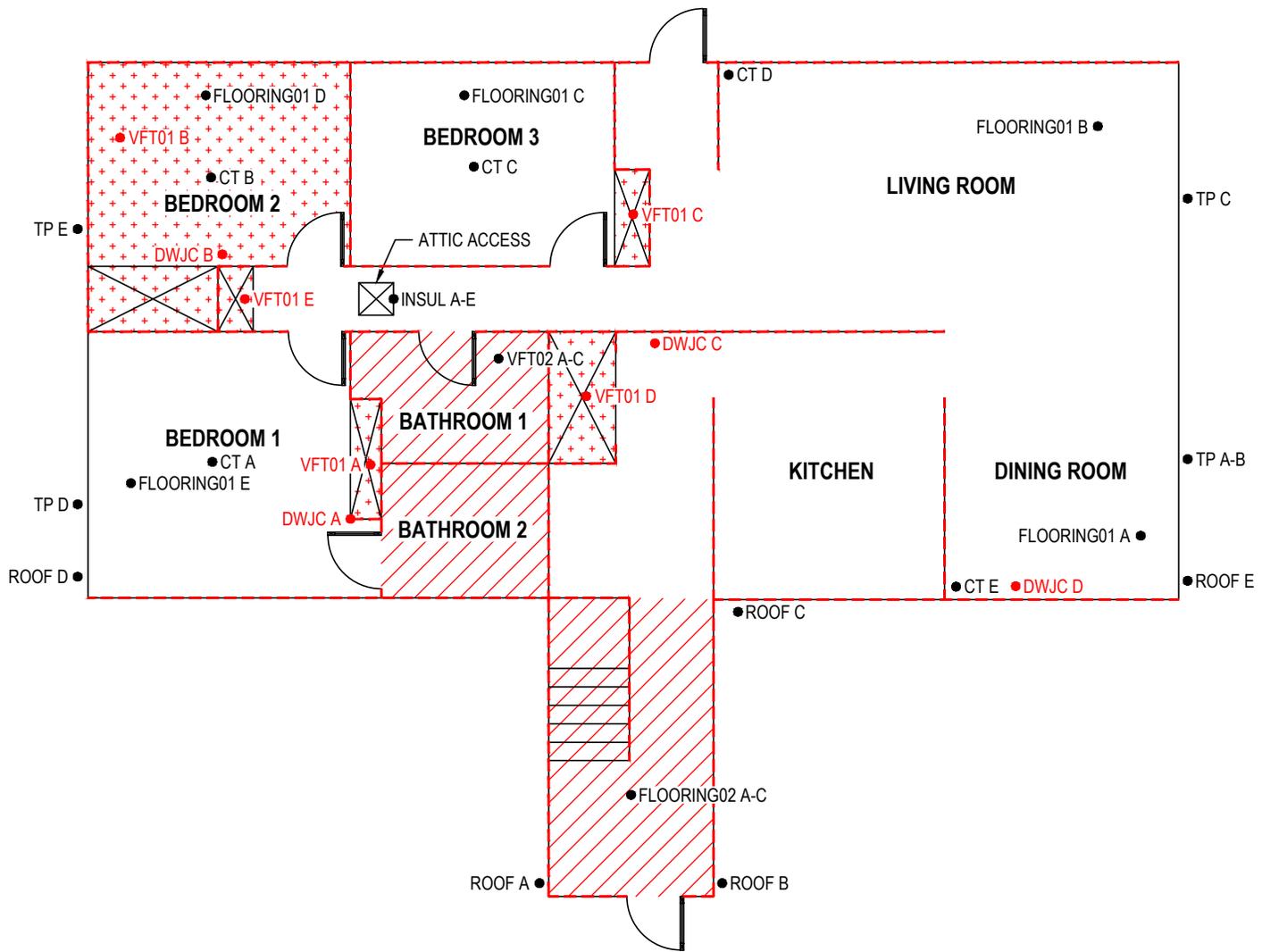
/cee/jmt

REFERENCES

- Government of Alberta, 2019. Alberta Asbestos Abatement Manual, August 2019
- Government of Canada, 1985. Hazardous Products Act R.S.C., 1985, c. H-3
- Government of Canada, 1997. Nuclear Safety and Control Act, S.C. 1997, c. 9
- Government of Canada, 1999. Canadian Environmental Protection Act, 1999, S.C. 1999, c. 33
- Government of Canada, 2000. Nuclear Substances and Radiation Devices Regulations, SOR/2000-207
- Government of Canada, 2003. Federal Halocarbon Regulations, SOR/2003-289, (amended July 2009)
- Government of Canada, 2016. Surface Coating Materials Regulations, SOR/2016-193
- Government of Canada, 2020. National Plumbing Code of Canada
- Transport Canada, 1992. Transportation of Dangerous Good Act, 1992, c. 34
- Environment Canada, 1988. Handbook on PCBs in Electrical Equipment, Third Edition, (April 1988)
- Environment Canada, 1991. Identification of Lamp Ballasts Containing PCBs, EPS2/CC/2 (revised August 1991)

FIGURES

- Figure 1 Sample Locations, First Floor
- Figure 2 Sample Locations, Basement



STATUS
ISSUED FOR USE

LEGEND:

- - SAMPLE LOCATION
- - SAMPLE LOCATION CONTAINING ASBESTOS
- - ACM: DRYWALL JOINT COMPOUND ON INTERIOR WALLS
- ▨ - ACM: DRYWALL JOINT COMPOUND ON INTERIOR CEILINGS
- ▩ - ACM: GREY VINYL FLOOR TILE (SOME HIDDEN)

NOTES

DRAWING IS NOT TO SCALE
ABBREVIATIONS
 ACM - ASBESTOS CONTAINING MATERIAL
 CT - CIELING TILE
 DWJC - DRYWALL JOINT COMPOUND
 INSUL - INSULATION
 TP - TAR PAPER
 VFT - VINYL FLOOR TILE

CLIENT

Parks Canada

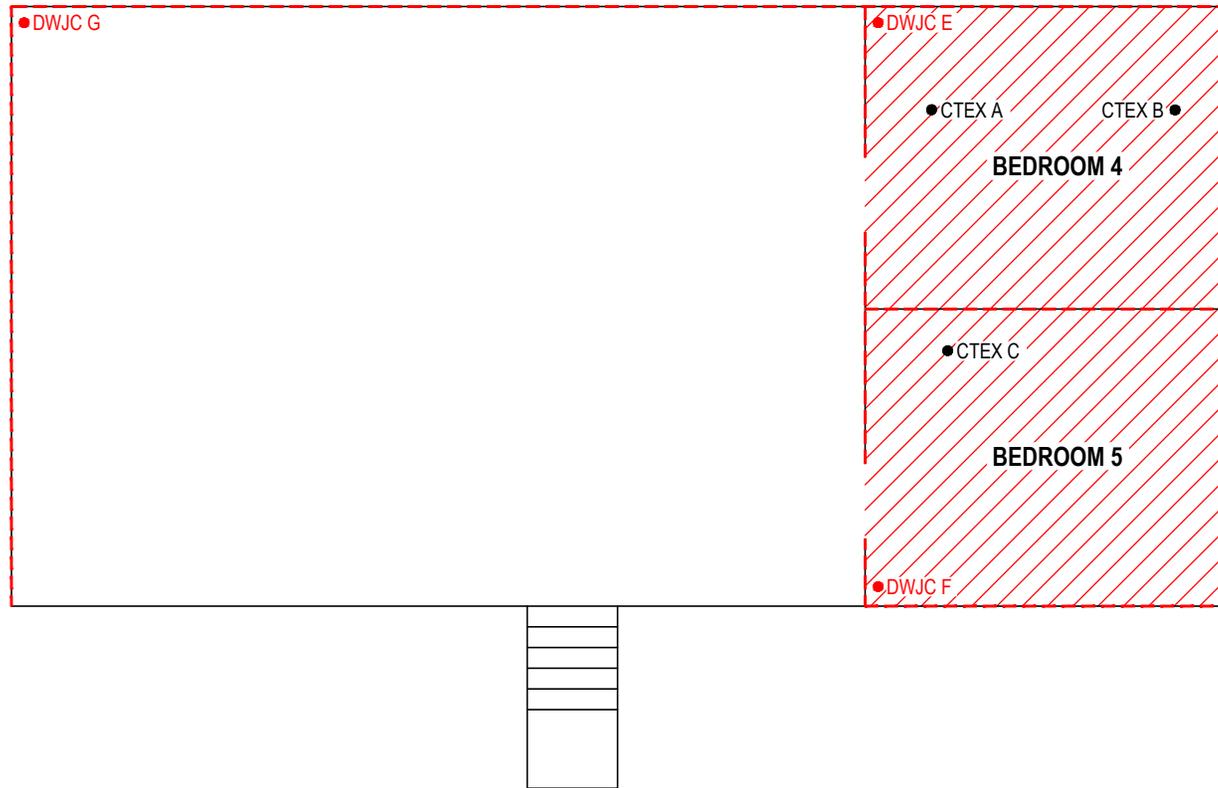


**HAZARDOUS BUILDING MATERIALS ASSESSMENT
113B MCDERMOT AVENUE, FORT CHIPEWYAN, AB**

**SAMPLE LOCATIONS
FIRST FLOOR**

PROJECT NO. ENW.GENV03105-01	DWN MRV	CKD MB	REV 0
OFFICE EDM	DATE March 2022		

Figure 1



STATUS
ISSUED FOR USE

LEGEND:

- - SAMPLE LOCATION
- - SAMPLE LOCATION CONTAINING ASBESTOS
- ACM: DRYWALL JOINT COMPOUND ON INTERIOR WALLS
- ▨ - ACM: DRYWALL JOINT COMPOUND ON INTERIOR CEILINGS

NOTES

DRAWING IS NOT TO SCALE
ABBREVIATIONS
 ACM - ASBESTOS CONTAINING MATERIAL
 CTEX - CIELING TEXTURE COAT
 DWJC - DRYWALL JOINT COMPOUND

CLIENT

Parks Canada



**HAZARDOUS BUILDING MATERIALS ASSESSMENT
 113B MCDERMOT AVENUE, FORT CHIPEWYAN, AB**

**SAMPLE LOCATIONS
 BASEMENT**

PROJECT NO. ENW.GENV03105-01	DWN MRV	CKD MB	REV 0
OFFICE EDM	DATE March 2022		

Figure 2

TABLES

Table 1	Asbestos Results
Table 2	Lead Paint Results

Table 1: Analytical Results for Asbestos

Sample ID	Lab ID	Asbestos Type and Concentration (% or Point Count)	Material Description/Type	Location	Approximate Quantity	Condition
INSUL A	652200656-0001	None Detected	Insulation, grey	Attic throughout	100 m ²	Moderate
INSUL B	652200656-0002	None Detected				Moderate
INSUL C	652200656-0003	None Detected				Moderate
INSUL D	652200656-0004	None Detected				Moderate
INSUL E	652200656-0005	None Detected				Moderate
VFT01 A	652200656-0006	2% Chrysotile	Vinyl Floor Tile, greys	Main floor closets throughout; Bedroom 2	20 m ²	Good
	652200656-0006A	None Detected	Mastic, black			Good
VFT01 B	652200656-0007	Positive Stop	Vinyl Floor Tile, greys			Good
	652200656-0007A	None Detected	Mastic, black			Good
VFT01 C	652200656-0008	Positive Stop	Vinyl Floor Tile, greys			Good
	652200656-0008A	None Detected	Mastic, black			Good
VFT01 D	652200656-0009	Positive Stop	Vinyl Floor Tile, greys			Good
	652200656-0009A	None Detected	Mastic, black			Good
VFT01 E	652200656-0010	Positive Stop	Vinyl Floor Tile, greys			Good
	652200656-0010A	None Detected	Mastic, black			Good
VFT02 A	652200656-0011	None Detected	Vinyl Floor Tile, grey/white	Bathroom 1	5 m ²	Good
	652200656-0011A	None Detected	Mastic, black			Good
VFT02 B	652200656-0012	None Detected	Vinyl Floor Tile, grey/white			Good
	652200656-0012A	None Detected	Mastic, black			Good
VFT02 C	652200656-0013	None Detected	Vinyl Floor Tile, grey/white			Good
	652200656-0013A	None Detected	Mastic, black			Good
FLOORING01 A	652200656-0014	None Detected	Engineered wood planks; brown	Main floor; living, dining, kitchen, mudroom, bedrooms 1-3	100 m ²	Good
FLOORING01 B	652200656-0015	None Detected				Good
FLOORING01 C	652200656-0016	None Detected				Good
FLOORING01 D	652200656-0017	None Detected				Good
FLOORING01 E	652200656-0018	None Detected				Good
FLOORING02 A	652200656-0019	None Detected	Engineered wood planks; black	Entrance landing	2.5 m ²	Good
FLOORING02 B	652200656-0020	None Detected				Good
FLOORING02 C	652200656-0021	None Detected				Good
ROOF A	652200656-0022	None Detected	Asphalt shingle, black/grey	Building roof	175 m ²	Good
ROOF B	652200656-0023	None Detected				Good
ROOF C	652200656-0024	None Detected				Good
ROOF D	652200656-0025	None Detected				Good
ROOF E	652200656-0026	None Detected				Good
TP A	652200656-0027	None Detected	Tar paper, black	Exterior walls	150 m ²	Good
TP B	652200656-0028	None Detected				Good
TP C	652200656-0029	None Detected				Good
TP D	652200656-0030	None Detected				Good
TP E	652200656-0031	None Detected				Good
DWJC A	652200656-0032	3% Chrysotile	Drywall joint compound	Main floor and basement throughout	365 m ²	Good
DWJC B	652200656-0033	Positive Stop				Good
DWJCC	652200656-0034					Good
DWJC D	652200656-0035					Good
DWJC E	652200656-0036					Good
DWJC F	652200656-0037					Good
DWJC G	652200656-0038					Good
CT A	652200656-0039		None Detected	Ceiling tile panel, white	Main floor; living, dining, kitchen, mudroom, bedrooms 1-3	130 m ²
CT B	652200656-0040	None Detected	Good			
CT C	652200656-0041	None Detected	Good			
CT D	652200656-0042	None Detected	Good			
CT E	652200656-0043	None Detected	Good			
CTEX A	652200656-0044	None Detected	Ceiling texture coat (stucco)	Basement; bedroom 4 and 5	40 m ²	Good
CTEX B	652200656-0045	None Detected				Good
CTEX C	652200656-0046	None Detected				Good

Notes:

- ACM - Asbestos Containing Material
- CT - Ceiling Tile panel
- CTEX - Ceiling Texture Coat (Stucco)
- DWJC - Drywall joint compound (quantity includes all coated drywall in the subject building)
- TP - Tar Paper
- INSUL - insulation
- VFT - Viny Floor Tile
- Red and Bold** - Sample results exceed the guideline for asbestos content.
- Italicized* - Indicates underlying materials (including mastics)

Table 2: Analytical Results For Lead in Paint

Sample ID	Total Lead in Paint ¹ Guideline (mg/kg)	Leachable lead in Paint ² Guideline (mg/L)	Total Lead Concentration (mg/kg)	Leachable Lead Concentration (mg/L)	Paint Description	Location	Approximate Quantity	Condition
P001	90	5.0	<5.0	N/A	Interior wall/ceiling, white	Interior throughout	365 m ²	Moderate

Notes:

Bold and Underlined - Paint with total lead greater than guideline (90 mg/kg)

Red and Bold - paint with values greater than guidelines for leachable lead concentration (5.0 mg/L)

1. Guideline for the Management of Waste Lead and Lead Paint (GNWT 2004)

2. Guideline for the Management of Waste Lead and Lead Paint (GNWT 2017)

APPENDIX A

TETRA TECH'S LIMITATIONS ON THE USE OF THIS DOCUMENT

LIMITATIONS ON USE OF THIS DOCUMENT

GEOENVIRONMENTAL

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If any error or omission is detected by the Client or an Authorized Party, the error or omission must be immediately brought to the attention of TETRA TECH.

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The Client acknowledges that it has fully cooperated with TETRA TECH with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The Client further acknowledges that in order for TETRA TECH to properly provide the services contracted for in the Contract, TETRA TECH has relied upon the Client with respect to both the full disclosure and accuracy of any such information.

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This Professional Document is based solely on the conditions presented and the data available to TETRA TECH at the time the data were collected in the field or gathered from available databases.

The Client, and any Authorized Party, acknowledges that the Professional Document is based on limited data and that the conclusions, opinions, and recommendations contained in the Professional Document are the result of the application of professional judgment to such limited data.

The Professional Document is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site conditions present, or variation in assumed conditions which might form the basis of design or recommendations as outlined in this report, at or on the development proposed as of the date of the Professional Document requires a supplementary investigation and assessment.

TETRA TECH is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the Client.

1.7 NOTIFICATION OF AUTHORITIES

In certain instances, the discovery of hazardous substances or conditions and materials may require that regulatory agencies and other persons be informed and the client agrees that notification to such bodies or persons as required may be done by TETRA TECH in its reasonably exercised discretion.

APPENDIX B

PHOTO PAGES



Photo 1: View of the front entrance of the subject building, facing southeast.



Photo 2: Interior of the front entrance of the subject building, facing north. Note white interior walls (P001) not found to be lead-based paint. Also note the drywall joint compound (DWJC) throughout the subject building, confirmed to contain asbestos.



Photo 3: View of the grey vinyl floor tile (VFT01) observed in all closets throughout the main floor, as well as hidden below the engineered wood floor (FLOORING01) in bedroom 2. The vinyl floor tile was confirmed to contain asbestos.

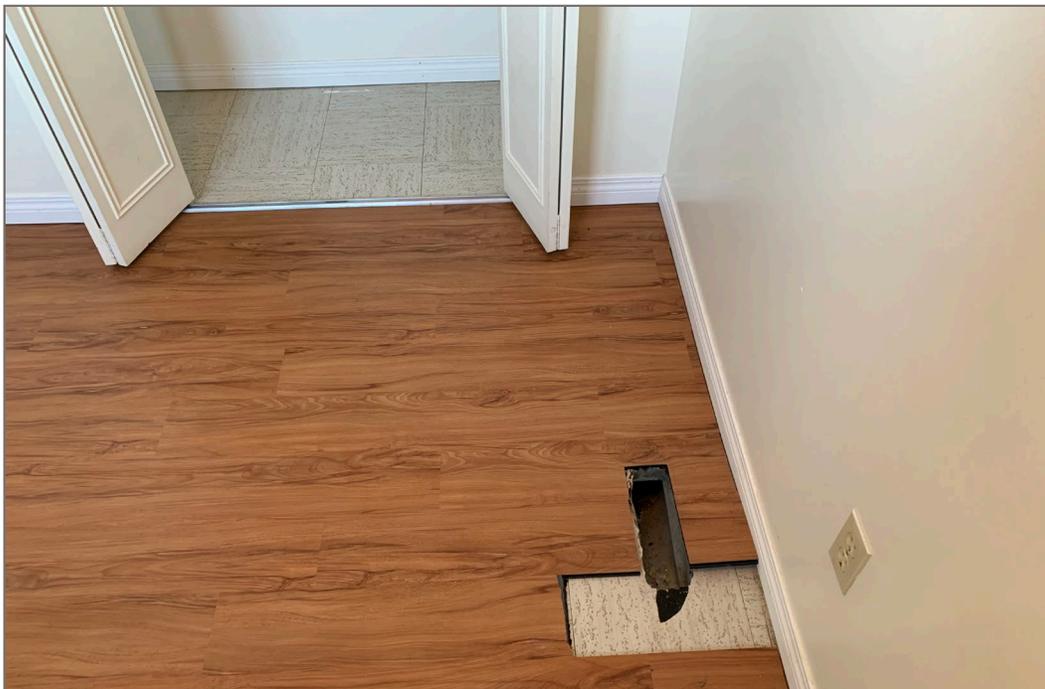


Photo 4: View of hidden VFT (VFT01) in bedroom 2 of the main floor, confirmed to contain asbestos.



Photo 5: View of the common area of the basement, facing northwest. Note lower portions of drywall on the interior walls of the basement have been abated. There were no obvious signs of mould at the time of the HBMA.



Photo 6: Copper piping observed in the basement at the time of the HBMA which may contain lead solder.

APPENDIX C

LABORATORY CERTIFICATES OF ANALYSIS



EMSL Canada Inc.

2333 18th Avenue NE, Unit 48 Calgary, AB T2E 8T6

Tel/Fax: (403) 879-1149 / (403) 879-1152

<http://www.EMSL.com> / CalgaryLab@EMSL.com

EMSL Canada Order: 652200656

Customer ID: 55TTED42

Customer PO:

Project ID:

Attention: Michael Blanchette
Tetra Tech EBA
14940-123 Avenue
Edmonton, AB T5V 1B4

Phone: (780) 699-9600

Fax:

Received Date: 01/24/2022 11:25 AM

Analysis Date: 01/25/2022 - 01/28/2022

Collected Date: 01/18/2022

Project: 113B MCDERMOT FT CHIPEWYAN / 704-ENW.GENV03105-01

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

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
INSUL A <small>652200656-0001</small>	ATTIC - ATTIC INSULATION	Gray Fibrous Homogeneous	95% Cellulose 2% Glass	3% Non-fibrous (Other)	None Detected
INSUL B <small>652200656-0002</small>	ATTIC - ATTIC INSULATION	Gray Fibrous Homogeneous	95% Cellulose <1% Glass	5% Non-fibrous (Other)	None Detected
INSUL C <small>652200656-0003</small>	ATTIC - ATTIC INSULATION	Gray Fibrous Homogeneous	95% Cellulose 2% Glass	3% Non-fibrous (Other)	None Detected
INSUL D <small>652200656-0004</small>	ATTIC - ATTIC INSULATION	Gray Fibrous Homogeneous	95% Cellulose	5% Non-fibrous (Other)	None Detected
INSUL E <small>652200656-0005</small>	ATTIC - ATTIC INSULATION	Gray Fibrous Homogeneous	95% Cellulose	5% Non-fibrous (Other)	None Detected
VFT01 A-VFT <small>652200656-0006</small>	FLOOR 1 - VINYL FLOOR TILE	Gray Non-Fibrous Homogeneous		98% Non-fibrous (Other)	2% Chrysotile
VFT01 A-Mastic <small>652200656-0006A</small>	FLOOR 1 - VINYL FLOOR TILE	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
VFT01 B-VFT <small>652200656-0007</small>	FLOOR 1 - VINYL FLOOR TILE				Positive Stop (Not Analyzed)
VFT01 B-Mastic <small>652200656-0007A</small>	FLOOR 1 - VINYL FLOOR TILE	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
VFT01 C-VFT <small>652200656-0008</small>	FLOOR 1 - VINYL FLOOR TILE				Positive Stop (Not Analyzed)
VFT01 C-Mastic <small>652200656-0008A</small>	FLOOR 1 - VINYL FLOOR TILE	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
VFT01 D-VFT <small>652200656-0009</small>	FLOOR 1 - VINYL FLOOR TILE				Positive Stop (Not Analyzed)
VFT01 D-Mastic <small>652200656-0009A</small>	FLOOR 1 - VINYL FLOOR TILE	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
VFT01 E-VFT <small>652200656-0010</small>	FLOOR 1 - VINYL FLOOR TILE				Positive Stop (Not Analyzed)
VFT01 E-Mastic <small>652200656-0010A</small>	FLOOR 1 - VINYL FLOOR TILE	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
VFT02 A-VFT <small>652200656-0011</small>	FLOOR 1 - VINYL FLOOR TILE	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 01/28/2022 11:34:47



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<http://www.EMSL.com> / CalgaryLab@EMSL.com

EMSL Canada Order: 652200656

Customer ID: 55TTED42

Customer PO:

Project ID:

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

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
VFT02 A-Mastic 652200656-0011A	FLOOR 1 - VINYL FLOOR TILE	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
VFT02 B-VFT 652200656-0012	FLOOR 1 - VINYL FLOOR TILE	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
VFT02 B-Mastic 652200656-0012A	FLOOR 1 - VINYL FLOOR TILE	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
VFT02 C-VFT 652200656-0013	FLOOR 1 - VINYL FLOOR TILE	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
VFT02 C-Mastic 652200656-0013A	FLOOR 1 - VINYL FLOOR TILE	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
FLOORING01 A 652200656-0014	FLOOR 1 - FLOORING	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
FLOORING01 B 652200656-0015	FLOOR 1 - FLOORING	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
FLOORING01 C 652200656-0016	FLOOR 1 - FLOORING	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
FLOORING01 D 652200656-0017	FLOOR 1 - FLOORING	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
FLOORING01 E 652200656-0018	FLOOR 1 - FLOORING	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
FLOORING02 A 652200656-0019	FLOOR 1 - FLOORING	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
FLOORING02 B 652200656-0020	FLOOR 1 - FLOORING	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
FLOORING02 C 652200656-0021	FLOOR 1 - FLOORING	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
ROOF A 652200656-0022	ROOF - ROOFING	Gray/Black Fibrous Homogeneous	5% Cellulose 25% Glass	70% Non-fibrous (Other)	None Detected
ROOF B 652200656-0023	ROOF - ROOFING	Gray/Black Fibrous Homogeneous	5% Cellulose 25% Glass	70% Non-fibrous (Other)	None Detected
ROOF C 652200656-0024	ROOF - ROOFING	Black Fibrous Homogeneous	5% Cellulose 25% Glass	70% Non-fibrous (Other)	None Detected
ROOF D 652200656-0025	ROOF - ROOFING	Gray/Black Fibrous Homogeneous	5% Cellulose 20% Glass	75% Non-fibrous (Other)	None Detected
ROOF E 652200656-0026	ROOF - ROOFING	Gray/Black Fibrous Homogeneous	5% Cellulose 25% Glass	70% Non-fibrous (Other)	None Detected
TP A 652200656-0027	EXTERIOR WALLS - TAR PAPER	Black Fibrous Homogeneous	95% Cellulose	5% Non-fibrous (Other)	None Detected

Initial report from: 01/28/2022 11:34:47



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EMSL Canada Order: 652200656

Customer ID: 55TTED42

Customer PO:

Project ID:

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

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
TP B 652200656-0028	EXTERIOR WALLS - TAR PAPER	Black Fibrous Homogeneous	95% Cellulose	5% Non-fibrous (Other)	None Detected
TP C 652200656-0029	EXTERIOR WALLS - TAR PAPER	Black Fibrous Homogeneous	95% Cellulose	5% Non-fibrous (Other)	None Detected
TP D 652200656-0030	EXTERIOR WALLS - TAR PAPER	Black Fibrous Homogeneous	95% Cellulose	5% Non-fibrous (Other)	None Detected
TP E 652200656-0031	EXTERIOR WALLS - TAR PAPER	Black Fibrous Homogeneous	95% Cellulose	5% Non-fibrous (Other)	None Detected
DWJC A 652200656-0032	FLOOR 1 - DRYWALL JOINT COMPOUND	Beige Non-Fibrous Homogeneous		97% Non-fibrous (Other)	3% Chrysotile
DWJC B 652200656-0033	FLOOR 1 - DRYWALL JOINT COMPOUND				Positive Stop (Not Analyzed)
DWJC C 652200656-0034	FLOOR 1 - DRYWALL JOINT COMPOUND				Positive Stop (Not Analyzed)
DWJC D 652200656-0035	FLOOR 1 - DRYWALL JOINT COMPOUND				Positive Stop (Not Analyzed)
DWJC E 652200656-0036	BASEMENT - DRYWALL JOINT COMPOUND				Positive Stop (Not Analyzed)
DWJC F 652200656-0037	BASEMENT - DRYWALL JOINT COMPOUND				Positive Stop (Not Analyzed)
DWJC G 652200656-0038	BASEMENT - DRYWALL JOINT COMPOUND				Positive Stop (Not Analyzed)
CT A 652200656-0039	FLOOR 1 - CEILING TILE	Brown/White Fibrous Homogeneous	95% Cellulose	5% Non-fibrous (Other)	None Detected
CT B 652200656-0040	FLOOR 1 - CEILING TILE	Brown/White Fibrous Homogeneous	95% Cellulose	5% Non-fibrous (Other)	None Detected
CT C 652200656-0041	FLOOR 1 - CEILING TILE	Brown/White Fibrous Homogeneous	95% Cellulose	5% Non-fibrous (Other)	None Detected
CT D 652200656-0042	FLOOR 1 - CEILING TILE	Brown/White Fibrous Homogeneous	95% Cellulose	5% Non-fibrous (Other)	None Detected
CT E 652200656-0043	FLOOR 1 - CEILING TILE	Brown/White Fibrous Homogeneous	95% Cellulose	5% Non-fibrous (Other)	None Detected
CTEX A-Texture 652200656-0044	BASEMENT - CEILING TEXTURE	White Non-Fibrous Homogeneous		30% Perlite 70% Non-fibrous (Other)	None Detected
CTEX A-Joint Compound 652200656-0044A	BASEMENT - CEILING TEXTURE	White Non-Fibrous Homogeneous		20% Perlite 80% Non-fibrous (Other)	None Detected

Initial report from: 01/28/2022 11:34:47



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<http://www.EMSL.com> / CalgaryLab@EMSL.com

EMSL Canada Order: 652200656

Customer ID: 55TTED42

Customer PO:

Project ID:

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

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
CTEX B 652200656-0045	BASEMENT -	White		30% Perlite	None Detected
	CEILING TEXTURE	Non-Fibrous		70% Non-fibrous (Other)	
		Homogeneous			
CTEX C 652200656-0046	BASEMENT -	White		20% Perlite	None Detected
	CEILING TEXTURE	Non-Fibrous		80% Non-fibrous (Other)	
		Homogeneous			

Analyst(s)

Kurt Carlson (38)

Leanne Roy (7)

Jefferson Salvador, Laboratory Manager
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 "Interim Method") but augmented with procedures outlined in the 1993 ("final") version of the method. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Estimation of uncertainty is available on request.

Samples analyzed by EMSL Canada Inc. Calgary, AB NVLAP Lab Code 500100-0

Initial report from: 01/28/2022 11:34:47



TETRA TECH CANADA INC..
ATTN: MICHAEL BLANCHETTE
14940 123 Ave NW
North Bldg.
Edmonton AB T5V 1B4

Date Received: 22-JAN-22
Report Date: 27-JAN-22 16:56 (MT)
Version: FINAL

Client Phone: 780-699-9600

Certificate of Analysis

Lab Work Order #: L2680704
Project P.O. #: NOT SUBMITTED
Job Reference: 704-ENW.GENV03110-01
C of C Numbers: 20-902735
Legal Site Desc:

Kieran Tordoff
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 9450 17 Avenue NW, Edmonton, AB T6N 1M9 Canada | Phone: +1 780 413 5227 | Fax: +1 780 437 2311
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2680704-1 P001 Sampled By: CLIENT on 18-JAN-22 Matrix: PAINT Miscellaneous Parameters Lead (Pb)	<5.0		5.0	mg/kg	27-JAN-22	27-JAN-22	R5710458

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
PB-PAINT-MS-VA	Bulk	Lead in Paint by ICPMS	EPA 200.2/6020A (mod)

This method uses a heated strong acid digestion with HNO₃ and HCl and is intended to liberate metals that may be environmentally available. Silicate minerals are not solubilized. Analysis is by Collision/Reaction Cell ICPMS.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

20-902735

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

*mg/kg - milligrams per kilogram based on dry weight of sample
 mg/kg wwt - milligrams per kilogram based on wet weight of sample
 mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
 mg/L - unit of concentration based on volume, parts per million.*

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2680704

Report Date: 27-JAN-22

Page 1 of 2

Client: TETRA TECH CANADA INC.
14940 123 Ave NW North Bldg.
Edmonton AB T5V 1B4

Contact: MICHAEL BLANCHETTE

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PB-PAINT-MS-VA		Bulk						
Batch	R5710458							
WG3689685-4	CRM	SCP SS-2						
Lead (Pb)			96.9		%		70-130	27-JAN-22
WG3689685-2	DUP	L2680704-1						
Lead (Pb)		<5.0	<5.0	RPD-NA	mg/kg	N/A	40	27-JAN-22
WG3689685-3	LCS							
Lead (Pb)			91.9		%		80-120	27-JAN-22
WG3689685-1	MB							
Lead (Pb)			<5.0		mg/kg		5	27-JAN-22

Quality Control Report

Workorder: L2680704

Report Date: 27-JAN-22

Page 2 of 2

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.



Report To Contact and company name below will appear on the final report		Reports / Recipients			Turnaround Time (TAT) Requested				AFFIX ALS BARCODE LABEL HERE (ALS use only)		
Company:	Edon Tech	Select Report Format:	<input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL)	<input type="checkbox"/> Routine [R] If received by 3pm M-F - no surcharges apply <input type="checkbox"/> 4 day [P4] If received by 3pm M-F - 20% rush surcharge minimum <input type="checkbox"/> 3 day [P3] If received by 3pm M-F - 25% rush surcharge minimum <input checked="" type="checkbox"/> 2 day [P2] If received by 3pm M-F - 50% rush surcharge minimum <input type="checkbox"/> 1 day [E] If received by 3pm M-F - 100% rush surcharge minimum <input type="checkbox"/> Same day [E2] If received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests							
Contact:	Michael Blanchette	Merge QC/QCI Reports with COA	<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A	Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm							
Phone:	780 699 9600	Select Invoice Distribution: <input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			For all tests with rush TATs requested, please contact your AM to confirm availability.						
Company address below will appear on the final report		Select Invoice Recipients			Analysis Request				NUMBER OF CONTAINERS Total Lead TCLP Lead SAMPLES ON HOLD EXTENDED STORAGE REQUIRED SUSPECTED HAZARD (see notes)		
Street:	14940 123 Ave NW	Email 1 or Fax:	Michael.Blanchette@edon-tech.com			Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below					
City/Province:	Edmonton, AB	Email 2:									
Postal Code:		Email 3:									
Invoice To	Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	Select Invoice Distribution: <input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX									
Company:		Email 1 or Fax:									
Contact:		Email 2:									
Project Information		Oil and Gas Required Fields (client use)									
ALS Account # / Quote #:		AFE/Cost Center:	PO#								
Job #:	704-FNU.GFNV03110-01	Major/Minor Code:	Routing Code:								
PO / AFE:		Requisitioner:									
LSD:		Location:									
ALS Lab Work Order # (ALS use only):	L2680704	ALS Contact:	Sampler:								
ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type							
	D001	18-Jan-22		Paint	1	X					
Drinking Water (DW) Samples¹ (client use)		Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)			SAMPLE RECEIPT DETAILS (ALS use only)						
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input type="checkbox"/> NO		Save Paint Sample for TCLP follow-up ↑ Potential			Cooling Method: <input type="checkbox"/> NONE <input type="checkbox"/> ICE <input type="checkbox"/> ICE PACKS <input type="checkbox"/> FROZEN <input type="checkbox"/> COOLING INITIATED						
Are samples for human consumption/ use? <input type="checkbox"/> YES <input type="checkbox"/> NO					Submission Comments identified on Sample Receipt Notification: <input type="checkbox"/> YES <input type="checkbox"/> NO						
					Cooler Custody Seals Intact: <input type="checkbox"/> YES <input type="checkbox"/> N/A Sample Custody Seals Intact: <input type="checkbox"/> YES <input type="checkbox"/> N/A						
					INITIAL COOLER TEMPERATURES °C: N/A FINAL COOLER TEMPERATURES °C: N/A						
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)						
Released by:	MB	Date:	Jan 21, 2022	Time:	18:15	Received by:	JL	Date:	Jan 22, 22	Time:	