END OF SECTION

LIST OF DRAWINGS

Drawing No.		Drawing Name
R.007489.025	C00	Sheet List
R.007489.025	C01	Site Location Plan
R.007489.025	C02	Locations of Hazardous Materials Abatement - Basement Floor Plan
R.007489.025	C03	Locations of Hazardous Materials Abatement – First Floor Plan
R.007489.025	C04	Locations of Hazardous Materials Abatement - Attic Floor Plan

LIST OF APPENDICES

Appendix A Supporting Documentation – Hazardous Materials Survey

1 GENERAL

1.01 PRECEDENCE

.1 Division 1 sections take precedence over technical specification sections in other Divisions of this specification.

1.02 EXISTING CONDITIONS

.1 Existing Building
  .1 Residential Building is present on site.

.2 Existing Services
  .1 All utilities servicing the building are functioning.

.3 Special Requirements
  .1 Submit Schedule in accordance with Section 01 32 16.07 - Construction Progress Schedules - Bar (GANTT) Chart.
  .2 No work adjacent to open water may commence until appropriate measures are taken to control sediment releases in water as prescribed under Section 01 41 00 – Regulatory Requirements.

1.03 BACKGROUND INFORMATION

.1 The subject property is located at 9609, 102 Street in the village of Fort Simpson. The property reportedly constructed in 1972, is a one-storey wood frame structure have vinyl siding, a peaked roof and formed concrete foundation wall. The building is heated by an oil-fired furnace. There is a 1135 L oil tank located on the exterior north side of the building. The building is vacant.

.2 Arcadis Canada Inc. (Arcadis) was retained by Public Works and Government Services Canada (PWGSC) to conduct a hazardous materials survey of the Residential Building located at 9609, 102 Street, Fort Simpson in the Northwest Territories in 2016.

.3 The hazardous materials survey was completed to identify hazardous building materials in the Residential Building.

.4 The results of the hazardous materials survey identified potential hazards on site which include, but are not limited to, the following:
  .1 Hazardous materials (e.g. mercury-containing materials such as florescent lights and thermostats, lead-containing paints, ozone-depleting substances such as refrigerants in a domestic refrigerator and heating oil in one heating oil tank).
  .2 Asbestos-containing materials including drywall joint compound, vinyl floor tiles and associated mastics, vinyl sheet flooring, heat shields on light fixtures and vermiculite attic insulation.
  .4 Hazards that may be encountered at the site include, but are not limited to:
    .1 Site conditions
    .2 Petroleum hydrocarbon contaminated soil
    .3 Hazardous waste

.5 Lead
.6 Asbestos (other than that listed above)

.5 Supporting Documents include, but are not limited to:
.1 Hazardous Materials Survey and Structural Engineering Assessment, 9609, 102 Street, Fort Simpson, Northwest Territories, Arcadis Canada Inc., August 5 2016.
.2 Ft. Simpson Residential Structural Assessment, Unit A&B 9801 - 101 St. Ft. Simpson, NT and 9609 – 102 St., Ft. Simpson, NT., October 17, 2016 (Appendix D of Arcadis Hazardous Materials Survey).

1.04 DESCRIPTION OF WORK

.1 Work for this Contract comprises the activities of removal of select hazardous materials, including, but not limited to, the following:
.1 Mobilization and demobilization of personnel, equipment, support facilities and materials required to complete the Work as often as required.
.2 Upgrading and Maintenance of on-site access routes and laydown areas, as required, to facilitate construction activities and temporary storage.
.3 Segregating and packaging Hazardous Materials. Hazardous Materials may include, but may not be limited to:
.1 Lead-containing materials (e.g. paint);
.2 Asbestos-containing materials
.3 Mercury-containing fluorescent light tubes and wall - mounted thermostats.
.4 Prior to commencement of asbestos abatement operations, remove appliances, millwork, cabinets, etc., as required to access drywall applications. All removed materials are to be cleaned and the contractor is to make provisions to store removed items on site.
.5 Decommissioning of all site utilities.
.6 Approval of utility decommissioning and hazardous materials abatement by the Departmental Representative.
.7 Demolition of the site building.
.8 Removal of contents of aboveground heating oil storage tank and removal of tank.
.9 Transportation and disposal of Hazardous Materials to the Contractor’s Designated Off-Site Disposal Facility.
.10 Transportation and disposal of non-hazardous materials to the Contractor’s Designated Off-Site Disposal Facility.
.11 Returning the site to its original grade.
.12 Provision of the following site support services:
.1 Safety, fire protection, and medical services

1.05 DEFINITIONS

.1 Departmental Representative: Within the context of these Specifications, the term Departmental Representative refers to the person exercising the roles and attributes of Canada under the contract.

.2 Departmental Representative's Authorized Personnel: Within the context of these Specifications, the term Departmental Representative's

Authorized Personnel refers to personnel appointed by Departmental Representative or authorized on site by Departmental Representative. Departmental Representative's Authorized Personnel provide recommendations/technical guidance to Departmental Representative as required, for the enforcement of these specifications.

.3 Contractor: Contractor retained to undertake the abatement and demolition work as defined within the context of these specifications.

.4 Contractor's Site Superintendent: Contractor's resident site representative, who is authorized to make decisions on behalf of Contractor.

.5 The word “provide” means supply and install, operate, submit or any other procedure necessary to complete the work as intended.

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

.7 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 (and therefore, which require precautions as outlined in the related requirements), animals, or plant life when released into the environment. The locations of known Hazardous Materials are indicated on the Drawings.

.8 Hazardous Waste: hazardous material no longer used for its original purpose and that has been characterized as a hazardous waste in accordance with the testing and acceptance requirements of the recycling, treatment or disposal facility.

1.06 SUBMITTALS

.1 All submittals in accordance with Section 01 33 00 - Submittal Procedures. A submittal list, for reference purposes only, is attached at the rear of that Section.

1.07 ON-SITE DOCUMENTS

.1 Maintain at job site, one copy each of the following:
- .1 Contract drawings.
- .2 Specifications.
- .3 Requests for Clarification and responses.
- .4 Addenda.
- .5 Change Orders.
- .6 Other modifications to Contract.
- .7 Previous site reports.
- .8 Copy of approved Work Schedule.
- .9 Manufacturers' installation and application instructions.
- .10 Material and Safety Data Sheets.
- .11 Site Specific Health and Safety Plan. Response Plans including:
  - .1 Spill Contingency Plan.
  - .2 Emergency Response Plan.
- .12 Labour conditions and wage Schedules.

.13 Up-to-date record drawings.
.14 All applicable Territorial permits and licenses.
.15 All applicable Federal permits and licenses.
.16 All applicable municipal permits and licenses
.17 Workers' Safety and Compensation Commission (WSCC) Notification of Project.
.18 Letter of Good Standing with WSCC.
.19 Other documents as specified.

1.08 WORK SCHEDULE

.1 Provide and maintain Work Schedule in accordance with instructions of Section 01 32 16.07 Construction Progress Schedules - Bar (GANTT) Chart.

.2 Keep the Departmental Representative advised of planned Work activities in accordance with the instructions of Section 01 33 00 – Submittal Procedures.

1.09 CONTRACTOR USE OF SITE

.1 Use of site is unrestricted until substantial performance.

.2 Coordinate use of premises under direction of Departmental Representative.

1.10 EXAMINATION OF SITE

.1 Prior to mobilization of equipment and supplies, check the field conditions including buried and above ground utilities, to ensure that the correct equipment, and supplies are being mobilized to site for the execution of the Work, and notify Departmental Representative in writing, of all matters which could prejudice proper execution of the Work. Provide a minimum of three (3) days notice to Departmental Representative prior to examining the site.

.2 Commencement of mobilization constitutes acceptance of existing conditions, and verification of dimensions.

1.11 DEPARTMENTAL REPRESENTATIVE FURNISHED ITEMS

.1 Not Used

1.12 PERMITS AND LICENSES

.1 Be responsible for obtaining and paying for permits, licenses and approvals associated with the site work.

.2 Register, obtain and pay for all required licenses and permits for individual tradesmen employed for Work as referenced in the various Sections of the Contract Specifications for the duration of employment.

.3 Obtain and pay for any other licenses or permits required to perform the activities required on site.

.4 Provide supplemental information to the regulators for any necessary license amendments or reporting requirements.

.5 Pay all costs associated with complying with the requirements for the permits and licenses noted in the above clauses.

1.13 SITE SUPERVISION

.1 Designate Contractor's Site Superintendent to be on site at all times during construction, to have full authority to make decisions for Contractor, to be knowledgeable of the requirements of the contract, and to act upon Departmental Representative's instructions.

.2 Notify Departmental Representative one (1) week in advance of Site Superintendent change.

1.14 ADDITIONAL DRAWINGS

.1 Departmental Representative may furnish additional drawings to assist with proper execution of the Work. These drawings will be issued for clarification only. Such drawings have the same meaning and intent as if they were included with plans referred to in Contract documents.

1.15 WORKER ORIENTATION SEMINAR

.1 Develop, prior to the start of Work, course material for a Worker Orientation Seminar. The outline of this seminar will be approved by Departmental Representative and is intended to describe the abatement activities at the site, and provide instruction for the applicable health, safety, and environmental policies and regulations as related to the site Work activities.

.2 The Worker Orientation Seminar will be conducted at the beginning of the abatement and demolition activities (i.e. the first morning of the abatement work site activities).

.3 Submit two (2) hard copies and one (1) electronic copy of the Worker Orientation Seminar course material to Departmental Representative for review at least one (1) week prior to the seminar. Include information describing the facility to be used for conducting the seminar.

.4 The Orientation Course will address, but is not necessarily limited to, the following topics:

- .1 Project Communication
  - .1 Roles of Departmental Representative.
  - .2 Roles of Contractor and Contractor's authorized representatives.
  - .3 Lines of Project communication.
- .2 Hazardous Materials Abatement (Scope of Work).
  - .1 Collection, containerization, and transportation for disposal of non-hazardous waste and debris.
  - .2 Asbestos abatement.
  - .3 Lead Abatement
  - .4 Collection, containerization, and transportation for disposal of hazardous waste material.

.3 Overview of the Site
.4 Project Organization/Schedule/Administration
  .1 Personnel policies.
  .2 Supervisory reporting relationships.
  .3 Communication.
  .4 Work Schedules and hours.
  .5 Site rules.
.5 Environmental Issues and Protection Procedures
  .1 Climate.
  .2 Land use.
  .3 Water.
  .4 Dust suppression.
  .5 Heritage resources.
  .6 Spill contingency plans/procedures.
  .7 Training activities.
.6 General Site Specific Health and Safety
  .1 Team Work.
  .2 Work attitudes/productivity.
  .3 Anti-Harassment Policy.
  .4 First aid procedures.
  .5 Protective equipment and clothing.
  .6 Safe operation of equipment and tools.
  .7 WHMIS requirements.
  .8 Climate.
  .9 Work Specific Task Requirements
  .10 Asbestos abatement.
  .11 Lead abatement.
  .12 Demolition and material disposal.
  .13 Transportation of Dangerous Goods (TDG).
  .14 Environmental mitigation procedures.
  .15 Emergency spill response training.
.5 On the first morning of the project, conduct Worker Orientation Seminars for site Workers (Contractor's Workforce), and Departmental Representative based on the course material approved by Departmental Representative.
.6 Each person on site will attend the orientation seminar. Require each attendee to sign a record of attendance upon completion of the seminar. Retain, for Departmental Representative's review at any time, this record of attendance.

1.16 MEASUREMENT FOR PAYMENT

.1 Work under this contract will be paid for as follows:
  .1 Lump sum pay items will be paid at the lump sum price tendered for each lump sum item listed in the Basis of Payment Form.
  2. Miscellaneous and all other items, whether specifically defined in the specific sections of the Specifications or not, will be paid under Item BOPC-1, Balance of Project Costs, in the Basis of Payment Form.

.2 Direct costs include all costs directly attributable to a particular pay item including equipment, operators, materials, etc. All direct costs for lump sum items are to be included in the appropriate price item in the Basis of Payment Schedule.

.3 Indirect costs include all costs not directly attributable to the pay items including profit, supervision, overhead, administration, CGL Insurance, WCB, allowance for equipment maintenance and depreciation repairs, and any other relevant costs. All indirect costs associated with specific lump sum items will be included in Item BOPC-1, Balance of Project Costs, in the Basis of Payment Schedule.

.4 All costs for the preparation of the Worker Orientation Seminar Material and for conducting the seminars, including the preparation of meeting room facilities as required, are to be included in the lump-sum price for Worker Orientation Seminar, Item 01 11 00-1, as indicated in the Basis of Payment Schedule.

2 PRODUCTS

2.01 NOT USED

.1 Not Used

3 EXECUTION

3.01 NOT USED

.1 Not Used

END OF SECTION

1 GENERAL

1.01 DEFINITIONS

.1 Project Start-Up Teleconference: conference call to be held within ten (10) days after Contract Award and to include the Contractor and Departmental Representatives.

.2 Pre-Construction Meeting: teleconference meeting to be held prior to Contractor Mobilization to include the Contractor and Departmental Representatives.

.3 Pre-Mobilization Site Visit: Contractor's visit to the site to check field conditions and obtain actual conditions required to ensure correct execution of the Work prior to site mobilization.

.4 Tailgate Meeting: meeting to be held on-site daily during the project and to include Contractor, construction staff and Departmental Representative.

.5 Pre-Demobilization Meeting (Final Walk Over): meeting to be held on site and to include the Contractor and Departmental Representative. Meeting to be held to record any outstanding work required prior to the demobilization of personnel, machinery, and equipment.

1.02 ADMINISTRATIVE

.1 Responsibilities of Departmental Representative
- .1 Schedule and administer Project meetings throughout the progress of the Work.
- .2 Prepare agenda for meetings unless otherwise specified.
- .3 Distribute written notice of each meeting five (5) days in advance of meeting date to the contractor.
- .4 Preside at meetings unless otherwise specified.
- .5 Record the meeting minutes unless otherwise specified. Include significant proceedings and decisions. Identify actions by parties.
- .6 Reproduce and distribute copies of minutes within three (3) days after meetings and transmit to meeting participants and affected parties not in attendance.

.2 Responsibilities of Contractor
- .1 Provide physical space and make arrangements for meetings.
- .2 Representative of Contractor, Sub-Contractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

.3 Authorities Having Jurisdiction
- .1 Interested persons representing Authorities Having Jurisdiction (AHJ) may also attend meetings.

1.03 PROJECT START-UP TELECONFERENCE MEETING

.1 Within ten (10) days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities. The meeting will be a teleconference between all parties in attendance.

.2 Departmental Representative, Contractor, major Sub-Contractors, field inspectors and supervisors will be in attendance.

.3 Establish time and location of meeting and notify parties concerned minimum five (5) days before meeting.

.4 Departmental Representative will chair the meeting and take minutes. Meeting will be informal and agenda to include the following:
- .1 Appointment of official representative of participants in the Work.
- .2 Preliminary Schedule of Work.
- .3 Preliminary Schedule of submission of Work Plan and Cost Breakdown and other submissions.
- .4 Preliminary requirements for temporary facilities, site security, equipment and proposed methods of mobilization and demobilization.
- .5 Set-up of Pre-Construction Meeting.

1.04 PRE-CONSTRUCTION MEETING

.1 Request a teleconference meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.

.2 Departmental Representative, Contractor, major Sub-Contractors, and supervisors will be in attendance.

.3 Establish time of meeting and notify parties concerned minimum five (5) days before meeting.

.4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.

.5 Agenda to include:
- .1 Schedule of Work: in accordance with Section 01 32 16.07 - Construction Progress Schedules - Bar (GANTT) Chart.
- .2 Submittal requirements in accordance with Section 01 33 00 – Submittal Procedures, and Section 01 78 00 – Closeout Submittals.
- .3 Schedule of submission in accordance with Section 01 33 00 - Submittal Procedures including but not limited to:
  - .1 Specific Health and Safety Plan;
    - .1 Emergency Response Plan;
    - .2 Spill Contingency Plan.
  - .2 Equipment to be used by Contractor.
  - .3 Location of equipment and proposed methods for mobilization and demobilization.
- .4 Requirements for temporary facilities (e.g. fencing).
- .5 Delivery Schedule of specified equipment.
- .6 Site safety.

.7 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
.8 Departmental Representative provided products.
.9 Monthly progress claims, administrative procedures, photographs, hold backs.
.10 Appointment of inspection and testing agencies or firms.
.11 Regulatory Issues.
.12 Any other business.

1.05 PRE-MOBILIZATION SITE VISIT

.1 Prior to mobilization, perform a Pre-Mobilization Site Visit to check field conditions and obtain actual conditions required to ensure correct execution of the Work. Notify Departmental Representative in writing by submitting a Pre-Mobilization Site Visit Report within seven (7) days of completing the visit, of all matters which could prejudice proper execution of the Work.

1.06 TAILGATE MEETINGS

.1 Contractor to preside over daily tailgate meetings with all construction staff and document minutes with daily reporting requirements.

.2 Daily tailgate meeting will focus on health and safety issues, and the schedule of the upcoming day.

.3 Departmental Representative to be present at all Tailgate Meetings.

1.07 PRE-DEMOBILIZATION MEETING (FINAL WALK OVER)

.1 A meeting of parties in contract to discuss the demobilization and close-out, and to resolve issues arising from same.

.2 Departmental Representative, Contractor, major Sub-Contractors, field inspectors and supervisors will be in attendance.

.3 Departmental Representative will preside.

.4 Agenda may include:
.1 Health, safety and security issues.
.2 Outstanding Work
.3 Schedules and action Contractor plans for demobilization.
.4 Confirmation of quantities.
.5 Summary of interactions with Authority Having Jurisdiction (AHJ).
.6 Submittals relating to the transportation and disposal of hazardous materials.

.5 Departmental Representative will record minutes of meetings and circulate to attending parties and affected parties not in attendance within seven (7) days after meeting.

1.08 SUBMITTALS

.1 Submit Preliminary Construction Schedule to Departmental Representative within five (5) working days of Contract Award which is to also include a chart for planning, monitoring and reporting of Project progress.

.2 Submit requests for payment for review, and for transmittal to Departmental Representative.

.3 Submit requests for interpretation of Contract Documents, and obtain instructions through Departmental Representative.

.4 Submit and process substitutions through Departmental Representative.

.5 Deliver closeout submittals for review to Departmental Representative.

.6 Provide submittals to the Departmental Representative for review. Include submittals as noted in Section 01 33 00 – Submittal Procedures.

1.09 MEASUREMENT FOR PAYMENT

.1 Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule.

2 PRODUCTS

2.01 NOT USED

.1 Not Used

3 EXECUTION

3.01 NOT USED

.1 Not Used

END OF SECTION

1 GENERAL

1.01 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.

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

.4 Construction Work Week: Monday to Sunday, inclusive, will provide seven (7) days Work week and define Schedule calendar working days as part of Bar (GANTT) Chart submission.

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

.6 Milestone: significant event in Project, usually completion of major deliverable.

.7 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.

1.02 REQUIREMENTS

.1 Ensure detailed Schedule is practical and remains within specified Contract duration.

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

.3 Provide and maintain a work schedule showing anticipated progress stages and final completion of work within time period required by Contract.

.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.

1.03 SUBMITTALS

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

.2 Submit Project Schedule to Departmental Representative within five (5) working days of receipt of acceptance.

1.04 PROJECT SCHEDULE

.1 Develop detailed Project Schedule.

.2 Ensure detailed Project Schedule includes as a minimum milestone and activity types as follows:
- .1 Award.
- .2 Permits.
- .4 Mobilization.
- .5 Site Activities (expand as required to suit Contractor’s task breakdown).
- .6 Interim Certificate of Completion.
- .7 Demobilization.
- .8 Closeout Submittals.
- .9 Final Certificate of Completion.

.3 Submit preliminary construction progress Schedule in accordance with Section 01 33 00 - Submittal Procedures to Departmental Representative coordinated with Departmental Representative's Project Schedule.

.4 After review, revise and resubmit Schedule to comply with revised Project Schedule.

.5 During progress of Work revise and resubmit with each monthly progress claim, or as directed by Departmental Representative.

1.05 PROJECT SCHEDULE REPORTING

.1 Submit with Monthly Invoice the following:
- .1 Health and safety related performance measures, as required.
- .2 Project Schedule update depicting extent completion of work activities, and work outstanding.

1.06 PROJECT MEETINGS

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

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

1.07 COST AND QUANTITY CONTROL

.1 Provide a Contract Work Breakdown Structure (CWBS) based on

Contractor's Cost Breakdown and any modifications requested by Departmental Representative as follows:

.1 CWBS to be an organization of the Work to be performed, services to be provided and data to be submitted by Contractor, as well as payments to be made to Contractor under the terms of the Contract.

.2 The CWBS to clearly define the Work elements of each item of the CWBS.

.3 The CWBS to include a breakdown of pay items included under Item BOPC -1, Balance of Project Costs in the Basis of Pricing Schedule. All lump sum pay items included in the Basis of Pricing Schedule to also be included in the CWBS.

.4 Prepare the CWBS in computerized spreadsheet format compatible with the most recent release of Microsoft Excel software. Provide CWBS in hard copy format.

.5 Submit the CWBS within 15 days following contract award date.

.2 Equipment and Material Control:

.1 Record data on status of construction material and equipment and report upon Departmental Representative's request.

.3 Manpower Performance Measures:

.1 Record and report manpower listing for each company employed under this Contract, including Sub-Contractors, detailing daily man-hours during the current month and cumulative total to date and report upon Departmental Representative's request.

.2 Provide statistics related to lost time accidents upon Departmental Representative's request.

1.08 MEASUREMENT FOR PAYMENT

.1 Include all direct costs for the preparation of the Project Schedule and related submittals in lump sum price for Submittals, Item 01 33 00-1, as indicated in the Basis of Payment Schedule.

.2 Except as otherwise indicated herein, Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule.

2 PRODUCTS

2.01 NOT USED

.1 Not Used

3 EXECUTION

3.01 NOT USED

.1 Not Used

END OF SECTION

1 GENERAL

1.01 DEFINITION

.1 Not used.

1.02 ADMINISTRATIVE

.1 Submit to Departmental Representative submittals listed for review. Submittal List (Table 1) is bound into specification section and is for information only. Submit with reasonable promptness and in orderly sequence so as to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.

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

.3 Present submittals in SI Metric units.

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

.5 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated 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 will be considered rejected.

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

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

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

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

1.03 PHOTOGRAPHS

.1 Provide digital photos in "Joint Photographic Experts Group" (.jpg) format for Progress Photographs and Final Photographs.

.2 Digital photographs to have a minimum of 2,592 x 1,944 pixel (5 Megapixel) resolution.

.3 Progress and Final Photographs to be submitted on one compact disc

(CD). Provide two (2) copies of the Photograph CD.

.4 Printed (colour) copies of digital photographs:
.1 Size: 100 mm x 125 mm.
.2 Two digital photographs per 215 x 280 mm page.
.3 Pages to be white, of photographic quality paper and to be three-hole punched, ready for insertion into a three-ring binder. Binder(s) to be vinyl, hard-covered, 3 inch D ring, sized for 215 x 280 mm paper, with spine pocket.

.5 Identification: Typewritten or generated by computer, the name and number of the Project on cover and spine of binder and CD case. Each photograph to be labelled with the digital photo file name positioned so as to not interfere with the view of the main activity or feature presented on the photograph. Also provide a description of each photograph in photographic log format. Photographic log to be included with each computer disk, CD, and binder. Description to include:
.1 Digital photograph file name;
.1 Name and description of feature.
.2 View direction.
.3 Date of exposure.
.4 GPS location.
.5 Before and after photographs of location.

.6 Quantity: Provide sufficient number of photographs to adequately describe the Work activities carried out. A minimum of two photographs taken from two viewpoints are to be provided for each activity.

.7 Provide two sets in two binders of digital photographs.

.8 Submit final photographs prior to final progress payment request.

1.04 MEASUREMENT FOR PAYMENT

.1 All direct costs related to preparation and submittal of photographs as outlined in this section are to be included in the lump sum item 01 78 00-1 Closeout Submittals. All other miscellaneous work and indirect costs under this section will not be measured and are to be included in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule.

2 PRODUCTS

2.01 NOT USED

.1 Not Used

3 EXECUTION

3.01 NOT USED

.1 Not Used

Table 1
Submittal List

Specification Section	Description	Date
01 31 19	Project Schedule - Baseline	Within five (5) days of Contract Award
01 31 19	Project Schedule – Monthly Update	With monthly Progress Claim Request
01 11 00	Worker Orientation Course Seminar	One (1) week prior to site work.
01 31 19	Pre-Mobilization Site Visit Report	Within seven (7) days of completing the visit
01 33 00	Final Photographs	Prior to final Progress Claim Request
01 35 29.14	Site Specific Health and Safety Plan	Within fifteen (15) days of Contract Award
01 35 29.14	Emergency Response Plan	As Part of the Site Specific Health and Safety Plan
01 35 29.14	Spill Contingency Plan	As Part of the Site Specific Health and Safety Plan
01 35 29.14	Fire Safety Plan	As Part of the Site Specific Health and Safety Plan
01 35 29.14	Proof of PPE certification (including Respiration Fit Testing Requirement)	Prior to Work Activities
01 35 29.14	Report Accidents	Verbal report immediately followed by written report in 24 hours
01 74 21	Waste Audit and Reduction Workplan	Within seven (7) days of completing the pre-mobilization visit
01 74 21	Summary of waste materials	Before final payment
01 77 00	Certification of Completed Work	As Work is Completed
01 78 00	Project Records	As Required
02 41 16	Demolition drawings	Before Work on site
02 81 00	WHMIS Safety Data Sheets	Before bringing material on site
02 81 00	Hazardous Materials Management Plan	Before Work on site
31 23 33.01	Underground utility records	Before Work on site
31 23 33.01	Samples of proposed fill material	One (1) week prior to beginning Work

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 02 41 16 – Structure Demolition

.2 Section 02 82 00.03 – Asbestos Abatement – Maximum Precautions

.3 Section 02 83 10 – Lead-Based Paint Abatement – Minimum Precautions

1.02 REFERENCES

.1 See Section 01 41 00 – Regulatory Requirements

1.03 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 engineering controls.
- .6 Weekly results of collected air sampling data, including compliance air monitoring results.
- .7 Other information required by Departmental Representative or relevant to agenda for upcoming progress meeting.

.4 Site Layout: within seven (7) 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 Staging areas.
- .2 Equipment and personnel decontamination areas.
- .3 Means of ingress, egress and temporary traffic control facilities.
- .4 Equipment and material staging areas.
- .5 Demolition debris stockpile areas.

.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 29.14 - Health and Safety for Contaminated Sites.

1.04 REGULATORY REQUIREMENTS

.1 Provide erosion and sediment control in accordance with applicable regulations.

.2 Comply with federal, territorial, and local anti-pollution laws, ordinances, codes, and regulations when disposing of waste materials, debris, and rubbish.

.3 Work to meet or exceed minimum requirements established by federal, territorial, and local laws and regulations which are applicable.
  .1 Contractor: responsible for complying with amendments as they become effective.

.4 In event that compliance exceeds scope of work or conflicts with specific requirements of contract notify Departmental Representative immediately.

1.05 SEQUENCING AND SCHEDULING

.1 Do not commence Work involving contact with potentially contaminated materials until drum staging pad is operational and approved by Departmental Representative.

1.06 EQUIPMENT DECONTAMINATION FACILITY

.1 Not used.

1.07 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.

1.08 SOIL STOCKPILING FACILITIES

.1 Not used.

1.09 DESIGN REQUIREMENTS

.1 Not used.

1.10 WASTEWATER STORAGE TANK

.1 Not used.

1.11 DRUMS

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

1.12 VEHICULAR ACCESS AND PARKING

.1 Not used.

1.13 DUST AND PARTICULATE CONTROL

.1 Execute Work by methods to minimize raising dust from construction operations.

.2 Implement and maintain dust and particulate control measures as determined necessary by Departmental Representative during construction and in accordance with applicable regulations.

.3 Provide positive means to prevent airborne dust from dispersing into atmosphere. Use water misting system for dust and particulate control.

.4 Use chemical means for water misting system for dust and particulate control only with Departmental Representative'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 Departmental Representative 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.

1.14 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 Departmental Representative.

.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.

1.15 EQUIPMENT DECONTAMINATION

.1 Not used.

1.16 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 materials. Cover stockpiled materials with an impermeable liner during periods of work stoppage including at end of each working day and as directed by Departmental Representative

.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 unstabilized 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 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.

1.17 DEWATERING

.1 Not used.

1.18 EROSION AND SEDIMENT CONTROL

.1 Not used.

1.19 PROGRESS CLEANING

.1 Maintain cleanliness of Work and surrounding site to comply with federal, territorial, 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.

1.20 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 Departmental Representative. Departmental Representative will direct Contractor to perform additional decontamination if required.

1.21 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 Departmental Representative:
.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 in accordance with the specifications under Section 02 41 16 – Structure Demolition, Section 02 82 00.03 – Asbestos Abatement – Maximum Precautions and Section 02 83 10 – Lead-Base Paint Abatement – Minimum Precautions.

.9 Minimize generation of hazardous waste to maximum extent practicable. Take necessary precautions to avoid mixing clean and contaminated wastes.

.10 Identify and evaluate recycling and reclamation options as alternatives to land disposal, such as:

.1 Hazardous wastes recycled in manner constituting disposal;

.2 Lead-acid battery recycling;

1.22 RECORD KEEPING

.1 Maintain adequate records to support information provided to Departmental Representative regarding exception reports, annual reports, and biennial reports.

.2 Maintain bills of ladings for minimum of 375 days from date of shipment or longer period required by applicable law or regulation.

1.23 MEASUREMENT FOR PAYMENT

.1 Direct costs related to Work under this section are to be included in the lump sum price Item 01 74 21 Construction/Demolition Waste Management and Disposal. All other miscellaneous work and indirect costs under this section will not be measured and are to be included in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.1 Site Specific Health and Safety Requirements

.1 Maintain and complete all health and safety, fire safety, and environmental compliance activities in accordance with applicable sections and AHJ.

.2 Compliance concerns are to be discussed as part of Pre-Construction teleconference and the Construction Meeting held on site, as directed by Departmental Representative. At the discretion of the Departmental Representative a standalone Compliance Meeting may be called.

.3 The intent of the compliance meeting is to review reporting and inspection requirements to meet the intent of Government of Northwest Territories Occupational Health & Safety Regulations, regulatory, and other requirements as may be required.

.4 Compliance meetings to be held at the Work site.

.5 Departmental Representative will record minutes, chair the meeting and distribute minutes to parties of record prior to the next Scheduled meeting.

.6 Attendees:
- .1 Contractor: Manager and/or Supervisor(s), representatives of major Sub-Contractors, and others as necessary.
- .2 Departmental Representative, and representatives of Independent Inspection Agencies.

.7 Agenda:
- .1 Review site safety and security issues.
- .2 Review and approval of minutes of previous meeting as required.
- .3 Review of items of significance that could affect Work.
- .4 Inspect the site, as determined by the Departmental Representative or as dictated by the AHJ.
- .5 Identify and record field observations, problems, and conflicts that must be noted in reports required by the AHJ.
- .6 Identify corrective measures and procedures to regain approval from AHJ.
- .7 Identification of requirements for maintenance of quality standards needed for compliance with applicable Codes and Legislation.
- .8 Review environmental and regulatory compliance.
- .9 Other topics for discussion as appropriate to current status of the Work.

1.01 RELATED REQUIREMENTS

.1 Section 02 41 16 – Structure Demolition

.2 Section 02 82 00.03 – Asbestos Abatement – Maximum Precautions

.3 Section 02 83 10 – Lead-Based Paint Abatement – Minimum Precautions

.4 Section 31 23 33.01 – Excavating, Trenching and Backfilling

1.02 REFERENCES

.1 Perform Work in accordance with National Building Code of Canada (NBC) including all amendments and other codes of territorial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.

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

.3 Perform Work in accordance with the Specifications and meet or exceed all codes, standards, guidelines and regulations applicable to the Work and issued under the authority of the Government of Canada and the Government of Northwest Territories. Advise Departmental Representative of any discrepancies in the codes, standards and regulations applicable to the Work.

1.03 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 (7) 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, territorial, or federal agencies.

.13 Written respiratory protection program for project activities.

.14 Procedures dealing with heat and/or cold stress.

.16 Spill containment program if drummed waste material is generated, excavated, stored, or managed on site.

.7 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within five (5) days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within three (3) days after receipt of comments from Departmental Representative.

.8 Medical Surveillance: submit certification of medical surveillance for site personnel, within seven (7) 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 (7) 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.

1.04 REGULATORY REQUIREMENTS

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

1.05 SITE CONDITIONS

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

1.06 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 Departmental Representative in writing. Departmental Representative will respond in writing, either accepting or requesting improvements.

1.07 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, territorial, and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.08 HAZARD COMMUNICATION REQUIREMENTS

.1 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations, Part X - Hazardous Substances.

.2 Provide Departmental Representative with Material Safety Data Sheets (MSDS) and documentation on any "hazardous" chemical that Contractor or Contractor Representatives plan to bring onto site.

1.09 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. Departmental Representative may also stop Work for health and safety considerations.

1.10 UNFORESEEN HAZARDS

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

1.11 HEALTH AND SAFETY OFFICER AND REGISTERED OCCUPATIONAL HYGIENIST / CERTIFIED INDUSTRIAL HYGIENIST

.1 Employ and assign to Work competent and authorized representative as Health and Safety Adviser. Health and Safety Adviser must:
- .1 Have minimum 2 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 and report directly to the Departmental Representative.

1.12 PERSONNEL HEALTH, SAFETY, AND HYGIENE

.1 Training:
- .1 Ensure personnel entering site are trained in accordance with specified personnel training requirements. Training session must be completed by Health and Safety Officer.

.2 Levels of Protection:
- .1 Establish levels of protection for each Work area based on planned activity and location of activity.

.3 Personal Protective Equipment:
- .1 Furnish site personnel with appropriate PPE as specified above. Ensure that safety equipment and protective clothing is kept clean and maintained.
- .2 PPE in accordance with the specifications under Section 02 82 00 03 – Asbestos Abatement – Maximum Precautions and Section 02 83 10 – Lead-Base Paint Abatement – Minimum Precautions.

.4 Develop protective equipment usage procedures and ensure that procedures are strictly followed by site personnel; include following procedures as minimum:
- .1 Ensure prescription eyeglasses worn are safety glasses and do not permit contact lenses on site within work zones.
- .2 Ensure footwear is steel-toed safety shoes or boots and is covered by rubber overshoes when entering or working in potentially contaminated work areas.
- .3 Dispose of or decontaminate PPE worn on site at end of each workday.
- .4 Decontaminate reusable PPE before reissuing.
- .5 Ensure site personnel have passed respirator fit test prior to entering potentially contaminated work areas.

.5 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 In absence of additional air monitoring information or substance identification, minimum levels of respiratory protection will be required as follows:
- .6 Immediately notify Departmental Representative when level of respiratory protection required increases.
- .7 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.
- .8 Assess ability for site personnel to wear respiratory protection.
- .9 Ensure site personnel are able to pass respirator fit test prior to entering potentially contaminated work areas.

.11 Heat Stress/Cold Stress: implement cold stress monitoring program as applicable and include in site-specific Health and Safety Plan.

.12 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.
- .3 Decontamination facilities in accordance with the specifications under Section 02 82 00 03 – Asbestos Abatement – Maximum Precautions and Section 02 83 10 – Lead-Base Paint Abatement – Minimum Precautions.

.13 Emergency and First-Aid Equipment:
- .1 Locate and maintain emergency and first-aid equipment in appropriate location on site including first-aid kit to accommodate number of site personnel; portable emergency eye wash; two 9 kg ABC type dry chemical fire extinguishers.

.14 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 2-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.

1.13 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 Departmental Representative who will, in conjunction with Health and Safety Officer, determine when operations should be shut down and restarted.
- .4 Operate air monitoring equipment with personnel trained in equipment provided and under control of Health and Safety Officer.
- .5 Conduct air monitoring on routine basis around active work locations. Perform hourly monitoring minimum and additionally as dictated by site activities.
- .6 Furnish wind speed and direction indicator capable of providing permanent record, at unobstructed location on site located above elevation of work area with unobstructed view to affected workers.
- .7 Air Monitoring to be completed in accordance with the specifications under Section 02 82 00 03 – Asbestos Abatement – Maximum Precautions.

.2 Air Monitoring Reporting: report air monitoring results daily to Departmental Representative on separate form.

1.14 CONTINGENCY AND EMERGENCY RESPONSE

.1 Meet specified requirements.

.2 Arrange and attend co-ordination meeting held with appropriate authorities including City, Fire, Hospital, Police, and AHJ; meeting will identify off-site Emergency Response Co-ordinator through whom information and co-ordination will occur in event of incident.

1.15 SITE CONTROL

.1 Safety Meeting
- .1 Conduct daily task specific safety meetings as per Project requirements and as directed by Departmental Representative.
- .2 Conduct safety meetings with workers engaged in outdoor Work under summer or winter conditions. Topics must include hot and cold stress, exhaustion, buddy systems, and any other items inherent in working outdoors.
- .3 Conduct mandatory daily safety meetings (toolbox) 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 an as needed basis or as specified by the AHJ. Keep records of meetings on file.

.2 Fuel Management

.1 All vehicle and equipment refuelling must be conducted by appropriately trained personnel using the effective personal protective equipment in a manner which meets or exceeds regulatory requirements including using drip pans, double walled tanks and secondary containment for tanks, filler nozzles and valves, as required.
.2 Records of fuel usage by activity must be maintained.
.3 All fuel transports including mobile refuelling trucks and fuel transport to stationary equipment such as generators or pumps or distributed storage areas, must occur in approved (CSA) containers with the notification and consent of site safety personnel.

.3 Vehicle and Equipment Usage
.1 Seatbelts must be worn at all times vehicle or equipment is in operation.
.2 Speed limits must be set and obeyed.
.3 If site access is unsafe or marginally unsafe, maintain to acceptable standards. Do not risk property damage or injury.
.4 Vehicles are to not be idled for longer than 10 minutes (warm up) unless explicitly used as a place of refuge during animal encounters or for personnel working outdoors during winter operations. Exceptions are to be made in consultation with Departmental Representative.
.5 Perform vehicle maintenance and lubrication of equipment in a manner that avoids spillage of fuels, oils, grease and coolants. When refuelling equipment, use leak free containers and reinforced rip and puncture proof hoses and nozzles. Remain in attendance for duration of refuelling operation, and ensure that all storage container outlets are properly sealed after use.
.6 Place drip pans under stationary equipment with potential leaks.
.7 All mobile equipment brought to the site must have rotating beacons and vehicles should have beacons and buggy whips.
.8 Dispose of used oil, grease and coolants from Contractor’s vehicles maintenance activities as hazardous waste as set out in Section 02 81 01 Hazardous Materials. Include costs for disposal in this Section.
.9 Helmets must be worn during the use of ATVs.

.4 Flammable Liquids
.1 The handling, storage and use of flammable liquids will be governed by the current National Fire Code of Canada.
.2 Flammable liquids such as gasoline, kerosene and naphtha may be kept for ready use in quantities not exceeding 45 litres provided they are stored in approved safety cans bearing the Underwriter's Laboratory of Canada or Factory Mutual seal of approval. Storage of quantities of flammable liquids exceeding 45 litres for Work purposes, requires the permission of the permitting authority.
.3 Do not transfer flammable liquids in the vicinity of open flames or any type of heat-producing devices.
.4 Do not use flammable liquids having a flash point below 38°C such as naphtha or gasoline as solvents or cleaning agents.
.5 Store flammable waste liquids, for disposal, in approved containers located in a safe ventilated area. Quantities are to be kept to a minimum and Departmental Representative is to be notified when disposal is required.
.6 Dispose of all flammable liquids in accordance with all

applicable environmental regulations and with the requirements of Section 02 81 01 Hazardous Materials.

.5 Storage and Handling of Fuel

.1 Locate fuel storage areas as approved by Departmental Representative.

.2 Inspect fuel storage and dispensing facilities daily. Make available fire fighting and spill response equipment for immediate access at each fuel storage location.

.3 Store all drums containing fuel and /or hazardous materials in an elevated position, either on their side with bungs facing 9 and 3 o'clock position, or on pallets, upright, and banded.

.4 All drums to be individually identified. Label will be to industry standards and will provide all information necessary for health and safety and environmental purposes. Make available, to all personnel, Material Safety Data Sheets for all materials maintained at site or along right-of-ways.

.5 All drums/fuel containers to be labelled with Contractor's name.

.6 Treat all waste petroleum products, including used oil filters as hazardous materials.

.7 Conduct regular inspections of all machinery hydraulic, fuel and cooling systems. Repair leaks immediately.

.8 Pre-assemble and maintain emergency spill equipment, including absorbent material. Maintain spill mats or pan under mobile fuelling containers and a spill kit at the refuelling area.

.9 Remove all full and empty drums, fuel storage facilities and associated materials and equipment from site at conclusion of Work.

.6 Spill Contingency Plan

.1 Submit to Departmental Representative for approval, detailed Spill Contingency Plan. Identify response capabilities by detailing response times, and types and volumes of spills to which Contractor can respond. Following information is required as a minimum:

.1 A description of pre-emergency planning.

.2 Personnel roles, lines of authority and communication, emergency phone numbers.

.3 Emergency alerting and response procedures.

.4 Evacuation routes and procedures, safe distances and places of refuge.

.5 Directions/methods of getting to nearest medical facility.

.6 Emergency decontamination procedures.

.7 Emergency medical treatment and First-Aid.

.8 Emergency equipment and materials.

.9 Emergency protective equipment.

.10 Procedures for reporting incidents.

.11 Spill and disposal response and containment plans for all materials that could potentially be spilled including a spill response.

.7 Medical

.1 Provide and maintain first aid and medical care and facilities for all workers as required by the Statutes of the Government of Northwest Territories *Occupational Health & Safety Regulations*.

.2 Provide the appropriate first aid kit, based on the number of workers, in accordance with the Government of Northwest

Territories *Occupational Health & Safety Regulations*.

.3 Establish an emergency response plan acceptable to Departmental Representative, for the removal of any injured person to medical facilities or a doctor's care in accordance with applicable legislative and regulatory requirements.

.4 Provide the appropriate number of first aid attendants on site in accordance with the Government of Northwest Territories *Occupational Health & Safety Regulations* (minimum of one).

.5 Emergency and First Aid Equipment:

.1 Locate and maintain emergency and first aid equipment in appropriate location on site including first aid kit to accommodate number of site personnel; portable emergency eye wash; fire protection equipment as required by legislation.

.2 Provide a minimum of 1 qualified first aid attendant on site at all times when Work activities are in progress; duties of first aid attendant may be shared with other light duty Work related activities.

.8 Accidents and Accident Reports

.1 Immediately report, verbally, followed by a written report within 24 hours, to Departmental Representative, all accidents of any sort arising out of or in connection with the performance of the Work, giving full details and statements of witnesses. If death or serious injuries or damages are caused, report the accident promptly to Departmental Representative by telephone or facsimile in addition to any report required under federal and territorial laws and regulations.

.2 If a claim is made by anyone against Contractor or Sub-Contractor on account of any accident, promptly report the facts in writing to Departmental Representative, giving full details of the claim.

.9 Security

.1 Limit site access only to persons employed on the Project. Unauthorized persons will be permitted on site only with the approval of Departmental Representative or Contractor.

.10 Fire Safety

.1 Provide all fire prevention, fire protection and fire fighting services at the Project site where all fire prevention and protection equipment is to be certified and inspected by fire prevention service professionals.

.2 Implement a fire safety program that includes fire prevention, fire protection, fire fighting requirements and an evacuation strategy in the event of a fire. Submit details of the fire safety program in writing to Departmental Representative for review prior to start of construction. Such review does not relieve Contractor from any obligations or responsibilities required by the Contract.

.3 Ensure that any Sub-Contractors and other Contractor personnel on-site are briefed on fire safety requirements and are familiar with the fire prevention, fire protection and fire fighting program.

.4 The fire safety program to meet or exceed the most recent editions of the following codes and standards:

.1 Government of Northwest Territories Occupational Health & Safety Regulations.

.2 National Fire Code of Canada.
.3 Canada Labour Code Part II.

.5 Personnel designated for fire fighting services must be provided with training for any special hazards that may be present. These personnel must also be provided with protective equipment as required by the Canada Labour Code Part II.

.11 Reporting Fires

.1 A person discovering a fire and all fire related incidents will report immediately, by fastest available means, to Departmental Representative and site superintendent.

.2 A person discovering a fire will if possible, remain in the vicinity to direct fire fighting personnel.

.12 Fire Extinguishers

.1 Provide and maintain fire extinguishers in sufficient quantity to protect in an emergency.

.13 Smoking Precautions

.1 Do not permit smoking inside the building or in any temporary storage areas.

.2 Smoking is prohibited within 7.5 metres of fuel storage and dispensing facilities.

.3 Provide and place signs indicating that smoking within 7.5 metres of fuel storage and dispensing facilities is not permitted, and that the vehicle ignition must be turned off while the vehicle is being refuelled. Provide at least one weather-resistant sign at each fuel dispensing location. The signs will have a minimum dimension of 200 mm and letters not less than 25 mm high. In lieu of lettering, signs may have international "No Smoking - Ignition Off" symbols not less than 100 mm in diameter. Install signs in a location visible to all drivers approaching the dispensing location, and at the dispensing unit.

.14 Rubbish and Waste Materials

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

.2 Storage:

.1 Extreme care is required where it is necessary to store oily waste in Work areas to ensure maximum possible cleanliness and safety.

.2 Greasy or oily rags or materials subject to spontaneous combustion will be disposed of as hazardous material in accordance with Section 02 81 01 Hazardous Materials.

.15 Hazardous Substances

.1 If the Work entails the use of any toxic or hazardous materials or otherwise creates a hazard to life, safety or health, Work will be in accordance with the National Fire Code of Canada, Occupational Health and Safety Legislation, and WHMIS.

.2 Departmental Representative is to be advised, and a "Hot Work" permit issued by Contractor's designated representative in all cases involving welding, burning or the use of blow torches and salamanders, in buildings or facilities. Special precautions are necessary to safeguard life and property from damage by fire or explosives.

.3 Wherever Work is being carried out in dangerous or hazardous areas involving the use of heat, fire watchers, equipped with

sufficient fire extinguishers, will be provided. The determination of dangerous or hazardous areas along with the level of precaution necessary for Fire Watch will be at the discretion of Contractor. Notify Departmental Representative prior to that determination.

.4 Provide proper ventilation and eliminate all sources of ignition where flammable liquids, such as lacquers or urethanes are used.

.16 Questions and Clarifications

.1 Direct any questions or clarification to Departmental Representative.

1.16 MEASUREMENT FOR PAYMENT

.1 All direct costs related to the preparation of the Site-specific Health and Safety Plan (and related planning submittals) are to be included in the lump sum item 01 35 29.14 Site-Specific Health and Safety Plan.

.2 All direct costs related to the work related to controlling the site is to be included in lump sum item 02 81 01-1 Hazardous Materials Abatement.

.3 All other miscellaneous work and indirect costs under this section will not be measured and are to be included in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 References and Codes

.1 Perform Work in accordance with National Building Code of Canada (NBC) including all amendments and other codes of territorial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.

.2 Meet or exceed requirements of:
- .1 Contract documents.
- .2 Specified standards, codes and referenced documents.
- .3 Perform 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 Government of Nunavut. Advise Departmental Representative of any discrepancies in the codes, standards and regulations applicable to the Work.

1.02 References and Codes - Federal

.1 Meet or exceed the most recent amendments or revisions to the 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:
- .1 Canada Labour Code Part II-Occupational Health and Safety (R.S.1985,c.L-2).
- .2 Canada Occupational Health and Safety Regulations (SOR/86-304).
- .3 Canadian Environmental Protection Act, (S.C. 1999, c.33).
- .4 Controlled Products Regulations (SOR/88-66).
- .5 Interprovincial Movement of Hazardous Waste Regulations (SOR/2002-301).
- .6 Department of Justice Canada (Jus)/CEPA, 1999 Federal PCB Regulations, (SOR/2008-273).
- .7 National Construction, Renovation and Demolition Non-hazardous Solid Waste Management Protocol, PWGSC 2002.
- .8 National Fire Code of Canada, 2005.
- .9 National Building Code of Canada, 2005.
- .10 Ozone Depleting Substances Regulations, 1998 (SOR/99-7).
- .11 Transportation of Dangerous Goods Act, 1992 (S.C. 1992, c.34).
- .12 Transportation of Dangerous Goods Regulations (SOR/2001-286).
- .13 Territorial Land Use Regulations (C.R.C., c.1524).
- .14 Fisheries Act (R.S., 1985, c. F-14).
- .15 Health Canada Guidelines for Canadian Drinking Water Quality, May 2008.
- .17 Arctic Waters Pollution and Prevention Act (A.S. 1985 CA-12).
- .18 Northwest Territories Waters and Northwest Territories Surface Rights Tribunal Act (SOR/2002-253)

1.03 References and Codes - Northwest Territories

.1 Meet or exceed the most recent amendments or revisions to the governing codes, standards and guidelines, and regulations

applicable to Work and issued under the authority of the Government of Northwest Territories including, but not limited to:

.1 Environmental Protection Act (Northwest Territories) (R.S.N.W.T. 1988, c. E-7)
.2 Labour Standards Act (Northwest Territories) S.N.W.T. 2003,c.15
.3 Public Health Act, R.S.N.W.T. 1988, c.P-12.
.4 Spill Contingency Planning and Reporting Regulations NU R-068-93.
.5 Fire Prevention Act, R.S.N.W.T. 1988, c.F-6.
.6 Transportation of Dangerous Goods Act, S.N.W.T. 1990, c.36 2008,c.8
.7 Transportation of Dangerous Goods Regulations, N.W.T. Reg. 049-2002
.8 Used Oil and Waste Fuel Management Regulations, N.W.T. R-064-2003
.9 Work Site Hazardous Materials Information System Regulations, R.R.N.W.T. 1990, c.S-2.

1.04 Standards, Guidelines and Policies

Standards, Guidelines And Policies

.1 Meet or exceed the most recent amendments or revisions to the governing standards, guidelines, and policies applicable to the Work, including, but not limited to:

.1 Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products, (PN 1326), 2003 CCME.
.2 Guidelines for Canadian Drinking Water Quality, April 2004, Canadian Council of Ministers of the Environment.
.3 Guidelines for Effluent Quality and Wastewater Treatment at Federal Establishments, April 1976, Environmental Conservation Directorate.
.4 Environmental Guideline for Waste Batteries, January 2002, Government of the Northwest Territories.
.5 Guideline for the Management of Waste Lead and Lead Paint, Northwest Territories, 2011.
.6 Environmental Guideline for Waste Solvents, January 2002, Government of the Northwest Territories.
.7 Environmental Guideline for Site Remediation, January 2002, Government of the Northwest Territories.
.8 Environmental Guideline for Air Quality – Sulphur Dioxide and Suspended Particulates, January 2002 – Government of the Northwest Territories.
.9 Environmental Guideline for Dust Suppression, January 2002, Government of the Northwest Territories.
.10 Environmental Guideline for the General Management of Hazardous Waste, January 2002, Government of Northwest Territories.
.11 Environmental Guideline for Ozone Depleting Substances, January 2002, Government of the Northwest Territories.

1.05 Permits and Licenses

.1 Any deviations from the current abatement and demolition plan may

require Permit amendments or field authorizations. Notify Departmental Representative of any proposed deviations.

.2 Respond to all regulatory inquiries in order to get permits and licenses and provide Departmental Representative with a copy of each response.

1.06 Hazardous Material

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

1.07 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, HRSDC and Health Canada.

.2 Deliver copies of WHMIS data sheets to Departmental Representative on delivery of materials.

1.08 Submittals

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

1.09 MEASUREMENT FOR PAYMENT

.1 Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule.

2 PRODUCTS

2.01 NOT USED

.1 Not Used

3 EXECUTION

3.01 NOT USED

.1 Not Used

END OF SECTION

1 GENERAL

1.01 Inspection

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

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

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

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

1.02 Submittals

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

1.03 Independent Inspection Agencies

.1 Independent Inspection/Testing Agencies will be engaged by Departmental Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Departmental Representative.

.2 Provide access for executing inspection and testing by appointed agencies.

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

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

1.04 Access to Work

.1 Allow inspection/testing agencies access to Work, off site manufacturing and storage areas.

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

1.05 Procedures

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

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

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

1.06 Rejected Work

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

.2 If in opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Departmental Representative may deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Departmental Representative.

1.07 Reports

.1 Departmental Representative will distribute copies of reports.

.2 Provide copies to Sub-Contractor of Work being inspected or tested and manufacturer or fabricator of material being inspected or tested.

1.08 MEASUREMENT FOR PAYMENT

.1 Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule.

2 PRODUCTS

2.01 NOT USED

.1 Not Used

3 EXECUTION

3.01 NOT USED

.1 Not Used

END OF SECTION

Part 1 General

1.1 WASTE MANAGEMENT GOALS

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

.2 Obtain approval from Departmental Representative of proposed Hazardous Waste Storage Area.

.3 Provide Departmental Representative documentation certifying that waste management, recycling, reuse of recyclable and reusable materials have been extensively practiced.

.4 Accomplish maximum control of solid construction waste.

.5 Preserve environment and prevent pollution and environment damage.

1.2 RELATED REQUIREMENTS

.1 Section 02 41 16 – Structure Demolition.

.2 Section 31 23 33-01 – Excavating, Trenching and Backfilling.

.3 Section 02 81 01 – Hazardous Materials

1.3 DEFINITIONS

.1 Non-hazardous Waste - construction renovation and demolition waste suitable for disposal at a non-hazardous waste disposal facility.

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

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

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

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

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

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

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

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

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

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

.10 Waste Audit (WA): detailed inventory of materials in building. Involves quantifying by volume/weight amounts of materials and wastes generated during construction, demolition, deconstruction, or renovation project. Indicates quantities of reuse, recycling and landfill. Refer to Schedule A.

.11 Waste Reduction Workplan (WRW): written report which addresses opportunities for reduction, reuse, or recycling of materials. Refer to Schedule B. WRW is based on information acquired from WA (Schedule A).

1.4 DOCUMENTS

.1 Maintain at job site, one copy of following documents:

.1 Waste Audit.

.2 Waste Reduction Workplan.

.3 Schedules A and B completed for project.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Prepare and submit following within seven (7) days of pre-mobilization site visit:

.1 Submit 2 copies of completed Waste Audit (WA): Schedule A.

.2 Submit 2 copies of completed Waste Reduction Workplan (WRW): Schedule B.

.3 Submit before final payment summary of waste materials salvaged for reuse, recycling or disposal by project using deconstruction/disassembly material audit form.

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

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

.3 For each material reused, sold or recycled from project, include quantities by number, type and size of items and the destination.

.4 For each material land filled from project, include amount of material (measured in trucks, tonnage, or as applicable for receiving facility) and identity of landfill or transfer station.

1.6 WASTE AUDIT (WA)

.1 Conduct WA prior to project start-up.

.2 Prepare WA: Schedule A.

.3 Record, on WA - Schedule A, extent to which materials or products used consist of recycled or reused materials or products.

1.7 WASTE REDUCTION WORKPLAN (WRW)

.1 Prepare WRW prior to project start-up.

.2 WRW should include but not limited to:

.1 Destination of materials listed.

.2 Deconstruction/disassembly techniques and sequencing.

.3 Schedule for deconstruction/disassembly.

.4 Location.

.5 Security.

.6 Protection.

.7 Clear labelling of storage areas.

.8 Details on materials handling and removal procedures.

.9 Quantities for materials to be salvaged for reuse or recycled and materials sent to landfill.

.3 Structure WRW to prioritize actions and follow 3R's hierarchy, with Reduction as first priority, followed by Reuse, then Recycle.

.4 Describe management of waste.

.5 Identify opportunities for reduction, reuse, and recycling of materials. Based on information acquired from WA.

.6 Post WRW or summary where workers at site are able to review content.

.7 Set realistic goals for waste reduction, recognize existing barriers and develop strategies to overcome these barriers.

.8 Monitor and report on waste reduction by documenting total volume and cost of actual waste removed from project.

1.8 STORAGE, HANDLING AND PROTECTION

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

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

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

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

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

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

.7 Prevent contamination of materials to be salvaged and recycled and carry out source separation in accordance with requirements for acceptance by designated facilities.

1.9 DISPOSAL OF WASTES

.1 Do not bury rubbish or waste materials.

.2 Do not dispose of waste into waterways, storm, or sanitary sewers.

.3 Temporary hazardous waste storage must be in Hazardous Waste Storage Area.

.4 Keep records of construction waste including:

.1 Number and size of bins/trucks.

.2 Waste type of each bin/truck.

.3 Total quantity of bins/trucks generated.

.4 Tonnage reused or recycled.

.5 Receipt by approved facility of reused, recycled, or disposal destination.

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

.6 Prepare project summary to verify destination and quantities received by authorized facility on a material-

by-material basis as identified in pre-demolition material audit and in actual records of construction waste.

1.10 USE OF SITE AND FACILITIES

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

1.11 SCHEDULING

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

1.12 MEASUREMENT FOR PAYMENT

.1 All direct costs related to Work under this section are to be included in the lump sum item 01 74 2 Construction/Demolition Waste Management and Disposal. All other miscellaneous work and indirect costs under this section will not be measured and are to be included in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 APPLICATION

.1 Do Work in compliance with WRW.

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

.3 Abatement and source separation of Hazardous Materials is required prior to demolition. Obtain written approval of the Departmental Representative prior to the initiation of demolition activities.

3.2 CLEANING

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

.2 Clean-up work area as work progresses.

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

3.3 WASTE AUDIT (WA)

.1 Schedule A - Waste Audit (WA):

(1) Material Category	(2) Material Quantity Unit	(3) Estimated Waste %	(4) Total Quantity of Waste (unit)	(5) Generation Point	(6) % Recycled	(7) % Reused
Wood and Plastics Material Description						
Off-cuts						
Warped Pallet Forms						
Plastic Packaging						
Cardboard Packaging						
Other						
Doors and Windows Material Description						
Painted Frames						
Glass						
Wood						
Metal						
Other						

3.4 WASTE REDUCTION WORKPLAN (WRW)

.1 Schedule B:

(1) Material Category	(2) Person(s) Respon-sible	(3) Total Quantity of Waste (unit)	(4) Reused Amount (units) Projected	Actual	(5) Recycled Amount (unit) Projected	Actual	(6) Material(s) Destina-tion
Wood and Plastics Material Description							
Chutes							
Warped Pallet							

Forms							
Plastic Packaging							
Card-board Packaging							
Other							
Doors and Windows Material Description							
Painted Frames							
Glass							
Wood							
Metal							
Other							

END OF SECTION

1 GENERAL

1.01 Closeout Procedures

.1 Notify Departmental Representative when Work is considered ready for substantial performance.

.2 Accompany Departmental Representative on preliminary inspection to determine items listed for completion or correction.

.3 Comply with Departmental Representative's instructions for correction of items of Work listed in executed Certificate of Substantial Completion.

.4 Notify Departmental Representative of instructions for completion of items of Work determined in Departmental Representative's final inspection.

1.02 Inspection and Declaration

.1 Contractor's Inspection: Conduct an inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
  .1 Notify Departmental Representative in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.
  .2 Request Departmental Representative's Inspection.

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

.3 Completion: submit written certificate that following have been performed:
  .1 Work has been completed and inspected for compliance with Contract Documents.
  .2 Defects have been corrected and deficiencies have been completed.
  .3 Work is complete and ready for Final Inspection.

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

1.03 MEASUREMENT FOR PAYMENT

.1 Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule.

2 PRODUCTS

2.01 NOT USED

.1 Not Used

3 EXECUTION

3.01 NOT USED

.1 Not Used

END OF SECTION

1 GENERAL

1.01 Format

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

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

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

.4 Arrange content by site feature under Section numbers and sequence of Table of Contents.

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

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

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

1.02 Contents – Each Volume

.1 Table of Contents: provide title of Project;
- .1 date of submission; names, addresses, and telephone numbers of Contractor with name of responsible parties.
- .2 Schedule of work including off-site transport of waste.
- .3 Summary of Health and Safety issues, Environmental issues and performance indicators.
- .4 Waste acceptance certificates.
- .5 Submittals.
- .6 Photographs as per Section 01 33 00 – Submittal Procedures.

.2 For each aspect of the work:
- .1 list names, addresses and telephone numbers of Sub-Contractors and suppliers, including local source of supplies and replacement parts.

.3 Drawings: supplement the summary of work with drawings to illustrate relations of component parts of equipment and systems.

.4 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified.

1.03 Photograph Requirements

.1 Submit photographs as per Section 01 33 00 – Submittal Procedures.

1.04 Documents

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

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

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

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

1.05 Recording Actual Site Conditions

.1 Record information on set of black line opaque drawings, and in copy of Project Manual, provided by Departmental Representative.

.2 Provide felt tip marking pens, maintaining separate colours for each major system, for recording information.

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

.4 Contract Drawings: legibly 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 manufacturer's certifications, inspection certifications, and field test records, required by individual specifications sections.

1.06 Record Drawings

.1 Departmental Representative will provide to Contractor, one sets of white prints for record drawing purposes.

.2 Maintain Project record drawings and record accurately deviations from Contract documents on one set of prints.

.3 Record changes in red.

.4 At completion of Project and prior to final inspection, neatly transfer record notations to second set of drawings and submit both sets to Departmental Representative. Forward information on completed areas at

the end of the construction season.

1.07 Other Records

.1 Prior to completion of Project, submit the following to the Departmental Representative:
- .1 Copies of all documents and permits obtained by the Contractor.
- .2 Results of all testing carried out by the Contractor.
- .3 Any other pertinent information.
- .4 Copies of all shipping documents identifying the shipper, the receiver and all carriers involved in the transport of materials.
- .5 information as required by the AHJ.
- .6 Information as required by other applicable permits.

.2 Consolidate the above information in one document and submit five copies to the Departmental Representative.

1.08 MEASUREMENT FOR PAYMENT

.1 All direct costs related to this section are to be included in the lump sum item 01 78 00-1 Closeout Submittals. All other miscellaneous work and indirect costs under this section will not be measured and are to be included in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule.

2 PRODUCTS

2.01 NOT USED

.1 Not Used

3 EXECUTION

3.01 NOT USED

.1 Not Used

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 02 81 01 Hazardous Materials

.2 Section 02 82 00.03 Asbestos Abatement – Maximum Precautions

.3 Section 02 83 10 Lead-Base Paint Abatement – Minimum Precautions

.4 Section 31 23 33-01 – Excavating, Trenching and Backfilling.

1.2 REFERENCES

.1 Reference Standards:

.1 Canadian Environmental Protection Act (CEPA)

.1 CCME PN 1326-2013, Environmental Code of Practice for Aboveground and Underground Storage Tank Systems for Petroleum Products and Allied Petroleum Products.

.2 CSA International

.1 CSA Z783-12 (R2016) - Deconstruction of buildings and their related parts.

.3 Department of Justice Canada (Jus)

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

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

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

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

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

.4 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.

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

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

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

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

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Meetings:

.1 Hold project meetings in accordance with Section 01 31 19 - Project Meetings.

.2 Scheduling:

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

.1 In event of unforeseen delay notify Departmental Representative.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures and Section 01 74 21 - Construction/Demolition Waste Management Disposal.

.2 Prior to beginning of Work on site submit detailed Waste Reduction Workplan in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal and indicate:

.1 Descriptions of and anticipated quantities in percentages of materials to be salvaged reused, recycled and landfilled.

.2 Schedule of selective demolition.

.3 Number and location of dumpsters.

.4 Anticipated frequency of tippage.

.5 Name and address of haulers and waste receiving organizations.

.3 Submit copies of certified receipts/weigh bills from authorized disposal sites and reuse and recycling facilities for material removed from site on a daily basis.

.1 Written authorization from Departmental Representative is required to deviate from haulers or receiving organizations listed in Waste Reduction Workplan.

.4 Shop Drawings:

.1 Prior to beginning of Work on site submit for review and approval demolition drawings, diagrams or details showing sequence of demolition work and supporting structures and underpinning.

.5 Allow a pre-demolition inspection of the site building by the Departmental Representative to confirm the abatement of hazardous materials and the decommissioning of site utilities. Departmental Representative to approve of abatement and decommissioning before any demolition work.

1.5 QUALITY ASSURANCE

.1 Regulatory Requirements: Ensure Work is performed in compliance with CEPA, TDGA, and applicable Territorial and Municipal regulations.

1.6 SITE CONDITIONS

.1 Environmental protection:

.1 Ensure Work is done in accordance with Section 01 35 13.43 Special Project Procedures for Contaminated Sites.

.2 Ensure Work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.

.3 Fires and burning of waste or materials is not permitted on site.

.4 Do not bury rubbish waste materials.

.5 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.

.1 Ensure proper disposal procedures are maintained throughout project.

.6 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers, or onto adjacent properties.

.7 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with Authorities having jurisdiction.

.8 Protect trees, plants and foliage on site and adjacent properties where indicated.

.9 Prevent extraneous materials from contaminating air beyond application area, by providing temporary enclosures during demolition work.

.10 Cover or wet down dry materials and waste to prevent blowing dust and debris. Control dust on all temporary roads.

1.7 EXISTING CONDITIONS

.1 If material resembling spray or trowel applied asbestos or other designated substance be encountered in course of demolition, stop work, take preventative measures, and notify Departmental Representative. Proceed only after receipt of written instructions have been received from Departmental Representative.

.2 Structures to be demolished are based on their condition on date that tender is accepted.

1.8 MEASUREMENT FOR PAYMENT

.1 All direct costs related to Work under this section are to be included in the lump sum item 02 41 16 Structure Demolition.

.2 All direct costs related to the transportation and disposal of wastes are to be included in the lump sum item 01 74 21 Construction/Demolition Waste Management and Disposal.

.3 All other miscellaneous work and indirect costs under this section will not be measured and are to be included in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule.

Part 2 Products

2.1 EQUIPMENT

.1 Equipment and heavy machinery:

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

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

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

Part 3 Execution

3.1 PREPARATION

.1 Protection of in-place conditions:

.1 Work in accordance with Section 01 35 13.43 Special Project Procedures for Contaminated Sites.

.2 Prevent movement, settlement or damage of adjacent structures, services, landscaping, adjacent grades and properties.

.1 Provide bracing and shoring as required.

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

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

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

.2 Surface Preparation:

.1 Disconnect electrical and telephone service lines entering buildings to be demolished.

.1 Post warning signs on electrical lines and equipment which must remain energized to serve other properties during period of demolition.

.2 Disconnect and cap mechanical services.

.1 Sewer and water lines: remove to property line.

.2 Other underground services: remove and dispose of as directed by Departmental Representative.

.3 Septic Tanks:

.4 Aboveground storage tanks and piping: remove and dispose in accordance with CCME PN 1326.

.5 Do not disrupt active or energized utilities traversing premises.

.6 Remove rodent and vermin as required by Departmental Representative.

3.2 DEMOLITION

.1 Do demolition work in accordance with Section 01 35 13.4 - Special Project Procedures for Contaminated Sites and 01 35 29.14 - Health and Safety for Contaminated Sites.

.2 Blasting operations not permitted during demolition.

.3 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.

.4 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 Section 02 81 01 - Hazardous Materials, Section 02 82 00.03 - Asbestos Abatement – Maximum Precautions and Section 02 83 10 - Lead-Base Paint Abatement – Minimum Precautions. Refer Existing Conditions in PART 1.

.5 Allow Departmental Representative access for pre-demolition inspection.

.6 Demolish structure.

.7 Demolish basement walls to minimum of 300 mm below adjacent grade, as directed by the Departmental Representative.

.8 Break 100mm holes per 10m² area in concrete slabs which are not to be removed, to prevent accumulation of water.

.1 Keep floor drains open if permanent drainage still connected.

.9 Pieces of concrete and masonry not larger that 200 mm broken from demolition work may be used as backfill in open basements on excavations provided voids are filled.

.1 Keep demolition fill 300 mm below finished grade level.

.2 Do not backfill basement areas until inspected by Departmental Representative.

.10 Remove existing equipment, services, and obstacles where required for refinishing or making good of existing surfaces, and replace as work progresses.

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

.12 Demolish to minimize dusting. Keep materials wetted as directed by Departmental Representative.

.13 Demolish masonry and concrete walls.

.14 Remove structural framing.

.15 Contain fibrous materials to minimize release of airborne fibres while being transported within facility.

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

.17 Use natural lighting to do Work where possible.

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

3.3 CLEANING

.1 Develop Waste Reduction Workplan related to Work of this Section and in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

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

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

.4 Transport material designated for alternate disposal using approved haulers and receiving organizations listed in Waste Reduction Workplan and in accordance with applicable regulations.

.1 Written authorization from Departmental Representative is required to deviate from haulers or receiving organizations listed in Waste Reduction Workplan.

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

.1 Disposal facilities must be those approved of and listed in Waste Reduction Workplan.

.2 Written authorization from Departmental Representative is required to deviate from disposal facilities listed in Waste Reduction Workplan.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 02 82 00.03 – Asbestos Abatement – Maximum Precautions

.2 Section 02 83 10 – Lead-Based Paint Abatement – Minimum Precautions

1.02 REFERENCES

.1 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 (and therefore, which require precautions as outlined in the related requirements), animals, or plant life when released into the environment. The locations of known Hazardous Materials are indicated on the Drawings.
- .3 Hazardous Waste: hazardous material no longer used for its original purpose and that has been characterized as a hazardous waste in accordance with the testing and acceptance requirements of the recycling, treatment or disposal facility.

.2 Reference Standards:
- .1 Canadian Environmental Protection Act,1999 (CEPA 1999)
  - .1 Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations (SOR/2005-149).
  - .2 Department of Justice Canada (Jus)
    - .1 Transportation of Dangerous Goods Act, 1992 (TDG Act) 1992, (c. 34).
    - .2 Transportation of Dangerous Goods Regulations (T-19.01-SOR/2001-286).
  - .3 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
    - .1 Material Safety Data Sheets (MSDS).
  - .4 National Research Council Canada Institute for Research in Construction (NRC-IRC)
    - .1 National Fire Code of Canada-2005.
  - .5 National Building Code of Canada (NBC), Part 8 - Safety Measures at Construction and Demolition Sites (2005).
  - .6 Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations, SOR/2005-149.

.3 As identified in specification sections.

1.03 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:
.1 Submit manufacturer's instructions, printed product literature and data sheets for hazardous materials intended to be brought on site and include intended use, product characteristics, performance criteria, physical size, finish and limitations. Submit two copies of WHMIS MSDS to the Departmental Representative for each hazardous material required prior to bringing hazardous material on site.
.2 Submit hazardous materials management plan to Departmental Representative that identifies hazardous materials, usage, location, personal protective equipment requirements, and disposal arrangements.

1.04 DELIVERY, STORAGE AND HANDLING

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

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

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

.4 Storage and Handling Requirements:
.1 Co-ordinate storage of hazardous materials with Departmental Representative and abide by internal requirements for labeling and storage of materials and wastes.
.2 Store and handle hazardous materials and wastes in accordance with applicable federal and territorial laws, regulations, codes, and guidelines.
.3 Store and handle flammable and combustible materials in accordance with National Fire Code of Canada requirements.
.4 Keep no more than 45 liters of flammable and combustible liquids such as gasoline, kerosene and naphtha for ready use.
.1 Store flammable and combustible liquids in approved safety cans bearing the Underwriters' Laboratory of Canada or Factory Mutual seal of approval.
.2 Storage of quantities of flammable and combustible liquids exceeding 45 litres for work purposes requires the written approval of the Departmental Representative.
.5 Transfer of flammable and combustible liquids is prohibited within buildings.
.6 Transfer flammable and combustible liquids away from open flames or heat-producing devices.
.7 Solvents or cleaning agents must be non-flammable or have flash point above 38 degrees C.
.8 Store flammable and combustible waste liquids for disposal in approved containers located in safe, ventilated area. Keep quantities to minimum.
.9 Observe smoking regulations, smoking is prohibited in areas where hazardous materials are stored, used, or handled.
.10 Storage requirements for quantities of hazardous materials and

wastes in excess of 5 kg for solids, and 5 litres for liquids:

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

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

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

.4 Segregate incompatible materials and wastes.

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

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

.7 Maintain clear egress from storage area.

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

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

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

.11 When hazardous waste is generated on site:

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

.2 Comply with applicable federal, territorial and municipal laws and regulations for generators of hazardous waste.

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

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

.5 Label containers with legible, visible safety marks as prescribed by federal and territorial regulations.

.6 Only trained personnel is allowed to handle, offer for transport, or transport dangerous goods.

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

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

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

.12 Ensure personnel have been trained in accordance with Workplace Hazardous Materials Information System (WHMIS) requirements.

.13 Report spills or accidents immediately to Departmental Representative and territorial authorities. Submit a written spill report to Departmental Representative within 24 hours of incident.

1.05 MEASUREMENT FOR PAYMENT

.1 All direct costs related to Work under this section are to be included in the lump sum item 02 81 01-1 Hazardous Materials Abatement.

.2 All direct costs related to the transportation and disposal of wastes are to be included in the lump sum item 01 74 21 Construction/Demolition Waste Management and Disposal.

.3 All other miscellaneous work and indirect costs under this section will not be measured and are to be included in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule.

2 PRODUCTS

2.01 MATERIALS

.1 Description:
- .1 Bring on site only quantities hazardous material required to perform Work.
- .2 Maintain MSDS in proximity to where materials are being used. Communicate this location to personnel who may have contact with hazardous materials.

3 EXECUTION

3.01 Cleaning

.1 Progress Cleaning:
- .1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

.3 Waste Management: separate waste materials for disposal.
- .1 Dispose of hazardous waste materials in accordance with applicable federal and territorial acts, regulations, and guidelines.
- .2 Recycle hazardous wastes for which there is approved, cost effective recycling process available.
- .3 Send hazardous wastes to authorized hazardous waste disposal or treatment facilities.
- .4 Burning, diluting, or mixing hazardous wastes for purpose of disposal is prohibited.
- .5 Disposal of hazardous materials in waterways, storm or sanitary sewers, or in municipal solid waste landfills is prohibited.
- .6 Dispose of hazardous wastes in timely fashion in accordance with applicable territorial regulations.
- .7 Minimize generation of hazardous waste to maximum extent practicable. Take necessary precautions to avoid mixing clean and contaminated wastes.

.8 Identify and evaluate recycling and reclamation options as alternatives to land disposal, such as:
- .1 Hazardous wastes recycled in manner constituting disposal.
- .2 Hazardous waste burned for energy recovery.
- .3 Lead-acid battery recycling.
- .4 Hazardous wastes with economically recoverable precious metals.

END OF SECTION

1 GENERAL

1.01 Section Includes:

.1 Requirements and procedures for asbestos abatement on friable asbestos-containing materials.

.2 Remove and dispose as asbestos waste, drywall and associated joint compounds, vinyl flooring and associated mastics, heat shields in light fixtures and vermiculite and fiberglass attic insulation, as indicated on the attached Drawings.

.3 Comply with requirements of this Section when performing following Work:
- .1 Removal or disturbance as specified of more than 0.09 square metre of friable asbestos-containing material during the repair, alteration, maintenance or demolition of a building at site.
- .2 Breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable asbestos-containing material, if the work is done by means of power tools that are not attached to dust-collecting devices equipped with HEPA filters.

1.02 References

.1 Department of Justice Canada (Jus).
- .1 Canadian Environmental Protection Act, 1999 (CEPA).

.2 Transport Canada (TC).
- .1 Transportation of Dangerous Goods Act, 1992 (TDGA).

.3 Government of Northwest Territories
- .1 Occupational Health & Safety Regulations, DRAFT September 2010

1.03 Definitions

.1 Airlock: system for permitting ingress or egress without permitting air movement between contaminated area and uncontaminated area, typically consisting of two curtained doorways at least 2 m apart.

.2 Amended Water: water with a non-ionic surfactant wetting agent added to reduce water tension to allow wetting of fibres.

.3 Asbestos-Containing Building Materials (ACBMs): materials that contain 0.1 per cent or more asbestos by dry weight and are identified under Existing Conditions including fallen materials and settled dust.

.4 Asbestos Work Areas: area where work takes place which will, or may disturb ACMs.

.5 Authorized Visitors: WSCC Representative, Department Representative, or other designated representatives, and representatives of regulatory agencies.

.6 Competent worker: in relation to specific work, means a worker who:

.7 Is qualified because of knowledge, training and experience to perform the work.

.8 Is familiar with the Territorial laws and with the provisions of the regulations that apply to the work.

.9 Has knowledge of all potential or actual danger to health or safety in the work.

.10 Curtained doorway: arrangement of closures to allow ingress and egress from one room to another while permitting minimal air movement between rooms, typically constructed as follows:

.1 Place two overlapping sheets of polyethylene over existing or temporarily framed doorway, secure each along top of doorway, secure vertical edge of one sheet along one vertical side of doorway, and secure vertical edge of other sheet along opposite vertical side of doorway.

.2 Reinforce free edges of polyethylene with duct tape and weight bottom edge to ensure proper closing.

.3 Overlap each polyethylene sheet at openings not less than 1.5 m on each side.

.11 DOP Test: testing method used to determine integrity of Negative Pressure unit using dioctyl phthalate (DOP) HEPA-filter leak test.

.12 Friable Materials: material that when dry can be crumbled, pulverized or powdered by hand pressure and includes such material that is crumbled, pulverized or powdered.

.13 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with a filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.

.14 Negative pressure: system that extracts air directly from work area, filters such extracted air through High Efficiency Particulate Air filtering system, and discharges this air directly outside work area to exterior of building.

.15 System to maintain minimum pressure differential of 5 Pa relative to adjacent areas outside of work areas, be equipped with alarm to warn of system breakdown, and be equipped with instrument to continuously monitor and automatically record pressure differences.

.16 Non-Friable Materials: material that when dry cannot be crumbled, pulverized or powdered by hand pressure.

.17 Occupied Areas: any area of building or work site that is outside Asbestos Work Area.

.18 Polyethylene sheeting sealed with tape: polyethylene sheeting of type and thickness specified sealed with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide continuous polyethylene membrane to protect underlying surfaces from water damage or damage by sealants, and to prevent escape of

asbestos fibres through sheeting into clean area.

.19 Sprayer: garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must be appropriate capacity for scope of work.

1.04 Action and Informational Submittals

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

.2 Before beginning work:

.1 Obtain from appropriate agency necessary permits for transportation and disposal of asbestos waste and submit to the Department Representative five (5) days before work commences. Ensure that dump operator is fully aware of hazardous nature of material being dumped and proper methods of disposal. Submit proof satisfactory to the Department Representative that suitable arrangements have been made to receive and properly dispose of asbestos waste.

.2 Submit proof satisfactory to the Department Representative that all asbestos workers have received appropriate training and education by a competent person on hazards of asbestos exposure, good personal hygiene, entry and exit from Asbestos Work Area, aspects of work procedures and protective measures while working in Asbestos Work Areas, and the use, cleaning and disposal of respirators and protective clothing. Submit proof of attendance in form of certificate.

.3 Ensure supervisory personnel have attended asbestos abatement course, of not less than two days duration, approved by the Department Representative. Submit proof of attendance in form of certificate. Minimum of one Supervisor for every ten workers.

.4 Submit layout of proposed enclosures and decontamination facilities to the Department Representative for review.

.5 Submit documentation including test results for sealer proposed for use.

.6 Submit Provincial/Territorial and/or local requirements for Notice of Project form.

.7 Submit proof satisfactory to the Department Representative that employees have respirator fitting and testing. Workers must be fit tested (irritant smoke test) with respirator that is personally issued.

.8 Submit documentation including test results, fire and flammability data, and Material Safety Data Sheets (MSDS) for chemicals or materials including but not limited to following:

.1 Encapsulants.

.2 Amended water.

.3 Slow drying sealer.

.9 Ensure all HEPA-filtered equipment has been tested before the job commences.

.10 Procedures to deal with emergencies such as fire or injury must be developed and in place prior to work starting.

1.05 Quality Assurance

.1 Regulatory Requirements: comply with Federal, Provincial/Territorial

and local requirements pertaining to asbestos, provided that in case of conflict among those requirements or with these specifications more stringent requirement applies. Comply with regulations in effect at time work is performed.

.2 Health and Safety:
.1 Do construction occupational health and safety in accordance with Section 1.4.

.3 Safety Requirements: worker and visitor protection.
.1 Protective equipment and clothing to be worn by workers while in Asbestos Work Area includes:
.1 Air purifying full face-mask respirator Powered air purifying respirator (PAPR) or better, 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. Requirements for each worker:
.3 Remove street clothes in clean change room and put on respirator with new filters or reusable filters that have been tested as satisfactory, clean coveralls and head covers before entering Equipment and Access Rooms or Asbestos Work Area. Store street clothes, uncontaminated footwear, towels, and similar uncontaminated articles in clean change room.
.4 Remove gross contamination from clothing before leaving work area then proceed to Equipment and Access Room and remove clothing except respirators. Place contaminated work

suits in receptacles for disposal with other asbestos - contaminated materials. Leave reusable items except respirator in Equipment and Access Room. Still wearing the respirator proceed naked to showers. Using soap and water wash body and hair thoroughly. Clean outside of respirator with soap and water while showering; remove respirator; remove filters and wet them and dispose of filters in container provided for purpose; and wash and rinse inside of respirator. When not in use in work area, store work footwear in Equipment and Access Room. Upon completion of asbestos abatement, dispose of footwear as contaminated waste or clean thoroughly inside and out using soap and water before removing from work area or from Equipment and Access Room.

.5 After showering and drying off, proceed to clean change room and dress in street clothes at end of each day's work, or in clean coveralls before eating, smoking, or drinking. If re-entering work area, follow procedures outlined in paragraphs above.

.6 Enter unloading room from outside dressed in clean coveralls to remove waste containers and equipment from Holding Room of Container and Equipment Decontamination Enclosure system. Workers must not use this system as means to leave or enter work area.

.4 Eating, drinking, chewing, and smoking are not permitted in Asbestos Work Area.

.5 Ensure workers are fully protected with respirators and protective clothing during preparation of system of enclosures prior to commencing actual asbestos abatement.

.6 Provide and post in Clean Change Room and in Equipment and Access Room the procedures described in this Section, in both official languages.

.7 Ensure that no person required to enter an Asbestos Work Area has facial hair that affects seal between respirator and face.

.8 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.

1.06 Waste Management and Disposal

.1 Waste asbestos cannot be reused or recycled.

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

.3 Collect and separate for disposal paper, plastic, and corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.

.4 Separate for recycling and place in designated steel waste containers

in accordance with Waste Management Plan

.5 Place materials defined as hazardous or toxic in designated containers.

.6 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional, Territorial, and Municipal regulations.

.7 Fold up metal banding, flatten and place in designated area for recycling.

.8 Disposal of asbestos waste generated by removal activities must comply with Federal, Provincial, Territorial and Municipal regulations. Dispose of asbestos waste in sealed double thickness 6 ml bags or leak proof drums. Label containers with appropriate warning labels.

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

.10 Friable waste asbestos is classified as a Class 9 Miscellaneous Waste by the Transportation of Dangerous Goods Act. The classification, packaging, labeling and placarding of this waste must conform to the federal and territorial Transportation of Dangerous Goods Act and Regulations. Schedule I of the Regulations classifies waste asbestos as follows:
.1 Shipping Name: WASTE Asbestos White (chrysotile, actinolite, anthophyllite, tremolite)
.2 Classification: 9
.3 Product Identification Number: UN2590 Packing Group: III

.11 Asbestos waste must be stored, transported and disposed of in sealed containers that are impervious to asbestos and asbestos waste.

.12 Removal is a necessary pre-requisite for demolition of a building containing asbestos-containing materials (ACM) or when planned renovations will disturb the asbestos. Obtain written approval from the Departmental Representative following abatement and removal of ACM and prior to the initiation of demolition.

.13 Waste asbestos is not recycled. All friable waste asbestos generated through this abatement project shall be disposed of at a licensed landfill. Non-friable waste asbestos will most likely become friable material once disturbed during the abatement process.

1.07 Existing Condition

.1 Test results of asbestos containing materials to be handled, removed, or otherwise disturbed and disposed of during this Project are summarized in the Hazardous Materials Survey provided in 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 Department Representative of suspect asbestos containing material discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material until instructed by the Department Representative.

1.08 Scheduling

.1 Notify all agencies with involvement in asbestos abatement.

.2 Not later than seven (7) days before beginning Work on this Project notify following in writing:
- .1 Regional Office of Labour Canada.
- .2 Territorial Authority having jurisdiction.
- .3 Disposal Authority.
- .4 WSCC Prevention Services

.3 Inform sub-trades of presence of asbestos containing materials identified in Existing Conditions.

.4 Submit to the Department Representative copy of notifications prior to start of Work.

.5 Hours of Work: perform work involving asbestos abatement located at the Site during normal working hours.

.6 The ACM abatement work shall be completed on an agreed schedule between the Department Representative and abatement contractor.

1.09 Personnel Training

.1 Before beginning Work, provide to the Department Representative satisfactory proof that every worker has had instruction and training in hazards of asbestos exposure, in personal hygiene including dress and showers, in entry and exit from Asbestos Work Area, in aspects of work procedures including glove bag procedures, and in use, cleaning, and disposal of respirators and protective clothing.

.2 Instruction and training related to respirators includes, at minimum:
- .1 Proper 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 competent, qualified person.

.4 Supervisory personnel to complete required training.

1.10 MEASUREMENT FOR PAYMENT

.1 All direct costs related to Work under this section are to be included in the lump sum item 02 81 01-1 Hazardous Materials Abatement. All other miscellaneous work and indirect costs under this section will not be measured and are to be included in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule.

2 PRODUCTS

2.01 Materials

.1 Polyethylene: minimum 0.15 mm thick unless otherwise specified; in sheet size to minimize joints.

.2 FR polyethylene: minimum 0.15 mm thick, woven fibre reinforced fabric bonded both sides with polyethylene.

.3 Tape: fibreglass - reinforced duct tape suitable for sealing polyethylene under both dry conditions and wet conditions using amended water.

.4 Wetting agent: 50% polyoxyethylene ester and 50% polyoxyethylene ether, or other material approved by the Department Representative mixed with water in concentration to provide adequate penetration and wetting of asbestos containing material.

.5 Waste Containers: contain waste in two separate containers.
- .1 Inner container: 0.15 mm thick sealable polyethylene bag or where glove bag method is used, glove bag itself.
- .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 0.15 mm thick sealable polyethylene bag.
- .3 Labeling 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 Asbestos Regulations 29 CFR 1910.1001. Label in both official languages.
- .4 Tape: tape suitable for sealing polyethylene to surfaces under both dry and wet conditions using amended water.

.6 Additional Equipment where required:
- .1 portable HEPA-filtered exhaust units with extra fuses;
- .2 replacement HEPA filters;
- .3 flexible or rigid duct;
- .4 vacuum cleaners fitted with HEPA filters;
- .5 electrical extension cords;
- .6 portable ground fault circuit interrupter (GFCI);
- .7 garden hose;
- .8 hand pump garden sprayer to wet asbestos;
- .9 wetting agent (50 per cent polyoxyethylene ether and 50 percent polyoxyethylene, or equivalent);
- .10 scrapers, nylon brushes, dust pans, shovels, etc.;
- .11 scaffolds with railings;
- .12 duct tape or an alternative tape with similar or better adhesive qualities;
- .13 polyethylene sheeting having a minimum six mil thickness;
- .14 six mil thick labelled asbestos disposal bags;
- .15 barriers and warning signs;

3 EXECUTION

3.01 Procedures

.1 Do construction occupational health and safety in accordance with Section 01 35 32 - Specific Health and Safety Plan.

.2 Work Areas:

.1 Shut off and isolate air handling and ventilation systems to prevent fibre dispersal to other building areas during work phase. Conduct smoke tests to ensure that duct work is airtight. Seal and caulk joints and seams of active return air ducts within Asbestos Work Area.

.2 Prior to beginning Work, remove moveable objects furniture and carpeting from work area.

.3 Preclean moveable furniture and carpeting within proposed work area using HEPA vacuum and remove from work area to temporary location in adjacent Site.

.4 Preclean fixed casework, plant, and equipment within proposed work area, using HEPA vacuum and cover with polyethylene sheeting sealed with tape.

.5 Clean proposed work area using, where practicable, HEPA vacuum cleaning equipment. If not practicable, use wet cleaning method. Do not use methods that raise dust, such as dry sweeping, or vacuuming using other than HEPA vacuum equipment.

.6 The spread of dust from the work area to be prevented by:

.1 Using enclosures of polyethylene or other suitable material that is impervious to asbestos (including, if the enclosure material is opaque, one or more transparent window areas to allow observation of the entire work area from outside the enclosure), if the work area is not enclosed by walls.

.2 Using curtains of polyethylene sheeting or other suitable material that is impervious to asbestos, fitted on each side of each entrance or exit from the work area.

.7 Put negative pressure system in operation and operate continuously from time first polyethylene is installed to seal openings until final completion of work including final cleanup. Provide continuous monitoring of pressure difference using automatic recording instrument. The system to maintain a negative air pressure of 0.02 inches of water, relative to the area outside the enclosed area. The system to be inspected and maintained by a competent person prior each use to ensure that there is no air leakage, and if the filter is found to be damaged or defective, it to be replaced before the ventilation system is used.

.8 Seal off openings such as corridors, doorways, windows, skylights, ducts, grilles, and diffusers, with polyethylene sheeting sealed with tape.

.9 Cover floor and wall surfaces with polyethylene sheeting sealed with tape. Cover floors first so that polyethylene extends at least 300 mm up walls then cover walls to overlap floor sheeting.

.10 Build airlocks at entrances to and exits from work area so that work area is always closed off by one curtained doorway when workers enter or exit.

.11 At each access to work areas 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)".

.12 After work area isolation, remove heating, ventilating, and air conditioning filters, pack in sealed plastic bags 0.15 mm minimum thick and treat as contaminated asbestos waste. Remove ceiling - mounted objects such as lights, partitions, other fixtures not previously sealed off, and other objects that interfere with asbestos removal, as directed by WSCC, and Department Representative. Use localized water spraying during fixture removal to reduce fibre dispersal.

.13 Maintain emergency and fire exits from work area, or establish alternative exits satisfactory to Territorial Fire Marshall.

.14 Where application of water is required for wetting asbestos containing materials, shut off electrical power, provide 24 volt safety lighting and ground fault interrupter circuits on power source for electrical tools, in accordance with applicable CSA Standard. Ensure safe installation of electrical lines and equipment.

.15 Worker Decontamination Enclosure System:

.1 Worker Decontamination Enclosure System includes Equipment and Access Room, Shower Room, and Clean Room, as follows:

.1 Equipment and Access Room: build Equipment and Access Room between Shower Room and work area, with two curtained doorways, one to Shower Room and one to work area. Install portable toilet, waste receptor, and storage facilities for workers' shoes and protective clothing to be reworn in work area. Build Equipment and Access Room large enough to accommodate specified facilities, other equipment needed, and at least one worker allowing him /her sufficient space to undress comfortably.

.2 Shower Room: build Shower Room between Clean Room and Equipment and Access Room, with two curtained doorways, one to Clean Room and one to Equipment and Access Room. Provide one shower for every five workers. Provide constant supply of hot and cold or warm water. The building is not currently serviced with water or wastewater services. Cold and hot water sources will be made available at the time of the abatement work. Provide piping and connect to water sources and drains. Pump waste water through 5 micrometre filter system acceptable to the Department Representative before directing into drains. Provide soap, clean towels, and appropriate containers for disposal of used respirator filters.

.3 Clean Room: build Clean Room between Shower Room and clean areas outside of enclosures, with two curtained doorways, one to outside of enclosures and one to Shower Room. Provide lockers or hangers and hooks for workers' street clothes and personal belongings. Provide storage for clean protective clothing and

respiratory equipment. Install mirror to permit workers to fit respiratory equipment properly.

.16 Container and Equipment Decontamination Enclosure System:

.1 Container and Equipment Decontamination Enclosure System consists of Staging Area within work area, Washroom, Holding Room, and Unloading Room. Purpose of system is to provide means to decontaminate waste containers, scaffolding, waste and material containers, vacuum and spray equipment, and other tools and equipment for which Worker Decontamination Enclosure System is not suitable.

.2 Staging Area: designate Staging Area in work area for gross removal of dust and debris from waste containers and equipment, labelling and sealing of waste containers, and temporary storage pending removal to Washroom. Equip Staging Area with curtained doorway to Washroom.

.3 Washroom: build Washroom between Staging Area and Holding Room with two curtained doorways, one to Staging Area and one to Holding Room. Provide high - pressure low - volume sprays for washing of waste containers and equipment. Pump waste water through 5 micrometre filter system before directing into drains. Provide piping and connect to water sources and drains.

.4 Holding Room: build Holding Room between Washroom and Unloading Room, with two curtained doorways, one to Washroom and one to Unloading Room. Build Holding Room sized to accommodate at least two waste containers and largest item of equipment used.

.5 Unloading Room: build Unloading Room between Holding Room and outside, with two curtained doorways, one to Holding Room and one to outside.

.17 Construction of Decontamination Enclosures:

.1 Build suitable framing for enclosures, and line with polyethylene sheeting sealed with tape. Use one layer of FR polyethylene on floors where appropriate not covering the ACM vinyl sheet flooring material.

.2 Build curtained doorways between enclosures so that when people move through or when waste containers and equipment are moved through doorway, one of two closures comprising doorway always remains closed.

.18 Maintenance of Enclosures:

.1 Maintain enclosures in tidy condition.

.2 Ensure that barriers and polyethylene linings are effectively sealed and taped. Repair damaged barriers and remedy defects immediately upon discovery.

.3 Visually inspect enclosures at beginning of each working period.

.4 Use smoke methods to test effectiveness of barriers when directed by Departmental Representative.

.19 Do not begin Asbestos Abatement work until:

.1 Arrangements have been made for disposal of waste.

.2 For wet stripping techniques, arrangements have been made for containing, filtering, and disposal of waste water.

.3 Work area and decontamination enclosures effectively segregated.

.4 Tools, equipment, and materials waste containers are on

hand.

.5 Arrangements have been made for building security.

.6 Warning signs are displayed where access to contaminated areas is possible.

.7 Notifications have been completed and other preparatory steps have been taken. Establish the work procedures to be followed and assemble the equipment required to perform the job. Obtain the necessary building permit(s) by the municipality or accredited agency that issues building permits. Have the following documentation available:

.1 required permits;

.2 written lock-out procedures;

.3 proof of worker training;

.4 names of supervisory personnel;

.5 shop drawings of work area layout/decontamination facility;

.6 construction schedule;

.7 certification of HEPA-filtered equipment;

.8 code of practice for respiratory protection.

.8 Ensure all HEPA-filtered equipment has been tested before the job commences.

.9 Ensure workers are adequately trained in the hazards and proper methods of working with asbestos.

3.02 Supervision

.1 Minimum of one Supervisor for every ten workers is required.

.2 Approved Supervisor must remain within Asbestos Work Area during disturbance, removal, or other handling of asbestos containing materials.

3.03 Asbestos Removal

.1 Before removing asbestos:

.1 Prepare site.

.2 Spray asbestos material with water containing specified wetting agent, using airless spray equipment capable of providing "mist" application to prevent release of fibres. Saturate asbestos material sufficiently to wet it to substrate without causing excess dripping. Spray asbestos material repeatedly during work process to maintain saturation and to minimize asbestos fibre dispersion.

.2 Remove saturated asbestos material in small sections. Do not allow saturated asbestos to dry out. As it is being removed pack material in sealable plastic bags 0.15 mm minimum thick and place in labelled containers for transport.

.3 Seal filled containers. Clean external surfaces thoroughly by wet sponging. Remove from immediate working area to Staging Area. Clean external surfaces thoroughly again by wet sponging before moving containers to decontamination Washroom. Wash containers thoroughly in decontamination Washroom, and store in Holding Room pending removal to Unloading Room and outside. Ensure that containers are removed from

Holding Room by workers who have entered from uncontaminated areas dressed in clean coveralls.

.4 After completion of stripping work, wire brushed and wet sponged surfaces from which asbestos has been removed to remove visible material. During this work keep surfaces wet.

.5 Where the Department Representative decides complete removal of asbestos containing material is impossible due to obstructions such as structural members or major service elements, and provides written direction, encapsulate material as follows:

.1 Apply surface film forming type sealer to provide 0.635 mm minimum dry film thickness over sprayed asbestos surfaces. Apply using airless spray equipment to avoid blowing off fibres. Apply penetrating type sealer to penetrate existing sprayed asbestos surfaces to uniform depth of 25 mm minimum.

.6 After wire brushing and wet sponging to remove visible asbestos, wet clean entire work area including Equipment and Access Room, and equipment used in process. After 24 hour period to allow for dust settling, wet clean these areas and objects again. During this settling period no entry, activity, or ventilation will be permitted. After second 24 hour period under same conditions, clean these areas and objects again using HEPA vacuum followed by wet cleaning. After inspection by the Department Representative apply continuous coat of slow drying sealer to surfaces of work area. Allow at least 16 hours with no entry, activity, ventilation, or disturbance other than operation of negative pressure units during this period.

.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/Territorial 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.

3.04 Final Clean-up

.1 Following cleaning specified in Section 3.3 above, and when air sampling shows that asbestos levels on both sides of seals do not exceed 0.01 fibres/cc as determined by membrane filter method at 400-500X magnification phase contrast illumination, as described in NIOSH Method 94-113 or equivalent, proceed with final cleanup.

.2 Remove polyethylene sheet by rolling it away from walls to centre of work area. Vacuum visible asbestos containing particles observed during cleanup, immediately, using HEPA vacuum equipment.

.3 Place polyethylene seals, tape, cleaning material, clothing, and other contaminated waste in plastic bags and sealed labelled waste containers for transport.

.4 Include in clean-up Work areas, Equipment and Access Room, Washroom, Shower Room, and other contaminated enclosures.

.5 Include in clean-up sealed waste containers and equipment used in Work and remove from work areas, via Container and Equipment Decontamination Enclosure System, at appropriate time in cleaning sequence.

.6 Conduct final check to ensure that no dust or debris remains on surfaces as result of dismantling operations and carry out air monitoring again to ensure that asbestos levels in building do not exceed 0.01 fibres/cc. Repeat cleaning using HEPA vacuum equipment, or wet cleaning methods where feasible, in conjunction with sampling until levels meet this criteria.

.7 As work progresses, and to prevent exceeding available storage capacity on site, remove sealed and labelled containers containing asbestos waste and dispose of to authorized disposal area in accordance with requirements of disposal authority. Ensure that each shipment of containers transported to dump is accompanied by Contractor's representative to ensure that dumping is done in accordance with governing regulations.

.8 Perform inspection of Asbestos Work Area to confirm compliance with specification and governing authority requirements. Deviation from these requirements that have not been approved in writing by the Department Representative may result in Work stoppage, at no cost to Owner

.9 The Department Representative 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.

.10 When asbestos leakage from Asbestos Work Area has occurred or is likely to occur the Department Representative may order Work shutdown. No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

3.05 Re-Establishment of Objects and Systems

.1 When cleanup is complete:
  .1 The building is to be demolished and there will not be any re-establishment of objects and systems in the building.

3.06 Air Monitoring

.1 From beginning of Work until completion of cleaning operations the Department Representative will take air samples on daily basis outside of work area enclosure in accordance with Health Canada recommendations.
  .1 Contractor will be responsible for monitoring inside enclosure in accordance with applicable Provincial/Territorial Occupational Health and Safety Regulations.

.2 Use results of contractor’s air monitoring inside work area to establish type of respirators to be used. Workers may be required to wear sample pumps for up to full-shift periods.
  .1 If fibre levels are above safety factor of respirators in use, stop abatement, apply means of dust suppression, and use higher safety factor in respiratory protection for persons inside enclosure.
  .2 If air monitoring by Departmental Representative shows that areas outside work area enclosures are contaminated, enclose, maintain and clean these areas, in same manner as that applicable to work areas.
  .3 Conduct air sampling to determine airborne asbestos fibre concentration before and during the abatement work, and prior to removal of the enclosure. All air sampling must be completed by competent personnel following specified methods.

.3 Where possible, results should be made available to workers on the same day (or as soon as possible following the sampling). Contractor’s sampling should include the following:
  .1 Before work starts in the work areas — Background samples to establish baseline airborne fibre levels;
  .2 On a daily basis outside the enclosure — sample when there are unprotected workers in the immediate vicinity of the enclosure. In some cases, sampling may be required in other areas such as the floors above or below, or in adjacent rooms, depending on the set-up of the work site and occupancy of these areas;
  .3 During initial and subsequent stages of the abatement project — personal sampling of workers conducting removal. Ensure that results are within acceptable limits for the respiratory protection selected. Personal samples should be collected at least daily, but can be collected more frequently depending on work conditions. Filters must be analyzed and results provided to workers within 24 hours;
  .4 On a daily basis in the clean room — sample during bulk removal operations. Sampling must cover at least half of the workshift and at least one shift of decontamination. Samples must be analyzed and results provided to workers within 24 hours;
  .5 Before the enclosure is dismantled – the air inside the enclosure must be sampled. At a minimum, one sample should be collected or

every 450 m2 of enclosure area to determine suitability for re-occupancy. The air test should be completed using aggressive air sampling techniques.

.6 If the levels inside the containment exceed the protection factor of the type of respiratory equipment being used, work must stop until appropriate respirators are supplied and airborne fibre levels can be controlled.

.4 Final air monitoring test results should be less than 0.01 fibres per cubic centimetre using aggressive Sampling techniques. If the final air tests fail, the Containment cannot be dismantled. The work area should be glue-sprayed again and re-tested.

3.07 Inspection

.1 Perform inspection of Asbestos Work Area to confirm compliance with specification and governing authority requirements. Deviation from these requirements that have not been approved in writing by Departmental Representative may result in Work stoppage, at no cost to Owner.

.2 Departmental Representative 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 Departmental Representative 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

1 GENERAL

1.01 Summary

.1 Removal of lead-containing coatings with a chemical gel or paste and fibrous laminated cloth wrap or power tool with an effective dust collection system equipped with a HEPA filter or non-powered hand tool, other than manual scraping and sanding on wood building materials and concrete as included on the attached drawings.

1.02 RELATED REQUIREMENTS

.1 Section 02 82 00.02 Asbestos Abatement-Maximum Precautions.

.2 Section 02 81 01 Hazardous Materials

.3 Section 01 74 21 Construction/Demolition Waste Management and Disposal

1.03 REFERENCES

.1 Department of Justice Canada
  .1 Canadian Environmental Protection Act, 1999 (CEPA).

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

.3 Human Resources and Social Development Canada (HRSDC)
Canada Labour Code Part II, - SOR 86-304 - Occupational Health and Safety Regulations.

.4 Transport Canada (TC)
  .1 Transportation of Dangerous Goods Act, 1992 (TDGA).

.5 U.S. Department of Health and Human Services/Centers for Disease Control and Prevention/National Institute for Occupational Safety and Health (NIOSH)
  .1 NIOSH 94-113 - NIOSH Manual of Analytical Methods (NMAM), 4th Edition (1994).

.6 Government of Northwest Territories, Department of Environment: Environmental Guideline for the General Management of Waste Lead and Lead Paint (Original 2001, updated 2014).

1.04 DEFINITIONS

.1 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with a filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.

.2 Authorized Visitors: Departmental Representative.

.3 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. For protection of underlying surfaces from damage and to prevent lead dust entering in clean area.

.4 Sprayer: garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must be appropriate capacity for scope of work.

.5 Action level: employee exposure, without regard to use of respirators, to airborne concentration of lead of 50 micrograms per cubic meter of air (50 ug/mü) calculated as 8-hour time-weighted average (TWA). Minimum precautions for lead abatement are based on airborne lead concentrations less than 0.05 milligrams per cubic meter of air for removal of lead based paint by methods noted in paragraph 1.1.

.6 Competent person: individuals capable of identifying existing lead hazards in workplace taking corrective measures to eliminate them.

.7 Lead dust: wipe sampling on vertical surfaces and/or horizontal surfaces, dust and debris is considered to be lead contaminated if it contains more than 40 micrograms of lead in dust per square foot.

1.05 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Provide proof satisfactory to Departmental Representative that suitable arrangements have been made to dispose of lead-based paint waste in accordance with requirements of authority having jurisdiction.

.3 Provide: Provincial, Territorial and local requirements for Notice of Project Form.

.4 Quality Control:
- .1 Provide Departmental Representative necessary permits for transportation and disposal of lead-based paint waste and proof that it has been received and properly disposed.
- .2 Provide proof satisfactory to Departmental Representative that employees have had instruction on hazards of lead exposure, respirator use, dress, entry and exit from Work Area, and aspects of work procedures and protective measures.
- .3 Provide proof that supervisory personnel have attended lead abatement course, of not less than two days duration, approved by Departmental Representative. Minimum of one supervisor for every ten workers.
  - .1 Product data:
    - .1 Provide documentation including test results, fire and flammability data, and Material Safety Data Sheets (MSDS) for chemicals or materials including:
      - .1 Encapsulants.
      - .2 Amended water.
      - .3 Slow drying sealer.

1.05 QUALITY ASSURANCE

.1 Regulatory Requirements: comply with Federal, Provincial/Territorial and local requirements pertaining to lead paint, provided that in case of conflict among those requirements or with these specifications more stringent requirement applies. Comply with regulations in effect at time work is performed.

.2 Health and Safety:

.1 Do construction occupational health and safety in accordance with Section 01 35 29.14 Health and Safety for Contaminated Sites.

.2 Safety Requirements: worker and visitor protection.

.1 Protective equipment and clothing to be worn by workers and visitors in work Area include:

.1 Respirator NIOSH approved and equipped with replaceable HEPA filter cartridges with an assigned protection factor of 10, acceptable to Authority having jurisdiction. Suitable for type of lead and level of lead dust exposure. Provide sufficient amount of filters.

.2 Half mask respirator: half-mask particulate respirator with - series filter, and 95 % efficiency could be provided.

.2 Eating, drinking, chewing, and smoking are not permitted in work area.

.3 Ensure workers wash hands and face when leaving work area.

.4 Visitor Protection:

.1 Provide approved respirators to Authorized Visitors to work areas.

.2 Instruct Authorized Visitors procedures to be followed in entering and exiting work area.

1.07 WASTE MANAGEMENT AND DISPOSAL

.1 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal regulations.

.2 Disposal of lead waste generated by removal activities must comply with Federal, Territorial and Municipal regulations. Dispose of lead waste in sealed double thickness 6 ml bags or leak proof drums. Label containers with appropriate warning labels.

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

1.08 EXISTING CONDITIONS

.1 The laboratory results indicated that several paint samples collected from the site contained concentrations of lead in excess of the recommended limit of the Government of Northwest Territories.

.2 Information pertaining to lead based paint are summarized in the Hazardous Materials Survey provided in Appendix A.

.3 Notify Departmental Representative of lead based paint discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material until instructed by Departmental Representative.

1.09 SCHEDULING

.1 Not later than seven (7) days before beginning Work on this Project notify the following in writing, where appropriate:
.1 Territorial Authority having jurisdiction.
.2 Disposal Authority.

.2 Inform sub trades of presence of lead-containing materials identified in Existing Conditions.

.3 Provide Departmental Representative copy of notifications prior to start of Work.

1.10 WASTE MANAGEMENT AND DISPOSAL

.1 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal regulations.

.2 Disposal of lead waste generated by removal activities must comply with Federal, Provincial, Territorial and Municipal regulations. Dispose of lead waste in sealed double thickness 6 ml bags or leak proof drums. Label containers with appropriate warning labels.

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

1.11 PERSONNEL TRAINING

.1 Provide Departmental Representative satisfactory proof that every worker has had instruction and training in hazards of lead exposure, in personal hygiene, in aspects of work procedures, and in use, cleaning, and disposal of respirators.

.2 Instruction and training related to respirators includes, at minimum:

.1 Proper 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 competent, qualified person.

.4 Supervisory personnel to complete required training.

1.12 MEASUREMENT FOR PAYMENT

.1 All direct costs related to Work under this section are to be included in the lump sum item 02 81 01-1 Hazardous Materials Abatement. All other miscellaneous work and indirect costs under this section will not be measured and are to be included in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule.

PART 2 - PRODUCTS

2.01 MATERIALS

.1 Polyethylene 0.15 mm thick unless otherwise specified; in sheet size to minimize joints.

.2 Tape: fibreglass - reinforced duct tape suitable for sealing polyethylene under dry conditions and wet conditions using amended water.

.3 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 lead paint residue.

.4 Lead waste containers: fibre type acceptable to dump operator with tightly fitting covers and 0.15 mm thickness sealable polyethylene liners.

.1 Label containers with pre-printed bilingual cautionary Warning Lead clearly visible when ready for removal to disposal site.

PART 3 - EXECUTION

3.01 SUPERVISION

.1 One Supervisor for every ten workers is required.

.2 Supervisor must remain within work area during disturbance, removal, or handling of lead based paints.

3.02 PREPARATION

.1 Remove and store items to be salvaged or reused.

.1 Protect and wrap items and transport and store in area specified by Departmental Representative.

.2 Work Area:

.1 Shut off and isolate HVAC system to prevent dust dispersal into other building areas. Conduct smoke tests to ensure duct work is airtight.

.2 Pre-clean fixed casework and equipment within work area, using HEPA vacuum and cover and seal with polyethylene sheeting and tape.

.3 Clean work area using HEPA vacuum. If not practicable, use wet cleaning method. Do not raise dust.

.4 Seal off openings with polyethylene sheeting and seal with tape.

.5 Protect floor surfaces covered from wall to wall with polyethylene sheets.

.6 Maintain emergency fire exits or establish alternatives satisfactory to Authority having jurisdiction.

.7 Where water application is required for wetting lead containing materials, provide temporary water supply appropriately sized for application of water as required.

.8 Provide electrical power and shut off for operation of powered tools and equipment. Provide 24 volt safety lighting and ground fault interrupter circuits on power source for electrical tools, in accordance with applicable CSA Standard. Ensure safe installation of electrical cables and equipment.

.3 Do not start work until:

.1 Arrangements have been made for disposal of waste.

.2 Tools, equipment, and materials waste containers are on site.

.3 Arrangements have been made for building security.

.4 Notifications have been completed and preparatory steps have been taken.

3.03 LEAD ABATEMENT

.1 Removal of lead-containing coatings with a chemical gel or paste and fibrous laminated cloth wrap; or removal equipped with HEPA filters; or removal with using power tools non-powered hand tool, other than manual scraping and sanding.

.2 Remove lead based paint in small sections and pack as it is being removed in sealable 0.15 mm plastic bags and place in labelled containers for transport.

.3 Seal filled containers. Clean external surfaces thoroughly by wet sponging. Remove from immediate working area to staging area. Clean external surfaces thoroughly again by wet sponging. Wash containers

thoroughly pending removal to outside. Ensure containers are removed by workers who have entered from uncontaminated areas dressed in clean coveralls.

.4 After completion of stripping work, wire brush and wet sponge surface from which lead based paint has been removed to remove visible material. During this work keep surfaces wet.

.5 After wire brushing and wet sponging to remove visible lead based paint, and after encapsulating lead containing material impossible to remove, wet clean entire work area, and equipment used in process. After inspection by Departmental Representative apply continuous coat of slow drying sealer to surfaces of work area. Do not disturb work area for 8 hours no entry, activity, ventilation, or disturbance during this period.

3.04 INSPECTION

.1 Perform inspection to confirm compliance with specification and governing authority requirements. Deviations from these requirements not approved in writing by Departmental Representative will result in work stoppage, at no cost to Owner.

.2 Departmental Representative 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.

3.05 LEAD SURFACE SAMPLING - WORK AREAS

.1 Final lead surface sampling to be conducted as follows:

.1 After work area has passed a visual inspection for cleanliness approved and accepted by Departmental Representative. Apply coat of lock-down agent to surfaces within enclosure, and appropriate setting period of 8 hours has passed, Departmental Representative will perform lead wipe sampling.

.1 Final lead wipe sampling results from horizontal and vertical surfaces must show lead levels of less than 40 micrograms of lead in dust per square foot. Samples collected and analyzed in accordance with EPA 747-R-95-007.

.2 If wipe sampling results show levels of lead in excess of 40 micrograms per square foot, re-clean work area at contractor's expense and apply another acceptable coat of lock-down agent to surfaces.

.3 Repeat as necessary until fibre levels are less than 40 micrograms per square foot.

3.6 FINAL CLEANUP

.1 Following cleaning and when lead wipe surfaces sampling are below acceptable concentrations, proceed with final cleanup.

.2 Remove polyethylene sheet by rolling it away from walls to centre of work area. Vacuum visible lead containing particles observed during cleanup, immediately, using HEPA vacuum.

.3 Place polyethylene sheets, tape, cleaning material, clothing, and contaminated waste in plastic bags and sealed labelled waste containers for transport.

.4 Conduct final check to ensure no dust or debris remains on surfaces as result of dismantling operations.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 02 41 16 – Structure Demolition

1.2 MEASUREMENT PROCEDURES

.1 Shoring, bracing, cofferdams, underpinning and de-watering of excavation will not be measured separately for payment.

1.3 REFERENCES

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

.1 ASTM C136-05, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.2 ASTM D698-00ae1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3) (600 kN-m/m^3).

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.

1.4 DEFINITIONS

.1 Unclassified excavation: excavation of deposits of whatever character encountered in Work.

.2 Waste material: excavated material unsuitable for use in Work or surplus to requirements.

.3 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.

.4 Recycled fill material: material, considered inert, obtained from alternate sources and engineered to meet requirements of fill areas.

.5 Unsuitable materials:

.1 Weak, chemically unstable, and compressible materials.

.6 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.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Preconstruction Submittals:

.1 Submit records of underground utility locates, indicating: location plan of existing utilities as found in field, clearance record from utility authority and location plan of relocated and abandoned services, as required.

.3 Samples:

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

.2 Inform Departmental Representative at least 4 weeks prior to beginning Work, of proposed source of fill materials.

.3 Submit 70 kg samples of type of fill specified.

.4 Ship samples to Departmental Representative, in tightly closed containers to prevent contamination and exposure to elements.

1.6 QUALITY ASSURANCE

.1 Qualification Statement: submit proof of insurance coverage for professional liability.

.2 Do not use soil material until written report of soil test results are approved by Departmental Representative.

.3 Health and Safety Requirements:

.1 Do construction occupational health and safety in accordance with Section 01 35 29.14 - Health and Safety for Contaminated Sites.

.4 Buried services:

.1 Before commencing work establish location of buried services on and adjacent to site.

.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 within 2 m of foundations: cap cut-offs.

.4 Prior to beginning excavation Work, notify applicable authorities having jurisdiction establish location and state of use of buried utilities and structures. Authorities having jurisdiction to clearly mark such locations to prevent disturbance during Work.

.5 Confirm locations of buried utilities by careful test excavations.

.6 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered.

.7 Where utility lines or structures exist in area of excavation, obtain direction of Departmental Representative before removing.

.8 Record location of maintained, re-routed and abandoned underground lines.

.9 Confirm locations of recent excavations adjacent to area of excavation.

.5 Existing buildings and surface features:

.1 Conduct, with Departmental Representative, condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, wires, rail tracks, pavement, survey bench marks 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 Departmental Representative.

Part 2 Products

2.1 MATERIALS

.1 Aggregate quality: sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material, clay lumps or minerals, free from adherent coatings and injurious amounts of disintegrated pieces or other deleterious substances.

.2 Coarse aggregates satisfying requirements of applicable section to be one of or blend of following:

.1 Crushed rock.

.2 Gravel and crushed gravel composed of naturally formed particles of stone.

.3 Gradations to be within limits specified when tested to ASTM C136. Sieve sizes to CAN/CGSB-8.1.

.4 Table:

Sieve Designation	Type 2
	% Passing
75 mm	100
50 mm	-
37.5 mm	-
25 mm	-
19 mm	-
12.5 mm	-
9.5 mm	-
4.75 mm	22-85
2.00 mm	-

0.425 mm	5-30
0.180 mm	-
0.075 mm	0-10

.3 Type 3 fill: selected material from excavation or other sources, approved by Departmental Representative for use intended, unfrozen and free from rocks larger than 75 mm, cinders, ashes, sods, refuse or other deleterious materials

Part 3 Execution

3.1 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.

3.2 PREPARATION/PROTECTION

.1 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.

.2 Protect buried services that are required to remain undisturbed.

3.3 FILL TYPES AND COMPACTION

.1 Use Type 2 fill as indicated to fill the former building footprint up to an elevation of 150 mm above the adjacent grade.

.2 Place fill in lifts not exceeding 300 mm and compact to 95% of corrected maximum dry density. Compaction densities are percentages of maximum densities obtained from ASTM D698.

3.4 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.

3.5 BACKFILLING

.1 Do not proceed with backfilling operations until completion of following:

.1 Departmental Representative has inspected and approved of demolition below finish grade.

.2 Inspection, testing, approval, and recording location of underground utilities.

.2 Areas to be backfilled to be free from debris, snow, ice, and water.

.3 Do not use backfill material which is frozen or contains ice, snow or debris.

.4 Place backfill material in uniform layers and compact each layer before placing succeeding layer.

3.6 RESTORATION

.1 Upon completion of Work, remove waste materials and debris in accordance to Section 01 74 21 - Construction/Demolition Waste Management and Disposal, trim slopes, and correct defects as directed by Departmental Representative.

.2 Clean and reinstate areas affected by Work as directed by Departmental Representative.

.3 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

END OF SECTION

DRAWINGS

Sheet Size: A1 (841mm x 594mm)

Public Works and Government Services Canada

Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region

HAZARDOUS MATERIALS ABATEMENT SPECIFICATIONS

DRAWING INDEX	
Sheet No.	TITLE
R.007 489.025 C00	SHEET LIST
R.007 489.025 C01	SITE LOCATION PLAN
R.007 489.025 C02	BASEMENT FLOOR PLAN
R.007 489.025 C03	FIRST FLOOR PLAN
R.007 489.025 C04	ATTIC FLOOR PLAN

9609 102 STREET
FORT SIMPSON, NT

ISSUED FOR TENDER - SEPTEMBER 2017

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

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

Revision	Description	Date
5		
4		
3		
2		
1	ISSUED FOR TENDER	
0	ISSUED FOR REVIEW	10 Aug.2017

Client

PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

Project title

HAZARDOUS MATERIALS ABATEMENT SPECIFICATIONS

Drawn by: P.A.L.

Designed by: J.D.

Approved by:

PWGSC Project Manager: T.Burr

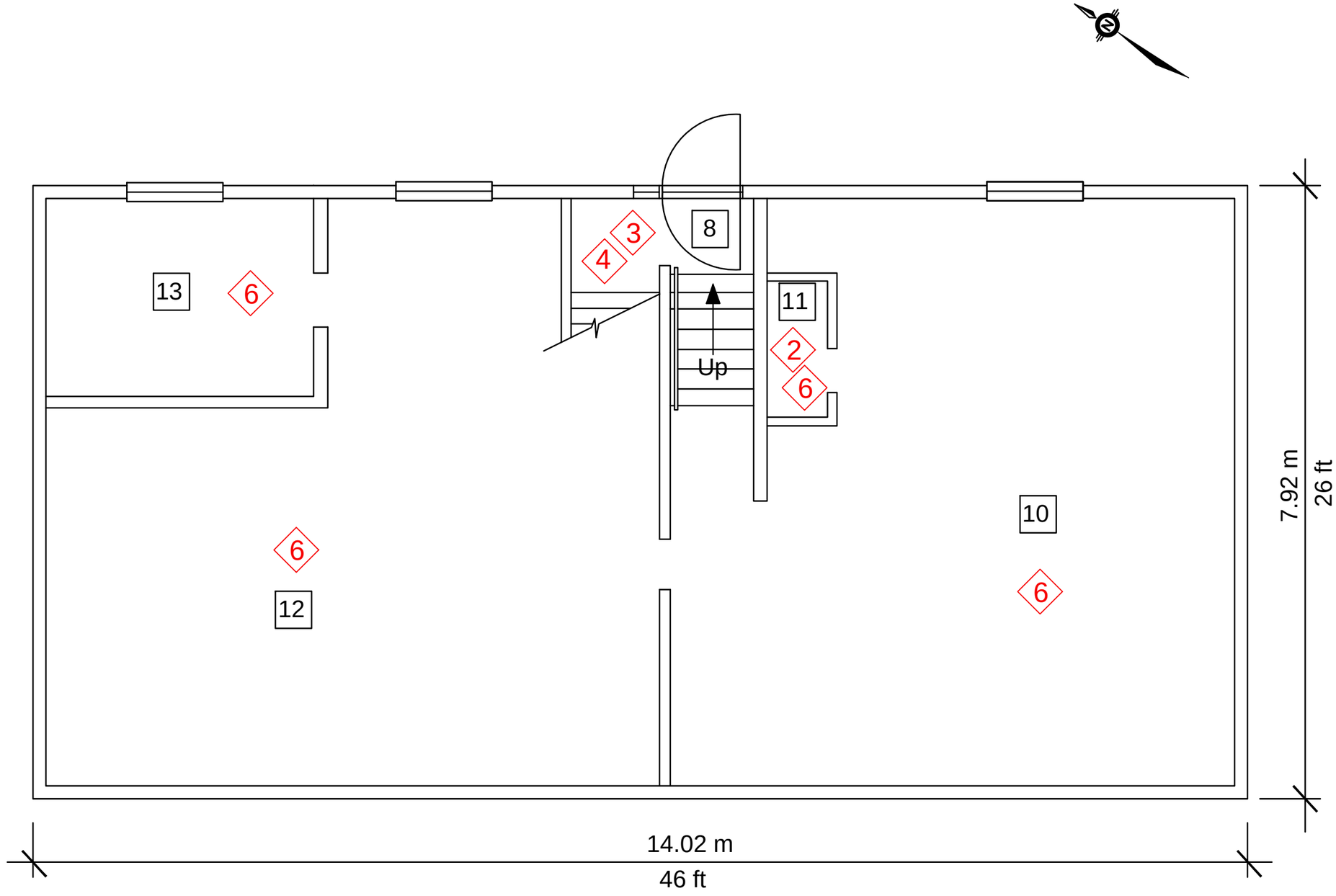
Drawing title

SITE LOCATION PLAN
9609, 102 STREET, FORT SIMPSON, NT

Project no.	Sheet	Revision
R.007 489.025	CO1	0

PWGSC – ANSI B–L1 – 11X17

A000



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Scale - 1:50

LEGEND

8 ROOM NUMBER

Public Works and Government Services Canada

Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

ABATEMENT NOTES:

1. REMOVE AND DISPOSE AS NON HAZARDOUS WASTE, CARPETING AND/OR LAMINATE FLOORING, AS REQUIRED TO ACCESS VINYL FLOORING.
2. REMOVE AND DISPOSE AS ASBESTOS WASTE, ALL VINYL FLOORING.
3. REMOVE AND DISPOSE AS ASBESTOS WASTE, ALL VINYL FLOORING AND ASSOCIATED MASTICS. MASTICS ARE TO BE COMPLETELY REMOVED FROM SUBSTRATE MATERIALS.
4. REMOVE AND DISPOSE AS ASBESTOS WASTE, HEAT SHEILDS IN LIGHT FIXTURES.
5. REMOVE AND DISPOSE AS ASBESTOS WASTE, ALL VERMICULITE AND FIBERGLASS ATTIC INSULATION.
6. REMOVE AND DISPOSE AS LEAD WASTE, ALL PAINT FINISHES ON CONCRETE FLOORS.

GENERAL ABATEMENT NOTES:

A. REMOVE AND DISPOSE AS ASBESTOS WASTE, ALL DRYWALL AND ASSOCIATED JOINT COMPOUNDS ON WALL AND CEILINGS.

B. REMOVE AND DISPOSE AS MERCURY WASTE, TWENTY FLUORESCENT LIGHT TUBES AND ONE WALL-MOUNTED THERMOSTAT.

Revision	Description	Date
5		
4		
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2		
1	ISSUED FOR TENDER	
0	ISSUED FOR REVIEW	10 Aug.2017

Client

PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

Project title

HAZARDOUS MATERIALS ABATEMENT SPECIFICATIONS

Drawn by: P.A.L.

Designed by: J.D.

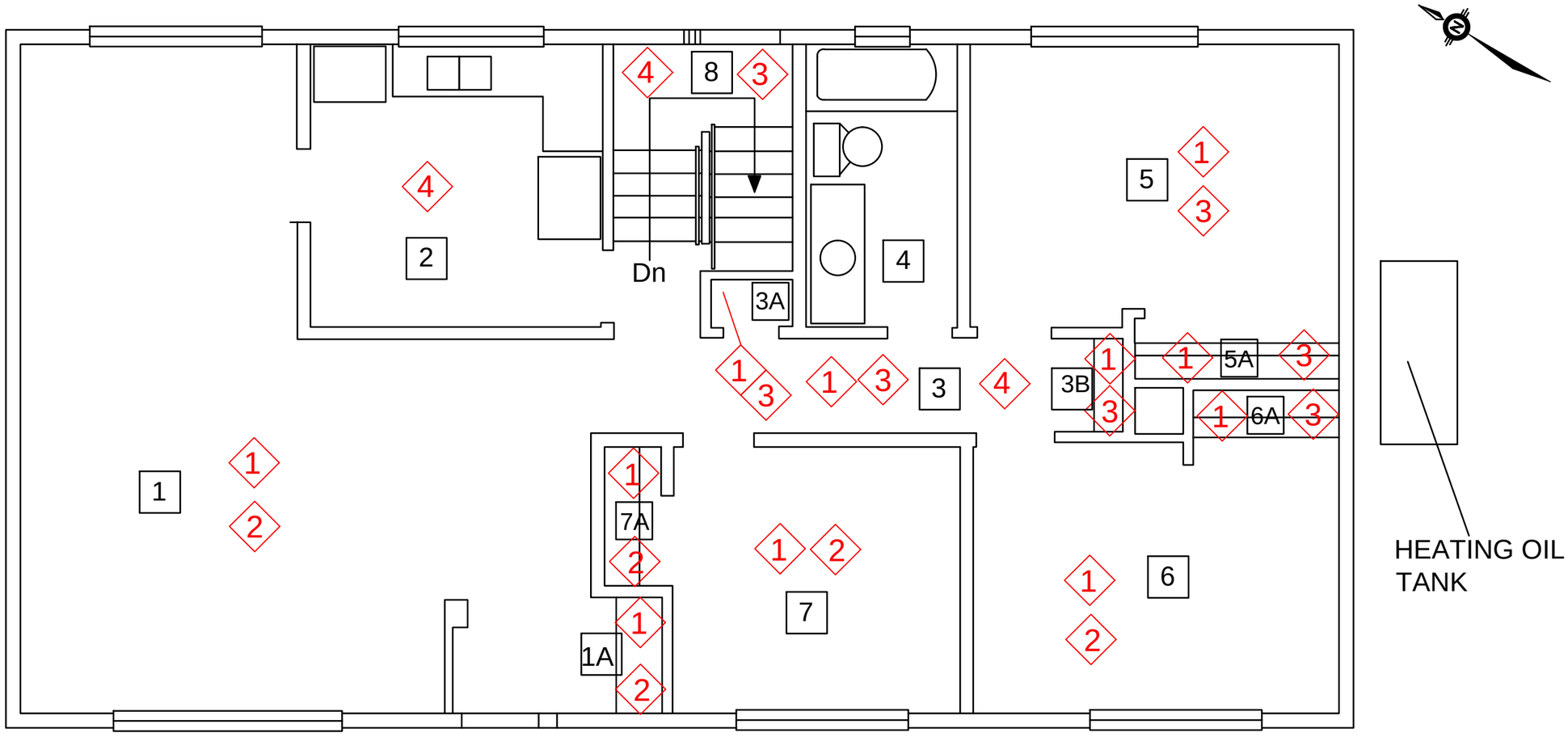
Approved by:

PWGSC Project Manager: T.Burr

Drawing title

BASEMENT FLOOR PLAN
9609, 102 STREET, FORT SIMPSON, NT

Project no.	Sheet	Revision
R.007 489.025	CO2	0



LEGEND

8 ROOM NUMBER

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

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

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0	ISSUED FOR REVIEW	10 Aug.2017

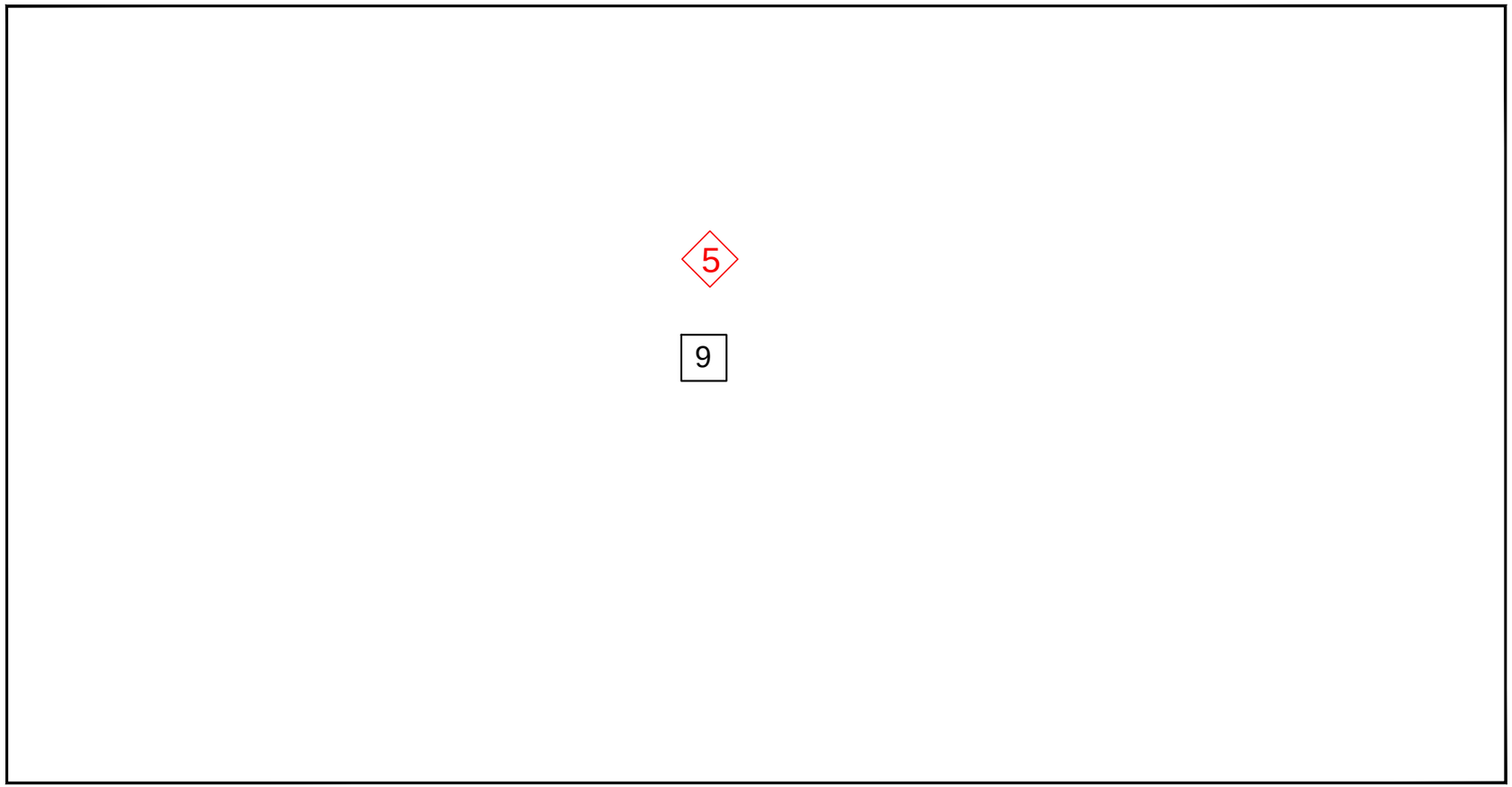
Client
PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

Project title
HAZARDOUS MATERIALS ABATEMENT SPECIFICATIONS

Drawn by: P.A.L.
Designed by: J.D.
Approved by:
PWGSC Project Manager: T.Burr

Drawing title
FIRST FLOOR PLAN
9609, 102 STREET, FORT SIMPSON, NT

Project no.	Sheet	Revision
R.007 489.025	CO3	0



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Scale - 1:50

LEGEND

9 ROOM NUMBER

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

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

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Client
PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

Project title
HAZARDOUS MATERIALS ABATEMENT SPECIFICATIONS

Drawn by: P.A.L.
Designed by: J.D.
Approved by:
PWGSC Project Manager: T.Burr

Drawing title
ATTIC FLOOR PLAN
9609, 102 STREET, FORT SIMPSON, NT

Project no.	Sheet	Revision
R.007 489.025	CO4	0

APPENDIX A

Supporting Documentation

ARCADIS Design & Consultancy for natural and built assets

Public Works and Government Services Canada
Environmental Services

HAZARDOUS MATERIALS SURVEY AND STRUCTURAL ENGINEERING ASSESSMENT

Residential Building

9609, 102 Street, Fort Simpson, Northwest Territori

August 5, 2016

Jean Daigle

Environmental Specialist

Rein Andre B.A.

Manager, Hazardous Materials and Industrial Hygiene Group

Charles Gravelle M.Sc.E., P.Eng. (NT)

Principal

HAZARDOUS MATERIALS SURVEY AND STRUCTURAL ENGINEERING ASSESSMENT

Residential Building
9609, 102 Street, Fort Simpson
Northwest Territories

Prepared for:
Mr. Michael Molinski
Senior Environmental Specialist
Environmental Services
Public Works and Government Services Canada
Western Region
101-167 Lombard Avenue
10025 Jasper Avenue
Winnipeg, Manitoba R3B 0T6

Prepared by:

Arcadis Canada Inc.
121 Granton Drive
Suite 12
Richmond Hill, Ontario L4B 3N4
Tel 905 882 5984
Fax 905 882 8962

Our Ref.:

702541-000

Date:

August 5, 2016

CONTENTS

FIGURES

TABLES

APPENDICES

EXECUTIVE SUMMARY

Arcadis Canada Inc. (Arcadis) was retained by Public Works and Government Services Canada (PWGSC), to conduct a hazardous materials survey and structural engineering assessment of a residential building located at 9609, 102 Street in Fort Simpson, Northwest Territories.

It is our understanding that the hazardous materials survey and structural engineering assessment are being performed to determine the following:

- locations of Hazardous materials in the building and associated costs for abatement; and
- structural deficiencies and associated costs to repair and/or demolish.

HAZARDOUS MASTERIALS

Asbestos

Asbestos-containing materials found to be present in the building are as follows:

- joint compound associated with all gypsum board applications;
- vinyl floor tiles, select vinyl sheet flooring and select flooring mastics;
- vermiculite attic insulation; and
- heat shields on select light fixtures.

Lead

Of the thirteen (13) samples of the predominant paints analyzed, lead was detected in excess of 600 parts per million in only 1 of the 13 paint samples. Less than 600 parts per million of lead was detected in six of the 13 paint samples. Lead was not detected (less than the detection limits of 90, 100 and 150 parts per million) in 6 of the 13 paint samples.

Mercury

Mercury-containing florescent light tubes were observed in several areas in the building and one (1) mercury-containing thermostat was observed in the building.

Silica

Materials observed in the building which should be considered to contain silica include drywall, drywall joint compound, textured finishes and concrete.

PCBs

One (1) fluorescent light ballast in the building may contain PCBs.

Ozone-Depleting Substances (ODS)

No ODS or halocarbon-containing equipment was observed during the course of the investigation.

Man-Made Mineral Fibre

Glass fibre insulation was observed in the wall spaces of the exterior walls and the attic spaces in the building.

Mould

No suspect mould was observed during the course of the investigation.

Urea Formaldehyde Foam Insulation (UFFI)

UFFI was not observed in the building during the course of the investigations.

Radioactive Materials

During the course of our site inspections, one ceiling-mounted smoke detector was observed in the building that may contain radioactive materials

Heating Oil

The building has an outdoor heating oil tank (~1,100 L capacity) with heating oil supplying fuel to an oil-fired furnace.

1 INTRODUCTION

Arcadis Canada Inc. (Arcadis) was retained by Public Works and Government Services Canada (PWGSC), to conduct a hazardous materials survey and structural engineering assessment in a residential building located at 9609, 102 Street in Fort Simpson, Northwest Territories. The residential building was reportedly constructed in 1972. The building is comprised of a one storey wood frame structure with a full basement, poured concrete foundation walls and poured concrete slab on grade basement floor. The building has exterior vinyl siding and a pitched roof system with asphalt roof shingles. Interior finishes are generally gypsum board on walls and ceilings, with sheet and vinyl tile flooring with carpeting on most vinyl flooring. The building has an outdoor heating oil tank supplying fuel to oil-fired furnace with an electric hot water heater.

Exterior perimeter walls are constructed of 2” x 4” wood framing on 16” centres with assumed 5/8” plywood sheathing. R12 glass fibre insulation batts are present in the wall cavities with a 6 mil polyethylene vapour barrier with gypsum board applied to the interior side of the walls. A black construction paper was observed on the surface of the exterior plywood sheathing, 2” extruded polystyrene insulation board and vinyl siding.

Partition walls are constructed of 2” x 4” wood framing on 16” centres with gypsum board applied to the walls.

Floors are comprised of 2” x 10” wood joists on 16” centres covered with 5/8” plywood sheathing with various additional plywood underlayments in select areas followed by various floor finishes. The joists are supported by the concrete foundation walls and a central steel beam supported by adjustable steel columns.

The roof structure is comprised of a 2” x 4” roof truss system on 24” centres with plywood sheathing. The attic space is insulated with one layer of R12 glass fibre batt insulation followed by approximately 4” to 6” of vermiculite insulation covered in approximately 12” of blown glass fibre attic insulation.

Roofing materials are comprised of black roofing paper with one layer of asphalt roof shingles.

It is our understanding that hazardous materials survey and structural engineering assessment are being performed to determine whether the building will be repaired or demolished. At the time of the survey, the building was vacant. The site location plan is provided in Figure 1 (following page 1-2). Floor plans for the residential building are provided in Appendix A.

The survey was undertaken to report on the presence or suspected presence of readily observable hazardous materials in the building as well as to access the structural elements and habitability of the building.

1.1 Scope of Work

The scope of work for the hazardous materials survey:

- inspection of readily-accessible areas in the designated study areas for the presence of hazardous materials used in building construction materials;
- obtaining representative bulk samples of materials suspected of containing asbestos, and paint chip samples;

- laboratory analyses of bulk samples for asbestos content and analysis of paint chip samples for lead content;
- preparation of a report outlining the findings of the investigation;
- preparation of a Class A cost estimate to complete the abatement of hazardous materials; and
- preparation of a tender-ready Technical Specification Package for the abatement of hazardous materials.

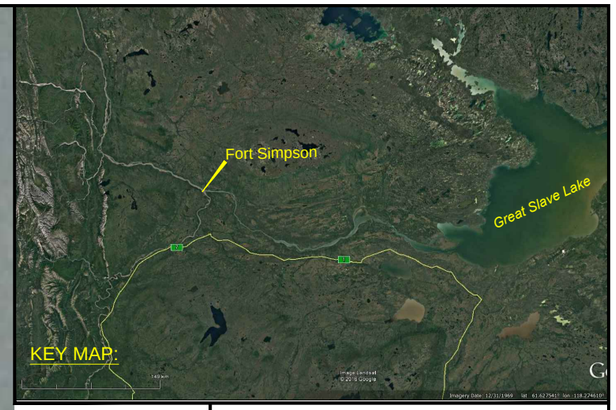
Mr. Jean Daigle of Arcadis visited the site on 6, 7 and 8 July, 2016 to conduct the hazardous materials survey. The Class A cost estimate for hazardous materials abatement has been issued as a separate document.

The scope of work for the structural engineering assessment:

- complete a structural engineering assessment of the building;
- assess the building for any repairs required to deem the building safe for habitation;
- preparation of a Class A cost estimate to repair the building;
- preparation of a Class A cost estimate for the demolition of the building; and
- preparation of a report outlining the findings of the assessment including a discussion and Table to compare the cost of demolition verses repairing the building and recommendations.

The structural engineering assessment was performed by the structural engineering firm Williams Engineering Canada (WEC) out of Yellowknife, NWT, who were retained by Arcadis. The structural engineering assessment report prepared by WEC is provided in Appendix D.

Mr. Paul Clyne of WEC visited the site on 6 July, 2016 to conduct the structural engineering assessment.



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ARCADIS

PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

HAZARDOUS MATERIALS SURVEY

LOCATIONS OF ASBESTOS-CONTAINING MATERIALS

RESIDENTIAL UNIT

9609, 102 STREET, FORT SIMPSON, NWT

SITE LOCATION

Drawn By: P.A.L.	Approved By: J.D.	Project No: 702541-000
Date: AUG. 2016	Scale: AS SHOWN	FIGURE - 1

Z:\702000 Series\702541-000\702541-000 9609 102 ST.dwg LAYOUT: SITE LOCATION ACM SAVED: 8/4/2016 1:15 PM PLOTTED: 8/4/2016 1:47 PM BY: PAUL LANDRY

2 BACKGROUND INFORMATION ON HAZARDOUS MATERIALS

The Government of the Northwest Territories (GNWT) Occupational Health & Safety Regulations requires that an employer provide any information, instruction, training and supervision that is necessary to protect the health and safety of workers. "Hazardous materials" which require special handling during construction or demolition activities include asbestos, lead, silica, mercury, polychlorinated biphenyls (PCBs), ozone-depleting substances (ODS), man-made mineral fibres (MMMF) mould and urea formaldehyde foam insulation (UFFI).

Other regulatory requirements (and guidelines) which apply to control of exposure to hazardous materials are referenced in the sections below.

2.1 Asbestos

Asbestos has been widely used in buildings, both in friable applications (materials which can be crumbled, pulverized or powdered by hand pressure, when dry) such as pipe and tank insulation, sprayed-on fireproofing and acoustic texture material and in non-friable manufactured products such as floor tile, gaskets, cement board and so on. The use of asbestos in friable applications was curtailed around the mid-1970s and, as such, most buildings constructed prior to about 1975 contain some form of friable construction material with an asbestos content. The use of asbestos in certain non-friable materials continued beyond the mid-1970s.

Control of exposure to asbestos is governed in Northwest Territories by the *Guideline for the Management of Waste Asbestos*. Asbestos is defined as any material containing 1% or more, by dry weight, asbestos fibres. Disposal of asbestos waste (friable and non-friable materials) is governed by the *Guideline for the General Management of Hazardous Waste in the NWT.*

Public Works and Government Services Canada (PWGSC) Departmental Policy 057 – Asbestos Management provides requirements for asbestos management in federal buildings. This document states:

- "Public Works and Government Services Canada shall comply with all federal, provincial, territorial and municipal regulations, statutes and requirements with regard to asbestos containing materials (ACM) in government owned or leased buildings and facilities."

PWGSC DP 057 – Asbestos Management - defines asbestos-containing material and classifies asbestos work operations into three types (Type 1, 2 and 3) and specifies procedures to be followed in conducting Type 1 (minimum precautions) and 2 (intermediate precautions) asbestos work. Type 3 procedures are not included in the standard procedures provided in DP 057.

However *DP 057* states that procedures for Type 3 work are developed for the particular work to be undertaken, and the specific circumstances and worksite. These procedures are to be developed in compliance with the *National Master Specification*, Section 02 81 00.03, Asbestos Abatement (maximum precautions).

The *Northwest Territories Occupational Health and Safety Regulations* (Draft – September 1, 2010) contains requirements for asbestos management and abatement in Part 24. Sections of this draft regulation state the following with respect to asbestos abatement and demolition:

"Asbestos process" means any activity that may release asbestos dust, and includes:

(a) the sawing, cutting or sanding of asbestos-containing materials,

(b) the repair, maintenance, replacement or removal of asbestos surfaces,

(c) the cleaning or disposal of asbestos materials,

(d) the mixing or application of asbestos shorts, cements, grouts, putties or similar compounds,

(e) the storing or conveyance of materials containing asbestos, and

(f) the demolition of structures containing asbestos.

Where an asbestos process is undertaken, an employer shall ensure that:

(a) the area is effectively isolated or otherwise enclosed to prevent the escape of asbestos dust to any other part of the work site;

(b) a warning notice is conspicuously displayed indicating that asbestos work is in progress;

(c) all asbestos-containing materials removed are placed in appropriate receptacles that are impervious to asbestos and that are clearly labelled "Asbestos"; and

(d) the receptacles referred to in paragraph (c) are handled and transported in a manner that will protect them from physical damage.

DP 057 and the NWT Draft Regulation classify removal of more than a minor amount of friable asbestos-containing material as "Type 3" and "High Risk" work, respectively.

2.2 Lead

Lead is a heavy metal that can be found in construction materials such as paints, coatings, mortar, concrete, solder, packings, sheet metal, caulking, glazed ceramic products and cable splices. Lead has been used historically in exterior and interior paints.

The *Environmental Guideline for Waste Lead and Lead Paint* – GNWT April 2001 states that "Products that contain lead in excess of 600 parts per million (0.06% by weight) are considered hazardous waste and shall be managed in accordance with this guideline"

2.3 Mercury

Mercury has been used in electrical equipment such as alkaline batteries, fluorescent light bulbs (lamps), compact fluorescent lamps (CFL), high intensity discharge (HID) lights (mercury vapour, high pressure sodium and metal halide), "silent switches" and in instruments such as thermometers, manometers and barometers, pressure gauges, float and level switches and flow meters. Mercury-containing lamps, the bulk

of which are 1.22 m (four foot) fluorescent lamps contain between 7 and 40 mg of mercury each. Mercury compounds have also been used by many manufacturers historically as additives in latex paint to protect the paint from mildew and bacteria during production and storage.

Mercury has been used in electrical equipment such as alkaline batteries, fluorescent light bulbs (lamps), high intensity discharge (HID) lights (mercury vapour, high pressure sodium and metal halide), “silent switches” and in instruments such as thermometers, manometers and barometers, pressure gauges, float and level switches and flow meters. Mercury-containing lamps, the bulk of which are 1.22 m (four foot) fluorescent lamps contain between 7 and 40 mg of mercury each. Mercury compounds have also been used by many manufacturers historically as additives in latex paint to protect the paint from mildew and bacteria during production and storage.

The intentional addition of mercury to Canadian-produced consumer paints for interior use was prohibited in 1991. Mercury may have remained in paints after 1991, however, as a result of impurities in the paint ingredients or cross-contamination due to other manufacturing processes. The *GNWT Occupational Health and Safety Regulations (Draft) September 2010* sets a contamination limit of 0.025mg/m^3(for inorganic forms, including metallic mercury).

Mercury-containing thermostats and silent light switches are mercury tilt switches which are small tubes with electrical contacts at one end of the tube. A mercury tilt switch is usually present when no switch is visible. Mercury switches often have the word “TOP” stamped on the upper end of the switch, which is visible after removing the cover plate. If mercury switches are to be removed, the entire switch should be removed and placed into a suitable container for storage and disposal.

Waste light tubes generated during renovations or building demolition and waste mercury from equipment must either be recycled or disposed of in accordance with the requirements of *Guideline for the General Management of Hazardous Waste in the NWT.*

Waste mercury from mercury switches or gauges should, however, be properly collected and shipped to a recycling facility or disposed of as a hazardous waste. Removal of mercury-containing equipment (e.g., switches, gauges, controls, etc.) should be carried out in a manner which prevents spillage and exposure to workers.

2.4 Silica

Silica exists in several forms of which crystalline silica is of most concern with respect to potential worker exposures. Quartz is the most abundant type of crystalline silica. Some commonly used construction materials containing silica include brick, refractory brick, concrete, concrete block, cement, mortar, rock and stone, sand, fill dirt, topsoil and asphalt containing rock or stone.

2.5 PCBs

Any equipment containing PCBs such as transformers, switchgear, light ballasts and capacitors, which is removed from service due to age, failure or as a result of decommissioning, is considered to constitute a PCB waste. Although current federal legislation (effective 1 July 1980) has prohibited the manufacture and

sale of new equipment containing PCBs since that time, continued operation of equipment supplied prior to this date and containing PCBs is still permitted. Handling, storage and disposition of such equipment is, however, tightly regulated and must be managed in accordance with provincial and federal government requirements as soon as it is taken out of service or becomes unserviceable.

In most institutional, commercial facilities and in smaller industrial facilities, the primary source of equipment potentially containing PCBs is fluorescent and HID light ballasts. Small transformers may also be present. In larger industrial facilities, larger transformers and switch gear containing, or potentially containing, PCBs may also be present.

PCB wastes are prohibited from shipment to disposal facilities in the United States. Out of Territory facilities that will accept PCB waste solids and liquids for destruction include the Alberta Special Waste Management facility operated by Earth Tech (Canada) Inc. in Swan Hills, Alberta, and the Bennett Environmental facility in Quebec.

Removal of in-service equipment containing PCBs, such as fluorescent light ballasts, capacitors and transformers, is subject to the requirements of the federal PCBs Regulations (discussed below). The federal PCB regulations outline the end of use dates for all equipment containing PCBs and storage/disposal requirements.

Exceptions are provided for fluorescent light ballasts and pole-mounted transformers where an end of use date of 31 December 2025 has been specified. The regulations also limit the storage of PCB material to a maximum of one year from the date the regulations came into effect or one year following removal of the equipment from service, whichever is the later date.

The regulations also allow for the filing of applications for exemption from the applicable end of use dates specified above. There are a number of circumstances under which an application may be filed. In addition to the above, there are several other requirements, including filing of annual reports, notification for changes in inventories for stored PCBs, and so forth.

PCBs may be present in caulking used in windows, door frames and masonry columns in buildings built or renovated between 1950 and 1979.

PCBs were also commonly added to industrial paints from the 1940s to the late 1970s. PCBs were added directly to the paint mixture to act as a fungicide, to increase durability and flexibility, to improve resistance to fires and to increase moisture resistance. The use of PCBs in new products was banned in Canada in the 1970s. PCB amended paints were used in specialty industrial/institutional applications prior to the 1970s including government buildings and equipment such as industrial plants, radar sites, ships as well as non-government rail cars, ships, grain bins, automobiles and appliances.

2.6 Ozone-depleting Substances and Halocarbons

The *Federal Halocarbon Regulations*, 2003 (FHR 2003) were published in August 2003 under the authority of the *Canadian Environmental Protection Act*, 1999. The purpose of the FHR 2003 is to reduce and prevent emissions of ozone-depleting substances and of their halocarbon alternatives to the environment from air-conditioning, refrigeration, fire-extinguishing and solvent systems that are:

- located on federal or aboriginal lands; or
- owned by federal departments, boards and agencies, Crown corporations, or federal works and undertakings.

Contractor responsibilities under the FHR 2003 include the following:

- only a certified and licensed technician may install, service, leak test or charge halocarbon containing equipment;
- if a leak test is conducted on a piece of air conditioning or refrigeration equipment, the contractor is to affix a notice containing all of the information as required in Schedule 2, item 2 of the FHR 2003, including: a) name and address of owner of the system, b) name of operator of the system, c) specific location of the system, d) description of the system, e) name of certified person, f) certificate number, g) name of employer of certified person, h) type of halocarbon in the system, i) charging capacity of the system, and j) date of last two leak tests;
- no halocarbons are to be knowingly released from a refrigeration or air conditioning system, or from a fire extinguishing system (unless to fight a fire). If any work is done on an air conditioning, refrigeration, or fire extinguishing system that may result in a release of a halocarbon, the halocarbon shall first be recovered into a container designed for that purpose;
- in the event that a halocarbon-containing system must be charged, a leak test is to first be performed. If a leak is detected for a halocarbon-containing system, the owner of the equipment (and contract authority) must be informed of the leak as soon as possible. In the case of a leak resulting in a release of greater that 100 kg, or of unknown weight from a unit with a capacity equal to or greater than 100 kg, the contractor must report the release within 24 hours to Environment Canada at (867) 920-8130 via the Northwest Territories Department of Environment and Natural Resources emergency spill line for the Northwest Territories and Nunavut; and
- upon servicing a halocarbon-containing system, the service log book for the unit is to be completed by the contractor. Before dismantling, decommissioning or destroying any halocarbon-containing system; the halocarbon(s) will be recovered and a notice shall be affixed to the system. The notice shall meet the requirements listed in Schedule 2, Item 3 of the FHR 2003.

2.7 Man-Made Mineral Fibre

Man-made mineral fibres (MMMF), also known as Synthetic Vitreous Fibres (SVF), include mineral wool (rock wool and slag wool), glass wool (fibre glass) and refractory ceramic fibres (RCF). MMMFs have been produced and widely used in Canada for the past 60 years and are commonly used in the construction industry as insulation and fire protection material.

Measures to control worker exposure and the spread of dust created during the disturbance of MMMF-containing materials are provided in *Synthetic Vitreous Fibres Guidelines for Construction*, 2005, a document prepared by The Construction Safety Association of Ontario (CSAO). The following recommendations are made in the CSAO guideline for the removal, maintenance and demolition of materials which contain MMMF:

- Where practicable, the insulation should be lightly misted with water before and during removal.
- The work area should be isolated by safety tape and warning signs.
- In most situations, a United States National Institute for Occupational Safety and Health (NIOSH) approved N95 air-purifying respirator, dust-resistant safety goggles, and disposable coveralls will provide adequate protection. However, if the activity generates substantial amounts of dust, a more protective respirator may be necessary. For example, major demolition may require a full-facepiece respirator or a supplied-air respirator instead of a half-facepiece air-purifying respirator.
- All waste material should be placed in covered, sealed waste disposal containers as it is removed. If the material is wet, it should be placed in waterproof containers.
- Material to be removed should be handled carefully and not thrown about. Rough handling will release dust and fibres into the air.
- Before maintenance or removal, ventilation duct openings and other openings that could permit the spread of fibres should be temporarily sealed.
- Work areas should be kept clean and scrap material removed as often as necessary to keep the area clean.

The recommended procedures for removal of RCF are more stringent than for mineral wool and glass wool and include construction of temporary enclosures, installation of high efficiency particulate air (HEPA) filtration units, use of disposable coveralls and an Nl00 full-facepiece respirator or a powered air purifying respirator (PAPR) with HEPA filters.

Also, special care is required when removing RCF that have endured prolonged heating of temperatures above 900°C because it may contain crystalline silica in the form of cristobalite.

2.8 Mould

Moulds are forms of fungi that are found everywhere both indoors and outdoors all year round. Outdoors, moulds live in the soil, on plants and on dead and decaying matter. More than 1000 different kinds of indoor moulds have been found in buildings. Moulds spread and reproduce by making spores, which are all small and light-weight, able to travel through air, capable of resisting dry, adverse environmental conditions, and hence capable of surviving a long time. Moulds need moisture and nutrients to grow and their growth is stimulated by warm, damp and humid conditions.

Recommended work practices are outlined in *Mould Guidelines for the Canadian Construction Industry. Standard Construction Document CCA 82 2004*, Canadian Construction Association.

2.9 Urea Formaldehyde Foam Insulation (UFFI)

Urea formaldehyde foam insulation (UFFI) is a polymer manufactured at point-of-use by blending urea formaldehyde resin with a phosphoric acid catalyst and compressed air at a nozzle tip. This nozzle was used to inject the freshly mixed foam product into enclosed wall cavities. UFFI was introduced in Canada in the 1970s. In response to concerns about the health effects of formaldehyde gas, the installation of UFFI was banned in Canada in 1980.

2.10 Radioactive Materials

Aside from nuclear and biomedical industries, radioactive materials may be present in very small amounts within glow-in-the-dark compasses and watch faces, gas lamp mantles and in smoke detectors. Smoke detectors typically contain 1 microcurie of Americium-241. Standard smoke detectors do not require a radioactive license and can be disposed in a MOECC licensed landfill.

2.11 Heating Oil

Heating oils are regulated under the Used Oil and Waste Fuel management Regulations provisions of the GNWT Environmental Protection Act. In practice heating oil is considered a resource and is generally recovered and recycled where possible. For the purposes of this program we have assumed that the above ground tanks located on the north and south side of the building will be decommissioned and reused or sold by the remediation contractor.

3 RESULTS AND DISCUSSION

3.1 Asbestos

During the course of our hazardous materials survey, representative bulk samples of materials were collected by Arcadis staff. The samples were forwarded to EMSL Canada Inc. for asbestos analyses. EMSL holds a current Certificate of Accreditation for Bulk Asbestos Fibre Analysis under the Voluntary Accreditation Program (NVLAP). The results of the bulk sample analyses for asbestos content are provided in Table 3.1, and the laboratory report is provided in Appendix B.

Table 3.1: Summary of Results of Analyses of Bulk Samples for Asbestos Content

Sample No.	Location	Description	Asbestos Content
1-A	Attic 9	Vermiculite attic insulation – brown coloured	**Tremolite**
2-A	Room 3	Heat shield on light fixture – grey coloured with foil layer	**30% Chrysotile**
3-A	Room 4	Mastic on vinyl tub surround – brown coloured	None Detected (TEM)
3-B	Room 4	Mastic on vinyl tub surround – brown coloured	None Detected
3-C	Room 4	Mastic on vinyl tub surround – brown coloured	None Detected
4-A	Room 4	Caulking on bathtub and hardboard tub surround – white coloured	None Detected (TEM)
4-B	Room 4	Caulking on bathtub and hardboard tub surround – white coloured	None Detected
4-C	Room 4	Caulking on bathtub and hardboard tub surround – white coloured	None Detected
5-A	Exterior East	Black paper under vinyl siding on plywood sheathing	None Detected (TEM)
5-B	Exterior East	Black paper under vinyl siding on plywood sheathing	None Detected
5-C	Exterior East	Black paper under vinyl siding on plywood sheathing	None Detected
6-A	Exterior Room 1	Caulking on exterior window frame – white coloured	None Detected (TEM)
6-B	Exterior Room 7	Caulking on exterior window frame – white coloured	None Detected
6-C	Exterior Room 6	Caulking on exterior window frame – white coloured	None Detected
7-A	Roof East	Asphalt roof shingle – green coloured	None Detected (TEM)
7-B	Roof East	Asphalt roof shingle – green coloured	None Detected
7-C	Roof West	Asphalt roof shingle – green coloured	None Detected
8-A	Roof East	Black roofing paper	None Detected (TEM)
8-B	Roof East	Black roofing paper	None Detected

Sample No.	Location	Description	Asbestos Content
8-C	Roof West	Black roofing paper	None Detected
9-A	Room 7	12” x 12” vinyl floor tile – beige with dark brown streaks	**8.6% Chrysotile** (TEM)
10-A	Room 7	Mastic on vinyl floor tile Sample No. 9 – black coloured	<0.1% Chrysotile (TEM)[(1)]
10-B	Room 7	Mastic on vinyl floor tile Sample No. 9 – black coloured	None Detected
10-C	Room 1	Mastic on vinyl floor tile Sample No. 9 – black coloured	None Detected
11-A	Room 6	12” x 12” vinyl floor tile – grey and blue coloured	**1.1% Chrysotile**
12-A	Room 6	Mastic on vinyl floor tile Sample No. 11 – black coloured	None Detected (TEM)
12-B	Room 6	Mastic on vinyl floor tile Sample No. 11 – black coloured	None Detected
12-C	Room 6	Mastic on vinyl floor tile Sample No. 11 – black coloured	None Detected
13-A	Room 3A	12” x 12” vinyl floor tile – beige with light brown streaks	**1.1% Chrysotile**
13-B	Room 5A	12” x 12” vinyl floor tile – beige with light brown streaks	None Detected
13-C	Room 5A	12” x 12” vinyl floor tile – beige with light brown streaks	None Detected
14-A	Room 3A	Mastic on vinyl floor tile Sample No. 13 – black coloured	**10.9% Chrysotile** (TEM)
15-A	Room 4	Vinyl sheet flooring – grey coloured slate style with 9” square pattern with grey coloured mastic – composite sample of vinyl, paper and mastic	None Detected (TEM)
15-B	Room 8	Vinyl sheet flooring – grey coloured slate style with 9” square pattern with grey coloured mastic – composite sample of vinyl, paper and mastic	None Detected
15-C	Room 2	Vinyl sheet flooring – grey coloured slate style with 9” square pattern with grey coloured mastic – composite sample of vinyl, paper and mastic	None Detected
16-A	Room 4	Remnant paper and mastic on sub floor – green coloured paper and yellow coloured mastic – composite sample of paper and mastic	None Detected (TEM)
16-B	Room 4	Remnant paper and mastic on sub floor – green coloured paper and yellow coloured mastic – composite sample of paper and mastic	None Detected
16-C	Room 4	Remnant paper and mastic on sub floor – green coloured paper and yellow coloured mastic – composite sample of paper and mastic	None Detected
17-A	Room 2	Vinyl flooring with black paper backing – yellow coloured	None Detected (TEM)

Sample No.	Location	Description	Asbestos Content
17-B	Room 2	Vinyl flooring with black paper backing – yellow coloured	None Detected
17-C	Room 8	Vinyl flooring with black paper backing – yellow coloured	None Detected
18-A	Room 2	Mastic on vinyl flooring Sample No. 17 – brown coloured	None Detected (TEM)
18-B	Room 2	Mastic on vinyl flooring Sample No. 17 – brown coloured	None Detected
18-C	Room 8	Mastic on vinyl flooring Sample No. 17 – brown coloured	None Detected
19-A	Room 8	Vinyl floor tile – grey coloured	**6.9% Chrysotile** (TEM)
20-A	Room 8	Mastic on vinyl floor tile Sample No. 19 – brown coloured	**4.9% Chrysotile** (TEM)
21-A	Room 11	Vinyl sheet flooring – yellow coloured	**22.8% Chrysotile**
22-A	Room 7	Joint compound on drywall wall	<0.25% Chrysotile(1)
22-B	Room 6	Joint compound on drywall wall	0.43% Chrysotile(1)
22-C	Room 5	Joint compound on drywall wall	**2.2% Chrysotile**
23-A	Room 3	Textured finish on drywall ceiling	0.86% Chrysotile(1)
23-B	Room 6	Textured finish on drywall ceiling	0.89% Chrysotile(1)
23-C	Room 7	Textured finish on drywall ceiling	0.44% Chrysotile(1)
23-D	Room 1	Textured finish on drywall ceiling	0.41% Chrysotile(1)
23-E	Room 2	Textured finish on drywall ceiling	<0.25% Chrysotile(1)
24-A	Room 13	12” x 12” acoustic ceiling tile – white coloured surface with yellow coloured material	None Detected
24-B	Room 13	12” x 12” acoustic ceiling tile – white coloured surface with yellow coloured material	None Detected
24-C	Room 13	12” x 12” acoustic ceiling tile – white coloured surface with yellow coloured material	None Detected

NOTES:

(1) “Asbestos-containing material” is defined as the material that contains 1.0% or more asbestos by dry weight

< = Less than
Chrysotile = Chrysotile Asbestos
Tremolite = Tremolite Asbestos
Bulk samples were analyzed by Polarized Light Microscopy (PLM) analysis, except where “TEM” is noted, in which case Transmission Electron Microscopy analysis was also performed.

Determination of the locations of asbestos-containing materials was made based on the results of bulk sample analyses, visual observations and physical characteristics of the applications as well as our knowledge of the uses of asbestos in building materials. The locations of asbestos-containing materials

and locations and sample numbers of bulk samples collected and analyzed are shown on the floor plans provided in Appendix A.

Based on visual observations and results of laboratory analyses of samples collected by Arcadis, the following asbestos containing materials were found to be present in the building:

- Joint compound associated with all gypsum board applications on walls and ceilings located throughout the building;
- Vinyl floor tiles located below carpeting in Rooms 6, 6A, 7 and 7A;
- Vinyl floor tiles located below laminate flooring in Rooms 1 and 1A;
- Vinyl floor tiles and associated asbestos-containing mastic located under carpeting in Rooms 5 and 5A;
- Vinyl floor tiles and associated asbestos-containing mastic located under laminate flooring in Rooms 3, 3A and 3B;
- Vinyl floor tiles and associated asbestos-containing mastic located below top layer of non-asbestos-containing vinyl sheet flooring and ¼" plywood on stair treads and stair risers in Stairwell 8;
- Vinyl sheet flooring in Room 11;
- Vermiculite insulation located between lower layer of glass fibre batt attic insulation and top layer of blown glass fibre attic insulation in Attic 9; and
- Heat shields on light fixtures in Rooms 2, 3 and 8. All asbestos-containing vinyl sheet flooring found to be present in various areas throughout Unit A have paper backing.

All asbestos-containing materials observed were noted to be in good condition. The locations of the asbestos-containing materials are shown on the floor plans provided in Appendix A.

Glass fibre insulation is readily visually distinguishable (typically yellow or pink in colour) from asbestos-containing insulation materials and was, therefore, not tested for asbestos content.

Vinyl floor tiles, mastics and heat shields are non-friable materials. *DP 057* classifies removal of these non-friable asbestos-containing materials as Type 1 (minimum precautions) operations if the material is wetted and the work is done only using non-powered, hand-held tools. If the removal work is done using power tools that are attached to dust-collecting devices equipped with HEPA filters, then the work is classified as Type 2 (intermediate precautions). If the power tools do not have HEPA filtered dust collecting devices, then the work is Type 3 (maximum precautions).

Vinyl sheet flooring with paper backing is a non-friable material, however, the actions of removing this type of material may cause the paper backing to become friable and wetting may not adequately control the spread of dust and fibres during removal operations by means of non-powered hand-held tools. As such, it may be prudent to not use Type 1 procedures for work on these materials. It is recommended that removal of this type of material should therefore be classified as a Type 2 or Type 3 operation depending on the tools used, and the amount of material to be removed.

Vermiculite insulation is a friable material. *DP 057* classifies removal of friable asbestos-containing materials as Type 3 (maximum precautions) operations.

Asbestos may also be present in materials which were not sampled during the course of the asbestos survey carried out by Arcadis, including, but not limited to gaskets in piping, internal components of boilers, components of electrical equipment (e.g. electric wiring insulation, non-metallic sheathed cable, electrical panel partitions, arc chutes, high-grade electrical paper, etc.), etc., and/or in locations that are presently inaccessible (e.g., in pipe chases, behind walls). Confirmatory testing of any such materials could be undertaken as the need arises (i.e., at the time of renovations, modifications or demolition) or the materials can be assumed to contain asbestos based on findings in adjacent areas.

If any materials which may contain asbestos and which were not tested during the course of the surveys are discovered during any construction/renovation activities, the work shall not proceed until such time as the required notifications have been made and an appropriate course of action is determined.

3.2 Lead

Thirteen (13) samples of the predominant paints observed throughout the building were collected by Arcadis during the course of the site investigations. The samples were submitted to EMSL Canada Inc. for analysis of lead content. The results of the analyses are presented in Table 3.2, the laboratory reports are provided in Appendix B and locations and sample numbers of paint samples collected and analyzed are shown on the floor plans provided in Appendix A.

The *Environmental Guideline for Waste Lead and Lead Paint* – GNWT April 2001 states that “Products that contain lead in excess of 600 parts per million (0.06% by weight) are considered hazardous waste and shall be managed in accordance with this guideline”

Lead was detected in excess of 600 parts per million in only 1 of the 13 paint samples. Lead was detected less than 600 parts per million in six of the 13 paint samples. Lead was not detected (less than the detection limits of 90, 100 and 150 parts per million) in 6 of the 13 paint samples.

In general, representative paint samples taken from building materials such as gypsum board, wooden building materials and concrete walls had lead less than 600 parts per million. Paint on the concrete floor in the basement had lead in excess of 600 parts per million.

All paint applications were observed to be generally in good condition. If paint (or other lead-containing coatings or materials) will be disturbed during the course of construction or demolition work, the measures and procedures outlined in the *GNWT Environmental Guideline for Waste Lead and Lead Paint (April 2001)* should be followed.

Lead may also be present in lead pipe, in the solder on the seals of bell joints of any cast iron drainpipe and in the solder on the sweated on joints between copper pipe and fittings.

Table 3.2: Summary of Results of Analyses of Paint Samples for Lead Content

Sample No.	Location	Description	Lead Content (mg/kg)
P-1	Room 7	Paint on drywall wall – white coloured	<90
P-2	Room 6	Paint on drywall wall – white coloured	**380**
P-3	Room 7	Paint on wood door jamb – white coloured	**370**
P-4	Room 5A	Paint on wood shelf – white coloured	**110**
P-5	Room 5	Paint on wood baseboard – white coloured	<100
P-6	Room 5	Paint on wood window casing – white coloured	<90
P-7	Room 8	Paint on wood frame on side light next to door – white coloured	<90
P-8	Room 8	Paint on metal entrance door – white coloured	<150
P-9	Room 10	Paint on concrete floor – grey coloured	**2,300**
P-10	Room 13	Paint on concrete wall – cream/grey coloured	<90
P-11	Room 13	Paint on plywood wall – cream coloured	**130**
P-12	Room 8	Paint on wood stair stringer – white/cream coloured	**150**
P-13	Room 4	Paint on drywall wall – white/cream coloured	**130**

NOTES:

< = less than.
mg/kg - milligrams lead per kilogram paint.
1 mg/kg - 1 part per million (ppm).

Lead paint management protocols would only be required should the concrete floor be removed from the structure as part of any future demolition work. The paint can remain in-situ until that time.

3.3 Mercury

During the course of our site inspections, fluorescent lights were observed in various locations in the interior of the building. Mercury should be assumed to be present as a gas in all fluorescent light tubes. Numbers and locations of fluorescent light tubes observed in the building are as follows:

- Room 2 – Four fluorescent light tubes;
- Room 10 – Eight fluorescent light tubes;
- Room 12 – Six fluorescent light tubes; and
- Room 13 – Two fluorescent light tubes;

One wall mounted mercury-containing thermostat was observed in Room 3.

If any fluorescent light tubes are removed, the light tubes should be recycled for mercury. At this time there is no requirement to remove the lights identified as containing mercury.

Proper procedures for removing mercury-containing equipment (thermostats for example, and any other mercury-containing equipment found to be present at the time of renovations) typically involve:

- removal of the mercury-containing equipment in a manner designed to prevent breakage;
- removal of the equipment over or in a containment device sufficient to collect and contain any mercury released in case of breakage;
- ensuring that a mercury clean-up system is readily available to immediately transfer any mercury resulting from spills or leaks from broken equipment and that any mercury resulting from spills or leaks is immediately transferred to an appropriate container;
- ensuring that the area in which equipment is removed is well ventilated;
- ensuring that employees removing equipment are thoroughly familiar with proper waste mercury handling and emergency procedures, including transfer of mercury from containment devices to appropriate containers;
- storing removed switches in closed, non-leaking containers that are in good condition; and
- packing removed switches in the container with packing materials adequate to prevent breakage during storage, handling and transportation.

Proper procedures for removing and handling mercury-containing fluorescent lamp tubes typically involve:

- ensuring that electrical power to light fixtures has been disconnected and locked out;
- taking all necessary precautions to ensure that fluorescent lamp tubes are removed in a manner that prevents breakage; and
- transporting fluorescent lamp tubes to a licensed processing location for separation and recovery of mercury.

3.4 Silica

Materials observed in the building which should be considered to contain silica included drywall, drywall joint compound, textured finishes and concrete.

Measures and procedures recommended for demolition activities, including dismantling and break up of concrete, masonry, etc. are as follows:

- workers exposed to silica should wear a half-mask particulate respirator with N, R-, or P-series filters and 95, 99 or 100% efficiency;
- clean up after each operation should be done to prevent dust containing silica from spreading;
- compressed air should not be used for removing dust from clothing;
- workers exposed to silica should be provided with or have access to washing facilities equipped with clean water, soap, and individual towels;

- silica dust on personal protective clothing and equipment should be removed by damp wiping or HEPA vacuuming;
- contaminated personal protective clothing and equipment should be handled with care to prevent disturbing the silica dust and the generation of airborne silica dust;
- washing facilities and laundering procedures must be suitable for handling silica-contaminated laundry; and
- warning signs should be posted in sufficient numbers to warn of the silica hazard. There should be a sign, at least, at each entrance to the work area. The signs should display the following information in large, clearly visible letters:
  - there is a silica dust hazard;
  - access to the work area is restricted to authorized persons;
  - respirators must be worn in the work area.

No silica abatement is required at this time save for work required to remove asbestos-containing materials that also contain silica. Silica protection measures will be required should future demolition take place.

3.5 PCBs

Fluorescent lights were observed in Rooms 2, 10, 12 and 13 during the course of our site inspections. All ballasts associated with florescent light fixtures in Rooms 2, 10 and 13 were accessed by Arcadis staff, and manufacturer's labels on all ballasts clearly identified that the ballasts do not contain PCBs. Of the three light ballasts accessed in Room 12, manufacturer's labels on the ballasts associated with the two ceiling-mounted light fixtures clearly identified that the ballasts do not contain PCBs. The manufacturer's label on the third ballast associated with the wall-mounted light fixture located on the north wall in Room 12 was inconclusive and the ballast may contain PCBs and will have to be examined by a licensed electrician prior to disposal or to confirm the presence of PCBs.

3.6 Ozone-depleting Substances and Halocarbons

No ODS or halocarbon-containing equipment was observed during the course of the investigation.

3.7 Man-Made Mineral Fibre

Glass fibre insulation was observed in the wall spaces of the exterior walls and the attic spaces in the building.

The procedures outlined in Section 2.7 of this report should be followed during handling of this insulation.

3.8 Mould

No suspect mould was observed was observed during the course of the investigation.

The inspection of mould was limited to visual observations of readily-accessible surfaces and did not include intrusive inspections of wall cavities. During renovations or demolition work, any mould-impacted materials uncovered/discovered should be remediated following the measures and procedures outlined in the *Canadian Construction Association Standard Construction Document CCA-82 2004 - Mould guidelines for the Canadian Construction Industry*.

3.9 Urea Formaldehyde Foam Insulation (UFFI)

UFFI was not observed in the building during the course of the investigations.

3.10 Radioactive Materials

During the course of our site inspections, one ceiling-mounted smoke detector was observed in Room 3 that may contain radioactive materials.

Standard smoke detectors do not require a radioactive license and can be disposed in a MOECC-licensed landfill.

3.11 Heating Oil

The building has an outdoor heating oil tank (~1,100 L capacity) with heating oil supplying fuel to an oil-fired furnace.

For the purposes of this program we have assumed that the heating oil will be either be recovered and transferred, by PWGSC, to one of their other facilities within Fort Simpson or the remediation contractor will recover the fuel for their own use. The tanks would be managed in a similar manner.

5 USE AND LIMITATIONS OF THIS HAZARDOUS MATERIALS SURVEY REPORT

This report, prepared for Public Works and Government Services Canada, does not provide certification or warranty, expressed or implied, that the investigation conducted by Arcadis identified all hazardous materials in the study area at the subject facility. The work undertaken by Arcadis was directed to provide information on the presence of hazardous materials in building construction materials based on visual inspection of readily-accessible areas in the designated study area of the subject buildings and on the results of laboratory analyses of a limited number of bulk samples of material for asbestos content and laboratory analysis of a limited number of paint samples for lead content. The survey did not include for identification of asbestos in equipment (including electrical equipment and wiring), nor material outside of the building (e.g., asphaltic pavement).

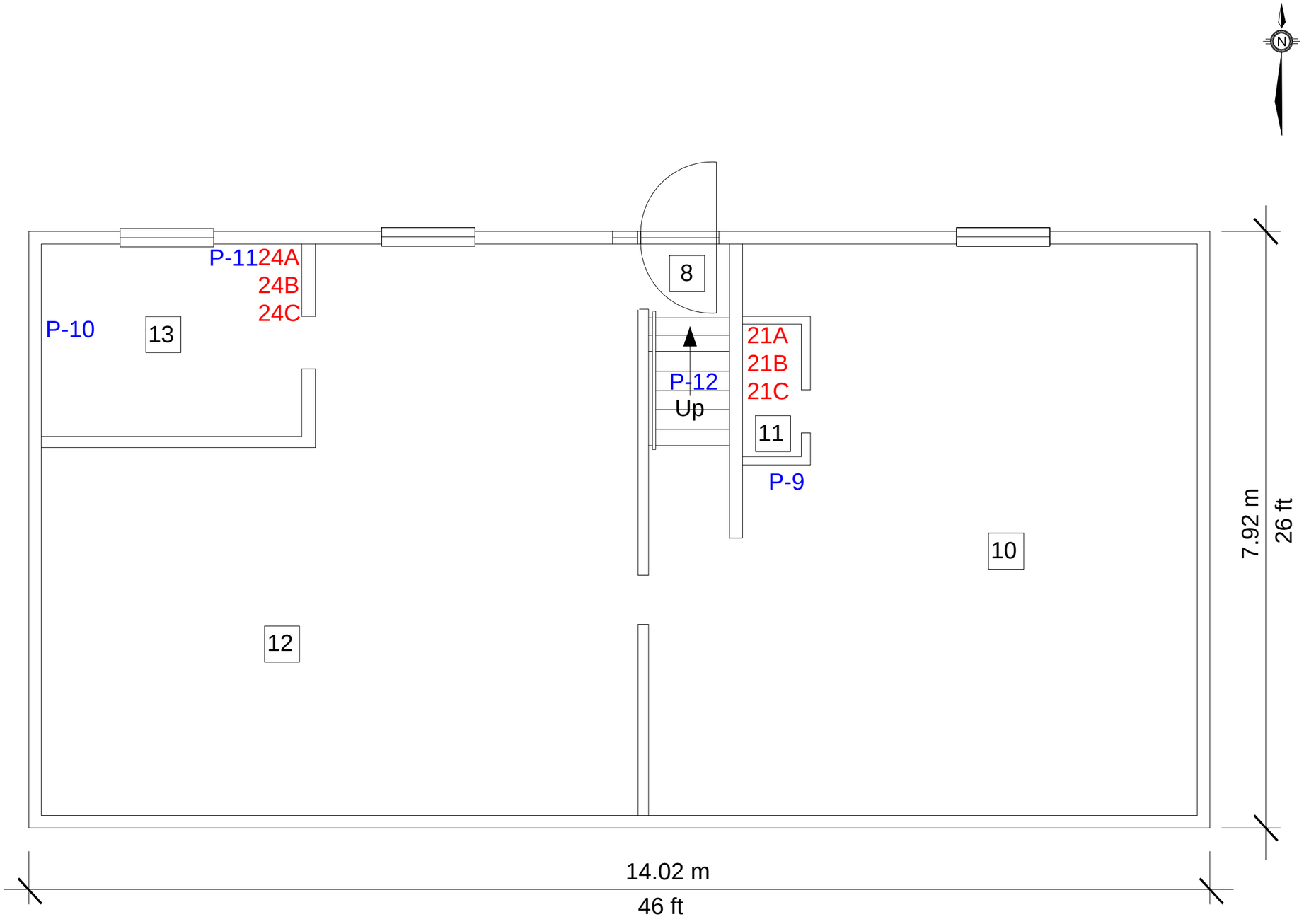
The material in this report reflects Arcadis' best judgment in light of the information available at the time of the investigation, which was performed on 6, 7 and 8 July, 2016.

This report is not intended to be used as a scope of work or technical specification for remediation of hazardous materials.

This report was prepared by Arcadis for Public Works and Government Services Canada. Any use which any other party makes of the report, or reliance on, or decisions to be based on it, is the responsibility of such parties.

APPENDIX A

Floor Plans



LEGEND:

10	FUNCTIONAL SPACE
1A	LOCATION AND SAMPLE NUMBER OF ASBESTOS BULK SAMPLE
P-1	LOCATION AND SAMPLE NUMBER OF PAINT SAMPLE

0 1 2 metres

SCALE 1:50

ARCADIS

PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

HAZARDOUS MATERIALS SURVEY

LOCATIONS OF BULK SAMPLES

RESIDENTIAL UNIT

9609, 102 STREET, FORT SIMPSON, NWT

BASEMENT PLAN

Drawn By: P.A.L.	Approved By: J.D.	Project No: 702541-000
Date: AUG. 2016	Scale: AS SHOWN	Drawing No: 702541-000-1

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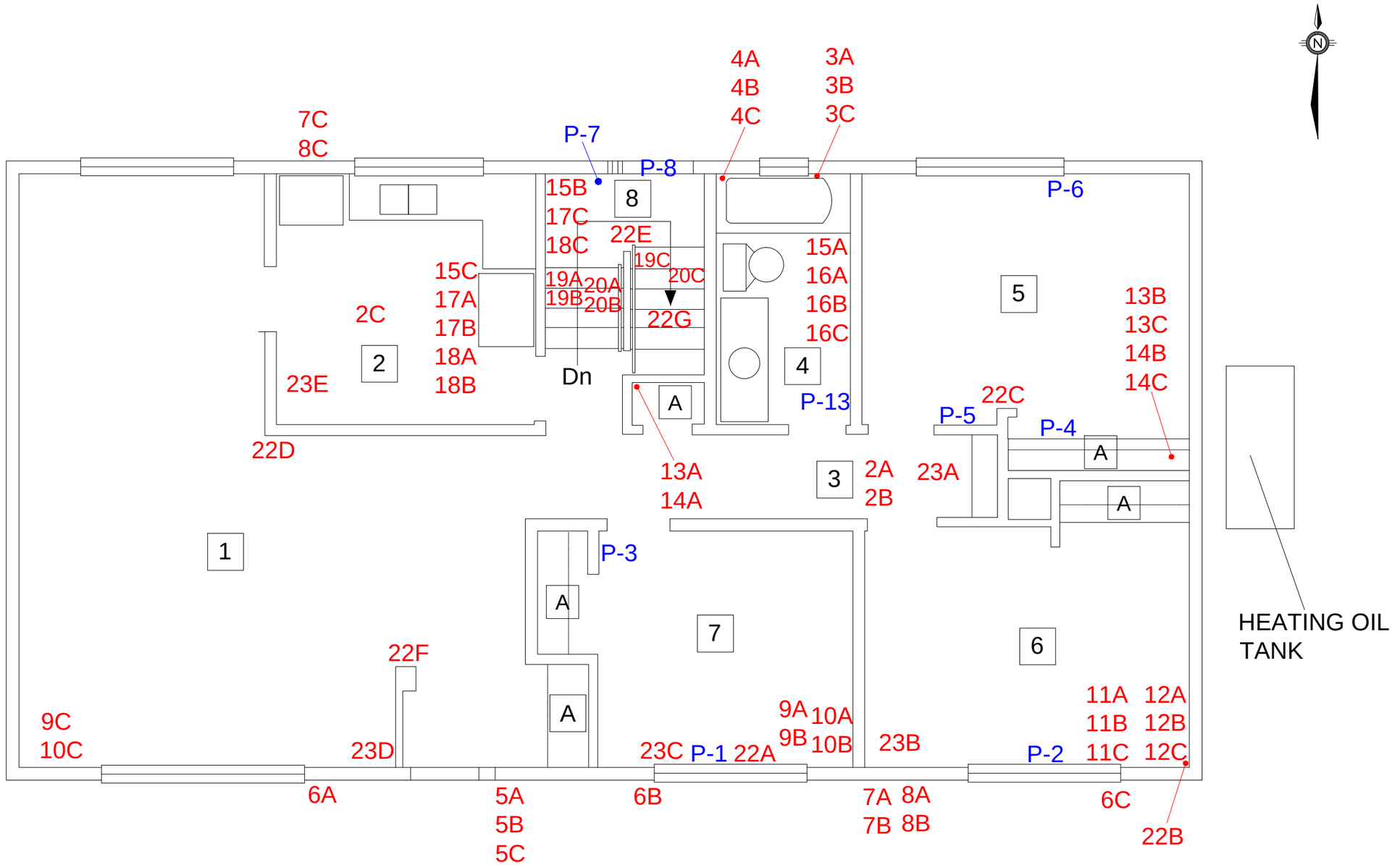

LEGEND:

10	FUNCTIONAL SPACE
1A	LOCATION AND SAMPLE NUMBER OF ASBESTOS BULK SAMPLE
P-1	LOCATION AND SAMPLE NUMBER OF PAINT SAMPLE

0 1 2 metres

SCALE 1:50

ARCADIS

PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

HAZARDOUS MATERIALS SURVEY

LOCATIONS OF BULK SAMPLES

RESIDENTIAL UNIT

9609, 102 STREET, FORT SIMPSON, NWT

FIRST FLOOR PLAN

Drawn By: P.A.L.	Approved By: J.D.	Project No: 702541-000	
Date: AUG. 2016	Scale: AS SHOWN	Drawing No: 702541-000-2	

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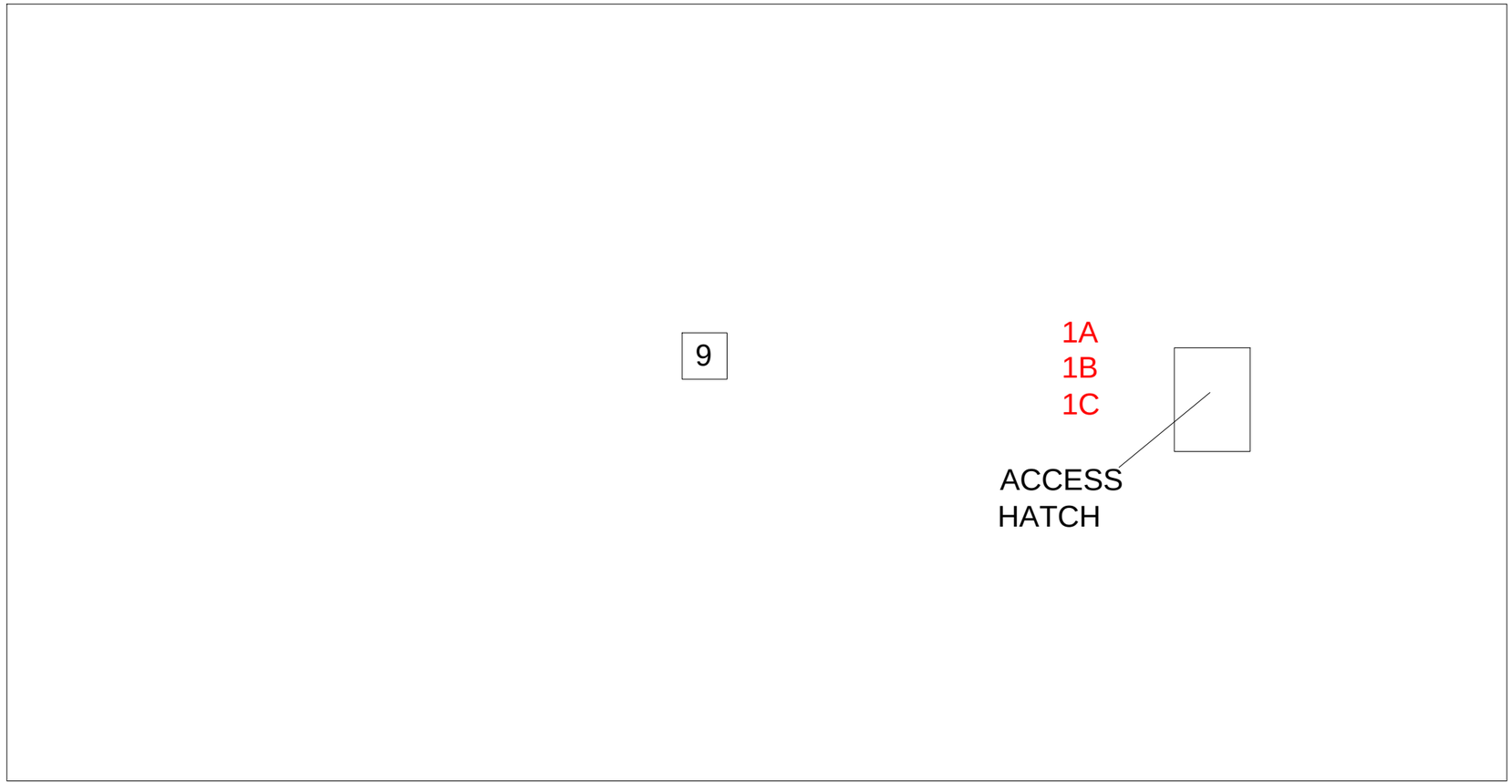

LEGEND:

2 FUNCTIONAL SPACE

1A LOCATION AND SAMPLE NUMBER OF ASBESTOS BULK SAMPLE

0 1 2 metres

SCALE 1:50

ARCADIS

PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

HAZARDOUS MATERIALS SURVEY

LOCATIONS OF BULK SAMPLES

RESIDENTIAL UNIT

9609, 102 STREET, FORT SIMPSON, NWT

ATTIC

Drawn By: P.A.L.	Approved By: J.D.	Project No: 702541-000
Date: AUG. 2016	Scale: AS SHOWN	Drawing No: 702541-000-3

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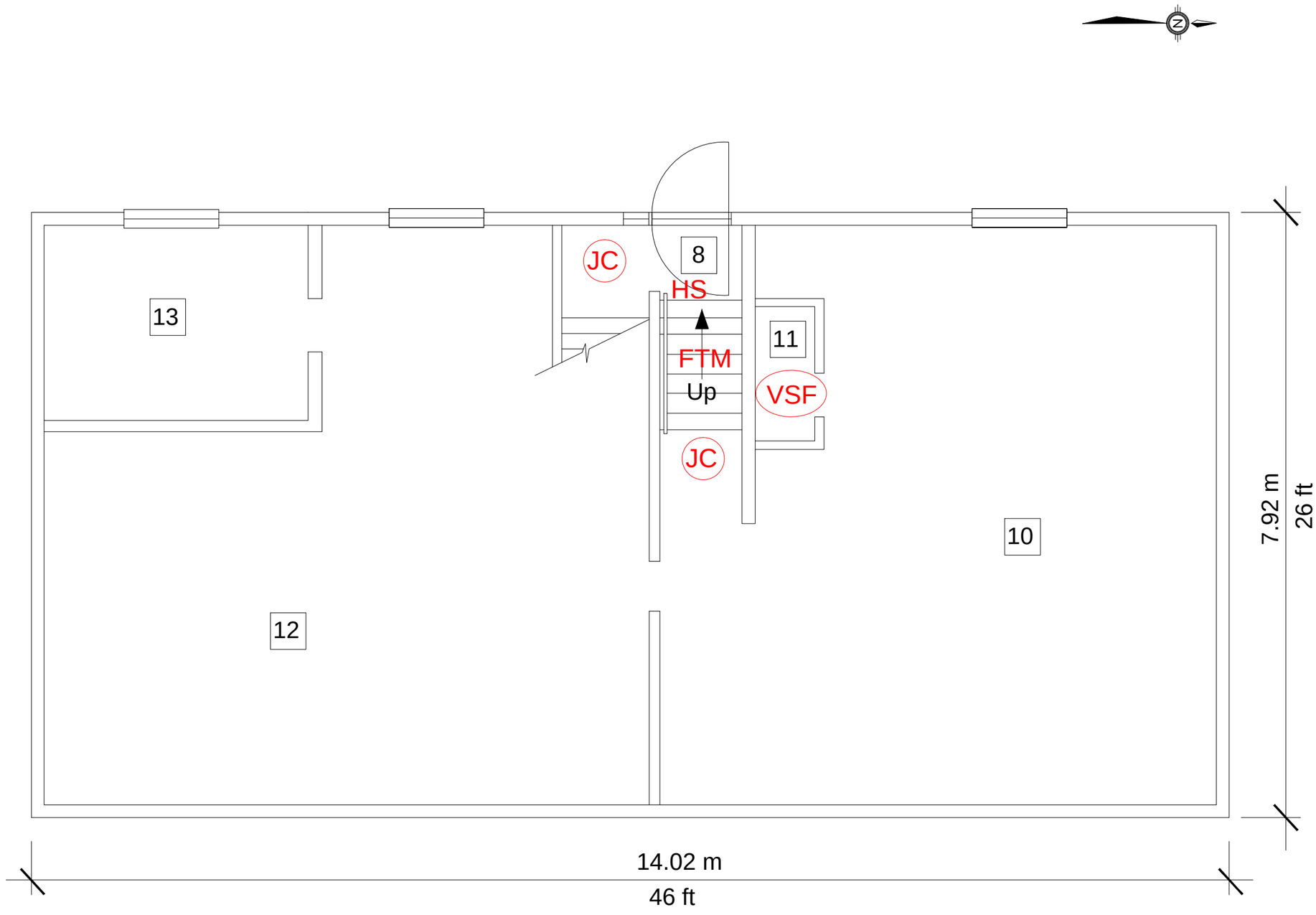


LEGEND:

8	FUNCTIONAL SPACE
○	THROUGHOUT FUNCTIONAL SPACE
JC	ASBESTOS DRYWALL COMPOUND
FTM	ASBESTOS VINYL FLOOR TILES AND ASBESTOS MASTIC
VSF	ASBESTOS VINYL SHEET FLOORING
HS	ASBESTOS HEAT SHEILD ON LIGHT FIXTURE

0 1 2 metres

SCALE 1:50

ARCADIS

PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

HAZARDOUS MATERIALS SURVEY

LOCATIONS OF ASBESTOS-CONTAINING MATERIALS

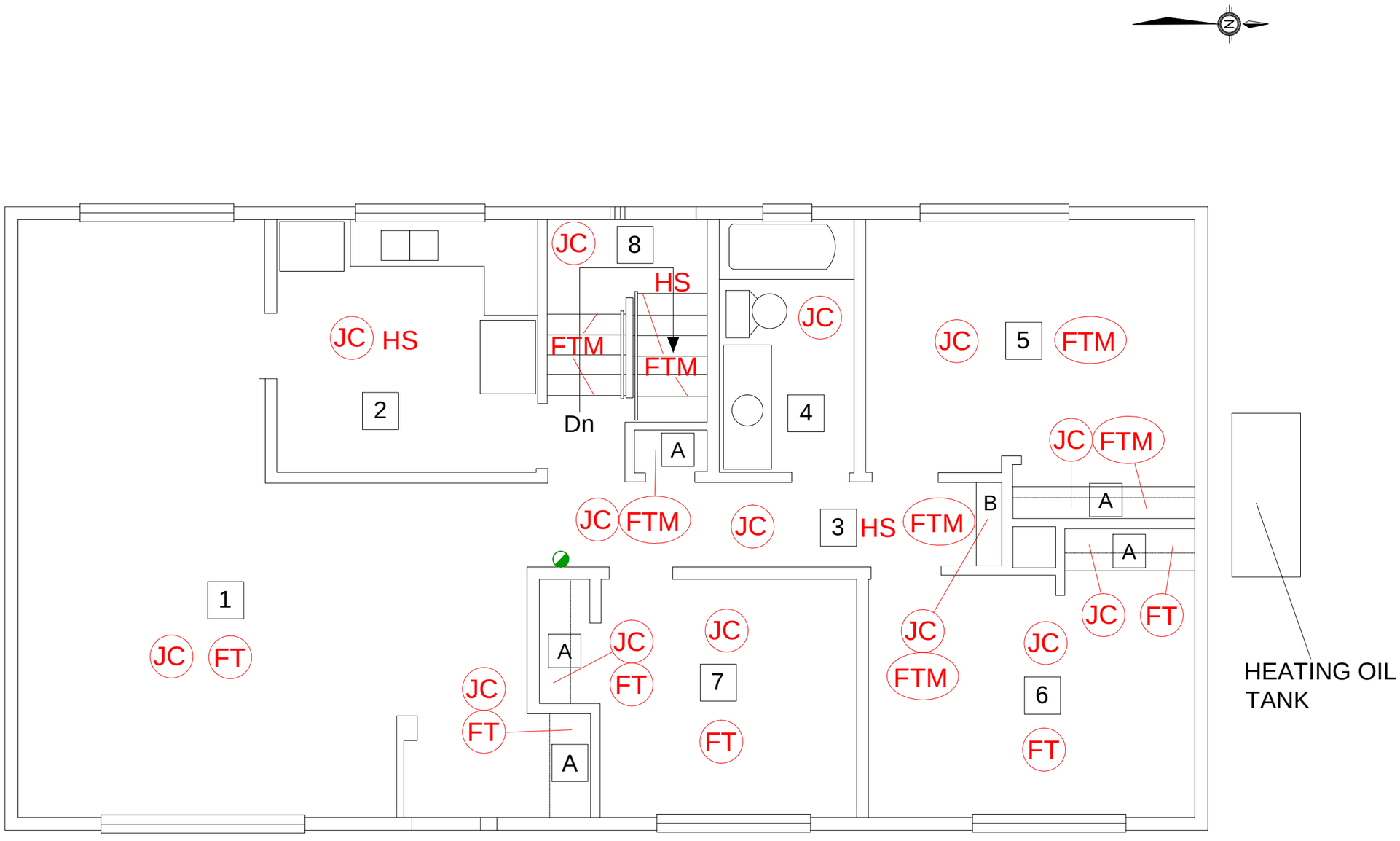
RESIDENTIAL UNIT

9609, 102 STREET, FORT SIMPSON, NWT

BASEMENT PLAN

Drawn By: P.A.L.	Approved By: J.D.	Project No: 702541-000	
Date: AUG. 2016	Scale: AS SHOWN	Drawing No: 702541-000-1	

Z:\702000 Series\702541-000\702541-000 9609 102 ST ACM.dwg LAYOUT: BASEMENT SAVED: 8/4/2016 12:55 PM BY: PAUL LANDRY PLOTTED: 8/4/2016 1:48 PM



LEGEND:

2	FUNCTIONAL SPACE
○	THROUGHOUT FUNCTIONAL SPACE
JC	ASBESTOS DRYWALL COMPOUND
FT	ASBESTOS VINYL FLOOR TILES
FTM	ASBESTOS VINYL FLOOR TILES AND ASBESTOS MASTIC
VSF	ASBESTOS VINYL SHEET FLOORING
HS	ASBESTOS HEAT SHEILD ON LIGHT FIXTURE
◔	MERCURY- CONTAINING THERMOSTAT

0 1 2 metres

SCALE 1:50

ARCADIS

PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

HAZARDOUS MATERIALS SURVEY

LOCATIONS OF ASBESTOS-CONTAINING MATERIALS

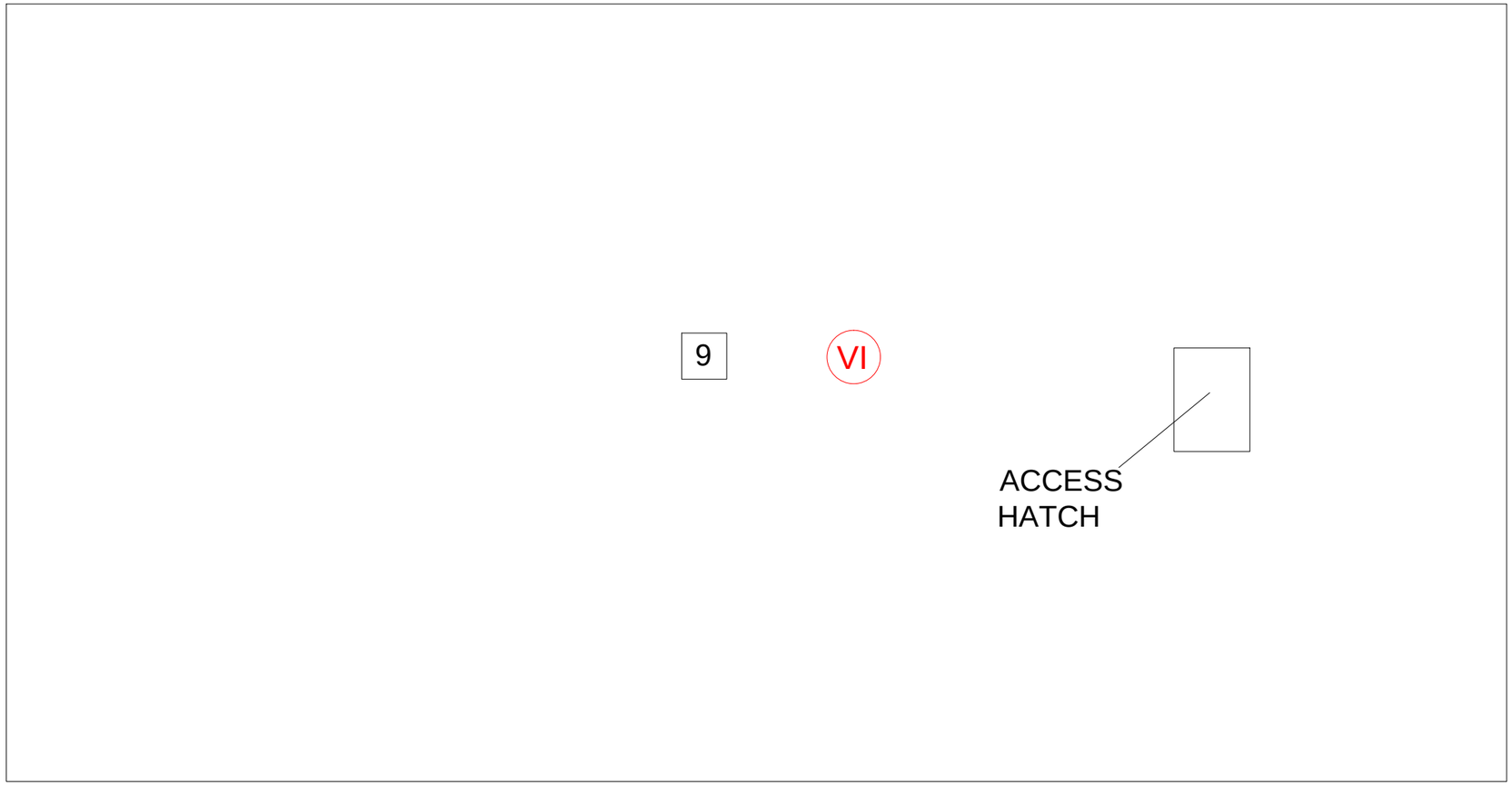
RESIDENTIAL UNIT

9609, 102 STREET, FORT SIMPSON, NWT

FIRST FLOOR PLAN

Drawn By: P.A.L.	Approved By: J.D.	Project No: 702541-000	
Date: AUG. 2016	Scale: AS SHOWN	Drawing No: 702541-000-2	

Z:\702000 Series\702541-000\702541-000 9609 102 ST ACM.dwg LAYOUT: FIRST FL SAVED: 8/4/2016 12:55 PM PLOTTED: 8/4/2016 1:49 PM BY: PAUL LANDRY



LEGEND:

9	FUNCTIONAL SPACE
○	THROUGHOUT FUNCTIONAL SPACE
VI	ASBESTOS VERMICULITE ATTIC INSULATION

0 1 2 metres

SCALE 1:50

ARCADIS

PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

HAZARDOUS MATERIALS SURVEY

LOCATIONS OF ASBESTOS-CONTAINING MATERIALS

RESIDENTIAL UNIT

9609, 102 STREET, FORT SIMPSON, NWT

ATTIC

Drawn By: P.A.L.	Approved By: J.D.	Project No: 702541-000
Date: AUG. 2016	Scale: AS SHOWN	Drawing No: 702541-000-3

Z:\702000 Series\702541-000\702541-000 9609 102 ST ACM.dwg LAYOUT: ATTIC SAVED: 8/4/2016 12:55 PM PLOTTED: 8/4/2016 1:50 PM BY: PAUL LANDRY

APPENDIX B

Laboratory Reports

EMSL Canada Inc.

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

EMSL Canada Order 551607989
Customer ID: 55DCSL97
Customer PO: 702541
Project ID:

Attn: Jean Daigle
ARCADIS Canada Inc.
121 Granton Drive
Unit 12
Richmond Hill, ON L4B 3N4

Phone: (905) 882-5984
Fax: (905) 882-8962
Collected:
Received: 7/19/2016
Analyzed: 7/29/2016

Proj: FORT SIMPSON BUILDING 9609/702541

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

Client Sample ID: 2-A ***Lab Sample ID:*** **551607989-0004**

Sample Description: ROOM 3/HEAT SHIELD ON LIGHT FIXTURE- GREY COLOURED WITH FOIL LAYER

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/25/2016	Gray	0%	70%	**30% Chrysotile**	

Client Sample ID: 2-B ***Lab Sample ID:*** **551607989-0005**

Sample Description: ROOM 3/HEAT SHIELD ON LIGHT FIXTURE- GREY COLOURED WITH FOIL LAYER

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/25/2016			Positive Stop (Not Analyzed)		

Client Sample ID: 2-C ***Lab Sample ID:*** **551607989-0006**

Sample Description: ROOM 2/HEAT SHIELD ON LIGHT FIXTURE- GREY COLOURED WITH FOIL LAYER

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/25/2016			Positive Stop (Not Analyzed)		

Client Sample ID: 3-A ***Lab Sample ID:*** **551607989-0007**

Sample Description: ROOM 4/MASTIC ON VINYL TUB SURROUND- BROWN COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	7/26/2016	Yellow	0.0%	100%	None Detected	
TEM Grav. Reduction	7/26/2016	Yellow	0.0%	100%	None Detected	

Client Sample ID: 3-B ***Lab Sample ID:*** **551607989-0008**

Sample Description: ROOM 4/MASTIC ON VINYL TUB SURROUND- BROWN COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/25/2016	Tan	0%	100%	None Detected	

Client Sample ID: 3-C ***Lab Sample ID:*** **551607989-0009**

Sample Description: ROOM 4/MASTIC ON VINYL TUB SURROUND- BROWN COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/25/2016	Tan	0%	100%	None Detected	

Client Sample ID: 4-A ***Lab Sample ID:*** **551607989-0010**

Sample Description: ROOM 4/CAULKING ON BATHTUB AND HARDBOARD TUB SURROUND- WHITE COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	7/26/2016	White	0.0%	100%	None Detected	
TEM Grav. Reduction	7/26/2016	White	0.0%	100%	None Detected	

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

EMSL Canada Order 551607989
Customer ID: 55DCSL97
Customer PO: 702541
Project ID:

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

Client Sample ID: 4-B **Lab Sample ID:** **551607989-0011**

Sample Description: ROOM 4/CAULKING ON BATHTUB AND HARDBOARD TUB SURROUND- WHITE COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/25/2016	White	0%	100%	None Detected	

Client Sample ID: 4-C **Lab Sample ID:** **551607989-0012**

Sample Description: ROOM 4/CAULKING ON BATHTUB AND HARDBOARD TUB SURROUND- WHITE COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/25/2016	White	0%	100%	None Detected	

Client Sample ID: 5-A **Lab Sample ID:** **551607989-0013**

Sample Description: EXTERIOR EAST/BLACK PAPER UNDER VINYL SIDING ON PLYWOOD SHEATHING

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	7/26/2016	Black	0.0%	100%	None Detected	
TEM Grav. Reduction	7/26/2016	Black	0.0%	100%	None Detected	

Client Sample ID: 5-B **Lab Sample ID:** **551607989-0014**

Sample Description: EXTERIOR EAST/BLACK PAPER UNDER VINYL SIDING ON PLYWOOD SHEATHING

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/25/2016	Black	60%	40%	None Detected	

Client Sample ID: 5-C **Lab Sample ID:** **551607989-0015**

Sample Description: EXTERIOR EAST/BLACK PAPER UNDER VINYL SIDING ON PLYWOOD SHEATHING

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/25/2016	Black	60%	40%	None Detected	

Client Sample ID: 6-A **Lab Sample ID:** **551607989-0016**

Sample Description: EXTERIOR ROOM 1/CAULKING ON EXTERIOR WINDOW FRAME- WHITE COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	7/26/2016	White	0.0%	100%	None Detected	
TEM Grav. Reduction	7/26/2016	White	0.0%	100%	None Detected	

Client Sample ID: 6-B **Lab Sample ID:** **551607989-0017**

Sample Description: EXTERIOR ROOM 7/CAULKING ON EXTERIOR WINDOW FRAME- WHITE COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/25/2016	White	0%	100%	None Detected	

Client Sample ID: 6-C **Lab Sample ID:** **551607989-0018**

Sample Description: EXTERIOR ROOM 6/CAULKING ON EXTERIOR WINDOW FRAME- WHITE COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/25/2016	White	0%	100%	None Detected	

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

EMSL Canada Order 551607989
Customer ID: 55DCSL97
Customer PO: 702541
Project ID:

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

Client Sample ID: 7-A ***Lab Sample ID:*** **551607989-0019**
Sample Description: ROOF EAST/ASPHALT ROOF SHINGLE- GREEN COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	7/26/2016	Black	0.0%	100%	None Detected	
TEM Grav. Reduction	7/26/2016	Black	0.0%	100%	None Detected	

Client Sample ID: 7-B ***Lab Sample ID:*** **551607989-0020**
Sample Description: ROOF EAST/ASPHALT ROOF SHINGLE- GREEN COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	7/25/2016	Black	15%	85%	None Detected	

Client Sample ID: 7-C ***Lab Sample ID:*** **551607989-0021**
Sample Description: ROOF WEST/ASPHALT ROOF SHINGLE- GREEN COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	7/25/2016	Black	15%	85%	None Detected	

Client Sample ID: 8-A ***Lab Sample ID:*** **551607989-0022**
Sample Description: ROOF EAST/BLACK ROOFING PAPER

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	7/26/2016	Black	0.0%	100%	None Detected	
TEM Grav. Reduction	7/26/2016	Black	0.0%	100%	None Detected	

Client Sample ID: 8-B ***Lab Sample ID:*** **551607989-0023**
Sample Description: ROOF EAST/BLACK ROOFING PAPER

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	7/25/2016	Black	60%	40%	None Detected	

Client Sample ID: 8-C ***Lab Sample ID:*** **551607989-0024**
Sample Description: ROOF WEST/BLACK ROOFING PAPER

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	7/25/2016	Black	60%	40%	None Detected	

Client Sample ID: 9-A ***Lab Sample ID:*** **551607989-0025**
Sample Description: ROOM 7/12" X 12" VINYL FLOOR TILE- BEIGE WITH DARK BROWN STREAKS

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	7/26/2016	Beige	0.0%	99.4%	**0.57% Chrysotile**	
TEM Grav. Reduction	7/29/2016	Beige	0.0%	91.4%	**8.6% Chrysotile**	

Client Sample ID: 9-B ***Lab Sample ID:*** **551607989-0026**
Sample Description: ROOM 7/12" X 12" VINYL FLOOR TILE- BEIGE WITH DARK BROWN STREAKS

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	7/26/2016				Positive Stop (Not Analyzed)	

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EMSL Canada Order 551607989
Customer ID: 55DCSL97
Customer PO: 702541
Project ID:

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

Client Sample ID: 9-C **Lab Sample ID:** **551607989-0027**
Sample Description: ROOM 1/12" X 12" VINYL FLOOR TILE- BEIGE WITH DARK BROWN STREAKS

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/26/2016			Positive Stop (Not Analyzed)		

Client Sample ID: 10-A **Lab Sample ID:** **551607989-0028**
Sample Description: ROOM 7/MASTIC ON VINYL FLOOR TILE SAMPLE NO.9- BLACK COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	7/26/2016	Black	0.0%	100%	None Detected	
TEM Grav. Reduction	7/26/2016	Black	0.0%	100%	**<0.1% Chrysotile**	

Client Sample ID: 10-B **Lab Sample ID:** **551607989-0029**
Sample Description: ROOM 7/MASTIC ON VINYL FLOOR TILE SAMPLE NO.9- BLACK COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/25/2016	Black	0%	100%	None Detected	

Client Sample ID: 10-C **Lab Sample ID:** **551607989-0030**
Sample Description: ROOM 1/MASTIC ON VINYL FLOOR TILE SAMPLE NO.9- BLACK COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/25/2016	Black	0%	100%	None Detected	

Client Sample ID: 11-A **Lab Sample ID:** **551607989-0031**
Sample Description: ROOM 6/12" X 12" VINYL FLOOR TILE- GREY AND BLUE COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	7/26/2016	Blue	0.0%	98.9%	**1.1% Chrysotile**	
TEM Grav. Reduction	7/26/2016			Positive Stop (Not Analyzed)		

Client Sample ID: 11-B **Lab Sample ID:** **551607989-0032**
Sample Description: ROOM 6/12" X 12" VINYL FLOOR TILE- BEIGE WITH DARK BROWN STREAKS

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/26/2016			Positive Stop (Not Analyzed)		

Client Sample ID: 11-C **Lab Sample ID:** **551607989-0033**
Sample Description: ROOM 6/12" X 12" VINYL FLOOR TILE- BEIGE WITH DARK BROWN STREAKS

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/26/2016			Positive Stop (Not Analyzed)		

Client Sample ID: 12-A **Lab Sample ID:** **551607989-0034**
Sample Description: ROOM 6/MASTIC ON VINYL FLOOR TILE SAMPLE NO.11- BLACK COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	7/26/2016	Black	0.0%	100%	None Detected	
TEM Grav. Reduction	7/26/2016	Black	0.0%	100%	None Detected	

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EMSL Canada Order 551607989
Customer ID: 55DCSL97
Customer PO: 702541
Project ID:

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

Client Sample ID: 12-B **Lab Sample ID:** **551607989-0035**
Sample Description: ROOM 6/MASTIC ON VINYL FLOOR TILE SAMPLE NO.11- BLACK COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/25/2016	Black	0%	100%	None Detected	

Client Sample ID: 12-C **Lab Sample ID:** **551607989-0036**
Sample Description: ROOM 6/MASTIC ON VINYL FLOOR TILE SAMPLE NO.11- BLACK COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/25/2016	Black	0%	100%	None Detected	

Client Sample ID: 13-A **Lab Sample ID:** **551607989-0037**
Sample Description: ROOM 3A/12" X 12" VINYL FLOOR TILE- BEIGE WITH LIGHT BROWN STREAKS

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	7/26/2016	Beige	0.0%	98.9%	**1.1% Chrysotile**	
TEM Grav. Reduction	7/26/2016				Positive Stop (Not Analyzed)	

Client Sample ID: 13-B **Lab Sample ID:** **551607989-0038**
Sample Description: ROOM 5A/12" X 12" VINYL FLOOR TILE- BEIGE WITH LIGHT BROWN STREAKS

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/26/2016				Positive Stop (Not Analyzed)	

Client Sample ID: 13-C **Lab Sample ID:** **551607989-0039**
Sample Description: ROOM 5A/12" X 12" VINYL FLOOR TILE- BEIGE WITH LIGHT BROWN STREAKS

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/26/2016				Positive Stop (Not Analyzed)	

Client Sample ID: 14-A **Lab Sample ID:** **551607989-0040**
Sample Description: ROOM 3A/MASTIC ON VINYL FLOOR TILE SAMPLE NO.13- BLACK COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	7/26/2016	Black	0.0%	99.5%	**0.54% Chrysotile**	
TEM Grav. Reduction	7/29/2016	Black	0.0%	89.1%	**10.9% Chrysotile**	

Client Sample ID: 14-B **Lab Sample ID:** **551607989-0041**
Sample Description: ROOM 5A/MASTIC ON VINYL FLOOR TILE SAMPLE NO.13- BLACK COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/26/2016				Positive Stop (Not Analyzed)	

Client Sample ID: 14-C **Lab Sample ID:** **551607989-0042**
Sample Description: ROOM 5A/MASTIC ON VINYL FLOOR TILE SAMPLE NO.13- BLACK COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/26/2016				Positive Stop (Not Analyzed)	

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EMSL Canada Order 551607989
Customer ID: 55DCSL97
Customer PO: 702541
Project ID:

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

Client Sample ID: 15-A **Lab Sample ID:** **551607989-0043**

Sample Description: ROOM 4/VINYL SHEET FLOORING- GREY COLOURED SLATE STYLE W/ 9" SQUARE PATTERN W/ GREY COLOURED MASTIC- COMPOSITE OF VINYL, PAPER & MAS

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	7/26/2016	Brown	0.0%	100%	None Detected	
TEM Grav. Reduction	7/26/2016	Brown	0.0%	100%	None Detected	

Client Sample ID: 15-B **Lab Sample ID:** **551607989-0044**

Sample Description: ROOM 8/VINYL SHEET FLOORING- GREY COLOURED SLATE STYLE W/ 9" SQUARE PATTERN W/ GREY COLOURED MASTIC- COMPOSITE OF VINYL, PAPER & MAS

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/25/2016	Gray	15%	85%	None Detected	

Client Sample ID: 15-C **Lab Sample ID:** **551607989-0045**

Sample Description: ROOM 2/VINYL SHEET FLOORING- GREY COLOURED SLATE STYLE W/ 9" SQUARE PATTERN W/ GREY COLOURED MASTIC- COMPOSITE OF VINYL, PAPER & MAS

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/25/2016	Gray	15%	85%	None Detected	

Client Sample ID: 16-A **Lab Sample ID:** **551607989-0046**

Sample Description: ROOM 4/REMNANT PAPER & MASTIC ON SUB FLOOR- GREEN COLOURED PAPER & YELLOW COLOURED MASTIC- COMPOSITE SAMPLE OF PAPER & MASTIC

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	7/26/2016	Brown	0.0%	100%	None Detected	
TEM Grav. Reduction	7/26/2016	Brown	0.0%	100%	None Detected	

Client Sample ID: 16-B **Lab Sample ID:** **551607989-0047**

Sample Description: ROOM 4/REMNANT PAPER & MASTIC ON SUB FLOOR- GREEN COLOURED PAPER & YELLOW COLOURED MASTIC- COMPOSITE SAMPLE OF PAPER & MASTIC

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/25/2016	Gray	90%	10%	None Detected	

Client Sample ID: 16-C **Lab Sample ID:** **551607989-0048**

Sample Description: ROOM 4/REMNANT PAPER & MASTIC ON SUB FLOOR- GREEN COLOURED PAPER & YELLOW COLOURED MASTIC- COMPOSITE SAMPLE OF PAPER & MASTIC

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/25/2016	Gray	90%	10%	None Detected	

Client Sample ID: 17-A **Lab Sample ID:** **551607989-0049**

Sample Description: ROOM 2/VINYL FLOORING W/ BLACK PAPER BACKING- YELLOW COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	7/26/2016	Gray	1.4%	98.6%	None Detected	
TEM Grav. Reduction	7/26/2016	Gray	0.0%	100%	None Detected	

Client Sample ID: 17-B **Lab Sample ID:** **551607989-0050**

Sample Description: ROOM 2/VINYL FLOORING W/ BLACK PAPER BACKING- YELLOW COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/26/2016	Gray	45%	55%	None Detected	

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EMSL Canada Order 551607989
Customer ID: 55DCSL97
Customer PO: 702541
Project ID:

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

Client Sample ID: 17-C **Lab Sample ID:** **551607989-0051**
Sample Description: ROOM 8/VINYL FLOORING W/ BLACK PAPER BACKING- YELLOW COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/26/2016	Gray	45%	55%	None Detected	

Client Sample ID: 18-A **Lab Sample ID:** **551607989-0052**
Sample Description: ROOM 2/MASTIC ON VINYL FLOORING SAMPLE NO.17- BROWN COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	7/26/2016	Red/Black	0.0%	100%	None Detected	
TEM Grav. Reduction	7/26/2016	Red/Black	0.0%	100%	None Detected	

Client Sample ID: 18-B **Lab Sample ID:** **551607989-0053**
Sample Description: ROOM 2/MASTIC ON VINYL FLOORING SAMPLE NO.17- BROWN COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/26/2016	Black	0%	100%	None Detected	

Client Sample ID: 18-C **Lab Sample ID:** **551607989-0054**
Sample Description: ROOM 8/MASTIC ON VINYL FLOORING SAMPLE NO.17- BROWN COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/26/2016	Black	0%	100%	None Detected	

Client Sample ID: 19-A **Lab Sample ID:** **551607989-0055**
Sample Description: ROOM 8/VINYL FLOOR TILE- GREY COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	7/26/2016	Gray	0.0%	99.1%	**0.92% Chrysotile**	
TEM Grav. Reduction	7/29/2016	Gray	0.0%	93.1%	**6.9% Chrysotile**	

Client Sample ID: 19-B **Lab Sample ID:** **551607989-0056**
Sample Description: ROOM 8/VINYL FLOOR TILE- GREY COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/26/2016				Positive Stop (Not Analyzed)	

Client Sample ID: 19-C **Lab Sample ID:** **551607989-0057**
Sample Description: ROOM 8/VINYL FLOOR TILE- GREY COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/26/2016				Positive Stop (Not Analyzed)	

Client Sample ID: 20-A **Lab Sample ID:** **551607989-0058**
Sample Description: ROOM 8/MASTIC ON VINYL FLOOR TILE SAMPLE NO.19- BROWN COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	7/26/2016	Brown	0.0%	99.0%	**0.97% Chrysotile**	
TEM Grav. Reduction	7/29/2016	Brown	0.0%	95.1%	**4.9% Chrysotile**	

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EMSL Canada Order 551607989
Customer ID: 55DCSL97
Customer PO: 702541
Project ID:

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

Client Sample ID: 20-B **Lab Sample ID:** **551607989-0059**
Sample Description: ROOM 8/MASTIC ON VINYL FLOOR TILE SAMPLE NO.19- BROWN COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/26/2016			Positive Stop (Not Analyzed)		

Client Sample ID: 20-C **Lab Sample ID:** **551607989-0060**
Sample Description: ROOM 8/MASTIC ON VINYL FLOOR TILE SAMPLE NO.19- BROWN COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/26/2016			Positive Stop (Not Analyzed)		

Client Sample ID: 21-A **Lab Sample ID:** **551607989-0061**
Sample Description: ROOM 11/VINYL SHEET FLOORING- YELLOW COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	7/26/2016	Beige	0.0%	77.2%	**22.8% Chrysotile**	
TEM Grav. Reduction	7/26/2016			Positive Stop (Not Analyzed)		

Client Sample ID: 21-B **Lab Sample ID:** **551607989-0062**
Sample Description: ROOM 11/VINYL SHEET FLOORING- YELLOW COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/26/2016			Positive Stop (Not Analyzed)		

Client Sample ID: 21-C **Lab Sample ID:** **551607989-0063**
Sample Description: ROOM 11/VINYL SHEET FLOORING- YELLOW COLOURED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/26/2016			Positive Stop (Not Analyzed)		

Client Sample ID: 22-A **Lab Sample ID:** **551607989-0064**
Sample Description: ROOM 7/JOINT COMPOUND ON DRYWALL WALL

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	7/26/2016	White	0.0%	100%	**<0.25% Chrysotile**	

Client Sample ID: 22-B **Lab Sample ID:** **551607989-0065**
Sample Description: ROOM 6/JOINT COMPOUND ON DRYWALL WALL

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	7/26/2016	White/Yellow	0.0%	99.6%	**0.43% Chrysotile**	

Client Sample ID: 22-C **Lab Sample ID:** **551607989-0066**
Sample Description: ROOM 5/JOINT COMPOUND ON DRYWALL WALL

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	7/26/2016	Yellow	0.0%	97.8%	**2.2% Chrysotile**	

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Customer ID: 55DCSL97
Customer PO: 702541
Project ID:

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

Client Sample ID: 22-D **Lab Sample ID:** **551607989-0067**
Sample Description: ROOM 1/JOINT COMPOUND ON DRYWALL WALL

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	7/26/2016				Positive Stop (Not Analyzed)	

Client Sample ID: 22-E **Lab Sample ID:** **551607989-0068**
Sample Description: ROOM 8/JOINT COMPOUND ON DRYWALL WALL

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	7/26/2016				Positive Stop (Not Analyzed)	

Client Sample ID: 22-F **Lab Sample ID:** **551607989-0069**
Sample Description: ROOM 1/JOINT COMPOUND ON DRYWALL WALL

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	7/26/2016				Positive Stop (Not Analyzed)	

Client Sample ID: 22-G **Lab Sample ID:** **551607989-0070**
Sample Description: ROOM 8/JOINT COMPOUND ON DRYWALL CEILING

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	7/26/2016				Positive Stop (Not Analyzed)	

Client Sample ID: 23-A **Lab Sample ID:** **551607989-0071**
Sample Description: ROOM 3/TEXTURED FINISH ON DRYWALL CEILING

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	7/26/2016	White	0.0%	99.1%	**0.86% Chrysotile**	

Client Sample ID: 23-B **Lab Sample ID:** **551607989-0072**
Sample Description: ROOM 6/TEXTURED FINISH ON DRYWALL CEILING

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	7/29/2016	Yellow	0.0%	99.1%	**0.89% Chrysotile**	

Client Sample ID: 23-C **Lab Sample ID:** **551607989-0073**
Sample Description: ROOM 7/TEXTURED FINISH ON DRYWALL CEILING

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	7/29/2016	White/Yellow	0.0%	99.6%	**0.44% Chrysotile**	

Client Sample ID: 23-D **Lab Sample ID:** **551607989-0074**
Sample Description: ROOM 1/TEXTURED FINISH ON DRYWALL CEILING

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	7/29/2016	White/Yellow	0.0%	99.6%	**0.41% Chrysotile**	

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EMSL Canada Order 551607989
Customer ID: 55DCSL97
Customer PO: 702541
Project ID:

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

Client Sample ID: 23-E **Lab Sample ID:** **551607989-0075**

Sample Description: ROOM 2/TEXTURED FINISH ON DRYWALL CEILING

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	7/29/2016	White/Yellow	0.0%	100%	**<0.25% Chrysotile**	

Client Sample ID: 24-A **Lab Sample ID:** **551607989-0076**

Sample Description: ROOM 13/12" X 12" ACOUSTIC CEILING TILE- WHITE COLOURED SURFACE W/ YELLOW COLOURED MATERIAL

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/26/2016	Brown	80%	20%	None Detected	

Client Sample ID: 24-B **Lab Sample ID:** **551607989-0077**

Sample Description: ROOM 13/12" X 12" ACOUSTIC CEILING TILE- WHITE COLOURED SURFACE W/ YELLOW COLOURED MATERIAL

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/26/2016	Brown	80%	20%	None Detected	

Client Sample ID: 24-C **Lab Sample ID:** **551607989-0078**

Sample Description: ROOM 13/12" X 12" ACOUSTIC CEILING TILE- WHITE COLOURED SURFACE W/ YELLOW COLOURED MATERIAL

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/26/2016	Brown	85%	15%	None Detected	

Analyst(s):

Arabee Sathiaseelan	PLM Grav. Reduction (4) TEM Grav. Reduction (4)
Jon Delos Santos	PLM (20)
Katarzyna Fila	PLM (6)
Natalie D'Amico	PLM Grav. Reduction (23) TEM Grav. Reduction (12)
Romeo Samson	PLM (1)
Shorthri Kalikutty	PLM (1)

Reviewed and approved by:

Matthew Davis
or Other Approved Signatory

None Detected = <0.5%. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted. This report must not be used to claim product endorsement by NVLAP of any agency of the U.S. Government.

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

Report amended: 08/10/201613:12:11 Replaces amended report from: 08/10/201613:12:11 Reason Code: Client-Change to Sample ID

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EMSL Canada Or	551607989
CustomerID:	55DCSL97
CustomerPO:	702541
ProjectID:	

Attn: **Jean Daigle**
ARCADIS Canada Inc.
121 Granton Drive
Unit 12
Richmond Hill, ON L4B 3N4

Phone:	(905) 882-5984
Fax:	(905) 882-8962
Received:	07/19/16 5:00 PM
Analysis Date:	7/25/2016
Collected:	

Project: **FORT SIMPSON BUILDING 9609/702541**

Test Report:Qualitative Asbestos Analysis by Transmission Electron Microscopy (TEM) and Filtration Technique

Sample	Description	TEM Result	Notes
1-A *551607989-0001*	ATTIC 9 - VERMICULITE ATTIC INSULATION- BROWN COLOURED	**Tremolite**	
1-B *551607989-0002*	ATTIC 9 - VERMICULITE ATTIC INSULATION- BROWN COLOURED	**Not Analyzed**	
1-C *551607989-0003*	ATTIC 9 - VERMICULITE ATTIC INSULATION- BROWN COLOURED	**Not Analyzed**	

Analyst(s)

Arabee Sathiaseelan (1)

Matthew Davis
or other approved signatory

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Samples analyzed by EMSL Canada Inc. Mississauga, ON

Initial report from 07/26/2016 15:39:46

EMSL Canada Inc.
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EMSL Canada Or	551607972
CustomerID:	55DCSL97
CustomerPO:	702541
ProjectID:	

Attn: **Jean Daigle**
ARCADIS Canada Inc.
121 Granton Drive
Unit 12
Richmond Hill, ON L4B 3N4

Phone: (905) 882-5984
Fax: (905) 882-8962
Received: 07/19/16 9:00 AM
Collected:

Project: **FORT SIMPSON BUILDING 9609/702541**

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

Client Sample Description	*Lab ID*	*Collected*	*Analyzed*	*Lead Concentration*
P-1	*551607972-0001*		7/21/2016	<90 mg/Kg
	Site: ROOM 7 - PAINT ON DRYWALL WALL - WHITE			
P-2	*551607972-0002*		7/21/2016	380 mg/Kg
	Site: ROOM 6 - PAINT ON DRYWALL WALL - WHITE			
P-3	*551607972-0003*		7/21/2016	370 mg/Kg
	Site: ROOM 7 - PAINT ON WOOD DOOR JAM - WHITE			
P-4	*551607972-0004*		7/21/2016	110 mg/Kg
	Site: ROOM 5A - PAINT ON WOOD SHELF - WHITE			
P-5	*551607972-0005*		7/21/2016	<100 mg/Kg
	Site: ROOM 5 - PAINT ON WOOD BASEBOARD - WHITE Insufficient sample to reach reporting limit.			
P-6	*551607972-0006*		7/21/2016	<90 mg/Kg
	Site: ROOM 5 - PAINT ON WOOD CASING ON WINDOW - WHITE			
P-7	*551607972-0007*		7/21/2016	<90 mg/Kg
	Site: ROOM 8 - PAINT ON WOOD FRAME ON SIDE - LIGHT WHITE			
P-8	*551607972-0008*		7/21/2016	<150 mg/Kg
	Site: ROOM 8 - PAINT ON METAL ENTRANCE DOOR-WHITE			
P-9	*551607972-0009*		7/21/2016	2300 mg/Kg
	Site: ROOM 10 - PAINT ON CONCRETE FLOOR - GREY			
P-10	*551607972-0010*		7/21/2016	<90 mg/Kg
	Site: ROOM 13 - PAINT ON CONCRETE WALL - CREAM / GREY			
P-11	*551607972-0011*		7/21/2016	<130 mg/Kg
	Site: ROOM 13 - PAINT ON PLYWOOD WALL - CREAM Insufficient sample to reach reporting limit.			
P-12	*551607972-0012*		7/21/2016	150 mg/Kg
	Site: ROOM 8 - PAINT ON WOOD STAIR STRINGER - WHITE/CREAM			
P-13	*551607972-0013*		7/21/2016	130 mg/Kg
	Site: ROOM 4 - PAINT ON DRYWALL WALL - WHITE/CREAM			

Shiraz Saloojee
or other approved signatory

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

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

Initial report from 07/26/2016 07:17:36

APPENDIX C

Photographs

Project Photographs

Residential Building
9609, 102 Street,
Fort Simpson, NWT

Photo: 1

Description:
Exterior finishes – Vinyl siding and metal soffits and fascia.

Location:
Exterior East Elevation

Photo: 2

Description:
Typical perimeter wall construction, gypsum board on wood framing, polyethelyene vapour barrier with glass fibre insulation inside wall cavity and plywood exterior sheathing.

Location:
Room 7

Project Photographs

Residential Building
9609, 102 Street,
Fort Simpson, NWT

Photo: 3

Description:
Carpet on asbestos vinyl floor tile with non-asbestos mastic on 5/8“ plywood, sub-floor.

Location:
Room 7

Photo: 4

Description:
Carpet on asbestos vinyl floor tile with non-asbestos mastic on 5/8“ plywood, sub-floor.

Location:
Unit A – Room 1

Project Photographs

Residential Building
9609, 102 Street,
Fort Simpson, NWT

Photo: 5

Description:
Laminate flooring on asbestos vinyl floor tile with non-asbestos mastic on 5/8“ plywood sub-floor.

Location:
Room 1

Photo: 6

Description:
Carpet on asbestos vinyl floor tile with asbestos mastic on 5/8“ plywood, sub-floor.

Location:
Room 5

Project Photographs

Residential Building
9609, 102 Street,
Fort Simpson, NWT

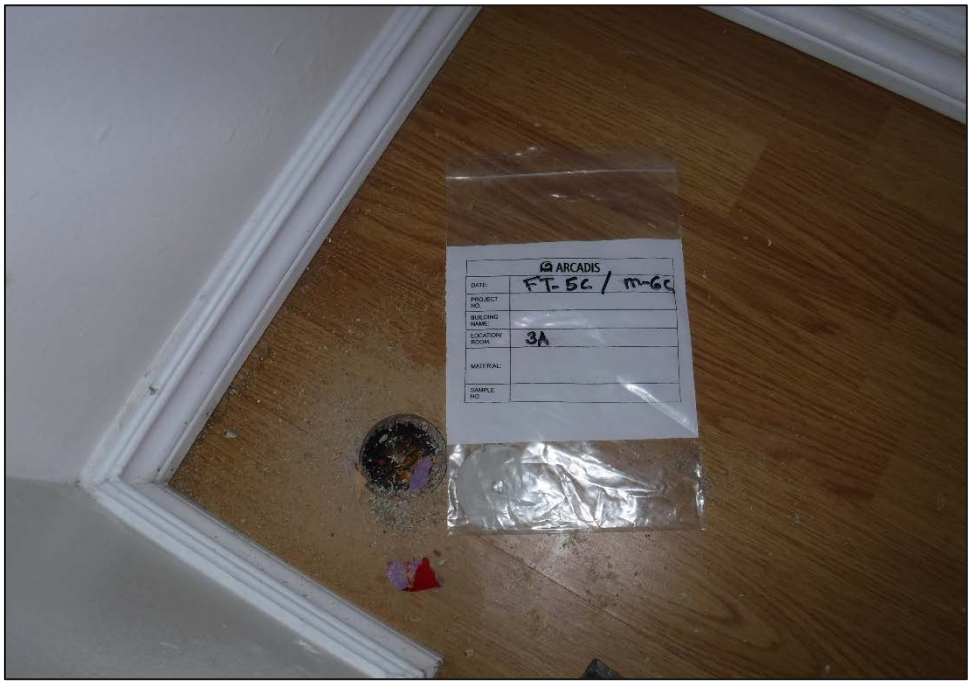


Photo: 7

Description:
Laminate flooring on asbestos vinyl floor tile with asbestos mastic on 5/8“ plywood sub-floor.

Location:
Room 3A

Photo: 8

Description:
Non-asbestos vinyl sheet flooring on 1/4” plywood on non-asbestos remnant paper backing on 5/8“ plywood sub-floor.

Location:
Room 4

Project Photographs

Residential Building
9609, 102 Street,
Fort Simpson, NWT

Photo: 9

Description:

Non-asbestos vinyl sheet flooring on 1/4” plywood on asbestos vinyl floor tile with asbestos mastic.

Location:

Room 8 - Stair treads and stair risers.

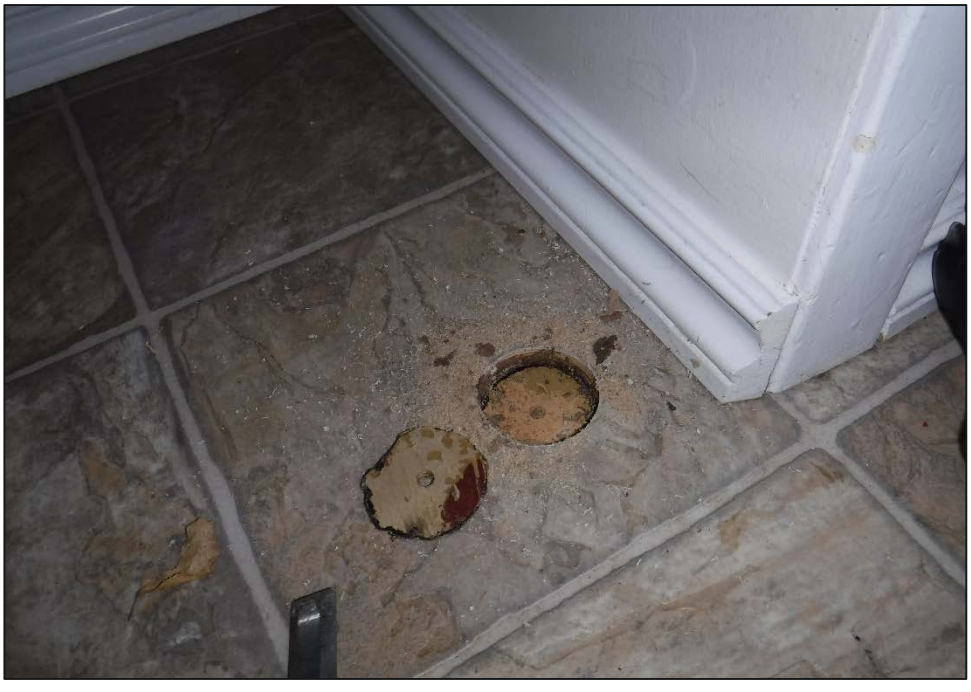


Photo: 10

Description:

Non-asbestos vinyl sheet flooring on 1/4” plywood on non asbestos vinyl floor tile with non-asbestos mastic.

Location:

Room 8 – Entrance door landing.

Project Photographs

Residential Building
9609, 102 Street,
Fort Simpson, NWT

Photo: 11

Description:
Asbestos vinyl sheet flooring (no mastic - flooring nailed to plywood floor).

Location:
Room 11

Photo: 12

Description:
Non-asbestos mastic on vinyl bathtub surround.

Location:
Room 4

Project Photographs

Residential Building
9609, 102 Street,
Fort Simpson, NWT

Photo: 13

Description:
Asbestos joint compound on gypsum board wall.

Location:
Room 1

Photo: 14

Description:
Non-asbestos textured ceiling finish on gypsum board with asbestos joint compound. Smoke detector.

Location:
Room 3

Project Photographs

Residential Building
9609, 102 Street,
Fort Simpson, NWT

Photo: 15

Description:
Asbestos heat shield on ceiling light fixture.

Location:
Room 3

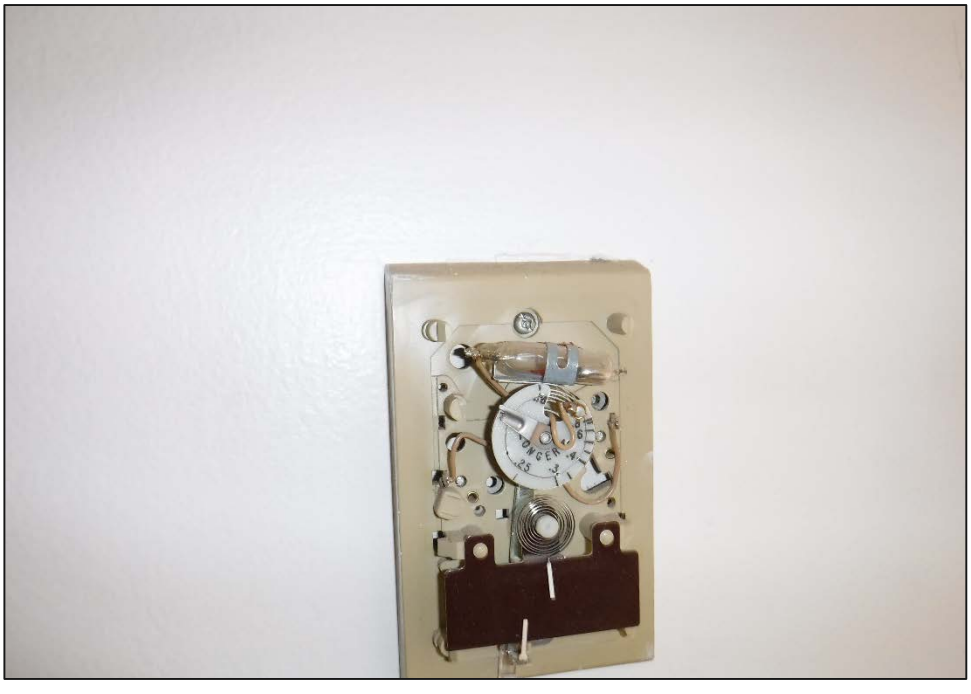


Photo: 16

Description:
Wall-mounted mercury thermostat.

Location:
Room 3

Project Photographs

Residential Building
9609, 102 Street,
Fort Simpson, NWT

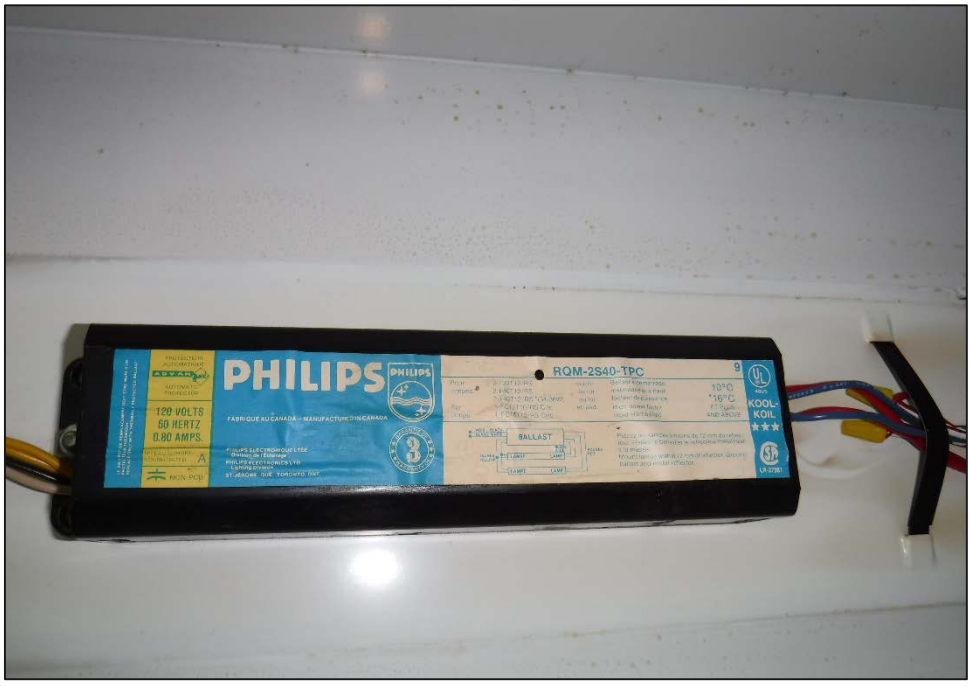


Photo: 17

Description:
Non-PCB light ballast.

Location:
Room 2

Photo: 18

Description:
Non-PCB light ballast.

Location:
Unit A – Room 10

Project Photographs

Residential Building
9609, 102 Street,
Fort Simpson, NWT

Photo: 19

Description:
Non-PCB light ballast.

Location:
Room 10

Photo: 20

Description:
Suspect PCB-containing light ballast in wall-mounted light fixture.

Location:
Room 12

Project Photographs

Residential Building
9609, 102 Street,
Fort Simpson, NWT

Photo: 21

Description:
Non-asbestos acoustic ceiling tiles.

Location:
Room 13

Photo: 22

Description:
Attic space with top layer of blown glass fibre attic insulation.

Location:
Attic

Project Photographs

Residential Building
9609, 102 Street,
Fort Simpson, NWT

Photo: 23

Description:
Asbestos vermiculite attic insulation located between blown glass fibre insulation and glass fibre batt insulation.

Location:
Attic

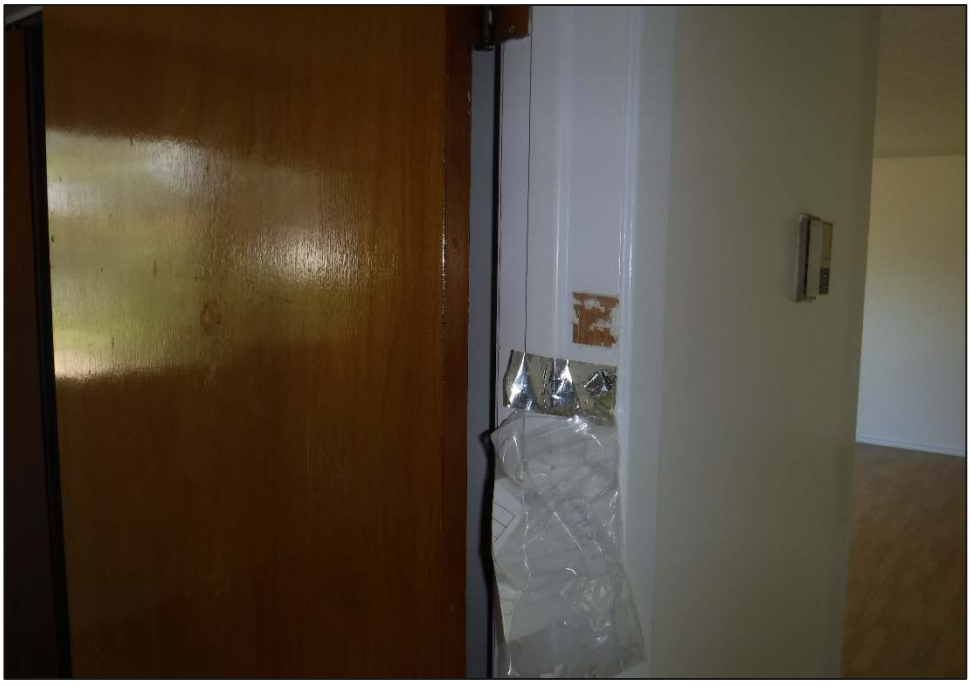


Photo: 24

Description:
Non-lead paint on wood door jamb.

Location:
Room 7.

Project Photographs

Residential Building
9609, 102 Street,
Fort Simpson, NWT

Photo: 25

Description:
Non-lead paint on metal entrance door.

Location:
Room 8

Photo: 26

Description:
Oil-fired furnace. Lead paint on concrete floor.

Location:
Room 10

Project Photographs

Residential Building
9609, 102 Street,
Fort Simpson, NWT

Photo: 27

Description:
Electric hot water heater.

Location:
Room 10

Photo: 28

Description:
Detail of wood joists imbedded in concrete foundation wall.

Location:
Room 10.

Project Photographs

Residential Building
9609, 102 Street,
Fort Simpson, NWT

Photo: 29

Description:
Outdoor fuel oil Tank.

Location:
Exterior north wall.

Photo: 30

Description:
Non asbestos asphalt roof shingle and associated roofing paper.

Location:
Exterior Roof Facing southwest.

Project Photographs

Residential Building
9609, 102 Street,
Fort Simpson, NWT

Photo: 31

Description:
Vinyl siding on extruded polystyrene insulation board.

Location:
Exterior – North wall

Photo: 32

Description:
Exterior finishes.

Location:
Exterior West Elevation

APPENDIX D

Williams Engineering Canada Structural Assessment Report

WILLIAMS ENGINEERING CANADA

ENGAGE. INNOVATE. INSPIRE.

File No. 35407.00

October 17, 2016

Via email Jean.Daigle@arcadis.com

Arcadis Canada Inc.
121 Granton Drive, Suite 12
Richmond Hill, Ontario L4B 3N4

Attention: Mr. Jean Daigle
Environmental Specialist

Subject: Ft. Simpson Residential BCA
Structural Assessment
Unit A&B 9801 - 101 St. Ft. Simpson, NT.
9609 – 102 St., Ft. Simpson, NT.

1. Introduction

Williams Engineering Canada Inc. (WEC) was retained by Arcadis Canada Inc. (ACI) to complete a structural condition assessment for two federal residential buildings in Fort Simpson, Northwest Territories.

On Wednesday the 6th of July 2016, Paul Clyne P.Eng. from WEC visited the buildings with Mr. Jean Daigle from ACI. The properties are located at 9801-101 street (LTO 2979, LOT 535 and 536) and 9609-102 street (LTO 2979, LOT 531) in Fort Simpson, Northwest Territories. Both properties were unoccupied, but the building at 9801-101 Street was being used to store equipment.

The Structural Engineering Assessment was conducted by doing a non-destructive assessment of the structure. This assessment consisted of a walk through noting observations and sampling with photographs. Some measurements were also taken.

This structural review identifies conditions which are indicators of structural distress and/or movement within the building. Examples of indicators of interior and/or exterior distresses are:

- cracking, spalling, or deflection of concrete elements;
- surface cracking of the structure or finishes on walls, ceilings, and floorings;
- cracking of window glazing;
- differential movement of structural components, exterior elements, sidewalks, etc.;
- binding of doors;
- signs of water marking, and staining of surfaces.

Although a number of these indicators are of a cosmetic and/or architectural nature, they do provide insight into the condition of the structure, which may be hidden behind the finishes or claddings.

The following information was made available to WEC before the site visit;

- D.P.W. Housing, Six Standard 3-Bedroom House 1971-72, Project 12201, Dated 27/07/1971
  - Drawing A-2 – Basement & Main Floor Plans, General Details
  - Drawing A-3 – Elevations

2. Unit A&B 9801-101 Street – Semi-detached two storey dwelling

Overview

No drawings were available for this building. These two units are semi-detached and symmetrical about the central dividing wall. The foundation system for this building consists of a concrete basement. The front and back exterior walls are load bearing and there is a central line of wood columns and beams that support the main floor. The superstructure above basement level is two stories and is of conventional wood frame construction. There is a large wood deck to the front of the building and a smaller deck at back entrances to each unit.

Photo 1 – Front Elevation, Unit A

Photo 2 – Front Elevation, Unit B

Photo 3 – Side Elevation, Unit A

Photo 4 – Side and Back Elevation, Unit B

Foundation / Basement - Unit A&B 9801-101 Street

Description

The building is founded on a concrete basement. Perimeter walls appear to be of uniform thickness with local thickenings formed to the inside of the wall at beam locations. Exterior basement walls are finished to the inside with wood board finish. The dividing basement wall was painted exposed concrete. Unit A had a concrete tank structure built independent of the perimeter wall. This tank has been repurposed and has been retrofitted with a door. The basement floor is concrete and generally slopes towards a sump which is located at the west wall in the corner beside the dividing wall, in each basement unit. Housekeeping pads are formed with hollow blocks under furnace units. The central wood columns are

supported on concrete upstands at column locations. The floor appears to have been finished with a concrete topping.

Photo 5 – Basement, Unit A

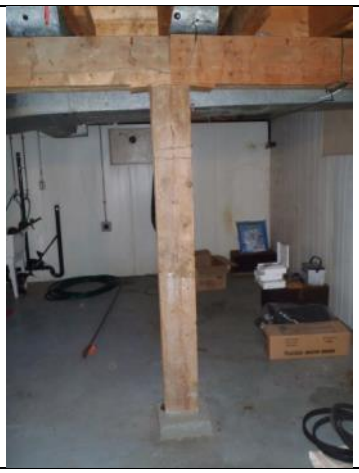


Photo 6 – Basement, Unit B

Photo 7 – Disused Concrete tank in Unit A

Photo 8 – Concrete finish in concrete tank

Photo 9 – Sump

Conditions and Recommendations

Condition	Recommendation	Photo
Cracks are visible throughout the basement slab. Some of the cracks are associated with the concrete topping delaminating from the concrete slab. A hollow sound can be heard when the slab is tapped with a hard object at these locations.	We would recommend that concrete topping is removed local to areas that have delaminated. The exposed surface area should be prepared with a bonding agent and new concrete topping placed.	
Uniform cracks in the concrete run from the back to the front wall at column locations in both basements. These cracks appear to be old and have not changed recently. Due to the uniform nature of these cracks it is likely that these occurred at or shortly after construction of the basement slab	No recommendation	
Patches of honeycombed concrete are visible in exposed concrete basement wall. These areas appear to be in fair condition.	No recommendation	
Some cracks and chipped concrete were visible at beam pocket locations in the dividing wall.	It is recommended that these cracks are repaired with an injection mortar that is suitable for the size of crack at this location.	

The basement slab area directly around the main water connection is wet to touch. This may have been caused by either a small leak, or condensation forming on a cold pipe. There are signs of corrosion on the pipe.	Although this is a non-structural item, it is recommended that this be repaired to maintain a dry slab.	

Main Floor - Unit A&B 9801-101 Street

Description

Main floor structure is comprised of ¾" (19mm) wood plank floor deck laid diagonally, supported on 2 x 8 (38mm x 184mm) joists spaced a 16" (400mm) on centre. Joists are fully blocked over supports and have herring-bone bridging at mid-span. Joists are supported on the front and back concrete basement walls, and on a central wood beam. The wood beam is a built up section comprised of three ply 2 x 10 (38mm x 235mm). The built up wood beam is supported on three wood columns that measure approximately 140mm x 191mm in cross section. Beam ends are supported on thickenings in the basement walls.

The main floor structure supports the main floor walls. Both partitions and exterior walls are framed from 2x4 (38mm x 89mm) lumber. All walls have ¾" (19mm) wood plank fastened diagonally to both sides of the wall. Finishes are then fastened to the wood plank. Generally the walls have been finished with drywall throughout the main floor.

At the time of our assessment the building was being used for storage, so not all locations were accessible. Photos 16 – 21 show some of the rooms with items stored.

Photo 10 – Main floor joists

Photo 11 – Main floor joist spacing

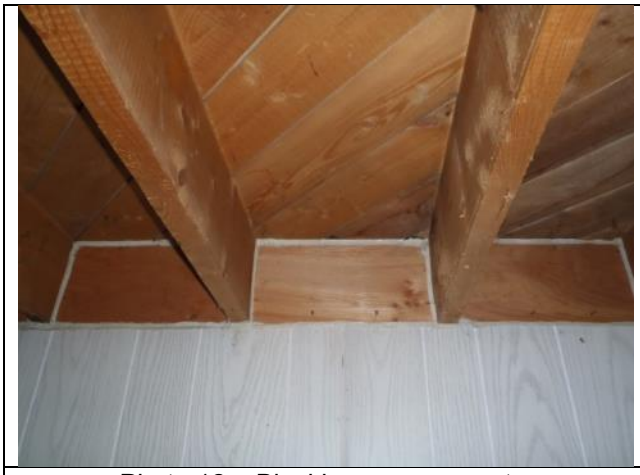


Photo 12 – Blocking over supports

Photo 13 – Herring bone bridging

Photo 14 – Main floor Beam

Photo 15 – Wood column

Photo 16 – Main floor, Room 4

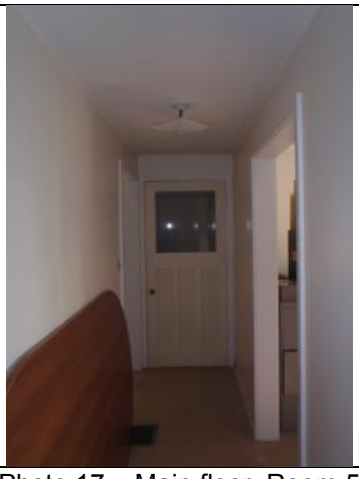


Photo 17 – Main floor, Room 5

Photo 18 – Main floor, Room 1

Photo 19 – Main floor, Room 15

Photo 20 – Main floor, Room 20

Photo 21 – Main floor, Room 16

See Appendix A, SK-01 and SK-02 for room numbers

Conditions and Recommendations

Condition	Recommendation	Photo
Generally the main floor deck was in fair condition. Some small patches of water staining were observed under the kitchen area on the underside of the floor deck and side of joists. These appear to have been localised leaks some time back and have been repaired and are currently dry.	No recommendations	
Joists and main floor beams that were observe were in fair condition.	No recommendations	See Photos10 – 14 above
Wood columns are generally plumb and straight and in fair condition. There is some vertical checking along the columns.	No recommendations	

Walls at main floor level were generally in fair condition. At the time of our assessment, baseboards and some trim had been removed and it appeared that drywall and paint had been touched up recently. Some small cracks and bulges similar to the accompanying picture were observed around some window and door openings and on the walls in the stair area.	No recommendations	

Second Floor - Unit A&B 9801-101 Street

Description

Second floor structure was concealed behind finishes. We would assume that second floor framing layout is similar to the main floor framing. Instead of a supporting beam and columns the second floor is likely to be supported on a central load bearing wall.

The second floor structure supports the main floor walls. Both partitions and exterior walls are framed from 2x4 (38mm x 89mm) lumber. All walls have ¾" (19mm) wood plank fastened diagonally to both sides of the wall. Finishes are then fastened to the wood plank. Generally the walls have been finished with drywall throughout the second floor. The bathroom is the only room with different wall finishes.

Photos 22 to 25 were taken in various rooms at second floor level.

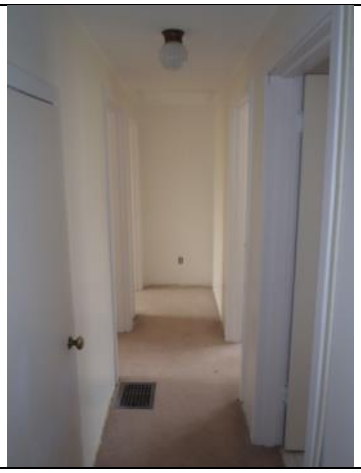


Photo 22 – Second Floor, Room 8

Photo 23 – Second Floor, Room 11

Photo 24 – Second Floor, Room 9

Photo 25 – Second Floor, Room 22

See Appendix A, SK-01 and SK-02 for room numbers

Conditions and Recommendations

Condition	Recommendation	Photo
Wall finishes in room 9 were water damaged. It is likely that water has been entering the external wall assembly in this area.	We recommend that the wall finishes are removed in the area in the vicinity of the bath to assess the damage. Compromised structure shall be replaced with similar.	
At main floor level bulges were observed in the ceiling finishes. An example of this is shown in the attached photo.	No recommendations.	
Walls at second floor level were generally in fair condition. Some small cracks and bulges similar to the accompanying picture were observed around some window and door openings.	No recommendations.	

Roof - Unit A&B 9801-101 Street

Description

The roof structure was observed through the attic hatch in Unit A. The roof is duo-pitch, sloping from the ridge at the centre, to the front and back walls. The structure is comprised of a ¾" (19mm) wood plank deck laid over 2x4 (38mm x 89mm) wood rafters at 16" (400mm) on-centre. Rafters span from the ridge board to the front and back bearing walls. Rafters continue over the wall to forms overhanging eaves. Some rafters are tied with collar ties, 1x6 (19mm x 140mm) wood plank. At ceiling level, 2x6 (38mm x 140mm) wood ties span front to back wall at rafter centres and act as tie members. Tie members are sheathed with ¾" (19mm) wood plank to the underside. Ceiling finishes are fastened to the wood plank.

Photo 26 – Gable wall framing

Photo 27 – Roof Framing

Photo 28 – Collar Ties

Photo 29 – Deck and Rafters

Conditions and Recommendations

Condition	Recommendation	Photo
Framing observed in the attic space was in fair condition.	No recommendations	-

Exterior - Unit A&B 9801-101 Street

Description

Both units have wood decks at the front and back entrances. The front decks extend the full width of the building and the back decks extend approximately half the building width. Decks are conventional wood construction and are founded directly at grade.

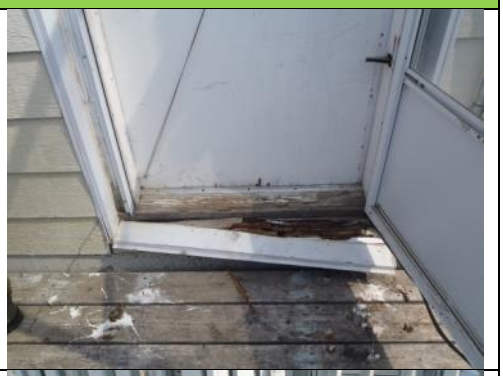
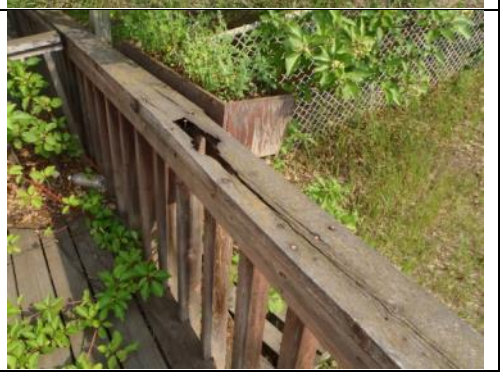
Photo 30 – Unit A, West Deck

Photo 31 – Unit A&B, West Deck

Photo 32 – Unit A, East Deck

Photo 33 – Unit B, East Deck

Conditions and Recommendations

Condition	Recommendation	Photo
The back door threshold in Unit B is rotted.	Door threshold is to be removed to assess if damage extends further into structure. Replace with similar as required.	
The east deck in both units is in poor condition. There are signs of decay throughout the structure.	We recommend that the existing deck is fully removed. The area within the deck footprint shall have all vegetation removed and the organic layer of soil stripped back. Subgrade is to be prepared and a new pressure treated wood deck structure constructed.	
The west deck in both units is in poor condition. There are signs of decay throughout the structure.	We recommend that the existing deck is fully removed. The area within the deck footprint shall have all vegetation removed and the organic layer of soil stripped back. Subgrade is to be prepared and a new pressure treated wood deck structure constructed.	

3. 9609-102 Street – 3 Bedroom Dwelling

Overview

Two drawings were available for this building. The drawings were comprised of basement and main floor plans and details, and building elevations. This building consists of a concrete basement. Front and back exterior walls are load bearing and there is a central line of columns and beams that support the main floor. The superstructure above basement level is one story and is of conventional wood frame construction. The building has a footprint of approximately 1100ft^2 (102m^2).

Photo 34 – Front (East) Elevation

Photo 35 – Back (West) and Side Elevation

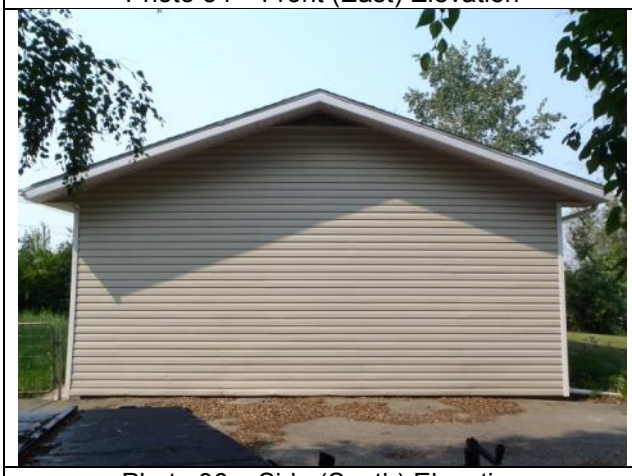


Photo 36 – Side (South) Elevation

Photo 37 – North side

Foundation / Basement - 9609-102 Street

Description

According to the drawings, a 1'-4" (400mm) wide strip footing supports the 8" (200mm) thick concrete perimeter basement wall. Two 2' x 2' x 6" (600mm x 600mm x 150mm) concrete pads support 3" (76mm) diameter adjustable steel columns along the central line of the basement. The basement floor is a concrete slab. Slab thickness is not indicated on drawings. A floor drain is located in the North West corner, and the drawings indicate a 4" (102mm) weeping tile all around the outside of the basement wall footing.

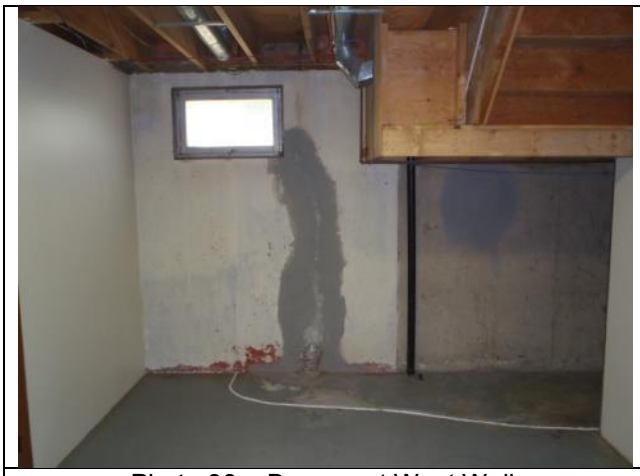


Photo 38 – Basement West Wall

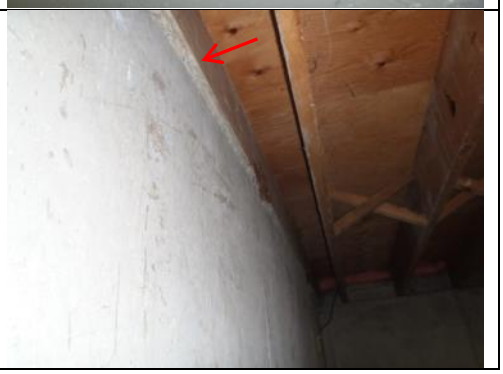
Photo 39 – Basement South Wall

Photo 40 – Basement North Wall

See Appendix A, SK-03 for plan layout

Conditions and Recommendations

Condition	Recommendation	Photo
The north basement wall is cracked local to the main floor beam pocket. A waterproofing paint has been applied to the crack.	We recommend that this crack is repaired with an injection mortar suitable for the size of crack.	
Substantial cracking was observed throughout the basement walls. On the west basement wall cracks generally occur at window openings and extend down to the floor slab, see photo 38 above. Efflorescence was observed at most cracks. There is also a build-up over cracks which have been coated with a waterproofing paint. The buildup may be a crack repair attempt.	We recommend that sections of basement wall with substantial cracking are to removed and replaced with new reinforced concrete wall. A concrete specialist should be consulted to investigate the properties of the existing concrete. We also recommend that access to the basement be limited to only essential maintenance tasks.	 

The South basement wall is in the most critical condition. The wall is severely cracked in a typical failure pattern for a laterally loaded panel, see photo 39 above. The photo to the right is taken across the face and shows the wall deflecting inward, with wide open cracks on the tension face of the wall. This wall has failed.	We recommend that the south basement wall be removed and replaced with a new reinforced concrete basement wall. The new basement wall design should be done by a structural engineer in consultation with a geotechnical consultant that has conducted a site specific investigation. A concrete specialist should be consulted to investigate the properties of the existing concrete. We also recommend that access to the basement be limited to only essential maintenance tasks.	
Some area of the basement wall show signs of water ingress.	A concrete specialist should be consulted to investigate the properties of the existing concrete and provide recommendations for repair or replacement.	
The rim joist along the basement end walls appear to have been pushed inward. The bottom of the joist in the photo is visible toward the centre of the wall.	Joists are to be adjusted to correct position as concrete wall repairs are done.	

Main Floor - 9609-102 Street

Description

Main floor structure is comprised of a plywood sub-floor deck supported on 2 x 10 (38mm x 235mm) joists spaced a 16" (400mm) on centre. Joists are not blocked over central supports and have herring-bone bridging at mid-span. Joists are supported on the east and west concrete basement walls, and on a central steel beam. The steel beam is supported on two 3" (76mm) diameter adjustable steel columns. Beam ends are pocketed into the north and south concrete basement walls.

The main floor structure supports the main floor walls. Both partitions and exterior walls are framed from 2x4 (38mm x 89mm) lumber. Stud spacing and sheathing specification is unknown. Generally the walls have been finished with drywall throughout the main floor.

Photo 41 – Main floor joists on basement wall

Photo 42 – Main floor joist herring bone bridging

Photo 43 – Main floor joists over central beam

Photo 44 – Main Floor, Room 1

Photo 45 – Main floor, Room 2

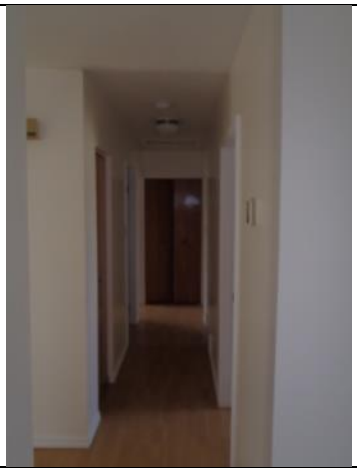


Photo 46 – Main Floor, Room 3

Photo 47 – Main floor, Room 4

Photo 48 – Main floor, Room 5

Photo 49 – Main floor, Room 6

Photo 50 – Main floor, Room 7

See Appendix A, SK-03 for plan layout

Conditions and Recommendations

Condition	Recommendation	Photo
No blocking between joists provided over main floor beam.	We recommend installing blocking between joists	
During our assessment we took some level measurements throughout the main floor. Our level survey showed that the north end of the main floor is approximately 42mm lower than the south end.	No recommendations, but house could be relevelled as basement walls are replaced.	
Generally there are very few signs of distress at main floor level. Some minor cracks or bulges in drywall finishes are visible around window openings. Generally main floor framing and walls are in fair to good condition.	No recommendations	

Roof - 9609-102 Street

Description

The roof structure was observed through the attic hatch in the ceiling at main floor level. The roof is duo-pitch, sloping from the ridge at the centre, to the east and west walls. The structure is comprised of a plywood sheathing fastened to 2x4 (38mm 89mm) wood roof truss at 24" (600mm) on-centre. Truss members span the east and west bearing walls. Ceiling finishes are fastened to the truss bottom chord members.

Photo 51 – Roof Framing

Photo 52 – Roof Framing

Conditions and Recommendations

Condition	Recommendation	Photo
Framing observed in the attic space was in good condition.	No recommendations	-

Exterior - 9609-102 Street

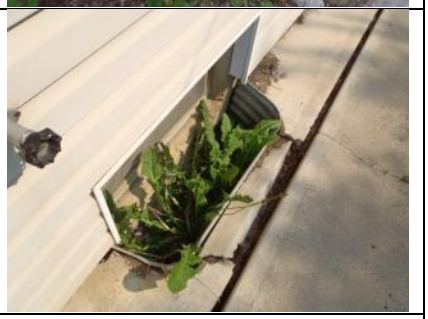
Description

There is a concrete set of steps and pathway on the east side of the building and a concrete sidewalk formed around light wells on the west side of the building.

Photo 53 – Concrete steps and path on east side

Photo 54 – concrete sidewalk on west side

Conditions and Recommendations

Condition	Recommendation	Photo
The concrete steps at the main entrance are cracked along where it joins the basement wall. This may be due to seasonal movement.	No recommendations	
Concrete around light wells has failed. Concrete may have failed due to soil conditions and seasonal effects.	Concrete is to be removed and replaced with new detail. New detail should be designed by structural engineer working in conjunction with a geotechnical consultant.	
Concrete paths at east and west of building are cracked throughout. Concrete has probably cracked due to seasonal shifting of the sub-grade.	Concrete paths should be replaced if surface becomes uneven and becomes a safety concern.	

5. Closure

This report has been prepared based upon the information referenced herein. It has been prepared in a manner consistent with good engineering judgement. Should new information come to light, Williams Engineering Canada Inc. requests the opportunity to review this information and our conclusions contained in this report. This report has been prepared for the exclusive use of Arcadis Canada Inc. and there are no representations made by Williams Engineering Canada Inc. to any other party. Any use that a third party makes of this report, or any reliance on or decisions made based on it, are the responsibility of such third parties

Yours truly,

Williams Engineering Canada Inc.

REGISTERED PROFESSIONAL ENGINEER
10/24/2016
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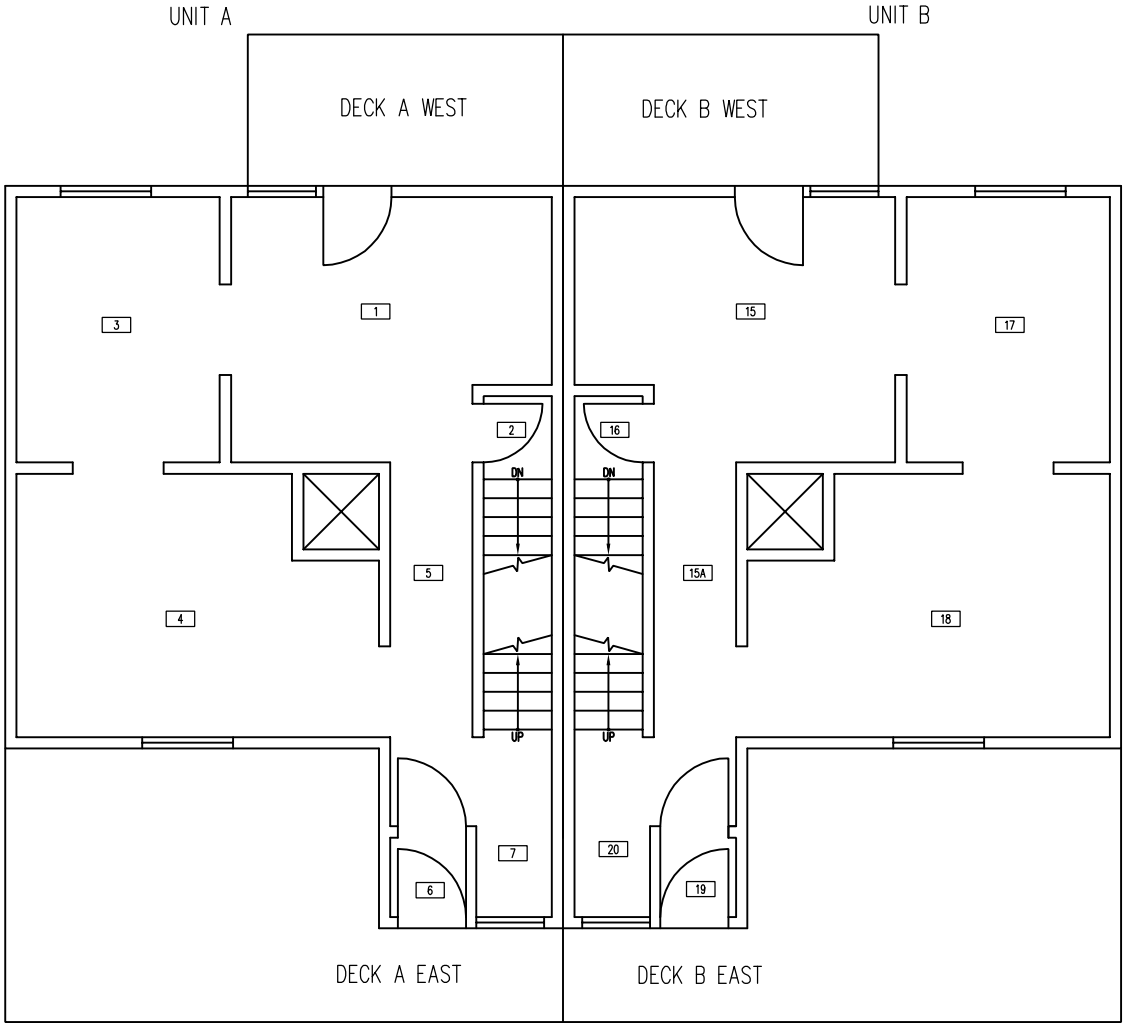
Appendix A

Sketches



MAIN FLOOR PLAN

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WILLIAMS ENGINEERING
CANADA

JOB. TITLE: PUBLIC WORKS BUILDING INVESTIGATION FT. SIMPSON, NT

DWG. TITLE: UNIT A&B 9801-101ST FLOOR PLANS

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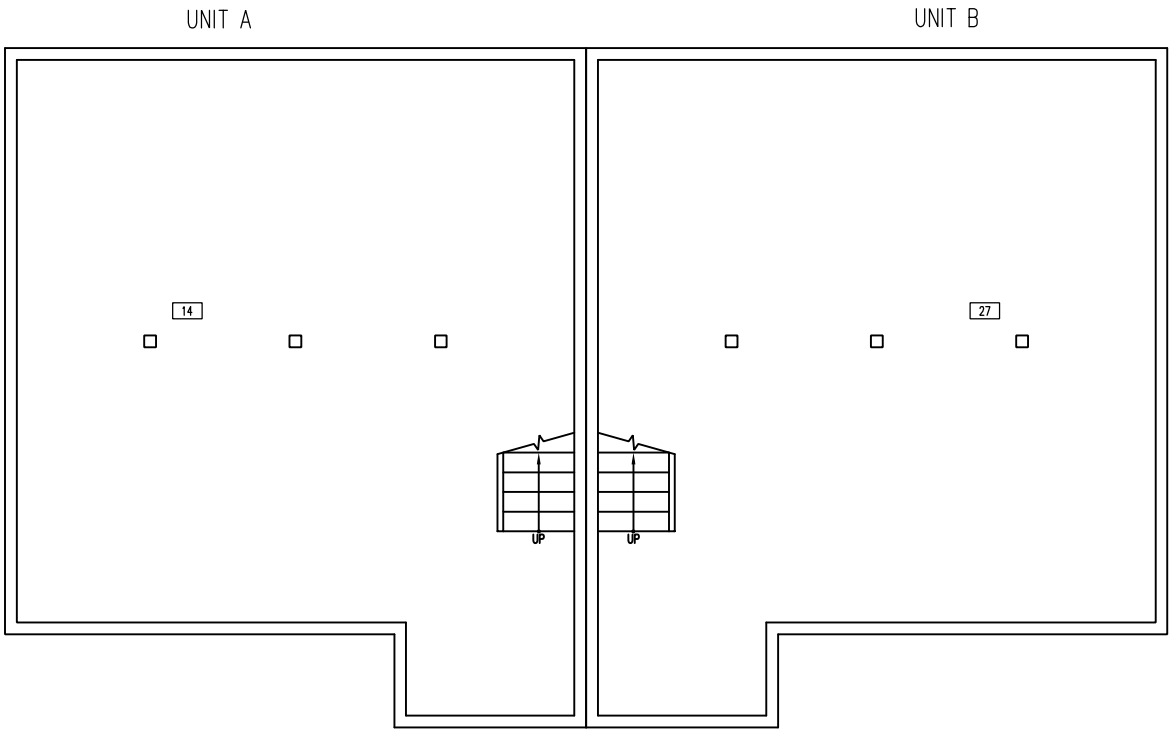
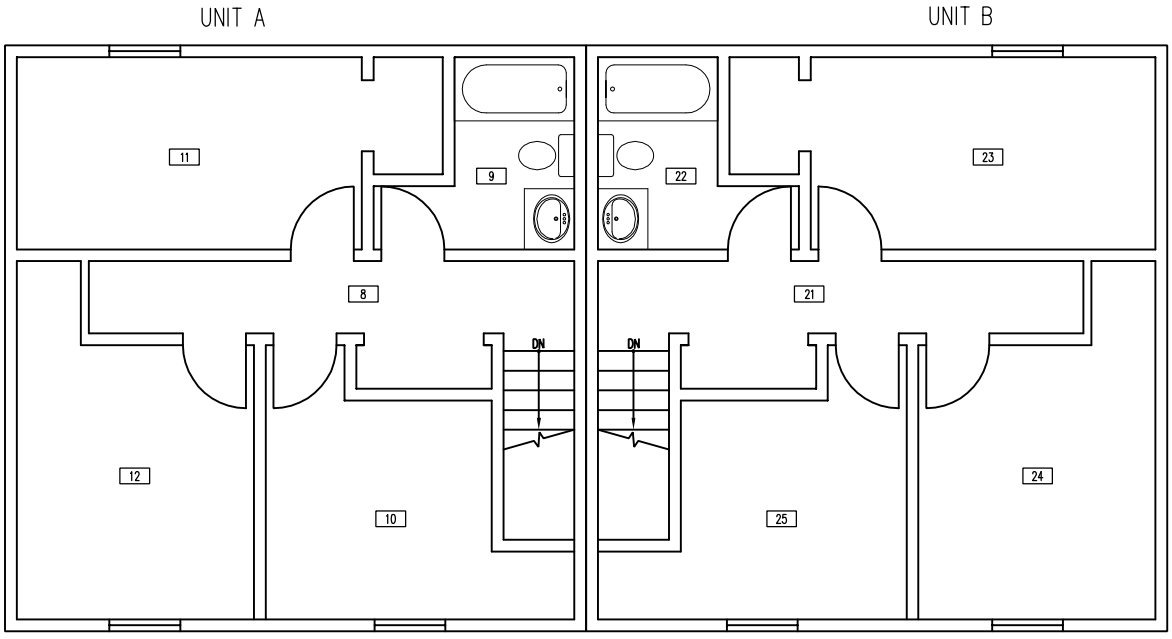


BASEMENT PLAN



SECOND FLOOR PLAN

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DWG. TITLE: UNIT A&B 9801-101ST FLOOR PLANS

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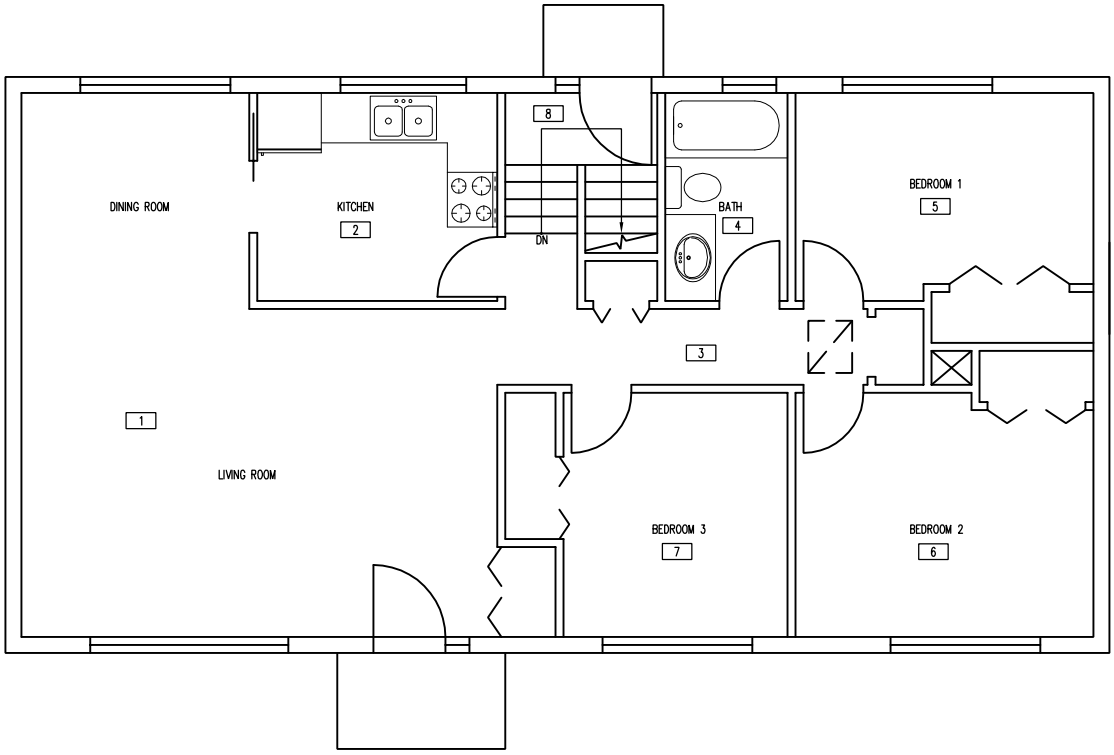
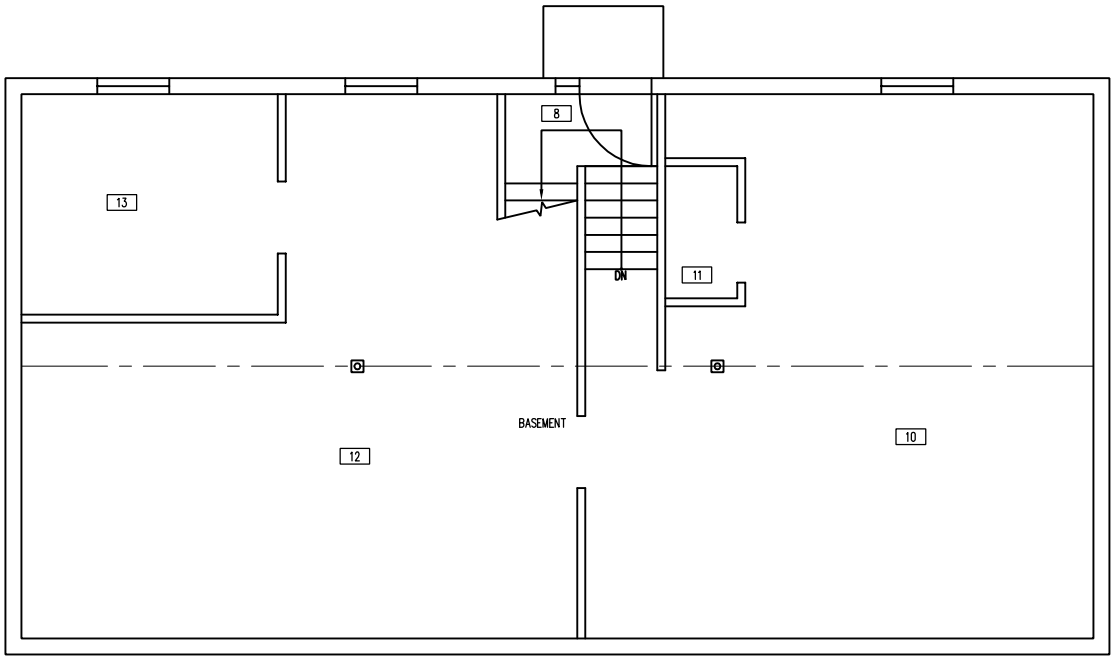


MAIN FLOOR PLAN



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