CONSULTANTS – SEAL & SIGNATURE

Discipline	Seal/Signature/Date
Architectural Kasian	 2021-10-18

Pages

Division 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS

Division 01 - GENERAL REQUIREMENTS

Division 02 – EXISTING CONDITIONS

Division 03 - CONCRETE

Not used

Division 04 - MASONRY

Not used

Division 05 – METALS

Division 06 - WOOD AND PLASTICS

Division 07 - THERMAL AND MOISTURE PROTECTION

Division 08 - OPENINGS

Not used

Division 09 - FINISHES

Division 12 - EQUIPMENT

Not used

Division 13 – EQUIPMENT

Not used

Appendix A

Hazardous Building Material Assessment E0897 Employee Housing, Unit B – 117 Nass Road, New Aiyansh, BC & E0896 RCMP Detachment and Shed - 117 Nass Road, New Aiyansh, BC

DRAWINGS

Architectural

A-000 RESIDENTIAL BUILDING PAGE
A-100 RESIDENTIAL BUILDING SITE PLAN
A-201 EXISTING RESIDENTIAL BUILDING (UNIT B) - PLANS
A-202 EXISTING RESIDENTIAL BUILDING (UNIT B) - EXTERIOR ELEVATIONS
A-203 EXISTING RESIDENTIAL BUILDING (UNIT B) - WALL SECTIONS
A-204 EXISTING RESIDENTIAL BUILDING (UNIT B) - SECTION DETAILS

END OF TABLE

Part 1 General

1.1 CODES

.1 Perform work to CURRENT Codes, Construction Standards and Bylaws, including Amendments up to the TENDER closing date.

1.2 DESCRIPTION OF WORK

.1 Work under this Contract covers the redevelopment of exterior work/building envelope to RCMP Buildings in New Aiyansh, B.C.

.2 Work to be performed under this Contract includes, but is not limited to, the following items covered further in the Contract documents.

.1 R.019029.001 – New Aiyansh Residence Exterior Envelope Replacement

.1 Exterior siding removal and replacement.
.2 Gutters, Fascia, and Downspouts removal and replacement.
.3 Soffit removal and replacement.
.4 Removal and replacement of existing trims.
.5 Painting of existing doors, windows, stairs, and handrails.
.6 Repairing and making good existing dampproofing.
.7 Adding concrete faced insulation and drainage mats.
.8 Hazmat abatement

.3 "Green" Requirements:

.1 Use only environmentally responsible green materials/products with no VOC emissions or minimum VOC emissions of indoor off-gassing contaminants for improved indoor air quality – subject of Departmental Representative's approval of submitted MSDS Product Data.

.2 Use materials/products containing highest percentage of recycled and recovered materials practicable – consistent with maintaining cost effective satisfactory levels of competition.

.3 Adhere to waste reduction requirement for reuse or recycling of waste materials, thus diverting materials from landfill.

1.3 CONTRACT DOCUMENTS

.1 The Contract documents, drawings and specifications are intended to complement each other, and to provide for and include everything necessary for the completion of the work.

.2 Drawings are, in general, diagrammatic and are intended to indicate the scope and general arrangement of the work.

1.4 DIVISION OF SPECIFICATIONS

.1 The specifications are subdivided in accordance with the current 6-digit National Master Specifications System.

.2 A division may consist of the work of more than 1 subcontractor. Responsibility for determining which subcontractor provides the labour, material, equipment and services required to complete the work rests solely with the Contractor.

.3 In the event of discrepancies or conflicts when interpreting the drawings and specifications, the specifications govern.

1.5 TIME OF COMPLETION

.1 Complete the project **New Aiyansh Residence Exterior Envelope Replacement** ready for use within 35 (thirty five) weeks after site possession.

1.6 HOURS OF WORK

.1 Restrictive as follows:

.1 Schedule deconstruction, removal and construction work after normal working hours of the building and during the day on weekends and/or holidays. Normal weekday working hours of the building are 8 am to 5 pm hours.

.2 Notify Departmental Representative of all after hours work, including weekends and holidays.

1.7 WORK SCHEDULE

.1 Carry on work as per indicated “PHASES” and as follows:

.1 Within 10 working days after Contract award, provide a “phasing bar chart” and a schedule showing anticipated progress stages and final completion of the work within the time period required by the Contract documents. Indicate the following:

.1 Submission of shop drawings, product data, MSDS sheets and samples.

.2 Commencement and completion of work of each section of the specifications or trade for each phase as outlined.

.3 Final completion date within the time period required by the Contract documents.

.2 Do not change approved Schedule – without notifying Departmental Representative.

.3 Interim reviews of work progress based on work schedule will be conducted as decided by Departmental Representative and schedule updated by Contractor in conjunction with and to approval of Departmental Representative.

1.8 COST BREAKDOWN

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

1.9 CODES, BYLAWS, STANDARDS

.1 Perform work in accordance with the National Building Code of Canada (NBC) 2015, and other indicated Codes, Construction Standards and/or any other Code or Bylaw of local application.

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

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

.4 In any case of conflict or discrepancy, the most stringent requirements shall apply.

1.10 DOCUMENTS REQUIRED

.1 Maintain 1 copy each of the following at the job site:

- .1 Contract drawings.
- .2 Contract specifications.
- .3 Addenda to Contract documents.
- .4 Copy of approved work schedule.
- .5 Reviewed/approved shop drawings.
- .6 Change orders.
- .7 Other modifications to Contract.
- .8 Field test reports.
- .9 Reviewed/approved samples.
- .10 Manufacturers' installation and application instructions.
- .11 One set of record drawings and specifications for "as-built" purposes.
- .12 National Building Code of Canada 2105.
- .13 Current construction standards of workmanship listed in technical Sections.
- .14 Building Safety Plan.

1.11 REGULATORY REQUIREMENTS

.1 Obtain and pay for – Building Permit, Certificates, Licenses and other permit required by regulatory municipal, provincial or federal authorities to complete the work.

.2 Provide inspection authorities with plans and information required for issue of acceptance certificates.

.3 Furnish inspection certificates in evidence that the work installed conforms with the requirements of the authority having jurisdiction.

1.12 CONTRACTOR'S USE OF SITE

.1 Use of site:

- .1 Exclusive and complete for execution of work after site possession. Contractor to take possession of site on April 1, 2021 or earlier upon approval by departmental representative.
- .2 Assume responsibility for assigned premises for performance of this work.
- .3 Be responsible for coordination of all work activities on site, including the work of other contractors engaged by the Departmental Representative such as moving contractors and furniture installers.

.2 Perform work in accordance with Contract documents. Ensure work is carried out in accordance with indicated phasing.

.3 Do not unreasonably encumber site with material or equipment. No items to be delivered to site prior to site possession date.

.4 Use only indicated [elevators] for moving workers and material.

- .1 Protect walls of passenger elevators, to approval of Departmental Representative prior to use.
- .2 Accept liability for damage, safety of equipment and overloading of existing equipment.

1.13 EXAMINATION

.1 Examine site and be familiar and conversant with existing conditions likely to affect work

1.14 EXISTING SERVICES

.1 Where work involves breaking into or connecting to existing services, carry out work at times directed by the authorities having jurisdiction.

1.15 LOCATION OF EQUIPMENT AND FIXTURES

.1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.

.2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space, and in accordance with manufacturer's recommendations for safety, access and maintenance.

.3 Inform Departmental Representative of impending installation and obtain his approval for actual locations.

.4 Submit field drawings or shop drawings to indicate the relative position of various services and equipment when required by the Departmental Representative.

.5 Install firestops and smoke seals in accordance with ULC-S115, around pipe, ductwork, cables and other objects penetrating fire separations to provide fire resistance not less than the fire resistance of surrounding floor, ceiling and wall assembly.

.6 Making good is defined as matching construction and finishing materials and the adjacent surfaces such that there is no visible difference between existing and new surfaces when viewed from 1.5 metres in ambient light and includes painting the whole surface to the next change in plane.

1.16 SETTING OUT OF WORK

.1 Assume full responsibility for and execute complete layout of work to locations, lines and elevations indicated.

.2 Provide devices needed to lay out and construct work.

.3 Supply such devices as templates required to facilitate Departmental Representative's inspection of work.

1.17 ACCEPTANCE OF SUBSTRATES

.1 Each trade shall examine surfaces prepared by others and job conditions which may affect his work and shall report defects to the Departmental Representative. Commencement of work shall imply acceptance of prepared work or substrate surfaces.

1.18 QUALITY OF WORK

.1 Ensure that quality workmanship is performed through use of skilled tradesmen, under supervision of qualified journeyman.

.2 The workmanship, erection methods and procedures to meet minimum standards set out in the National Building Code of Canada 2015.

.3 In cases of dispute, decisions as to standard or quality of work rest solely with the Departmental Representative, whose decision is final.

1.19 WORKS COORDINATION

.1 Coordinate work of subtrades

.1 Designate one person to be responsible for review of contract documents and shop drawings and managing coordination of Work.

.2 Convene meetings between subcontractors whose work interfaces and ensure awareness of areas and extent of interface required.

.1 Provide each subcontractor with complete plans and specifications for Contract, to assist them in planning and carrying out their respective work.

.2 Develop coordination drawings when required, illustrating potential interference between work of various trades and distribute to affected parties.

.1 Pay particular close attention to overhead work above ceilings and within or near to building structural elements.

.2 Identify on coordination drawings, building elements, service lines, rough-in points and indicate location services entrance to site.

.3 Facilitate meeting and review coordination drawings. Ensure subcontractors agree and sign off on drawings.

.4 Publish minutes of each meeting.

.5 Plan and coordinate work in such a way to minimize quantity of service line offsets.

.6 Submit copy of coordination drawings and meeting minutes to Departmental Representative for information purposes.

.3 Submit shop drawings and order of prefabricated equipment or rebuilt components only after coordination meeting for such items has taken place.

.4 Work coordination:

.1 Ensure cooperation between trades in order to facilitate general progress of Work and avoid situations of spatial interference.

.2 Ensure that each trade provides all other trades reasonable opportunity for completion of Work and in such a way as to prevent unnecessary delays, cutting, patching and removal or replacement of completed work.

.3 Ensure disputes between subcontractors are resolved.

.5 Departmental Representative is not responsible for, or accountable for extra costs incurred as a result of Contractor’s failure to coordinate Work.

1.20 APPROVAL OF SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

.1 In accordance with Section 01 33 00, submit the requested shop drawings, product data, MSDS sheets and samples indicated in each of the technical Sections.

.2 **Allow sufficient time for the following**:

.1 Review of product data.

.2 Approval of shop drawings.

.3 Review of re-submission.

.4 Ordering of approved material and/or

1.21 SECURITY CLEARANCES

.1 NO security clearances required

1.22 PROJECT MEETINGS

.1 Departmental Representative will arrange project meetings and assume responsibility for setting times

.2 Consultant shall be recording and distributing minutes.

1.23 TESTING AND INSPECTION

.1 The Contractor will appoint and pay for the services of testing agency or testing laboratory as specified, and where required for the following:

.1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.

.2 Inspection and testing performed exclusively for Contractor's convenience.

.3 Testing, adjustment and balancing of conveying systems, mechanical and electrical equipment and systems:

.1 Mill tests and certificates of compliance.

.2 Tests specified to be carried out by Contractor under the Departmental Representative's supervision.

.2 Where tests or inspections by designated testing laboratory reveal work is not in accordance with the Contract requirements, Contractor shall pay costs for additional tests or inspections as the Departmental Representative may require to verify acceptability of correct work.

.3 Contractor shall furnish labour and facilities to:

.1 Notify Departmental Representative in advance of planned testing.

.4 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.

.5 Pay costs for uncovering and making good work that is covered before required inspection or testing is completed and approved by Departmental Representative.

.6 The Departmental Representative may require, and pay for, additional inspection and testing services not included in Paragraph 27.1.

.7 Provide Departmental Representative with 2 copies of testing laboratory reports as soon as they are available.

1.24 AS-BUILT DOCUMENTS

.1 The Departmental Representative will provide 2 sets of drawings, 2 sets of specifications, and 2 copies of the original AutoCAD files for "as-built" purposes.

.2 As work progresses, maintain accurate records to show all deviations from the Contract documents. Note on as-built specifications, drawings and shop drawings as changes occur.

.3 Refer to Section 01 70 00.

1.25 CLEANING

.1 Daily conduct cleaning and disposal operations. Comply with local ordinances and anti-pollution laws.

.2 **Ensure cleanup of the work areas each day after completion of work**.

.3 Clean interior building areas when ready to receive finish painting and continue cleaning on an as-needed basis until building is sufficiently completed or ready for occupancy.

.4 In preparation for interim and final inspections:

.1 Examine all sight-exposed interior and exterior surfaced and concealed spaces.

.2 Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from sight-exposed interior and exterior finished surfaces, including glass and other polished surfaces.

.5 Use cleaning materials and methods in accordance with instructions of the manufacturer of the surface to be cleaned.

1.26 DUST CONTROL

.1 Provide temporary dust tight screens or partitions to localize dust generating activities, and for protection of workers, finished areas of work and public.

1.27 PUBLIC WAY CONSTRUCTION

.1 Design, erect and maintain hoarding and covered pedestrian walkways to support all loads including windloads and provide protection, complete with signs and electrical lighting as required by authority having jurisdiction.

.2 Provide one lockable truck entrance gate and one pedestrian door as directed and conforming to applicable traffic restrictions on adjacent street. Equip gates with locks and keys. Paint public side of site enclosure in colour selected by Departmental Representative.

1.28 ENVIRONMENTAL PROTECTION

.1 Prevent extraneous materials from contaminating air beyond construction area, by providing temporary enclosures during work.

.2 Do not dispose of waste or volatile materials into water courses, storm or sanitary sewers.

.3 Ensure proper disposal procedures in accordance with all applicable territorial regulations.

1.29 MAINTENACE MATERIALS, SPECIAL TOOLS AND SPARE PARTS

.1 Specific requirements for maintenance materials, tools and spare parts are specified in individual sections of Divisions 02 to 13.

1.30 ADDITIONAL DRAWINGS

.1 The Departmental Representative may furnish additional drawings for clarification. These additional drawings have the same meaning and intent as if they were included with plans referred to in the Contract documents.

.2 Upon request, Departmental Representative may furnish up to a maximum of 10 sets of Contract documents for use by the Contractor at no additional cost. Should more than 10

sets of documents be required the Departmental Representative will provide them at additional cost.

1.31 BUILDING SMOKING ENVIRONMENT

.1 Smoking within the building is not permitted.

1.32 SYSTEM OF MEASUREMENT

.1 The metric system of measurement (SI) will be employed on this Contract.

1.33 FAMILIARIZATION WITH SITE

.1 Before submitting the tender, the General Contractor may visit the site to become more familiar with the site conditions.

1.34 SUBMISSION OF TENDER

.1 Submission of a tender is deemed to confirmation of the fact that the Tenderer has analyzed the Contract documents and is fully aware of the scope..

Part 2 Products

.1 Not used.

Part 3 Execution

.1 Not used.

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.2 ADMINISTRATIVE

.1 Submit to Departmental Representative submittals listed for review. 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 shall not proceed until review is complete.

.3 Present Shop Drawings, product data, samples and mock-ups in units shown on Drawings.

.4 Where items or information is not manufactured or produced in SI Metric units, converted values within the metric measurement tolerances are acceptable.

.5 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirement have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents.

.6 Fire protection and life-safety shop drawings shall be submitted to the responsible authority as a complete package, by trade, after review and comment by the design consultant. After shop drawing review by the responsible authority, comments from both consultant and responsible authority shall be acted upon prior to material order and installation.

.7 Submittals not stamped, signed, dated, identified as to specific project, and attesting to their being reviewed will be returned without being examined and shall be considered rejected.

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

.9 Verify field measurements and affected adjacent Work are coordinated.

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

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

.12 Keep one (1) reviewed copy of each submission on site.

1.3 SUBMITTALS

.1 Prepare and issue submittals to Departmental Representative for review.

.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 Process substitutions through Departmental Representative.

.5 Process change orders through Departmental Representative.

.6 Deliver closeout submittals for review and preliminary inspections, for transmittal to Departmental Representative.

1.4 SHOP DRAWINGS AND PRODUCT DATA

.1 Allow ten (10) days for Departmental Representative's review of each submission.

.2 Adjustments made on Shop Drawings and Product Data by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.

.3 Make changes in Shop Drawings and Product Data as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of any revisions other than those requested.

.4 Submissions shall include:

.1 Transmittal letter, containing date, project title and number, Trade Contractor's name and address, identification and quantity of each shop drawing, product data and sample, and other pertinent data.

.2 Trade Contractor's stamp, signed by Trade Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.

.3 Details of appropriate portions of Work as applicable:

.1 Fabrication.

.2 Layout, showing dimensions, including identified field dimensions, and clearances.

. .3 Setting or erection details.

.4 Capacities.

.5 Performance characteristics.

.6 Standards.

.7 Operating weight.

.8 Wiring diagrams.

.9 Single line and schematic diagrams.

.10 Relationship to other parts of the Work.

.5 After Departmental Representative's review, the General Contractor will distribute copies.

.6 Submit electronic full-colour copy of Shop Drawings and Product Data for each requirement requested in specification sections and as Departmental Representative may reasonably request. Electronic submittals are limited to those printable on Letter and Tabloid sized paper.

.7 Submit one (1) full colour prints of Shop Drawings and Product Data for each requirement requested in specification Sections and as Departmental Representative may reasonably request for large format submittals and formats greater than Tabloid size.

.8 Delete information not applicable to project. Delete information by crossing-out text manually.

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

.10 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned, and fabrication and installation of Work may proceed. If Shop Drawings and Product Data are rejected, noted copy will be returned and re-submission of corrected Shop Drawings and Product Data, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

1.5 SAMPLES

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

.2 Deliver samples prepaid to Departmental Representative's business address.

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

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

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

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

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

1.6 CERTIFICATES AND TRANSCRIPTS

.1 Immediately after award of Contract, submit:

1. Workers' Compensation Board status.

2. Transcription of insurance.

3 Safety Certificate.

Part 2 Products

.1 Not used.

Part 3 Execution

.1 Not used.

END OF SECTION

Part 1 General

PWGSC Update on Asbestos Use

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

COVID 19

All contractors shall follow Canadian Construction Association COVID-19 - Standardized Protocols for All Canadian Construction Sites

1.1 REFERENCES

.1 Government of Canada.

- .1 Canada Labour Code - Part II (as amended)
- .2 Canada Occupational Health and Safety Regulations. (as amended)

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

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

.3 The Canadian Electrical Code (as amended)

.4 Canadian Standards Association (CSA) as amended:

- .1 CSA Z797-2018 Code of Practice for Access Scaffold.
- .2 CSA S269.1-2016 Falsework for Construction Purposes.
- .3 CSA S350-M1980 (R2003) Code of Practice for Safety in Demolition of Structures.
- .4 CSA Z1006-10 Management of Work in Confined Spaces.
- .5 CSA Z462-18 Workplace Electrical Safety Standard

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

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

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

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

.7 Province of British Columbia:

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

.8 Appendix A: Hazardous Building Materials Assessment Site Review Report (24 February 2020)

1.2 RELATED SECTIONS

.1 Refer to the following current NMS sections as required:

- .1 Section 01 11 55 - General Instructions

1.3 WORKERS' COMPENSATION BOARD COVERAGE

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

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

1.4 COMPLIANCE WITH REGULATIONS

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

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

1.5 SUBMITTALS

.1 Submit to Departmental Representative submittals listed for review in accordance with Section 01 33 00.

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

.3 Submit the following:

.1 Organizations Health and Safety Plan.

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

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

.3 Copies of incident and accident reports.

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

.5 Emergency Response Procedures.

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

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

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

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

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

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

1.6 RESPONSIBILITY

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

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

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

1.7 HEALTH AND SAFETY COORDINATOR

.1 The Health and Safety Coordinator must:

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

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

.3 Be on site during execution of work.

1.8 GENERAL CONDITIONS

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

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

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

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

1.9 PROJECT/SITE CONDITIONS

.1 Work at site will involve contact with:

.1 Multi-employer work site.

.2 Federal employees and general public.

.3 Energized electrical services.

.4 Working from heights.

.5 Persons incarcerated in the federal institutional system.

.6 Reference: PSPC Preliminary Hazard Assessment

1.10 UTILITY CLEARANCES

.1 The Contractor is solely responsible for all utility detection and clearances prior to starting the work.

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

1.11 REGULATORY REQUIREMENTS

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

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

1.12 WORK PERMITS

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

1.13 FILING OF NOTICE

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

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

1.14 SITE SPECIFIC HEALTH AND SAFETY PLAN

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

.2 Prepare and comply with the Site Specific Safety Plan (SSSP) or Health and Safety Plan (HASP) based on the required hazard assessment, including, but not limited to, the following:

- .1 Primary requirements:
  - .1 Contractor's safety policy.
  - .2 Identification of applicable compliance obligations.
  - .3 Definition of responsibilities for project safety/organization chart for project.
  - .4 General safety rules for project.
  - .5 Job-specific safe work, procedures.
  - .6 Inspection policy and procedures.
  - .7 Incident reporting and investigation policy and procedures.
  - .8 Occupational Health and Safety Committee/Representative procedures.
  - .9 Occupational Health and Safety meetings.
  - .10 Occupational Health and Safety communications and record keeping procedures.
  - .11 COVID 19 Protocols and Procedures
- .2 Summary of health risks and safety hazards resulting from analysis of hazard assessment, with respect to site tasks and operations which must be performed as part of the work.
- .3 List hazardous materials to be brought on site as required by work. SDS required for all products.
- .4 Indicate Engineering and administrative control measures to be implemented at the site for managing identified risks and hazards.
- .5 Identify personal protective equipment (PPE) to be used by workers.

.6 Identify personnel and alternates responsible for site safety and health.
.7 Identify personnel training requirements and training plan, including site orientation for new workers.

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

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

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

1.15 EMERGENCY PROCEDURES

.1 List standard operating procedures and measures to be taken in emergency situations. Include an emergency response and emergency evacuation plan and emergency contacts (i.e.names/telephone numbers) of:
.1 Designated personnel from own company.
.2 Regulatory agencies applicable to work and as per legislated regulations.
.3 Local emergency resources.
.4 Departmental Representative.
.5 A route map with written directions to the nearest hospital or medical clinic.

.2 Include the following provisions in the emergency procedures:
.1 Notify workers and the first-aid attendant, of the nature and location of the emergency.
.2 Evacuate all workers safely.
.3 Check and confirm the safe evacuation of all workers.
.4 Notify the fire department or other emergency responders.
.5 Notify adjacent workplaces or residences which may be affected if the risk extends beyond the workplace.
.6 Notify Departmental Representative.

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

.1 Work at high angles.
.2 Work in confined spaces or where there is a risk of entrapment.
.3 Work with hazardous substances.
.4 Underground work.
.5 Work on, over, under and adjacent to water.
.6 Workplaces where there are persons who require physical assistance to be moved.

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

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

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

1.16 HAZARDOUS PRODUCTS

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

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

.1 Advise Departmental Representative beforehand of the product(s) intended for use. Submit applicable SDS and WHMIS 2015 documents as per Section 01 33 00.

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

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

.4 The contractor shall ensure that only pre-approved products are bought onto the work site in an adequate quantity to complete the work.

1.17 ASBESTOS HAZARD

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

.2 Removal and handling of asbestos will be in accordance with current applicable Provincial / Federal Regulations.

1.18 PCB REMOVALS

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

.2 Remove, handle, transport and dispose of as indicated in Division 2 specifications.

1.19 REMOVAL OF LEAD-CONTAINING PAINT

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

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

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

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

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

1.20 OVERLOADING

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

1.21 FALSEWORK

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

1.22 SCAFFOLDING

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

1.23 CONFINED SPACES

.1 Carry out work in compliance with current Provincial / Territorial regulations.

1.24 POWDER-ACTUATED DEVICES

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

1.25 FIRE SAFETY AND HOT WORK

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

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

.3 Hot Work permits are a mandatory requirement for any hot work activities.

1.26 FIRE SAFETY REQUIREMENTS

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

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

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

.4 Provide a fire rated storage cabinet as per NFC 2015 Subsection 4.2.10. Storage of gasoline in jerry cans outside of fire rated storage cabinet is limited to 5 litres.

1.27 FIRE PROTECTION AND ALARM SYSTEM

.1 Fire protection and alarm systems shall not be:

- .1 Obstructed.
- .2 Shut off.
- .3 Left inactive at the end of a working day or shift.

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

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

1.28 UNFORESEEN HAZARDS

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

1.29 POSTED DOCUMENTS

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

- .1 Site Specific Safety Plan (SSSP) or Health and Safety Plan (HASP)
- .2 Sequence of work.

.3 Emergency procedures.
.4 Site drawing showing project layout, locations of the first-aid station, evacuation route and marshalling station, and the emergency transportation provisions.
.5 Notice of Project.
.6 Floor plans or site plans. Must be posted in a non-inmate access area and locked up when not being used.
.7 Notice as to where a copy of the Workers' Compensation Act and Regulations are available on the work site for review by employees and workers.
.8 Workplace Hazardous Materials Information System (WHMIS 2015) documents.
.9 Material Safety Data Sheets (SDS).
.10 List of names of Joint Health and Safety Committee members, or Health and Safety Representative, as applicable.
.11 All Hazardous Material and Substance Reports including Lab Analysis

.2 Post all Material Safety Data Sheets (MSDS) on site, in a common area, visible to all workers and in locations accessible to tenants when work of this Contract includes construction activities adjacent to occupied areas.
.3 Postings should be protected from the weather, and visible from the street or the exterior of the principal construction site shelter provided for workers and equipment, or as approved by the Departmental Representative.

1.30 MEETINGS

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

1.31 CORRECTION OF NON-COMPLIANCE

.1 Immediately address health and safety non-compliance issues identified by the Departmental Representative.
.2 Provide Departmental Representative with written report of action taken to correct non-compliance with health and safety issues identified.
.3 The Departmental Representative may issue a "stop work order" if noncompliance of health and safety regulations is not corrected immediately or within posted time. The General Contractor/subcontractors will be responsible for any costs arising from such a "stop work order".

Part 2 Products

.1 Not used.

Part 3 Execution

.1 Not used

END OF SECTION

Part 1 General

1.1 DEFINITIONS

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

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

1.2 SUBMITTALS

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

.2 Prior to commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and approval by Consultant Environmental Protection Plan is to present comprehensive overview of known or potential environmental issues which must be addressed during construction.

.3 Address topics at level of detail commensurate with environmental issue and required construction tasks.

.4 Environmental protection plan, include:

.1 Names of persons responsible for ensuring adherence to Environmental Protection Plan.

.2 Names and qualifications of persons responsible for manifesting hazardous waste to be removed from site.

.3 Names and qualifications of persons responsible for training site personnel.

.4 Descriptions of environmental protection personnel training program.

.5 Erosion and sediment control plan.

.6 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Plan to include measures for marking limits of use areas including methods for protection of features to be preserved within authorized work areas.

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

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

.9 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, do not become air borne and travel off project site.

.10 Contaminant prevention plan that: identifies potentially hazardous substances to be used on job site; identifies intended actions to prevent introduction of such materials into air, water, or ground; and details provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.

.11 Wastewater management plan that identifies methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.

1.3 FIRES

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

1.4 DISPOSAL OF WASTES

.1 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.

.2 Contractor shall ensure all food waste is removed from construction site and properly disposed of daily.

1.5 DRAINAGE

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

.2 Do not pump water containing suspended materials into waterways or drainage systems. Migration to water retention pond is allowed.

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

1.6 SITE CLEARING AND PLANT PROTECTION

.1 Protect trees and plants on site and adjacent properties where indicated on Drawings and in Specifications.

.2 Wrap in burlap, trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2 m.

.3 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones.

.4 Minimize stripping of topsoil and vegetation.

.5 Restrict tree removal to areas indicated or designated by Consultant.

1.7 POLLUTION CONTROL

.1 Maintain temporary erosion and pollution control features installed under this contract.

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

.3 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area, by providing temporary enclosures.

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

1.8 NOTIFICATION

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

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

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

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

Part 2 Products

2.1 Not used

Part 3 Execution

3.1 Not used

END OF SECTION

Part 1 General

1.1 RELATED DOCUMENTS

.1 This section describes requirements applicable to all Sections within Divisions 02 to 09.

1.2 AUTHORITY HAVING JURISDICTION

.1 This Project has been designed in accordance with applicable local codes and ordinances, and with requirements of other authorities having jurisdiction.

.2 The Trade Contractor will notify the General Contractor in writing of any work not designed to local codes/ordinances, so as not to delay construction.

.3 Comply with the current edition of the National Building Code 2015 and British Columbia Building Code 2018, including all subsequent bulletins and updates.

1.3 LAWS, NOTICES, PERMITS AND FEES

.1 The laws of the Place of the Work shall govern the Work.
.2 General Contractor shall be responsible for any required permits and fees.
.3 The Trade Contractor shall be responsible for permits, licenses or certificates necessary for the performance of the Work which were in force at the date of executing the Agreement.
.4 Give the required notices and comply with the laws, ordinances, rules, regulations or codes which are or become in force during the performance of the Work and which relate to the Work, to the preservation of the public health and to construction safety.
.5 If the Trade Contractor knowingly performs or allows work to be performed that is contrary to any laws, ordinances, rules, regulations or codes, the Trade Contractor shall be responsible for and shall correct the violations thereof; and shall bear the costs, expenses and damages attributable to the failure to comply with the provisions of such laws, ordinances, rules, regulations or codes.
.6 Determine detailed requirements of authorities having jurisdiction.
.7 Pay construction damage deposits levied by municipality in connection with the issuance of a permit.

1.4 HAZARDOUS MATERIAL DISCOVERY

.1 If hazardous material is encountered in course of Work, immediately stop work and notify General Contractor.

1.5 PERSONNEL SMOKING

.1 Comply with regulatory and Departmental Representative imposed smoking restrictions during execution of the Work within or outside the premises.

Part 2 Products

.1 Not used.

Part 3 Execution

.1 Not used

END OF SECTION

Part 1 General

1.1 DEFINITIONS

.1 Quality Assurance: Activities, actions, and procedures performed before and during execution of the Work by the General Contractor to protect against defects and deficiencies and confirming that construction is consistent with regulatory requirements, qualification statements and certification requirements listed within the Contact Documents.

.2 Quality Control (Testing by General Contractor): Tests, inspections, procedures, and related actions performed by the General Contractor during and after execution of the Work using third party testing agency to verify that completed construction complies with specified standards and technical requirements within the Contract Documents; these services do not include contract administration and reporting performed by Departmental Representative, or Quality Auditing activities performed by Departmental Representative.

.3 Quality Audit (Testing by Departmental Representative): Tests, inspections, procedures and related actions performed by the Departmental Representative during and after execution of the Work using third party testing agency to establish that work complies with Contract Documents and are additional to the Quality Control and Assurance provided by the General Contractor, or contract administration and reporting performed by Departmental Representative.

.4 Mock-ups: Full size, physical example assemblies to illustrate finishes and materials. Mock-ups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not samples; mock-ups establish the standard by which the Work will be judged. Testing Agency: An entity engaged to perform specific tests, inspections, or both.

Testing laboratory to mean the same as testing agency.

1.2 REFERENCE STANDARDS

.1 The testing of materials may be requested by the Departmental Representative, to prove conformance with these standards.

.2 The referenced standards and amendments or updates that may be in force on the day of receipt of Bids is applicable to the Work for the duration of the Contract.

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Coordination of Testing by General Contractor: General Contractor will coordinate all testing required by Departmental Representative and individual requirements of the specifications; General Contractor shall submit examination results from testing performed to Departmental Representative as required by Contract Documents.

.2 Scheduling Testing Activities: Schedule activities to accommodate required quality assurance and quality control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting:

.1 Schedule times for tests, inspections, obtaining samples, and similar activities.

.2 Distribution: Distribute schedule to Departmental Representative, testing agencies, and each party involved in performance of portions of the Work when tests and inspections are required.

1.4 SUBMITTALS

.1 Submit required information in accordance with Section 01 33 00 – Submittal Procedures.

.2 Action Submittals: Before starting work of this Section, submit the following:

.1 Qualification Data: For testing agencies specified in this Section to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority

.2 Schedule of Tests and Inspections: Submit in tabular form and include the following:

.1 Specification Section number and title

.2 Description of test and inspection

.3 Identification of applicable standards

.4 Identification of test and inspection methods

.5 Number of tests and inspections required

.6 Time schedule or time span for tests and inspections

.7 Entity responsible for performing tests and inspections

.8 Requirements for obtaining samples

.9 Unique characteristics of each quality control service

.3 Reports: Prepare and submit certified written reports that include the following:

.1 Date of issue

.2 Project title and number

.3 Name, address, and telephone number of testing agency

.4 Dates and locations of samples and tests or inspections

.5 Names of individuals making tests and inspections

.6 Description of the Work and test and inspection method

.7 Identification of product and Specification Section

.8 Complete test or inspection data

.9 Test and inspection results and an interpretation of test results

.10 Ambient conditions at time of sample taking and testing and inspecting

.11 Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements

.12 Name and signature of laboratory inspector

.13 Recommendations on re-testing and re-inspecting

.4 Permits, Licenses, and Certificates: Submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work for Departmental Representative's records.

1.5 QUALITY ASSURANCE

.1 Qualifications:

.1 Fabricator Qualifications: Experienced in producing products similar to those indicated for this project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

.2 Factory Authorized Service Representative Qualifications: An authorized representative of manufacturer trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

.3 Installer Qualifications: Experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this project, whose work has resulted in construction with a record of successful in-service performance.

.4 Manufacturer Qualifications: Experienced in manufacturing products or systems similar to those indicated for this project and with a record of successful in service performance.

.5 Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this project in material, design, and extent.

.6 Testing Agency Qualifications: An agency with the experience and capability to conduct testing and inspecting indicated, and that specializes in types of tests and inspections to be performed.

1.6 MOCK-UPS

.1 Before installing portions of the Work requiring mock-ups, build mock-ups for each form of construction and finish required to comply with the requirements of this Section, and any additional requirements listed in the technical Sections, using materials indicated for the completed Work.

.2 Build mock-ups in location and of size indicated; or if not indicated, as directed by Departmental Representative.

.3 Notify Departmental Representative seven (7) days in advance of dates and times when mock-ups will be constructed, unless indicated otherwise:

.1 Failure to prepare mock-up in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default is acceptable.

.2 When requested in writing by the General Contractor, Departmental Representative will assist in preparing a schedule fixing the dates for preparation or mock-ups.

.4 Mock-ups are required to demonstrate proposed range of aesthetic effects and workmanship:

.1 Obtain Departmental Representative's acceptance of mock-ups prior to starting work, fabrication, and construction. Modify or replace unacceptable mock-ups as directed by the Departmental Representative to obtain acceptance.

.2 Maintain mock-ups during construction in an undisturbed condition as a standard for judging the completed Work.

.3 Demolish and remove mock-ups from Project site when directed by the Departmental Representative; acceptable mock-ups in an undisturbed condition at the time of Substantial Performance may become part of the completed Work where they form a part of the completed Work, unless indicated specifically otherwise.

1.7 QUALITY CONTROL TESTING BY THE CONTRACTOR

.1 The Contractor shall retain the services of a testing agency under supervision of a registered professional engineer, and pay the cost of testing services for quality Control, including, but not limited to, the following:

.2 The Contractor shall provide all labour, materials and equipment, and shall perform all tests, for linings, coatings, pressure tests, leakage tests, infiltration tests, disinfection, and all other tests specified under the various sections of the specifications, including all documentation, reporting and professional certification of conformance.

1.8 INSPECTION AND TESTING OF WORK

.1 Work included: From time to time during progress of the work, the Departmental Representative may require that Quality Control Testing be performed to determine that materials and workmanship provided for the work meet the specified requirements.

.2 Related Work Specified Elsewhere: Requirements for testing may be described in various sections of these specifications. Where no testing requirements are described, but the Departmental Representative decides that testing is required, the Departmental Representative may require testing to be performed under current pertinent standards for testing.

1.9 INDEPENDENT PROFESSIONAL QUALITY CONTROL

.1 All costs required to ensure and demonstrate quality and conformance shall be borne by the Contractor and shall be included in other related unit price and lump sum bid. No separate payment will be made for this item.

.2 The Contractor will appoint a professional independent Geotechnical Engineering and Testing firm and other appropriately qualified professionals with a suitable Laboratory and other necessary testing equipment and fully qualified to perform whatever Quality Control Testing as stipulated in these specifications plus any additional testing that is deemed necessary by the Departmental Representative to confirm the compliance of the work within the Contract Documents. For items such as ESC Consulting, Electrical Testing, Hazmat inspections, etc., the Contractor shall engage the services of a fully qualified professional permitted to practice at the project location.

.3 Departmental Representative will not pay for or reimburse Contractor for any services related to testing of the following:

.1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.

.2 Inspection and testing performed exclusively for Contractor's convenience.

.3 Testing, adjustment and balancing of conveying systems, mechanical and electrical equipment and systems.

.4 Mill tests and certificates of compliance.

.5 The Contractor’s responsibility for Quality Control of the Work under these specifications.

.4 Where tests by designated testing laboratory reveal work not in accordance with Contract requirements, the Contractor shall pay costs for additional tests and documented proof of conformance as Departmental Representative may require to verify acceptability of corrected work.

.5 Where tests are called prematurely or the testing laboratory is delayed by the Contractor, the Contractor shall pay all additional costs incurred. The Contractor shall be responsible for the ordering, coordination, scheduling and locating related to testing. The Contractor shall not be entitled to submit any claims for the cost of delays or standby time that may be caused by the need for testing or any independent testing that may be deemed necessary by the Departmental Representative.

.6 The Contractor will appoint an independent Survey firm to perform required Quality conformance surveys if it is deemed necessary by the Departmental Representative to confirm compliance of the work within the Contract Documents.

.7 If the independent survey firm reveals work not in accordance with Contract requirements, the Contractor shall pay costs for the survey and the costs for correcting the work.

1.10 LABORATORIES/AGENCIES

.1 Independent Testing Agencies shall provide proof of professional accreditation for performing such work within the jurisdiction of the project location and will be subject to the approval of the Departmental Representative for the purpose of testing portions of the work. Costs of such services will be included in other related unit price and lump sum bid and incidental to the project. No separate payment will be made for this item.

.2 The cost of transportation (including shipping charges) shall be borne by the Contractor and shall be included in other related unit price and lump sum bid and incidental to the project. No separate payment will be made for this item.

.3 The Contractor shall pay the full cost of all testing and reporting required for the approval of materials such as pipe, aggregates, and fittings and all other materials, workmanship and product, including professional certification of compliance.

1.11 ACCESS TO WORK AND PLANT

.1 Allow the Testing Agencies access to all portions of work on site and manufacturing and fabrication plants, as may be necessary to carry out their work. Cooperate to provide reasonable facilities for such access.

1.12 PROCEDURES FOR INSPECTION AND TESTING

.1 If work is designated for special tests, inspections, or approvals in the Contract Documents, or by the Departmental Representative's instructions or the laws or ordinances of the Place of the Work, give the Independent Testing Agency timely notice requesting inspection. Inspection by the Independent Testing Agency will be made promptly. Arrange for inspections by other authorities and give the Departmental Representative timely notice of the date and time.

.2 Submit necessary samples and/or materials required for testing, as specifically requested in the Specifications. Submit with reasonable promptness and in an orderly sequence, so as to cause no delay in Work.

.3 Provide workers and facilities to obtain and handle samples and/or materials on-site. Provide sufficient space to facilitate the storage and curing of test samples.

.4 If defects are revealed during testing, the appointed agency will request additional testing to ascertain full degree of defects. Correct defects and irregularities as advised by the Departmental Representative.

.5 The Contractor shall correct defects and irregularities and pay all costs for all additional testing, necessary to demonstrate that any work where original tests failed have been corrected.

.6 The Contractor's independent testing firm shall provide professionally certified asphalt mix design 30 days prior to any paving and provide calculation of any deficiency penalty amounts to the Departmental Representative for review. The Departmental Representative will not provide any approval of asphalt mix designs. The Contractor's engineer shall retain professional responsibility for the adequacy and performance of the mix design.

1.13 COVERED WORK

.1 If the Contractor covers or permits to be covered work that has been designated for inspections or approvals before they are made, uncover such work, have the inspections or tests satisfactorily completed, and make good such work.

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

1.14 REJECTED WORK

.1 Defective work, whether the result of poor workmanship, use of defective products or damage through carelessness or other acts of omission of the Contractor, and whether incorporated in the work or not, which has been rejected by the Departmental Representative as failing to conform to the Contract Documents shall be removed promptly from the work and replaced or re-executed by the Contractor in accordance with the Contract Documents at the Contractor's expense.

.2 Other work destroyed or damaged by such removals, replacement or re-execution shall be made good promptly at the Contractor's expense.

.3 In the case where any rejected work requires removal and replacement which involves materials provided or made available to the Contractor by the Departmental Representative, the Contractor shall provide replacement materials at no cost to the Departmental Representative.

1.15 REPORTS

.1 Submit one compiled pdf of inspection and test reports promptly to the Departmental Representative for all requested Quality Control Testing as requested by the Departmental Representative.

.2 Submit a monthly testing summary report to the Departmental Representative.

.3 Submit a complete testing and compliance certification report prior to approval of substantial completion.

1.16 TESTS AND DESIGNS

.1 Furnish to the Departmental Representative test results and mix designs as specifically requested in the Specifications. The cost of test results and mix design shall be borne by the Contractor.

1.17 REFERENCE STANDARDS

.1 Within the test of the Specifications, reference may be made to the following standards:

ACI	- American Concrete Institute
AISC	- American Institute of Steel Construction
ANSI	- American National Standards Institute
ASTM	- American Society of Testing and Materials
AWWA	- American Water Works Association
CAN	- National Standard of Canada
CEC	- Canadian Electric Code (published by CSA)
CGA	- Canadian Gas Association
CGSB	- Canadian Government Specification Board
CISC	- Canadian Institute of Steel Construction
CLA	- Canadian Lumberman's Association
CPCA	- Canadian Painting Contractors Association
CPCI	- Canadian Prestressed Concrete Institute
CRCA	- Canadian Roofing Contractors Association
CSA	- Canadian Standards Association
DIN	- Deutsches Institut Normung
EEMAC	- Electrical and Electronic Manufacturer's Association of Canada
EIB	- Electrical Inspection Branch
FMEC	- Factory Manual Engineering Corporation
IEEE	- Institute of Electrical and Electronic Engineers
IPCEA	- Insulated Power Cable Engineers Association
NAAMM	- National Association of Architectural Metal Manufacturers
NACE	- National Association of Corrosion Engineers
NBC	- National Building Code
NEMA	- National Electrical Manufacturers Association
NFPA	- National Fire Protection Association
NWTI	- National Wood Tank Institute of the USA
TTMAC	- Terrazzo, Tile and Marble Association of Canada
ULC	- Underwriters Laboratories of Canada

Conform to the latest version of such standards available at the time of bidding, in whole or in part, as specified.

In the event that any standards reference is discovered to be missing from the above list, then the applicable standards reference that must be met by the Contractor shall be determined by the Departmental Representative.

.2 If there are questions as to whether any product of system is in conformance with applicable standards, the Departmental Representative reserves the right to have such products or systems tested to prove or disprove conformance with the Contract Documents, or by the Contractor in the event of non-conformance.

Part 2 Products

Not used

Part 3 Execution

3.1 SITE QUALITY CONTROL

.1 Technical specification Sections indicate specific requirements for site quality control inspections and testing. This Section describes administrative requirements for conducting site quality control inspections and testing.

.2 Departmental Representative Responsibilities for Quality Audits: Departmental Representative will engage a qualified testing agency to perform testing and inspections where quality control services are indicated as Departmental Representative's responsibility within the technical specification Sections or where the Departmental Representative requires additional testing to confirm that performance requirements required by the Contract Documents.

.1 Departmental Representative will provide General Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of the types of testing and inspecting they are engaged to perform.

.2 Costs for re-testing and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents shall be paid by General Contractor.

.3 Additional tests and inspections may be required by the Departmental Representative where additional tests are determined to be necessary to establish confirmation of performance.

.3 Costs for testing and inspection required by technical specification Sections or by Authority Having Jurisdiction are identified within affected technical specification Sections as being paid for by the General Contractor.

.4 General Contractor's Project Control: Use only specified materials or materials found acceptable by the Departmental Representative; be responsible for and maintain an effective quality control program and perform sufficient inspections and tests of all items of Work, to verify compliance with Contract Documents:

.1 Verify that installation is in accordance with the specified requirements, to manufacturer's written instructions, or to methods that have been submitted and found acceptable by the Departmental Representative prior to proceeding with the Work.

.5 Manufacturer's Site Services: Engage a factory authorized service representative to inspect site assembled components and equipment installation, including service connections where indicated and submit written report of findings or test results to Departmental Representative.

.6 Testing Agency Responsibilities: Cooperate with Departmental Representative and General Contractor in performance of duties; provide qualified personnel to perform required tests and inspections and as follows:

.1 Notify Departmental Representative and General Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.

.2 Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.

.3 Submit a certified written report of each test, inspection, and similar quality control service through the General Contractor when tests are paid for by the General Contractor, and submit to the Departmental Representative.

.4 Testing agency is not required to undertake instructions that releases, revokes, alters or increases requirements of the Contract Documents or approves or accepts any portion of the Work.

.5 Testing agency is not required to perform any duties of General Contractor.

.6 Testing agency is not required to perform any duties of the Departmental Representative.

.7 Associated Services: Cooperate with agencies performing required tests, inspections and similar quality control services, and provide reasonable auxiliary services as requested:

.1 Notify agency sufficiently in advance of operations to permit personnel assignment and scheduling

.2 Preliminary design mix proposed for use for material mixes that require control by testing agency

.3 Access to the Work

.4 Incidental labour and facilities necessary to facilitate tests and inspections

.5 Adequate quantities of representative samples of materials that require testing and inspecting.

.6 Assist agency in obtaining samples

.7 Facilities for storage and site curing of test samples.

.8 Repair: Repair damaged construction and restore substrates and finishes in accordance with Section 01 70 00 on completion of testing, inspecting, sample taking, and similar services:

.1 Protect construction exposed by, or for quality control service activities.

.2 Repair and protection of the Work are General Contractor's responsibility regardless of the assignment of responsibility for quality control services.

3.2 CLOSEOUT ACTIVITIES

.1 Re-testing/Re-inspections: General Contractor to be responsible for quality control services including re-testing and re-inspecting, for construction that revised or replaced Work that failed to comply with requirements of the Contract Documents:

.1 Costs for re-testing and re-inspections to be paid for by the General Contractor.

.2 Correction of Rejected Work: Remove defective Work, whether the result of poor workmanship, use of defective products or damage and whether incorporated in the Work or not, which has been rejected by the Departmental Representative as failing to conform to the Contract Documents:

.1 Replace or re-execute in accordance with originally specified performance requirements.

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

.3 Departmental Representative may deduct from the Contract Price the difference in value between the Work performed and that called for by the Contract Documents; the amount of which will be determined by the Departmental Representative, where corrective work is not expedient to repair rejected Work, or Work is not performed in accordance with the Contract Documents.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

.1 In each technical specification Section, text may reference specific reference standards relating to materials required for the Project. Comply with referenced standards indicated to the extent indicated, or where no extent is specified conform to applicable portions.

.2 If the Departmental Representative has doubt of Work conforming to referenced standards, tests may be ordered to verify conformance.

.3 Cost for testing to determine whether performance is being met by the referenced standards will be born by Departmental Representative in event of conformance with Contract Documents or born by Contractor in event of non-conformance.

.4 Conform to referenced standards latest date of issue in effect on Bid closing date, except where a specific date or issue is specified.

1.2 COORDINATION

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

Part 2 Products

2.1 QUALITY OF PRODUCTS

.1 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error:

.1 Remove and replace defective products and work results at Contractor's own expense and be responsible for delays and expenses caused by rejection.

.2 Decision rests strictly with the Departmental Representative based upon requirements of Contract Documents where any disputes arise as to quality of products.

.3 Maintain uniformity of manufacture for any particular item or similar item throughout the Work.

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

2.2 AVAILABILITY OF PRODUCTS

.1 Review product delivery requirements and anticipate foreseeable supply delays for items immediately upon signing Contract:

.1 Immediately notify Departmental Representative of foreseeable supply delays in order that substitutions or other remedial action may be authorized in sufficient time to prevent delay in performance of Work.

.2 Failure to notify Departmental Representative at commencement of Work where it subsequently appears that Work may be delayed as a result of foreseeable delays, Departmental Representative reserves right to substitute more readily available products of similar qualities, at no increase in Contract Price or Contract Time.

2.3 STORAGE, HANDLING AND PROTECTION OF PRODUCTS

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

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

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

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

.5 Keep sand for grout or mortar materials, clean and dry. Store sand on platforms and cover with waterproof protection layers during inclement weather.

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

.7 Store and mix paints in temperature controlled rooms with ventilation. Remove oily rags and other combustible waste from site daily. Take every precaution necessary to prevent spontaneous combustion.

.8 Remove and replace damaged products at own expense.

.9 Touch-up damaged factory finishes, and as directed by Departmental Representative. Use touch-up materials matching original. Do not paint over name plates.

2.4 TRANSPORTATION OF PRODUCTS

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

.2 Transportation cost of products supplied by Departmental Representative will be paid for by Departmental Representative; unload, handle and store such products unless explicitly indicated otherwise.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Install, apply, or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures included with products, obtain written instructions directly from manufacturers.

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

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

3.2 QUALITY OF WORKMANSHIP

.1 Construct Work with workers experienced and skilled in respective construction duties. Departmental Representative reserves right to request dismissal from site workers deemed incompetent or careless.

.2 Immediately notify Departmental Representative if Contract Documents is such as to make it impractical to produce required results.

.3 Decisions of quality of workmanship in cases of dispute rest solely with Departmental Representative.

3.3 CONCEALMENT

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

.2 Before installation, inform Departmental Representative of interferences. Install as directed by Departmental Representative.

3.4 REMEDIAL WORK

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

.2 Perform remedial work by specialists familiar with materials affected.

.3 Perform remedial work in a manner to neither damage, nor put at risk any portion of Work.

3.5 LOCATION OF FIXTURES

.1 Locations indicated of fixtures, outlets, mechanical items, and electrical items are approximate.

.2 Inform Departmental Representative of installation conflicts. Propose alternative installation and install as directed by Departmental Representative.

3.6 PROTECTION OF WORK IN PROGRESS

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

3.7 EXISTING UTILITIES

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

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

END OF SECTION

Part 1 General

1.1 STARTING COMPONENTS

.1 Coordinate schedule for start-up of various equipment and systems. Notify Departmental Representative seven (7) days prior to start-up of each item.

.2 Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions which may cause damage.

.3 Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer. Verify that wiring and support components for equipment are complete and tested.

.4 Execute start-up under supervision of applicable manufacturer's representative and Contractors' personnel in accordance with manufacturers' instructions.

.5 Submit a written report in accordance with Section 01 33 00 that equipment or system has been properly installed and is functioning correctly.

1.2 START-UP REPORT

.1 Develop and provide report forms for all control points, software and hardware. Submit completed reports for review and acceptance.

.2 Include manufacturer's equipment start-up reports and test certificates as an appendix to the maintenance manual.

- .1 Maintain this manual current.
- .2 Maintain a schedule for work with the commissioning schedule.

.3 Complete, submit, and verify maintenance manual to the Departmental Representative with all data entered and sign-offs, prior to Substantial Completion of the Work.

1.3 CONTRACTOR START UP

.1 Contractor to perform the following during start-up:

- .1 Start equipment and systems.
- .2 Test, adjust and balance equipment.
- .3 Demonstrate equipment in operation.

.2 Complete and submit start-up reports including:

- .1 Contractor's system and equipment start up reports.
- .2 Manufacturers' equipment start up reports.

.3 Correct Contract deficiencies and defects identified.

.4 The following will be performed to an on-going cycle of:

.1 Departmental Representative's inspections.

.2 Documentation of results.

.3 Diagnosis of problems.

.4 Correction of Contract Deficiencies and execution of Change Orders as required.

.5 Verification of results.

.5 When partial utilization of the Work is required, the applicable requirements specified in this section apply to the part(s) of the Work to be utilized.

1.4 SEASONAL CONSTRAINTS

.1 Notwithstanding requirements in this section, additional separate cycles of Contractor start-up, performance testing and fine tuning may be necessitated at a later time on equipment and systems whose full operation is dependent on seasonal conditions.

1.5 TESTING, ADJUSTING, AND BALANCING

.1 Prepare each system and item of equipment before testing, adjusting and balancing.

.2 Verify that each system and equipment installation is complete and in functional operation. Verify appropriate ambient conditions.

.3 Perform testing, adjusting and balancing of operating equipment.

.4 Prior to start of balancing, ensure equipment is:

.1 piped, ducted, wired and wireless services, including associated components and equipment,

.2 manually and mechanically operated, including components and equipment,

.3 test, adjust and balance equipment,

.4 operated at designated times, under conditions required for testing, adjusting, and balancing,

.5 Report any deficiencies or defects which may affect the balancing or noted during testing, adjusting and balancing, which cannot be promptly corrected.

.6 Adjust operating Products and equipment to ensure smooth and unhindered operation.

.7 Commencement of Warranty Periods: the date of Substantial Performance of the Work shall be the date for commencement of the warranty period.

1.6 CLOSEOUT SUBMITTALS

.1 Prepare instructions and data using personnel experienced in maintenance and operation of described products. Copy will be returned after final inspection, with Departmental Representative's comments. Revise content of documents as required prior to final submission.

.2 Two (2) weeks prior to Substantial Performance of the Work, submit four (4) final copies of printed operating and maintenance manuals.

.3 Ensure spare parts, maintenance materials and special tools provided are new, undamaged or defective.

.4 Organize data in the form of an instructional manual. Binders: Vinyl, hard covered, 3 'D' ring, loose leaf. Text: Manufacturer's electronic and printed data.

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

.6 Provide scaled computer drawing files in *.dxf or *.dwg AutoCAD Release 2014 format .

1.7 RECORDING ACTUAL SITE CONDITIONS

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

.2 Record information concurrently with construction progress. Do not conceal Work of the Project until required information is accurately recorded.

.3 Contract drawings and shop drawings - legibly mark each item to record actual construction, including:

.1 Measured depths of foundation in relation to finish first floor datum.

.2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

.3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.

.4 Field changes of dimension and detail.

.5 Changes made by change orders.

.6 Details not on original Contract Drawings.

.7 References to related shop drawings and modifications.

.4 Specifications: Legibly mark each item to record actual construction, including:

.1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.

.2 Changes made by Addenda and change orders.

1.8 FINAL SURVEY

.1 Submit final site survey certificate, certifying that elevations and locations of completed Work are in conformance or non-conformance with Contract Documents.

.2 Inaccurate or neglectful information shall become a liability to the Contractor.

1.9 WARRANTIES AND BONDS

.1 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten (10) days after completion of the applicable item of work. Designate name on warranty document in the name of the Departmental Representative.

1.10 MATERIALS AND FINISHES

.1 Building Products, Applied Materials, and Finishes: Include product data, with catalogue number, size, composition, and colour and texture designations for inclusion in the Maintenance Manual.

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

.3 Moisture-protection and Weather-exposed Products: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental

1.11 SPARE PARTS

.1 Provide spare parts, in quantities specified in individual specification sections.

.2 Receive and catalogue all items. Submit inventory listing to Departmental Representative. Include approved listings in Maintenance Manual.

.3 Provide maintenance and extra materials, in quantities specified in individual specification sections.

.1 Provide 1 box of ceramic tiles per ceramic tile type.

.4 Provide special tools, in quantities specified in individual specification section.

.5 Provide items with tags identifying their associated function and equipment.

1.12 STORAGE, HANDLING AND PROTECTION

.1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration. Store in original and undamaged condition with manufacturer's seal and labels intact.

.2 Store paints and freezable materials in a heated and ventilated room.

Part 2 Products

.1 Not used.

Part 3 Execution

.1 Not used.

END OF SECTION

Part 1 General

1.1 ADMINISTRATIVE REQUIREMENTS

.1 Coordination: Coordinate repair or replacement of broken or damaged materials with original installing Subcontractors.

1.2 QUALITY ASSURANCE

.1 Regulatory Requirements: Conduct cleaning and waste removal operations to comply with local laws and ordinances, Federal and local environmental and antipollution regulations.

.1 Remove paint from ULC, CSA, WHI and similar labels, including mechanical and electrical nameplates.

.2 Do not burn waste materials.

.3 Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

.2 Qualification Requirements:

.1 Cleaners: Use experienced workers or professional cleaners for final cleaning.

1.3 WARRANTY

.1 Do not clean products in a manner that will void manufacturer's warranties.

Part 2 Products

2.1 MATERIALS

.1 Use only cleaning materials recommended by manufacturer of material to be cleaned. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

Part 3 Execution

3.1 PREPARATION

.1 Verify that cleaning agents and methods do not remove finishes or coatings on surfaces.

3.2 CLOSEOUT ACTIVITIES

.1 Perform the following cleaning operations before requesting final review for acceptance of Declaration of Substantial Performance by the Departmental Representative in accordance with Section 01 70 00.

.2 Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.

.1 Sweep paved areas broom clean.

.2 Remove petrochemical spills, stains and other foreign deposits.

.3 Remove snow and ice to provide safe access to building.

.4 Remove tools, construction equipment, machinery, and surplus material from

.5 Project site. Clean each surface or unit to condition expected in an average institutional building cleaning and maintenance program.

.6 Comply with manufacturer's cleaning instructions and recommendations.

.7 Clean exposed exterior and interior hard surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances.

.8 Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.

.9 Sweep concrete floors broom clean in unoccupied spaces. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.

.10 Clean transparent materials, including mirrors and glass in doors and windows:

.1 Remove glazing compounds and other noticeable, vision obscuring materials.

.2 Replace chipped or broken glass and other damaged transparent materials.

.3 Clean mirrors and glass, taking care not to scratch surfaces.

.4 Restore reflective surfaces to their original condition. Remove non-permanent labels.

.11 Remove protective films from equipment and accessories.

.12 Touch-up, repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

.13 Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.

.14 Replace parts subject to unusual operating conditions. Restore equipment, machinery or systems used as temporary facilities to “as-new” condition so that warranties take effect at Substantial Performance.

.15 Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.

.16 Replace disposable air filters and clean permanent air filters within renovated floors and any filters at joint connections with building main duct system. Clean exposed surfaces of diffusers, registers, and grills.

.17 Clean ducts, blowers, and coils within renovated floors and at joint connections with building main duct system.

.18 Clean light fixtures, lamps, globes, and reflectors.

.19 Replace burned out bulbs, those noticeably dimmed by use.

.20 Replace defective and noisy starters in fluorescent and mercury vapour fixtures.

.21 Prepare Work in a clean state and ready for occupancy.

END OF SECTION

Part 1 General

1.1 CONTRACTOR START-UP

.1 Contractor shall do the following during Contractor Start-Up, not necessarily in order listed:

.1 Start equipment and systems.

.2 Test, adjust and balance equipment and systems.

.3 Complete and submit Contractor Start-Up reports including:

.1 Contractor's system and equipment start-up reports.
.2 Testing, adjusting and balancing reports.
.3 Manufacturers' equipment start-up reports.

.4 Review Contract Documents and inspect the Work to ensure completeness of the Work and compliance with requirements of Contract Documents.

.5 Correct Contract Deficiencies identified as a result of the foregoing and as may be identified by the Departmental Representative**.**

.6 Execute Change Orders issued by the Departmental Representative.

.7 Perform all other work and activities required for fulfillment of prerequisites to Interim Acceptance of the Work as specified in Section 01 70 00.

.2 The Departmental Representative will do the following during Contractor Start-Up.

.1 Carry out pre-interim inspections as necessary.

.2 Witness manufacturers' equipment start-up.

.3 Verify starting, testing, adjusting and balancing by Contractor.

.4 Review and approve Contractor Start-Up reports.

.5 Cooperate in systems and equipment demonstration and instruction.

.6 Initiate Change Orders as required.

.7 Verify correction of Contract Deficiencies by Contractor.

.8 Verify execution of Change Orders by Contractor.

.9 Perform other activities related to Interim Acceptance of the Work as specified in Section 01 70 00.

.3 The preceding will be carried out in an ongoing cycle of:

.1 Departmental Representative's inspections.
.2 Documentation of results.
.3 Diagnosis of problems.
.4 Correction of Contract Deficiencies and execution of Change Orders as required.
.5 Verification of results.

1.2 PERFORMANCE TESTING

.1 Performance Testing will commence upon Interim Acceptance of the Work.

.2 The Departmental Representative will do the following during Performance Testing:

.1 Carry out a series of preplanned systems and equipment operating tests under conditions simulating, to the extent possible, full and partial operating loads.

.2 Record test results.

.3 Diagnose problems and determine whether they are the result of Contract Deficiencies.

.4 Initiate Change Orders as required.

.5 Repeat tests as required following correction of Contract Deficiencies and execution of Change Orders by Contractor and verify results.

.3 Contractor shall do the following during Performance Testing:

.1 Correct Contract Deficiencies previously outstanding and those identified during Performance Testing.

.2 Execute Change Orders issued by the Departmental Representative.

.4 The preceding will be carried out in an ongoing cycle of:

.1 Performance testing.
.2 Documentation of results.
.3 Diagnosis of problems.
.4 Correction of Contract Deficiencies and execution of Change Orders as required.
.5 Verification of results.

1.3 FINE TUNING

.1 Fine Tuning shall commence upon Practical Completion of the Work.

.2 Contractor shall do the following during Fine Tuning:

.1 Correct all Contract Deficiencies previously outstanding and those identified during Fine Tuning.

.2 Execute Change Orders issued by the Departmental Representative.

.3 Perform all other work and activities required for fulfillment of prerequisites to Final Acceptance of the Work.

.3 Representative will conduct user surveys and take environmental measurements as necessary to identify existing and potential problems.

1.4 SEASONAL CONSTRAINTS

.1 Notwithstanding all-inclusive requirements specified in this Section, additional separate cycles of Contractor Start-Up, Performance Testing and Fine Tuning may be necessitated at a later time on equipment and systems whose full operation is dependent on seasonal conditions.

.2 Contractor's responsibilities with respect to such later Facility Start-Up activities shall be as specified in this Section.

Part 2 Products

.1 Not used

Part 3 Execution

.1 Not used

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 This Section includes the following:

.1 Demolition of items indicated on Drawings

.2 Other related demolition activities

1.2 RELATED REQUIREMENTS

.1 Refer to Drawings for demolition notes and details.

1.3 RELATED REQUIREMENTS

.1 The Workers Compensation Act, Safety Regulations governing buildings, construction and demolition.

.2 Occupational Health and Safety Regulations B.C.

.3 British Columbia Building Code (2018).

.4 CSA S350-M 1980, Code of Practice for Safety in Demolition of Structures (or latest edition).

1.4 DEFINITIONS

.1 Demolish (or Remove): Detach items from existing construction and legally dispose of them off site, unless indicated to be removed and salvaged or removed and reinstalled.

.2 Remove and Salvage: Detach items from existing construction and deliver them to Departmental Representative, and ready for reuse where indicated.

.3 Remove and Reinstall (or Save and Reuse or Remove and Relocate): Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

.4 Existing to Remain: Existing items of construction that are not removed and that are not otherwise indicated as being removed, removed and salvaged, or removed and reinstalled.

1.5 ADMINISTRATIVE REQUIREMENTS

.1 Materials Ownership: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Departmental Representative's property, demolished materials shall become General Contractor’s property and shall be removed from Project site.

1.6 QUALITY ASSURANCE

.1 Regulatory Requirements: Comply with governing environmental notification requirements and regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

.2 Standards: Comply with regulations of local Authorities Having Jurisdiction. Where differences occur between the local regulations and referenced standards, the most restrictive requirement governs.

1.7 SITE CONDITIONS

.1 Departmental Representative assumes no responsibility for condition of areas indicated for demolition. Conditions existing during the Bid Period will be maintained by the Departmental Representative as far as practical.

.2 Storage or sale of removed items or materials on site is not permitted.

.3 Maintain those portions of existing utilities indicated to remain in service and protect them against damage during demolition operations.

Part 2 Products

1.8 DEMOLITON

.1 Demolish and remove building envelope and walls as noted on architectural Drawings.

.2 Demolish and remove exterior existing materials as noted on architectural Drawings.

.3 Salvage and protect items indicated on the Drawings for re-use.

.4 Clean and make good all surfaces to allow for new material installation and tie-in.

Part 3 Execution

1.9 EXAMINATION

.1 Verify that utilities have been disconnected and capped, if applicable.

.2 Survey existing conditions and correlate with requirements indicated to determine extent of demolition required.

.3 Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

1.10 UTILITY SERVICES

.1 Locate, identify, disconnect, and seal or cap off indicated utilities serving buildings and structures being demolished.

.1 Arrange to shut off affected utilities with utility companies.

.2 Cut off pipe or conduit a 600 mm minimum below grade, and as required for new construction.

.2 Coordinate with Mechanical and Electrical Subcontractors for shutting off, disconnecting, removing, and sealing or capping utilities.

.3 Do not start demolition work until utility disconnecting and sealing is complete and verified in writing.

1.11 PREPARATION

.1 Provide temporary barricades and other protection required to prevent injury to people and damage to facilities to remain.

1.12 DEMOLITION

.1 Demolish and remove existing construction only to the extent required by new construction, and as indicated. Use methods required to complete the Work within limitations of governing regulations.

.1 Dispose of demolished items and materials promptly.

.2 Return site elements of construction and site surfaces that are to remain to condition existing before demolition operations began.

.2 Existing Items to Remain:

.1 Protect existing site areas indicated to remain from damage and soiling demolition activities.

1.13 DISPOSAL OF DEMOLISHED MATERIALS

.1 Do not burn demolished materials.

.2 Promptly dispose of demolished materials.

.3 Transport demolished materials off site and legally dispose.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 01 55 – General Instructions.

.2 Section 01 33 00 – Submittal Procedures.

.3 Section 01 35 33 – Health and Safety Requirements

1.2 REFERENCES

.1 Report:

.1 Hazardous Building Material Assessment E0896 Employee Housing, Unit B – 117 Nass Road, new Aiyansh, BC & and E0897, RCMP Detachment and Shed, 117 Nass Road, New Aiyansh, BC, dated September 18, 2020, Prepared by Arcadis Canada Inc.

.2 Definitions:

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

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

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

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

.3 Reference Standards:

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

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

.2 SOR/2018-196 Prohibition of Asbestos and Products Containing Asbestos Regulations.

.2 Department of Justice Canada

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

.2 Transportation of Dangerous Goods Regulations (T-19.01-SOR/2019-101).

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

.1 Safety Data Sheets (SDS).

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

.1 National Fire Code of Canada (2015).

.5 WorkSafe BC

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

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

.3 "Lead-Containing Paints and Coatings; Preventing Exposure in the Construction Industry" (2017)

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

.5 "Developing a Silica Exposure Control Plan" (2014)

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

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

.8 The British Columbia Waste Management Act - Ozone Depleting Substances and Other Halocarbons Regulation (BC Reg. 317/2012).

.9 The Federal Halocarbons Regulation (July 2003).

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

.11 Canadian Construction Association

.1 Standard Construction Document CCA 82 "Mould Guidelines for the Canadian Construction Industry" (2018)

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data to be used by the Contractor to complete the Work:

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

.2 Submit two copies of Workplace Hazardous Materials Information System (WHMIS) Safety Data Sheets (SDS) in accordance with Section 01 35 30 - Health and Safety Requirements to Departmental Representative for each hazardous material required prior to bringing hazardous material on site.

.3 Submit Exposure Control Plan (ECP) to Departmental Representative that identifies hazardous materials, usage, location, personal protective equipment requirements, and disposal arrangements.

.4 Construction/Demolition Waste Management:

.1 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating percentage of construction/demolition wastes were recycled or salvaged

.5 Low-Emitting Materials: submit listing of adhesives and sealants used in building, comply with VOC and chemical component limits or restrictions requirements.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle hazardous materials to be used by the Contractor to complete the Work in accordance with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver hazardous materials to be used by the Contractor to site in original factory packaging, labelled with manufacturer's name and address.

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

.4 Storage and Handling Requirements:

.1 Co-ordinate storage of hazardous materials to be used by the Contractor to complete the Work with Departmental Representative and abide by internal requirements for labelling and storage of materials and wastes.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

.4 Segregate incompatible materials and wastes.

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

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

.7 Maintain clear egress from storage area.

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

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

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

.11 When hazardous waste is generated on site:

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

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

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

.4 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 provincial regulations.

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

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

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

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

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

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

Part 2 Products

2.1 MATERIALS

.1 Description:

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

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

Part 3 Execution

3.1 HAZARDOUS MATERIALS ABATEMENT

.1 Scope of Abatement Activities.

.1 Abatement shall be conducted to handle, alter, remove and/or dispose of hazardous building materials as identified in the Assessment Report in accordance with applicable regulations, guidelines, standards and/or best practices for such work, where such identified hazardous building materials will be impacted (handled, altered, damaged, removed) by the Work.

.2 Contractor is responsible for reviewing plans, specifications and reports such that they understand the locations and amounts of hazardous materials that will be impacted by the Work of this contract, and such that appropriate plans and budgets can be included in their overall bids.

.3 The listing below is a summary of the identified hazardous building material categories that are anticipated to require disturbance, along with their associated removal and disposal regulations, guidelines and/or standards.

.1 Asbestos-Containing Materials (ACMs)

.1 Refer to the Assessment Report for identities and locations of ACMs that may require disturbance during the Work.

.2 Actions that will disturb identified ACMs are to be conducted in accordance with the requirements of the 2017 WorkSafe BC publication “Safe Work Practices for Handling Asbestos”, by appropriately trained personnel.

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

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

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

.6 From beginning of Work until completion of cleaning operations, Departmental Representative will separately engage an Environmental Specialist to take air samples inside and outside of Asbestos Work Area enclosure[s] in accordance with British Columbia’s Occupational Health and Safety Regulation and the current version of the WorkSafeBC Manual entitled “Safe Work Practices for Handling Asbestos”.

.7 If air monitoring shows that areas outside Asbestos Work Area enclosure[s] are contaminated, enclose, maintain and clean these areas in same manner as that applicable to Asbestos Work Area, at no additional cost to the Contract

.8 Ensure that respiratory safety factors are not exceeded.

.2 Lead and Lead-Containing Paints (LCPs)

.1 Refer to the Assessment Report for identities and locations of lead-containing materials (including LCPs) that may require disturbance during the Work.

.2 Actions that will disturb lead-containing materials (including paints and materials coated with LCPs) are to be conducted in accordance with the requirements of the current version of the WorkSafe BC publication "Lead-Containing Paint and Coatings: Preventing Exposure in the Construction Industry" and "Safe Work Practices for Handling Lead", keeping airborne exposure to lead dust to less than the 8-hour Occupational Exposure Limit (OEL) for lead of 0.05 milligram per cubic metre (mg/m^3).

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

.1 Refer to the provisions of the 2017 WorkSafe BC publication "Lead-Containing Paint and Coatings: Preventing Exposure in the Construction Industry" and "Safe Work Practices for Handling Lead", for removal of LCPs from surfaces before any welding and torch-cutting, should the Contractor plan to use such methods to complete the Work.

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

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

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

.3 Polychlorinated Biphenyls (PCBs)

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

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

.4 Mould

.1 Removal, alteration and/or disposal of mould-impacted materials is not anticipated to be required during the Work.

.5 Mercury

.1 Refer to the Assessment Report for identities and locations of mercury materials that may require disturbance during the Work.

.2 Precautions should be taken if workers may potentially be exposed to mercury or mercury vapours to ensure that workers exposure levels do not exceed the occupational exposure limit of 0.025 mg/m^3 as per the BC Reg. 296/97. This can be achieved by providing respiratory and skin protection applicable to the hazard and task to be completed.

.6 Silica

.1 When silica-containing materials are to be disturbed and/or removed (e.g., coring through concrete slabs, demolition of masonry or concrete units), ensure dust control measures are employed such that airborne silica dust concentrations do not exceed the exposure limit as stipulated by BC Reg. 296/97 (Cristobalite and Quartz – each 0.025 mg/m^3). This would include, but not be limited to, the following:

.1 Developing a Silica Exposure Control Plan

.2 Providing workers with respiratory protection

.3 Wetting the surface of the materials, use of water or dust suppressing agents to prevent dust emissions

.4 Providing workers with facilities to properly wash prior to exiting the work area.

3.2 CLEANING

.1 Progress Cleaning: 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 reuse and recycling.

.1 Dispose of hazardous waste materials in accordance with applicable federal and provincial acts, regulations, and guidelines.

.2 Recycle hazardous wastes for which there is approved, cost effective recycling process available.

.3 Send hazardous wastes to authorized hazardous waste disposal or treatment facilities.

.4 Burning, diluting, or mixing hazardous wastes for purpose of disposal is prohibited.

.5 Disposal of hazardous materials in waterways, storm or sanitary sewers, or in municipal solid waste landfills is prohibited.

.6 Dispose of hazardous wastes in timely fashion in accordance with applicable federal and provincial regulations.

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

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

.1 Hazardous wastes recycled in manner constituting disposal.

.2 Hazardous waste burned for energy recovery.

.3 Hazardous wastes with economically recoverable precious metals.

END OF SECTION

Part 1. General

1.1 SECTION INCLUDES

.1 Work of this section included, but is not limited to:

.1 Supply and installation for all metal fabrications complete with all anchoring, fastenings and hardware.

.2 Miscellaneous steel and iron sections for shelf angles, loose lintels, lintels carrying members not covered elsewhere.

1.2 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 09 91 00 - Painting.

1.3 REFERENCES

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

.1 ASTM A53/A53M-12, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.

.2 ASTM A269A269M-15a, Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.

.3 ASTM A307-14e1, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

.4 ASTM A666-15, Specification for Annealed or Cold-Worked Austenitic Stainless Steel, Strip, Plate and Flat Bar.

.2 Canadian Standards Association (CSA):

.1 CAN/CSA-G40.20/G40.21-13(R2018), General Requirements for Rolled or Welded Structural Quality Steel.

.2 CAN/CSA-G164-18, Hot Dip Galvanizing of Irregularly Shaped Articles.

.3 CAN/CSA-S16-14, Limit States Design of Steel Structures.

.4 CSA W48-18, Filler Metals and Allied Materials for Metal Arc Welding.

.5 CSA W59-13, Welded Steel Construction (Metal Arc Welding).

.3 The National Association of Architectural Metal Manufacturer's (NAAMM):

.1 AMP 555-92, Code of Standard Practice for Architectural Metal Industry, including Miscellaneous Iron.

.4 The Society for Protective Coatings (SSPC)/National Association of Corrosion Engineers (NACE International):

.1 SSPC Surface Preparation Guidelines:

.1 SSPC-SP2, Hand Tool Cleaning.

.2 SSPC-SP3, Power Tool Cleaning.

.3 SSPC-SP5/NACE No. 1, White Metal Blast Cleaning.

.4 SSPC-SP6/NACE No. 3, Commercial Blast Cleaning.

.2 Application, Inspection and Quality Control Guidelines.

1.4 SHOP DRAWINGS

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

.2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

.3 For items where design is delegated to the fabricator, provide shop drawings signed and sealed by the professional engineer registered in the Province of NWT, responsible for the design.

1.5 PROTECTION

.1 Cover exposed stainless-steel surfaces with pressure sensitive heavy protection paper or apply strippable plastic coating, before shipping to job site.

.2 Leave protective covering in place until final cleaning of building. Provide instructions for removal of protective covering.

Part 2. Products

2.1 MATERIALS

.1 Steel sections and plates: to CAN/CSA-G40.20/G40.21, Grade 300W.

.2 Steel pipe: to ASTM A53/A53M standard weight, galvanized finish.

.3 Welding materials: to CSA W59.

.4 Welding electrodes: to CSA W48 Series.

.5 Bolts and anchor bolts: to ASTM A307.

.6 Grout: non-shrink, non-metallic, flowable, 15 MPa at 24 hours.

2.2 FABRICATION

.1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.

.2 Use self-tapping shake-proof flat headed screws on items requiring assembly by screws or as indicated.

.3 Where possible, fit and shop assemble work, ready for erection.

.4 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.

2.3 FINISHES

.1 Prior to priming steel, prepare all surfaces in conformance with SSPC-SP-3 - Power Tool Cleaning for non-exposed locations and SSPC SP-5 - While-metal Blast Cleaning for exposed architectural finished locations. Adjust blast grit to suit primer coat thickness specified in Sections 09 91 00.

.2 Shop paint primer: conforming to CAN/CSA-G40.20/CAN/CSA-G40.21, except surfaces receiving nelson studs and steel supporting second floor receiving sprayed fire proofing. Apply primer to properly prepared surfaces at temperature above 7ºC. Leave surfaces to be welded unprimed.

.3 Hot dip galvanizing: galvanize steel, where indicated, to ASTM A213, minimum zinc coating of 600 g/m². (Severe, unprotected exposures).

.4 Electrolytic galvanizing: galvanize steel, where indicated, to ASTM A591, minimum zinc coating of 180 g/m². (Non-severe, protected exposures).

.5 Wipe coat galvanizing: galvanize steel, where indicated to ASTM G189, minimum zinc coating of 75 g/m². (Non-severe, protected exposures).

.6 Touch-up galvanized surfaces with zinc rich coating to CGWB 1.181.

.7 Zinc Rich Paint: Conforming CGSB 1.181.

.1 Clean metal to equivalent of commercial sand blast SSPC-SP6, remove sandblast in residue.

.2 Apply one coat of zinc rich paint to all surfaces exposed after assembly to minimum dry film thickness of 60 µm (2.5 mil). Apply coating immediately after cleaning.

.8 Isolation Coating: Apply an isolation coating to contact surfaces of following components in contact with cementitious materials and dissimilar metals except stainless steel:

.1 exterior components.

.2 interior components exposed to high humidity conditions.

.9 Paint: Prepare the Work and paint in accordance with CAN/CSAQ-S16.1, primed ready for site finish as specified in Section 09 91 00.

2.4 SHOP PAINTING

.1 Apply one shop coat of primer to metal items, with exception of galvanized or concrete encased items.

.2 Use primer unadulterated, as prepared by manufacturer. Paint on dry surfaces, free from rust, scale, grease. Do not paint when temperature is lower than 7ºC.

.3 Clean surfaces to be field welded; do not paint.

2.5 SCHEDULE OF COMPONENTS

.1 Exterior stairs guardrails and handrails; primed and painted:

.1 Refer to architectural drawings

Part 3. Execution

3.1 EXAMINATION

.1 Examine areas and conditions under which work is to be performed and notify the Consultant in writing of conditions detrimental to the proper and timely completion of the work.

.2 Do not proceed with the work until unsatisfactory conditions have been corrected to the satisfaction of the installer.

.3 Take field measurements to verify or supplement dimensions.

.4 Commencement of the installation will be construed as acceptance of the site conditions and, thereafter, the Contractor shall be fully responsible for satisfactory work as specified herein.

3.2 ERECTION

.1 Except where otherwise indicated, install all metal fabrications.

.2 Erect metalwork square, plumb straight, and true, accurately fitted, with tight joints and intersections.

.3 Provide suitable means of anchorage, such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.

.4 Make field connections with bolts to CAN/CSA S16.1 or weld connections in accordance with CSA W59.

.5 Hand items over for casting into concrete or building into masonry to appropriate trades together with setting templates.

.6 Touch-up rivets, field welds, bolts and burnt or scratched surfaces after completion of erection with primer. Refer to Section 09 91 00 for touch-up exterior ferrous surfaces.

.7 Touch-up galvanized surfaces with zinc primer where burned by field welding.

3.3 METALWORK INTEGRATED INTO THE WORK OF OTHER SECTIONS

.1 Coordinate with the appropriate other Sections, work which is to be integrated into the work of those Sections.

.2 Where appropriate, fabricate the work of this Section and hand over to others of installation.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Floor, wall, exterior stair.

.2 Preservative treatment of wood.

.3 Miscellaneous framing and sheathing.

1.2 RELATED SECTIONS

.4 Section 05 50 00 - Metal Fabrications: Prefabricated steel elements to be built into work of this Section.

1.3 REFERENCES

.1 CAN/CGSB 11.3-M87 - Hardboard.

.2 CANPLY (Canadian Plywood Association) - Grading and certification.

.3 CAN/CSA-O80 Series-08 - Wood Preservation

.4 CSA-O121-08 - Douglas Fir Plywood.

.5 CSA-O151-09 - Canadian Softwood Plywood.

.6 CSA-O153-M1980 (R2008) - Poplar Plywood.

.7 CSA-O325-07 - Construction Sheathing.

.8 CSA-O437 Series-93 (R2006) - Standards on OSB and Waferboard.

.9 NPA A208.1-2009 - Particleboard.

.10 APA (American Plywood Association) - Grades and Specifications.

.11 NLGA (National Lumber Grades Authority) - Standard Grading Rules for Canadian Lumber, 2007 Edition.

.12 See structural drawings for additional requirements for work of this Section.

1.4 COORDINATION

.1 See Section 01 11 55 - Project Management and Coordination.

.2 Construction Manager will define extent and scope of work of this Section.

1.5 SUBMITTALS FOR INFORMATION

.1 Section 01 33 00: Submission procedures.

.2 Product Data: Provide technical data on wood preservative materials.

1.6 QUALITY ASSURANCE

.1 Perform Work in accordance with the following agencies:

.1 Lumber Grading Agency: Certified by NLGA.

.2 Plywood Grading Agency: Certified by CANPLY.

1.7 DELIVERY, STORAGE, AND PROTECTION

.1 Section 01 10 00: Transport, handle, store, and protect products.

.2 Protect materials from warping or other distortion by stacking in vertical position.

Part 2 Products

2.1 LUMBER MATERIALS

.1 Lumber Grading Rules: NLGA.

.2 Non-structural Light Framing: Stress Group A or D spruce species, #2 or better, 19% maximum moisture content.

.3 Studding: Stress Group A or D, spruce species, [19%] maximum moisture content.

.4 Miscellaneous Framing: Stress Group D, spruce species,19% maximum moisture content, pressure preservative treated, where called for on drawings.

2.2 SHEATHING MATERIALS

.1 Plywood Roof Sheathing: D Rated Fir Sheathing, exterior grade, unsanded

.2 Particleboard Wall Sheathing: Oriented Strand Board; wood chips set with waterproof resin binder; D grade; unsanded faces.

.3 Plywood Floor Sheathing: Douglas Fir, D rated, unsanded.

.4 Telephone and Electrical Panel Boards: 19 mm (3/4 in.) fir plywood, sanded.

2.3 UNDERLAYMENT MATERIALS

.1 Particleboard Underlayment: Waferboard Structural Particleboard; wood shavings set with waterproof resin binder; D grade; sanded faces.

2.4 EXTERIOR STRAPPING

.1 Plywood Sheathing: 10 mm (3/8") x 100 mm (4in.) nominal, continuous strips, cut from pressure treated plywood. Treat cut edges prior to installation.

2.5 SHEATHING AND UNDERLAYMENT LOCATIONS

.1 Flat Roof Sheathing: 19 mm (3/4 inch) thick, 1 200 x 2 400 mm 48 x 96-inch sized sheets, tongue and groove edges, preservative treated.

.2 Above Grade Wall Sheathing: 10 mm (3/8 inch) thick, 1 200 x 2 400 mm 48 x 96-inch sized sheets, square edges.

.3 Floor Sheathing: 22 mm (7/8 inch) thick, 1 200 x 2 400 mm 48 x 96-inch sized sheets, tongue and groove edges.

.4 Floor Underlayment: 10mm (3/8 in.) thick, 1 200 x 2 400 mm 48 x 96-inch sized sheets.

2.6 STRAPPING LOCATIONS

.1 Install strapping over membrane air barrier, vertically at 400 mm (16 in.) on centre, affixed to wall wood studs, to receive work of Section 07 42 43. Attach with drywall screws.

.2 Strapping to be pressure treated.

2.7 ACCESSORIES

.1 Fasteners: Electro galvanized for high humidity and treated wood locations, unfinished steel elsewhere.

.2 Drywall Screws: Bugle head, hardened steel, power driven type, length to achieve full penetration of sheathing substrate.

.3 Die Stamped Connectors: 2mm (1/16 in.) thick, hot dipped galvanized steel, unless otherwise shown on structural drawings.

.4 Joist Hangers: Hot dipped galvanized steel, sized to suit framing conditions. See structural drawings.

.5 Sill Gasket on Top of Foundation Wall: 6 mm 1/4-inch-thick, plate width, closed cell polyethylene foam.

.6 Subfloor Glue: APA AFG-01 waterproof of solvent base, air cure type, cartridge dispensed.

.7 Building Paper: Plain untreated cellulose building paper No.15 asphalt felt.

2.8 PRESERVATIVE TREATMENT

.1 Wood Preservative (Pressure Treatment): CSA-O80 Series using water borne preservative with 0.25% retainage.

.2 Wood Preservative (Surface Application): AWPA treatment C1

Part 3 Execution

3.1 FRAMING

.1 Set structural members level and plumb, in correct position.

.2 Make provisions for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb, and in true alignment until completion of erection and installation of permanent bracing.

.3 Place horizontal members, crown side up.

.4 Construct load bearing framing and curb members full length without splices.

.5 Bridge framing in excess of [2.3 m 8 ft] span at mid-span. Fit solid blocking at ends of members.

.6 Place sill gasket directly on cementitious foundation. Puncture gasket clean and fit tight to protruding foundation anchor bolts.

.7 Coordinate installation of plywood web joists prefabricated wood trusses. See Construction Manager for work of this Section.

.8 Curb roof openings except where prefabricated curbs are provided. Form corners by alternating lapping side members.

.9 Coordinate curb installation with installation of decking and support of deck openings roofing vapour retardant.

3.2 SHEATHING

.1 Secure roof sheathing with longer edge perpendicular to framing members and with ends staggered and sheet ends overbearing.

.2 Use sheathing clips between sheets between roof framing members.

.3 Secure wall sheathing with long dimension perpendicular to wall studs, with ends over firm bearing and staggered.

.4 Secure subfloor sheathing with longer edge perpendicular to floor framing and with end joints staggered and sheet ends overbearing. Attach with subfloor glue.

.5 Install telephone and electrical panel back boards with [plywood] sheathing material where required. Size the back board by 300 mm 12 inches beyond size of electrical panel.

3.3 SITE APPLIED WOOD TREATMENT

.1 Apply preservative treatment to manufacturer's written instructions.

.2 Brush apply two (2) coats of preservative treatment on wood in contact with cementitious materials. Treat site-sawn cuts and cut edges of exterior wall strapping.

.3 Allow preservative to dry prior to erecting members.

3.4 ERECTION TOLERANCES

.1 Section 01 73 00: Tolerances.

.2 Framing Members: 6 mm (1/4 inch) from true position, maximum.

.3 Surface Flatness of Floor: 2 mm in 1 m (1/4 inch in 10 ft) maximum.

3.5 SCHEDULES

.1 See drawings.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 This section includes restoration wood work for the following items:
- .1 Exterior standing and running trim work.

.2 All new trim work are to:
- .1 Conform to the requirements of ASTM E84, CAN/ULC-S102.

1.2 RELATED WORK SPECIFIED IN OTHER SECTIONS

.1 Section 06 11 00 – Wood Framing

.2 Section 09 91 00 – Painting

.3 Architectural drawings

1.3 REFERENCE DOCUMENTS

.1 Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Architectural Woodwork Institute (AWI)
- .1 Architectural Woodwork Quality Standards, 2nd edition, 2014.

.2 ASTM International
- .1 ASTM E1333-14 Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates from Wood Products Using a Large Chamber.
- .2 ASTM F1667-13 Standard Specification for Driven Fasteners: Nails, Spikes and Staples.
- .3 ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials.

.3 NLGA (National Lumber Grades Authority) 2017- Standard Grading Rules for Canadian Lumber.

.4 CSA Group (CSA)
- .1 CSA O121-08(R2013), Douglas Fir Plywood.
- .2 CSA O151-09(R2014), Canadian Softwood Plywood.
- .3 CSA 0115- M1982 (R2001)- Hardwood and Decorative Plywood.

.5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
- .1 Material Safety Data Sheets (MSDS).
- .2 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.

.6 Underwriters Laboratories of Canada (ULC)
- .1 CAN4-S104-M80(R1985), Architectural Coatings.
- .2 CAN/ULC-S102, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Shop Drawings:
- .1 Prepare and submit shop drawings in general accordance with AWMAC AWS manual.
- .2 Indicate profiles and dimensions, assembly techniques, jointing, methods of fastening, terminations and other related details.
- .3 Indicate materials, thicknesses, finishes and hardware.

.4 Include schedule or key plan.
.5 Show profiles, elevations and details at scales recommended by AWMAC AWS.
.6 Where necessary, show location and type of blocking and backing required within supporting assemblies.

.2 Samples:
.1 Submit triplicate 300 mm long representative samples of each typical item of finish carpentry.
.1 Standing and running trim: 300 mm long.
.2 Samples for site applied finish:
Furnish three samples of each finish carpentry item and
composite panel material to Contractor for preparation of field applied finish samples.

.3 Certifications: submit certificates signed by manufacturer certifying materials comply with specified performance characteristics, physical properties and requirements of referenced standards.

1.5 QUALITY ASSURANCE

.1 Perform Work of this Section by finish carpentry contractor .

.2 Mock-ups:
.1 Construct mock-ups as directed by Departmental Representative.
.2 Shop prepare one wall paneling, typical example of each specified item of standing and running trim, stair, complete with shop applied finishes, and install where directed by DCC Representative.
.3 Allow 24 hours for inspection of mock-up by Departmental Representative before proceeding with Work.
.4 When accepted, mock-up will demonstrate minimum standard for Work.
.5 Do not proceed with work prior to receipt of written acceptance of mock-up by Departmental Representative.
.6 Accepted mock-up may remain as part of finished work.

.3 Lumber by grade stamp of agency certified by Canadian Lumber Standards Association Board (CLSAB).

.4 Plywood, particle board, OSB, and wood board composite panels to CSA and ANSI Standards.

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, store and handle materials in accordance with AWS recommendations and as follows.

.2 Deliver finish carpentry materials only when area of work is enclosed, plaster and concrete work is dry, area is broom clean and site environmental conditions are acceptable for installation.

.3 Storage and Handling Requirements:
.1 Store materials off ground in dry location indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
.2 Maintain indoor temperature and humidity within range recommended by AWS for location of the Work.
.3 Store products on site as specified for minimum 72 hours prior to installation.
.4 Store and protect finish carpentry products from moisture, nicks, scratches, and blemishes.
.5 Replace defective or damaged materials with new.

1.7 WARRANTY

.1 Architectural woodwork shall be manufactured and/or installed to AWMAC's architectural woodwork standards in effect at time of tender and shall be subject to an inspection at the manufacturing facility and/or site.

.2 If the architectural woodwork contractor is not an AWMAC MSQ Qualified Manufacturer Member, they shall provide Departmental Representative with a two (2) year warranty.

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Part 2 Products

2.1 REGULATORY REQUIREMENTS

.1 Wood fire rated trim, stairs and panels: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104 for ratings specified or indicated.

.2 Provide fire labelled frames for openings requiring fire protection ratings. Test products in conformance with CAN4-S104, NFPA 252 and listed by nationally recognized agency having factory inspection services.

2.2 QUALITY GRADE

.1 Provide all materials and perform all work of this Section in accordance with AWMAC AWS Custom Grade.
- .1 All wall applied finish carpentry is to be treated with specified fire resistive stain and top coat.

2.3 MATERIALS

.1 Softwood lumber: average moisture content of 6% and maximum of 9% for interior work, an average of 12% and maximum of 15% for exterior work, SPF species, to AWMAC custom grade.
- .1 CAN/CSA-O141, kiln dried, dressed 4 sides.
- .2 NLGA Standard Grading Rules for Canadian Lumber.

.2 Hardwood lumber: average moisture content of 6% and maximum of 9% for interior work, Oak species,
- .1 To AWMAC custom grade.
- .2 NLGA Standard Grading Rules for Canadian Lumber.

.3 Hardwood plywood: to CSA O115, of thickness indicated, 1220mm (4') x 2440mm (8') size sheets, Oak species, rotary cut face veneer of architectural grade. Use Fire Retardant plywood or MDF core to provide flame spread rating of 25. Select veneers to provide random match.

.4 Canadian softwood plywood: to CSA O151, solid one side select sheathing grade.

.5 Douglas fir plywood: to CSA O121-, good one side grade.

.6 Poplar plywood: to CSA O153, standard sheathing grade, interior moisture resistant type.

.7 Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln dried to less than 8% moisture content.

.8 Fasteners: to suit size and nature of components being fastened.
.1 Nails and Spikes: to CSA B111:
.1 Use common spiral nails and spiral spikes except where indicated otherwise.
.2 Use hot dip galvanized finished steel for exposed exterior work, highly humid interior areas and for pressure - preservative and fire-retardant treated lumber.
.3 Bolt, nut, washer, screw and pin type fasteners: hot dip galvanized finish to CSA G164.

.9 Adhesive: recommended by manufacturer.

.10 Sealant: 1 part silicone to CAN/CGSB-19.13, non-staining, mould and mildew resistant, refer to Section 07 92 00, colour to be confirmed by Departmental Representative.

2.4 EXTERIOR STANDING AND RUNNING TRIM

.1 Window and Door Trims: as per Drawings.

2.5 FACSIA

.1 To match existing sizes and finishes.

2.6 STAIRS LANDING AND COLUMN WRAPS

.1 To match existing sizes and finishes.

2.7 FASTENINGS

.1 Provide screws, bolts, expansion shields and other fastening devices required for satisfactory installation.

.2 Exposed fasteners to match existing.

.3 Nails and staples: to ASTM F1677.

Part 3 Execution

3.1 EXAMINATION

.1 Visit site and note state of completion within various areas in which finish carpentry is being installed; verify that surfaces are ready to receive work of this Section and that other work is finished and painted before being built-over or covered in any way by installed millwork:

.2 Verify that areas in which finish carpentry is scheduled are finished and ready to accept work of this Section; completed, tested and accepted.

.3 Starting work will be considered as acceptance of conditions.

3.2 PREPARATION

.1 Back prime woodwork before installation, to AWS.

.2 Confirm access is sufficient for large pieces of millwork, and that they can be transported easily and safely to final installation location.

.3 Protect adjacent finished surfaces and materials from damage by work of this Section.

3.3 INSTALLATION

.1 Install items of finish carpentry in accordance with AWMAC AWS grade specified for respective items.

.2 Install items of finish carpentry at locations shown on drawings.
- .1 Position accurately, level, plumb straight.
- .2 Fasten and anchor securely.

3.4 CONSTRUCTION

.1 Fastening:
- .1 Position items of finished carpentry work accurately, level, plumb, true and fasten or anchor securely.
- .2 Design and select fasteners to suit size and nature of components being joined. Use proprietary devices as recommended by manufacturer.
- .3 Set finishing nails to receive filler. Where screws are used to secure members, countersink screw in round smooth cut hole and plug with wood plug to match material being secured.
- .4 Replace items of finish carpentry with damage to wood surfaces including hammer and other bruises.
- .5 Apply finishes as scheduled.

.2 Standing and running trim:
- .1 Butt and cope internal joints to make snug, tight, joint. Cut right angle joints of casing and base with mitred joints.
- .2 Fit backs of trims and casing snugly to wall surfaces to eliminate cracks at junction of base and casing with walls.
- .3 Install door and window trim in single lengths without splicing.

3.5 JOBSITE FINISHING

.1 Before finishing, all exposed portions of woodwork shall have handling marks or effects of exposure to moisture removed with a thorough, final sanding over all surfaces of the exposed portions using the appropriate grit sandpaper, and they shall be cleaned before applying sealer or finish.

3.6 CLEANING

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

3.7 TOUCHUP AND PROTECTION

.1 Fill and retouch all nicks, chips and scratches in factory finishes and substrate materials to AWS standards. Replace damaged items that cannot be repaired to AWS standards.

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by finish carpentry installation.

.3 Leave work to be site finished ready for finishing by Section 09 91 00- Painting.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Cold applied asphalt bitumen damp proofing.

.2 Surface applied drainage panels.

.3 Supply and installation of board insulation.

1.2 RELATED SECTIONS.

.1 Section 07 14 16 - Fluid Applied Waterproofing: Deck waterproofing.

.2 Section 07 21 13 - Board Insulation: Foundation insulation materials.

1.3 REFERENCES

.1 ASTM D41-05 - Asphalt Primer Used in Roofing, Damp proofing, and Waterproofing.

.2 ASTM D449-03 - Asphalt Used in Damp proofing and Waterproofing.

.3 CAN/CGSB-37.2-M88 - Emulsified Asphalt, Mineral-Colloid Type, Unfilled, for Damp proofing and Waterproofing and for Roof Coatings.

.4 CAN/CGSB 37.3-M89 - Application of Emulsified Asphalts for Damp proofing or Waterproofing.

.5 CAN/CGSB 37.5-M89 - Cutback Asphalt Plastic Cement.

.6 CGSB 37-GP-6Ma-83 - Asphalt, Cutback, Unfilled, for Damp proofing.

.7 CAN/CGSB 37.16-M89 - Filled, Cutback, Asphalt for Damp proofing and Waterproofing.

.8 CGSB 37-GP-36M-76 - Application of Filled Cutback Asphalts for Damp proofing and Waterproofing.

1.4 SUBMITTALS FOR REVIEW

.1 Section 01 33 00: Submission procedures.

.2 Product Data: Provide properties of primer, bitumen, and mastics.

1.5 SUBMITTALS FOR INFORMATION

.1 Section 01 33 00: Submission procedures.

.2 Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.6 QUALITY ASSURANCE

.1 Perform Work in accordance with NRCA Waterproofing Manual.

.2 Applicator by Company specializing in performing the work of this section.

1.7 ENVIRONMENTAL REQUIREMENTS

.1 Section 01 33 00: Environmental conditions affecting products on site.

.2 Applicator by Company specializing in performing the work of this section.

Part 2 Products

2.1 MATERIALS, GENERAL

.1 Damp proofing:

.1 Solvent-Based Emulsified Asphalt: CAN/CGSB-37.2 cold-applied, asbestos-free, non-fibered, compound for exterior concrete surfaces below grade.

.2 Water-Based Emulsified Asphalt: CAN/CGSB-37.2 cold-applied, asbestos-free, fibered, clay emulsified-asphalt compound for exterior concrete surfaces below grade.

2.2 AUXILIARY MATERIALS

.1 General: Furnish auxiliary materials recommended in writing by damp proofing manufacturer for intended use and compatible with bituminous damp proofing.

.2 Drainage Panel: 6 mm thick formed plastic, hollowed sandwich.

.1 Representative Product: Delta-MS by Cosella Dorken.

Part 3 Execution

3.1 EXAMINATION

.1 Section 01 33 00: Verification of existing conditions before starting work.

.2 Verify substrate surfaces are durable, free of matter detrimental to adhesion or application of damp proofing system.

.3 Verify items which penetrate surfaces to receive damp proofing are securely installed.

3.2 PREPARATION

.1 Protect adjacent surfaces not designated to receive damp proofing.

.2 Clean and prepare surfaces to receive damp proofing in accordance with manufacturer's written instructions.

.3 Do not apply damp proofing to surfaces unacceptable to manufacturer.

.4 Apply mastic to seal penetrations, small cracks, or minor honeycomb in substrate.

3.3 APPLICATION, GENERAL

.1 Comply with manufacturer's written instructions for substrate preparation, damp proofing application, cure time between coats, and drying time before backfilling unless more stringent requirements are indicated.

.1 Apply damp proofing to provide continuous plane of protection.

.2 Apply additional coats if recommended in writing by manufacturer or to achieve a smooth surface and uninterrupted coverage.

.2 Where damp proofing footings and foundation walls, apply from finished-grade line to top of footing; extend over top of footing and down a minimum of 6 inches (150 mm) over outside face of footing.

.1 Extend damp proofing 12 inches (300 mm) onto intersecting walls and footings, but do not extend onto surfaces exposed to view when Project is completed.

.3 Apply bitumen damp proofing in accordance with CAN/CGSB-37.3.

.4 Apply bitumen at a temperature limited by equiviscous temperature (EVT) plus or minus 14 degrees C (25 degrees F); do not exceed finish blowing temperature for four hours.

.5 Apply bitumen in one coat, continuous and uniform, at a rate of 1.5 L/sq. m (1.5 gal/100 sq. ft).

.6 Seal items projecting through damp proofing surface with mastic. Seal watertight.

.7 Request Consultant inspection prior to backfill.

.8 Where damp proofing interior face of above-grade, exterior walls, continue damp proofing through intersecting walls by keeping vertical mortar joints at intersection temporarily open or by damp proofing wall before constructing intersecting walls.

3.4 SCHEDULE

.1 See Drawings.

.2 Apply to exterior of all foundation walls and sides of concrete pits.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Work of this Section includes, but is not limited to the following:
- .1 Supply and installation of exterior board and cavity insulation above grade.
- .2 Supply and installation of board insulation below grade.

1.2 RELATED SECTIONS

.1 Section 07 26 16 - Thermofusible Air/Vapour Membranes.
.2 Section 07 62 00 - Sheet Metal Flashing and Trim.

1.3 REFERENCES

.1 American Society for Testing and Materials (ASTM):
- .1 ASTM C1363-97 Standard Test Method for the Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.
- .2 ASTM D1621-00, Standard Test Methods for Compressive Properties of Rigid Cellular Plastics.
- .3 ASTM D2842-01, Standard Test Methods for Water Absorption of Rigid Cellular Plastics.
- .4 ASTM D5113-97, Standard Test Method for Determining Adhesive Attack on Rigid Cellular Foam.

.2 Underwriters Laboratories of Canada (ULC):
- .1 CAN/ULC-S102.2-03 (R2000), Surface Burning Characteristics of Flooring, Floor Covering and Miscellaneous Materials and Assemblies.
- .2 CAN/ULC-S701-2001, Thermal Insulation, Polystyrene, Boards and Pipe Covering.

.3 Canadian General Standards Board (CGSB):
- .1 CAN/CGSB 71-GP-24M AMEND, Adhesive, Flexible, for Bonding Cellular Polystyrene.

Part 2. Products

2.1 INSULATION MATERIALS

.1 Perimeter Foundation Insulation: Extruded polystyrene board to CAN/UCL-S701, Type 4 rigid, closed cell type, with integral high density skin, c/w integral 9 mm thick latex - modified concrete facing.
- .1 Thermal resistance: long term RSI value of 0.87/25 mm, to ASTM C518. Total RSI value as indicated on the drawings.
- .2 Compressive Strength: to ASTM D1621, minimum 210 kPa.
- .3 Water Absorption: to ASTM D2842, 0.7% by volume maximum.
- .4 Edges: Tongue and groove sides, square edge ends.
- .5 Water Vapour Permeance: to ASTM D96, 50 ng/Pas m2.

.2 Type 4 Rigid Extruded Polystyrene Insulation (XPS): to CAN/ULC-S701, Type 4, CFC free and HCFC free:
- .1 Compressive Strength: 210 kPa (30 psi).
- .2 Thickness: as indicated on Drawings.

.3 Below Slab Insulation: Extruded polystyrene board to CAN/UCL-S701, Type 4, rigid, closed cell type, with integral high density skin.
- .1 Thermal resistance: long term RSI value of 0.87/25 mm, to ASTM C518. Total RSI value as indicated on the drawings.
- .2 Compressive Strength: to ASTM D1621, minimum 210 kPa.
- .3 Water Absorption: to ASTM D2842, 0.7% by volume maximum.
- .4 Edges: Shiplapped.
- .5 Water Vapour Permeance: to ASTM D96, 50 ng/Pas m2.

.4 Polyisocyanurate Roof Insulation: Polyisocyanurate pre-formed rigid insulation board to CAN/ULC-S701, Type 1, Class 1 or 2.
- .1 Thermal resistance: long term RSI value of 1.05/25 mm. Total RSI value as indicated on the drawings.
- .2 Compressive Strength: minimum 170 kPa.
- .3 Water Absorption: to ASTM D2842, 0.7% by volume maximum.
- .4 Edges: Shiplapped
- .5 Water Vapour Permeance: to ASTM E96, <90 ng/Pas m2, per 255 mm thickness.
- .6 Flame Spread/Smoke Developed Values: 100-205/over 500 to CAN/ULC-S102.2.

.5 Void Forms: Geospan compressible fill material in dimensions to fit the foundation requirements.

.6 Cavity Wall Insulation: Fibrous mineral wool insulation, non-combustible, light weight and water repellent, semi-rigid insulation board, in accordance with CAN/ULC S704, Type 1 for use in cavity wall applications. UL certified.
- .1 Thermal Resistance: long term RSI value of 0.76/25mm. Total RSI value as indicated on the drawings.
- .2 Compressive Strength: 70 kg/m3 density nominal.
- .3 Flame Spread Rating: 5 or less in accordance with CAN/ULC S102
- .4 Edges: Square.

2.2 ACCESSORIES

.1 Adhesive for Perimeter Insulation: Conforming to CGSB 71-GP-24M, Type 1.

.2 Insulation Fasteners: High quality, impale resistant plastic or galvanized steel fastener system, specifically designed for board insulation, self-tapping steel stud framing screw or self drilling concrete/masonry screw as applicable, 45mm diameter minimum, shaft length to suit insulation thickness.

.3 Clips Adhesive – high solid rubberized adhesive, as recommended by Insulation Clip Manufacturer.

Part 3. Execution

3.1 INSPECTION

.1 Ensure all surfaces which are to receive rigid insulation are clean, free of deleterious matter and are sufficiently level to allow the proper installation of insulation.
.2 Verify that all flashings, provided under other Sections, to divert moisture to exterior properly placed.

3.2 INSTALLATION

.1 Install rigid insulation to maintain continuous thermal insulation, vapour barrier and air tightness for building spaces and elements.
.2 Saw-cut all rigid insulation.
.3 Cut and trim insulation neatly to fit spaces. Butt edges and ends tight. Fit insulation tight against mechanical, electrical and other items protruding plane of insulation.
.4 Use insulation free of broken or chipped edges.
.5 Follow the instructions for use of materials of insulation and accessory manufacturers.

3.3 PERIMETER INSULATION

.1 Apply adhesive in continuous 6 mm beads in a grid pattern to prevent potential air movement behind the insulation boards. Apply adhesive fully around protrusions.
.2 Install boards on exterior face of foundation, grade beam perimeter, vertically. Extend boards minimum 600 mm vertically from bottom of finish floor slab.
.3 Place boards in a method to maximize contact with bedding. Stagger side and end joints. Butt edges and ends tight to adjacent boards.
.4 Extend boards across control and expansion joints, unbonded to foundation 75 mm on one side of joint.
.5 Cut and fit insulation tight to protrusions or interruptions to insulation plane.
.6 Layout concrete-faced insulation boards to maximize board sizes. Do not use boards less than 150 mm wide.
.7 Install concrete-faced insulation board system vertically, complete with fastening clips and cap flashing in accordance with manufacturer's installation guidelines.

3.4 BELOW-SLAB INSULATION

.1 Place insulation under slabs as indicated on the drawings on grade after base for slab is complete. Lay boards on level compacted fill.
.2 Cut and fit insulation tight to protrusions or interruptions to insulation plane.
.3 Prevent insulation from being displaced or damaged while placing vapour retarder and placing slab.

END OF SECTION

Part 1. General

1.1 INTERFACE WITH ADJACENT SYSTEMS

.1 Co-ordination between all installers of each component of vapour and air retarder system is essential to ensure continuity of system and that junctions between the various components are effectively sealed.

.2 Verify with manufacturers and all tradesmen involved with installation procedures of building products incorporated into air barrier elements including, but not limited to, various membranes, coatings and sealants as well as continuity with roofing membrane.

1.2 PRE-INSTALLATION CONFERENCE

.1 Convene 1 week before commencing Work of this Section.

.2 Arrange for manufacturer's factory-trained agent to be on site at beginning of installation to provide training and supervision of personnel who will install coating. Agent shall also provide frequent inspection visits thereafter to assure quality and competence of membrane installation.

1.3 DELIVERY, STORAGE & HANDLING

.1 Deliver materials to job site in original unopened packages, clearly marked with manufacturer's name, brand name and description of contents.

.2 Use all means necessary to protect membrane materials before, during and after installation and, to protect the installed Work of all other trades.

.3 Protect all materials stored on site. Do not store membrane more than two pallets high off ground. Do not store in temperature above 32°C for prolonged period of time. Store in dry area, away from high heat, open flame or sparks.

1.4 JOB CONDITIONS

.1 Apply air/vapour retarder membrane to gypsum board surfaces which are dry, when temperature is 4°C or higher.

.2 Apply air/vapour retarder membrane to cast-in-place concrete, precast concrete, masonry (strike masonry joints flush) which are smooth, clean, dry and in good condition. All moisture, grease, machine oil or other foreign material must be removed. Concrete must be cured, minimum 7 days, and dry before application, and when temperature is 5°C or higher.

Part 2. Products

2.1 MATERIALS

.1 Asphalt Based Primer:

.1 Description: A blend of SBS modified bitumen, fast-evaporating solvents and adhesive enhancing additives. It is required to prime most surfaces such as concrete, metal and wood substrates in order to improve the adhesion of torch-applied waterproofing membranes.

Specific gravity at 20ºC (kg/l)	0.91
Solids by Weight (%)	35
Viscosity, Brookfield (cps. 25ºC	50
Flash point (ASTM D-93)	-3ºC (26ºF)
Drying time	1 to 12 hours depending on temperature and thickness.

2.2 AIR/VAPOUR BARRIER MEMBRANE

.1 Description: Membranes composed of a glass grid reinforcement and SBS modified bitumen. The membrane top surface is lightly sanded to accept spray applied polyurethane foam insulation. The under surface is covered with a thermofusible plastic film. These membranes are torch applied only. Never bond with hot asphalt.

.2 Components:

Reinforcement: glass fleece.

Elastomeric bitumen: Mix of selected bitumen and SBS polymer.

.3 Properties:

Thickness:	2.7 mm
Strain energy (kN/m):	(MD) = 0.5, (XD) = 0.5
Breaking strength (kN/m):	(MD) = 10, (XD) = 7.5
Ultimate elongation (%):	(MD) = 4, (XD) = 4
Cold bending at -30ºC:	No cracking
Softening point:	³ 110ºC
Static puncture resistance (N):	90
Water vapour permeance (ng/sq. m.sPa.)	0.22

.4 Prefabricated membrane: Complies with CAN/CGSB-37.56-M, 9th Draft.

2.3 WATERPROOFING MASTIC

.1 Description: is a black, solvent-based mastic containing SBS modified bitumen, fibres and mineral fillers.

Specific gravity at 20ºC (kg/l)	1.12
Application temperatures	-10 to +35ºC (14 to 95ºF)
Solids by Weight (%)	83
Flash point (ASTM D-93)	25ºC (77ºF)
Setting time	between 4 to 24 hours depending on temperature and quantity applied.

2.4 ROOF TO WALL TIE-IN MEMBRANE

.1 Description: membrane composed of a composite heavy duty reinforcement and SBS modified bitumen. A silicone release film covers the self-adhesive under face and the top face is sanded.

.2 Components:

Reinforcement: non-woven polyester and glass grid

Elastomeric bitumen: Mix of selected bitumen and SBS polymer.

.3 Properties:

Thickness:	3.0 mm
Strain energy (kN/m):	(MD) = 7.8, (XD) = 7.2
Breaking strength (kN/m):	(MD) = 15, (XD) = 13.5
Ultimate elongation (%):	(MD)= 40, (XD) = 25
Cold bending at -30ºC:	No cracking
Softening point:	³ 110ºC
Static puncture resistance (N):	³ 400

.4 Prefabricated membrane: Complies with CAN/CGSB-37.56-M, 9th Draft.

2.5 MASONRY FLASHING

.1 Description: self-adhesive membrane composed of thermoplastic polymer modified bitumen and a high-density polyethylene film. The lower surface is covered with a silicone release film. Refer to technical details for installing the specified membrane. Self-adhesive membranes that will be covered with sprayed insulation must be mechanically fastened with a specially designed metal bar.

.2 Components:

Reinforcement: high density polyethylene film

Elastomeric bitumen: Mix of selected bitumen and SBS polymer.

.3 Properties:

Thickness:	1.5 mm
Dimensions:	Width: 1 m, length: 18.7 m
Strain energy (kN/m):	(MD) = 16, (XD) = 18
Ultimate elongation (%):	(MD) = 500, (XD) = 300
Static puncture resistance (N):	³ 200
Tearing strength (N):	(MD) = 100, (XD) = 100
Breaking strength (kN/m):	(MD) = 5, (XD) = 6

.4 Prefabricated membrane: Complies with CAN/CGSB-37.56-M, 9th Draft.

2.6 ACCESSORIES

.1 Ice and Water Shield as shown on Drawings.

.2 Roofing Slip Sheet as shown on Drawings.

Part 3. Execution

3.1 EXAMINATION & PREPARATION OF SURFACES

.1 Prior to commencement of work, the Waterproofing Contractor must receive a written order to proceed from the Departmental Representative accepting deck conditions.

.2 Before commencing work, all surfaces must be smooth, dry, clean and free of ice and debris.

.3 Do not install materials in conditions of snow or rain.

.4 Concrete must be cured a minimum of seven (7) days and an adhesion test is recommended before membrane application.

3.2 METHOD OF EXECUTION

.1 Install elements on clean and dry surfaces according to the manufacturer's recommendations.

.2 Work shall be performed on a continuous basis as surface and weather conditions allow.

.3 Adjoining surfaces shall be protected against any damage that could result from the waterproofing installation.

.4 Ensure that all identification tapes have been removed prior to torching membranes.

3.3 EQUIPMENT

.1 Maintain all waterproofing equipment and tools in good condition.

.2 Use only manufacturer approved torches and rollers.

.3 Ensure that equipment is used safely and that propane tanks are regularly inspected.

3.4 PRIMER APPLICATION

.1 Surface where membrane is applied shall receive an asphalt primer coating at the rate of 0.15 to 0.20 l/sq. m.

3.5 AIR/VAPOUR BARRIER MEMBRANE INSTALLATION

.1 Dynamic cracking in the substrate, or cracks of greater than 3 mm in width shall be reported to the Engineer prior to membrane installation. Static cracking up to 3 mm in width must be covered with a membrane strip 150 mm wide, centred over the crack. This strip is to be installed before the installation of the covering membrane.

.2 Where membranes are to be installed onto walls without masonry anchors, or where masonry anchors shall be installed after the membrane installation, the membrane should be installed in the vertical sense. Cut membrane strips in lengths of 2 m - 3 m. Weld the membrane using a propane gas torch. Membrane segments must overlap by a minimum of 50 mm. Smooth and seal joints at the membrane edges using a trowel.

.3 Where masonry anchors are already in place prior to the membrane installation, install the membrane in a horizontal orientation. The installation should begin from the bottom and work in an upward direction along the wall surface, using the width of membrane recommended and supplied by the manufacturer.

Install the membrane segments horizontally between the masonry anchors. Weld the membrane in place using a propane torch. Cut the membrane at each anchor. Fold the membrane onto the wall surface on either side of the anchor while welding it into place.

The overlaps between membrane strips and at their edges should be a minimum of 50 mm. Using a trowel, smooth and seal the joints and edges of the membrane. Seal around the masonry anchors by heating the membrane and smoothing the liquid bitumen around the anchor using a trowel.

.4 Across opening, that is areas where the membrane is unsupported, (around windows, below edge beams, etc.) stop the membrane on the wall surface at the edge of the opening on either side. To extend the air/vapour barrier across the opening, cut a membrane strip 300 mm wide and 3 m long. Install this strip centred over the unsupported opening, parallel to its length, so as to minimize the number of overlaps between membrane strips which span the opening.

.5 Holes and rips in the membrane must be repaired with the appropriate membrane material. A patching piece must be welded into place and exceed the affected surface area by at least 100 mm.

.6 The Contractor shall verify meticulously the membrane installation at the end of each day of work and also before installation of insulation.

.7 The membrane must be carefully installed around openings in the wall (windows, doors, etc.) in such a manner as to prevent any air leak at these areas (refer to drawings and details). The air/vapour barrier membrane must be installed to create a continuous seal at all construction elements such as foundations, roofs and walls, and at junctures of different materials or construction types (curtain wall construction, etc.). Where installation cannot be carried out using a torch, use approved self-adhesive membrane, using primer to prime the surface prior to membrane installation. Apply firm pressure onto the self-adhesive membrane surface in order to ensure proper adhesion. Where the self-adhesive membrane is jointed to a torch-welded membrane, the self-adhesive membrane should always overlap on top of the other, and the joint be sealed with mastic. In the case of a torch-on membrane with a sanded surface, that surface must be primed with primer prior to applying the self-adhesive membrane.

.8 Install insulation as soon as possible following the inspection of the membrane by the professional.

3.6 WATERPROOFING FOR VARIOUS DETAILS

.1 Install waterproofing membranes in conformance with various details illustrated in the manufacturers' installation details:

.1 Install Ice and Water Shield membrane as shown on roof details.

.2 Install Roof Slip Sheet as shown on rood details.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Surface preparation.
.2 Application of an underslab vapour retarder.

1.2 DOCUMENTS

.1 This section, along with the drawings, forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.3 RELATED WORK SPECIFIED ELSEWHERE

.1 Section 07 26 13 – Thermofusible Air-Vapour Membranes

1.4 REFERENCE STANDARDS

.1 ASTM D1709 Standard Test Methods for Impact Resistance of Plastic Film by the Free-Falling Dart Method.
.2 ASTM E96 - Standard Test Methods for Water Vapour Transmission of Materials.
.3 ASTM E154 - Standard Test Methods for Water Vapour Retarders Used in Contact with earth Under Concrete Slabs.
.4 ASTM E1643 - Standard Practice for Installation of Water Vapour Retarders Used in contact with Earth or Granular Fill Under Concrete Slabs.
.5 ASTM E1745 - Standard Specification for Plastic Water Vapour Retarders Used in contact with Soil or Granular Fill Under Concrete Slabs.
.6 ASTM F1249 Standard Test Method for Water Vapour Transmission Rate Through Plastic film and Sheeting Using a Modulated Infrared Sensor.

1.5 DELIVERY, STORAGE, AND HANDLING

.1 Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
.2 Store materials in a clean, dry area in accordance with manufacturer's instructions.
.3 Protect materials during handling and application to prevent damage or contamination.
.4 Ensure membrane is stamped with manufacturer’s name, product name, and membrane thickness at intervals of no more than 225 cm.

1.6 ENVIRONMENTAL REQUIREMENTS

.1 Product not intended for uses subject to abuse or permanent exposure to the elements.
.2 Do not apply on frozen ground.

Part 2 Products

2.1 MATERIALS

.1 Plastic Vapour Retarder
  .1 Performance-Based Specification: Vapour retarder membrane shall be manufactured from virgin polyolefin resins, and when tested according to all requirements of ASTM E1745, shall meet the following minimum performance requirements:

1. Maximum Water Vapour Permeance (ASTM E154 Sections 7, 8, 11, 12, 13, by ASTM E96, Method B or ASTM F1249)
    1. As received: 0.0063 perms.
    2. After Wetting and Drying: 0.0052 perms.
    3. Resistance to Plastic Flow and Temperature: 0.0057 perms.
    4. Effect Low Temperature and Flexibility: 0.0052 perms.
    5. Resistance to Deterioration from Organisms and Substances in Contacting Soil: 0.0052 perms.
2. Puncture Resistance (ASTM D1709): >3,200 grams.
3. Tensile Strength ASTM E154, Section 9: 13 kN / mm

2.2 ACCESSORIES

.1 Seam Tape
- .1 High Density Polyethylene Tape with pressure sensitive adhesive. Minimum width 100 mm.

.2 Pipe Collars
- .1 Construct pipe collars from vapour retarder material and pressure sensitive tape per manufacturer's instructions.

Part 3 Execution

3.1 SURFACE PREPARATION

.1 Prepare surfaces in accordance with manufacturer's instructions.

.2 Level, tamp, or roll earth or granular material beneath the slab base.

3.2 EXAMINATION

.1 Examine surfaces to receive membrane. Notify architect if surfaces are not acceptable. Do not begin surface preparation or application until unacceptable conditions have been corrected.

3.3 APPLICATION

.1 Install the vapour retarder membrane in accordance with manufacturer's instructions and ASTM E 1643.

.2 Unroll vapour retarder with the longest dimension parallel with the direction of the pour.

.3 Lap vapour retarder over footings and seal to foundation walls.

.4 Overlap joints 150 mm and seal with manufacturer's tape.

.5 Seal all penetrations (including pipes) with manufacturer's pipe boot.

.6 No penetration of the vapour retarder is allowed except for reinforcing steel and permanent utilities.

.7 Repair damaged areas by cutting patches of vapour barrier, overlapping damaged area 150 mm and taping all four sides with tape.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Supply and installation of building wrap.

.2 Clip system and siding installation.

.3 Caulking and sealing of finished installation.

.4 Related trim, flashings, accessories and fastenings.

1.2 RELATED SECTIONS

.1 Section 06 11 00 - Wood Framing: Wall sheathing.

.2 Section 06 11 00 – Wood Framing: Supply and installation of wood furring strips.

.3 Section 07 26 13 - Vapour / Air Barriers: Sheet air barrier.

.4 Section 07 62 00 - Sheet Metal Flashing and Trim.

1.3 REFERENCES

.1 ASTM C1186 - Standard Specification for Flat Fiber-Cement Sheets.

.2 ASTM D3359 - Standard Test Method for Measuring Adhesion by Tape Test, Tool and Tape.

.3 ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 degrees C.

1.4 SUBMITTALS FOR REVIEW

.1 Section 01 33 00: Submittal Procedures.

.2 Product Data: Provide panel properties, configurations, special shapes, and securement methods.

.3 Shop Drawings: Indicate metal flashings, joint locations, fastening locations, and installation details.

.4 Samples: Submit two (2) panel units, 600 mm (24inch) in size illustrating colour, surface finish and texture.

1.5 CLOSEOUT SUBMITTALS

.1 Section 01 33 00: Submittal Procedures.

.2 Submit warranty information, in name of Owner.

1.6 QUALITY ASSURANCE

.1 Installer Qualifications: Company specializing in performing the work of this section.

1.7 MOCK-UP

.1 Section 01 45 00: Requirements for mock-up.

.2 Provide mock-up including furring strips and air barrier.

.3 Locate where directed by Consultant.

.4 Approved mock-up may remain as part of the Work.

1.8 DELIVERY, STORAGE, AND PROTECTION

.1 Section 01 10 00: Transport, handle, store, and protect products.

.2 Store products in manufacturer's unopened packaging until ready for installation.

.3 Store siding on edge or lay flat on a smooth level surface. Protect edges and corners from chipping. Store sheets under cover and keep dry prior to installing.

1.9 WARRANTY

.4 Provide a thirty (30) year non pro-rated product warranty to include for failure to meet specified requirements.

.5 Provide a fifteen (15) year limited warranty on trim boards.

.6 Provide a fifteen (15) limited warranty from substantial completion, that finish will not peel, crack or chip. Finish warranty includes coverage for labour and material.

.7 Workmanship Warranty: Warrant application for 2 years.

Part 2 Products

2.1 MATERIALS

.1 Fiber-cement Siding - complies with ASTM C 1186 Type A Grade II.

.2 Fiber-cement Siding - complies with ASTM E 136 as a non-combustible material.

.3 Fiber-cement Siding - complies with ≈STM E 84 Flame Spread Index = 0, Smoke Developed Index = 5.

.4 Trim:

.1 Inside Corner: smooth finish, colours to match horizontal and vertical siding,

.2 Outside Corner: smooth finish, colours to match horizontal and vertical siding.

.3 Perimeter wall panel areas: smooth finish.

2.2 ACCESSORIES

.1 Fasteners: Wood Framing: No. 11 gauge 1-1/4 inches (32 mm) corrosion resistant roofing nails, or as recommended by Manufacturer.

2.3 FLASHING MATERIALS

.1 Sheet Flashings: As specified in Section 07 62 00.

.2 Flashings to be installed at locations recommended by Manufacturer.

Part 3 Execution

3.1 EXAMINATION

.1 Section 01 10 00: Verify existing conditions before starting work.

.2 Review and confirm that penetrations have been installed and completed, prior to start of this work.

.3 Confirm layout and details with consultant prior to start of work.

3.2 PREPARATION

.1 Clean surfaces thoroughly prior to installation.

.2 Install Engineered weather barrier in accordance with local building code requirements.

.3 Use Seam Tape and joint and laps.

.4 Install flashing and Flex Flashing.

3.3 SIDING INSTALLATION

.1 Install materials in strict accordance with manufacturer's installation instructions.

.2 Starting: Install a minimum 1/4 inch (6 mm) thick lath starter strip at the bottom course of the wall. Apply planks horizontally with minimum 1-1/4 inches (32 mm) wide laps at the top. The bottom edge of the first plank overlaps the starter strip.

.3 Allow minimum vertical clearance between the edge of siding and any other material in strict accordance with the manufacturer's installation instructions.

.4 Align vertical joints of the planks over framing members.

.5 Maintain clearance between siding and adjacent finished grade.

.6 Locate splices at least one stud cavity away from window and door openings.

3.4 TRIM INSTALLATION

.1 Install materials in strict accordance with manufacturer's installation instructions. Install flashing around all wall openings.

.2 Place fasteners no closer than 3/4 inch (19 mm) and no further than 2 inches (51 mm) from side edge of trim board and no closer than 1 inch (25 mm) from end. Fasten maximum 16 inches (406 mm) on center.

.3 Allow 1/8-inch gap between trim and siding.

.4 Seal gap with high quality, paint-able caulk.

END OF SECTION

Part 1. General

1.1 RELATED SECTIONS

.1 Section 07 62 00 - Sheet Metal Flashing and Trim.

1.2 SUBMITTALS

.1 Comply with requirements of Division 01.
.2 Provide product data indicating dimensions, profiles, attachment methods, trim, and related work.
.3 Provide duplicate samples representative of materials, finishes, colours and profiles.
.4 Provide data indicating vented soffit free opening area.

1.3 REFERENCE DOCUMENTS

.1 ASTM A792/A792M-10, Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.

Part 2. Product

2.1 METAL FASCIA, GUTTERS, AND SOFFITS

.1 Material: aluminum or aluminum-zinc alloy coated steel.
.2 Vented Type: minimum $0.10\ m^2$ of opening for every $30\ m^2$ of building area, uniformly perforated to manufacturer's standard.
.3 Solid Type (non-vented): Smooth finished.
.4 Soffit Profile: grooved at maximum 150 mm centres.
.5 Soffit Trim, same material and colour as soffit, and as follows:
  .1 Manufacturer's standard J-trim, mitre trim.
  .2 Soffit Transition Moulding: cove, quarter round or crown type.
.6 Gutters Profile: as shown on Drawings.
.7 Fascia: same material and colour as soffit.
.8 Downspouts (Existing Building): Match existing materials and dimensions.
.9 Finish and Colour:
  .1 Selected by Departmental Representative.
  .2 Refer to drawings for locations.

2.2 ACCESSORIES

.1 Fasteners: nails to CSA B111-1974, galvanized steel, aluminum screws.
.2 Sheathing Paper: #15 asphalt paper or spunbonded olefin sheet, to CAN/CGSB-51.32-M77.

.3 Sheathing Tape: as recommended by sheathing paper manufacturer.

.4 Staples: galvanized wire, minimum 6 mm leg.

3. Execution

3.1 VERIFICATION OF CONDITIONS

.1 Verify acceptability of substrates for soundness, dimensions and flatness.

.2 Verify flashings specified in Related Sections are installed.

3.2 SHEATHING PAPER INSTALLATION

.1 Install sheathing paper horizontally to form weathertight building envelope. Provide minimum number of joints. Shingle lap edges minimum 150 mm.

.2 Repair punctures, small rips and tears with sealing tape.

.3 Where punctures and tears cannot be repaired with sheathing tape, replace entire damaged section.

.4 Tape sheathing paper to penetrating mechanical and electrical items to form weathertight seal.

3.3 INSTALLATION, GENERALLY

.1 Install soffits and trim as indicated on drawings, as specified and to manufacturer's written instructions.

.2 Install penetration trim for a snug fit at all penetrations, including lights, vents, hose bibbs, etc.

.3 Install soffit transition moulding where soffits meet siding.

.4 Distribute vented soffit panels uniformly, when not indicated on drawings.

.5 Unless indicated otherwise on drawings, orient soffit panels across soffit width.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 American Society for Testing and Materials (ASTM International).
  .1 ASTM A653/A653M-19, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

1.2 SUBMITTALS

.1 Section 01 33 00: Submittal Procedures.
.2 Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
.3 Submit two samples 50 x 50 mm in size illustrating metal finish colour.

1.3 DELIVERY, STORAGE, AND HANDLING

.1 Stack preformed and prefinished material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
.2 Prevent contact with materials which may cause discolouration or staining.

Part 2 Products

2.1 SHEET MATERIALS

.1 Prepainted Galvanized Steel Sheet: ASTM A653/A653M, 22 gauge (0.026 inch) zinc coated galvanized steel sheet. Custom colours selected by Departmental Representative from unrestricted range.
.2 Aluminum: Clear anodized sheet, minimum 0.8 mm thickness.

2.2 ACCESSORIES

.1 Fasteners: DT2000 coated or stainless steel. Exposed fasteners permitted only on approval of Departmental Representative.
.2 Exposed Sealant: Silicone type, as specified in Section 07 92 00; colour to match sheet metal finish.
.3 Bedding Sealant: Butyl, as specified in Section 07 92 00.
.4 Protective Backing Paint: Bituminous.

2.3 FABRICATION

.1 Form sections true to shape, accurate in size, square, and free from distortion or defects.
.2 Fabricate cleats of same material as sheet, minimum 50 mm wide, interlockable with sheet.
.3 Form pieces in longest possible lengths.
.4 Hem exposed edges on underside 13 mm; mitre and seam corners.
.5 Form material with flat lock seams.
.6 Fabricate vertical faces with bottom edge formed outward 6 mm and hemmed to form drip.

.7 Fabricate flashings for curtain wall, windows, louvres and other openings to profiles indicated. Coordinate installation with work of other sections.

2.4 FINISH

.1 Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 0.4 mm.

Part 3 Execution

3.1 PREPARATION

.1 Install starter and edge strips, and cleats before starting installation.

3.2 INSTALLATION

.1 Secure flashings in place using concealed fasteners. Use exposed fasteners only where permitted.
.2 Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.
.3 Seal metal joints watertight.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 06 11 00 Wood Framing

.2 Section 07 62 00 Metal Flashing and Trim

1.2 REFERENCES

.1 Canadian General Standards Board (CGSB):

.1 CGSB 19-GP-14M, Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing (Reaffirmed, June 1984)

.2 CAN/CGSB-19.17M90, One Component, Acrylic Emulsion Base Sealing Compound.

.3 CAN/CGSB-19.13-M87, Sealing Compound, One Component, Elastomeric, Chemical Curing.

.4 CAN/CGSB-19.24-M90, Sealing Compound, Multi-Component, Chemical Curing.

.2 American Society for Testing and Materials (ASTM):

.1 ASTM C920-02, Elastomeric Joint Sealants.

.2 ASTM D2240-04, Rubber Property - Durometer Hardness.

1.3 QUALITY ASSURANCE

.1 Caulking shall be performed by a caulking contractor with 3 or more years successful experience in Work of similar size and complexity.

.2 Before performing Work of this Section, submit the names of proposed materials. If specified using CGSB Standards, indicate Qualification Number.

1.4 DELIVERY, STORAGE, HANDLING

.1 Deliver containers labeled and sealed, complete with written application and maintenance instructions.

.2 Store materials in a dry heated enclosure in accordance with manufacturer's instructions.

1.5 WARRANTY

.1 Contractor hereby warrants that caulking work will not leak, crack, crumble, melt, shrink, run, lose adhesion or stain adjacent surfaces in accordance with General Conditions, but for three (3) years.

.2 Provide Warranty for sealants to include in maintenance manuals as specified in Section 01 11 55 – General Requirements.

Part 2 Products

2.1 SEALANT MATERIALS

.1 Type S-1; acrylic sealant: Acrylic latex conforming to CAN/CGSB-19.17M.

.2 Type S-3; silicone sealant: General construction, conforming to CAN/CGSB-19.13M.

.3 Type S-4; silicone sealant: Structural glazing, conforming to CAN/CGSB-19.13M.

.4 Type S-5; acoustical sealant: Non-hardening, conforming to CAN/CGSB-19.21M.

.5 Type S-6; air-seal sealant: Butyl non-hardening, conforming to CGSB 19-GP-14M.

.6 Type S-7; multi-component sealant: Chemical curing, exterior wall sealant conforming to CAN/CGSB-19.24M.

.7 Type S-8; horizontal joint sealant: Two component, self levelling, conforming to CAN/CGSB-19.24M and ASTM C920.

.8 Type S-10; polyurethane sealant: One component, non-sag, for general construction, conforming to CAN/CGSB-19.13M.

.9 Type S-11; saw-cut sealant: Multi-component, self-levelling, conforming to ASTM D2240.

.10 Type S-13; polysulphide sealant: One component, non-sag, for general construction, conforming to CAN/CGSB-19.13M.

.11 Acceptable materials: Use any manufacturers products listed in this section meeting the requirements of the specification and the application as recommended by the manufacturer:

.12 GE Silicones Limited, Telephone: (604) 294-5514 or (800) 668-4644.

.13 Dow Corning Canada Inc., Telephone: (403) 271-6778, (604) 688-9904 or (517) 494-6000

.14 Chemtron Manufacturing Ltd., Telephone: (403) 252-7803

.15 Sika Chemical of Canada Ltd., Telephone: (780) 486-6111 or (800) 933-7452

.16 ChemRex Inc., Sonneborn, Telephone: (800) 433-9517 or (780) 453-6682

.17 Tremco Ltd., Telephone: (800) 363-9879 or (780) 452-5954

2.2 ACCESSORIES

.1 Backer Rod: Non-staining, non-absorbent, reticulated closed cell backer rod, round shape; 30% -50% oversized.

.2 Primer: Non-staining type as recommended by sealant manufacturer.

.3 Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

.4 Joint Cleaner: Non-corrosive solvent type recommended by sealant manufacturer for applicable substrate materials.

2.3 COLORS

.1 Colors: To match adjacent materials, as selected by Consultant, from manufacturer's standard colour range.

2.4 SELECTION OF SEALANT TYPES

.1 Where no specified type of sealant is shown or specified choose one of the sealants specified in this Section appropriate for its location.

.2 Make sealant selections consistent with manufacturer's recommendations.

.3 Use acrylic sealant Type S-1 only on the interior and only in situations where little or no movement can occur.

.4 Use silicone general construction sealant Type S-3 or polyurethane sealant Type S-7 and S-10 for all joints, interior and exterior, where no other specific sealant type specified.

.5 Use structural glazing silicone Type S-4 for sealing glass, interior and exterior.

.6 Use acoustical sealant Type S-5 and air seal sealant Type S-6 only where they will be fully concealed and only where no constant or consistent air pressure difference will exist across the joint.

.7 Use multi-component sealant Type S-7 for exterior vertical joints where large movement is anticipated. Not for continuous water immersion.

.8 Use multi-component sealant type S-11 for saw-cuts in slabs on grade interior and exterior.

.9 Use multi-component sealant type S-7 for edge joint sealant at slab edges at walls, columns, interior shaft walls and grade beams.

.10 Use multi-component sealant type S-7, primed penetration element surfaces other than concrete, for mechanical and electrical service penetrations in concrete foundation walls.

Part 3 Execution

3.1 INSPECTION

.1 Carefully inspect surfaces, materials to receive sealants and verify they are physically capable of retaining sealant bond.

.2 Verify that fillers and backing provided under other Sections properly installed.

3.2 PREPARATION

.1 Maintain workmanship of highest quality in accordance with best trade practice.

.2 Ensure that joint forming materials are compatible with sealant.

.3 Clean and prepare joints in accordance with manufacturer's recommendation. Wire brush loose materials and other foreign matter which might impair adhesion of sealant.

.4 Use air stream to blow out dirt and water from crevices.

.5 Prime all porous material (e.g. wood, masonry, concrete, ceramic or paver tile, etc.)

.6 Prime other joints when recommended by manufacturer. Use a brush that will reach all parts of the joints. Mask adjoining surfaces with tape prior to priming to prevent staining.

3.3 APPLICATION

.1 Apply sealant in strict accordance with manufacturer's recommendations.

.2 For joints where movement is possible, apply backer rod to achieve a joint depth of one half the joint width but not less than 9 mm (5/16”); for joints larger than 25 mm (1”) use a depth of 13 mm (½”).

.3 Use pressure gun fitted with suitable nozzle. Use sufficient pressure to fill voids and joints solid.

.4 Form surface of sealant smooth, free from ridges, wrinkles, sags, or air pockets and imbedded impurities. Neatly tool surface to a slight concave appearance.

.5 Tool sealants to achieve air tight joints. Use wet tools as required.

.6 Ensure bead is solid, filling entire space between sides and bedding material, exerting sufficient pressure to obtain maximum bond, by allowing sealant to bulge out in advance of nozzle.

.7 Apply sealant within recommended temperature ranges. Consult manufacturer when sealant can not be applied within recommended temperature range.

.8 Seal perimeters of hollow metal door frames on both sides.

3.4

.1 Seal control joints in gypsum board and stucco, and junctures between interior partitions with exterior walls.

.2 Seal window and door frames around the inside perimeter, so that an airtight seal is obtained, as indicated on drawings.

.3 Seal joints in floors and walls and around service and mechanical and electrical fixture penetrations.

.4 Seal at all locations where dissimilar material meet.

3.5 BOND BREAKER

.1 Use backer rod as specified, to limit depth of sealant and to act as bond breaker at back of joint.

.2 Where depth of joint does not permit the use of backer rod apply paper masking tape to back of joint to act as bond breaker.

.3 Ensure that no joints are formed which are bonded on adjacent sides where there is any possibility of movement.

3.6 HORIZONTAL JOINT SEALANT

.1 Carefully level and accurately place horizontal joint sealant to result in a smooth, level joint, well bonded to the side surfaces.

.2 Prepare and prime surfaces in strict accordance with manufacturer's recommendations.

.3 Keep adjacent surfaces free from spilled materials. Use masking tape if necessary.

3.7 CLEAN UP

.1 Clean adjacent surfaces immediately, leaving Work neat and clean.

.2 Remove excess sealant and droppings using recommended cleaners as Work progresses.

.3 On porous surfaces allow sealant to cure overnight and remove excess by light wire brushing.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Master Painters Institute (MPI)

.1 MPI Architectural Painting Specifications Manual, 2004.

1.2 SUBMITTALS

.1 Submittals in accordance with Section 01 33 00.
.2 Submit product data and instructions for each paint and coating product to be used.
.3 Samples: Submit full range colour sample chips to indicate where colour availability is restricted.

1.3 DELIVERY, STORAGE AND HANDLING

.1 Packing, Shipping, Handling and Unloading: in accordance with manufacturer's written instructions.
.2 Remove damaged, opened and rejected materials from site.
.3 Storage and Protection:
.1 Provide and maintain dry, temperature controlled, secure storage.
.2 Store materials and supplies away from heat generating devices.
.3 Store materials and equipment in well ventilated area with temperature range 7°C to 30°C.

1.4 EXTRA MATERIALS

.1 Section 01 70 00 Extra materials.

.2 Provide minimum 1(one) 4L can of each type of paint used on the project

1.5 SITE CONDITIONS

.1 Heating, Ventilation and Lighting:
.1 Provide heating facilities to maintain ambient air and substrate temperatures above 10°C for 24 hours before, during and after paint application until paint has cured sufficiently.
.2 Provide continuous ventilation for seven days after completion of application of paint.
.3 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.

.2 Surface and Environmental Conditions:

.1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.
.2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits.
.3 Apply paint when previous coat of paint is dry or adequately cured.

1.6 GUARANTY

.1 The Contractor will provide a two-year guaranty in accordance with the MPI (Master Painters Institute) quality assurance program as follows:

□

1.7

.1 The local MPI Accredited Quality Assurance's 2-year Guaranty or

.2 100%, 2-year Maintenance Bond in accordance with MPI Painting Specification Manual requirements for paint, commencing at date of substantial Performances.

.2 All painting and decorating work shall be inspected by a Paint Inspection Agency (inspector) acceptable to the specifying authority and the local MPI Accredited Quality Assurance Association. The painting contractor shall notify the Paint Inspection Agency a minimum of one week prior to commencement of work and provide a copy of the project painting specification, plans and elevation drawings (including pertinent details) as well as Finish Schedule.

.3 All surfaces requiring painting shall be inspected by the Paint Inspection Agency who shall notify the Departmental Representative and General Contractor by writing of any defects or problems, prior to commencing painting work, or after the prime coat shows defects in substrate.

.4 During the above period, any surface which, in the opinion of the Departmental Representative, becomes defectives, shall be refinished to his approval and at no expense to the Departmental Representative.

Part 2 Products

2.1 MATERIALS

.1 Paint materials listed in the current MPI Approved Products List (APL) are acceptable for use on this project.

.2 All interior paint materials selected from the MPI APL must meet the MPI Green Performance Standard (GPS) where available, unless otherwise directed by the Departmental Representative.

.3 Provide Epoxy Paint for floors and walls of service area and drive-through as per finish schedule on drawings. For service area and drive through floors use 2 Part epoxy Paint with Sharp Grit for Slip Resistance.

.4 Provide paint materials for paint systems from single manufacturer.

.5 Conform to latest MPI requirements for interior and exterior painting work including preparation and priming.

2.2 COLOURS

.1 Departmental Representative will provide Colour Schedule after Contract award. Preliminary colour selection is indicated on Finish Schedule.

.2 Selection of colours from manufacturer's full range of colours.

.3 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

2.3 MIXING AND TINTING

.1 Perform colour tinting operations prior to delivery of paint to site.

.2 Use and add thinner in accordance with paint manufacturer's recommendations. Do not use kerosene or similar organic solvents to thin water-based paints.

.3 Thin paint for spraying in accordance with paint manufacturer's instructions.

2.4 GLOSS/SHEEN RATINGS

.1 Paint gloss shall be defined as the sheen rating of applied paint, in accordance with the following values:

□

Gloss Level Category	Units @ 60°	Units @ 85º
G1 - matte	0 to 5	max. 10
G2 - velvet	0 to 10	10 to 35
G3 - eggshell	10 to 25	10 to 35
G4 - satin	20 to 35	min. 35
G5 - semi-gloss	35 to 70	
G6 - gloss	70 to 85	
G7 - high gloss	> 85	

.2 Gloss level ratings of painted surfaces shall be selected by Departmental Representative after Contract Award, unless noted otherwise.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 GENERAL

.1 Perform preparation and operations for interior painting in accordance with MPI Architectural Painting Specifications Manual except where specified otherwise.

.2 Apply paint materials in accordance with paint manufacturer's written application instructions.

3.3 PREPARATION

.1 Protection:
- .1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore surfaces as directed by Departmental Representative.
- .2 Protect items that are permanently attached such as Fire Labels on doors and frames.
- .3 Protect factory finished products and equipment.
- .4 Protect passing pedestrians, building occupants and general public in and about the building.

.2 Clean and prepare surfaces in accordance with MPI Architectural Painting Specification Manual requirements.

.3 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to 1000 mm.

3.4 APPLICATION

.1 Conform to manufacturer's application instructions unless specified otherwise.

.2 Apply coats of paint continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.

.3 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.

.4 Sand and dust between coats to remove visible defects.

.5 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as tops of interior cupboards and cabinets and projecting ledges.

.6 Finish top, bottom, edges and cut-outs of doors after fitting as specified for door surfaces.

□

3.5 INTERIOR PAINT AND COATING SYSTEMS

.1 Interior painting systems to be based on MPI Custom grade unless noted otherwise.
.2 Concrete horizontal surfaces: floors and stairs:
  .1 INT 3.2C - Epoxy finish: Two coats epoxy finish.
.3 Concrete Masonry Units:
  .1 INT 4.2D - High performance architectural latex finish: one coat MPI #4 latex block filler, two finish coats latex.
  .2 INT 4.2G - Epoxy (tile-like) finish for wet environments and as scheduled: one coat MPI #116 epoxy block filler, two finish coats epoxy.
.4 Structural Steel: overhead and structural members; columns, beams, joists, etc. and adjacent fabrications.
  .1 INT 5.1C - Waterborne Dry Fall Finish: one coat alkyd metal primer, one finish coat waterborne dry fall (MPI Custom grade).
.5 Galvanized Metal: doors and frames.
  .1 INT 5.3L - Alkyd Finish: One coat non-cementitious primer, two finish coats alkyd (to MPI Premium Grade).
.6 Dressed lumber: including wood bases, casings, mouldings:
  .1 INT 6.3E - Polyurethane Varnish Finish (over stain): one coat stain, minimum two coats polyurethane finish.
.7 Hardboard: Pre-primed doors and frames:
  .1 INT 6.3T - Latex Finish (over factory primer): two coats latex.
.8 Plywood Mounting Boards: electrical room.
  .1 INT 6.4P - Pigmented Fire Retardant finish: apply to ULC approved procedures.
.9 Gypsum Board:
  .1 INT 9.2A - Latex (over latex sealer): one coat primer/sealer MPI#50, two finish coats latex (to MPI Premium Grade).
.10 Canvas and Cotton Coverings.
  .1 INT 10.1A - Latex: two finish coats latex; flat finish, alternatively use INT 5.1C.

3.6 EXTERIOR PAINT COATING SYSTEMS

.1 Asphalt Surfaces: zone/traffic marking for drive and parking areas, etc.

  .1 EXT 2.1B - Alkyd Zone/Traffic Marking Finish: minimum dry film thickness 7 mil.

.2 Galvanized Metal: fabrications, gates, bollards, doors and frames.

  .1 EXT 5.3B - Alkyd Finish: One coat non chromate passivated, Gloss level as directed (to MPI Premium Grade).

3.7 MECHANICAL AND ELECTRICAL EQUIPMENT

.1 Paint finished area exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as indicated.
.2 Other unfinished areas: leave exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish and touch up scratches and marks.
.3 Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.
.4 Do not paint over nameplates.
.5 Keep sprinkler heads free of paint.

□

3.8 SITE TOLERANCES

.1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
.2 Ceilings: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.
.3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

3.9 RESTORATION

.1 Clean and re-install hardware items removed before undertaken painting operations.
.2 Remove protective coverings and warning signs as soon as practical after operations cease.
.3 Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.
.4 Protect freshly completed surfaces from paint droppings and dust. Avoid scuffing newly applied paint.

END OF SECTION

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ARCADIS Design & Consultancy for natural and built assets

Public Services and Procurement Canada

HAZARDOUS BUILDING MATERIAL ASSESSMENT

RCMP BUILDINGS – E DIVISION

E0897 Employee Housing, Unit B - 117 Nass Road, New Aiyansh, BC

&

E0896 RCMP Detachment and Shed, 117 Nass Road, New Aiyansh, BC

PSPC Project # R.112077.001

September 18, 2020

Arcadis Project No.: 30053059

HAZARDOUS BUILDING MATERIAL ASSESSMENT

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01	00	August 14, 2020	All	Draft Report	J. Botti
02	01	August 18, 2020	All	Final Report	J. Botti
03	02	September 18, 2020	All	Final Report	J. Botti

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TABLES

APPENDICES

ACRONYMS AND ABBREVIATIONS

ACM	Asbestos-Containing Materials
Arcadis	Arcadis Canada Inc.
CLC	Canada Labour Code
COHSR	Canada Occupational Health and Safety Regulations
HPP	Hazard Prevention Program
LCB	Lead-Containing Paints
NIOSH	National Institute for Occupational Safety and Health
NJC	National Joint Council
OHS	Occupational Health and Safety
PCBs	Polychlorinated Biphenyls
PLM	Polarized Light Microscopy
PSPC	Public Services and Procurement Canada
RCMP	Royal Canadian Mounted Police
TEM	Transmission Electron Microscopy
USEPA	United States Environmental Protection Agency

EXECUTIVE SUMMARY

Arcadis Canada Inc. (Arcadis) was retained by Public Services and Procurement Canada (PSPC, Client) to conduct a hazardous building material assessment of Building E0897, Employee Housing, Unit B - 117 Nass Road, New Aiyansh, BC, and Building E0896, RCMP Detachment and Shed, 117 Nass Road, New Aiyansh, BC.

Building E0897, Employee Housing:

- Arcadis conducted a limited pre-construction assessment based on the renovation scope. The objective of the pre-construction assessment was to identify hazardous building materials in preparation for building renovation. The renovation scope was limited to the part of the building scheduled for renovation, which consists of building envelope replacement.

Building E0896, RCMP Detachment and Shed:

- Detachment: Arcadis conducted a limited pre-construction assessment based on the renovation scope. The objective of the pre-construction assessment was to identify hazardous building materials in preparation for building renovation. The renovation scope was limited to the part of the building scheduled for renovation, which consisted of construction of a new garage with electrical tie in to the existing detachment building and demolition of select areas of pavement.

- Shed: Arcadis collected additional samples to bring the existing pre-demolition assessment into compliance. The demolition scope consists of complete demolition of the shed and demolition of select areas of pavement.

Arcadis performed the assessment on July 23, 2020. The assessment was conducted by Janine Galandy, Senior Technologist of Arcadis.

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

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

Summary of Findings

Asbestos: Asbestos-containing materials (ACM) were confirmed to be present as follows:

Building	Material	Location(s)	Total Quantity	Condition	Asbestos Type (%)
Building E0897, Employee Housing	Window Putty (Grey)	Exterior South – By Main Entrance	Two windows at Main Entrance Door	Good	4% Chrysotile
Building E0896, Detachment	Brown exterior door caulking	Exterior East – by Exit	Three doors	Good	0.29-0.62% Chrysotile
Building E0896, Detachment	Brown exterior window caulking	Exterior East – by Exit	Windows throughout	Good	0.25-0.78% Chrysotile

Lead: Lead is confirmed present in the following paints and or surface coatings:

Building E0897, Employee Housing				
Color (substrate)	Location(s)	Total Quantity	Condition	Concentration (ppm)
Green paint on wood trim	Exterior trim by foundation (west, in carport)	40 linear feet	Fair	1,600

Building E0896, RCMP Detachment Shed: no lead paint or products were identified.

Building E0896, RCMP Detachment: no lead products were identified, and the proposed renovation work is not anticipated to impact quantities of paint that would cause concerning elevated airborne levels.

Polychlorinated Biphenyls (PCBs): Materials presumed to contain PCBs were not observed in all assessed buildings.

Suspect Visible Mould: Suspect visible mould and moisture-impacted building materials were not observed in all assessed buildings.

Mercury:

Building E0897, Employee Housing:

- Mercury vapour was visually confirmed in the assessed area including two compact fluorescent light bulbs on the exterior: one bulb on the roof of the carport, and one bulb beside the door on the staircase deck.

Ozone Depleting Substances (ODS): ODS were not observed in all assessed buildings.

Silica:

Building E0897, Employee Housing:

- Crystalline silica was observed in the assessed area: poured concrete.

Building E0896, RCMP Detachment and Shed:

- Crystalline silica was observed in the assessed area: asphalt roof shingles, poured concrete and asphalt pavement.

Recommendations

The following is a summary of significant recommendations; refer to the body of the report for detailed recommendations.

1. Remove and properly dispose of asbestos-containing materials if disturbed by the planned renovation work.
2. Remove and dispose of mercury-containing items when taken out of service or if disturbed by the planned renovation work.
3. Prepare plans and update performance specifications for hazardous material removal required for the planned work. The specifications should include the scope of work, personal protective equipment, respiratory protection, and disposal of waste materials.
4. Provide this report and the detailed plans and specifications to the contractor prior to bidding or commencing work.
5. Follow appropriate safe work procedures when handling asbestos, lead, and silica.
6. Retain a qualified consultant to specify, inspect and verify the successful removal of hazardous materials.
7. Update the asbestos inventory upon completion of the abatement and removal of asbestos-containing materials.

Findings of this report are subject to our standard Limitations, as outlined in Section 7.

This Executive Summary is subject to the same standard limitations as contained in the report and must be read in conjunction with the entire report.

1 INTRODUCTION

1.1 Purpose

Arcadis Canada Inc. (Arcadis) was retained by Public Services and Procurement Canada (PSPC, Client) to conduct a hazardous building material assessment of Building E0897, Employee Housing, Unit B - 117 Nass Road, New Aiyansh, BC, and Building E0896, RCMP Detachment and Shed, 117 Nass Road, New Aiyansh, BC.

Building E0897, Employee Housing:

- Arcadis conducted a limited pre-construction assessment based on the renovation scope. The objective of the pre-construction assessment was to identify hazardous building materials in preparation for building renovation. The renovation scope was limited to the part of the building scheduled for renovation, which consists of building envelope replacement.

Building E0896, RCMP Detachment and Shed:

- Detachment: Arcadis conducted a limited pre-construction assessment based on the renovation scope. The objective of the pre-construction assessment was to identify hazardous building materials in preparation for building renovation. The renovation scope was limited to the part of the building scheduled for renovation, which consisted of construction of a new garage with electrical tie in to the existing detachment building and demolition of select areas of pavement.

- Shed: Arcadis collected additional samples to bring the existing pre-demolition assessment into compliance. The demolition scope consists of complete demolition of the shed and demolition of select areas of pavement.

Arcadis performed the assessment on July 23, 2020. The assessment was conducted by Janine Galandy, Senior Technologist of Arcadis.

1.2 Scope of Work

The scope of work for the project, as referenced in the Arcadis Workplan dated June 5, 2020, identifies the requirement to conduct a hazardous building material assessment. Specifically, the scope of work included:

- Review of previous reports, construction specifications and drawings and identify any gaps related to hazardous building materials.
- Development of sampling strategy to address the identified gaps.
- Collect and submit representative suspect asbestos material and lead paint chip samples for analysis.
- Collect and submit representative samples of caulking for PCBs where impacted by the proposed renovations.
- Submit samples to accredited laboratories for analysis.
- Evaluation and interpretation of field findings and sample analytical results to develop conclusions and recommendations pertaining to hazardous building materials identified

For the purpose of this assessment, hazardous building materials re defined as follows:

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

A general description of the building included in this assessment is provided in the table below:

Table 1. Building Description

Building Number (BU)	Building Name	Address	Total Inside Gross m^2	Year Constructed	Building Description
E0897	Employee Housing	Unit B – 117 Nass Rd, New Aiyansh, BC	150	1987	Two storey residential building. Wood frame and concrete foundation. Vinyl siding, wood trim, metal trim, wood staircase, metal soffits, and asphalt shingle roofing. Interior finishes include drywall, ceiling texture coat, acoustic ceiling tile, wood laminate flooring, vinyl sheet flooring, ceramic tile flooring, concrete, and wood. Heating is supplied by forced air furnace system.
E0896	RCMP Detachment	117 Nass Rd, New Aiyansh, BC	386	1980's	One storey plus one below grade. Concrete structure and foundation. Asphalt shingle roofing. Interior finishes include drywall, acoustic ceiling tiles, concrete, masonry block, wood, and vinyl sheet flooring. Heating is supplied by forced air furnace system.
E0896	RCMP Detachment Shed	117 Nass Rd, New Aiyansh, BC	3	1980's	One storey. Wood frame and wood foundation. Wood siding. Asphalt shingle roofing. Interior wood ceiling, walls, and floor with poly

Building Number (BU)	Building Name	Address	Total Inside Gross m^2	Year Constructed	Building Description
					vapour barrier and fibreglass batt insulation.

2 BACKGROUND INFORMATION

Arcadis was provided and instructed to rely on information presented in the following reports:

- Asbestos Building Materials Survey Report, Building # E0897, dated January 10, 2018, prepared by Pinchin Ltd. (2018 Pinchin Report – Employee Housing)
- Pre-Demolition Hazardous Building Materials Assessment Site Review Report, E0896 – RCMP Detachment Shed, 117 Nass Road, New Aiyansh, BC, dated February 24, 2020, prepared by Stantec Consulting Ltd.. (Pre-Demo Stantec Report - Shed)
- Asbestos Building Materials Survey Report, Building # E0896, dated January 12, 2018, prepared by Pinchin Ltd. (2018 Pinchin Report – Detachment)
- Supplemental Asbestos-Containing Materials Assessment, E0896-RCMP Detachment, 117 Nass Road, New Aiyansh, BC, dated March 17, 2020, prepared by Stantec Consulting Ltd. (2020 Stantec Report – Detachment)
- Asbestos Reassessment – Building #E0896, 117 Nass Road, New Aiyansh, BC, dated March 14, 2019, prepared by Pinchin Ltd. (2019 Pinchin Report – Detachment)

2.1 Exclusions

Building E0897, Employee Housing:

- The assessment was restricted to accessible locations of the building. Roofing or other material that may cause damage to the building envelope were not included unless specifically impacted by the proposed renovations and sampling would not compromise the building envelope integrity.

Building E0896, RCMP Detachment and Shed:

- Detachment: The assessment was conducted by reviewing previous reports for the site. It was determined that no additional sampling was necessary.
- Shed: The assessment was restricted to accessible locations of the building.

3 SURVEY METHODOLOGY

Sampling activities were conducted in accordance with Arcadis' Standard Operation Procedures which take into account current federal and provincial regulations pertaining to such work (i.e., sampling procedures, required number of samples and laboratory analytical procedures). Regulations are presented in Appendix D.

Representative bulk samples were collected of accessible suspect, PCB, lead, and asbestos in sufficient quantities for laboratory analysis. Samples were sealed in polyethylene zip-lock bags labeled with the

sample number, suspect material description, and sample location. As part of sampling procedures, sampling tools were cleaned between sample collection events to avoid the potential for cross-contamination of samples.

All sample bags were compiled in order and placed into a single container accompanied with a chain of custody form outlining the project information, date, building location, number of samples, and sample description. Samples were submitted to the analytical laboratory in a sealed container via courier.

3.1 Asbestos-Containing Materials

A separate set of samples was collected of each type of homogenous material suspected to contain asbestos. A homogenous material is defined by the US EPA as material that is uniform in texture and appearance, was installed at one time, and is unlikely to consist of more than one type or formulation of material. The homogeneous materials are determined by visual examination, available information on the phases of the construction and prior renovations.

Bulk sampling protocols followed the ASTM E2356 Standard, which indicates requirements for the number of samples to collect for each homogeneous material. The table below provides an outline of the minimum number of samples to be collected from the ASTM E2356 Standard.

Table 2. Bulk Material Sample Quantities

Type of Material	Size of Area of Homogeneous Material	Minimum Number of Samples Collected
Any homogeneous material, including but not limited to fireproofing, drywall joint compound, ceiling tile stucco, acoustical and stipple finishes, and visually similar floor tiles	Less than 90 m^2 (<1,000 ft^2)	3
	90 m^2 or more, but less than 450 m^2 (1,000-5,000 ft^2)	5
	450 m^2 or more (>5,000 ft^2)	7

In some cases, manufactured products such as asbestos cement pipe were visually identified without sample confirmation.

Flooring mastic/adhesive are only sampled and analyzed if present on the underside of flooring samples (vinyl floor tile and vinyl sheet flooring) in sufficient quantity for laboratory analysis.

Attempts to distinguish and delineate asbestos-containing drywall compound from new non-asbestos drywall compound is often unachievable. Arcadis collected drywall joint compound samples from exterior walls, columns or other locations which are unlikely to have been renovated in an attempt to determine the presence of asbestos in the original drywall compound.

Arcadis submitted the bulk samples to a NVLAP accredited laboratory for analysis. The analysis is performed in accordance with Test Method EPA/600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials, July 1993.

EPA Method 600 states that materials characterized by interfering binder/matrix or low asbestos content may require additional gravimetric reduction sample treatment beyond routine polarized light microscopy (PLM) analysis (e.g. dissolution with hydrochloric acid, treatment with organic solvents or ashing in a muffle furnace or low temperature plasma asher to remove unwanted components).

Arcadis submitted one sample of each sample set (3) of vinyl floor tiles be analyzed by transmission electron microscopy (TEM) if the first two samples are reported negative by PLM.

The asbestos analysis was completed using a stop positive approach. Only one result of greater than the regulated criteria is required to determine that a material is asbestos-containing, but all samples must be analyzed to conclusively determine that a material is non-asbestos. The laboratory stopped analyzing samples from a homogeneous material once greater than the criteria was detected in any of the samples of that material. All samples of a homogeneous material were analyzed if no asbestos was detected. Where building materials are described in this report as non-asbestos, or described as containing no asbestos, this is subject to the limitations of the analytical method used and should be understood to mean no asbestos was detected.

The classification, condition, and accessibility were assessed for the materials which could contain asbestos. To determine these factors, Arcadis followed the methodology outlined in the ASTM E356 Standard. The Standard provides definitions and criteria for the assessment of ACM. The classification, conditions, and accessibility information are provided in Appendix E.

Bulk samples of materials which could contain asbestos were collected and submitted to EMSL Canada Inc. (EMSL) for analysis of asbestos content. Asbestos-containing materials are defined as 0.5% or greater, or any amount if vermiculite.

3.2 Lead

Arcadis collected samples of distinctive paint finishes and surface coatings present in more than a limited application, where removal of the paint is possible. Arcadis collects samples by scraping the painted finish to include base and covering applications. Although the surfaces where samples were collected may be covered with more than one coat of paint, the paint samples are described by the surface (visible) colour only. As analytical results are referenced to the surface paint colour only, the lead content of all painted surfaces similar to that represented by the surface paint colour were presumed to be the same, regardless of differing sub surface paints, if any.

The 2017 WorkSafeBC publication *Safe Work Practices for Handling Lead* (Lead Guideline) indicates the following:

> *Unlike for asbestos-containing material, WorkSafeBC does not numerically define what would be considered a lead-containing paint or coating. All suspected paints or coatings should be tested for lead because, depending on the nature of the work, even a small amount could pose a risk to workers. In order to determine which controls and personal protective equipment would be required for a particular job, a qualified person must consider this information as part of the risk assessment.*

- Improper removal of lead paint containing 600 mg/kg lead results in airborne lead concentrations that exceed half of the exposure limit
  - Exposure limit indicated in both the COHSR and BC Reg. 296/97 is 0.05 mg/m^3
  - Potential for exposure exceeding half of the occupational exposure limit would be the trigger for implementation of an exposure control plan.
- Lead concentrations as low as 90 mg/kg may present a risk to pregnant women and children

- Any risk assessment should include for the presence of high risk individuals within the workplace

When reviewing the above, “high risk” individuals are not expected to be present in the workplace associated with this building during building material alteration activities (i.e., demolition) that would create significant disturbance to paint with such individuals present. As such, paints containing 600 ppm lead or more will be considered “lead-containing” for the purpose of this report, such that appropriate risk assessments can be completed for demolition planning. However, information regarding the lead content of all paints tested is provided herein, for reference and risk assessment should the consideration of high risk individuals be necessary, based on the requirements of a particular situation.

Although a concentration of 600 ppm lead has been used to define paint coatings as LCPs, it should be noted that this is related to painted surfaces and the determination of appropriate provisions to protect occupants and employees from exposure to elevated concentrations of lead during typical operations and maintenance or simple renovation. This does not include painted metal surfaces that are to be welded, burned or torch-cut.

Using an arc welder or oxyacetylene torch on steel that is coated with lead-containing paint can create hazardous lead fumes and is prohibited by section 12.115 of BC Reg. 296/97.

> Regulatory excerpt: **12.115 Coatings on metals**
>
> *A coating on metal which could emit harmful contaminants (such as lead, chromium, organic materials, or toxic combustion products) must be removed from the base metal, whenever practicable, before welding or cutting begins.*

In addition, the following information is provided in the Lead Guideline:

- Welding or torch cutting of paints or coatings on metal can create very high concentrations of airborne lead fumes. Torch cutting structural steel, coated with paint containing as little as 130 mg/kg (equivalent to ppm) lead, can release airborne levels of lead as high as 0.8 mg/m^3 (16 times the exposure limit).

Given this information and that the analytical detection limit for lead paint analysis is approximately 80– 90 ppm (not significantly different than 130 ppm, which, per above, may release airborne lead levels 16 times the exposure limit), any paint coating on a metal surface to be welded, burned or torch-cut must be removed prior to that action being undertaken, unless a project-specific or tasks-specific risk assessment and safe work practices are developed by a qualified person.

Paint and surface coatings are evaluated for condition. The criteria for condition evaluation pertaining to LCPs described herein are generally based on the United States Housing and Urban Development (HUD) 2012 *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing*.

When evaluating the condition of LCPs, an attempt should be made to determine whether the deterioration is due to a moisture problem or some other existing building deficiency. **“Poor”** surfaces are considered to be a hazard and should be corrected. “**Fair”** surfaces should be repaired but are not yet considered to

be a hazard; if not repaired, they should be monitored frequently. "**Good/intact"** surfaces should be monitored to ensure that they remain in a nonhazardous condition.

In addition, the presence of paint debris must be considered in evaluating condition. Given the variety of paint uses, there are many applications that can have a tendency for the paint to "wear" from the surface slowly, over an extended period of time. Conditions where paint has worn from a surface are worth noting for maintenance discussions (i.e., related to re-coating the surface should, for example, the coating provide weather protection), however, in the absence of loose paint chip debris/dust, such conditions would not represent a potential exposure situation related to lead.

The condition evaluation criteria for LCPs are summarized in the table below.

Table 3. Lead-Containing Paint Condition Categories

Type of Building Component[1]	Total Area of Deteriorated Paint on Each Component		
	Good/Intact	**Fair[2]**	**Poor[3]**
Exterior components with large surface areas.	Entire surface is intact.	Less than or equal to 10 square feet	More than 10 square feet
Interior components with large surface areas (walls, ceilings, floors, doors.	Entire surface is intact.	Less than or equal to 2 square feet	More than 2 square feet
Interior and exterior components with small surface areas (windowsills, baseboards, soffits, trim).	Entire surface is intact.	Less than or equal to 10% of the total surface area of the component.	More than 10% of the total surface area of the component

NOTES:

1. Building component in this table refers to each individual component or side of building, not the combined surface area of all similar components in a room (e.g., a wall with 1 square foot of deteriorated paint is in "fair" condition, even if the other three walls in a room are intact).
2. Surfaces in "fair" condition should be repaired and/or monitored but are not considered to be "lead-containing paint hazards".
3. Surfaces in "poor" condition are considered to be "lead-containing paint hazards" and should be addressed through abatement or interim controls.

Analysis for lead in paints or surface coatings was performed in accordance with EPA Method No. 3050B/Method No. 7420; flame atomic absorption at laboratory accredited by the American Industrial Hygiene Association (AIHA).

3.3 Polychlorinated Biphenyls (PCBs)

The presence or absence of fluorescent lights was documented during the course of our investigation to determine whether there were any of the T12 type. T12 fluorescent lamps, with a diameter of 1.5 inches, utilize transformer type magnetic ballasts, which may contain PCBs. The use of T12s has been discontinued and replaced with new high-efficiency 1-inch T8 lamps (and other types) which use electronic ballasts which do not contain PCBs.

Wet transformers were assessed for PCBs based on the age of the building, a review of maintenance records and examination of labels or nameplates on equipment, where present and accessible. The information is compared to known ban dates of PCBs and Environment Canada publications.

Dry type transformers are presumed to be free of dielectric fluids and hence non-PCB. Caulking's were not sampled for PCB content unless specifically impacted by the proposed renovation scope. The material is considered a PCB solid if PCB content is 50ppm or greater based on the threshold given in SOR/2008-273.

3.4 Suspect Visible Mould

Arcadis identified the presence of any suspect mould and/or moisture-impacted building materials by visual inspection during the course of our site investigation. Suspect mould is typically a coloured, textured substance or discolouration/staining on a building material surface which, based on our experience, may be mould growth. If any mould growth is concealed within wall, ceiling, or floor cavities, it is not addressed in this assessment. No mould sampling or moisture testing is performed unless directed by the Client. The adjective *suspect* is used where the presence of mould has not been confirmed by laboratory analysis.

3.5 Mercury

Building materials/products/equipment (e.g. thermostats, barometers, pressure gauges, light tubes), suspected to contain mercury were identified by visually inspection only. Dismantling of equipment suspected of containing mercury was not performed. Sampling of these materials for laboratory analysis of mercury content was not performed.

Mercury spills or damaged mercury-containing equipment was recorded where observed.

3.6 Ozone Depleting Substances (ODS)

Arcadis determined the potential presence of ODS (chlorofluorocarbons, hydrochlorofluorocarbons, hydrofluorocarbons, halons, etc.) in air conditioning units, chillers, commercial coolers, and fire suppression systems by visual inspection of manufactures' labels or plates, maintenance records, or logbooks, etc.

3.7 Silica

Arcadis identified building materials suspected of containing crystalline silica (e.g. concrete, cement, tile, brick, masonry, mortar) by knowledge of current and historic applications and visual inspection only. Arcadis did not perform sampling of these materials for laboratory analysis of crystalline silica content.

4 RESULTS

4.1 Asbestos

During the course of our assessment, representative bulk samples of material were collected by Arcadis staff. The samples were forwarded to EMSL in Burnaby, British Columbia for asbestos analyses. EMSL holds a current Certificate of Accreditation for Bulk Asbestos Fibre Analysis under the Voluntary Accreditation Program (NVLAP). Bulk sampling was performed in general accordance with the

requirements specified in ASTM E2356 Standard, BC Reg. 296/97 and in the WorkSafe BC publication Safe Work Practices for Handling Asbestos.

Results of bulk sample analysis for asbestos content are provided in the table below. Samples that exceed the criteria are highlighted in yellow.

Site Photographs provided in Appendix A. Laboratory certificates of analysis have been provided in Appendix B. Floor plans indicating sample locations are provided in Appendix C.

Table 4. Results of Bulk Sample Analysis for Asbestos

Building E0897, Employee Housing			
Sample Number	**Sample Description**	**Sample Location**	**Asbestos Type %**
S-01A	Envelope Paper	Exterior South – By Main Entrance	None Detected
S-01B	Envelope Paper	Exterior East	None Detected
S-01C	Envelope Paper	Exterior East	None Detected
S-01D	Envelope Paper	Exterior West – By Side Entrance	None Detected
S-01E	Envelope Paper	Exterior West – By Stairs	None Detected
S-01F	Envelope Paper	Exterior North	None Detected
S-01G	Envelope Paper	Exterior North	None Detected
S-02A	**Window Putty (Grey)**	**Exterior South – By Main Entrance**	**4% Chrysotile**
S-02B	**Window Putty (Grey)**	**Exterior South – By Main Entrance**	**Stop Positive – Not Analyzed**
S-02C	**Window Putty (Grey)**	**Exterior South – By Main Entrance**	**Stop Positive – Not Analyzed**
S-03A	Window Caulking (White)	Exterior South	None Detected
S-03B	Window Caulking (White)	Exterior South	None Detected
S-03C	Window Caulking (White)	Exterior South	None Detected

Building E0896, RCMP Detachment Shed			
Sample Number	**Sample Description**	**Sample Location**	**Asbestos Type %**
S-04A*	Asphalt Shingle	Shed Roof – West	None Detected
S-04B*	Asphalt Shingle	Shed Roof – East	None Detected

S-05A	Asphalt	Road - By Detachment	None Detected
S-05B	Asphalt	Road - By Detachment	None Detected
S-05C	Asphalt	Road - By Detachment	None Detected
*Additional samples collected to meet sample quantity regulation requirements.			

Building E0896, RCMP Detachment			
Sample Number	**Sample Description**	**Sample Location**	**Asbestos Type %**
As per the 2020 Stantec Report – Detachment, asbestos was identified in brown exterior door caulking (0.29-0.62% Chrysotile), and in brown exterior window caulking (0.25-0.78% Chrysotile).			

No other asbestos-containing material was identified in the previous reports.

Common Materials

Building E0897, Employee Housing:

- The following building materials were common in the assessed area; however, these materials do not contain asbestos and were not sampled during the survey: metal trim, wood trim, Styrofoam insulation and concrete.

Building E0896, RCMP Detachment and Shed:

- Detachment: As per the previous reports, the following building materials were common in the area of proposed renovation; however, these materials do not contain asbestos and were not sampled during the survey: metal siding and concrete.
- Shed: The following building materials were common in the assessed area; however, these materials do not contain asbestos and were not sampled during the survey: vapour barrier, wood, and fiberglass batt insulation.

Asbestos-containing materials were confirmed present in the following table:

Table 5. Summary of Confirmed Asbestos-Containing Materials

Building	Material	Location(s)	Total Quantity	Condition	Asbestos Type (%)
Building E0897, Employee Housing	Window Putty (Grey)	Exterior South – By Main Entrance	Two windows at Main Entrance Door	Good	4% Chrysotile
Building E0896, Detachment	Brown exterior door caulking	Exterior East – by Exit	Three doors	Good	0.29-0.62% Chrysotile
Building E0896, Detachment	Brown exterior window caulking	Exterior East – by Exit	Windows throughout	Good	0.25-0.78% Chrysotile

Presumed Materials

As per the previous reports, the following materials are presumed to contain asbestos:

- Building E0896, RCMP Detachment:
  - Six (6) textile vibration dampeners in furnace room
  - Electrical components or wiring within control centers, breakers, motors or lights, insulation on wiring
  - Fire resistant doors

4.2 Lead

During the course of our site investigation, representative bulk samples of predominant paint types were collected by Arcadis staff. The samples were forwarded to EMSL for lead analyses. Results of bulk sample analysis for lead content are provided in the table below. Results that exceed the criteria are highlighted in yellow. The laboratory report is provided in Appendix B.

Table 6. Results of Analyses of Bulk Samples for Paint for Lead

Building E0897, Employee Housing			
Sample No.	**Sample Location(s)**	**Sample Description**	**Lead Content (ppm)**
L-01	Exterior stairwell (west)	White paint on wood steps	<80
L-02	Exterior gutter (west)	White paint on metal gutter	<100
L-03	**Exterior trim by foundation (west)**	**Green paint on wood trim**	**1,600**
L-04	Exterior siding (west)	Beige paint on vinyl siding	<86

L-05	Exterior window shutters (south)	Brown paint on metal window shutter	<410

Lead was detected at a level above the definition of lead paint (600 mg/kg) in sample L-03 (green paint on exterior wood trim by foundation). Where one colour of paint is indicated in the sample descriptions in the table above, only one layer of paint was observed.

All paint applications were noted to be generally in good condition.

Building E0896, RCMP Detachment Shed:

- No lead paint was detected as per the Pre-Demo Stantec Report - Shed, and no other suspect lead paint or products were observed by Arcadis during this assessment.

Building E0896, RCMP Detachment:

- Though no paint samples for lead analysis were collected during this assessment or in the previous reports, the proposed renovation work is not anticipated to impact quantities of paint that would cause concerning elevated airborne levels.

4.3 Polychlorinated Biphenyls (PCBs)

Building E0897, Employee Housing:

- Based on the age of this building, PCBs are not suspected to be present.

Building E0896, RCMP Detachment Shed:

- As per the Pre-Demo Stantec Report – Shed, no materials suspected to contain PCBs were observed.

Building E0897, RCMP Detachment:

- Based on the age of the building, PCB's are not suspected.

4.4 Suspect Visible Mould

Building E0897, Employee Housing:

- Suspect mould growth and/or moisture impact was not observed in the assessed area.

Building E0896, RCMP Detachment Shed:

- As per the Pre-Demo Stantec Report - Shed, suspect mould growth and/or moisture impact was not observed.

Building E0897, RCMP Detachment:

- Suspect mould growth and/or moisture impact was not observed on the exterior of the building in the proposed renovation area.

4.5 Mercury

Building E0897, Employee Housing:

- Mercury was observed in the assessed area including two compact fluorescent light bulbs on the exterior: one bulb on the roof of the carport, and one bulb beside the door on the staircase deck.

Building E0896, RCMP Detachment Shed:

- As per the Pre-Demo Stantec Report – Shed, mercury was not observed.

Building E0896. RCMP Detachment:

- Mercury lighting was observed in the building, but not anticipated to be impacted by the proposed renovations.

4.6 Ozone Depleting Substances (ODS)

Building E0897, Employee Housing:

- ODS were not observed in the assessed area.

Building E0897, RCMP Detachment Shed:

- As per the Pre-Demo Stantec Report – Shed, ODS were not observed.

Building E0896. RCMP Detachment:

- ODS were not observed in the assessed area.

4.7 Silica

Building E0897, Employee Housing:

- Crystalline silica was observed in the assessed area: poured concrete.

Building E0896, RCMP Detachment Shed:

- Crystalline silica was observed in the assessed area: asphalt roof shingles, poured concrete and asphalt pavement.

Building E0896, RCMP Detachment:

- Crystalline silica was observed in the assessed area: concrete and drywall.

5 RECOMMENDATIONS

If future building renovation or demolition is required beyond the scope of this project, a detailed intrusive assessment must be conducted. The assessment should include destructive testing (i.e. coring and/or removal of building finishes and components), and sampling of materials not previously tested (i.e. roofing materials, mastics etc.).

5.1 Building Renovation Work

The following specific recommendations are made regarding renovation involving the hazardous materials identified.

1. Remove and properly dispose of asbestos-containing materials if disturbed by the planned renovation work.
2. Remove and dispose of mercury-containing items when taken out of service or if disturbed by the planned renovation work.
3. Prepare plans and update performance specifications for hazardous material removal required for the planned work. The specifications should include the scope of work, personal protective equipment, respiratory protection, and disposal of waste materials.
4. Provide this report and the detailed plans and specifications to the contractor prior to bidding or commencing work.
5. Follow appropriate safe work procedures when handling asbestos, lead, and silica.
6. Retain a qualified consultant to specify, inspect and verify the successful removal of hazardous materials.
7. Update the asbestos inventory upon completion of the abatement and removal of asbestos-containing materials.

The following general recommendations are made regarding renovation involving the hazardous materials identified.

Asbestos

If the identified ACM will not be removed prior to commencement of the work, disturbance of ACM must follow the appropriate asbestos precautions for the classification of work being performed.

Asbestos-containing materials must be disposed of at a landfill approved to accept asbestos waste.

Lead

Construction disturbance of lead in paint and coatings (or other materials) may result in over-exposure to lead dust or fumes. The need for work procedures, engineering controls and personal protective equipment will need to be assessed on a project-by-project basis and must comply with provincial standards or guidelines. Performing an exposure assessment during work that disturbs lead in paints and coatings may be able to alleviate the use of some of the precautions specified by these standards or guidelines.

For building materials that are to be disposed at a landfill, all lead-based paints and associated substrate (concrete, plaster, wood, etc.) must undergo Toxicity Characteristic Leachate Properties (TCLP) metals testing to determine disposal procedures. Upon the completion of the test, the total concentration of metals in the waste extract must be compared to Schedule 4, Table 1 of the Hazardous Waste Regulation. The disposal of lead-containing paint is regulated under the Federal *Transportation of Dangerous Goods Act* and by the British Columbia Ministry of Environment

Suspect Visible Mould

No mould was observed; if mould is uncovered during the proposed work, use appropriate precautions, and protect workers using methods that comply with provincial guidelines.

Mercury

Do not break lamps. Recycle fluorescent lamps when taken out of service.

Silica

Construction disturbance of silica-containing products may result in excessive exposures to airborne silica, especially if performed indoors and dry. Cutting, grinding, drilling or demolition of materials containing silica

should be completed only with proper respiratory protection and other worker safety precautions that comply with provincial standards or guidelines.

6 REFERENCES

The following legislation and documents were referenced in completing the assessment and this report:

1. Occupational Health and Safety Regulation, B.C. Reg. 296/97, WorkSafe BC.
2. Safe Work Practices for Handling Asbestos, WorkSafe BC, 2017 Edition.
3. Hazardous Waste Regulation, B.C. Reg. 63/88, November 2017, BC Environmental Management Act.
4. Ozone Depleting Substances and Other Halocarbons Regulation, B.C. Reg. 317/2012 Environmental Management Act.
5. PCB Regulations, SOR/2008-273, Canadian Environmental Protection Act.
6. Lead-Containing Paint and Coatings, Preventing Exposure in the Construction Industry, WorkSafe BC, June 2017.
7. Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing, United States Housing and Urban Development (HUD) 2012.
8. Mould Guidelines for the Canadian Construction Industry, Standard Construction Document 2018, Canadian Construction Association.
9. Minister of Justice Canada Labour Code. R.S.C., 1985, c. L-2. March 2020.
10. Minister of Justice. 2018. Canada Occupational Health and Safety Regulations. SOR/86-304, June 2019.
11. Public Services and Procurement Canada Asbestos Management Standard. June 2019.
12. Transport Canada Consolidated Transport of Dangerous Goods Regulations including Amendment SOR/2019-101.
13. ASTM E2356 Standard Practice for Comprehensive Buildings Asbestos Surveys.
14. Royal Canadian Mounted Police, Asbestos Management Plan, Version 2020-01, January 2020.

7 LIMITATIONS

This report, prepared for Public Services and Procurement Canada on behalf of Royal Canadian Mounted Police, does not provide certification or warranty, expressed or implied, that the investigation conducted by Arcadis identified all hazardous materials associated with the subject building. The work undertaken by Arcadis was directed to provide information on the presence of hazardous materials in construction materials based on visual inspection of readily accessible areas of the subject building, and on the results

of laboratory analysis of a limited number of bulk samples. 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 July 23, 2020. This report is not intended to be used as a scope of work or technical specification for remediation of hazardous materials. 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

Site Photographs

Project Photographs

Services and Procurement Canada
Building E0896, RCMP Detachment Shed, 117 Nass Road, New Aiyansh, BC

Photo: 1

Date:
July 23, 2020

Description:
Exterior – front of building.

Photo: 2

Date:
July 23, 2020

Description:
Exterior – back of building

Project Photographs

Services and Procurement Canada
Building E0896, RCMP Detachment Shed, 117 Nass Road, New Aiyansh, BC

Photo: 3

Date:
July 23, 2020

Description:
Overview of interior

Photo: 4

Date:
July 23, 2020

Description:
Overview of roof

Project Photographs

Services and Procurement Canada
Building E0896, RCMP Detachment Shed, 117 Nass Road, New Aiyansh, BC

Photo: 5

Date:
July 23, 2020

Description:
Overview of concrete and asphalt paved road – south elevation

Photo: 6

Date:
July 23, 2020

Description:
Overview of concrete and asphalt paved road – north elevation

Project Photographs

Services and Procurement Canada
E0897 RCMP Employee Housing, Unit B, 117 Nass Rd, New Aiyansh, BC

Photo: 1

Date:
July 23, 2020

Description:
Exterior – front of building.

Photo: 2

Date:
July 23, 2020

Description:
Exterior – back of building

Project Photographs

Services and Procurement Canada
E0897 RCMP Employee Housing, Unit B, 117 Nass Rd, New Aiyansh, BC

Photo: 3

Date:
July 23, 2020

Description:
Lead containing green paint on wood trim by foundation (1,600 ppm) – west exterior in carport

Photo: 4

Date:
July 23, 2020

Description:
Asbestos containing grey window putty (4% Chrysotile) – windows at main entrance door

Project Photographs

Services and Procurement Canada
E0897 RCMP Employee Housing, Unit B, 117 Nass Rd, New Aiyansh, BC

Photo: 5

Date:
July 23, 2020

Description:
Mercury compact fluorescent light bulb – by door on staircase deck

Photo: 6

Date:
July 23, 2020

Description:
Mercury compact fluorescent light bulb – carport roof

APPENDIX B

Laboratory Certificates of Analysis

EMSL Canada Inc.

4506 Dawson Street Burnaby, BC V5C 4C1
Phone/Fax: (604) 757-3158 / (604) 757-4731
http://www.EMSL.com / vancouverlab@EMSL.com

EMSL Canada Order 692001739
Customer ID: 55ACAV42
Customer PO: 30053059
Project ID:

Attn: Jerry Botti
ARCADIS Canada Inc.
308-1080 Mainland Street
Vancouver, BC V6B 2T4

Phone: (604) 632-9941
Fax:
Collected: 7/23/2020
Received: 7/28/2020
Analyzed: 8/04/2020

Proj: 30053059 / 117B NASS RD, NEW AIYANSH, BC

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

Client Sample ID: S-01A ***Lab Sample ID:*** **692001739-0001**
Sample Description: EXTERIOR SOUTH - BY MAIN ENTRANCE/ENVELOPE PAPER

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	7/31/2020	Brown	85.0%	15.0%	None Detected	

Client Sample ID: S-01B ***Lab Sample ID:*** **692001739-0002**
Sample Description: EXTERIOR EAST/ENVELOPE PAPER

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	7/31/2020	Black	85.0%	15.0%	None Detected	

Client Sample ID: S-01C ***Lab Sample ID:*** **692001739-0003**
Sample Description: EXTERIOR EAST/ENVELOPE PAPER

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	7/31/2020	Brown	85.0%	15.0%	None Detected	

Client Sample ID: S-01D ***Lab Sample ID:*** **692001739-0004**
Sample Description: EXTERIOR WEST - BY SIDE ENTRANCE/ENVELOPE PAPER

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	7/31/2020	Brown	85.0%	15.0%	None Detected	

Client Sample ID: S-01E ***Lab Sample ID:*** **692001739-0005**
Sample Description: EXTERIOR WEST - BY STAIRS/ENVELOPE PAPER

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	7/31/2020	Brown	85.0%	15.0%	None Detected	

Client Sample ID: S-01F ***Lab Sample ID:*** **692001739-0006**
Sample Description: EXTERIOR NORTH/ENVELOPE PAPER

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	7/31/2020	Brown	85.0%	15.0%	None Detected	

Client Sample ID: S-01G ***Lab Sample ID:*** **692001739-0007**
Sample Description: EXTERIOR NORTH/ENVELOPE PAPER

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	8/04/2020	Black	80.0%	20.0%	None Detected	

EMSL Canada Inc.

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http://www.EMSL.com / vancouverlab@EMSL.com

EMSL Canada Order 692001739
Customer ID: 55ACAV42
Customer PO: 30053059
Project ID:

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

Client Sample ID: S-02A ***Lab Sample ID:*** **692001739-0008**
Sample Description: EXTERIOR SOUTH - BY MAIN ENTRANCE/WINDOW PUTTY (GREY)

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/31/2020	Gray	0.0%	96.0%	**4% Chrysotile**	

Client Sample ID: S-02B ***Lab Sample ID:*** **692001739-0009**
Sample Description: EXTERIOR SOUTH - BY MAIN ENTRANCE/WINDOW PUTTY (GREY)

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/31/2020				Positive Stop (Not Analyzed)	

Client Sample ID: S-02C ***Lab Sample ID:*** **692001739-0010**
Sample Description: EXTERIOR SOUTH - BY MAIN ENTRANCE/WINDOW PUTTY (GREY)

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/31/2020				Positive Stop (Not Analyzed)	

Client Sample ID: S-03A ***Lab Sample ID:*** **692001739-0011**
Sample Description: EXTERIOR SOUTH/WINDOW CAULKING (WHITE)

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/31/2020	White	0.0%	100.0%	None Detected	

Client Sample ID: S-03B ***Lab Sample ID:*** **692001739-0012**
Sample Description: EXTERIOR SOUTH/WINDOW CAULKING (WHITE)

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/31/2020	White	0.0%	100.0%	None Detected	

Client Sample ID: S-03C ***Lab Sample ID:*** **692001739-0013**
Sample Description: EXTERIOR SOUTH/WINDOW CAULKING (WHITE)

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	8/04/2020	White	0.0%	100.0%	None Detected	

Client Sample ID: S-04A ***Lab Sample ID:*** **692001739-0018**
Sample Description: SHED ROOF - WEST/ASPHALT SHINGLE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	7/31/2020	Black	0.0%	100.0%	None Detected	

Client Sample ID: S-04B ***Lab Sample ID:*** **692001739-0019**
Sample Description: SHED ROOF - EAST/ASPHALT SHINGLE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	8/04/2020	Black	0.0%	100.0%	None Detected	

EMSL Canada Inc.

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http://www.EMSL.com / vancouverlab@EMSL.com

EMSL Canada Order 692001739
Customer ID: 55ACAV42
Customer PO: 30053059
Project ID:

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

Client Sample ID: S-05A ***Lab Sample ID:*** **692001739-0020**

Sample Description: ROAD - BY DETACHMENT/ASPHALT

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	7/31/2020	Black	0.0%	100.0%	None Detected	

Client Sample ID: S-05B ***Lab Sample ID:*** **692001739-0021**

Sample Description: ROAD - BY DETACHMENT/ASPHALT

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	7/31/2020	Black	0.0%	100.0%	None Detected	

Client Sample ID: S-05C ***Lab Sample ID:*** **692001739-0022**

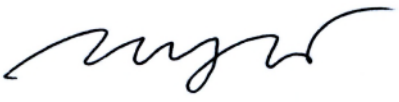
Sample Description: ROAD - BY DETACHMENT/ASPHALT

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	8/04/2020	Black	0.0%	100.0%	None Detected	

Analyst(s):

Chloe Huang PLM (4)
Margaret Lee PLM (12)

Reviewed and approved by:



Nicole Yeo, Laboratory Manager
or Other Approved Signatory

None Detected = <0.1%. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted. This report must not be used to claim product endorsement by NVLAP of any agency or the U.S. Government

Samples analyzed by EMSL Canada Inc. Burnaby, BC

Report amended: 08/14/202013:27:18 Replaces amended report from: 08/14/202009:58:47 Reason Code: Client-Change to Appearance

EMSL Canada Inc.
2333 18th Avenue NE, Unit 48, Calgary, AB T2E 8T6
Phone/Fax: (403) 879-1149 / (403) 879-1152
http://www.EMSL.com CalgaryLab@EMSL.com

EMSL Canada Or	652005344
CustomerID:	55ACAV42
CustomerPO:	30053059
ProjectID:	

Attn: **Jerry Botti**
ARCADIS Canada Inc.
308-1080 Mainland Street
Vancouver, BC V6B 2T4

Phone: (604) 632-9941
Fax:
Received: 7/29/2020 08:30 AM
Collected: 7/23/2020

Project: **30053059 / 117B NASS RD, NEW NIYANSH, BC**

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

Client Sample Description	*Lab ID*	*Collected*	*Analyzed*	*Weight*	*Lead Concentration*
L-01	*652005344-0001*	7/23/2020	8/5/2020	0.2651 g	<80 ppm
	Site: WHITE PAINT ON WOOD STEPS ON EXTERIOR STAIRWELL				
L-02	*652005344-0002*	7/23/2020	8/5/2020	0.2008 g	<100 ppm
	Site: WHITE PAINT ON METAL GUTTER Insufficient sample to reach reporting limit.				
L-03	*652005344-0003*	7/23/2020	8/5/2020	0.2569 g	1600 ppm
	Site: GREEN PAINT ON EXTERIOR WOOD TRIM				
L-04	*652005344-0004*	7/23/2020	8/5/2020	0.2334 g	<86 ppm
	Site: BEIGE PAINT ON EXTERIOR VINYL SIDING Insufficient sample to reach reporting limit.				
L-05	*652005344-0005*	7/23/2020	8/5/2020	0.0491 g	<410 ppm
	Site: BROWN PAINT ON EXTERIOR METAL WINDOW SHUTTERS Insufficient sample to reach reporting limit.				

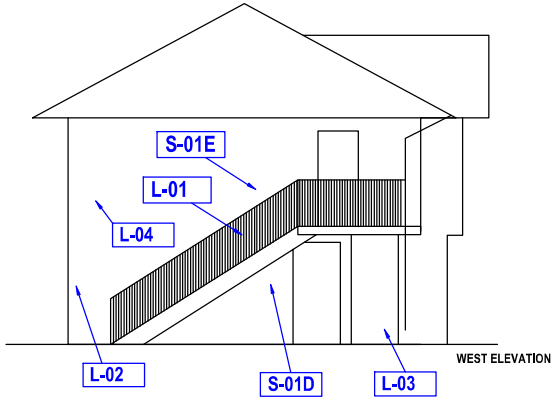
jgsalvador

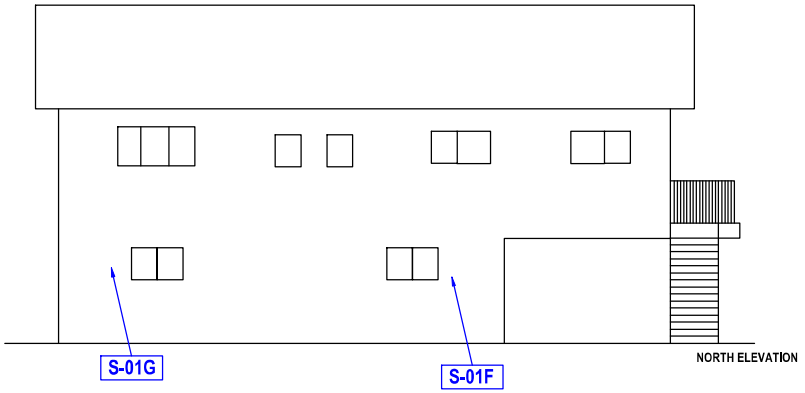
Jefferson Salvador, Laboratory Manager
or other approved signatory

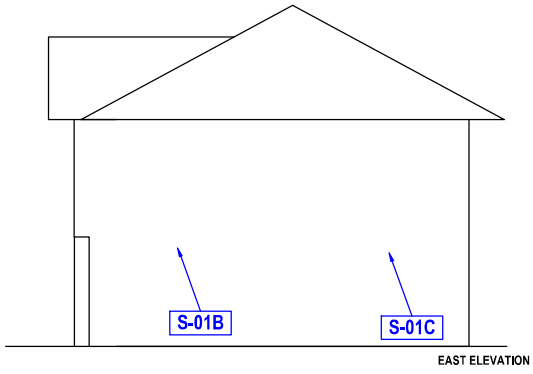
Initial report from 08/05/2020 15:46:41

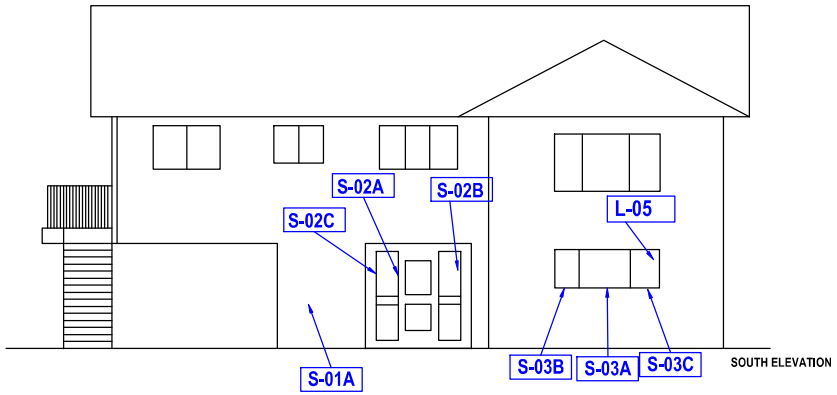
APPENDIX C

Floor Plans









LEGEND

S-XXX Bulk Asbestos Sample

L-XXX Bulk Lead Paint Sample

N.T.S

Title: **RCMP DIV E HAZARDOUS BUILDING MATERIAL ASSESSMENT 2020 - EXTERIOR**

Project: BUILDING E0897
UNIT B, 117 NASS RD., NEW AIYANSH, B.C.

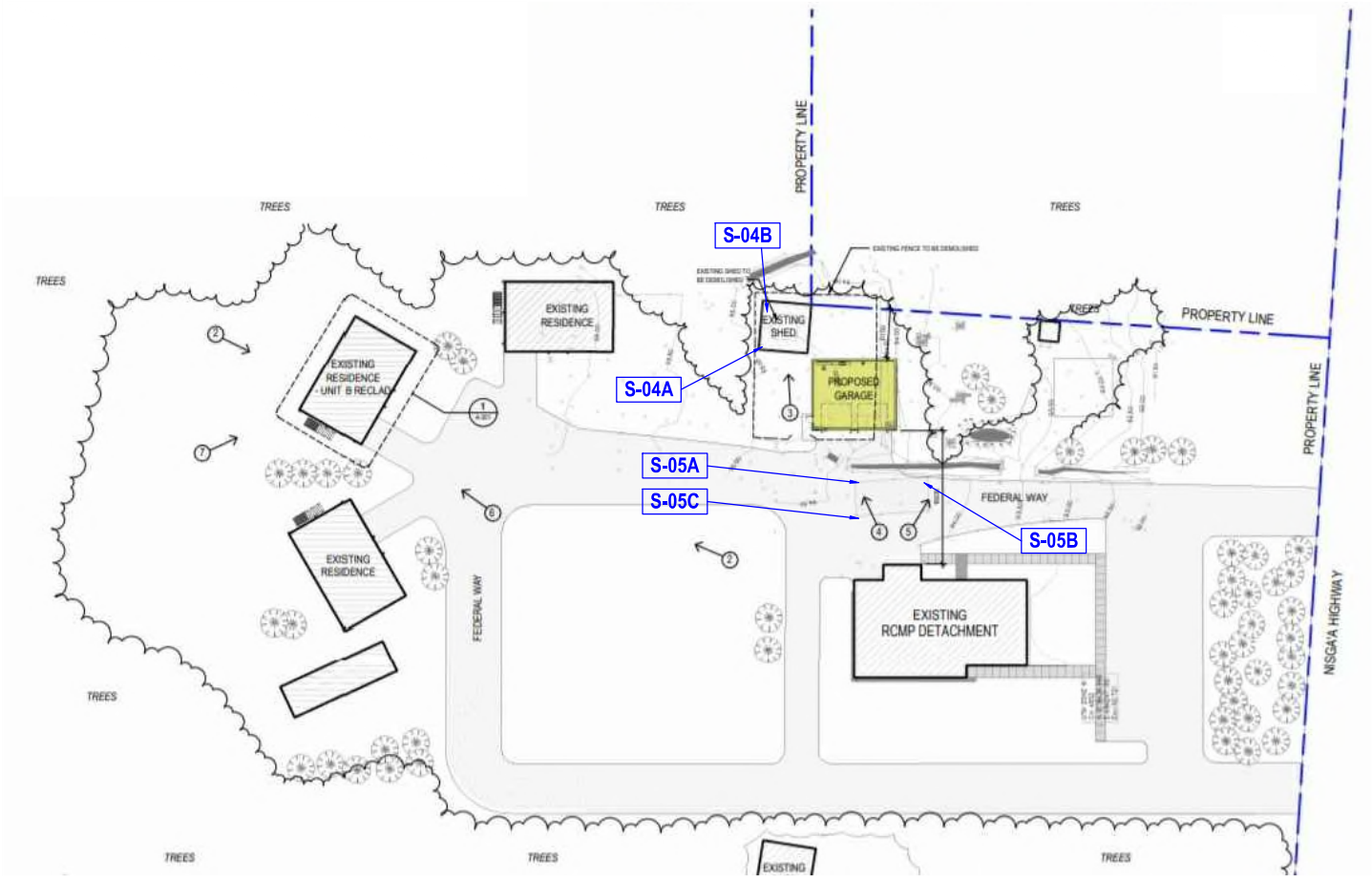
Client: PUBLIC SERVICES AND PROCUREMENT CANADA

Project Number: 30053059	Drawn By: CB	Plot Size: 11X17"	Date: JULY 2020

ARCADIS

FIGURE 1

exterior G:\PROJECTS\30053059 - PSPC_RCMP Construction 2020\CAD\30053059-Aiyansh.dwg



LEGEND

S-XXX Bulk Asbestos Sample

N.T.S

Title: RCMP DIV E HAZARDOUS BUILDING MATERIAL ASSESSMENT
2020 - SITE PLAN

Project: SHED DEMOLITION - RCMP DETACHMENT, NEW AIYANSH, B.C.

Client: PUBLIC SERVICES AND PROCUREMENT CANADA

Project Number:	Drawn By:	Plot Size:	Date:
30053059	CB	11X17"	JULY 2020

ARCADIS

FIGURE 2

SITEPLAN G:\PROJECTS\30053059 - PSPC_RCMP Construction 2020\CAD\30053059-Aiyansh.dwg

APPENDIX D

Regulations and Health Effects

Asbestos

Occupational Health and Safety (OHS) for federal employees is regulated by the Canada Labour Code (CLC) Part II. The *Canada Occupational Health and Safety Regulations (COHSR), Part X, Hazardous Substances* covers specific requirements related to the management and control of asbestos-containing materials (ACM). The COHSR, Part X, Hazardous Substances, states an employee shall be kept free from exposure to a concentration of airborne chrysotile asbestos in excess of 0.1 fibre/cm^3 or f/cc. There are also specific requirements for hazard prevention detailed in the Hazard Prevention Program (HPP) in the CLC.

For the purposes of this report, the following federal requirements will be followed, unless provincial requirements are more stringent. Federal legislation and policy referenced in this report includes:

- Canada Labour Code, March 2020;
- Canada Occupational Health and Safety Regulations Part X, Hazardous Substances; SOR/86-304, June 2019;
- Public Services and Procurement Canada Asbestos Management Standard, June 2019;
- Asbestos Management Plan, Royal Canadian Mounted Police, Version 2020-01, January 2020; and,
- Transport Canada, Transport of Dangerous Goods Regulations

The management and requirements for the potential disturbance of asbestos in buildings is also regulated at the provincial level under the *British Columbia Occupational Health and Safety Regulations,296/97, and Safe Work Practices for Handling Asbestos, WorkSafeBC, 2017 Edition*.

The BC Occupational Health and Safety Regulations, 296/97 (BC Reg 296/97), require specific actions when asbestos is a potential health hazard in a workplace. Section 6.1 of the regulation defines an asbestos-containing material as follows:

"asbestos-containing material" means the following:

(a) a manufactured article or other material, other than vermiculite insulation, that would be determined to contain at least 0.5% asbestos if tested in accordance with one of the following methods:

(i) Asbestos, Chrysotile by XRD, Method 9000 (Issue 2, dated August 15, 1994) in the NIOSH Manual of Analytical Methods, published by the United States National Institute for Occupational Safety and Health, Centre for Disease Control;

(ii) Asbestos (bulk) by PLM, Method 9002 (Issue 2, dated August 15, 1994) in the NIOSH Manual of Analytical Methods, published by the United States National Institute for Occupational Safety and Health, Centre for Disease Control;

(iii) Test Method for the Determination of Asbestos in Bulk Building Materials (EPA/600/R-93/116, dated July 1993) published by the United States Environmental Protection Agency;

(b) vermiculite insulation that would be determined to contain any asbestos if tested in accordance with the Research Method for Sampling and Analysis of Fibrous Amphibole in Vermiculite Attic Insulation (EPA/600/R-04/004, dated January 2004) published by the United States Environmental Protection Agency;

The duties of employers, contractors, or owners include:

- identifying and labeling ACM that can potentially release asbestos fibres;
- keeping a current written record of all ACM present in the workplace;
- conducting regular surveillance and maintenance of asbestos materials to prevent fibre release;
- developing a written exposure control plan if workers may be exposed to harmful levels of asbestos;
- conducting work in a way that prevents the release of asbestos fibres as much as possible;
- notifying, informing, and training workers; and,
- notifying Occupational Health and Safety (OHS) at least 48 hours before beginning an asbestos-abatement.

Disturbance of asbestos during construction and demolition is regulated under section 20.112 of BC Reg 296/97.

The 2017 WorkSafeBC publication Safe Work Practices for Handling Asbestos (Asbestos Guide) is used by Occupational Health and Safety officers as a guide when reviewing abatement work practices and employer codes of practice, and generally meets the requirements of the COHSR.

The Asbestos Guide also provides significant additional background information pertaining to asbestos, along with details on health effects and other applicable legislation within the province of British Columbia (e.g., the federal Hazardous Products Act, the BC Building Code and waste disposal regulations).

Disposal of asbestos waste is governed by the British Columbia Hazardous Waste Regulation (BC Reg. 63/88). The Federal Transportation of Dangerous Goods Regulation and BC Reg. 63/88 set out the requirements for the proper transport of asbestos waste in British Columbia. In general, and for transportation and disposal, the waste must be placed in a double sealed container, properly labeled, free of cuts, tears or punctures and disposed of at a licensed waste station which has been properly notified of the presence of asbestos waste.

Health effects

Undisturbed asbestos within building materials poses no health risks. Asbestos poses a risk when building materials containing asbestos are impacted, or disturbed, thereby releasing the asbestos fibres into the air

Asbestos-related diseases are caused when suspended airborne asbestos fibres are inhaled and the fibres settle into various regions of the lungs and remain for extended periods. Once embedded in the lungs the asbestos fibres cause scarring within the lung tissue, ultimately leading to impaired lung function (asbestosis) and/or various cancers (lung cancer; mesothelioma). These asbestos-related diseases are irreversible and fatal. The risk of lung-related cancers is increased in individuals who smoke.

These asbestos-related diseases most often occur in individuals who have been exposed to high concentrations of airborne asbestos over a long period of time, though mesothelioma has been found in individuals with short-term exposures. Symptoms or the development of these asbestos-related diseases usually occur 10 to 25 years after exposure

Lead

In Canada, the Surface Coating Materials Regulations (SOR/2005-109) under the federal Hazardous Products Act provides a concentration of lead that must not be exceeded in surface coatings that are presently sold in this country. This value has recently been reduced from 600 ppm (2005) to 90 ppm (2010).

With respect to potential lead exposures associated with disturbance to surfaces coated with lead-containing products, the 2017 WorkSafeBC manual titled Lead-Containing Paint and Coatings: Preventing Exposure in the Construction Industry, indicates the following:

- Improper removal of lead paint containing 600 mg/kg lead results in airborne lead concentrations that exceed half of the exposure limit
    - This potential for exposure exceeding half of the occupational exposure limit would be the trigger for implementation of an exposure control plan.
- Lead concentrations as low as 90 mg/kg may present a risk to pregnant women and children
    - Any risk assessment should include for the presence of high risk individuals within the workplace

The disposal of lead-containing paint is regulated under the Federal *Transportation of Dangerous Goods Act* and by the British Columbia Ministry of Environment. All lead-based paints and associated nonmetal substrate (concrete, plaster, wood, etc.) must undergo Toxicity Characteristic Leachate Properties (TCLP) metals testing to determine disposal procedures. Upon the completion of the test, the total concentration of metals in the waste extract must be compared to Schedule 4, Table 1 of the Hazardous Waste Regulation.

The Federal Transportation of Dangerous Goods Regulation and BC Reg. 63/88 set out the requirements for the proper transport of lead waste in British Columbia.

Health Effects

Elemental lead and inorganic lead compounds are absorbed through ingestion or inhalation and can incorporate into the bone marrow, nerve tissue, brain, and kidneys. In children, symptoms of lead poisoning can include headaches, irritability, abdominal pain, vomiting, anemia, weight loss, poor attention span, noticeable learning difficulty, slowed speech development, and hyperactivity. In adults, symptoms of lead poisoning can include pain, numbness or tingling of the extremities, muscular weakness, headache, abdominal pain, memory loss, unsteady gait, pale skin, weight loss, vomiting, irritability, and anemia. Although adults are susceptible to the toxic effects of lead, children are at high risk due to the nature of a child's activities that involve the introduction of non-food items into their bodies.

Excessive airborne lead and surface contamination can be transferred to employees' hands and may results in lead ingestion. Therefore, work practices intended to minimize surface lead concentrations, such as frequent cleaning of work surfaces should be included in an overall lead exposure control plan

PCB

As of September 5, 2008, under subsection 93(1) of the *Canadian Environmental Protection Act,* (CEPA), Federal PCB regulations were published by the Canada Gazette Part II (SOR/2008-273) that imposed specific deadlines for the elimination of all PCBs in concentrations at or above 50 milligrams/kilogram (mg/kg). This regulation required the elimination of all PCBs and PCB-containing materials currently in-use and in storage and limited the period of time PCB materials could be stored before being eliminated. Other aspects of the regulation govern the labelling and reporting of stored PCB materials and equipment as well

as improved practices for the management of PCBs that remain in use (i.e., those with PCB concentrations less than 50 mg/kg) until their eventual elimination.

In British Columbia, PCB equipment becomes PCB wastes as soon as it is removed from service. This is the case even if the intent is to treat, recycle, or reuse the equipment.

When PCB wastes are stored in British Columbia, the full requirements of BC Reg. 63/88 apply to:

- 1.0 kg or more of pure PCB
- 100 L or more of any liquid containing more than 50 ppm of PCB
- 100 kg or more of any material other than a liquid, contaminated with more than 50 ppm of PCB

These amounts are the total of all amounts at a single location owned or controlled by the same person. They include PCB equipment. BC Reg. 63/88 also provides packaging requirements for storage, labeling requirements, waste destruction requirements, and references SOR/2008-273, indicating:

The Federal Transportation of Dangerous Goods Regulation sets out the requirements for the proper transport of PCB waste across provincial boundaries.

In British Columbia, a manifest issued by the Ministry of Environment (or equivalent federal document) must be used for hazardous wastes shipped from sites in British Columbia. A manifest must be used to transport:

- 5 kg or more of PCB solids
- 5 L or more of PCB liquids
- An amount of a PCB solid or PCB liquid containing more than 500 g of PCB within BC
- 500 g or more of solids, liquids, or mixtures of these containing 50 mg/kg of PCB outside of BC

Health effects

PCBs are insoluble in water; however, they readily dissolve in fats and other organic compounds. It is these attributes and fat-solubility that allow PCBs to persist in the environment and bio-accumulate in humans and animals. Exposure to PCBs can affect the immune system, reproductive system, nervous system, and endocrine system. In humans, PCBs are potentially cancer-causing.

Mould

At present, there are no specific laws or regulations governing acceptable levels of mould in buildings. The lack of specific regulatory standards is due in part to an inability to establish exposure-response relationships. Variation in individual susceptibility, limitations in sampling and analytical techniques, and the vast number of fungal agents and their products make it difficult to establish safe levels of exposure for all individuals. With a lack of defined exposure criteria, current Health Canada and other agency guidelines on the assessment and control of mould contamination in public buildings are largely based on prudent avoidance (i.e., remove any indoor growth or amplification site of mould, regardless of the concentration of moulds or their products in the indoor environment).

Although there are currently no regulations in Canada pertaining specifically to mould in buildings, occupational health and safety regulations typically require employers to take every precaution reasonable in the circumstances for the protection of workers.

The WorkSafeBC Guideline for Part 4 of BC Reg. 296/97 discusses the application of the Regulation to workplaces with mould showing on exposed or hidden surfaces, or where mould may be a factor in complaints regarding indoor air quality. The guideline provides information for investigating indoor air quality complaints with respect to mould contamination, including information on sampling for the

presence of moulds in buildings. Information is also provided on possible health effects and for cleanup personnel involved in the remediation of buildings damaged by water and mould.

Health Effects

There are a number of documented cases of health problems related to exposure to indoor fungi.

Both high-level, short-term exposures and lower-level, long-term exposures can result in illness. The most common symptoms from exposure to mould in indoor environments are runny nose, eye irritation, cough, congestion, aggravation of asthma, headache, flu-like symptoms, fatigue, and skin rash. People with suppressed immune systems may be susceptible to fungal infections as a result of exposure to indoor moulds.

People who are exposed to mould growth on building materials will not necessarily exhibit adverse health effects. However, the mould must still be removed. Humans are at risk from indoor mould when fungal spores, fragments or metabolites are released into the air and inhaled or physically contacted (dermal exposure).

Not everyone experiences allergic reaction; the susceptibility to exposure varies with the individual's genetic predisposition, age, state of health, and concurrent exposures. For these reasons, and because the measurement of exposure is not standardized and biological markers of exposure to fungi are largely unknown, it is not possible to establish "safe" or "unsafe" levels of exposure. However, federal, and provincial policies have been written to minimize mould exposure and the elimination of mould indoors.

Mercury

In Canada, the Surface Coating Materials Regulations (SOR/2005-109) under the federal *Hazardous Products Act* provides a concentration of mercury that must not be exceeded in surface coatings that are presently sold in this country. This value was set at 10 ppm in 2005. However, it is important to note that there is not a direct correlation between the concentration of mercury in a material to the potential occupational exposure if the material is disturbed.

Mercury disposal should be through a scrap dealer (elemental mercury), recycling firm for mercury vapour and returned to the manufacturer for light tubes and fixtures. Disposal of mercury waste is governed by BC Reg. 63/88.

The Federal Transportation of Dangerous Goods Regulation and BC Reg. 63/88 set out the requirements for the proper transport of mercury waste in British Columbia.

Health Effects

Routes of exposure for mercury and mercury compounds include inhalation, ingestion, skin and/or eye contact. Mercury is hazardous if it is inhaled or absorbed through the skin, therefore exposure controls (including both respiratory protection and skin protection) are important to consider.

Elemental (metallic) mercury most often causes health effects through inhalation of its vapour, which can be absorbed through the lungs. This kind of exposure can result when elemental mercury is spilled (or products that contain elemental mercury break) and the mercury is exposed to the air. Vapour concentrations can vary especially in warm or poorly-ventilated indoor spaces where the airborne concentration can exceed the permissible exposure limit (provincially set).

Chronic mercury "poisoning" can be caused by long-term exposure to low airborne concentrations (or low levels) of mercury. Symptoms or effects of mercury exposure include: tremors, emotional changes,

neuromuscular effects, mental changes/disturbances, digestive disturbances, headaches, insomnia, and changes in nervous response.

Silica

Regulations pertaining to silica are provided in BC Reg. 296/97. Included are general provisions (minimizing release; keeping worksite clear of unnecessary accumulations; ensuring methods for decontamination prevent generation of airborne silica), provisions for "restricted areas" (where there is a reasonable chance that the airborne concentration of silica exceeds or may exceed the occupational exposure limit), provisions for use in abrasive blasting, and provisions for health assessments for workers exposed to silica.

Health Effects

Crystalline silica dust particles, which are small enough to be inhaled into the lungs (respirable size), can cause a number of health problems. As with asbestos, silica within building materials poses no threat to human health if left undisturbed.

Exposure to crystalline silica airborne dust my cause scaring of the lungs with coughing and shortness of breath—also known as "silicosis", a form of disabling, progressive, and sometimes fatal pulmonary fibrosis.

Ozone Depleting Substances (ODS)

ODSs are regulated in British Columbia by the British Columbia *Waste Management Act*—Ozone Depleting Substances and Other Halocarbons Regulation (BC Reg. 387/99 as amended by BC Reg. 317/2012).

On federal land, aboriginal land and federal works, buildings and undertakings, the Federal Halocarbon Regulation 2003 (SOR/2003-289, including associated amendments) applies. All other buildings and uses of refrigerants and other agents are under the Ozone-Depleting Substances Regulations 1998 (SOR/99-7), under CEPA. The regulations prohibit the release of halocarbons contained in refrigeration systems, air conditioning systems, fire extinguishers (except to fight a fire that is not a fire caused for training purposes) or containers or equipment used in the re-use, recycling, reclamation or storage of a halocarbon.

The regulations also impose restrictions on the servicing and dismantling, disposing of or decommissioning of any system containing halocarbons and requires the recovery of halocarbons into an appropriate container by a certified individual. The regulation also details an owner's record-keeping obligations.

If ODS-containing materials are to be removed and disposed of, all ODSs must be handled, recycled, stored, and/or disposed of in accordance with the requirements of BC Reg. 63/88.

The Federal Transportation of Dangerous Goods Regulation and BC Reg. 63/88 set out the requirements for the proper transport of ODS waste in British Columbia.

Health Effects

Health effects are not typically related to exposure to ODSs directly, but to the consequences of ODS release to the atmosphere, subsequent degradation of the earth's ozone layer, and implications associated with increased UVB light exposure.

APPENDIX E

Classification, Condition and Accessibility

1.1 Spray Applied Fireproofing, Insulation and Texture Finishes

To evaluate the condition of ACM spray applied as fireproofing, thermal insulation, or texture, decorative or acoustic finishes, the following criteria are applied:

GOOD

Surface of material shows no significant signs of damage, deterioration, or delamination. Up to 1 percent visible damage to surface is allowed within range of **GOOD**. Evaluation of sprayed fireproofing requires the surveyor to be familiar with the irregular surface texture typical of sprayed asbestos products. **GOOD** condition includes un-encapsulated or unpainted fireproofing or texture finishes, where no delamination or damage is observed, and encapsulated fireproofing or texture finishes where the encapsulation has been applied after the damage or fallout occurred.

POOR

Sprayed materials show signs of damage, delamination, or deterioration. More than 1 percent damage to surface of ACM spray.

In observation areas where damage exists in isolated locations, both **GOOD** and **POOR** condition may be reported. The extent or percentage of each condition will be recorded on the survey or re-assessment form.

NOTE: **FAIR** condition is not utilized in the evaluation of the sprayed fireproofing, sprayed insulation, or texture coat finishes.

The evaluation of ACM spray applied as fireproofing, non-mechanical thermal insulation, or texture, decorative or acoustic finishes which are present above ceilings, may be limited by the number of observations made, and by building components such as ducts or full height walls that obstruct the above ceiling observations. Persons entering the ceiling are advised to be watchful for ACM **DEBRIS** prior to accessing or working above ceilings in areas of buildings with ACM regardless of the reported condition.

1.2 Mechanical Insulation

The evaluation of the condition of mechanical insulation (on boilers, breaching, ductwork, piping, tanks, equipment etc.) utilizes the following criteria:

GOOD

Insulation is completely covered in jacketing and exhibits no evidence of damage or deterioration. No insulation is exposed. Includes conditions where the jacketing has minor surface damage (i.e., scuffs or stains), but the jacketing is not penetrated.

FAIR

Minor penetrating damage to jacketed insulation (cuts, tears, nicks, deterioration, or delamination) or undamaged insulation that has never been jacketed. Insulation is exposed but not showing surface disintegration. The extent of missing insulation ranges should be minor to none.

POOR

Original insulation jacket is missing, damaged, deteriorated, or delaminated. Insulation is exposed and significant areas have been dislodged. Damage cannot be readily repaired.

The evaluation of mechanical insulation may be limited by the number of observations made and building components such as ducts or full height walls that obstruct observations. It is not possible to observe the full length of mechanical insulation from all angles.

1.3 Non-friable and Potentially Friable Materials

Non-friable materials generally have little potential to release airborne fibres, even when damaged by mechanical breakage. However, some non-friable materials, i.e., exterior asbestos cement products, may have deteriorated so that the binder no longer effectively contains the asbestos fibres. In such cases of significantly deteriorated non-friable material, the material should be treated as a friable product.

2. Evaluation of Accessibility

The accessibility of building materials known or suspected of being ACM is rated according to the following criteria:

ACCESS (A)

Areas of the building within reach (from floor level) of all building users. Includes areas such as gymnasiums, workshops, and storage areas where activities of the building users may result in disturbance of ACM not normally within reach from floor level.

ACCESS (B)

Frequently entered maintenance areas within reach of maintenance staff, without the need for a ladder. Includes: frequently entered pipe chases, tunnels and service areas or areas within reach from a fixed ladder or catwalk, e.g. tops of equipment, mezzanines.

ACCESS (C) EXPOSED

Areas of the building above 2.4 metres where use of a ladder is required to reach the ACM. Only refers to ACM that is exposed to view, from the floor or ladder, without the removal or opening of other building components such as ceiling tiles, or service access door or hatch. Does not include infrequently accessed service areas of the building.

ACCESS (C) CONCEALED

Areas of the building which require the removal of a building component, including lay-in ceilings and access panels into solid ceiling systems. Includes rarely entered crawl spaces, attic spaces, etc. Observations will be limited to the extent visible from the access points.

ACCESS (D)

Areas of the building behind inaccessible solid ceiling systems, walls, or mechanical equipment, etc. where demolition of the ceiling, wall, or equipment, etc. is required to reach the ACM. Evaluation of condition and extent of ACM is limited or impossible, depending on the surveyor's ability to visually examine materials in ACCESS D.

3. ACM DEBRIS

3.1 DEBRIS from Friable ACM

The presence of fallen ACM is noted separately from the presumed friable ACM source (sprayed fireproofing, thermal insulation, texture, decorative or acoustic finishes or mechanical insulation) and is referred to as **DEBRIS**.

3.2 DEBRIS from Damaged Non-Friable ACM

The presence of fallen ACM from damaged non-friable ACM is also reported separately from the non-friable ACM source. Only fallen non-friable ACM that has become friable is reported as **DEBRIS**.

The identification of the exact location or presence of **DEBRIS** on the top of ceiling tiles is limited by the number of observations made and the presence of building components such as ducts or full height walls

that obstruct observations. Workers are advised to be watchful for the presence of **DEBRIS** prior to accessing or working in proximity to mechanical insulation or above ceilings in areas of buildings with ACM regardless of the reported presence or absence of **DEBRIS**.

4. Action Matrix and Action Descriptions

The Asbestos Management Plan requires the following responses:

- Immediately clean-up **DEBRIS** that is likely to be disturbed.
- Remove, repair, or enclose friable ACM in **POOR** or **FAIR** condition whose continued deterioration will result in **DEBRIS** that is likely to be disturbed.

The following factors shall be considered in making site-specific recommendations for compliance with the existing applicable regulations or codes and the practical implementation of the Asbestos Management Plan:

1. ACM in **POOR** condition is not routinely repairable. If an abatement action is necessary, removal is the recommended action (enclosure is a viable option in unusual circumstances, e.g. where removal is difficult or costly and the asbestos-containing material can be thoroughly enclosed).

2. Mechanical insulation in **FAIR** condition will be repaired or removed based on the following general recommendations, applied on a case-by-case basis:
   - ACM insulation found in **FAIR** condition in ACCESS (B) or ACCESS (C) EXPOSED areas is to be repaired.
   - ACM mechanical insulation found in **FAIR** condition in ACCESS (B) and ACCESS (C) EXPOSED areas, where future damage to the ACM is likely to occur, is to be removed.

3. ACM in **GOOD** condition present in ACCESS (A) can be managed by surveillance, as long as it is not disturbed by future renovation, maintenance, or demolition. Proactive removal of the ACM in ACCESS (A) will be considered where damage is possible by on-going occupant activity (accidental or intentional).

4. Non-friable or manufactured products are considered in the action matrix as follows:
   - Non-friable and manufactured products reported in **POOR** condition, or friable **DEBRIS** resulting from the deterioration of non-friable ACM, are treated as friable materials and the appropriate action, and depending on accessibility is determined from the action matrix for friable ACM.
   - For non-friable or manufactured products reported in **GOOD** condition, Action 7 (surveillance) is recommended regardless of accessibility.

5. All asbestos-containing material from a particular area is to be removed where small quantities of asbestos are present, and removal will negate the need for the use of an Asbestos Management Program in that area.

The action matrix provided below establishes the recommended asbestos control action. The ACTIONS themselves are described in full following the table.

4.1 Action Matrix Tables

FRIABLE ACM				
ACCESS	**CONDITION**			**DEBRIS**
	GOOD	**FAIR**	**POOR**	
(A)	ACTION 5/7[1]	ACTION 5/6[2]	ACTION 3	ACTION 1
(B)	ACTION 7	ACTION 6/5[3]	ACTION 3	ACTION 1
(C) EXPOSED	ACTION 7	ACTION 6	ACTION 4	ACTION 2
(C) CONCEALED	ACTION 7	ACTION 7	ACTION 4	ACTION 2
(D)	ACTION 7	ACTION 7	ACTION 7	ACTION 7

[1] If material in **ACCESS (A)/GOOD** condition is not removed **ACTION 7** is required.

[2] If material in **ACCESS(A)/FAIR** condition is not removed **ACTION 6** is required.

[3] Remove ACM in **ACCESS (B)/FAIR** condition if ACM is likely to be disturbed.

4.2 Action Descriptions

ACTION 1 - Immediate Clean-Up of DEBRIS that is Likely to Be Disturbed

Access that is likely to cause a disturbance of the ACM **DEBRIS** is to be restricted and **clean up ACM DEBRIS is to be done immediately**. Use correct asbestos procedures. This action is required for compliance with regulatory requirements and good practice. The assessor should immediately notify the Asset or Property and Facility Manager, or Regional/Area Asbestos Management Coordinator of this condition.

ACTION 2 - Intermediate risk precautions for Entry into Areas with ACM DEBRIS

At locations where ACM **DEBRIS** can be isolated in lieu of removal or cleaned up, use appropriate means to limit entry to the area. Restrict access to the area to persons using intermediate risk asbestos precautions. The precautions will be required until the ACM **DEBRIS** has been cleaned up, and the source of the **DEBRIS** has been stabilized or removed.

ACTION 3 - ACM Removal Required for Compliance

Remove ACM for compliance with regulatory requirements and good practice. Utilize asbestos procedures appropriate to the scope of the removal work.

ACTION 4 - Access into areas where asbestos-containing material is present and likely to be disturbed by access requires intermediate risk precautions.

Intermediate risk asbestos precautions are to be used when entry or access into an area is likely to disturb the ACM. **ACTION 4** must be used until the ACM is re-moved (Use **ACTION 1** or **2** if **DEBRIS** is present). Intermediate risk or high-risk precautions should be used for removal (depending on extent of removal).

ACTION 5 - Proactive ACM Removal

Removal of ACM in lieu of repair may be considered, even if it is in **GOOD** condition at locations, where ACM is easily accessible, limited in quantity, and removal would be cost-effective.

ACTION 6 - ACM Repair

Repair ACM found in **FAIR** condition, and not likely to be damaged again or disturbed by normal use of the area or room. Upon completion of the re-pair work treat ACM as material **in GOOD** condition and implement **ACTION 7**. If ACM is likely to be damaged or disturbed during normal use of the area or room, **ACTION 5** is to be implemented.

ACTION 7 - Routine Surveillance

Institute routine surveillance of the ACM. Trained workers or contractors must use appropriate asbestos precautions (low, intermediate, or high) during disturbance of the remaining ACM.

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