Fisheries and Oceans Canada

Requisition No. _____
MERX I.D. No. _____

SPECIFICATIONS
For
Taylor Building Stair Tower Window Replacement
Pacific Biological Station, Nanaimo B.C.

Project No. F1700-130475 August 2013

SPECIFICATIONS

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DRAWINGS (bound separately)

Architectural

A-1.0 Plans, Existing Condition Plans, and Photographs
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END OF SECTION

1 CODES

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

2 DESCRIPTION OF WORK

.1 Work under this Contract covers: Replacement of the window system, Taylor Building Stair Tower

.2 "Green" requirements:

.1 Adhere to waste reduction requirement of Section 01 74 19 - Waste Management and Disposal for re-use or recycling of waste materials, thus diverting materials from landfill.

3 CONTRACT DOCUMENTS

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

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

4 DIVISION OF SPECIFICATIONS

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

.2 A division may consist of the work of more than one 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.

5 TIME OF COMPLETION

.1 Complete all work, within 12 weeks of Contract award.

6 WORK SCHEDULE

.1 Carry on work as follows:

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

following:

.1 Milestones for use of site and demolition based sequence described on demolition plan drawing.

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

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

.5 Final completion date within time period required by 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.

7 COST BREAKDOWN

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

8 CODES, BYLAWS, STANDARDS, REPORTS

.1 Perform work in accordance with National Building Code of Canada (NBC) 2010 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 location concerned.

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

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

9 DOCUMENTS REQUIRED

.1 Maintain one copy each of following at 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 Manufacturer installation and application instructions.
.11 One set of record drawings and specifications for record purposes.
.12 National Building Code of Canada (NBC) 2010.
.13 Current construction standards of workmanship listed in technical Sections.
.14 Building Safety Plan.

10 REGULATORY REQUIREMENTS

.1 Obtain and pay for Certificates, Licenses and other permit required by regulatory municipal, provincial or federal authorities to complete the work, including but not limited to building permit, demolition permit and plumbing permit.

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

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

11 CONTRACTOR USE OF SITE

.1 Use of site:
.1 Adjacent portions of site will remain occupied during Work.
.2 Co-ordinate use of site under direction of Departmental Representative to minimize disruption of occupied portions of site.

.2 Perform work in accordance with Contract documents. Ensure that work is carried out in accordance with phasing where applicable.

.3 Do not unreasonably encumber site with material or equipment.

.4 All Contractor and sub trade personnel to be present on site are required to attend a 20 minute contractors site safety orientation arranged by the Departmental Representative.

12 HOURS OF WORK

.1 Schedule work during building's normal operating hours of 8 a.m. to 5 p.m. Monday to Friday. Additional work can be scheduled outside of building's normal operating hours, subject to the approval of the Departmental Representative, and provided normal building operations are not impeded.

13 SECURITY CLEARANCES

.1 Personnel employed on this project will be subject to security check. Obtain requisite clearances, as instructed, for each individual required to enter premises.

.2 Contractor is fully responsible for securing premises and contents throughout construction period.

.3 Personnel will be checked at start of work shift and provided with pass which must be worn at all times.

.4 Contractor and sub trades to Co-operate with commissionaire instructions.

14 EXAMINATION

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

15 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 inspection of work.

16 QUALITY OF WORK

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

.2 Workmanship, erection methods and procedures to meet minimum standards set out in NBC.

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

17 APPROVAL OF SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

.1 In accordance with Section 01 33 00 - Shop Drawings, Product Data and Samples, submit requested shop drawings, product data, MSDS sheets and samples indicated in each technical Section.

.2 Allow sufficient time for following:
- .1 Review of product data.
- .2 Approval of shop drawings.
- .3 Review of re-submission.
- .4 Ordering of approved material and/or products - refer to individual specification sections.

18 PROJECT MEETINGS

.1 Contractor to arrange project meetings and assume responsibility for setting times and recording and distributing minutes.

19 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.

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

20 ENVIRONMENTAL PROTECTION

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

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

21 RECORD DOCUMENTS

.1 Departmental Representative will provide 2 sets of drawings and 2 sets of specifications for project record purposes.

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

.3 Refer to Section 01 78 30 - Closeout Submittals for recording procedures.

22 MAINTENANCE MATERIALS, SPECIAL TOOLS AND SPARE PARTS

.1 Specific requirements for maintenance materials, tools and spare parts are specified in individual specification sections.

23 ADDITIONAL DRAWINGS

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

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

24 BUILDING SMOKING ENVIRONMENT

.1 Do not smoke within building.

.2 Smoking only permitted in designated smoking area, if designated by Departmental Representative.

.3 If designated smoking area is not established, comply with B.C. Smoking Regulations regarding no smoking within 3 metres of building entrances, operable windows or air intakes.

25 SYSTEM OF MEASUREMENT

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

26 FAMILIARIZATION WITH SITE

.1 Before submitting tender, visit site as indicated in tender documents and become familiar with all conditions likely to affect the cost of Work.

27 SUBMISSION OF TENDER

.1 Submission of tender is deemed to be confirmation of the fact that the Tenderer has analysed the Contract documents and inspected the site and is fully conversant with all conditions.

END OF SECTION

1 APPROVALS

.1 Approval of shop drawings and samples: refer to Section 01 11 55 - General Instructions.

2 GENERAL

.1 This Section specifies general requirements and procedures for Contractor's submissions of shop drawings, product data, samples and other requested submittals to Departmental Representative for review. Additional specific requirements for submissions are specified in individual technical sections.

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

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

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

.5 Notify Departmental Representative in writing at time of submission, identifying deviations from requirements of Contract documents and stating reasons for deviations.

.6 Contractor's responsibility for deviations in submission from requirements of Contract documents is not relieved by Departmental Representative's review of submission unless Departmental Representative gives written acceptance of specific deviations.

.7 Make any changes in submissions which Departmental Representative may require consistent with Contract documents and resubmit as directed by Departmental Representative.

.8 Notify Departmental Representative in writing, when resubmitting, of any revisions other than those requested by Departmental Representative.

.9 Do not proceed with work until relevant submissions are reviewed and approved by Departmental Representative.

3 SUBMISSION REQUIREMENTS

.1 Co-ordinate each submission with requirements of work and Contract documents. Individual submissions will not be reviewed until all related information is available.

.2 Allow 10 working days for Departmental Representative's review of each submission, unless noted otherwise.

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

.4 Submissions to include:
- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and address of:
  - .1 Subcontractor.
  - .2 Supplier.
  - .3 Manufacturer.
  - .4 Contractor's stamp, signed by Contractor's authorized representative, certifying approval of submissions, verification of field measurements and compliance with Contract documents.

.5 Details of appropriate portions of work as applicable.
- .1 Fabrication.
- .2 Layout, showing dimensions (including identified field dimensions and clearances).
- .3 Setting or erection details.
- .4 Capacities.
- .5 Performance characteristics.
- .6 Standards.
- .7 Operating weight.
- .8 Wiring diagrams.
- .9 Single line and schematic diagrams.
- .10 Relationship to adjacent work.

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

4 SHOP DRAWINGS

.1 Shop drawings: original drawings or modified standard drawings provided by Contractor to illustrate details of portion of work which are specific to project requirements.

.2 Digital submittals opf shop drawings are acceptable. Submit in .pdf format.

.3 Cross-reference shop drawing information to applicable portions of Contract documents.

5 SHOP DRAWINGS REVIEW

.1 Review of shop drawings by Public Works and Government Services Canada is for the sole purpose of ascertaining conformance with the general concept.

.2 This review will not mean Public Works and Government Services Canada approves detail design inherent in shop drawings, responsibility for which remains with Contractor submitting same.

.3 This review will not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting all requirements of construction and Contract documents.

.4 Without restricting the generality of the foregoing, Contractor is responsible for:
- .1 . Dimensions to be confirmed and correlated at job site.
- .2 Information that pertains solely to fabrication processes or to techniques of construction and installation.
- .3 Co-ordination of work of all sub-trades.

6 PRODUCT DATA

.1 Product data: manufacturers' catalogue sheets, MSDS sheets, brochures, literature, performance charts and diagrams, used to illustrate standard manufactured products or any other specified information.

.2 Delete information not applicable to project.

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

.4 Cross-reference product data information to applicable portions of Contract documents.

.5 Digital submissions of product data are acceptable.

7 SAMPLES

.1 Samples: examples of materials, equipment, quality, finishes and workmanship.

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

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

8 PROGRESS SCHEDULE

.1 Submit work schedule and cost breakdown as required in Section 01 11 55 - General Instructions.

9 SUSTAINABLE (GREEN) REQUIREMENTS SUBMITTALS

.1 Provide submittals to show compliance with waste management and disposal requirements in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

END OF SECTION

1 REFERENCES

.1 Government of Canada:
- .1 Canada Labour Code - Part II
- .2 Canada Occupational Health and Safety Regulations.

.2 National Building Code of Canada (NBC) 2010:
- .1 Part 8, Safety Measures at Construction and Demolition Sites.

.3 Canadian Standards Association (CSA) as amended:
- .1 CSA Z797-2009 Code of Practice for Access Scaffold.
- .2 CSA S269.1-1975 (R2003) Falsework for Construction Purposes.
- .3 CSA S350-M1980 (R2003) Code of Practice for Safety in Demolition of Structures.

.4 Fire Protection Engineering Services, HRSDC:
- .1 FCC No. 301, Standard for Construction Operations.
- .2 FCC No. 302, Standard for Welding and Cutting.

.5 American National Standards Institute (ANSI):
- .1 ANSI/ASSE A10.3-2006, American National Standard - Construction and Demolition Operations- Safety Requirements for Powder-Actuated Fastening Systems.

.6 Province of British Columbia:
- .1 Workers' Compensation Act Part 3-Occupational Health and Safety.
- .2 Occupational Health and Safety Regulation.

2 RELATED SECTIONS

.1 Refer to the following sections as required:
- .1 Section 02 41 17 - Structure Demolition - Short Form: health and safety requirements specific to demolition.

3 WORKERS' COMPENSATION BOARD COVERAGE

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

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

4 COMPLIANCE WITH REGULATIONS

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

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

5 SUBMITTALS

.1 Submit to Departmental Representative submittals listed for review, in accordance with Section 01 33 00 - Shop Drawings, Product Data and Samples.

.2 Work effected by submittal will not proceed until review is complete.

.3 Submit following:

- .1 Health and Safety Plan.
- .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 (MSDS) and all other documentation required by Workplace Hazardous Materials Information System (WHMIS) requirements.
- .5 Emergency Procedures.

.4 Departmental Representative will review Contractor's site-specific project Health and Safety Plan and emergency procedures and provide comments to Contractor within 5 working days after receipt of plan. Revise plan as appropriate and re-submit 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 Health and Safety Plan and any revised version to Departmental Representative is for information and reference purposes only. It will not:

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

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

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

6 RESPONSIBILITY

.1 Assume responsibility as 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.

7 HEALTH AND SAFETY CO-ORDINATOR

.1 Health and Safety Co-ordinator must:

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

.2 Be responsible for implementing, daily enforcing and monitoring site-specific Health and Safety Plan.

.3 Be on site during execution of work.

8 GENERAL CONDITIONS

.1 Provide safety barricades and lights around work site as required to provide 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 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 as deemed necessary to protect site against entry.

09 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 above authorities, the most stringent provision will apply. Should dispute arise in determining the most stringent requirement, the Departmental Representative will advise on course of action to be followed.

10 WORK PERMITS

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

11 FILING OF NOTICE

.1 Complete and submit Notice of Project as required by Provincial authorities.

.2 Provide copies of all notices to Departmental Representative.

12 HEALTH AND SAFETY PLAN

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

.2 Prepare and comply with a site-specific project Health and Safety Plan based on hazard assessment, including but not limited to 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.
  - .9 Occupational Health and Safety meetings.
  - .10 Occupational Health and Safety communications and record keeping 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 work.
- .3 List hazardous materials to be brought on site as required by work.

.4 Indicate engineering and administrative control measures to be implemented at 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 plan in collaboration with all subcontractors. Ensure that work/activities of subcontractors are included in the hazard assessment and are reflected in plan.

.4 Revise and update Health and Safety Plan as required and re-submit to Departmental Representative.

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

13 EMERGENCY PROCEDURES

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

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

14 HAZARDOUS PRODUCTS

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

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

.1 Advise Departmental Representative beforehand of product(s) intended for use. Submit applicable MSDS and WHMIS documents as per Section 01 33 00 - Shop Drawings, Product Data and Samples.

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

.3 Provide adequate means of ventilation in accordance with Section 01 51 00 - Temporary Utilities.

15 OVERLOADING

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

16 FALSEWORK

.1 Design and construct falsework in accordance with CSA Z797.

17 SCAFFOLDING

.1 Design, construct and maintain scaffolding in a rigid, secure and safe manner, in accordance with CSA S269.1 and B.C. Occupational Health and Safety Regulations

18 HOISTING

.1 Provide and maintain hoists /cranes for the moving of workers,materials and equipment

.2 Hoists and cranes shall be operated by a qualified operator

19 CONFINED SPACES

.1 Carry out work in confined spaces in compliance with Provincial regulations, .

20 POWDER-ACTUATED DEVICES

.1 Use powder-actuated devices in accordance with ANSI/ASSE A10.3 only after receipt of written permission from Departmental Representative.

21 FIRE SAFETY AND HOT WORK

.1 Obtain Departmental Representative's authorization before 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.

22 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 daily basis.

.2 Handle, store, use and dispose of inflammable and combustible materials in accordance with the National Fire Code of Canada.

23 FIRE PROTECTION AND ALARM SYSTEMS

.1 Fire protection and alarm systems not to 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 fire department, building owner and tenants, resulting from false alarms.

.4 Cover fire exit signs leading into the area of work from the occupied areas of the building.

24 UNFORSEEN HAZARDS

.1 Should any unforeseen or peculiar safety-related factor, hazard or condition become

evident during performance of work, immediately stop work and advise Departmental Representative verbally and in writing.

25 POSTED DOCUMENTS

.1 Post legible versions of following documents on site:
- .1 Health and Safety Plan.
- .2 Sequence of work.
- .3 Emergency procedures.
- .4 Site drawing showing project layout, location(s) of first-aid station(s), evacuation route and marshalling station and emergency transportation provisions.
- .5 Notice of Project.
- .6 Floor plans or site plans.
- .7 Notice as to where a copy of Workers' Compensation Act and Regulations are available on work site for review by employees and workers.
- .8 Workplace Hazardous Materials Information System (WHMIS) documents.
- .9 Material Safety Data Sheets (MSDS).

- .10 List of names of Joint Health and Safety Committee members or Health and Safety Representative, as applicable.
  - .1 Name of "qualified co-ordinator" responsible for co-ordination of health and safety activities in accordance with Section 118 of Workers' Compensation Act.

.2 Post all Material Safety Data Sheets (MSDS) on site, in 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 to be protected from weather and be visible from street or exterior of principal construction site shelter provided for workers and equipment, or as approved by Departmental Representative.

26 MEETINGS

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

27 CORRECTION OF NON-COMPLIANCE

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

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

.3 Departmental Representative may issue "stop work order" if non-compliance of health and safety regulations is not corrected immediately or within posted time. General Contractor will be responsible for costs arising from such "stop work order".

END OF SECTION

1 ACCESS AND DELIVERY

.1 Only designated entrance may be used for access to building.
- .1 Maintain for duration of Contract.
- .2 Make good damage resulting from Contractor's use.

.2 All contractors are required to use only designated entrance and stairway.

.3 Portion of parking lot may be used by Contractor for loading and unloading purposes only. Arrange with Departmental Representative for location and extent.

.4 Limited parking is available on site in parking lot. Refer to drawings for location and extent. Building security may have unauthorized vehicles towed at Contractor's expense.

2 STORAGE FACILITIES

.1 Storage space will be limited to the area of construction.

.2 Portion of parking lot may be used by Contractor for storage space. Refer to drawings for location and extent.

3 POWER

.1 Electrical power and lighting at existing building may be used for construction purposes at no extra cost.

4 WATER SUPPLY

.1 Water supply is available at existing building and may be used for construction purposes at no cost.

5 SANITARY FACILITIES

.1 Existing designated washroom facilities may be used on approval of Departmental Representative. Clean and stock washroom daily and before final completion.

6 HEATING AND VENTILATION

.1 Do not begin work until arrangements have been made with Departmental Representative for protection of on-floor heating, ventilating and air conditioning.

.1 If there is dirt in heating and ventilation system, it will be Contractor's responsibility to return it to original state in accordance with Departmental Representative's specifications.

.2 Prevent dust and odour migration to occupied areas.

.1 Isolate area of work from adjacent occupied areas.

7 SCAFFOLDING

.1 Construct and maintain scaffolding in rigid, secure and safe manner.

.2 Erect scaffolding independent of walls. Remove promptly when no longer required.

.3 Limited area for scaffolding erection- refer to drawings.

.4 Access by manlift or similar required in some areas.

8 REMOVAL OF TEMPORARY FACILITIES

.1 Remove temporary facilities from site when directed by Departmental Representative.

9 SIGNS AND NOTICES

.1 Signs and notices for safety and instruction to be in both official languages or graphic symbols conforming to CAN/CSA Z321-96(R2006), Signs and Symbols for the Workplace.

.2 Maintain approved signs and notices in good condition for duration of project and dispose of off site on completion of project or when directed by Departmental Representative.

END OF SECTION

1 PRODUCTS/MATERIAL AND EQUIPMENT

.1 Use NEW products/material and equipment unless otherwise specified. Term "products" is referred to throughout specifications.

.2 Use products of one (1) manufacturer for material and equipment of same type or classification unless otherwise specified.

.3 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods.

.4 Notify Departmental Representative in writing of any conflict between these specifications and manufacturer instructions. Departmental Representative will designate which document is to be followed.

.5 Provide metal fastenings and accessories in same texture, colour and finish as base metal in which they occur.
- .1 Prevent electrolytic action between dissimilar metals.
- .2 Use non-corrosive fasteners, anchors and spacers for securing exterior work.

.6 Fastenings which cause spalling or cracking are not acceptable.

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

.8 Use heavy hexagon heads, semi-finished unless otherwise specified.

.9 Bolts may not project more than 1 diameter beyond nuts.

.10 Types of washers as follows:
- .1 Plain type washers: use on equipment and sheet metal.
- .2 Resilient washers: use with stainless steel items and fasteners.

.11 Deliver, store and maintain packaged material and equipment with manufacturer seals and labels intact.

.12 Prevent damage, adulteration and soiling of products during delivery, handling and storage. Immediately remove rejected products from site.

.13 Store products in accordance with supplier instructions.

.14 Touch up damaged factory finished surfaces to Departmental Representative's satisfaction:
- .1 Use primer or enamel to match original.
- .2 Do not paint over nameplates.

2 QUALITY OF PRODUCTS

.1 Products and materials (referred to as products) incorporated into work to be new, not damaged or defective and of best quality (compatible with specifications) for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.

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

.3 Retain purchase orders, invoices and other documents to prove that all products utilized in this Contract meet requirements of specifications. Produce documents when requested by Departmental Representative.

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

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

.6 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations.

3 AVAILABILITY OF PRODUCTS

.1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for any items.

.2 If delays in supply of products are foreseeable, notify Departmental Representative of such in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of work.

.3 In event of failure to notify Departmental Representative at start of work and should it subsequently appear that work may be delayed for such reason, Departmental Representative reserves right to substitute more readily available products of similar character, at no increase in either Contract price or Contract time.

4 MANUFACTURER INSTRUCTIONS

.1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer instructions.

.1 Do not rely on labels or enclosures provided with products.

.2 Obtain written instructions directly from manufacturer.

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

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

5 CONTRACTOR'S OPTIONS FOR SELECTION OF PRODUCTS FOR TENDERING

.1 Products are specified by "Prescriptive" specifications: select any product meeting or exceeding specifications.

.2 Products specified by performance and referenced standard: select any product meeting or exceeding referenced standard.

.3 When products are specified by referenced standard or by Performance specifications, upon request of Departmental Representative obtain from manufacturer and independent laboratory report showing that product meets or exceeds specified requirements.

END OF SECTION

1 PROJECT CLEANLINESS

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

.2 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative.

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

.4 Provide on-site containers for collection of waste materials and debris. Locate where directed by Departmental Representative.

.5 Provide and use clearly marked separate bins for recycling wherever facilities are available. Refer to Section 01 74 19 - Waste Management and Disposal for additional requirements.

.6 Remove waste material and debris from site and deposit in waste containers at end of each working day. Dispose of waste materials and debris off site.

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

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

.9 Provide adequate ventilation during use of volatile or noxious substances. Do not use building ventilation system for this purpose.

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

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

2 FINAL CLEANING

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

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

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

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

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

.6 Clean lighting reflectors, lenses and other lighting surfaces.

.7 Vacuum clean and dust building interiors, behind grilles, louvres and screens.

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

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

.10 Remove dirt and other disfiguration from exterior surfaces.

.11 Sweep and wash clean paved areas and all pavement parking/storage areas used by Contractor to remove all traces of construction spillage, stains and residue. Do not blast dirty water onto adjacent buildings and site features.

.12 Clean equipment and fixtures to sanitary condition; clean or replace filters of mechanical equipment.

3 WASTE MANAGEMENT AND DISPOSAL

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

END OF SECTION

1 RELATED WORK

.1 Refer to every technical section for waste management and disposal.

2 DEFINITIONS

.1 Waste Audit (WA): relates to projected waste generation. Involves controlled separation of waste.

.2 Waste Reduction Workplan (WRW): written report which addresses opportunities for reduction, re-use or recycling of materials.

.3 Materials Source Separation Program (MSSP): consists of series of ongoing activities to separate re-usable and recyclable waste material into material categories from other types of waste at point of generation.

3 MATERIALS SOURCE SEPARATION

.1 Before project start-up, prepare Materials Source Separation Program. Provide separate containers for re-usable and/or recyclable materials of following:
- .1 Metals.
- .2 Wood.
- .3 Glass.
- .4 Other materials as indicated in technical sections.

.2 Implement Materials Source Separation Program for waste generated on project in compliance with approved methods and as approved by Departmental Representative.

.3 Locate containers in locations, to facilitate deposit of materials without hindering daily operations.

.4 Locate separated materials in areas which minimize material damage.

4 DIVERSION OF MATERIALS

.1 Create list of materials to be separated from general waste stream and stockpiled in separate containers, to approval of Departmental Representative and consistent with applicable fire regulations.
- .1 Mark containers.
- .2 Provide instruction on disposal practices.

5 STORAGE, HANDLING AND APPLICATION

.1 Do work in compliance with Waste Reduction Workplan.

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

.3 Materials in separated condition: collect, handle, store on site and transport off-site to approved and authorized recycling facility.

.4 Materials must be immediately separated into required categories for re-use or recycling.

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

.6 On-site sale of salvaged/recyclable material is not permitted.

.7 Provide Departmental Representative with receipts indicating quantity of material delivered to landfill.

.8 Provide Departmental Representative with receipts indicating quantity and type of materials sent for recycling.

END OF SECTION

1 SUBMISSION

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

.2 Revise content of documents as required before final submittal.

.3 Phasing of submission:
- .1 2 weeks before substantial performance of work submit to Departmental Representative 4 final copies of operation and maintenance manuals.
- .2 2 weeks before substantial performance of work submit to Departmental Representative 4 final copies of supplements to operation and maintenance manuals for each subsequent phase.

.4 Ensure that spare parts, maintenance materials and special tools provided are new, neither damaged nor defective and of same quality and manufacture as products provided in work.

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

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

2 RECORD DOCUMENTS

.1 Contract drawings and shop drawings: legibly mark each item to record actual construction, including:
- .1 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
- .2 Field changes of dimension and detail.
- .3 Changes made by change orders.
- .4 Details not on original Contract drawings.
- .5 References to related shop drawings and modifications.

.2 Contract specifications: legibly mark each item to record actual "Workmanship of Construction", including;
- .1 Manufacturer, trade name and catalogue number of each "Product/Material" actually installed, particularly optional items and substitute items.
- .2 Changes made by addenda and change orders.
- .3 Recording information:
  - .1 Record changes in red ink.
  - .2 Mark on one (1) set of drawings, specifications and shop drawings with changes during progress of work.

.3 At completion of project and before final inspection, neatly transfer notations to 2nd set of drawings and submit both sets to Departmental Representative.

3 SPARE PARTS

.1 Provide spare parts in quantities specified in individual specification Sections.

.2 Provide items of same manufacture and quality as items in work.

.3 Deliver to on-site location as directed; place and store.

.4 Receive and catalogue all items. Submit inventory listing to Departmental Representative. Include approved listings in maintenance manual.

.5 Obtain receipt for delivered products and submit to Departmental Representative.

4 MAINTENANCE MATERIALS

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

.2 Provide items of same manufacture and quality as items in work.

.3 Deliver to on-site location as directed; place and store.

.5 Obtain receipt for delivered products and submit to Departmental Representative.

5 WARRANTIES, BONDS, TEST REPORTS, INSPECTION REPORTS

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

.2 Obtain Warranties, Bonds, Test Results, Inspection Reports executed in duplicate by subcontractors, suppliers, manufacturers and inspection agencies within 10 working days after completion of applicable item of work.

.3 Except for items put into use with Departmental Representative's permission, leave date of beginning of time of warranty until date of substantial performance is determined.

.4 Verify that documents are in proper form, contain full information and are notarized.

.5 Co-execute submittals when required.

.6 Retain warranties and bonds until time specified for submittal.

6 COMPLETION

.1 Submit written certificate that following have been performed:
- .1 Work has been completed and inspected for compliance with Contract documents.
- .2 Defects have been corrected and deficiencies have been completed.
- .3 Work is complete and ready for final inspection.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Sectioon 01 74 19 Construction/Demolition Waste Managment and Disposal

.2 Appendix 1- AREC Environmental Group-Limited Hazardous Materials Survey Report: Pacific Biological Station. July 29, 2013

1.2 REFERENCES

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

1.3 QUALITY ASSURANCE

.1 Health and safety requirements: do construction occupational health and safety in accordance with Section 01 35 33 - Health and Safety Requirements.

1.4 SUBMITTALS

.1 Submittals in accordance with Section 01 33 00 - Shop Drawings, Product Data and Samples.

.2 Prior to beginning Work on site submit detailed Waste Reduction Workplan in accordance with Section 01 74 19 - Construction/Demolition Waste Management and Disposal and indicate:
- .1 Descriptions of and anticipated quantities in percentages of materials to be salvaged, recycled and land filled.
- .2 Schedule of selective demolition.
- .3 Number and location of dumpsters.
- .4 Anticipated frequency of tippage.
- .5 Name and address of haulers, waste facilities and waste receiving organizations.

1.5 REGULATORY REQUIREMENTS

.1 Perform a Risk Assessment in accordance with WorksafeBC Occupational Health and Safety Regulation Part 6 "Substance Specific Requirements" , Section 6.6 subsections (1), (2), (3), and (4).

- .1 Refer to Hazardous Materials Survey-Appendix 1.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

PART 2 - PRODUCTS

2.1 EQUIPMENT

.1 Leave equipment and machinery running only while in use.

.2 Demonstrate that tools and machinery are being used in manner which allows for salvage of materials in best condition possible.

PART 3 - EXECUTION

3.1 PREPARATION

.1 Inspect site with Departmental Representative and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain.

.2 Protection:

- .1 Prevent movement, settlement, or damage to adjacent structures, utilities, and parts of building to remain in place. Provide bracing and shoring required.
- .2 Keep noise, dust and inconvenience to occupants to minimum.
- .3 Protect building systems, services and equipment.
- .4 Provide temporary dust screens, covers, railings, supports and other protection as required.
- .5 Erect and maintain temporary partitions to prevent spread of dust, odours, and noise to permit continued Owner occupancy.
- .6 Erect and maintain weatherproof closures for exterior openings.
- .7 Provide appropriate temporary signage including signage for exit or building egress.

3.2 DEMOLITION, SALVAGE AND DISPOSAL

.1 Conform to recomendations contained in Limited Hazardous Materials Survey Report (Appendix 1) when handling identified hazardous materials

.2 Remove handrails in construction area. Protect and store for later re-installation.

Provide new steel brackets as detailed. Maintain existing rail height on re installation.

.3 Remove existing intake louver . Protect and store for later reinstallation. Reinstate louver, conduit and electrical connections after window installation is completed. Modify conduit installation as detailed.

.4 Remove existing windows and frames to permit new construction. Sort materials into appropriate piles for recycling and for disposal.

.5 Demolish in an orderly and careful manner. Protect existing stairs, railings and adjacent finishes.

.6 Dispose of removed materials, to appropriate recycling facilities except where specified otherwise, in accordance with authority having jurisdiction.

3.3 REMOVAL FROM SITE

.1 Transport material designated for alternate disposal to facilities listed in waste reduction workplan and in accordance with applicable regulations. Do not deviate from facilities listed in waste reduction workplan without prior written authorization from Departmental Representative.

.2 Dispose of materials not designated for alternate disposal in accordance with applicable regulations. Disposal facilities must be approved of and listed in waste reduction workplan. Do not deviate from disposal facilities listed in waste reduction workplan without prior written authorization from Departmental Representative.

3.4 CLEANING AND RESTORATION

.1 Keep site clean and organized throughout demolition procedure.

.2 Upon completion of project, reinstate areas affected by Work including parking surfaces and walkways to condition which existed prior to beginning of Work.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 07 92 00 -Joint Sealants.

.2 Section 08 50 00- Windows.

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM International).
- .1 ASTM B209M-07, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

.2 Aluminum Association
- .1 DAF 45-03, designation system for Aluminum Finishes

1.3 QUALITY ASSURANCE

.1 Health and safety requirements: do construction occupational health and safety in accordance with Section 01 35 33 - Health and Safety Requirements.

1.4 SUBMITTALS

.1 Submittals in accordance with Section 01 33 00 - Shop Drawings, Product Data and Samples.

.2 Product data:
- .1 Provide mill certificates for sheet metal materials indicating country of origin.

.3 Samples.
- .1 Submit samples of metal flashing for final finish/colour verification prior to ordering project material. Samples to be aluminum with anodized finish. Samples to demonstrate that flashing finish matches window system finish.

1.5 DELIVERY, STORAGE, HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 10 - Product Requirements, unless more stringent care is required by respective material manufacturer.

.2 Store and handle pre-formed and pre-finished materials in a manner to prevent permanent deformation and marring of surfaces and finishes.

.3 During storage, keep materials away from corrosive materials and elements.

.4 Replace damaged metal flashings, at no cost to Contract.

1.6 WASTE MANAGEMENT AND DISPOSAL

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

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Sheet aluminum to ASTM B209M-07.

.1 Thickness: 16 Guage

.2 Fasteners:

.1 Concealed locations: stainless steel alloy or galvanized steel, type of sizes/strengths required for adequate anchorage of components.

.2 Exposed locations: stainless steel, type of sizes and strengths required to provide adequate anchorage of components, socket head design, complete with self-sealing soft neoprene washers.

2.2 FINISHES

.1 Finish exposed surfaces of aluminum flashings in accordance with DAF 45.

.1 Clear anodic finish: designation AA- clear anodic finish designation AA-M12C22A41 - Architectural Class 1 for 18 um (0.0007") of finish thickness.

2.3 FABRICATION

.1 Form sections and pieces square, true and accurate to size, free from distortion and other defects detrimental to appearance and performance.

.2 Fabricate all components in sizes required to produce least number of joints.

.3 Fabricate metal flashings using commercial production quality progressive die forming equipment capable of producing repeated identical straight, accurate, crisp formed profiles free of distortion, buckles and damage to pre-finished surfaces.

.4 Hem exposed edges. Fold under minimum 10 mm.

.5 Fabricate using not less than 16 GA design thickness anodized aluminum, unless detailed/indicated otherwise.

PART 3 - EXECUTION

3.1 INSTALLATION

.1 Install aluminum sill and sidewall flashings in correct sequence of construction to tuck behind items as detailed/indicated and to shed water to exterior face of building.

.2 Fit flashings together so that one end of each section is free to move in joint.

.3 Fit flashings secure in place. Make corners square, surfaces true and straight in all planes and all lines accurate to profiles.

3.2 CLEANING

.1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 07 62 05 - Metal Flashings: sealants used with metal flashing installation.

.2 Section 08 50 00 - Windows: sealants concealed within windows.

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM International).
- .1 ASTM C920-08, Standard Specification for Elastomeric Joint Sealants.
- .2 ASTM C1330-02(2007), Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.

.2 Canadian General Standards Board, (CGSB).
- .1 CAN/CGSB-19.13-M87, Sealing Compound, One-component, Elastomeric, Chemical Curing.
- .2 CAN/CGSB-19.17-M90, One-Component Acrylic Emulsion Base Sealing Compound.

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

1.3 QUALITY ASSURANCE

.1 Health and safety requirements: do construction occupational health and safety in accordance with Section 01 35 33 - Health and Safety Requirements.

1.4 SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Shop Drawings, Product Data and Samples.

.2 Product data:
- .1 Submit manufacturer product literature to describe:
  - .1 Caulking compounds.
  - .2 Primers.
  - .3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.
- .2 Submit Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS).
  - .1 Indicate VOC content of sealants and primers.
- .3 Submit full colour range charts for sealants which will remain exposed to view in final construction, for Departmental Representative colour selection

use.

.3 Manufacturer instructions:
.1 Submit instructions to include installation instructions for each product used.

1.5 DELIVERY, STORAGE, HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 10 - Product Requirements, unless more stringent care is required by respective material manufacturer.

.2 Deliver and store materials in original wrappings and containers with manufacturer's seals and labels, intact. Protect from freezing.

1.6 PROJECT CONDITIONS

.1 Environmental limitations:
.1 Do not proceed with installation of joint sealants under following conditions:
.1 When joint substrates are wet.
.2 When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4.4 degrees C.
.3 When joint substrates are frost covered.

.2 Joint width conditions:
.1 Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

.3 Joint substrate conditions:
.1 Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.7 ENVIRONMENTAL REQUIREMENTS

.1 Conform to manufacturer recommended temperatures, relative humidity and substrate moisture content for application and curing of sealants including special conditions governing use.

1.8 WHMIS

.1 Comply with WHMIS requirements regarding use and handling of sealants and primers.

1.9 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 19 - Waste Management and Disposal.

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

PART 2 - PRODUCTS

2.1 SEALANT MATERIALS

.1 Do not use sealants within building that emits strong odours, contains toxic chemicals.

.2 When low toxicity caulks are not possible, confine usage to areas which off- gas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off-gas time.

.3 Where sealants are qualified with primers use only these primers.

2.2 SEALANT MATERIAL DESIGNATIONS

.1 Acrylic latex, one part, to CAN/CGSB-19.17, paintable, colour selected by Departmental Representative.
- .1 VOC limit: maximum 250 g/L.

.2 Polyurethanes: non-sag, one part, to ASTM C 920 Type S, Grade NS, Class 35, Use NT, M, A and O or to CAN/CGSB-19.13, Type 2, MCG-2-25, MCG-2-40; colours selected by Departmental Representative.

2.3 ACCESSORIES

.1 Pre-formed compressible and non-compressible back-up materials: to ASTM C1330.
- .1 Polyethylene, urethane, neoprene or vinyl foam:
  - .1 Extruded closed cell foam backer rod.
  - .2 Size: oversize 30% to 50 %.
- .2 Neoprene or butyl rubber:
  - .1 Round solid rod, Shore A hardness 70.
- .3 High density foam:
  - .1 Extruded closed cell polyvinyl chloride (PVC), extruded polyethylene, closed cell, Shore A hardness 20, tensile strength 140 to 200 kPa, extruded polyolefin foam, 32 kg/m^3 density, or neoprene foam backer, size as recommended by manufacturer.

.1 Bond breaker tape:
.1 Polyethylene bond breaker tape which will not bond to sealant.

2.4 SEALANT SELECTION

.1 Interior applications:

.1 Perimeters of window frames to make junctions to walls filled, smooth and invisible suitable for "painting out" with wall finish.
.1 Acrylic latex.

.2 Exterior applications: penetrations in exterior walls to fill joints watertight including but not limited to perimeters of door and window frames, perimeters of wall vents, perimeters of all other wall penetrations.
.1 Polyurethane.

PART 3 - EXECUTION

3.1 MANUFACTURER INSTRUCTIONS

.1 Compliance: comply with manufacturer written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions and data sheets.

3.2 PROTECTION

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

3.3 APPLICATION

.1 Sealant:
.1 Apply sealant in accordance with manufacturer written instructions.
.2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.
.3 Apply sealant in continuous beads.
.4 Apply sealant using gun with proper size nozzle.
.5 Use sufficient pressure to fill voids and joints solid.
.6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.
.7 Tool exposed surfaces before skinning begins to give slightly concave shape.

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

.2 Curing:
- .1 Cure sealants in accordance with sealant manufacturer instructions.
- .2 Do not cover up sealants until proper curing has taken place.

.3 Clean-up:
- .1 Clean adjacent surfaces immediately and leave Work neat and clean.
- .2 Remove excess and droppings, using recommended cleaners as work progresses.
- .3 Remove masking tape after initial set of sealant.

3.4 CLEANING

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

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 07 62 05 - Metal Flashings

.2 Section 07 92 00 - Joint Sealants: visible caulking joints between frames and adjacent construction.

1.2 REFERENCES

.1 Aluminum Association
- .1 DAF 45-03, designation system for Aluminum Finishes

.2 AAMA 611 - Specifications for Anodized Architectural Aluminum.

.3 American Society for Testing and Materials International, (ASTM).
- .1 ASTM C834-10, Standard Specification for Latex Sealants.
- .2 ASTM C864-05(2011), Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
- .3 ASTM C920-08, Standard Specification for Elastomeric Joint Sealants.

.4 Canadian Standards Association (CSA International).
- .1 Canadian Suppliment to AAMA/WDMA/CSA 101/I.S.2/A440, NAFS-North American Fenestration Standard/Specification for windows, doors , and skylights.
- .2 CSA G40.20/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel

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

.6 IGMAC, Insulating Glass Manufacturer's Association of Canada, Glazing Guidelines for Sealed Insulating Glass Units.

.7 NBC, National Building Code of Canada 2010

1.3 QUALITY ASSURANCE

.1 Health and Safety requirements: do construction occupational health and safety in accordance with Section 01 35 33 - Health and Safety Requirements.

.2 Installers:

.1 Use experienced installers trained, approved and authorized by respective window manufacturer to install windows described in this Section.

.2 Provide proof of installer experience and window manufacturer approval if requested by Departmental Representative.

1.4 PERFORMANCE REQUIREMENTS

.1 Design exterior windows to withstand:

.1 Own weight plus weight of glass without suffering reduction in sash performance levels, permanent deformation of sash components or premature failure of insulating glass units.

.2 Wind loads listed in NBC for building location, unless more stringent values are identified on drawings, without suffering reduction in sash performance levels, permanent deformation of sash components or premature failure of insulating glass units.

.3 Seismic conditions listed in NBC for building location, unless more stringent values are identified on drawings, without suffering collapse or becoming dislodged from wall openings.

.2 Design exterior windows to accommodate thermal expansion and contraction through temperature ranges anticipated at building location without suffering reduction in sash performance levels, permanent deformation of sash components or premature failure of insulating glass units.

.3 Design windows to meet and maintain not less than following performance levels, in accordance with AAMA/WDMA/CSA 101/I.S.2/A440, NAFS

.1	Performance class	AW
.2	Airtightness level	0.5
.3	Specified DRWP	336 Pa
.4	Specified wind load-Positive	2.1 kPa
.5	Specified snow load	0 Pa
.6	Design Pressure-Positive	2100 Pa
.7	Design pressure-Negative	4900 Pas
.8	Specified Wind Load	4.9 kPa

1.5 SUBMITTALS

.1 Submittals in accordance with Section 01 33 00 - Shop Drawings, Product Data and Samples.

.2 Product data:

.1 Submit manufacturer printed product literature, specifications and data sheets for each type of fixed and operable window sash proposed for use in Work.

.2 Submit Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS).

.1 Indicate precautions for workers during handling of sealants.

.2 Indicate VOC content of sealant proposed for use within building envelope.

.3 Shop drawings: indicate following information.

.1 Materials and profiles: provide full-size, scaled details of heads jambs and sills; profiles of components: elevations of units; anchorage details; internal reinforcement; details of anchorage to concrete perimeter structure; description of related components, exposed finishes and fasteners; type of construction including joinery, fabrication and erection tolerances.

.2 Relationship of operable sash to fixed windows.

.3 Interior trim and exterior junctions with adjacent construction.

.4 Junctions between combination units.

.5 Elevations of units.

.6 Exposed finishes, method of anchorage, number of anchors, supports, reinforcement and accessories.

.7 Reinforcing contained within framing members.

.8 Locations of concealed caulking.

.9 Indicate flashings and their connection to window sash

.10 Glazing provisions.

.11 Use qualified professional structural engineer registered in British Columbia for wind load, seismic designs and structural atttachment to floor slab, head and sills.

.12 Submit shop drawings under seal of same professional engineer responsible for wind load and seismic designs.

.4 Samples:

.1 Submit sash samples to verify size appearance and project finish

.5 Manufacturer instructions:

.1 Submit manufacturer installation instructions.

1.6 DELIVERY, STORAGE, HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 10 - Product Requirements, unless more stringent care is required by respective material manufacturer.

1.7 WHMIS

.1 Comply with WHMIS requirements when handing and using sealants.

1.8 JOB CONDITIONS

.1 Field measurements: verify window openings by field measurements before fabrication and indicate measurements on shop drawings.

.2 Maintain environmental conditions (temperature, humidity and ventilation) within limits recommended by manufacturer for optimum results. Do not install windows under environmental conditions outside window manufacturer absolute limits.

1.9 WASTE MANAGEMENT AND DISPOSAL

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

1.10 WARRANTY

.1 Insulating glass units:

.1 For Work of this Section, 12 months warranty period is extended to 120 months for insulating glass units against failure. Unit failure will be deemed to occur if any of following are noted.

.1 Appearance of condensation between panes.

.2 Obstruction of vision within unit perimeter.

.3 Chipping, cracking or breakage of glass panes occurring due to manufacturing defects or under specified service conditions.

.4 Migration of edge spacer.

.2 Warranty includes removal and replacement of failed insulating glass units within warranty period, at no cost to Canada.

.2 Window sash:

.1 For Work of this Section, 12 months warranty period is extended to 24 months for windows against water leakage.

.2 Warranty includes removal and replacement of failed windows within

warranty period, at no cost to Canada.

1.11 CLOSEOUT SUBMITTALS

.1 Make submissions in accordance with Section 01 78 00 - Closeout Submittals.

.2 Provide following for inclusion in Project operating and maintenance manuals:

.1 Full identification of each type of window installed (i.e., model and model/series number) for future maintenance use in obtaining service and replacement parts.

.2 Name, address and telephone numbers of window manufacturer.

.3 Warranty certificates.

.4 Certification under seal of same professional engineer responsible for wind load and seismic designs that assemblies have been installed in accordance with sealed shop drawings.

.3

PART 2- PRODUCTS

2.1 MATERIALS

.1 Aluminum extrusions: Aluminum Association alloy AA6063-T5 or T6 anodizing quality.

.2 Sheet aluminum: Aluminum Association alloy AA1100-H14 anodizing quality.

.3 Internal reinforcing: steel sections to CSA G40.20/G40.21, sizes and quantities required to reinforce vertical mullions against wind loads described in Performance Criteria, galvanized to prevent rusting.

.4 Fasteners: stainless steel alloy finished to match adjacent material where exposed to view in final installation.

.5 Separator gaskets: suitable plastic, cork or rubber material to provide permanent separation of aluminum from steel for prevention of galvanic corrosion.

.6 Sealants: types recommended by window sash fabricator/installer to suit applications, compatible with substrates and adequate to provide permanent seal at temperature ranges anticipated.

.1 Sealer to ASTM C920-08

.2 VOC limit: maximum 250 g/L.

2.2 CURTAIN WALL SYSTEM

.1 Description: flush, exterior glazed, thermally broken pressure equalized rain screen curtain wall frame system, to accept insulating glass units detailed/indicated. Based on 1600UT System.

2.3 COMPONENTS

.1 Mullion Profile: : 63.5mm x 152 mm nominal dimension for vertical members, 63.5mm x 152 mm nominal dimension for horizontal members; thermally broken with interior tubular section insulated from exterior pressure plate; matching stops and pressure plate of sufficient size and strength to provide bite on glass; drainage holes, deflector plates and internal flashings to accommodate internal weep drainage system; internal mullion baffles to eliminate "stack effect" air movement within internal spaces.

.1 Custom mullion extrusions are required, as detailed in drawings.

.2 Pressure plates : Fiberglass construction

.3 Custom mounting brackets, as detailed in drawings.

.4 Operable sash:

.1 Description: aluminum extrusion assemblies containing glass reinforced nylon thermal break, rain screen system design.

.2 Operation: refer to drawings.

.3 Based on 526 Isoport.

.5 Glass materials: as specified in Section 08 80 50

.6 Glazing Materials: Type to suit application to achieve weather, moisture, and air infiltration requirements.

2.3 WINDOW FABRICATION

.1 Fabricate in accordance with reviewed shop drawings and to meet performance levels listed under **PERFORMANCE REQUIREMENTS**.

.2 Fabricate system components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.

.3 Maintain following tolerances.

.1 Squareness: maximum +/- 1.5 mm for units with diagonal measurement of 1800 mm or less, maximum +/- 3 mm for units with diagonal measurement exceeding 1800 mm.

.2 Maximum offset from true plane between 2 adjacent members butting end to end, in line: 1 mm.

.4 Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.

.5 Prepare components to receive anchor devices. Fabricate anchors.

.6 Arrange fasteners and attachments to ensure concealment from view.

.7 Prepare system components to receive operable windows.

.8 Reinforce framing members for external imposed loads.

2.4 FINISHES

.1 Finish exposed surfaces of aluminum components in accordance with DAF 45.

.1 Clear anodic finish: designation AA- clear anodic finish designation AA-M12C22A41 - Architectural Class 1 for 18 um(0.0007") of finish thickness.

PART 3 - EXECUTION

3.1 MANUFACTURER INSTRUCTIONS

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

3.2 INSTALLATION

.1 Install windows in accordance with reviewed shop drawings and to meet requirements described in Performance Criteria.

.2 Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

.3 Provide alignment attachments and shims to permanently fasten system to building structure.

.4 Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances.

.5 Install sill flashings. Use one peice length at each location.

.6 Seal joints between sash members and building construction with low expansion spray foam where indicated. Conceal foam within rough opening.

.7 Install operating sash in accordance with reviewed shop drawings.

3.3 CLEANING

.1 Clean frame, glass and flashing surfaces to remove stains and marks caused during installation.

.2 Remove protective films where used to protect aluminum finishes.

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

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 08 80 50 -Aluminum Windows- preparation of windows for glazing.

1.2 REFERENCES

.1 American Society for Testing and Materials International, (ASTM).
- .1 ASTM D2240-02b, Test Method for Rubber Property - Durometer Hardness.

.2 Canadian General Standards Board (CGSB).
- .1 CAN/CGSB-12.1-M90, Tempered or Laminated Safety Glass.
- .2 CAN/CGSB-12.8-M90, Insulating Glass Units.
- .3 CAN/CGSB-12.10-M76, Glass, Light and Heat Reflecting.

.3 IGMAC, Insulating Glass Manufacturer's Association of Canada, Glazing Guidelines for Sealed Insulating Glass Units.

.4 NBC, National Building Code of Canada. 2010

1.3 QUALITY ASSURANCE

.1 Health and safety requirements: do construction occupational health and safety in accordance with Section 01 35 33 - Health and Safety Requirements.

.2 Insulating glass units to be in accordance with IGMAC requirements, manufactured by IGMAC certified member and bear IGMAC certification plus date of manufacturer.

1.4 SUBMITTALS

.1 Make submissions in accordance with Section 01 33 00 - Shop Drawings, Product Data and Samples.

.2 Product data:
- .1 Submit 2 copies of WHMIS - Material Safety Data Sheets.
  - .1 Indicate VOC for glazing materials during application and curing.

1.5 DELIVERY, STORAGE, HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 10 - Product Requirements, unless more stringent care is required by respective material manufacturer.

1.6 WHMIS

.1 Comply with WHMIS requirements regarding handling and use of glazing materials.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 19 - Construction/Demolition Waste Management and Disposal.

1.8 WARRANTY

.1 For Work of this Section, 12 months warranty period is extended to 120 months for insulating glass units against failure. Unit failure will be deemed to occur if any of following are noted.
- .1 Appearance of condensation between panes.
- .2 Obstruction of vision within unit perimeter.
- .3 Chipping, cracking or breakage of glass panes occurring due to manufacturing defects or under specified service conditions.
- .4 Migration of edge spacer.

.2 Warranty includes removal and replacement of failed insulated glass units within warranty period, at no cost to Canada.

1.9 CLOSEOUT SUBMITTALS

.1 Make submissions in accordance with Section 01 78 00 - Closeout Submittals.

.2 Provide following for inclusion in Project operating and maintenance manuals:
- .1 Name, address and telephone numbers of insulating glass unit manufacturer.
- .2 Warranty certificates.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Safety glass: to CAN/CGSB-12.1 M90, transparent.
- .1 Laminated

.2 Low emissivity glass: to CAN/CGSB-12.10-M76.

.3 Insulating glass units: to CAN/CGSB-12.8-M 90 and IGMAC requirements containing CAN/CGSB-12.10-M76 low emissivity glass to exterior side with CAN/CGSB-12.1-M90 safety laminated clear glass to interior side, Argon gas filled space kept dry with dehydrating agent, separated by "warm edge" separators.

.1 Insulating glass unit is based on 6mm Guardian Sun Guard Supernatural 54 in a 26.1 mm thick insulated unit consisting of a 6 mm exterior pane with a reflective coating applied to #2 surface, a 12 mm air space and an inner pane consisting of 4 mm heat strengthened glass, a plastic interlayer and an inner layer of 4mm heat strenthened glass. Glass to have a clear appearance. Other products may be acceptable to Departmental Representative provided they meet or exceed these target values and are approved by Departmental Representative during bidding.

.1 Light transmittance: 52%
.2 U-value (Imperial):
.1 Winter night time: 0.28
.2 Summer daytime: 0.27
.3 Shading co-efficient: 0.32%
.4 Solar transmission: 0.21
.5 Solar heat gain coefficient: 0.28
.6 Light to solar heat gain (LSG): 1.87
.7 Ultra violet transmission: 0%

.2 Accessories:
.1 Setting blocks: neoprene, EPDM or silicone, 80-90 durometer hardness to ASTM D2240, sized to suit each application.
.2 Glazing tapes: pre-formed macro-polyisobutylene tape with continuous integral neoprene shim (to prevent "pumping out" of tape under glass load conditions), paper release, black colour, width x thickness to suit installations.
.3 Primers, sealers, cleaners: to glass glazing tape manufacturers standards and compatible with framing system material/finish.
.4 Sealant: polyurethane, non-sag formulation, one part, colours selected by Departmental Representative.

PART 3 - EXECUTION

3.1 MANUFACTURER INSTRUCTIONS

.1 Compliance: comply with manufacturer written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions and data sheets.

3.2 EXAMINATION

.1 Verify that openings for glazing are correctly sized and within tolerance.

.2 Verify that surfaces of glazing channels or recesses are clean, free of obstructions and ready to receive glazing.

3.3 GENERAL GLAZING REQUIREMENTS

.1 Clean sealing surfaces at perimeter of glass and sealing surfaces of rabbets before applying glazing tapes and sealant. Use solvent and cleaning agents recommended by manufacturer of sealing materials. Wipe dry.

.2 Seal porous glazing channels or recesses with substrate compatible primer or sealer.

.3 Install glazing tapes uniformly with accurately formed corners and bevels. Ensure that proper contact is made with glass and rabbet interfaces.

.4 Set glass on setting blocks, spaced as recommended by glass manufacturer. Place at least one block at quarter points from each corner.

.5 Centre glass in glazing rabbet to maintain required clearances at perimeter on all 4 sides.

.6 Re-install loose glazing stops to correct locations, each stop with full complement of screws drawn tight.

3.4 INSTALLATION

.1 Install insulating glass units into window framing in accordance with reviewed window shop drawings and window manufacturer requirements to achieve and maintain air infiltration and water penetration performance levels described in Section 08 50 00 - Aluminum Windows.

3.5 CLEANING

.1 Remove glazing materials from finish surfaces.

.2 Remove labels after work is complete.

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

3.6 PROTECTION OF FINISHED WORK

.1 After installation mark each glass with an "X" by using removable plastic tape or paste.

END OF SECTION

AREC Environmental Group, Ltd.
6825 A Veyaness
Victoria, BC V8M 2A7
778-351-1966
ARECEnvironmental.com

Limited Hazardous Material Survey Report: Pacific Biological Station

3190 Hammond Bay Rd., Nanaimo, BC

Limited Hazardous Materials Survey Report
3190 Hammond Bay Rd., Nanaimo, BC

Project - 1761

July 29, 2013

Attention: Les Stead – Facility Manager
Department of Fisheries and Oceans
250-756-7127
les.stead@dfo-mpo.gc.ca

Reference: Limited Hazardous Materials Survey of Pacific Biological Station, Nanaimo, BC
AREC Environmental Group, Ltd. has completed a destructive survey of Pacific Biological Station located at 3190 Hammond Bay Rd, Nanaimo, BC. The purpose of this survey was to document the presence of hazardous materials, including asbestos, silica, hantavirus, lead, or other heavy metal or toxic, flammable or explosive materials that may be handled, disturbed or removed throughout the building for the purpose of the proposed windows replacement project, as required per *WorkSafeBC OHS Regulation Part 20*. The site investigation was conducted on July 24, 2013, and we report the following:

SITE DESCRIPTION

This is a four-storey office building estimated to have been built in the 1970's. The interior wall coverings are glass, concrete, and drywall. The ceilings are wood and drywall. The floor finishes are vinyl floor tile (VFT) and sheet vinyl flooring (SVF). The exterior of the building is concrete with tar roofing.

SCOPE OF PROJECT

The survey conducted by AREC Environmental on July 24, 2013 was limited to materials suspected to be hazardous that will be disturbed or removed during the proposed renovation/replacement of the windows.

METHODOLOGY

A total of three (3) bulk samples suspected of containing asbestos were collected. These samples were analyzed at AREC Environmental's lab in accordance with the following method:

-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

RESULTS
Asbestos Containing Materials WERE Identified

Table 1 provides a summary of asbestos containing materials. Appendix A contains detailed sampling analyses at the end of this report.

Table 1: Summary of Asbestos Containing Materials

LOCATION	DESCRIPTION	PERCENTAGE	PHOTO #
Interior Window – Second Floor	Window Mastic	0.75% chrysotile	1

These are over the WorksafeBC limit of 0.5% and must be safely removed before renovation, demolition, or any other type of disturbance that could release fibers into the air.

WHAT IS ASBESTOS?

Asbestos is a fibrous material used in many products because it adds strength, heat-resistance, and chemical-resistance. Despite its many uses, asbestos is a hazardous material. Three types of asbestos have been used commercially:

- Chrysotile (white asbestos) is the most commonly used form of asbestos.
- Amosite (brown asbestos) has been used in sprayed coatings, in heat insulation products, and in asbestos cement products where greater structural strength is required.
- Crocidolite (blue asbestos) is no longer used in B.C. and is rarely found. Before 1973 it was commonly used in sprayed coatings on structural steelwork for fire protection and for heat or noise insulation. It was also used in gasket materials and asbestos cement pipe.

Other types of asbestos are actinolite, anthophyllite, and tremolite. These usually have had little commercial value or use.

Asbestos Containing Materials (ACM) is often referred to as friable and non-friable. Friable materials are materials that, when dry, can be easily crumbled or powdered by hand. This term may also refer to materials that are already crumbled and powdered. Some non-friable materials, such as vinyl-asbestos floor tile or asbestos cement products have the potential to become friable if they are disturbed and/or handled in an aggressive manner (for example, sanded with a power sander) or dropped from a height.

POTENTIAL HEALTH EFFECTS OF ASBESTOS

Asbestos has been recognized as a health hazard for people employed in its production and processing for centuries. However, it was not until the late Nineteenth Century and the onset of the Industrial Revolution that its use became widespread, and it was not until the early part of the Twentieth Century that the relationship between the use of asbestos and a variety of health effects became a source of concern to the medical profession.

Many serious, debilitating and often fatal diseases have been linked to the inhalation of asbestos fibers. Although the mechanism of asbestos related diseases is still not fully understood, it is known that there is normally a significant latency period between the time of exposure and the occurrence of disease. This latency period can typically be between ten to over forty years.

Asbestosis, mesothelioma and lung cancer are the diseases most commonly associated with asbestos exposure, although several other diseases have also been linked to asbestos exposure. Asbestosis is a chronic lung disease resulting from prolonged exposure to asbestos dust. The fibers gradually cause the lung to become scarred and stiff, making breathing difficult. Asbestosis is a progressive disease, meaning that scars keep forming in the lungs after the exposure to asbestos has stopped.

Lung cancer may be caused by asbestos fibers in the lung. No one knows exactly how asbestos causes lung cancer. Researchers have shown, however, that the combination of smoking tobacco and inhaling asbestos fibers greatly increases the risk of lung cancer. Again, asbestos may be one of many causes of lung cancer.

Mesothelioma is a rare but very malignant form of cancer affecting the lining of the chest or the abdominal cavity. This cancer spreads rapidly and is always fatal. The exact mechanism of the disease is unknown. There is a strong link between asbestos exposure and mesothelioma.

Lead Paint

Two (2) samples of paint were collected to determine lead content. These samples were collected by scraping the indicated surfaces. A summary of lead in paint results is given in Table 2.

Table 2: Lead Paint Results

Sample No.	Location	Material	Analysis: Lead (Pb)		PHOTO #
			Lead Results	Result units	
3190-P1	Interior Window	Brown Paint	0.018	wt%	4
3190-P2	Exterior Window	Reddish Brown Paint	**VOID	wt%	5

****Not enough paint was collected to properly analyze the sample. However, due to the age of the building and the results of sample 1, sample 2 should be assumed to be lead containing.**

WorkSafeBC considers paint with a lead content higher than 0.009% to be a lead-based paint, requiring the use of respirators and other personal protective equipment when cutting, burning, sanding, or grinding materials coated with paint containing lead at this level or higher. The paint samples contain lead at a concentration higher than WorkSafeBC's limit of 0.009%. WorkSafeBC requires that worker exposure to airborne lead be kept below 0.05 mg/m^3. Ensure no dust is generated and ensure there's not cutting, burning or grinding of painted materials unless safe work procedures are implemented.

Workers can be exposed to lead through inhalation of fumes and dusts, as well as through ingestion as a result of lead-contaminated hands, food, drinks, cosmetics, tobacco products, and clothing. Furthermore, workers can take lead home on their clothes, skin, hair, tools, and in their vehicles, potentially exposing their families to harmful health effects.

It does not matter if a person breathes in, swallows, or absorbs lead particles, the health effects are the same; however, the body absorbs higher levels of lead when it is breathed in. Within our bodies, lead is absorbed and stored in our bones, blood, and tissues.

Lead poisoning can happen if a person is exposed to very high levels of lead over a short period of time. When this happens, a person may feel:

- Abdominal pain
- Constipated
- Excessively tired
- Headache
- Irritable
- Loss of appetite
- Memory loss
- Pain or tingling in the hands and/or feet
- Weak

Because these symptoms may occur slowly or may be caused by other things, lead poisoning can be easily overlooked as their cause. Being exposed to high levels of lead may cause anemia, weakness, and kidney and brain damage. Very high lead exposure can cause death.

People with prolonged exposure to lead may also be at risk for high blood pressure, heart disease, kidney disease, and reduced fertility.

Silica

Silica is the second most common mineral on earth and makes up nearly all of what we call "sand" and "rock." It is found in plasters, stuccos, concrete and other similar materials. Exposure to silica dust can cause a disabling, sometimes fatal disease called silicosis, after fine particles deposit in the lungs and cause permanent damage to lung tissue. Symptoms from exposure may not appear for many years.

Silica dust is created when silica containing materials are disturbed by cutting, grinding, blasting, sanding, drilling, chipping and/or other methods. WorkSafeBC's Part 5 requires employers implement an exposure control plan when employees are or may be exposed to airborne concentrations of silica in excess of 50% of the exposure limit. Part of this exposure control plan includes training for workers on the hazards of silica, respiratory protection, personal protective equipment, and methods to control silica dust such as dust suppression ("wet methods"), local exhaust ventilation, HEPA equipped tools or other controls should be used to control silica dust.

Flammable Materials

No flammable materials were observed during this survey.

Hantavirus

Rodent feces have the potential to contain hantavirus. No rodent feces were observed.

Other Concerns

There may be additional asbestos containing materials in concealed and other inaccessible areas that can be disturbed during demolition/renovation. Should materials suspected of containing asbestos be discovered, all work must cease immediately at that location until the material has been identified.

RISK ASSESSMENT

Prior to the performance of any work that may disturb asbestos containing materials it is a regulatory requirement that a qualified person perform a Risk Assessment. This requirement is in compliance with the WorkSafeBC Occupational Health & Safety Regulation *Part 6 "Substance Specific Requirements"*; specifically Section 6.6 subsections (1), (2), (3), & (4).

The removal of asbestos containing **window putty** should be conducted using **Moderate Risk** asbestos abatement procedures. These procedures must be utilized by a qualified contractor and include as a minimum requirement:

- Notification in the form of a Notice of Project for Work involving Asbestos (NOPA) submitted to WorkSafeBC a minimum of 24 hours prior to commencement of the work.

In conjunction with the NOPA the Contractor must submit any bulk sampling results; a site specific Risk Assessment; and site-specific work procedures;

- HEPA filter equipped half-face Air Purifying Respirators.
- Disposable impervious coveralls complete with head covers
- Segregation of the work area by the use of warning signs and warning banner tape,
- Application of water to the asbestos materials being disturbed,
- HEPA filter equipped vacuum cleaner.

LIMITATIONS

AREC Environmental was retained to perform a survey of hazardous building materials establishing types and locations. Approximate quantities indicated herein are provided for Client information only, and are not intended to provide exact amounts for tendering purposes.

This report is intended for the exclusive use of the *CLIENT* in order to identify all accessible asbestos-containing materials and other specified hazardous materials in the surveyed property. The use of this document for any other purpose is at the sole risk of the user.

The contents of this report were based on a site survey conducted by AREC Environmental. Please note that this survey was intended to identify the asbestos-containing materials and other specified hazardous materials on the subject site only prior to the proposed renovation/demolition of the structure surveyed.

The scope of work was limited to an assessment of readily accessible materials at the subject building defined by the Client as being impacted by planned demolition/renovation. No major destructive investigation was performed in areas with solid covering, or where there was no absolute access point. Should suspect materials be encountered during demolition activity, work is to stop immediately and the material be tested for the presence or absence of the hazardous substance.

In certain instances visual identification of material was made based on similar homogeneous characteristics to analyzed samples (i.e. vent packing felt material may be considered typical to each other).

This report is **not** intended for use as a scope of work for removal or as a specification section for inclusion in Tender Documents. Any unauthorized use of this report in that fashion is at the sole discretion and liability of the Owner.

We trust this is the information you require. Should you have any additional questions please contact our office or the undersigned at your convenience. Thank you for having AREC Environmental conduct this work on your behalf.

Sincerely,

Roy Milner, Lab Manager

Reviewed by Mike King, Surveyor

PHOTOS (sampled for asbestos)

Photo 1: Brown Interior Window Mastic
(0.75% chrysotile)

Photo 2: Red Exterior Window Mastic
(none detected)

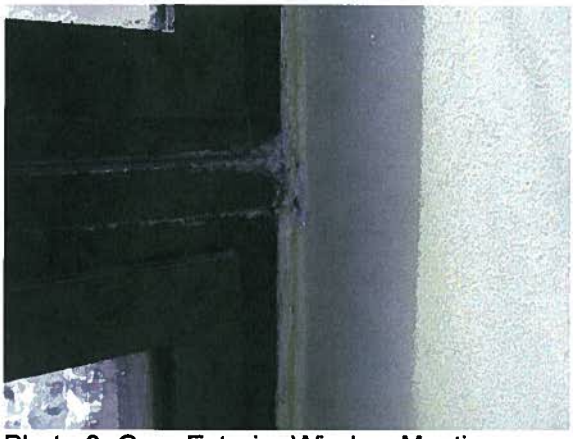

Photo 3: Grey Exterior Window Mastic
(none detected)

PHOTOS (paint sampled for lead)

Photo 4: Brown Paint
(0.018 wt% lead)

Photo 5: Reddish Brown Paint
(assumed to be lead containing)

APPENDIX A – SAMPLE ANALYSIS

Asbestos Inspection Results			
Project Number:	1761	Date of Survey:	July 24, 2013
Address:	3190 Hammond Bat Rd., Nanaimo, BC	Survey Company:	AREC
Description:	4-storey commercial/office building	Surveyor:	Mike King
Previous Renovations?	Yes	Age of Structure:	NA
Laboratory Analysis Method:	EPA 600/R-93/116 (July 1993) and/or EPA/600/R-04/004 (January 2004)	Analyst	Roy Milner

Area or Room	Building Materials	Sampling Location	Sample #	Asbestos Type and Percentage	Approximate Quantity of Asbestos
Interior Window 2nd Floor	Brown Window Mastic	Int. Window	3190-01	0.75% chrysotile	All Interior Window Mastic
Exterior Window 2nd Floor	Red Window Mastic	Ext. Window	3190-02	None detected	NA
Exterior Window 2nd Floor	Grey Window Mastic	Ex.t Window	3190-03	None detected	NA