



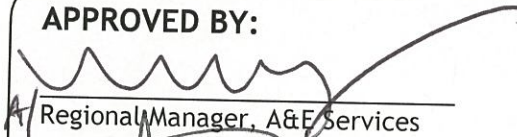
Public Works and Government Services Canada

Requisition No: EZ108-160947

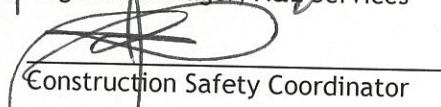
DRAWINGS & SPECIFICATIONS
for
Fire Suppression System Upgrade
For The Herbarium & Insectary Rooms
NRCAN Pacific Forestry Centre
Victoria, BC

Project No.: R.062840.001

APPROVED BY:


Regional Manager, A&E Services

Aug 10, 2015
Date


Construction Safety Coordinator

2015-08-07
Date

TENDER:


Project Manager

Aug. 06, 2015
Date

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APPENDIX A STANTEC HAZMAT STUDY



JUL 29 2015

List of Drawings (Bound Separately):

Fire Protection

F-1 Third Floor and Penthouse Fire Protection
FD-1 Third Floor and Penthouse Fire Protection

Electrical

E-01 of 5 Site Plan, Keyplan, Riser Diagram and Legend
E-02 of 5 Ground Floor Plan
E-03 of 5 Second Floor Plan
E-04 of 5 Third Floor Plan
E-05 of 5 Penthouse Floor Plan



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PART 1 GENERAL

1.1 Codes

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

1.2 Description of Work

- .1 This Contract covers the following work at the Pacific Forestry Centre, 506 West Burnside Road, Victoria, B.C.
 - .1 Design, supply and install a double-interlock preaction sprinkler fire protection system for Herbarium 353 and Insectary 367, located on the third floor of the A-Wing. Both rooms currently house valuable and irreplaceable specimen which are subjected to the risk of potential water damage by the existing wet sprinkler system.

Refer to Appendix A for Hazmat Assessment and Specifications for Existing Site Conditions and procedures to be followed when doing the work.
 - .2 The valuable equipment and contents and irreplaceable specimen in Herbarium 353 and Insectary 367 will be moved by the Owner before construction. The remaining valuable equipment and contents and irreplaceable specimen remaining in place during the course of construction shall be provided with appropriate protection by the Contractor against construction damage. Contractor to coordinate with the Department Representative prior to any movement of existing equipment/furniture.
- .2 Work to be performed under this Contract includes, but not limited to, the following items covered further in the Contract documents:
 - .1 Provide a detailed work plan including a project schedule
 - .2 Provide a detailed survey of the buildings and drawings of the current floor plan.
 - .3 Design the sprinkler fire protection system and related items to current floor plan.
 - .4 Submit sealed drawings & hydraulic calculations for review and obtain approval to proceed.
 - .5 Modify existing and install new sprinkler fire protection systems.
 - .6 Provide power to air compressor and fire alarm connections.
 - .7 Provide electrical sensors, fire alarm connections and fire alarm necessary for new double-interlock preaction sprinkler fire protection system.
 - .8 Comply with procedures, specifications and all WorkSafe BC regulations for identified hazardous materials.
 - .9 Commission and test the sprinkler fire protection system and related items
 - .10 Provide as-built drawings and closeout submittals.

- .3 "Green" Requirements:
 - .1 Use only environmentally responsible green materials/ products with no VOC emissions or minimum VOC emissions of indoor off-gassing contaminants for improved indoor air quality - subject of Departmental Representative's approval of submitted MSDS Product Data.
 - .2 Use materials/products containing highest percentage of recycled and recovered materials practicable - consistent with maintaining cost effective satisfactory levels of competition.
 - .3 Adhere to waste reduction requirement for reuse or recycling of waste materials, thus diverting materials from landfill.

1.3 Contract Documents

- .1 The Contract documents, drawings and specifications are intended to complement each other, and to provide for and include everything necessary for the completion of the work.
- .2 Drawings are, in general, diagrammatic and are intended to indicate the scope and general arrangement of the work.

1.4 Division of Specifications

- .1 The specifications are subdivided in accordance with the current 6-digit National Master Specifications System.
- .2 A division may consist of the work of more than 1 subcontractor. Responsibility for determining which subcontractor provides the labour, material, equipment and services required to complete the work rests solely with the Contractor.
- .3 In the event of discrepancies or conflicts when interpreting the drawings and specifications, the specifications govern.

1.5 Time of Completion

- .1 Complete the project within 12 weeks after Contract Award.

1.6 Hours of Work

- .1 Restrictive as follows:
 - .1 Schedule deconstruction, removal and construction work after normal working hours of the building (1600 hours-2400 hours) and during the day on weekends and/or holidays (0730 hours-1630 hours). Normal weekday working hours of the building are 0730 hours-1600hours.
 - .2 Notify Departmental Representative with a minimum of 48 hours notice of all after hours work, including weekends and holidays.
 - .3 Herbarium 353 and Insectary 367 shall remain accessible to building occupants during the course of construction.
 - .4 Work in the Penthouse Area, if not too noisy or disruptive can be done during normal working hours with coordination with the Department Representative.

1.7 Work Schedule

- .1 Carry on work as per indicated "PHASES" and as follows:
 - .1 Within 10 working days after Contract award, provide a "phasing bar chart" and a schedule showing anticipated progress stages and final completion of the work within the time period required by the Contract documents. Indicate the following:
 - .1 Submission of shop drawings, product data, MSDS sheets and samples.
 - .2 Commencement and completion of work of each section of the specifications or trade for each phase as outlined.
 - .3 Final completion date within the time period required by the Contract documents.
 - .2 Do not change approved Schedule - without notifying Departmental Representative.
 - .3 Interim reviews of work progress based on work schedule will be conducted as decided by Departmental Representative and schedule updated by Contractor in conjunction with and to approval of Departmental Representative.

1.8 Cost Breakdown

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

1.9 Codes, Bylaws, Standards

- .1 Perform work in accordance with the National Building Code of Canada (NBC), and other indicated Codes, Construction Standards and/or any other Code or Bylaw of local application.
- .2 Comply with applicable local bylaws, rules and regulations enforced at the location concerned.
- .3 Meet or exceed requirements of Contract documents, specified standards, codes and referenced documents.
- .4 In any case of conflict or discrepancy, the most stringent requirements shall apply.

1.10 Documents Required

- .1 Maintain 1 copy each of the following at the job site:
 - .1 Contract drawings.
 - .2 Contract specifications.
 - .3 Addenda to Contract documents.
 - .4 Copy of approved work schedule.
 - .5 Reviewed/approved shop drawings.
 - .6 Change orders.
 - .7 Other modifications to Contract.
 - .8 Field test reports.
 - .9 Reviewed/approved samples.
 - .10 Manufacturers' installation and application instructions.

- .11 One set of record drawings and specifications for "as-built" purposes.
- .12 Current construction standards of workmanship listed in technical Sections
- .13 Building Safety Plan.

1.11 Regulatory Requirements

- .1 Obtain and pay for - Building Permit, Certificates, Licenses and other permits required by regulatory municipal, provincial or federal authorities to complete the work.
- .2 Provide inspection authorities with plans and information required for issue of acceptance certificates.
- .3 Furnish inspection certificates in evidence that the work installed conforms with the requirements of the authority having jurisdiction.

1.12 Contractor's Use of Site

- .1 Use of site:
 - .1 Assume responsibility for assigned premises for performance of this work.
 - .2 Be responsible for coordination of all work activities on site
- .2 Perform work in accordance with Contract documents. Ensure work is carried out in accordance with indicated phasing.
- .3 Do not unreasonably encumber site with material or equipment
- .4 Use only services approved by the Departmental Representative.
- .5 Accept liability for damage, safety of equipment and overloading of existing equipment or services.

1.13 Examination

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

1.14 Existing Services

- .1 Where work involves breaking into or connecting to existing services, carry out work at times directed by the Departmental Representative.

1.15 Location of Equipment and Fixtures

- .1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate. Exact locations and dimensions that affect the work of this contract shall be verified by the contractor.
- .2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space, and in accordance with manufacturer's recommendations for safety, access and maintenance.
- .3 Inform Departmental Representative of impending installation and obtain his approval for actual location.
- .4 Submit field drawings or shop drawings to indicate the relative position of various services and equipment when required by the Departmental Representative and/or as specified.

1.16 Cutting and Patching

- .1 Cut existing surfaces as required to accommodate new work.
- .2 Remove items so shown or specified.
- .3 Do not cut, bore, or sleeve load-bearing members.
- .4 Make cuts with clean, true, smooth edges. Make patches inconspicuous in final assembly.
- .5 Fit work to be watertight to pipes, sleeves, ducts and conduits.
- .6 Patch and make good surfaces cut, damaged or disturbed, to Departmental Representative's approval. Match existing material, finish and texture.
- .7 Making good is defined as matching construction and finishing materials and the adjacent surfaces.

1.17 Setting Out of Work

- .1 Assume full responsibility for and execute complete layout of work to locations, lines and elevations indicated.
- .2 Provide devices needed to lay out and construct work.
- .3 Supply such devices as templates required to facilitate Departmental Representative's inspection of work.

1.18 Acceptance of Sub-trades

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

1.19 Quality of Work

- .1 Ensure that quality workmanship is performed through use of skilled tradesmen, under supervision of qualified journeyman.
- .2 In cases of dispute, decisions as to standard or quality of work rest solely with the Departmental Representative, whose decision is final.

1.20 Work Coordination

- .1 Coordinate work of sub-trades:
 - .1 Designate one person to be responsible for review of contract documents and shop drawings and managing coordination of Work.
- .2 Convene meetings between subcontractors whose work interfaces and ensure awareness of areas and extent of interface required.
 - .1 Provide each subcontractor with complete plans and specifications for Contract, to assist them in planning and carrying out their respective work.
 - .2 Publish minutes of each meeting.
 - .3 Plan and coordinate work in such a way to minimize quantity of service line offsets.
 - .4 Submit copy of coordination drawings and meeting minutes to Departmental Representative for information purposes.
- .3 Submit shop drawings and order of prefabricated equipment or rebuilt components only after coordination meeting for such items has taken place.
- .4 Work Cooperation:

- .1 Ensure cooperation between trades in order to facilitate general progress of Work and avoid situations of spatial interference.
- .2 Ensure that each trade provides all other trades reasonable opportunity for completion of Work and in such a way as to prevent unnecessary delays, cutting, patching and removal or replacement of completed work.
- .5 Ensure disputes between subcontractors are resolved.
- .6 Departmental Representative is not responsible for, or accountable for, extra costs incurred-as a result of Contractor's failure to coordinate Work.
- .7 Maintain efficient and continuous supervision.

1.21 Approval of Shop Drawings, Product Data and Sample

- .1 In accordance with Section 013300 Submittals, submit the requested shop drawings, product data, MSDS sheets and samples indicated in each of the technical Sections.
- .2 **Allow sufficient time for the following:**
 - .1 Review of product data.
 - .2 Approval of shop drawings.
 - .3 Review of re-submission.

1.22 Products Supplied by Departmental Representative

- .1 Products supplied by Departmental Representative - refer to following Appendices for details:
 - .1 None

1.23 Project Meetings

- .1 Departmental Representative will arrange project meetings and assume responsibility for setting times and recording and distributing minutes.

1.24 Testing and Inspections

- .1 Particular requirements for inspection and testing to be carried out by contractor or as otherwise approved by the Departmental Representative are specified in the related technical sections.
- .2 The Contractor will appoint and pay for the services of testing agency or testing laboratory as specified, and where required for the following:
 - .1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
 - .2 Inspection and testing performed exclusively for Contractor's convenience.
 - .3 Testing and adjustment mechanical and electrical equipment and systems.
 - .1 Tests specified to be carried out by Contractor under the Departmental Representative's supervision.
 - .2 Where tests or inspections by designated testing laboratory reveal work is not in accordance with the Contract requirements, Contractor shall pay costs for additional tests or inspections as the Departmental Representative may require to verify acceptability of corrected work.
- .4 Contractor shall furnish labour and facilities to: site

- .1 Notify Departmental Representative in advance of planned testing.
- .5 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.
- .6 Pay costs for uncovering and making good work that is covered before required inspection or testing is completed and approved by Departmental Representative.
- .7 The Departmental Representative may require, and pay for, additional inspection and testing services.
- .8 Provide Departmental Representative with 2 copies of testing laboratory reports as soon as they are available.

1.25 As-Built Documents

- .1 The Departmental Representative will provide 2 sets of drawings, 2 sets of specifications, and 2 copies of the original AutoCAD files for "as-built" purposes.
- .2 As work progresses, maintain accurate records to show all deviations from the Contract documents. Note on as-built specifications, drawings and shop drawings as changes occur.
- .3 Refer to Section 01 33 00 – Submittals Procedures.

1.26 Cleaning

- .1 Daily conduct cleaning and disposal operations. Comply with local ordinances and anti-pollution laws.
- .2 Ensure cleanup of the work areas each day after completion of work.
- .3 In preparation for interim and final inspections:
 - .1 Examine all sight-exposed interior and exterior surfaced and concealed spaces.
 - .2 Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from sight-exposed interior and exterior finished surfaces, including glass and other polished surfaces.
- .4 Use cleaning materials and methods in accordance with instructions of the manufacturer of the surface to be cleaned.

1.27 Environmental Protection

- .1 Prevent extraneous materials from contaminating air beyond construction area, by providing temporary enclosures during work.
- .2 Do not dispose of waste or volatile materials into water courses, storm or sanitary sewers.
- .3 Ensure proper disposal procedures in accordance with all applicable territorial regulations.

1.28 Maintenance Materials, Special Tools and Spare Parts

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

1.29 Additional Drawings

- .1 The Departmental Representative may furnish additional drawings for clarification. These additional drawings have the same meaning and intent as if they were included with plans referred to in the Contract documents.
- .2 Upon request, Departmental Representative may furnish up to a maximum of 10 sets of Contract documents for use by the Contractor at no additional cost. Should more than 10 sets of documents be required the Departmental Representative will provide them at additional cost.

1.30 Building Smoking Environment

- .1 Smoking within the building is not permitted.

1.31 System of Measurement

- .1 The metric system of measurement (SI) will be employed on this Contract except where existing installations are in Imperial units of measurement.

1.32 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 the work.**

1.33 Submission of Tender

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

PART 2 PRODUCTS

2.1 Not Used

- .1 Not Used

PART 3 EXECUTION

3.1 Not Used

- .1 Not Used

END OF SECTION

1. Approvals

- .1 Approval of shop drawings and samples: refer to Section 011155.

2. General

- .1 This Section specifies general requirements and procedures for the 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 the Departmental Representative.**

3. Submission Requirements

- .1 Coordinate each submission with the requirements of the work and the Contract documents. Individual submissions will not be reviewed until all related information is available.
- .2 Allow ten (10) 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 shall include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by Contractor's authorized representative, certifying approval of submissions, verification of field measurements and compliance with Contract documents.
 - .5 Details of appropriate portions of work as applicable:
 - .1 Fabrication.
 - .2 Layout, showing dimensions (including identified field dimensions) and clearances.
 - .3 Setting or erection details.
 - .4 Capacities.
 - .5 Performance characteristics.
 - .6 Standards.
 - .7 Operating weight.
 - .8 Wiring diagrams.
 - .9 Single line and schematic diagrams.
 - .10 Relationship to adjacent work.

- .5 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 portions of work which are specific to project requirements.
- .2 Maximum sheet size: 850 x 1050 mm.
- .3 Submit 6 prints of shop drawings for each requirement requested in the specification sections and/or as requested by the Departmental Representative.
- .4 Cross-reference shop drawing information to applicable portions of the 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. The Preaction Sprinkler System and the Fire Alarm shall be reviewed and accepted by the Fire Commissioner Office prior to start of any work.

- .2 This review shall not mean that Public Works and Government Services Canada approves the detail design inherent in the shop drawings, responsibility for which shall remain with Contractor submitting same.
- .3 This review shall not relieve the Contractor of responsibility for errors or omissions in the shop drawings or of responsibility for meeting all requirements of the construction and Contract documents.
- .4 Without restricting the generality of the foregoing, the Contractor is responsible for:
 - .1 Dimensions to be confirmed and correlated at the job site.
 - .2 Information that pertains solely to fabrication processes or to techniques of construction and installation.
 - .3 Coordination of the 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 Submit 6 copies of product data.

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 the 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 011155.

9. Test Results and Inspection Reports

- .1 Submit in duplicate test results and inspection reports required by following Sections:
 - 21 13 13 Sprinkler System

END OF SECTION

PART 1 - GENERAL

1.1 References

- .1 Government of Canada:
 - .1 Canada Labour Code - Part II.
 - .2 Canada Occupational Health and Safety Regulations.
- .2 American National Standards Institute (ANSI):
 - .1 ANSI A10.3-2006, – Safety Requirements for Powder-Actuated Fastening Systems ANSI for Construction and Demolition Operations
- .3 Canadian Standards Association (CSA):
 - .1 CSA Z797-2009 Code of Practice for Access Scaffold.
- .4 HRSDC Fire Protection Engineering Section:
 - .1 FCC No. 301-1982, Standard for Construction Operations.
- .5 National Building Code of Canada (NBCC 2005):
 - .1 Part 8, Safety Measures at Construction and Demolition Sites
- .6 Province of British Columbia Building Code (2006):
 - .1 Part 8, Safety Measures at Construction and Demolition Sites.
- .7 Province of British Columbia:
 - .1 Workers Compensation Act Part 3 - Occupational Health & Safety.
 - .2 Occupational Health & Safety Regulations.

1.2 Related Sections

- .1 Refer to the following current NMS sections as required:
 - .1 Section 01 11 55 General Requirements

1.3 Workers' Compensation Board Coverage

- .1 Comply fully with the Workers' Compensation Act, regulations and orders made pursuant thereto, and any amendments up to the completion of the work.
- .2 Maintain Workers' Compensation Board coverage during the term of the Contract, until and including the date that the Certificate of Final Completion is issued.

1.4 Compliance with Regulations

- .1 PWGSC may terminate the Contract without liability to PWGSC where the Contractor, in the opinion of PWGSC, refuses to comply with a requirement of the Workers' Compensation Act or the Occupational Health and Safety Regulations.
- .2 It is the Contractor's responsibility to ensure that all workers are qualified, competent and certified to perform the work as required by the Workers' Compensation Act or the Occupational Health and Safety Regulations.

1.5 Submittals

- .1 Submit to Departmental Representative submittals listed for review in accordance with Section 01 11 55.

- .2 Work effected by submittal shall not proceed until review is complete.
- .3 Submit the 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 The Departmental Representative will review the Contractor's site-specific project Health and Safety Plan and emergency procedures, and provide comments to the Contractor within 10 days after receipt of the plan. Revise the plan as appropriate and resubmit to Departmental Representative.
- .5 Medical surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of work, and submit additional certifications for any new site personnel to Departmental Representative.
- .6 Submission of the Health and Safety Plan, and any revised version, to the Departmental Representative is for information and reference purposes only. It shall not:
 - .1 Be construed to imply approval by the Departmental Representative.
 - .2 Be interpreted as a warranty of being complete, accurate and legislatively compliant.
 - .3 Relieve the Contractor of his legal obligations for the provision of health and safety on the project.

1.6 Responsibility

- .1 Assume responsibility as the Prime Contractor for work under this contract.
- .2 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .3 Comply with and enforce compliance by employees with safety requirements of Contract documents, applicable Federal, Provincial, Territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.7 Health and Safety Coordinator

- .1 The Health and Safety Coordinator (Registered Occupational Hygienist, Certified Industrial Specified Hygienist) must:
 - .1 Be responsible for completing all health and safety training, and ensuring that personnel that do not successfully complete the required training are not permitted to enter the site to perform work.
 - .2 Be responsible for implementing, daily enforcing, and monitoring the site-specific Health and Safety Plan.
 - .3 Be on site during execution of work.

1.8 General Conditions

- .1 Provide safety barricades and lights around work site as required to provide a safe working environment for workers and protection for pedestrian and vehicular traffic.
- .2 Ensure that non-authorized persons are not allowed to circulate in designated construction areas of the work site.
 - .1 Provide appropriate means by use of barricades, fences, warning signs, traffic control personnel, and temporary lighting as required.
 - .2 Secure site at night time or provide security guard as deemed necessary to protect site against entry.

1.9 Regulatory Requirements

- .1 Comply with specified codes, acts, bylaws, standards and regulations to ensure safe operations at site.
- .2 In event of conflict between any provision of the above authorities, the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, the Departmental Representative will advise on the course of action to be followed.

1.10 Work Permits

- .1 Obtain specialty permit related to project before start of work.

1.11 Filing of Notice

- .1 Submit a Notice of Project, form 52E49, to WorkSafe BC in accordance with OH&S Regulation 20.2, at least 24 hours before start of work.
- .2 Submit copy to Departmental Representative.

1.12 Health and Safety Plan

- .1 Conduct a site-specific hazard assessment based on review of Contract documents, required work, and project site. Identify any known and potential health risks and safety hazards.
- .2 Prepare and comply with a site-specific project Health and Safety Plan based on hazard assessment, including, but not limited to, the following:
 - .1 Primary requirements:
 - .1 Contractor's safety policy.
 - .2 Identification of applicable compliance obligations.
 - .3 Definition of responsibilities for project safety/organization chart for project.
 - .4 General safety rules for project.
 - .5 Job-specific safe work, procedures.
 - .6 Inspection policy and procedures.
 - .7 Incident reporting and investigation policy and procedures.
 - .8 Occupational Health and Safety Committee/Representative procedures.
 - .9 Occupational Health and Safety meetings.

- .10 Occupational Health and Safety communications and record keeping procedures.
- .2 Summary of health risks and safety hazards resulting from analysis of hazard assessment, with respect to site tasks and operations which must be performed as part of the work.
- .3 List hazardous materials to be brought on site as required by work.
- .4 Indicate Engineering and administrative control measures to be implemented at the site for managing identified risks and hazards.
- .5 Identify personal protective equipment (PPE) to be used by workers.
- .6 Identify personnel and alternates responsible for site safety and health.
- .7 Identify personnel training requirements and training plan, including site orientation for new workers.
- .3 Develop the plan in collaboration with all subcontractors. Ensure that work/activities of subcontractors are included in the hazard assessment and are reflected in the plan.
- .4 Revise and update Health and Safety Plan as required, and re-submit to the Departmental Representative.
- .5 Departmental Representative's review: the review of Health and Safety Plan by Public Works and Government Services Canada (PWGSC) shall not relieve the Contractor of responsibility for errors or omissions in final Health and Safety Plan or of responsibility for meeting all requirements of construction and Contract documents.

1.13 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 the following provisions in the emergency procedures:
 - .1 Notify workers and the first-aid attendant, of the nature and location of the emergency.
 - .2 Evacuate all workers safely.
 - .3 Check and confirm the safe evacuation of all workers.
 - .4 Notify the fire department or other emergency responders.
 - .5 Notify adjacent workplaces or residences which may be affected if the risk extends beyond the workplace.
 - .6 Notify Departmental Representative.
- .3 Provide written rescue/evacuation procedures as required for, but not limited to:
 - .1 Work at high angles.
 - .2 Work in confined spaces or where there is a risk of entrapment.
 - .3 Work with hazardous substances.

- .4 Underground work.
- .5 Work on, over, under and adjacent to water.
- .6 Workplaces where there are persons who require physical assistance to be moved.
- .4 Design and mark emergency exit routes to provide quick and unimpeded exit.
- .5 Revise and update emergency procedures as required, and re-submit to the Departmental Representative.

1.14 Hazardous Products

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of hazardous materials, and regarding labeling and provision of Material Safety Data Sheets (MSDS) acceptable to the Departmental Representative and in accordance with the Canada Labour Code.
- .2 Where use of hazardous and toxic products cannot be avoided:
 - .1 Advise Departmental Representative beforehand of the product(s) intended for use. Submit applicable MSDS and WHMIS documents as per Section 01 01 50.
 - .2 In conjunction with Departmental Representative, schedule to carry out work during "off hours" when tenants have left the building.

1.15 Electrical Safety Requirements

- .1 Comply with authorities and ensure that, when installing new facilities or modifying existing facilities, all electrical personnel are completely familiar with existing and new electrical circuits and equipment and their operation.
 - .1 Before undertaking any work, coordinate required energizing and de-energizing of new and existing circuits with Departmental Representative.
 - .2 Maintain electrical safety procedures and take necessary precautions to ensure safety of all personnel working under this Contract, as well as safety of other personnel on site.

1.16 Electrical Lockout

- .1 Develop, implement and enforce use of established procedures to provide electrical lockout and to ensure the health and safety of workers for every event where work must be done on any electrical circuit or facility.
- .2 Prepare the lockout procedures in writing, listing step-by-step processes to be followed by workers, including how to prepare and issue the request/authorization form. Have procedures available for review upon request by the Departmental Representative.
- .3 Keep the documents and lockout tags at the site and list in a log book for the full duration of the Contract. Upon request, make such data available for viewing by Departmental Representative or by any authorized safety representative.

1.17 Overloading

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

1.18 Falsework

- .1 Design and construct falsework in accordance with CSA S269.1.

1.19 Scaffolding

- .1 Design, construct and maintain scaffolding in a rigid, secure and safe manner, in accordance with CSA Z797-2009 Code of Practice for Access Scaffold and BC Occupational Health and Safety Regulations.

1.20 Confined Spaces

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

1.21 Power-Actuated Devices

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

1.22 Fire Safety and Hot Work

- .1 Obtain Departmental Representative's authorization before any welding, cutting or any other hot work operations can be carried out on site.
- .2 Hot work includes cutting/melting with use of torch, flame heating roofing kettles, or other open flame devices and grinding with equipment which produces sparks.

1.23 Fire Safety Requirements

- .1 Store oily/paint-soaked rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
- .2 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.

1.24 Fire Protection and Alarm System

- .1 Do not obstruct, shut-off or leave inactive at the end of a working day or shift, the fire protection and alarm systems.
- .2 Do not use fire hydrants, standpipes and hose systems for purposes other than firefighting.
- .3 Be responsible/liable for costs incurred from the fire department, the building owner and the tenants, resulting from false alarms.

1.25 Unforeseen Hazards

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

1.26 Posted Documents

- .1 Post legible versions of the following documents on site:
 - .1 Health and Safety Plan.
 - .2 Sequence of work.
 - .3 Emergency procedures.
 - .4 Site drawing showing project layout, locations of the first-aid station, evacuation route and marshalling station, and the emergency transportation provisions.

- .5 Notice of Project.
- .6 Floor plans or site plans. Must be posted in a non-inmate access are and locked up when not being used.
- .7 Notice as to where a copy of the Workers' Compensation Act and Regulations are available on the work site for review by employees and workers.
- .8 Workplace Hazardous Materials Information System (WHMIS) 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.
- .2 Post all Material Safety Data Sheets (MSDS) on site, in a common area, visible to all workers and in locations accessible to tenants when work of this Contract includes construction activities adjacent to occupied areas.
- .3 Postings should be protected from the weather, and visible from the street or the exterior of the principal construction site shelter provided for workers and equipment, or as approved by the Departmental Representative.

1.27 Meetings

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

1.28 Correction of Non-Compliance

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

END OF SECTION

PART 1 GENERAL

1.1 Inspection

- .1 Allow Departmental Representative access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
- .2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or law of Place of Work.
- .3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
- .4 Departmental Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. [If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Departmental Representative shall pay cost of examination and replacement.

1.2 Independent Inspection Agencies

- .1 Independent Inspection/Testing Agencies will be engaged by Departmental Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Departmental Representative.
- .2 Provide equipment required for executing inspection and testing by appointed agencies.
- .3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
- .4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no cost to Departmental Representative. Pay costs for retesting and re-inspection.

1.3 Access to Work

- .1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.
- .2 Co-operate to provide reasonable facilities for such access.

1.4 Procedures

- .1 Notify appropriate agency and Departmental Representative in advance of requirement for tests, in order that attendance arrangements can be made.
- .2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.
- .3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.5 Rejected Work

- .1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by

Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

- .2 Make good other Contractor's work damaged by such removals or replacements promptly.
- .3 If in opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Departmental Representative.

1.6 Reports

- .1 Submit 4 copies of inspection and test reports to Departmental Representative.
- .2 Provide copies to subcontractor of work being inspected or tested] [manufacturer or fabricator of material being inspected or tested.

1.7 Equipment and Systems

- .1 Refer to Divisions 22, 23 and 26 for definitive requirements.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not Used

PART 3 EXECUTION

3.1 Not Used

- .1 Not Used

END OF SECTION

1. Access and Delivery

- .1 Only the 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. Storage Facilities

- .1 Storage space will be limited to designated areas in the penthouse level.

3. Power

- .1 Electrical power and lighting at existing building may be used for construction purposes at no extra cost, provided that warranties are not affected thereby and electrical components used for temporary power are replaced when damaged. Do not use emergency power or UPS panels for this purpose.

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.

6. Heating and Ventilation

- .1 Do not begin work until arrangements have been made with the Departmental Representative for protection of on-floor heating, ventilating and air-conditioning.
 - .1 If there is any dirt in the heating and ventilation system, it will be the Contractor's responsibility to return it to its original state in accordance with the Departmental Representative's specifications.

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.

8. Removal of Temporary Facilities

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

9. Signs and Notices

- .1 Signs and notices for safety and instruction shall be in both official languages or graphic symbols conforming to CAN/CSA-Z321.
- .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. The term "products" is referred to throughout the specifications.
- .2 Use products of 1 manufacturer for material and equipment of the 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's instructions. Departmental Representative will designate which document is to be followed.
- .5 Provide metal fastenings and accessories in the 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 Soft gasket lock type washers: use where vibrations occur.
 - .3 Resilient washers: use with stainless steel.
- .11 Deliver, store and maintain packaged material and equipment with manufacturer's 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 suppliers' 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, materials and equipment (referred to as products) incorporated into work shall be new, not damaged or defective, and of the best quality (compatible with the specifications) for the purpose intended. If requested, furnish evidence as to type, source and quality of the 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 the requirements of the specifications. Produce documents when requested by the Departmental Representative.
 - .4 Should any dispute arise as to quality or fitness of products, the decision rests strictly with the Departmental Representative based upon the requirements of the Contract documents.
 - .5 Unless otherwise indicated in the specifications, maintain uniformity of manufacture for any particular or like item throughout the building.
 - .6 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

3. Availability of Products

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

4. Manufacturer's Instructions

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

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- .2 Notify Departmental Representative in writing of conflicts between the specifications and the manufacturer's instructions so that the Departmental Representative may establish the course of action.
- .3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes the Departmental Representative to require removal and re-installation at no increase in either the Contract price or the 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 under "Acceptable Products" (used for complex Mechanical or Electrical Systems): select any one of the indicated manufacturer's or any other manufacturer meeting or exceeding the Prescriptive specifications and indicated Products.
- .3 Products specified by performance and referenced standard: select any product meeting or exceeding the referenced standard.
- .4 Products specified to meet particular design requirements or to match existing materials: use only material specified Approved Product. Alternative products may be considered provided full technical data is received in writing by Departmental Representative in accordance with "Special Instructions to Tenderers".
- .5 When products are specified by a referenced standard or by or Performance specifications, upon request of Departmental Representative obtain from manufacturer an independent laboratory report showing that the product meets or exceeds the specified requirements.

6. Substitution After Contract Award

- .1 No substitutions are permitted without prior written approval of the Departmental Representative.
- .2 Proposals for substitution may only be submitted after Contract award. Such request must include statements of respective costs of items originally specified and the proposed substitution.
- .3 Proposals will be considered by the Departmental Representative if:
 - .1 products selected by tenderer from those specified are not available;
 - .2 delivery date of products selected from those specified would unduly delay completion of Contract, or
 - .3 alternative product to that specified, which is brought to the attention of and considered by Departmental Representative as equivalent to the product specified, and will result in a credit to the Contract amount.

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- .4 Should the proposed substitution be accepted either in part or in whole, assume full responsibility and costs when substitution affects other work on the project. Pay for design or drawing changes required as result of substitution.
- .5 Amounts of all credits arising from approval of the substitutions will be determined by the Departmental Representative, and the Contract price will be reduced accordingly.

END OF SECTION

PART 1 GENERAL

1.1 References

- .1 Public Works Government Services Canada (PWGSC) Standard Acquisition Clauses and Conditions (SACC)-ID: R0202D, Title: General Conditions "C", In Effect as Of: May 14, 2004.

1.2 Project Cleanliness

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by User or other parties.
- .2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.
- .3 Clear snow and ice from access to building, bank/pile snow in designated areas only.
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 Provide on-site containers for collection of waste materials and debris.
- .6 Provide and use marked separate bins for recycling. Refer to Section 01 74 19 - Construction/Demolition Waste Management and Disposal.
- .7 Dispose of waste materials and debris at designated dumping areas on off site.
- .8 Clean interior areas prior to start of finishing work, and maintain areas free of dust and other contaminants during finishing operations.
- .9 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .10 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
- .11 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .12 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

1.3 Final Cleaning

- .1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
- .3 Prior to final review remove surplus products, tools, construction machinery and equipment.
- .4 Remove waste products and debris [other than] [including] that caused by Owner or other Contractors.
- .5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.

- .6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .7 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.
- .8 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls and floors.
- .9 Clean lighting reflectors, lenses, and other lighting surfaces.
- .10 Vacuum clean and dust building interiors, behind grilles, louvres and screens.
- .11 Wax, seal, shampoo or prepare floor finishes, as recommended by manufacturer.
- .12 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
- .13 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
- .14 Remove dirt and other disfiguration from exterior surfaces.
- .15 Clean and sweep roofs, gutters, areaways, and sunken wells.
- .16 Sweep and wash clean paved areas.
- .17 Clean equipment and fixtures to sanitary condition; clean or replace filters of mechanical equipment.
- .18 Clean roofs, downspouts, and drainage systems.
- .19 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.
- .20 Remove snow and ice from access to building.

1.4 Waste Management and Disposal

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

1.5 Related Work

- .1 The valuable and irreplaceable specimen and equipment in the Insectary 367 and the Herbarium 353 and the affected areas of construction will be moved by the Owner. Provide appropriate protection for the specimen and equipment/furniture remaining during the course of construction. Coordinate with the department representative prior to any movement of existing equipment/furniture. Refer to drawings for layout.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not Used

PART 3 EXECUTION

3.1 Not Used

.1 Not Used

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): a written report which addresses opportunities for reduction, re-use or recycling of materials.
- .3 Materials Source Separation Program (MSSP): consists of a 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 the following:
 - .1 Gypsum board.
 - .2 Metals
 - .3 Wood.
 - .4 Plastics.
 - .5 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 a list of materials to be separated from the general waste stream and stockpiled in separate containers, to the approval of the 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 an 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 the 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

PART 1 GENERAL

1.1 Related Sections

- .1 Section 01 33 00 Submittal Procedures
- .2 Section 01 45 00 Quality Control

1.2 Submittals

- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prepare instructions and data using personnel experienced in maintenance and operation of described products.
- .3 Copy will be returned after final inspection, with Departmental Representative's comments.
- .4 Revise content of documents as required prior to final submittal.
- .5 Two weeks prior to Substantial Performance of the Work, submit to the Departmental Representative, four final copies of operating and maintenance manuals in English.
- .6 Ensure spare parts, maintenance materials and special tools provided are new, undamaged or defective, and of same quality and manufacture as products provided in Work.
- .7 Furnish evidence, if requested, for type, source and quality of products provided.
- .8 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.
- .9 Pay costs of transportation.

1.3 Format

- .1 Organize data as instructional manual.
- .2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219mm x 279mm with spine and face pockets.
- .3 When multiple binders are used correlate data into related consistent groupings. Identify contents of each binder on spine.
- .4 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
- .5 Arrange content by systems under Section numbers and sequence of Table of Contents.
- .6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- .7 Text: manufacturer's printed data, or typewritten data.
- .8 Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

1.4 Contents – Each Volume

- .1 Table of Contents: provide title of project;

- .1 Date of submission; names.
- .2 Addresses, and telephone numbers of Consultant and Contractor with name of responsible parties.
- .3 Schedule of products and systems, indexed to content of volume.
- .2 For each product or system:
 - .1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
 - .3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.
 - .4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
 - .5 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.

1.5 As-Built Documentations

- .1 Maintain, in addition to requirements in General Conditions, at site for Departmental Representative one record copy of:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Change Orders and other modifications to Contract.
 - .5 Reviewed shop drawings, product data, and samples.
 - .6 Field test records.
 - .7 Inspection certificates.
 - .8 Manufacturer's certificates.
- .2 Store record documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.
- .3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by Departmental Representative.

1.6 Equipment and Systems

- .1 Each Item of Equipment and Each System: include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions.

- .2 Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.
- .2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.
- .3 Include installed colour coded wiring diagrams.
- .4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
- .5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- .6 Provide servicing and lubrication schedule, and list of lubricants required.
- .7 Include manufacturer's printed operation and maintenance instructions.
- .8 Include sequence of operation by controls manufacturer.
- .9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- .10 Provide installed control diagrams by controls manufacturer.
- .11 Provide complete copy of Fire Alarm Verification Report prepared to the requirements of the most recent edition of CAN/ULC S537, submit to the Fire Commissioner Office for acceptance.
- .12 Provide Contractor's co-ordination drawings, with installed colour coded piping diagrams.
- .13 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- .14 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- .15 Additional requirements: as specified in individual specification sections.

1.7 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 site; place and store.
- .4 Receive and catalogue items. Submit inventory listing to Departmental Representative. Include approved listings in Maintenance Manual.
- .5 Obtain receipt for delivered products and submit prior to final payment.

1.8 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 site; place and store.
- .4 Receive and catalogue items. Submit inventory listing to Departmental Representative. Include approved listings in Maintenance Manual.
- .5 Obtain receipt for delivered products and submit prior to final payment.

1.9 Special Tools

- .1 Provide special tools, in quantities specified in individual specification section.
- .2 Provide items with tags identifying their associated function and equipment.
- .3 Deliver to site; place and store.
- .4 Receive and catalogue items. Submit inventory listing to Departmental Representative. Include approved listings in Maintenance Manual.
- .5 Obtain receipt for delivered products and submit prior to final payment.

1.10 Storage, Handling and Protection

- .1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.
- .2 Store in original and undamaged condition with manufacturer's seal and labels intact.
- .3 Store components subject to damage from weather in weatherproof enclosures.
- .4 Store paints and freezable materials in a heated and ventilated room.
- .5 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.

1.11 Warranties and Bonds

- .1 Develop warranty management plan to contain information relevant to Warranties.
- .2 Submit warranty management plan to Departmental Representative approval.
- .3 Warranty management plan to include required actions and documents to assure that Owner receives warranties to which it is entitled.
- .4 Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.
- .5 Submit, warranty information made available during construction phase, to Departmental Representative for approval prior to each monthly pay estimate.
- .6 Assemble approved information in binder and submit upon acceptance of work. Organize binder as follows:
 - .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
 - .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
 - .3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.

- .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.
- .7 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.
- .8 Include information contained in warranty management plan as follows:
 - .1 Roles and responsibilities of personnel associated with warranty process, including points of contact and telephone numbers within the organizations of Contractors, subcontractors, manufacturers or suppliers involved.
 - .2 Listing and status of delivery of Certificates of Warranty for extended warranty items.
 - .3 Provide list for each warranted equipment, item, feature of construction or system indicating:
 - .1 Name of item.
 - .2 Model and serial numbers.
 - .3 Location where installed.
 - .4 Name and phone numbers of manufacturers or suppliers.
 - .5 Names, addresses and telephone numbers of sources of spare parts.
 - .6 Warranties and terms of warranty: include one-year overall warranty of construction. Indicate items that have extended warranties and show separate warranty expiration dates.
 - .7 Cross-reference to warranty certificates as applicable.
 - .8 Starting point and duration of warranty period.
 - .9 Summary of maintenance procedures required to continue warranty in force.
 - .10 Cross-Reference to specific pertinent Operation and Maintenance manuals.
 - .11 Organization, names and phone numbers of persons to call for warranty service.
 - .12 Typical response time and repair time expected for various warranted equipment.
 - .4 Procedure and status of tagging of equipment covered by extended warranties.
 - .5 Post copies of instructions near selected pieces of equipment where operation is critical for warranty and/or safety reasons.
- .9 Respond in a timely manner to oral or written notification of required construction warranty repair work.
- .10 Written verification will follow oral instructions. Failure to respond will be cause for the Departmental Representative to proceed with action against Contractor.

1.12 Warranty Tags

- .1 Tag, at time of installation, each warranted item. Provide durable, oil and water resistant tag approved by Departmental Representative.
- .2 Attach tags with copper wire and spray with waterproof silicone coating.
- .3 Leave date of acceptance until project is accepted for occupancy.
- .4 Indicate following information on tag:
 - .1 Type of product/material.
 - .2 Model number.
 - .3 Serial number.
 - .4 Contract number.
 - .5 Warranty period.
 - .6 Inspector's signature.
 - .7 Construction Contractor.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not Used

PART 3 EXECUTION

3.1 Not Used

- .1 Not Used

END of SECTION

1. Section Includes

- .1 Includes general requirements for commissioning facilities and facility systems.
- .2 Refer to sections of Mechanical, Electrical and Communications disciplines.

2. Definitions

- .1 Acronyms:
 - .1 AFD - Alternate Forms of Delivery, service provider.
 - .2 BMM - Building Management Manual.
 - .3 Cx - Commissioning.
 - .4 EMCS - Energy Monitoring and Control Systems.
 - .5 O&M - Operation and Maintenance.
 - .6 PI - Product Information.
 - .7 PV - Performance Verification.
 - .8 TAB - Testing, Adjusting and Balancing.
- .2 Cx - a required program of tests, procedures and checks carried out systematically on systems and integrated systems of the finished Project. Cx is performed after systems and integrated systems are completely installed, functional and Contractor's Performance Verification responsibilities have been completed and approved.

3. Quality Assurance

- .1 Testing organization: current member in good standing of AABC certified to perform specified services.
- .2 Comply with applicable procedures and standards of the certification sponsoring association.
- .3 Perform services under direction of supervisor qualified under certification requirements of sponsoring association.

4. References

- .1 Associated Air Balance Council (AABC): National Standards for Field Measurement and Instrumentation, Total Systems Balance, Air Distribution-Hydraulics Systems.

5. Submittals

- .1 Prior to start of Work, submit name of organization proposed to perform services. Designate who has managerial responsibilities for coordination of entire testing, adjusting and balancing.
- .2 Submit documentation to confirm organization compliance with quality assurance provision.
- .3 Submit 3 preliminary specimen copies of each of report forms proposed for use.

- .4 Ten (10) days prior to Substantial Performance, submit 3 copies of final reports on applicable forms.
- .5 Submit reports of testing, adjusting and balancing postponed due to seasonal, climatic, occupancy, or other reasons beyond Contractor's control, promptly after execution of those services.

6. Procedures - General

- .1 Comply with procedural standards of certifying association under whose standard services will be performed.
- .2 Notify Departmental Representative 3 days prior to beginning of operations.
- .3 Accurately record data for each step.
- .4 Report to Departmental Representative any deficiencies or defects noted during performance of services.

7. Contractor's Responsibilities

- .1 Prepare each system for testing and balancing.
- .2 Cooperate with testing organization and provide access to equipment and systems.
- .3 Provide personnel and operate systems at designated times, and under conditions required for proper testing, adjusting, and balancing.
- .4 Notify testing organization 7 days prior to time project will be ready for testing, adjusting, and balancing.

8. Preparation

- .1 Provide instruments required for testing, adjusting, and balancing operations.
- .2 Make instruments available to Departmental Representative to facilitate spot checks during testing.
- .3 Retain possession of instruments and remove at completion of services.
- .4 Verify systems installation is complete and in continuous operation.

9. Final Reports

- .1 Organization having managerial responsibility shall make reports.
- .2 Ensure each form bears signature of recorder, and that of supervisor of reporting organization.
- .3 Identify each instrument used, and latest date of calibration of each.

10. Completion of Commissioning

- .1 Upon completion of Cx leave systems in normal operating mode.
- .2 Except for warranty and seasonal verification activities specified in Cx specifications, complete Cx prior to issuance of Interim Certificate of Completion.
- .3 Cx deliverables have been submitted and accepted by Departmental Representative.

END OF SECTION

PART 1 GENERAL

1.1 Related Sections

- .1 Section 01 11 55 General Instructions
- .2 Section 01 35 33 Health and Safety Requirements

1.2 References

- .1 Canadian Standards Association (CSA International)
 - .1 CSA S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures.
 - .2 WorksafeBC
 - .1 Safe Handling of Asbestos, A Manual of Standard Practices.

1.3 Health and Safety

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

1.4 Waste Management and Disposal

- .1 Separate waste materials for reuse and recycling in accordance with 01 01 50 – General Instructions.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Place materials defined as hazardous or toxic in designated containers.
- .4 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal regulations.
- .5 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan
- .6 Fold up metal banding, flatten and place in designated area for recycling.
- .7 Do not dispose of waste or volatile materials such as mineral spirits, oil petroleum based lubricant, or toxic cleaning solutions into storm or sanitary sewers. Ensure proper disposal procedures are maintained throughout project.
- .8 Mercury containing thermostats shall be disposed in accordance with safety regulations (see Recycling Council of British Columbia, <http://rcbc.bc.ca/education/faqs/mercury4>).

1.5 Environmental Protection

- .1 Do not dispose of waste or volatile materials into watercourses, storm or sanitary sewers.
- .2 Prevent extraneous materials from contaminating air beyond deconstruction area, by providing temporary enclosures during Work.
- .3 Employ reasonable means necessary to protect salvaged materials from vandalism, theft, adverse weather, or inadvertent damage.
- .4 Organize site and workers in matter which promotes efficient flow of materials through disassembly, processing, stockpiling, and removal.

- .5 Remove and transport toxic or dangerous materials from site in accordance with authority having jurisdiction.

1.6 Site Condition

- .1 The existing site and buildings will be in use during work of this Contract. Maintain building access at all doorways and corridors.
- .2 Investigate site and building to determine dismantling, processing and storage logistics required prior to beginning of Work.
- .3 Develop strategy for deconstruction to facilitate optimum salvage of reusable and recyclable materials.
- .4 Contractors shall expect to encounter Asbestos Containing Materials (ACM) and other hazardous building materials throughout the course of work. Appendix A contains Hazmat Reports relevant to this site and these reports identify ACM and hazardous materials that the Contractors will encounter.

If even one surveyed sample of a material at a particular location is identified to be ACM and/or hazardous material, Contractors shall treat this material throughout the rest of the site as "identified" ACM and/or hazardous material. Removal of these identified ACM and hazardous materials that the Contractors will encounter shall be the responsibility of the Contractors.

Should other suspected hazardous building substances not identified in the Contract Document be encountered, stop work, take preventative measures, and notify Departmental Representative immediately.

- .1 Do not proceed until written instructions have been received from Departmental Representative.
- .2 Removal of ACM and hazardous materials not identified in the Contract Document and Hazmat Reports will be under the control of the Departmental Representative and may be a change order to the contract price in accordance with General Conditions, or removed under a separate contract by the Departmental Representative.
- .5 Notify Departmental Representative before disrupting building access or services.
- .6 Take preventative measures during demolition process and do not disturb pipe elbow insulation, duct mastic or other suspicious substance which may contain hazardous materials. Exercise caution when cutting existing duct insulation.
- .7 Contractor shall prepare and submit a Site Specific Asbestos and Lead Exposure Control Plan to Departmental Representative within ten (10) working days of Award of Contract for review and approval, prior to start of construction.
- .8 All ACM and hazardous materials removal will be under the control of the Departmental Representative and may be a change order to the contract price in accordance with General Conditions, or removed under a separate contract by the Departmental Representative.
- .9 Locate any existing conduit, rebar, etc. within floor or walls prior to drilling and/or coring. Contractor is responsible for repairing any such conduit, rebar, etc. that is damaged in the course of construction.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used.

PART 3 EXECUTION

3.1 Preparation

- .1 Inspect site and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain.
- .2 Locate and protect utilities. Preserve active utilities traversing site in operating condition.
- .3 Notify and obtain approval of utility companies before starting demolition.

3.2 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 Do Work in accordance with Section 01 35 33 - Health and Safety Requirements.
- .6 Prevent debris from blocking drainage which must remain in operation.
- .7 Take precaution during demolition to protect all adjacent finished surfaces. Make good any damage to adjacent surfaces.

3.3 Salvage

- .1 Refer to demolition drawings and specifications for items to be salvaged for reuse.
- .2 Remove items to be reused and protect items from damage.

3.4 Disposal

- .1 Dispose of removed materials, to appropriate recycling facilities except where specified otherwise, in accordance with authority having jurisdiction.
- .2 The Owner reserves the option to request some or all existing equipment being removed and not required to be relocated to remain the property of the Owner. When directed by the Departmental Representative, remove such equipment and turn over to the Owner. Provide receipt verifying disposition of such equipment.

END OF SECTION

PART 1 GENERAL

1.1 Related Sections

- .1 Divisions 21, 26.

1.2 Description of Work

- .1 Apply firestop sealant and systems around all penetrations through openings in fire rated wall, floor and ceiling assemblies.
- .2 Seal around conduits penetrating fire separations.

1.3 References

- .1 ULC-S115-05 – Standard Method of Fire Tests of Firestop Systems.

1.4 Product Data

- .1 Submit product data and layout plan in accordance with Section 01 01 50.
- .2 Submit manufacturer's product data for materials and prefabricated devices, providing descriptions are sufficient for identification at job site. Include manufacturer's printed instructions for installation.
- .3 Submit plan showing location of each penetration and product data to indicate type of firestopping being installed at each location.

PART 2 PRODUCTS

2.1 Materials

- .1 Fire stopping and smoke seal systems: in accordance with ULC-S115.
 - .1 Systems capable of maintaining an effective barrier against flame, smoke and gases in compliance with requirements of ULC-S115 and not to exceed opening sizes for which they are intended.
 - .2 Fire stop system rating: to match wall/floor/roof assembly of rating indicated.
- .2 Service penetration assemblies: certified by ULC in accordance with ULC-S115 and listed in ULC Guide No. 40 U19.
- .3 Prefabricated flange units, with outer metal flange die-stamped from 0.3 mm thick 316 stainless steel, with inset of premoulded silicone elastomeric ring, factory moulded, U.L.C. or W.H. listed as a through penetration fire stop. Flange hinged for fixing over pipe and then secured tight with self-tapping screw.
- .4 Fire-resistance rating of installed fire stopping assembly not less than the fire- resistance rating of surrounding wall assembly.
- .5 Fire stopping and smoke seals at openings intended for ease of re-entry such as cables: elastomeric seal; do not use cementitious or rigid seal at such locations.
- .6 Fire stopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control: prefabricated silicone elastomeric seal; do not use a cementitious or rigid seal at such locations.
- .7 Primers: to manufacturer's recommendation for specific material, substrate, and end use.

PART 3 EXECUTION

3.1 Preparation

- .1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials. Ensure that substrates and surfaces are clean, dry and frost free.
- .2 Prepare surfaces in contact with fire stopping materials and smoke seals to manufacturer's instructions.

3.2 Installation

- .1 Install fire stopping and smoke seal material and components in accordance with ULC certification and manufacturer's instructions.
- .2 Seal holes or voids made by through penetrations, poke-through termination devices, and openings or joints to ensure continuity and integrity of fire separation are maintained.
- .3 Tighten self-tapping screw on flange unit to ensure adequate tight and permanent seal.

3.3 Inspection

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

3.4 Schedule

- .1 Fire stop and smoke seal at:
 - .1 Penetrations through fire-resistance rated walls, floors and ceilings.
 - .2 Around mechanical and electrical assemblies penetrating fire separations.
- .2 Floor, wall and ceiling assemblies where there is existing fire stopping will deemed to be fire rated. New penetrations through such assemblies shall be fire stopped. Review existing condition on site and keep records. Consult with Departmental Representative as required.

3.5 Clean Up

- .1 Remove excess materials and debris and clean adjacent surfaces immediately after application.

END OF SECTION

PART 1 GENERAL

1.1 Related Sections

- .1 Section 01 33 00 Shop Drawings, Product Data and Samples
- .2 Section 01 35 33 Health and Safety Requirements
- .3 Section 01 74 19 Waste Management And Disposal
- .4 Section 01 78 00 Closeout Submittals
- .5 Section 21 Fire Suppression
- .6 Section 22 Plumbing

1.2 Submittals

- .1 Submittals: in accordance with Section 01 33 00 - Shop Drawings, Product Data and Samples.
- .2 Shop Drawings to Show:
 - .1 Mounting arrangements.
 - .2 Operating and maintenance clearances.
- .3 Shop Drawings and Product Data Accompanied By:
 - .1 Detailed drawings of bases, supports, and anchor bolts.
 - .2 Acoustical sound power data, where applicable.
 - .3 Points of operation on performance curves.
 - .4 Manufacturer to certify current model production.
 - .5 Certification of compliance to applicable codes.
- .4 In addition to transmittal letter referred to in Section 01 33 00 - Shop Drawings, Product Data and Samples: use MCAC "Shop Drawing Submittal Title Sheet". Identify section and paragraph number.
- .5 Closeout Submittals:
 - .1 Provide operation and maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
 - .2 Operation and maintenance manual approved by, and final copies deposited with, Departmental Representative before final inspection.
 - .3 Operation Data to Include:
 - .1 Control schematics for systems including environmental controls.
 - .2 Description of systems and their controls.
 - .3 Description of operation of systems at various loads together with reset schedules and seasonal variances.
 - .4 Operation instruction for systems and component.
 - .5 Description of actions to be taken in event of equipment failure.

- .6 Valves schedule and flow diagram.
- .7 Colour coding chart.
- .4 Maintenance Data to Include:
 - .1 Servicing, maintenance, operation and trouble-shooting instructions for each item of equipment.
 - .2 Data to include schedules of tasks, frequency, tools required and task time.
- .5 Performance Data to Include:
 - .1 Equipment performance verification test results.
 - .2 Special performance data as specified.
- .6 Approvals:
 - .1 Submit 2 copies of draft Operation and Maintenance Manual to Departmental Representative for approval. Submission of individual data will not be accepted unless directed by Departmental Representative.
 - .2 Make changes as required and re-submit as directed by Departmental Representative.
- .7 Additional Data:
 - .1 Prepare and insert into operation and maintenance manual additional data when need for it becomes apparent during specified demonstrations and instructions.
- .8 Site Records:
 - .1 Departmental Representative will provide 1 set of reproducible mechanical drawings. Provide sets of white prints as required for each phase of work. Mark changes as work progresses and as changes occur. Include changes to existing mechanical systems, control systems and low voltage control wiring.
 - .2 Transfer information weekly to reproducibles, revising reproducibles to show work as actually installed.
 - .3 Use different colour waterproof ink for each service.
 - .4 Make available for reference purposes and inspection.
- .9 As-Built Drawings:
 - .1 Prior to start of Testing, Adjusting and Balancing for HVAC, finalize production of as-built drawings.
 - .2 Identify each drawing in lower right hand corner in letters at least 12 mm high as follows: - "AS BUILT DRAWINGS: THIS DRAWING HAS BEEN REVISED TO SHOW MECHANICAL SYSTEMS AS INSTALLED" (Signature of Contractor) (Date).
 - .3 Submit to Departmental Representative for approval and make corrections as directed.
 - .4 Submit completed reproducible as-built drawings with Operating and Maintenance Manuals.

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 Maintenance

- .1 Furnish spare parts in accordance with Section 01 78 00 - Closeout Submittals as indicated in the detailed product specification clauses.
- .2 Provide access doors for concealed expansion joints, traps, strainers, cleanouts, balance dampers, fire dampers, other parts requiring accessibility for operating and maintenance.
- .3 In suspended panel ceilings, use panel in place of access door; provide in such panel a button or other means of identification and easy removal when necessary.

1.5 Delivery, Storage and Handling

- .1 Waste Management and Disposal:
 - .1 Construction/Demolition Waste Management and Disposal: separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Construction/Demolition Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Access Doors

- .1 Access door size shall be as indicated and where not indicated, make 305mm x 406mm [12" x 16"] minimum or 610mm x 457mm [24" x 18"] where persons have to enter. For acoustical ceilings, conform to architectural panel pattern.
- .2 Unless otherwise indicated, access doors shall be hinged, flush type, steel framed panel, 14 gauge minimum, satin finished galvanized steel or type 304 stainless steel, with anchor straps for wet areas, washrooms, and all walls finished in ceramic tile.
- .3 Hinges shall be concealed, spring hinge to allow door to open 175°. Locking devices shall be flush cam type, screwdriver operated, doors and frames shall have prime coated rust inhibiting paint, unless made of stainless steel.
- .4 Where doors are required in fire rated walls, access doors shall be uninsulated and for all fire rated ceilings and walls where maximum temperature rise limitation is applicable, shall be insulated. All fire rated access doors shall have Warnock Hersey or ULC listed 2 hour fire rating and shall be installed in accordance with NFPA 80 and manufacturer's installation instructions.

PART 3 EXECUTION

3.1 Cleaning

- .1 Clean interior and exterior of all systems including strainers.

3.2 Field Quality Control

- .1 Site Tests: conduct following tests in accordance with Section 01 45 00 - Quality Control and submit report as described in PART 1 - SUBMITTALS.
- .2 Manufacturer's Field Services:
 - .1 Where specified, obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - SUBMITTALS.
 - .2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
 - .3 Schedule site visits, to review Work, as directed in PART 1 - QUALITY ASSURANCE.

3.3 Demonstration

- .1 Departmental Representative will use equipment and systems for test purposes prior to acceptance. Supply labour, material, and instruments required for testing.
- .2 Supply tools, equipment and personnel to demonstrate and instruct operating and maintenance personnel in operating, controlling, adjusting, trouble-shooting and servicing of all systems and equipment during regular work hours, prior to acceptance.
- .3 Use operation and maintenance manual and as-built drawings as part of instruction materials.
- .4 Instruction duration time requirements as specified in appropriate sections.

3.5 Protection

- .1 Protect equipment and systems openings from dirt, dust, and other foreign materials with materials appropriate to system.

END OF SECTION

PART 1 GENERAL

1.1 Related Sections

- .1 Section 01 33 00 Shop Drawings, Product Data and Samples
- .2 Section 01 35 33 Health and Safety Requirements
- .3 Section 01 61 00 Common Product Requirements
- .4 Section 01 74 19 Waste Management And Disposal
- .5 Section 01 78 00 Closeout Submittals
- .6 Section 28 31 00 Fire Detection and Alarm

1.2 References

- .1 American National Standards Institute/National Fire Prevention Association (ANSI/NFPA)
 - .1 ANSI/NFPA 13-2007, Installation of Sprinkler Systems.
 - .2 ANSI/NFPA 25-2007, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems.
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .3 Underwriter's Laboratories of Canada (ULC).
- .4 Fire Commissioner of Canada FC 403, "Sprinkler System".

1.3 Samples

- .1 Submit samples of following:
 - .1 Each type of sprinkler head.
 - .2 Signs.

1.4 Design Requirements

- .1 Design automatic wet and dry pipe fire suppression sprinkler systems in accordance with required and advisory provisions of NFPA 13, by hydraulic calculations for uniform distribution of water over design area.
- .2 Include with each system materials, accessories, and equipment inside building to provide each system complete and ready for use.
- .3 Design and provide each system to give full consideration to blind spaces, piping, electrical equipment, ducts, and other construction and equipment in accordance with detailed shop drawings.
- .4 Locate sprinkler heads in consistent pattern with ceiling grid, lights, and air supply diffusers.
- .5 Devices and equipment for fire protection service: ULC approved for use in sprinkler systems.
- .6 Design systems for earthquake protection for buildings in seismic zone applicable.
- .7 Location of Sprinkler Heads:
 - .1 Locate heads in relation to ceiling and spacing of sprinkler heads not to exceed that permitted by NFPA 13.

- .2 Uniformly space sprinklers on branch.
- .8 Water Distribution:
 - .1 Make distribution uniform throughout the area in which sprinkler heads will open.
- .9 Water Supply:
 - .1 Base hydraulic calculations on static and residual pressures indicated on drawings.

1.5 Submittals

- .1 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and datasheet in accordance with Section 01 33 00 – Shop Drawings, Product Data and Samples.
 - .2 Submit two copies of Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS) in accordance with Section 01 33 00 - Shop Drawings, Product Data and Samples.
- .2 Shop Drawings:
 - .1 Submit shop drawings in accordance with Section 01 33 00 - Shop Drawings, Product Data and Samples.
 - .2 Shop drawings: submit drawings stamped and signed by professional engineer registered or licensed in Province. of B.C.
 - .3 Indicate:
 - .1 Materials.
 - .2 Finishes.
 - .3 Method of anchorage
 - .4 Number of anchors.
 - .5 Supports.
 - .6 Reinforcement.
 - .7 Assembly details.
 - .8 Accessories.
- .3 Quality assurance submittals: submit following in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Test reports:
 - .1 Submit certified test reports for wet pipe fire protection sprinkler systems from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties.
 - .2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
 - .3 Instructions: submit manufacturer's installation instructions.

- .4 Closeout Submittals:
 - .1 Submit maintenance and engineering data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals in accordance with ANSI/NFPA 20.
 - .2 Manufacturer's Catalog Data, including specific model, type, and size for:
 - .1 Pipe and fittings.
 - .2 Sprinkler heads.
 - .3 Pipe hangers and supports.
 - .4 Mechanical couplings.
 - .3 Drawings:
 - .1 Sprinkler heads and piping system layout.
 - .1 Prepare detail working drawings of system layout in accordance with NFPA 13 using full size contract drawings.
 - .2 Show data essential for proper installation of each system.
 - .3 Show details, plan view, elevations, and sections of systems supply and piping.
 - .4 Show piping schematic of systems supply, devices, valves, pipe, and fittings.
 - .4 Design Data:
 - .1 Calculations of sprinkler system design.
 - .2 Indicate type and design density of each system.
 - .5 Field Test Reports:
 - .1 Preliminary tests on piping system.
 - .6 Records:
 - .1 As-Built drawings of each system.
 - .1 After completion, but before final acceptance, submit complete set of as-built drawings (prints) of each system for record purposes.
 - .2 Submit drawings in digital file versions with title block similar to full size contract drawings.
 - .7 Operation and Maintenance Manuals:
 - .1 Provide maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
 - .2 Provide detailed hydraulic calculations including summary sheet, and Contractors Material and Test Certificate for aboveground piping and other documentation for incorporation into manual specified in Section 01 78 00 - Closeout Submittals in accordance with ANSI/NFPA 13.

1.6 Quality Assurance

- .1 Qualifications:
 - .1 Installer: company or person specializing in wet sprinkler systems with documented experience approved by manufacturer.

- .2 Health and Safety:
 - .1 Do construction occupational health and safety in accordance with Section 01 35 33 - Health and Safety Requirements.
- .3 Inspections and Tests:
 - .1 All inspections, examinations and tests required by the "Authorities and Agencies" specified shall be arranged and paid for by the fire protection contractor, as necessary to obtain complete and final acceptance of the fire protection system.
 - .2 Provide Contractor's Material and Test Certificates and all required test papers as may be requested by all parties having jurisdiction and duly witnessed by Engineer, showing proof of:
 - Hydrostatic test of overhead piping @ 1400 kPa (200 PSI).
 - Verification of all alarm and trouble devices installed under this contract.
 - .3 If welding is required the Contractor shall submit a copy of the welder's certification to the Engineer for record purposes prior to starting work.

1.7 Maintenance

- .1 Extra Materials:
 - .1 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Provide spare sprinklers and tools as required by ANSI/NFPA 13.

1.8 Delivery, Storage and Handling

- .1 Packing, shipping, handling and unloading:
 - .1 Deliver, store and handle in accordance with Section 01 61 00 - Common Product Requirements.
 - .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Storage and Protection:
 - .1 Store materials indoors in dry location.
 - .2 Store and protect materials from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer.
- .3 Waste Management and Disposal:
 - .1 Construction/Demolition Waste Management and Disposal: separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Construction/Demolition Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Pipe, Fittings & Valves

- .1 Pipe:
 - .1 Piping shall meet or exceed one of the following standards:
 - .1 Black and Hot-Dipped Galvanized Welded and Seamless Steel Pipe – ASTM A795
 - .2 Welded and Seamless Steel Pipe – ANSI/ASTM A53
 - .3 Wrought Steel Pipe – ANSI B36.19M
 - .4 Elec.-Resistance Welded Steel Pipe – ASTM A135
 - .2 All thickness for pressures up to 2070 kPa (300 psi) shall be as follows:
 - .1 Joined by shop welding or roll grooving:
 - .1 Up to and incl. 125mm (5") – Schedule 10
 - .2 150mm (6") – 3.40mm (0.134)
 - .3 200mm, 250mm (8", 10") – 4.78mm (0.188")
 - .1 Joined by threaded fittings or cut grooves:
 - .1 up to 200mm (8") – Schedule 40
 - .2 200mm (8") and larger – Schedule 30
- .2 Fittings and joints to ANSI/NFPA 13:
 - .1 Ferrous: screwed, welded, flanged or roll grooved.
 - .2 Copper tube: screwed, soldered, brazed.
 - .3 System piping 50mm (2") and smaller shall be Schedule 40 and joined with threaded fittings in accordance with NFPA 13. Larger sizes shall be Schedule 10 and joined by welding or groove joining methods in accordance with NFPA 13.
 - .4 All grooved products shall be of one manufacturer. All grooved end fittings shall be of "full flow" design and manufactured from ductile iron conforming to ASTM A-536. Grooved coupling shall be designed with angle bolt pads to provide a rigid joint except where flexibility is required. "Flush cap" or "flush seal" gaskets shall be used with couplings in dry pipe systems.
 - .5 Cast iron floor and ceiling plates with set screws shall be provided whenever pipe passes through walls, floors and partitions. In finished areas, plates shall be chrome plated.
- .3 Valves:
 - .1 UL_C listed for fire protection service.
 - .2 Up to NPS 2: bronze, screwed ends, O. S. & Y. gate.
 - .3 NPS 2 1/2 and over: cast iron, flanged or roll grooved ends, indicating butterfly valve; OS & Y gate.
 - .4 Swing check valves.
 - .5 Ball drip.

- .6 All water supply and zone isolation valves shall be monitored with tamper switches. Electric wiring for control and alarm components will be provided Under Division 16.
- .7 Valves controlling water supply and alarm shut-off shall be of O. S. & Y. type with rising stem or approved gear operated butterfly valves with supervisory switch. Where a grooved piping system is installed, grooved end isolation/control valves may be used. Valves shall be supervised by a factory installed double throw/double pole switch.
- .8 All O. S. & Y. gate vales shall be monitored with tamper switches. Electric wiring for control and alarm components shall be provided under Division 16.
- .4 Pipe hangers:
 - .1 ULC listed for fire protection services.
 - .2 Hanger standards shall conform to Section 3-10 of NFPA 13. Use "C" clamps complete with lock nuts and restraining straps. Hangers shall be supplied and installed in accordance with NFPA 13. C-type clamps used to attach hangers to the building structure shall be equipped with lock nuts and retaining straps.
 - .3 Sway bracing shall be installed as per Section 3-5.3.5 of NFPA 13.

2.2 Sprinkler Heads

- .1 General: to ANSI/NFPA 13 and ULC listed for fire services.
- .2 All sprinklers in suspended ceiling areas shall be chrome finish recessed type with chrome flush type escutcheon plates. All sprinklers in open ceiling areas shall be of brass finish upright or pendent types. All sidewall sprinklers shall be chrome finish horizontal type.
- .3 Sprinkler shall be protected from mechanical injury by standard guards where necessary. The proximity of sprinklers to heating units shall be taken into consideration in determining the temperature rating.
- .4 Adjacent to each sprinkler valve station, provide one (1) 12-sprinkler capacity Underwriters approved cabinet complete with various type and temperatures of sprinklers in ratio to the numbers installed of each type along with a standard sprinkler wrench.

2.3 Supervisory Switches

- .1 General: to ANSI/NFPA 13 and ULC listed for fire service.
- .2 Valves:
 - .1 Mechanically attached to valve body, with normally open and normally closed contacts and supervisory capability.
- .3 Pressure or flow switch type:
 - .1 With normally open and normally closed contacts and supervisory capability.
 - .2 Provide switch with circuit opener or closer for automatic transmittal of alarm over facility fire alarm system.
 - .3 Connect into building fire alarm system.
 - .4 Connection of switch: Section 28 31 00 – Fire Detection and Alarm.

2.4 Pressure Gauges

- .1 Provide pressure gauges at the following locations:
 - dry pipe valve
 - compressor
 - top of all standpipe risers
- .2 Pressure gauges shall be ULC listed stem mount or wall mount type with Bourdon phosphor bronze tube, brass socket, 6 mm [1/4"] lower connection, aluminum case in black enamel finish, chrome removable slip ring, stainless steel rotary type movement, minimum 90mm [3 1/2"] dial of 1% of full scale range and pressure range to suit application, with lever handle cock and brass 6 mm [1/4"] NPT snubber to suit service.

2.5 Flow Switches

- .1 Provide alarm indication for each system or zone indicated. Flow switches shall be vane type with retard for pipes 50mm [2"] or larger; without retard for smaller pipe sizes.
- .2 All zones shall have a flow switch, an isolation valve and an integral test and drain.

2.6 Pipe Sleeves

- .1 Provide pipe sleeves where piping passes through walls, floors, and roofs.
- .2 Secure sleeves in position and location during construction.
- .3 Provide sleeves of sufficient length to pass through entire thickness of walls, floors, and roofs.
- .4 Provide 2.5 cm minimum clearance between exterior of piping and interior of sleeve or core-drilled hole.
 - .1 Firmly pack space with mineral wool insulation.
 - .2 Seal space at both ends of sleeve or core-drilled hole with plastic waterproof cement which will dry to firm but pliable mass, provide mechanically adjustable segmented elastomeric seal.
 - .3 In fire walls and fire floors, seal both ends of pipe sleeves or core-drilled holes with ULC listed fill, void, or cavity material.
- .5 Sleeves in Masonry and Concrete Walls, Floors, and Roofs:
 - .1 Provide hot-dip galvanized steel, ductile-iron, cast-iron sleeves.
 - .2 Core drilling of masonry and concrete may be provided in lieu of pipe sleeves when cavities in core-drilled hole are completely grouted smooth.
- .6 Sleeves in Other Than Masonry and Concrete Walls, Floors, and Roofs:
 - .1 Provide 0.61 mm thick galvanized steel sheet.

2.7 Escutcheon Plates

- .1 Provide split hinged type metal plates for piping passing through walls, floors, and ceilings in exposed spaces.
- .2 Provide polished chromium-plated finish on copper alloy plates in finished spaces.
- .3 Provide paint finish on metal plates in unfinished spaces.

2.8 Spare Parts Cabinet

- .1 For storage of maintenance materials, spare sprinkler heads and special tools.
- .2 Construct to sprinkler head manufacturer's standard.

2.9 Inspector's Test Connection

- .1 Locate inspector's test connection at hydraulically most remote part of each system, provide test connections approximately 3m above floor for each sprinkler system or portion of each sprinkler system equipped with alarm device.
- .2 Provide test connection piping to location where discharged without property damage.
- .3 Provide discharge orifice of same size as corresponding sprinkler orifice.

2.10 Signs

- .1 Attach properly lettered and approved metal signs to each valve and alarm device to ANSI/NFPA 13.
- .2 Permanently fix hydraulic design data nameplates to riser of each system.

2.11 Double-Interlocked Electric/Pneumatic Release Preaction Valve (Supervised)

- .1 ULC listed & FM Approved
- .2 Grooved connections, sized to suit hydraulic requirements.
- .3 Components:
 - .1 Preaction valve
 - .2 Accelerator (as required to comply with NFPA).
 - .3 25VDC NC electric solenoid valve and pneumatic actuator
 - .4 Water supply control valve
 - .5 Pilot operated relief valve
 - .6 Flow test valve
 - .7 Air maintenance device with low pressure alarm.
 - .8 Alarm pressure switch with supervisory capability.
 - .9 Pressure gauges.
 - .10 Drain valve.
 - .11 Alarm test valve with associated piping.
 - .12 Prime valve and check valve and restriction strainer
 - .13 Shut off valve - OS & Y with tamper-proof device wired back to fire alarm panel.
 - .14 Drain manifold.
 - .15 Preaction Panel.

- .1 Preaction panel shall be of same manufacturer as the preaction valve.
- .2 Multi-hazard release control panel for use on a preaction sprinkler system.
- .3 Integral power supply, battery charger and standby batteries.
- .4 Relays: alarm, trouble, supervisory and waterflow.
- .5 Class: Class A
- .6 Voltage: 120 VAC
- .7 Standard and custom programming capabilities.
- .8 Enclosure:
 - .1 Mount with panel centerline 1.5m above finished floor elevation.
 - .2 Switches and other controls not accessible without use of key.
 - .3 Design of panel: neat, compact assembly containing parts and equipment required to provide specified operating and supervising functions of system.
 - .4 Panel components: CSA approved.
 - .5 Panel cabinet: steel, finished on inside and outside with factory applied enamel finish.
- .4 All components shall be compatible with electrical devices specified under Divisions 26 and 28, and be of one manufacturer, where applicable.

2.12 Compressed Air Supply

- .1 Tank Mounted Automatic Air Compressor.
- .2 ULC listed.
- .3 Capacity:
 - .1 To restore normal air pressure in system within [30 min] [60 minutes for low differential systems].
 - .2 To provide air pressure [of 140 kPa in excess of calculated trip pressure of dry pipe valve] [in accordance with instruction sheet furnished with dry pipe valve].
- .4 Piping: ferrous, NPS 3/4 screwed joints and fittings, to ANSI/NFPA 13.

2.13 Relief Valve

- .1 ULC listed.

PART 3 EXECUTION

3.1 Manufacturer's Instruction

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

3.2 Above Ground Piping Systems

- .1 Provide fittings for changes in direction of piping and for connections.
 - .1 Make changes in piping sizes through tapered reducing pipe fittings, bushings will not be permitted.
 - .2 Perform welding in shop; field welding will not be permitted.
 - .3 Conceal piping in areas with suspended ceiling.

3.3 Pipe Installation

- .1 Install piping straight and true to bear evenly on hangers and supports. Do not hang piping from plaster ceilings.
- .2 Keep interior and ends of new piping and existing piping thoroughly cleaned of water and foreign matter.
- .3 Keep piping systems clean during installation by means of plugs or other approved methods. When work is not in progress, securely close open ends of piping to prevent entry of water and foreign matter.
- .4 Inspect piping before placing into position.
- .5 Install spare parts cabinet as indicated.
- .6 Valve identification:
 - .1 Identify drain valve and auxiliary valves.

3.4 Disinfection

- .1 Disinfect new piping.
- .2 Fill piping systems with solution containing minimum of 50 parts per million of chlorine and allow solution to stand for minimum of 24 hours.
- .3 Flush solution from systems with clean water until maximum residual chlorine content is not greater than 0.2 part per million or residual chlorine content of domestic water supply.
- .4 Obtain at least two consecutive satisfactory bacteriological samples from piping, analyzed by certified laboratory, and submit results prior to piping being placed into service.

3.5 Field Painting

- .1 Clean, pre-treat, prime, and paint new systems including piping, conduit, hangers, supports, miscellaneous metalwork, and accessories.
- .2 Apply coatings to clean, dry surfaces, using clean brushes.
- .3 Clean surfaces to remove dust, dirt, rust, and loose mill scale.

- .4 Immediately after cleaning, provide metal surfaces with 1 coat of pretreatment primer applied to minimum dry film thickness of 0.3 ml, and one coat of zinc chromate primer applied to minimum dry film thickness of 1.0 ml.
- .5 Shield sprinkler heads with protective covering while painting is in progress.
- .6 Upon completion of painting, remove protective covering from sprinkler heads.
- .7 Remove sprinkler heads which have been painted and replace with new sprinkler heads.
- .8 Provide primed surfaces with following:
 - .1 Piping in Finished Areas:
 - .1 Provide primed surfaces with 2 coats of paint to match adjacent surfaces.
 - .2 Provide valves and operating accessories with 1 coat of red alkyd gloss enamel applied to minimum dry film thickness of 1.0 mil.
 - .3 Provide piping with 50 mm wide red enamel bands self-adhering red plastic bands spaced at maximum of 6 m intervals throughout piping systems.
 - .2 Piping in Unfinished Areas:
 - .1 Finish painting not required in spaces above suspended ceilings, crawl spaces, pipe chases, mechanical equipment room, and spaces where walls or ceiling are not painted or not constructed of a pre-finished material.
 - .2 Provide piping with 50 mm wide red enamel bands self-adhering red plastic bands spaced at maximum of 6 m intervals.

3.6 Field Quality Control

- .1 Site Test, Inspection:
 - .1 Perform test to determine compliance with specified requirements in presence of Departmental Representative.
 - .2 Test, inspect, and approve piping before covering or concealing.
 - .3 Preliminary Tests:
 - .1 Hydrostatically test each system at 200 psig for a 2 hour period with no leakage or reduction in pressure.
 - .2 Flush piping with potable water in accordance with NFPA 13.
 - .3 Piping above suspended ceilings: tested, inspected, and approved before installation of ceilings.
 - .4 Test alarms and other devices.
 - .5 Test water flow alarms by flowing water through inspector's test connection. When tests have been completed and corrections made, submit signed and dated certificate in accordance with NFPA 13.
 - .4 Formal Tests and Inspections:
 - .1 Do not submit request for formal test and inspection until preliminary test and corrections are completed and approved.
 - .2 Submit written request for formal inspection at least 15 days prior to inspection date.
 - .3 Repeat required tests as directed.

- .4 Correct defects and make additional tests until systems comply with contract requirements.
- .5 Furnish appliances, equipment, instruments, connecting devices, and personnel for tests.
- .6 Authority of Jurisdiction, will witness formal tests and approve systems before they are accepted.
- .7 Altered and relocated sprinkler system to be inspected and tested in conformance with NFPA 25.

3.7 Field Review

- .1 Provide the services of the Professional Engineer who designed the fire protection systems for "Field Review" of the installation including completion of the Letters of Assurance of Professional Review and Compliance in accordance with the Building Code. Typewritten inspection reports shall be submitted to the project consultant during the construction period.
- .2 Assurance commitment letters shall be provided at the commencement of the project for Building Permit applications, and at its completion.
- .3 All work shall be carried out by Sprinkler Pipe Fitters who carry a "Certificate of Qualification" for this trade as issued by the B.C. Province Ministry of Labour.

3.8 Placing In Service

- .1 When the entire fire protection system has been completed to the satisfaction of the Departmental Representative and/or their agents and when operating and maintenance instructions have been provided, the Fire Protection Contractor shall, in the presence of the Departmental Representative, demonstrate the complete operation and maintenance required to the Departmental Representative's personnel. A complete operational test conducted on the entire installation for the purpose of verification of compliance with all applicable standards and codes shall be carried out.
- .2 Three copies of a complete operating manual shall be provided, which must include the following:
 - Detailed instructions for the normal maintenance of all installed equipment including operational procedures, frequency of operational checks, service instructions and trouble shooting instructions.
 - Valve schedule for all valves including location, service type and normal position for all systems.
 - Schematic showing the location of each inspectors test valves, low point drains and flow switches where applicable.
 - Warranties and certificates.
 - Manufacturer's operating and maintenance manuals.
 - Description of the operation of each system and the function of each piece of equipment.
 - Lubrication schedule for all lubricated equipment including recommended lubricants.

END OF SECTION

PART 1 GENERAL

1.1 Related Sections

- .1 Section 01 33 00 Shop Drawings, Product Data and Samples
- .2 Section 01 35 33 Health and Safety Requirements
- .3 Section 01 74 19 Waste Management And Disposal
- .4 Section 01 78 00 Closeout Submittals

1.2 References

- .1 American Society for Testing and Materials International, (ASTM).
 - .1 ASTM B 32-03, Specification for Solder Metal.
 - .2 ASTM B 306-02, Specification for Copper Drainage Tube (DWV).
 - .3 ASTM C 564-03a, Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings.
- .2 Canadian Standards Association (CSA International).
 - .1 CAN/CSA-B70-02, Cast Iron Soil Pipe, Fittings and Means of Joining.
 - .2 CAN/CSA-B125-01, Plumbing Fittings.

1.3 Submittals

- .1 Submittals in accordance with Section 01 33 00 - Shop Drawings, Product Data and Samples.
- .2 Provide maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.4 Health and Safety

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

1.5 Waste Management and Disposal

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management And Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Place materials defined as hazardous or toxic in designated containers.
- .4 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal regulations.

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

PART 2 PRODUCTS

2.1 Copper Tube and Fittings

- .1 Above ground sanitary storm and vent, Copper Type DWV to: ASTM B 306.
 - .1 Fittings.
 - .1 Cast brass: to CAN/CSA-B125.
 - .2 Wrought copper: to CAN/CSA-B125.
 - .2 Solder: tin-lead, 50:50, type 50A or lead free, tin-copper alloy 95:5, type TA to ASTM B 32.

2.2 Cast Iron Piping and Fittings

- .1 Buried sanitary storm and vent, cast iron (minimum NPS 2) to: CAN/CSA-B70.
 - .1 Joints.
 - .1 Mechanical joints.
 - .1 Neoprene or butyl rubber compression gaskets: to ASTM C 564 or CAN/CSA-B70.
 - .2 Stainless steel clamps.
 - .2 Above ground sanitary storm and vent: Cast iron to CAN/CSA-B70.
 - .1 Joints.
 - .1 Mechanical joints.
 - .1 Neoprene or butyl rubber compression gaskets with stainless steel clamps.

PART 3 EXECUTION

3.1 Installation

- .1 In accordance with Section 23 05 05 - Installation of Pipework.
- .2 Install in accordance with Canadian Plumbing Code, Provincial Plumbing Code and local authority having jurisdiction.

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- .3 Install buried pipe on 150 mm bed of clean washed sand, shaped to accommodate hubs and fittings, to line and grade as indicated. Backfill with 150 mm of clean washed sand.
- .4 Install above ground piping parallel and close to walls and ceilings to conserve headroom and space, and to grade as indicated.

3.2 Testing

- .1 Pressure test buried systems before backfilling.
- .2 Hydraulically test to verify grades and freedom from obstructions.

3.3 Performance Verification

- .1 Cleanouts:
 - .1 Ensure accessible and that access doors are correctly located.
 - .2 Open, cover with linseed oil and re-seal.
 - .3 Verify that cleanout rods can probe as far as the next cleanout, at least.
- .2 Test to ensure traps are fully and permanently primed.

END OF SECTION

PART 1 GENERAL

1.1 Summary

- .1 Section Includes:
 - .1 The supply and installation of Plumbing Specialties and Accessories.
- .2 Products Installed but not Supplied Under this Section:
 - .1 Install rough-in for equipment supplied by others, complete with valves on hot and cold water supplies, waste and vent.
 - .2 Equipment installed by others.
 - .1 Connect with unions.
 - .3 Equipment not installed.
 - .1 Capped for future connection by others.

1.2 Related Section

- .1 Section 01 33 00 Shop Drawings, Product Data and Samples
- .2 Section 01 74 19 Waste Management & Disposal
- .3 Section 01 78 00 Closeout Submittals
- .4 Section 01 35 33 Health and Safety Requirements.

.3 References

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM A 126-95(2001), Specification for Gray Iron Castings for Valves, Flanges and Pipe Fittings.
 - .2 ASTM B 62-93, Specification for Composition Bronze or Ounce Metal Castings.
- .2 American Water Works Association (AWWA)
- .3 Canadian Standards Association (CSA)
 - .1 CSA-B64 Series-01, Backflow Preventers and Vacuum Breakers.
 - .2 CSA-B356-00, Water Pressure Reducing Valves for Domestic Water Supply Systems.
- 4 Plumbing and Drainage Institute (PDI)
 - .1 PDI-WH201-92, Water Hammer Arresters Standard.

1.4 Submittals

- .1 Submittals in accordance with Section 01 33 00 - Shop Drawings, Product Data and Samples.
- .2 Indicate, for all plumbing specialties and accessories:
 - .1 Dimensions, construction details, roughing-in dimensions.

1.5 Closeout Submittals:

- .1 Submit maintenance data in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Include:
 - .1 Description of plumbing specialties and accessories, giving manufacturer's name, type, model, year, capacity.
 - .2 Details of operation, servicing, maintenance.
 - .3 List of recommended spare parts.

1.6 Health and Safety

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

1.7 Delivery Storage and Disposal

- .1 Waste Management and Disposal:
 - .1 Separate waste materials for recycling in accordance with Section 01 74 19 - Waste Management and Disposal.
 - .2 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan
 - .3 Fold up metal banding, flatten and place in designated area for recycling.

PART 2 PRODUCTS

2.1 Cleanouts

- .1 Cleanout plugs: heavy cast iron male ferrule with brass screws and threaded brass or bronze plug. Sealing-caulked lead seat or neoprene gasket.
- .2 Access covers:
 - .1 Wall access: face or wall type, polished nickel bronze or stainless steel round cover with flush head securing screws, bevelled edge frame complete with anchoring lugs.
 - .1 Floor access: round cast iron body and frame with adjustable secured nickel bronze top cast box with anchor lugs and:

- .1 Plugs: bolted bronze with neoprene gasket.
 - .2 Cover for unfinished concrete floors: cast iron round gasket, vandal-proof screws.
 - .3 Cover for terrazzo finish: polished [nickel bronze] [brass] with recessed cover for filling with terrazzo, vandal-proof locking screws
 - .4 Cover for tile and linoleum floors: polished nickel bronze with recessed cover for linoleum or tile infill, complete with vandal-proof locking screws.
 - .5 Cover for carpeted floors: polished nickel bronze with deep flange cover for carpet infill, complete with carpet retainer vandal-proof locking screws.
- 2.2 Water Hammer Arrestor**
1. Copper construction, bellows type: to PDI-WH201.
- 2.3 Back Flow Preventer**
- .1 To CSA-B64 Series, Type and size: as indicated
 - .2 Application: as indicated.
- 2.4 Vacuum Breaker**
- .1 To CSA-B64 Series.
- 2.5 Floor Drain FD-1**
- .1 Floor Drain, all duco coated cast iron body, size as noted, flashing clamp with seepage openings oval Funnel (8-1/4" x 3-1/4") duco Cast Iron, trap primer connection 13mm (1/2"), cast iron Grate.
- 2.6 Trap Seals Primer**
- .1 Brass, with integral vacuum breaker, NPS1/2 solder ends, NPS1/2 drip line connection.
- 2.7 Strainers**
- .1 860 kPa, Y type with 20 mesh, monel, bronze or stainless steel removable screen.
 - .2 NPS2 and under, bronze body, screwed ends, with brass cap.
 - .3 NPS2 1/2 and over, cast iron body, flanged ends, with bolted cap.

2.8 Hose Bibbs and Sediment faucets

- .1 Bronze construction complete with integral back flow preventer, hose thread spout, replaceable composition disc, and chrome plated in finished areas.

PART 3 EXECUTION

3.1 Installation

- .1 Install in accordance with Canadian Plumbing Code provincial codes, and local authority having jurisdiction.
- .2 Install in accordance with manufacturer's instructions and as specified.

3.2 Cleanouts

- .1 In addition to those required by code, and as indicated, install at base of soil and waste stacks, and rainwater leaders.
- .2 Bring cleanouts to wall or finished floor unless serviceable from below floor.
- .3 Building drain cleanout and stack base cleanouts: line size to maximum NPS4.

3.3 Water Hammer Arrestor

- .1 Install on branch supplies to each fixture or group of fixtures and where indicated.

3.4 Back Flow Preventers

- .1 Install in accordance with CAN/CSA-B64 Series, where indicated and elsewhere as required by code.
- .2 Pipe discharge to terminate over nearest drain and/ or service sink.

3.5 Hose Bibbs and Sediment Faucets

- .1 Install at bottom of all risers, at low points to drain systems, and as indicated.

3.6 Trap Seal Primers

- .1 Install for all floor drains and elsewhere, as indicated.
- .2 Install on cold water supply to nearest frequently used plumbing fixture, in concealed space, to approval of Consultant.
- .3 Install soft copper or plastic tubing to floor drain.

3.7 Performance Verification:

- .1 General:

- .1 In accordance with Section 23 08 01 – Performance Verification Mechanical Piping Systems.
- .2 PV procedures:
 - .1 Vacuum breakers, backflow preventers: operation under all conditions.
 - .2 Thermostatic controls: Verify temperature settings, operation of control, limit and safety controls.

END OF SECTION

PART 1 GENERAL

1.1 Related Sections

- .1 Section 01 01 50 General Instruction
- .2 Section 23 05 00 Common Work Results – Mechanical

1.2 References

- .1 National Building Code of Canada (NBC)

1.3 Shop Drawings

- .1 Submit shop drawings in accordance with Section 01 01 50 – General Instructions.
- .2 Provide vibration isolation systems shop drawings complete with performance and product data. Shop drawings shall demonstrate compliance with the National Building Code and shall bear the seal of a Professional Engineer.
- .3 Provide detailed drawings of all seismic restraint systems for piping and equipment.

1.4 Waste Management and Disposal

- .1 Separate and recycle waste materials in accordance with Section 01 11 55 – General Instructions.
- .2 Divert unused metal and wiring materials from landfill to metal recycling facility approved by Departmental Representative.
- .3 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .4 Dispose of packaging material in appropriate on-site bin for recycling in accordance with site waste management program.

PART 2 PRODUCTS

2.1 Vibration Isolation System – General

- .1 Performance of vibration isolation systems shall be designed by manufacturer specializing in vibration isolation materials and devices.
- .2 Size and shape of bases type shall be coordinated with submitted equipment.
- .3 Products shall of the same manufacturer unless otherwise noted.

2.2 Elastomeric Pads

- .1 Type EP1 - neoprene waffle or ribbed; 9 mm [3/8"] minimum thick; 50 durometer; maximum loading 350 kPa [50 psi].
- .2 Type EP2 - rubber waffle or ribbed; 9 mm [3/8"] minimum thick; 30 durometer natural rubber; maximum loading 415 kPa [60 psi].

- .3 Type EP3 - neoprene-steel-neoprene; 9 mm [3/8"] minimum thick neoprene bonded to 1.71 mm [16 gauge] steel plate; 50 durometer neoprene, waffle or ribbed; holes sleeved with isolation washers; maximum loading 350 kPa [50 psi].
- .4 Type EP4 - rubber-steel-rubber; 9 mm [3/8"] minimum thick rubber bonded to 1.71 mm [16 gauge] steel plate; 30 durometer natural rubber, waffle or ribbed; holes sleeved with isolation washers; maximum loading 415 kPa [60 psi].

2.3 Hangers

- .1 Colour coded springs, rust resistant, painted box type hangers. Arrange to permit hanger box or rod to move through a 30° arc without metal to metal contact.
- .2 Type H1 - neoprene - in-shear, molded with rod isolation bushing which passes through hanger box.
- .3 Type H2 - stable spring, elastomeric washer, cup with molded isolation bushing which passes through hanger box.
- .4 Type H3 - stable spring, elastomeric element, cup with molded isolation bushing which passes through hanger box.
- .5 Type H4 - stable spring, elastomeric element with pre-compression washer and nut with deflection indicator.

2.4 Acoustic Barriers for Anchors and Guides

- .1 Acoustic barriers: between pipe and support, consisting of 25 mm [1"] minimum thick neoprene isolation material.

2.5 Flexible Pipe Connectors

- .1 Inner corrugated hose: stainless steel.
- .2 Outer braid: Braided wire mesh stainless steel outer jacket.
- .3 Type of end connection: threaded for 50mm [2"] or smaller; flange for 65mm [2-1/2"] or larger.
- .4 Operating conditions:
 - .1 Working pressure: 1379 kPa [200 psi].
 - .2 Working temperature: 4540 °C [850 °F].

2.6 Seismic Control Measures

- .1 General:
 - .1 Design anchorage and attachment methods for all systems and/or equipment as specified herein.
 - .2 Seismic control systems to work in all directions.
 - .3 Fasteners and attachment points to resist same maximum load as seismic restraint.
 - .4 Drilled or power driven anchors and fasteners not permitted.
 - .5 No equipment, equipment supports or mounts to fail before failure of structure.

- .6 Supports of cast iron or threaded pipe not permitted.
- .7 Seismic control measures not to interfere with integrity of firestopping.
- .8 For equipment mounted on housekeeping pad, specify the minimum distance between anchor bolt and edge of housekeeping pad.
- .2 Static equipment:
 - .1 Anchor equipment to equipment supports. Anchor equipment supports to structure.
 - .2 Seismic restraints:
 - .1 Cushioning action to be gentle and steady.
 - .2 Shall never reach metal-like stiffness.
- .3 Vibration isolated equipment:
 - .1 Seismic control measures not to jeopardize noise and vibration isolation systems. Provide 6 to 9mm clearance during normal operation of equipment and systems between seismic restraint and equipment.
 - .2 Provide seismic restraints in addition to vibration isolation system to resist complete isolator unloading.
- .4 Piping systems:
 - .1 Provide seismic restraints for all piping in accordance to the latest edition of SMACNA Seismic Restraint Manual as described below:
 - .2 Seismic restraints may be omitted for the following conditions:
 - .1 All piping suspended by individual hangers 305mm [12"] or less in length, as measured from the top of the pipe to the bottom of the structural support for the hanger.
 - .3 To be compatible with requirements for anchoring and guiding of piping systems.
 - .4 Wet weight of piping shall be to be used for designing seismic restraint systems.
 - .5 Small pipes may be rigidly secured to larger pipes for restraint purposes, but not reverse.
 - .6 Where cable is used for restraining vibration isolated piping systems, install cable with sufficient slack to avoid short-circuiting of vibration isolators.
 - .5
- .5 Bracing methods:
 - .1 Approved by Departmental Representative.
 - .2 Structural angles or channels.
 - .3 Cable restraint system incorporating grommets, shackles and other hardware to ensure alignment of restraints and to avoid bending of cables at connection points. Incorporate neoprene into cable connections to reduce shock loads.

PART 3 EXECUTION

3.1 Manufacturer's Instructions

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

3.2 Installation

- .1 Seismic control measures to meet requirements of NBC.
- .2 Install vibration isolation equipment in accordance with manufacturers instructions and adjust mountings to level equipment.
- .3 Ensure piping and electrical connections to isolated equipment do not reduce system flexibility and that piping and conduit passage through walls and floors do not transmit vibrations.
- .4 Where isolation is bolted to floor use vibration isolation rubber washers.
- .5 Block and shim level bases so that piping connections can be made to rigid system at operating level, before isolator adjustment is made. Ensure that there is no physical contact between isolated equipment and building structure.

3.3 Field Quality Control

- .1 Provide the services of the Professional Engineer(s) who designed the restraint systems for "Field Review" of the installed components, and submit the following to the Departmental Representative:
 - .1 Assurance commitment letter, signed and sealed; provided at the commencement of the project.
 - .2 Signed and sealed shop drawings of seismic restraints for equipment and piping provided prior to installation.
 - .3 Typewritten inspection reports provided during the construction period.
 - .4 Schedule C-B, signed and sealed; provided after performing "Field Review".

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 26 05 32 - Outlet Boxes, Conduit Boxes and Fittings.

1.2 REFERENCES

- .1 Definitions:
 - .1 Electrical and electronic terms: unless otherwise specified or indicated, terms used in these specifications, and on drawings, are those defined by IEEE SP1122.
- .2 Reference Standards:
 - .1 CSA Group
 - .1 CSA C22.1-12, Canadian Electrical Code, Part 1 (22nd Edition), Safety Standard for Electrical Installations.
 - .2 CSA C22.2 No. 0-10, General Requirements – Canadian Electrical Code, Part II.
 - .3 CAN/CSA-C22.3 No.1-10, Overhead Systems.
 - .4 CAN3-C235-83(R2010), Preferred Voltage Levels for AC Systems, 0 to 50,000 V.
 - .2 Institute of Electrical and Electronics (IEEE)/National Electrical Safety Code Product Line (NESC)
 - .1 IEEE SP1122-2000, The Authoritative Dictionary of IEEE Standards Terms, 7th Edition.

1.3 SCOPE

- .1 To provide all electrical components of a double interlock electric/pneumatic pre-action fire protection system in the Insectary 367 and Herbarium 353 rooms in the Pacific Forestry Centre.
- .2 Remove and relocate existing lighting fixtures in Herbarium 353 to suit new sprinkler layout.
- .3 Complete a load panel survey of existing emergency panel BX-1 to ensure there is sufficient capacity for additional loads.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for preaction panel, heat detectors, fire alarm horn, fire alarm LED strobe, breakers and monitor modules and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Submit for review fire alarm riser diagram and plan.

- .4 Shop drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of British Columbia, Canada.
 - .2 Submit wiring diagrams and installation details of equipment indicating proposed location, layout and arrangement, control panels, accessories, piping, ductwork, and other items that must be shown to ensure co-ordinated installation.
 - .3 Identify on wiring diagrams circuit terminals and indicate internal wiring for each item of equipment and interconnection between each item of equipment.
 - .4 Indicate of drawings clearances for operation, maintenance, and replacement of operating equipment devices.
 - .5 Submit 2 copies of 600 x 600 mm minimum size drawings and product data to authority having jurisdiction.
 - .6 If changes are required, notify Departmental Representative of these changes before they are made.
- .5 Certificates:
 - .1 Provide CSA certified equipment.
 - .2 Where CSA certified equipment is not available, submit such equipment to inspection authorities for special approval before delivery to site.
 - .3 Submit test results of installed electrical systems and instrumentation.
 - .4 Permits and fees: in accordance with General Conditions of contract.
 - .5 Submit certificate of acceptance from authority having jurisdiction upon completion of Work to Departmental Representative.
- .6 Manufacturer's Field Reports: submit to Departmental Representative manufacturer's written report, within 3 days of review, verifying compliance of Work as described in PART 3 - FIELD QUALITY CONTROL.

1.5 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for preaction panel, fire alarm horn and LED strobes, and monitor modules for incorporation into manual.
 - .1 Provide for each system and principal item of equipment as specified in technical sections for use by operation and maintenance personnel.
 - .2 Operating instructions to include following:
 - .1 Wiring diagrams, control diagrams, and control sequence for each principal system and item of equipment.
 - .2 Start up, proper adjustment, operating, lubrication, and shutdown procedures.
 - .3 Safety precautions.
 - .4 Procedures to be followed in event of equipment failure.
 - .5 Other items of instruction as recommended by manufacturer of each system or item of equipment.

- .3 Print or engrave operating instructions and frame under glass or in approved laminated plastic.
- .4 Post instructions where directed.
- .5 For operating instructions exposed to weather, provide weather-resistant materials or weatherproof enclosures.
- .6 Ensure operating instructions will not fade when exposed to sunlight and are secured to prevent easy removal or peeling.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect equipment from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 DESIGN REQUIREMENTS

- .1 Operating voltages: to CAN3-C235.
- .2 Motors, electric heating, control and distribution devices and equipment to operate satisfactorily at 60 Hz within normal operating limits established by above standard.
 - .1 Equipment to operate in extreme operating conditions established in above standard without damage to equipment.
- .3 Language operating requirements: provide identification nameplates for control items in English and French.
- .4 Use one nameplate for each language.

2.2 MATERIALS AND EQUIPMENT

- .1 Provide equipment in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Equipment to be CSA certified. Where CSA certified equipment is not available, obtain special approval from inspection authorities before delivery to site and submit such approval as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.
- .3 Factory assemble control panels and component assemblies.

2.3 WARNING SIGNS

- .1 Warning Signs: in accordance with requirements of Departmental Representative.

- .2 Decal signs, minimum size 175 x 250 mm.

2.4 WIRING TERMINATIONS

- .1 Ensure lugs, terminals, screws used for termination of wiring are suitable for either copper or aluminum conductors.

2.5 EQUIPMENT IDENTIFICATION

- .1 Identify electrical equipment with nameplates as follows:
 - .1 Nameplates: lamicoid 3 mm thick plastic engraving sheet, black face, white core, lettering accurately aligned and engraved into core mechanically attached with self tapping screws.
 - .2 Sizes as follows:

NAMEPLATE SIZES			
Size 1	10 x 50 mm	1 line	3 mm high letters
Size 2	12 x 70 mm	1 line	5 mm high letters
Size 3	12 x 70 mm	2 lines	3 mm high letters
Size 4	20 x 90 mm	1 line	8 mm high letters
Size 5	20 x 90 mm	2 lines	5 mm high letters
Size 6	25 x 100 mm	1 line	12 mm high letters
Size 7	25 x 100 mm	2 lines	6 mm high letters

- .2 Labels: embossed plastic labels with 6 mm high letters unless specified otherwise.
- .3 Wordings on nameplates to be approved by Departmental Representative prior to manufacture.
- .4 Allow for minimum of twenty-five (25) letters per nameplate.
- .5 Nameplates for terminal cabinets and junction boxes to indicate system and/or voltage characteristics.
- .6 Disconnects, starters and contactors: indicate equipment being controlled and voltage.
- .7 Terminal cabinets and pull boxes: indicate system and voltage.
- .8 Transformers: indicate capacity, primary and secondary voltages.
- .9 Contractor shall confirm if site specific equipment identification is required. If site has identification requirements then labelling shall follow the site standards.

2.6 WIRING IDENTIFICATION

- .1 Identify wiring with permanent indelible identifying markings, numbered, on both ends of phase conductors of feeders and branch circuit wiring.
- .2 Maintain phase sequence and colour coding throughout.
- .3 Colour coding: to CSA C22.1.
- .4 Use colour coded wires in communication cables, matched throughout system.

2.7 CONDUIT AND CABLE IDENTIFICATION

- .1 Colour code conduits, boxes and metallic sheathed cables.
- .2 Code with plastic tape or paint at points where conduit or cable enters wall, ceiling, or floor, and at 15 m intervals.
- .3 Colours: 25 mm wide prime colour and 20 mm wide auxiliary colour.

Prime	Auxiliary	
up to 250 V	Yellow	
up to 600 V	Yellow	Green
up to 5 kV	Yellow	Blue
up to 15 kV	Yellow	Red
Telephone	Green	
Other Communication Systems	Green	Blue
Fire Alarm	Red	
Emergency Voice	Red	Blue
Other Security Systems	Red	Yellow

2.8 FINISHES

- .1 Shop finish metal enclosure surfaces by application of rust resistant primer inside and outside, and at least two coats of finish enamel.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for this installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 INSTALLATION

- .1 Do complete installation in accordance with CSA C22.1 except where specified otherwise.
- .2 Do overhead and underground systems in accordance with CAN/CSA-C22.3 No.1 except where specified otherwise.

3.3 NAMEPLATES AND LABELS

- .1 Ensure manufacturer's nameplates, CSA labels and identification nameplates are visible and legible after equipment is installed.

3.4 CONDUIT AND CABLE INSTALLATION

- .1 If plastic sleeves are used in fire rated walls or floors, remove before conduit installation.
- .2 Install cables, conduits and fittings embedded or plastered over, close to building structure so furring can be kept to minimum.

3.5 LOCATION OF OUTLETS

- .1 Locate outlets in accordance with Section 26 05 32 - Outlet Boxes, Conduit Boxes and Fittings.
- .2 Do not install outlets back-to-back in wall; allow minimum 150 mm horizontal clearance between boxes.
- .3 Change location of outlets at no extra cost or credit, providing distance does not exceed 3000 mm, and information is given before installation.

3.6 MOUNTING HEIGHTS

- .1 Mounting height of equipment is from finished floor to centreline of equipment unless specified or indicated otherwise.
- .2 If mounting height of equipment is not specified or indicated, verify before proceeding with installation.
- .3 Install electrical equipment at following heights unless indicated otherwise.
 - .1 Panelboards: as required by Code or as indicated.
 - .2 Fire alarm stations: 1500 mm.
 - .3 Fire alarm bells: 2100 mm.
 - .4 Wall mounted speakers: 2100 mm.

3.7 CO-ORDINATION OF PROTECTIVE DEVICES

- .1 Ensure circuit protective devices such as overcurrent trips, relays and fuses are installed to required values and settings.

3.8 FIELD QUALITY CONTROL

- .1 Conduct following tests in accordance with Section 01 45 00 - Quality Control.
 - .1 Power distribution system including phasing, voltage, grounding and load balancing.
 - .2 Circuits originating from branch distribution panels.
 - .3 Motors, heaters and associated control equipment including sequenced operation of systems where applicable.
 - .4 Systems: fire alarm.
 - .1 Megger circuits, feeders and equipment up to 350 V with a 500 V instrument.
 - .2 Megger 350-600 V circuits, feeders and equipment with a 1000 V instrument.
 - .3 Check resistance to ground before energizing.

- .2 Carry out tests in presence of Departmental Representative.
- .3 Provide instruments, meters, equipment and personnel required to conduct tests during and at conclusion of project.
- .4 Manufacturer's Field Services:
 - .1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.
 - .2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

3.9 SYSTEM STARTUP

- .1 Instruct Departmental Representative in operation, care and maintenance of systems, system equipment and components.

3.10 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 26 05 00 – Common Work Results - Electrical

1.2 REFERENCES

- .1 CSA International
 - .1 CAN/CSA-C22.2 No.18.2-06(R2011), Wiring Devices.
 - .2 CAN/CSA-C22.2 No.65-13, Electrical Connectors.
- .2 Electrical and Electronic Manufacturers' Association of Canada (EEMAC)
 - .1 EEMAC 1Y-2-1961, Bushing Stud Connectors and Aluminum Adapters (1200 Ampere Maximum Rating).
- .3 National Electrical Manufacturers Association (NEMA)

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for wire and box connectors and include product characteristics, performance criteria, physical size, finish and limitations.

1.4 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for wire and box connectors for incorporation into manual.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect wire and box connectors from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

- .1 Pressure type wire connectors to: CAN/CSA-C22.2 No.65, with current carrying parts of copper sized to fit copper conductors as required.
- .2 Fixture type splicing connectors to: CAN/CSA-C22.2 No.65, with current carrying parts of copper sized to fit copper conductors 10 AWG or less.
- .3 Bushing stud connectors: to NEMA to consist of:
 - .1 Connector body and stud clamp for stranded, copper conductors.
 - .2 Clamp for stranded, copper conductors.
 - .3 Stud clamp bolts.
 - .4 Bolts for copper conductors.
 - .5 Bolts for aluminum conductors.
 - .6 Sized for conductors as indicated.
- .4 Clamps or connectors for armoured cable, TECK cable, aluminum sheathed cable, mineral insulated cable, flexible conduit and non-metallic sheathed cable as required to: CAN/CSA-C22.2 No.18.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for wire and box connectors installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental.

3.2 INSTALLATION

- .1 Remove insulation carefully from ends of conductors and cables and:
 - .1 Apply coat of zinc joint compound on aluminum conductors prior to installation of connectors.
 - .2 Install mechanical pressure type connectors and tighten screws with appropriate compression tool recommended by manufacturer. Installation shall meet secureness tests in accordance with CAN/CSA-C22.2 No.65.
 - .3 Install fixture type connectors and tighten to CAN/CSA-C22.2 No.65. Replace insulating cap.
 - .4 Install bushing stud connectors in accordance with NEMA.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 26 05 00 – Common Work Results – Electrical.
- .2 Section 26 05 20 - Wire and Box Connectors.
- .3 Section 26 05 34 - Conduits, Conduit Fastenings and Conduit Fittings.

1.2 PRODUCT DATA

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

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Packaging Waste Management: remove for reuse and return of pallets, crates, padding and packaging materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

Part 2 Products

2.1 BUILDING WIRES

- .1 Conductors: stranded for 10 AWG and larger. Minimum size: 12 AWG.
- .2 Copper conductors: size as indicated, with 600 V insulation of cross-linked thermosetting polyethylene material rated RW90 XLPE, Jacketted.

2.2 FIRE ALARM CABLES

- .1 Fire alarm cables will be provided in accordance with manufacturers requirements. Confirm exact type of cabling with fire alarm representative. Fire alarm cables shall be rated for purpose.

2.3 PREACTION SYSTEM CABLES

- .1 Preaction system cables will be provided in accordance with manufacturers requirements. Confirm exact type of cabling with preaction system representative. Preaction system cables shall be rated for purpose.

Part 3 Execution

3.1 FIELD QUALITY CONTROL

- .1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Perform tests before energizing electrical system.

3.2 GENERAL CABLE INSTALLATION

- .1 Terminate cables in accordance with Section 26 05 20 - Wire and Box Connectors - (0-1000 V).
- .2 Cable Colour Coding: to Section 26 05 00 - Common Work Results for Electrical.
- .3 Conductor length for parallel feeders to be identical.
- .4 Lace or clip groups of feeder cables at distribution centres, pull boxes, and termination points.
- .5 Wiring in walls: typically drop or loop vertically from above to better facilitate future renovations. Generally wiring from below and horizontal wiring in walls to be avoided unless indicated.
- .6 Branch circuit wiring for surge suppression receptacles and permanently wired computer and electronic equipment to be 2-wire circuits only, i.e. common neutrals not permitted.
- .7 Provide numbered wire collars for control wiring. Numbers to correspond to control shop drawing legend. Obtain wiring diagram for control wiring.

3.3 INSTALLATION OF BUILDING WIRES

- .1 Install wiring as follows:
 - .1 In conduit systems in accordance with Section 26 05 34 - Conduits, Conduit Fastenings and Conduit Fittings.

3.4 INSTALLATION OF ARMOURED CABLES

- .1 Group cables wherever possible on channels.
- .2 Cables shall be installed as close to surface as possible.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 26 05 00 – Common Work Results – Electrical.

1.2 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.
- .3 Divert unused metal materials from landfill to metal recycling facility as approved by Departmental Representative.
- .4 Fold up metal banding, flatten and place in designated area for recycling.

Part 2 Products

2.1 SUPPORT CHANNELS

- .1 U shape, size 41 x 41 mm, 2.5 mm thick, surface mounted.

Part 3 Execution

3.1 INSTALLATION

- .1 Secure equipment to solid masonry, tile and plaster surfaces with lead anchors.
- .2 Secure equipment to poured concrete with expandable inserts.
- .3 Secure equipment to hollow masonry walls or suspended ceilings with toggle bolts.
- .4 Secure surface mounted equipment with twist clip fasteners to inverted T bar ceilings. Ensure that T bars are adequately supported to carry weight of equipment specified before installation.
- .5 Support equipment, conduit or cables using clips, spring loaded bolts, cable clamps designed as accessories to basic channel members.
- .6 Fasten exposed conduit or cables to building construction or support system using straps.
 - .1 One-hole steel straps to secure surface conduits and cables 50 mm and smaller.
 - .2 Two-hole steel straps for conduits and cables larger than 50 mm.
 - .3 Beam clamps to secure conduit to exposed steel work.
- .7 Suspended support systems.

- .1 Support individual cable or conduit runs with 6 mm dia threaded rods and spring clips.
- .2 Support 2 or more cables or conduits on channels supported by 6 mm dia threaded rod hangers where direct fastening to building construction is impractical.
- .8 For surface mounting of two or more conduits use channels at 1.5 m on centre spacing.
- .9 Provide metal brackets, frames, hangers, clamps and related types of support structures where indicated or as required to support conduit and cable runs.
- .10 Ensure adequate support for raceways and cables dropped vertically to equipment where there is no wall support.
- .11 Do not use wire lashing or perforated strap to support or secure raceways or cables.
- .12 Do not use supports or equipment installed for other trades for conduit or cable support except with permission of other trade and approval of Departmental Representative.
- .13 Install fastenings and supports as required for each type of equipment cables and conduits, and in accordance with manufacturer's installation recommendations.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 26 05 00 – Common Work Results – Electrical.

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CSA C22.1-12, Canadian Electrical Code, Part 1, 21st Edition.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Provide manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Provide shop drawings: in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Provide drawings stamped and signed by professional engineer registered or licensed in Province of British Columbia, Canada.

1.4 DELIVERY, STORAGE AND HANDLING

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

Part 2 Products

2.1 JUNCTION AND PULL BOXES

- .1 Construction:welded steel enclosure.
- .2 Covers Flush Mounted: 25 mm minimum extension all around.
- .3 Covers Surface Mounted: screw-on flat covers.

2.2 CABINETS

- .1 Construction: welded aluminum or as indicated hinged door, handle and catch

Part 3 Execution

3.1 JUNCTION, PULL BOXES AND CABINETS INSTALLATION

- .1 Install pull boxes in inconspicuous but accessible locations.
- .2 Mount cabinets with top not higher than 2 m above finished floor except where indicated otherwise.
- .3 Only main junction and pull boxes are indicated. Install additional pull boxes as required by CSA C22.1, latest edition.

3.2 IDENTIFICATION

- .1 Equipment Identification: to Section 26 05 00 - Common Work Results for Electrical.
- .2 Identification Labels: size 2 indicating system name, voltage and phase or as indicated.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 26 05 00 – Common Work Results – Electrical.

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CSA C22.1-12, Canadian Electrical Code, Part 1, 21st Edition.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Waste Management and Disposal:
 - .1 Separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

Part 2 Products

2.1 OUTLET AND CONDUIT BOXES GENERAL

- .1 Size boxes in accordance with CSA C22.1.
- .2 102 mm square or larger outlet boxes as required.
- .3 Gang boxes where wiring devices are grouped.
- .4 Blank cover plates for boxes without wiring devices.
- .5 Combination boxes with barriers where outlets for more than one system are grouped.

2.2 GALVANIZED STEEL OUTLET BOXES

- .1 One-piece electro-galvanized construction.
- .2 Single and multi gang flush device boxes for flush installation, minimum size 76 x 50 x 38 mm or as indicated. 102 mm square outlet boxes when more than one conduit enters one side with extension and plaster rings as required.
- .3 Utility boxes for outlets connected to surface-mounted EMT conduit, minimum size 102 x 54 x 48 mm.
- .4 102 mm square or octagonal outlet boxes for lighting fixture outlets.
- .5 Extension and plaster rings for flush mounting devices in finished plaster walls.

2.3 CONDUIT BOXES

- .1 Cast FS aluminum boxes with factory-threaded hubs and mounting feet for surface wiring of devices.

2.4 OUTLET BOXES FOR NON-METALLIC SHEATHED CABLE

- .1 Electro-galvanized, sectional, screw ganging steel boxes, minimum size 76 x 50 x 63 mm with two double clamps to take non-metallic sheathed cables.

2.5 FITTINGS - GENERAL

- .1 Bushing and connectors with nylon insulated throats.
- .2 Knock-out fillers to prevent entry of debris.
- .3 Conduit outlet bodies for conduit up to 35mm and pull boxes for larger conduits.
- .4 Double locknuts and insulated bushings on sheet metal boxes.

Part 3 Execution

3.1 INSTALLATION

- .1 Support boxes independently of connecting conduits.
- .2 Fill boxes with paper, sponges or foam or similar approved material to prevent entry of debris during construction. Remove upon completion of work.
- .3 For flush installations mount outlets flush with finished wall using plaster rings to permit wall finish to come within 6 mm of opening.
- .4 Provide correct size of openings in boxes for conduit, mineral insulated and armoured cable connections. Do not install reducing washers.
- .5 Vacuum clean interior of outlet boxes before installation of wiring devices.
- .6 Identify systems for outlet boxes as required.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 26 05 00 – Common Work Results - Electrical

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CAN/CSA C22.2 No. 18.2-06 (R2011), Wiring Devices
 - .2 CSA C22.2 No. 45-M1981(R2003), Rigid Metal Conduit.
 - .3 CSA C22.2 No. 56-04 (R2009), Flexible Metal Conduit and Liquid-Tight Flexible Metal Conduit.
 - .4 CSA C22.2 No. 83-M1985(R2003), Electrical Metallic Tubing.
 - .5 CSA C22.2 No. 211.2-06 (R2011), Rigid PVC (Unplasticized) Conduit.
 - .6 CAN/CSA C22.2 No. 227.3-05 (R2011), Nonmetallic Mechanical Protection Tubing (NMPT), A National Standard of Canada (February 2006).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product data: submit manufacturer's printed product literature, specifications and datasheets.
 - .1 Submit cable manufacturing data.
- .3 Quality assurance submittals:
 - .1 Test reports: submit certified test reports.
 - .2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
 - .3 Instructions: submit manufacturer's installation instructions.

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away from children.

Part 2 Products

2.1 CONDUITS

- .1 Rigid metal conduit: to CSA C22.2 No. 45, galvanized steel threaded.

- .2 Electrical metallic tubing (EMT): to CSA C22.2 No. 83, with couplings.
- .3 Flexible metal conduit: to CSA C22.2 No. 56, liquid-tight flexible metal, aluminum.
- .4 Flexible pvc conduit: to CAN/CSA-C22.2 No. 227.3.

2.2 CONDUIT FASTENINGS

- .1 One hole steel straps to secure surface conduits 50 mm and smaller.
 - .1 Two hole steel straps for conduits larger than 50 mm.
- .2 Beam clamps to secure conduits to exposed steel work.
- .3 Channel type supports for two or more conduits at 1.5 m on centre.
- .4 Threaded rods, 6 mm diameter, to support suspended channels.

2.3 CONDUIT FITTINGS

- .1 Fittings: to CAN/CSA C22.2 No. 18, manufactured for use with conduit specified.
Coating: same as conduit.
- .2 Ensure factory "ells" where 90 degrees bends for 25 mm and larger conduits.

2.4 EXPANSION FITTINGS FOR RIGID CONDUIT

- .1 Weatherproof expansion fittings with internal bonding assembly suitable for 100 mm linear expansion.
- .2 Watertight expansion fittings with integral bonding jumper suitable for linear expansion and 19 mm deflection.
- .3 Weatherproof expansion fittings for linear expansion at entry to panel.

2.5 FISH CORD

- .1 90lbs polypropylene fish cord.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 INSTALLATION

- .1 Install conduits to conserve headroom in exposed locations and cause minimum interference in spaces through which they pass.
- .2 Conceal conduits except in unfinished areas.
- .3 Surface mount conduits except where noted.

- .4 Use rigid galvanized steel threaded conduit except where specified otherwise.
- .5 Use epoxy coated conduit in corrosive areas.
- .6 Use electrical metallic tubing (EMT) above 2.4 m not subject to mechanical injury.
- .7 Use flexible metal conduit for connection to recessed incandescent fixtures without prewired outlet box and connection to surface or recessed fluorescent fixtures.
- .8 Use liquid tight flexible metal conduit for connection to motors or vibrating equipment in damp, wet or corrosive locations.
- .9 Use explosion proof flexible connection for connection to explosion proof motors.
- .10 Install conduit sealing fittings in hazardous areas.
 - .1 Fill with compound.
- .11 Minimum conduit size for lighting and power circuits: 19 mm.
- .12 Bend conduit cold:
 - .1 Replace conduit if kinked or flattened more than 1/10th of its original diameter.
- .13 Mechanically bend steel conduit over 19 mm diameter.
- .14 Field threads on rigid conduit must be of sufficient length to draw conduits up tight.
- .15 Install fish cord in empty and spare conduits.
- .16 Run 2 25 mm spare conduits up to ceiling space and 2-25 mm spare conduits down to ceiling space from each flush panel.
 - .1 Terminate these conduits in 152 x 152 x 102 mm junction boxes in ceiling space or in case of an exposed concrete slab, terminate each conduit in surface type box.
- .17 Remove and replace blocked conduit sections.
 - .1 Do not use liquids to clean out conduits.
- .18 Dry conduits out before installing wire.
- .19 Surface mounted conduits shall be painted to match the surrounding area.

3.3 SURFACE CONDUITS

- .1 Run parallel or perpendicular to building lines.
- .2 Locate conduits behind infrared or gas fired heaters with 1.5 m clearance.
- .3 Run conduits in flanged portion of structural steel.
- .4 Group conduits wherever possible on surface channels.
- .5 Do not pass conduits through structural members except as indicated.
- .6 Do not locate conduits less than 75 mm parallel to steam or hot water lines with minimum of 25 mm at crossovers.

3.4 CONCEALED CONDUITS

- .1 Run parallel or perpendicular to building lines.
- .2 Do not install horizontal runs in masonry walls.
- .3 Do not install conduits in terrazzo or concrete toppings.

3.5 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 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 REQUIREMENTS

- .1 Section 26 05 00 - Common Work Results for Electrical

1.2 REFERENCES

- .1 CSA International
 - .1 CSA C22.2 No.29-11, Panelboards and Enclosed Panelboards.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for breakers and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of British Columbia Canada.
 - .2 Include on drawings:
 - .1 Electrical detail of branch breaker type, quantity and ampacity.

1.4 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for breakers for incorporation into manual.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and breakers from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 BREAKERS

- .1 Breakers: to match existing type, sizes as indicated on Drawings.
- .2 Breaker for pre-action panel shall be red and include a lock-on device.

2.2 EQUIPMENT IDENTIFICATION

- .1 Provide equipment identification in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Nameplate for each panelboard size 4 engraved as indicated.
- .3 Nameplate for each circuit in distribution panelboards size 2 engraved as indicated.
- .4 Complete circuit directory with typewritten legend showing location and load of each circuit, mounted in plastic envelope at inside of panel door.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for panelboards installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 INSTALLATION

- .1 The Contractor shall provide a load survey of existing emergency panel BX-1 and confirm there is sufficient capacity for the additional breakers. Load panel details shall be provided to Departmental Representative for review and approval.
- .2 Install breakers into existing panelboard.
- .3 Install lock-on device to pre-action panel breaker.
- .4 Connect loads to circuits.
- .5 Connect neutral conductors to common neutral bus with respective neutral identified.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.

- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

3.4 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by breaker installation.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 26 05 00 – Common Work Results – Electrical.

1.2 REFERENCES

- .1 American National Standards Institute (ANSI)
 - .1 ANSI C82.1-04, Lamp Ballasts-Line Frequency Fluorescent Lamp Ballast.
 - .2 ANSI C82.4-02(R2007), Ballasts for High-Intensity-Discharge and Low-Pressure Sodium Lamps Multi Supply Type.
- .2 American National Standards Institute/Institute of Electrical and Electronics Engineers (ANSI/IEEE)
 - .1 ANSI/IEEE C62.41-1991, Recommended Practice for Surge Voltages in Low-Voltage AC Power Circuits.
- .3 ASTM International Inc.
 - .1 ASTM F1137-00(2006), Standard Specification for Phosphate/Oil and Phosphate/Organic Corrosion Protective Coatings for Fasteners.
- .4 Canadian Standards Association (CSA International)
- .5 ICES-005-07, Radio Frequency Lighting Devices.
- .6 Underwriters' Laboratories of Canada (ULC)

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Provide manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Provide complete photometric data prepared by independent testing laboratory for luminaires where specified, for review by Departmental Representative.
 - .3 Photometric data to include: spacing criterion.
- .3 Quality assurance submittals: provide following in accordance with Section 01 45 00 - Quality Control.
 - .1 Manufacturer's instructions: provide manufacturer's written installation instructions and special handling criteria, installation sequence and cleaning procedures.

1.4 QUALITY ASSURANCE

- .1 Provide mock-ups in accordance with Section 01 45 00 - Quality Control.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.
- .3 Divert unused metal materials from landfill to metal recycling facility.
- .4 Disposal and recycling of fluorescent lamps as per local regulations.
- .5 Disposal of old PCB filled ballasts.

Part 2 Products

2.1 LUMINAIRES

- .1 Existing luminaires shall be reused.

Part 3 Execution

3.1 INSTALLATION

- .1 Existing luminaires shall be removed and relocated to avoid conflicts with new sprinkler layout.
- .2 Locate and install luminaires as indicated.
- .3 Provide adequate support to suit ceiling system.

3.2 WIRING

- .1 Connect luminaires to lighting circuits:
 - .1 Install flexible or rigid conduit for luminaires as indicated.

3.3 LUMINAIRE SUPPORTS

- .1 For suspended ceiling installations support luminaires independently of ceiling.

3.4 LUMINAIRE ALIGNMENT

- .1 Align luminaires mounted individually parallel or perpendicular to building grid lines.

3.5 CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Remove surplus materials, excess materials, rubbish, tools and equipment.
- .2 Waste Management: separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

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END OF SECTION

Part 1 General

1.1 SUMMARY

- .1 Section Includes:
 - .1 Materials and installation for double-interlock preaction fire suppression system
 - .2 Trouble signal devices.
 - .3 Power supply facilities.
 - .4 Automatic alarm initiating devices.
 - .5 Audible signal devices.
 - .6 End-of-line devices.
 - .7 Visual alarm signal devices.
- .2 Related Requirements
 - .1 Section 26 05 00 – Common Work Results – Electrical.

1.2 SCOPE OF WORK

- .1 The Contractor is responsible for providing all electrical components for the installation of a double-interlock, electric/pneumatic preaction fire suppression system. This includes but is not limited to the following:
 - .1 Monitor modules.
 - .2 Isolation modules.
 - .3 Releasing relay.
 - .4 2-15A, 1 pole breakers to match existing in emergency panel BX-1.
 - .5 A lock-on device for the pre-action panel breaker in emergency panel BX-1.
 - .6 Rate of rise heat detectors.
 - .7 Fire alarm horn and LED strobe.
 - .8 Conduit, wiring, connectors, mounting equipment and end of line resistors.
 - .9 Update existing fire alarm panel to include new zones, trouble and alarm circuits.
 - .10 Provide cores through penthouse floor and first floor for conduit penetrations.
 - .11 Project junction boxes as indicated on the drawings and where required for pulling and splicing.
- .2 Power and monitoring connections shall be provided to the preaction valve, air compressor, tamper switch, flow switch and air pressure switch.
- .3 Installation of the preaction control panel. Panel shall be supplied by others.

1.3 REFERENCES

- .1 Government of Canada

- .1 TB OSH Chapter 3-03, 1997-01-28, Treasury Board of Canada, Occupational Safety and Health, Chapter 3-03, Standard for Fire protection Electronic Data Processing Equipment.
- .2 TB OSH Chapter 3-04, 1994-12-22, Treasury Board of Canada, Occupational Safety and Health, Chapter 3-04, Standard for Fire Alarm Systems.
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .3 Underwriter's Laboratories of Canada (ULC)
 - .1 CAN/ULC-S524-2012, Standard for the Installation of Fire Alarm Systems.
 - .2 CAN/ULC-S525-2007, Audible Signal Device for Fire Alarm Systems.
 - .3 CAN/ULC-S526-2007, Visual Signal Devices for Fire Alarm Systems.
 - .4 CAN/ULC-S527-1999, Control Units.
 - .5 CAN/ULC-S530-M1991, Heat Actuated Fire Detectors for Fire Alarm Systems.
 - .6 CAN/ULC-S536-S537-2004, Burglar and Fire Alarm Systems and Components.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and datasheet in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Submit two copies of Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS) in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings:
 - .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Shop drawings: stamped and signed by professional engineer registered or licensed in Province of British Columbia, Canada.
 - .2 Include:
 - .1 Layout of equipment.
 - .2 Zoning.
 - .3 Complete wiring diagram, including schematics of modules.
- .3 Quality assurance submittals: submit following in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
 - .2 Instructions: submit manufacturer's installation instructions.
 - .3 Manufacturer's Field Reports: manufacturer's field reports specified.
- .4 Closeout Submittals:

- .1 Submit maintenance and engineering data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals in accordance with ANSI 20.
- .2 Authority of Jurisdiction will delegate authority for review and approval of submittals required by this Section.
- .3 Submit to Authority of Jurisdiction 2 sets of approved submittals and drawings immediately after approval but no later than 15 working days prior to final inspection.
- .4 Submit following:
 - .1 Manufacturer's Data for:
 - .1 Monitor modules.
 - .2 Isolation modules.
 - .3 Releasing relay.
 - .4 Storage batteries.
 - .5 Battery charger.
 - .6 Heat detectors.
 - .7 Alarm horn and strobes.
 - .8 Valve tamper switches.
 - .9 Wiring.
 - .10 Conduit.
 - .11 Outlet boxes.
 - .12 Fittings for conduit and outlet boxes.
 - .13 Mark data which describe more than one type of item to indicate which type will be provided.
 - .14 Submit 1 original for each item and clear, legible, first-generation photocopies for remainder of specified copies.
 - .2 System wiring diagrams:
 - .1 Submit complete wiring diagrams of system showing points of connection and terminals used for electrical connections in the system.
 - .2 Show modules, relays, switches and lamps in control panel.
 - .3 Design data: Power Calculations:
 - .1 Submit design calculations for new work specified to substantiate that battery capacity exceeds supervisory and alarm power requirements.
 - .2 Show comparison of detector power requirements per zone versus control panel smoke detector power output per zone in both standby and alarm modes.
 - .3 Show comparison of notification appliance circuit alarm power requirements with rated circuit power output.
 - .4 Schedules:
 - .1 Conductor wire marker schedule.

- .5 Test Reports:
 - .1 Preliminary testing:
 - .1 Final acceptance testing.
 - .2 Submit for inspections and tests specified under Field Quality Control.

1.5 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Installer: company or person specializing in fire alarm system installations approved by manufacturer with 5 documented experiences.
 - .2 Provide services of representative or technician from manufacturer of system, experienced in installation and operation of type of system being provided, to supervise installation, adjustment, preliminary testing, and final testing of system and to provide instruction to project personnel.
 - .3 Maintenance Service:
 - .1 Provide one year's free maintenance with two inspections by manufacturer during warranty period. Inspection tests to conform to CAN/ULC-S536. Submit inspection report to Departmental Representative.

1.6 DELIVERY, STORAGE, AND HANDLING

- .1 Packing, shipping, handling and unloading:
 - .1 Deliver, store and handle in accordance with Section 01 61 00 - Common Product Requirements.
 - .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Waste Management and Disposal:
 - .1 Waste Management and Disposal: separate waste materials for recycling in accordance with Section 01 74 19 - Waste Management and Disposal.

1.7 FIRE ALARM SYSTEM

- .1 Electrical Contractor shall extend and modify the existing fire alarm system as indicated on the Drawings and specified herein.
- .2 All fire alarm devices installed shall be compatible with the preaction system.
- .3 Preaction panel, valve and air compressor shall be supplied by the Mechanical Contractor.
- .4 Modify existing fire alarm system to meet intent shown on drawings and current applicable Codes.
- .5 Provisions shall be made such that the fire alarm annunciators are operational at all times.
- .6 The pre-action system shall be installed in compliance with the BC Building code, the Standard for Installation of Fire Alarm Systems CAN/ULC-S524-06 and the Standard for Verification of Fire Alarm System Installations CAN/ULC-S537-04.

Part 2 Products

2.1 MATERIALS

- .1 Equipment and devices: ULC listed and labelled.
- .2 Use products of one manufacturer for equipment or material of same type or classification unless otherwise specified.
- .3 Power supply: to CAN/ULC-S524.
- .4 Audible signal devices: to CAN/ULC-S525.
- .5 Visual signal devices: to CAN/ULC-S526.
- .6 Control unit: to CAN/ULC-S527.
- .7 Refer to Section 21 13 13 – Sprinkler System, for details on preaction system. Initiating devices shall be compatible with preaction system.

2.2 SYSTEM OPERATION

- .1 Provide initiating and notification devices, conduit, wiring and all electrical components for interconnection of the dual-interlock electric/pneumatic preaction fire suppression system. Preaction control panel shall be supplied by others.
- .2 Provide separate circuits from control panel to each zone of initiating devices. Transmission of signals from more than one zone over common circuit to control panel is prohibited.
- .3 Operation Stages
 - .1 Stage 1
 - .1 Operation to actuation following:
 - .1 Heat detector from either zone 1 or 2.
 - .2 Actuation of device to initiate following:
 - .1 Activate pre-alarm horn.
 - .2 Stage 2
 - .1 Operation to actuation following:
 - .1 Heat detector from zone 1, 2 and low pressure signal.
 - .2 Actuation of operation device to initiate following:
 - .1 Activate general alarm and horn/strobe.
 - .2 Release solenoid output.
 - .3 Waterflow output is activated.
 - .4 Transmit signal to fire alarm control panel.
 - .5 Zone of alarm to be indicated on remote annunciators.
 - .3 Trouble Signal
 - .1 Operation to actuation following:
 - .1 Low air supervisory or valve tamper supervisory.
 - .2 Actuation of operation device to initiate following:

- .1 Trouble alarm will be activated.
- .2 Zone of alarm to be indicated on remote annunciator.

2.3 MONITOR MODULES

- .1 Shall be compatible with existing Edwards EST-2 system.
- .2 Capable of monitoring the following initiating device circuits: normally open alarm, normally open alarm with delayed latching, supervisory or monitor.

2.4 ALARM INITIATING DEVICE - HEAT DETECTORS

- .1 Provide heat detectors designed for detection of fire by combination fixed temperature rate-of-rise.
- .2 Combination fixed temperature rate-of-rise detectors: designed for surface outlet box mounting and supported independently of conduit, tubing or wiring connections.
 - .1 Contacts: self-resetting after response to rate-of-rise actuation.
 - .2 Operation under fixed temperature actuation to result in external indication.
 - .3 Detector units located in boiler rooms, showers or other areas subject to abnormal temperature changes to operate on fixed temperature principle only.
- .3 Locate detectors in accordance with their listing by ULC and the requirements of CAN/ULC-S524-06, except provide at least 2 detectors in rooms of 54 square meters or larger in area.
- .4 Mount detectors at underside of ceiling or deck above unless otherwise indicated.
 - .1 For mounting heights greater than 3m above floor level, reduce actual detector linear spacing for listed spacing as required by CAN/ULC-S524-06.
 - .2 For heights greater than 9m, space detectors no farther apart than 34% of their listed spacing.
- .5 Temperature rating of detectors in accordance with CANULC-S524-06.
- .6 Located detectors a minimum of 300mm to lighting fixtures and not closer than 600mm to air supply or return diffuser.
- .7 Ensure detectors located in areas subject to moisture or exterior atmospheric conditions or hazardous locations as defined by CSA C22.2, are approved for such locations.
- .8 Provide detectors with terminal screw type connections.
- .9 Removal of detector head from its base to cause activation of system trouble signals if detectors are provided with separable heads and bases.
- .10 Detectors shall be compatible with preaction panel system.

2.5 ALARM INITIATING DEVICE SPACING AND LOCATION

- .1 Detector spacing and location: in accordance with manufacturer's recommendations and requirements of CAN/ULC-S524-06.
- .2 Provide at least 2 detectors in rooms of 54 square meters or larger.

- .3 Spacing: not to exceed 9 m by 9 m per detector, and 9 linear m per detector along corridors.
- .4 Locate detectors minimum 0.9 m from air discharge or return grille, and not closer than 300 mm to lighting fixtures.
- .5 In areas without finished ceilings, mount detectors at underside of deck above unless otherwise indicated.
- .6 Mount detectors installed beneath raised floors with base within 50mm of underside of raised floor, with detector facing downward.
 - .1 Where space under raised floor is less than 300 mm in height, mount detectors with their bases either horizontal or vertical, with detection chamber(s) located in upper half of underfloor space.
 - .2 Do not mount detectors facing upward.

2.6 AUDIBLE AND VISUAL ALARM SIGNAL DEVICES

- .1 Provide system horn arranged to operate in conjunction with panel's integral alarm signal.
- .2 Locate horn as indicated.
 - .1 Provide horn with rigid plastic white on red engraved identification sign which reads "PRE-ACTION SYSTEM".
 - .2 Lettering on identification sign: minimum 25 mm high.
- .3 Audible device(s):
 - .1 Horns: 65 db, weatherproof mounting, 24 V dc.
- .4 Do not exceed 80 percent of listed rating in amperes of notification appliance circuit. Provide additional circuits above those shown if required to meet this requirement.
- .5 Provide appliances specifically listed for outdoor use in locations exposed to weather.
- .6 Finish appliances in red enamel.
- .7 For surface mounting provide appliance manufacturer's approved back box. Back box finish to match appliance finish.
- .8 Horn shall be compatible with preaction panel system.
- .9 Surface-mounted assembly of stroboscopic type suitable for use in electrically supervised circuit and powered from notification appliance circuits.
- .10 Appliances: minimum of 110 candela measured as approved by ULC, but not less than effective intensity required by National Building Code of Canada for appliance spacing and location.
- .11 Protect lamps with thermoplastic lens and labelled "FIRE" in letters at least 12 mm high.
- .12 Provide visible appliances within 300 mm of each audible appliance.
- .13 Visual alarms shall be compatible with preaction panel system.

2.7 END-OF-LINE DEVICES

- .1 End-of-line devices to control supervisory current in signalling circuits, sized to ensure correct supervisory current for each circuit. Open, short or ground fault in any circuit will alter supervisory current in that circuit, producing audible and visible alarm at main control panel and remotely as indicated.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 INSTALLATION

- .1 Install systems in accordance with CAN/ULC-S524 and TB OSH Chapter 3-04.
- .2 Install preaction panel and connect to ac power supply, dc standby power. Mount with panel centerline 1.5m above finished floor elevation.
- .3 Locate and install detectors and connect to alarm circuit wiring. Do not mount detectors within 1 m of air outlets. Maintain at least 600 mm radius clear space on ceiling, below and around detectors. Locate duct type detectors in straight portions of ducts.
- .4 Connect alarm circuits to preaction panel.
- .5 Locate and install horns and visual signal devices and connect to signalling circuits.
- .6 Connect signalling circuits to preaction panel.
- .7 Connect communication loop to existing fire alarm control panel.
- .8 Install and connect valve, flow switch, tamper switch and air pressure switch circuits.
- .9 Install end-of-line devices at end of signalling circuits.
- .10 Update fire alarm annunciator graphics (multiple locations, front and rear) with new zones. Provisions shall be made such that the fire alarm annunciators are operational at all times.
- .11 Sprinkler system: wire alarm and supervisory switches and connect to control panel.
- .12 Room detection system.
 - .1 Locate and install detectors. Make necessary connections between preaction panel and main fire alarm panel.
 - .2 Locate and install audible signals and visual alarms.
- .13 Connect fire suppression systems to control panel.

3.3 FIELD QUALITY CONTROL

- .1 Site Tests:

- .1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical and CAN/ULC-S537.
 - .2 Acceptance testing shall not be performed until the Contractor has completed and submitted the Verification Certificate.
 - .3 Fire alarm system:
 - .1 Test each device and alarm circuit to detectors and sprinkler system transmit alarm to preaction panel and actuate general alarm.
 - .2 Check annunciator panels to ensure zones are shown correctly.
 - .3 Simulate grounds and breaks on alarm and signalling circuits to ensure proper operation of system.
 - .4 Class A circuits.
 - .1 Test each conductor on circuits for capability of providing alarm signal on each side of single open-circuit fault condition imposed near midmost point of circuit. Reset control unit after each alarm function and correct imposed fault after completion of each test.
 - .2 Test each conductor on circuits for capability of providing alarm signal during ground-fault condition imposed near midmost point of circuit. Reset control unit after each alarm function and correct imposed fault after completion of each test.
 - .2 Manufacturer's Field Services:
 - .1 The Contractor shall arrange for the Manufacturer's representative to demonstrate the system to the local authorities and the Departmental Representative.
 - .2 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - SUBMITTALS.
 - .3 Field report from manufacturer's compliance verification shall be submitted to the Departmental Representative and the Fire Commissioner for review.
 - .4 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
 - .5 Schedule site visits, to review Work, as directed in PART 1 - QUALITY ASSURANCE.
- 3.4 TRAINING**
- .1 Arrange and pay for on-site lectures and demonstrations by fire alarm equipment manufacturer to train operational personnel in use and maintenance of fire alarm system.
- 3.5 CLEANING**
- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
 - .2 Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

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FIRE DETECTION AND ALARM
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END OF SECTION

APPENDIX A

STANTEC HAZMAT REPORT

**HAZARDOUS BUILDING
MATERIALS ASSESSMENT**

Canadian Forestry Service Center
506 West Burnside Road, Victoria, BC



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Public Works and Government
Services Canada
Environmental Services, Pacific
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Project No.: 1156-14042

March 21, 2014

HAZARDOUS BUILDING MATERIALS ASSESSMENT

Canadian Forestry Service Center 506 West Burnside Road, Victoria, BC

March 21, 2014

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HAZARDOUS BUILDING MATERIALS ASSESSMENT

Canadian Forestry Service Center 506 West Burnside Road, Victoria, BC

March 21, 2014

Executive Summary

Stantec Consulting Ltd. (Stantec) was retained by Public Works and Government Services Canada (PWGSC) on behalf of Natural Resources Canada to conduct a hazardous building materials assessment of the Canadian Forest Service Center (subject facility) located at 506 West Burnside Road, in Victoria, British Columbia.

The purpose of the project was to assess for the presence (or absence) and estimated extent of hazardous building materials within the subject facility in accordance with the requirements of the *Canada Labour Code, Part II* (Canada Labour Code) and the current version of British Columbia's *Occupational Health & Safety Regulation* (BC Reg. 296/97), prior to proposed renovation activities.

The hazardous building materials considered during this assessment included asbestos-containing materials (ACMs), lead, including lead-containing paints (LCPs), polychlorinated biphenyls (PCBs), microbiological (mould and/or moisture) affected building materials, mercury, ozone depleting substances (ODSs), and silica.

Based on Stantec's visual assessment and on the laboratory analyses performed on samples collected, hazardous building materials were identified within the subject facility.

A summary of findings and recommendations is presented below. Recommendations pertaining to the handling, removal, transportation and disposal of identified hazardous materials are provided in Section 6 of this report.

It should be noted that this summary is subject to the same restrictions and limitations as presented in Section 4 (Assessment Limitations) and Section 7 (Closure). The information provided is to be read in conjunction with the remainder of this report.

HAZARDOUS BUILDING MATERIALS ASSESSMENT

Canadian Forestry Service Center 506 West Burnside Road, Victoria, BC

March 21, 2014

Summary of Findings

Identified Asbestos-Containing Materials (ACMs)

- Skim coat plaster applied to the walls and ceilings of the north, south and west stairwells on all floors.
- Black colour fire stop caulking applied to floor penetrations for mechanical pipes throughout the penthouse.
- Grey colour fire stop caulking applied to floor penetrations for mechanical ductwork throughout the penthouse.
- Silver colour fire stop caulking (rigid consistency) applied to floor penetrations for mechanical ductwork throughout the penthouse.
- Light grey colour, chalk-like parging cement applied to pipe fittings observed in rooms 069, 073 and 045 on the ground floor and on one fitting observed in the first floor east hallway - Presumed present in other locations throughout A wing including inaccessible wall and ceiling cavities.
- Grey colour, fibrous parging cement applied to pipe fittings observed to be present within the ceiling space above rooms on the ground floor (047, CR1, CR2, CR3, 044, CR4, CR5 and CR6) - Presumed present in other locations throughout A wing including inaccessible wall and ceiling cavities.
- Flex duct fabric between mechanical ductwork in the penthouse.
- White colour fibrous insulation between mechanical ductwork and floor penetrations in the penthouse. This material may be present, concealed in other areas of the building.
- Red colour duct mastic on mechanical ductwork joints throughout.
- Cement products (including):
 - Cement board lining within fume hoods throughout
 - Cement exhaust pipe leading from fume hoods to exhaust fans on the roof throughout
 - Exhaust fans on the roof with cement vent caps (eight cement vent caps observed on the roof)
- Masonry block walls on the ground floor were not destructively assessed, but may be filled with vermiculite insulation (a suspected ACM).

Previously Identified ACMs:

- Inner lining material within herbarium storage cabinetry (ACM is not visible; it is reportedly present within the metal cabinet panels).
- Floor tile (9"x9" size) – Brown and blue colour tiles present within various rooms on all floors.

The above-noted materials were generally found to be in GOOD condition, with the exception of the following ACMs observed in POOR condition:

- Light grey colour, chalk-like parging cement applied to a fitting (flange) present within room 069.
- Grey colour, fibrous parging cement applied to fittings present within the ceiling space above rooms on the ground floor (047, CR1, CR2, CR3, 044, CR4, CR5 and CR6) were observed in POOR condition. These fittings are present above a solid plaster ceiling.

- Red colour duct mastic on mechanical ductwork joints throughout.

The above-noted material was generally found to be in GOOD condition.

- Drywall joint compound applied to drywall walls and ceilings throughout.
- Floor tile (9"x9" size) green colour present within workshop H05 and rooms H06, H07, H08 and H09.
- Cement panels present beneath windows on the exterior of the building.
- Cement board liner within a fume hood in room H08.
- Perimeter masonry block walls were not destructively assessed, but may be filled with vermiculite insulation (a suspected ACM).

The above-noted materials were generally found to be in GOOD condition, with the exception of drywall joint compound observed to have some minor damage (POOR condition) in sporadic locations on various walls.

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- Drywall joint compound applied to drywall walls and ceilings throughout.
- Floor tile (12"x12" size) beige with brown streaks present within the men's and women's washrooms.

The above-noted materials were generally found to be in GOOD condition, with the exception of drywall joint compound observed to have some minor damage (POOR condition) in sporadic locations on various walls.

- No ACMs identified.

The following LCPs were identified:

- Grey colour paint – Present on metal rooftop mechanical ductwork.
- White colour paint – Present on metal rooftop railing.
- Cream colour paint – Present on steel mechanical pipe within the penthouse.
- Silver colour paint – Present on cast iron drain pipe within the penthouse.
- Red colour paint – Present on steel sprinkler pipe throughout.
- Cream colour paint – Present on the walls and ceiling within the penthouse.
- Grey/blue colour paint – Present on the concrete floor in the east hallway on the 1st floor.
- White colour paint – Present on plaster walls and ceilings in stairwells.
- Red colour paint (with yellow colour paint layer beneath) – Present on metal doors and door frames throughout the ground floor north and south hallways.
- Grey colour paint – Present on metal exterior trim and stucco siding on the building.

Lead is expected to be present in the solder used on copper domestic pipes, in the caulking on bell fittings for cast iron drainage pipes and in electrical equipment (i.e., batteries for emergency lighting/signage).

The following LCPs were identified:

- Off-white colour paint – Present on metal doors and door trim throughout the ground floor.
- Green colour paint – Present on metal door trim throughout the ground floor.
- Yellow colour paint – Present on metal door trim throughout the ground floor.
- Grey colour paint – Present on metal door trim on the entrance door to A Wing on the 3rd floor.
- Grey colour paint – Present on metal siding on the exterior of the building.

Lead is expected to be present in the solder used on copper domestic pipes, in the caulking on bell fittings for cast iron drainage pipes and in electrical equipment (i.e., batteries for emergency lighting/signage).

The following LCPs were identified:

- Beige colour paint – Present on drywall interior walls and ceilings throughout.
- Light green colour paint – Present on metal interior posts and doors throughout.
- Dark green colour paint – Present on metal interior doors throughout.

Lead is expected to be present in the solder used on copper domestic pipes, in the caulking on bell fittings for cast iron drainage pipes and in electrical equipment (i.e., batteries for emergency lighting/signage).

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Identified Lead-Containing Paints (LCPs) and Other Lead-Containing Materials - continued

The following LCPs were identified:

- Grey colour paint – Present on wood exterior trim on the building.
- White colour paint – Present on wood exterior siding on the building.

Lead is expected to be present in the solder used on copper domestic pipes, in the caulking on bell fittings for cast iron drainage pipes and in electrical equipment (i.e., batteries for emergency lighting/signage).

The following LCPs were identified:

- Beige colour paint – Present on metal mechanical ductwork throughout.
- White colour paint – Present on drywall interior walls and ceilings throughout.

Lead is expected to be present in the solder used on copper domestic pipes, in the caulking on bell fittings for cast iron drainage pipes and in electrical equipment (i.e., batteries for emergency lighting/signage).

The following LCPs were identified:

- White colour paint – Present on wood shed structure.

Lead is expected to be present in the solder used on copper domestic pipes, in the caulking on bell fittings for cast iron drainage pipes and in electrical equipment (i.e., batteries for emergency lighting/signage).

- No suspected LCPs or other presumed lead-containing materials observed.

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Polychlorinated Biphenyls (PCBs)

The following observations were made pertaining to PCB-containing equipment within the subject facility:

- A Wing
 - Fluorescent light fixtures with low voltage light tubes observed predominantly throughout the building, which are not expected to have ballasts that contain PCBs.
 - Approximately 30-40 fluorescent light ballasts that appear to be of pre-1985 vintage may have ballasts that contain PCBs.
- B Wing
 - Fluorescent light fixtures with low voltage light tubes observed predominantly throughout the building, which are not expected to have ballasts that contain PCBs.
 - Approximately 10-20 fluorescent light ballasts that appear to be of pre-1985 vintage may have ballasts that contain PCBs.
- Header Building
 - Fluorescent light fixtures with low voltage light tubes observed predominantly throughout the building, which are not expected to have ballasts that contain PCBs.
 - Approximately 5-10 fluorescent light ballasts that appear to be of pre-1985 vintage may have ballasts that contain PCBs.
- Annex Building
 - Fluorescent light fixtures with low voltage light tubes observed predominantly throughout the building, which are not expected to have ballasts that contain PCBs.
 - Approximately 5-10 fluorescent light ballasts that appear to be of pre-1985 vintage may have ballasts that contain PCBs.
- Workshop/garages
 - Fluorescent light fixtures with low voltage light tubes observed predominantly throughout the building, which are not expected to have ballasts that contain PCBs.
 - Approximately 5 fluorescent light ballasts that appear to be of pre-1985 vintage may have ballasts that contain PCBs.
- Equipment shed
 - No suspected PCB-containing equipment observed.
- Glasshouse
 - No suspected PCB-containing equipment observed.
- Shadehouse
 - No suspected PCB-containing equipment observed.

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Mould

The following observations were made pertaining to mould and moisture-impacted materials within the subject facility:

- Header Building
 - Suspect mould and moisture-impacted drywall was observed on the ceiling in room H9 (approximately 5 square feet of suspect mould was observed).
 - NOTE: The above noted suspect mould/moisture-impacted material is present on an identified ACM.
- B Wing
 - No suspected mould and/or moisture-impacted building materials were observed.
- Header Building
 - No suspected mould and/or moisture-impacted building materials were observed.
- Annex Building
 - Moisture-impacted ceiling tiles and an adjacent light fixture were observed near the alternate entrance to the building.
- Workshop/garages
 - No suspected mould and/or moisture-impacted building materials were observed.
- Equipment shed
 - No suspected mould and/or moisture-impacted building materials were observed.
- Glasshouse
 - No suspected mould and/or moisture-impacted building materials were observed.
- Shadehouse
 - No suspected mould and/or moisture-impacted building materials were observed.

Mercury

The following observations were made pertaining to mercury-containing equipment within the subject facility:

- A Wing
 - One mercury-containing thermometer was observed within the penthouse.
- B Wing
 - Six mercury-containing thermometers were observed within the penthouse.
- Header Building
 - 10 mercury-containing thermometers were observed within the mechanical rooms (five in each mechanical room).
- Annex Building
 - None observed.
- Workshop/garages
 - None observed.
- Equipment shed
 - One mercury-containing thermostat was observed.
- Glasshouse
 - None observed.
- Shadehouse
 - None observed.

In addition to the above, mercury vapour is expected to be present within fluorescent light tubes observed throughout the subject facility.

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Ozone-Depleting Substances (ODS)	
<ul style="list-style-type: none">• Various pieces of equipment with ODSs present were identified throughout the subject facility. A summary listing provided by Natural Resources Canada of the ODS-containing equipment present, including location along with refrigerant type and amount in each piece of equipment, is presented in Appendix F.	
Silica	
<ul style="list-style-type: none">• Silica may be present in concrete, cement, mortar, ceramic wall and floor tiles, stucco finishes and acoustic ceiling tiles observed in various locations throughout the subject facility.	

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1.0 INTRODUCTION

Stantec Consulting Ltd. (Stantec) was retained by Public Works and Government Services Canada (PWGSC) on behalf of Natural Resources Canada to conduct a hazardous building materials assessment of the Canadian Forest Service Center (subject facility) located at 506 West Burnside Road, in Victoria, British Columbia.

The purpose of the project was to assess for the presence (or absence) and estimated extent of hazardous building materials within the subject facility in accordance with the requirements of the *Canada Labour Code, Part II* (Canada Labour Code) and the current version of British Columbia's *Occupational Health & Safety Regulation (BC Reg. 296/97)*, prior to proposed renovation activities.

The hazardous building materials considered during this assessment included asbestos-containing materials (ACMs), lead, including lead-containing paints (LCPs), polychlorinated biphenyls (PCBs), microbiological (mould and/or moisture) affected building materials, mercury, ozone depleting substances (ODSs), and silica.

Site work was completed within the subject facility between January 21 and 24, 2014.

2.0 BACKGROUND

The subject facility is comprised of the following structures:

- Main Building
 - A Wing: (Three storey building with a basement/ground level and a mechanical penthouse. Primarily constructed of concrete, interior finishes include, wall and ceiling plaster, ceiling tiles, terrazzo, vinyl and ceramic flooring. Brick, stucco and stone exterior cladding.)
 - B Wing: (Three storey building with a ground level and a mechanical penthouse. Primarily constructed of steel, interior finishes include drywall walls and ceilings, ceiling tiles, vinyl, sheet and ceramic flooring. Metal exterior cladding.)
- Header Building (Single storey building, primarily constructed of concrete, interior finishes include, vinyl and sheet flooring, drywall walls and ceilings. Brick exterior cladding.)
- Annex Building (Single storey building, primarily constructed of wood framing, interior finishes include drywall walls and ceiling, ceiling tiles, carpet and vinyl flooring. Wood and stucco exterior cladding.)
- Workshop/garages (Single storey workshop/garage structure, primarily constructed of wood and with a concrete foundation.)
- Equipment shed (Wood shed structure)
- Glasshouse
- Shadehouse

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Stantec understands that the A wing of the main building and the out buildings were constructed in the early 1960s and the B wing of the main building was added in 1984. These construction time periods are consistent with those dates when hazardous building materials were commonly used and/or may be present including, but not limited to ACMs, LCPs, PCBs, mould, mercury, ODSs, and silica.

In addition to the above, Stantec was provided with the following reports pertaining to asbestos-containing building materials at the subject facility:

- "Canadian Forest Service, 506 West Burnside Road, Victoria, BC, Asbestos Hazard Assessment Survey" prepared by North West Environmental, dated January 1999 (North West Assessment)
- "Workplace Investigation, Herbarium, Pacific Forestry Services, Victoria, BC" dated May 2005 (Workplace Investigation) – reviewed on-site only

According to the North West Assessment and the Workplace Investigation, the following ACMs have been identified within the subject facility:

- North West Assessment
 - Mechanical piping
 - Floor tile
 - Asbestos cement products
 - Drywall
 - Gaskets
 - Fire Doors
- Workplace Investigation
 - Inner liner material within Herbarium storage cabinetry

Stantec understands that a fire suppression system upgrade is planned within A Wing, and that as part of the project planning process, the North West Assessment was reviewed by PWGSC, and found to be outdated (regulatory changes pertaining to various hazardous building materials, including asbestos and lead, have occurred since its completion). As such, and as a measure of diligence in maintaining compliance with the Canada Labour Code and BC Reg. 296/97 as they pertain to identifying hazards prior to conducting renovation work within, and to update the records pertaining to hazardous building materials for the facility in general, PWGSC commissioned this assessment.

3.0 SCOPE AND METHODOLOGY

Zack Kranjec of Stantec conducted a visual assessment within the subject facility between January 21 and 24, 2014. Site work was conducted in general compliance with the requirements of the Canada Labour Code, the BC Reg. 296/97 and Stantec's Safe Work Practices (SWPs).

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Mechanical systems, structures and finishes of the subject facility were visually examined to determine the suspected presence of ACMs, lead including LCPs, PCBs, mercury, ODSs, and silica. Where building materials were suspected but not confirmed to contain asbestos or lead (in paint), samples were collected for analysis to confirm or deny the presence of these hazardous materials. Based on analytical results, visually similar materials were referenced to specific analyzed samples to reduce the number of samples collected.

Assessment and sampling activities were directed to include area-specific sampling of building materials that may be disturbed during the planned fire suppression system upgrade within A Wing, as well as to encompass the remainder of the subject facility.

Additional background information and the methodology used for the determination of presence or absence of each specific hazardous material considered in this assessment are outlined in the following sections.

3.1 ASBESTOS-CONTAINING MATERIALS (ACMs)

The common use of friable (materials which, when dry, can be easily crumbled or powdered by hand pressure) ACMs in construction generally ceased voluntarily in the mid-1970s but was only banned through legislation by the late 1980s. Friable asbestos was used in many building products, primarily high temperature insulations, spray-applied structural fireproofing, and a material called vermiculite that was commonly used as block wall insulation and may be contaminated with asbestos fibres. Asbestos was also used in many non-friable manufactured products such as floor tiles, ceiling tiles, Transite™ cement products, and various other construction materials. Some cement products currently used in the construction of buildings may still contain asbestos.

The presence of asbestos in federal workplaces, and pertaining to federally regulated workers is governed by the Canada Labour Code. The presence of asbestos in the workplace in British Columbia pertaining to provincially regulated workers is governed by BC Reg. 296/97. As both federally regulated workers and provincially regulated workers (e.g., contractors) are expected to carry out work activities within the subject facility, and as the provincial regulations are generally more prescriptive pertaining to asbestos (and generally include the requirements noted in the Canada Labour Code), this assessment was conducted to meet the requirements of the BC Reg. 296/97.

According to the current version of the BC Reg. 296/97, asbestos-containing material (ACM) means any material containing at least 0.5% asbestos, or vermiculite insulation with any asbestos.

Based on these criteria, samples were collected from "homogenous applications" of observed suspected ACMs (materials suspected to contain asbestos that are uniform in material type, color, texture application and estimated installation date) and submitted to EMSL Canada Inc. (EMSL) in Mississauga, Ontario for analysis of asbestos content using Polarized Light Microscopy (PLM) with dispersion staining, in accordance with the US Environmental Protection Agency

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(EPA) 600/R-93/116 Method "Method for the Determination of Asbestos in Bulk Building Materials".

EMSL's analytical laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

3.1.1 Sample Results Interpretation

When asbestos is detected in concentrations greater than 0.5% in one of the samples within a set that was collected to represent a "homogenous application" of a particular material (or detected in any concentration, in a set of samples collected for applications of vermiculite), the entire sample set and the entire application of that material is then considered to be ACM.

In addition to the above, a "positive stop" option was used during the laboratory analysis of the non-friable building material samples submitted for asbestos analysis (excluding non-friable or potentially friable wall and/or ceiling finish materials). The "positive stop" option is utilized by the laboratory when asbestos is detected at a concentration of greater than 0.5% in one of the samples within a set that was collected to represent a "homogenous application" of that non-friable material. At this point, further analysis of subsequent samples within the set is deemed to be unnecessary (as the entire set will be considered ACM, per above), and the remainder of the samples within the set are not analysed.

The "positive stop" option was not utilized for analysis of sample sets pertaining to friable materials or non-friable/potentially friable wall and/or ceiling finish materials, as both the asbestos content(s) and the application(s) of these materials are often inconsistent. For these materials, the analysis of all samples within the set can provide additional information that may assist in determining the extent of application of asbestos-containing versus non-asbestos forms of the materials – or can provide evidence that further sampling should be conducted, on a case-by-case basis.

3.1.2 Potential Asbestos-Containing Vermiculite Insulation

The assessment considered areas where vermiculite insulation, a potential ACM, would likely be present. This included making note of and assessing attic spaces, floor cavities and masonry or brick walls, which are typical areas where vermiculite is found. Where masonry or brick walls were observed, destructive assessment (drilling) was not conducted to assess the cavity for the presence of vermiculite.

3.1.3 Asbestos Sampling Quality Assurance/Quality Control

Sampling activities pertaining to asbestos were conducted in accordance with Stantec's Safe Work Practices (SWPs), which take into account current provincial regulations pertaining to such work (i.e., sampling procedures, required number of samples, and laboratory analytical procedures).

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Representative bulk samples were collected of accessible suspect ACMs in sufficient quantities for laboratory analyses. Suspect ACM samples were sealed in polyethylene zip-lock bags labeled with the sample number, suspect material description, and sample location. As part of sampling procedures, sampling tools were cleaned between sample collection events to avoid the potential for cross-contamination of samples.

Sample bags were compiled in order and placed into a single container accompanied with a Chain of Custody form outlining the project information, date, building location, number of samples, and sample description. Samples were submitted to the analytical laboratory in a sealed container via courier.

3.2 LEAD-CONTAINING PAINTS (LCPs) AND LEAD-CONTAINING MATERIALS

Lead may be used in its pure metallic form or combined chemically with other elements to form lead compounds. Metallic lead is used to make products such as electric storage batteries, ammunition, lead solder, radiation shields, pipes, and sheaths for electric cables. Metallic lead is sometimes combined with other metals such as copper, tin, and antimony as lead alloys for use in the manufacture of a variety of metal products. Lead is commonly found in buildings in the solder used on copper domestic pipes, in the caulking on bell fittings of cast iron drainage pipes and in electrical equipment.

The presence of lead-containing materials (other than paint) was assessed through visual means.

With respect to paint, the lead content of interior paint was limited to 0.5% by weight (5,000 parts per million, or "ppm" – equivalent to mg/kg) in 1976 under the Federal *Hazardous Products Act*. Recently, the *Hazardous Products Act* had reduced the criteria for surface coatings (including paint) to 600 mg/kg (600 ppm) to define them as "lead-containing" (this has since been reduced to 90 ppm). In addition, WorkSafeBC has compiled a manual titled "Lead-Containing Paint and Coatings: Preventing Exposure in the Construction Industry", (Lead Guideline) which defines a "lead-containing surface coating material" and indicates that "...the improper removal of lead paint containing 600 mg/kg lead results in airborne lead concentrations that exceed half of the exposure limit". As such, this value (600 ppm) will be referenced when defining paints as LCPs.

Samples of suspected LCPs were collected from major paint applications, and were collected to substrate, where possible, in sufficient quantity to conduct analyses for total lead content. Samples collected were placed into separate, sealed, and labeled polyethylene bags, and submitted to EMSL for analyses of total lead content using Flame Atomic Absorption Spectrometry AAS (SW 846 3050B*/7000B).

EMSL's analytical laboratory is also accredited by the American Industrial Hygiene Association (AIHA) Environmental Lead Laboratory Approval Program.

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3.3 POLYCHLORINATED BIPHENYLS (PCBs)

PCBs were used widely as coolants and lubricants in transformers, capacitors, and other electrical equipment. In fluorescent fixtures, PCBs were usually found within the small capacitors inside the ballast that controls the lamp. The Federal *Chlorobiphenyls Regulation*, SOR/91-152, prohibited the use of PCBs in electrical equipment manufactured after July 1, 1980.

The presence of PCB-containing equipment was assessed through visual means.

With respect to fluorescent lamp ballasts, due to the risk of electrical shock associated with dismantling operating fixtures, fluorescent lamp ballasts were not removed to view identification numbers/information.

The total number of fluorescent lamp ballasts that may contain PCBs within the subject facility was approximated.

Suspected PCB-containing electrical equipment can be visually inspected and compared to the Environment Canada reference guide entitled "Identification of Lamp Ballasts Containing PCBs, Report EPS 2/CC/2", dated August 1991 (PCB Guide).

3.4 MOULD

Moist building materials may provide suitable conditions for mould growth, and the removal of building materials impacted by mould growth may require workers with specific training and experience using work procedures that have been developed to protect workers and work areas from exposure to elevated concentrations of airborne mould.

The presence of suspect visible mould was assessed through visual means. Material observed with dark-colored staining and/or a textured and discolored appearance is described as "suspect mould". Mould identified visually is defined as "suspect mould" unless it is confirmed as mould by laboratory analysis.

3.4.1 Mould Reference Guidelines

With respect to mould and/or moisture, the assessment procedures utilized and abatement scope of work developed during this project were based on the recommendations provided in the documents listed below:

- Standard Construction Document CCA 82 "Mould Guidelines for the Canadian Construction Industry", Canadian Construction Association, 2004 (referred to as "CCA 82").
- "Guidelines on Assessment and Remediation of Fungi in Indoor Environment", New York City Department of Health, Bureau of Environmental and Occupational Disease Epidemiology, April 2000 (referred to as the "NYC Guidelines").
- "Fungal Contamination in Public Buildings: Health Effects and Investigation Methods", Federal-Provincial Committee on Environmental and Occupational Health, 2004 (referred to as the "Health Canada Guide").

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- "Indoor Air Quality in Office Buildings: A Technical Guide", Report of the Federal-Provincial Advisory Committee on Environmental and Occupational Health, 1995. (Referred to as the "IAQ Guide").
- "Bioaerosols: Assessment and Control", American Conference of Governmental Industrial Hygienists (ACGIH), 1999 (referred to as the ACGIH Report).

3.5 MERCURY

Mercury is commonly found in buildings as mercury vapour lighting, thermostats/thermometers with mercury-containing glass ampoules, electrical switches and can also be found in minor amounts in fluorescent lamp tubes and vapour bulbs and may be present in stable forms in adhesives. Exposure to mercury in federal workplaces is governed by the Canada Labour Code, while provincially it is governed by BC Reg. 296/97.

The presence of mercury and mercury-containing equipment was assessed through visual means.

3.6 OZONE-DEPLETING SUBSTANCES (ODSs)

Chlorofluorocarbons (CFCs) and other ODSs are often found in refrigeration units associated with air-conditioning or other refrigeration equipment. In September 1987, 47 countries agreed to the Montreal Protocol on Substances that Deplete the Ozone Layer. ODSs are regulated in BC by the *British Columbia Waste Management Act—Ozone Depleting Substances and Other Halocarbons Regulation* (BC Reg. 387/99 as amended by BC Reg. 109/2002) and the Federal *Halocarbon Regulations*, 2003 (FHR 2003).

The presence of ODSs and equipment containing these materials was assessed through visual means.

3.7 SILICA

Silica, also referred to as free crystalline silica, is found in concrete, cement, mortar, ceramic wall and floor tiles, stucco finishes and acoustic ceiling tiles. Prolonged exposure to, and inhalation of free crystalline silica, may result in respiratory disease known as silicosis, which is characterized by progressive fibrosis of the inner lung tissue and marked shortness of breath or impaired lung function.

Exposure to silica dust is governed by BC Reg. 296/97. According to both legislative instruments, the time-weighted average exposure limit for airborne silica dust is 0.025 mg/m³.

The presence of silica was assessed through visual means.

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4.0 ASSESSMENT LIMITATIONS

This report reflects the observations made within accessed areas of the subject facility and the results of analyses performed on specific materials sampled during the assessment. Analytical results reflect the sampled materials at the specific sample locations.

The limitations of this assessment pertaining to each of the considered hazardous building materials are outlined in the following sub-sections.

4.1 ASBESTOS-CONTAINING MATERIALS (ACMs)

Due to the limitations of sampling techniques and assessing occupied and operational facilities, and limitations associated with sampling so as not to compromise the integrity of various building systems (e.g., roof, envelope, etc.), the asbestos content of some materials within the subject facility could neither be confirmed nor denied. Suspected ACMs that were not sampled include, but are not limited to, the following:

- Roofing materials
- Sub-grade materials
- Interior components of mechanical equipment (e.g., inner linings or gaskets in boilers)
- Interior components of heating, ventilation and air conditioning (HVAC) units
- Heat protection materials inside mechanical installations (e.g., gaskets) and light fixtures (e.g., paper backing in sealed incandescent fixtures)
- Flooring material concealed beneath ceramic tile, brickwork, hardwood flooring, and/or concealed beneath existing sub-floors
- Drywall and/or wall plaster and associated finish materials concealed behind new and/or additional walls or ceilings
- Woven tape inside duct connection joints or inner ducting insulation
- Materials within wall cavities, hard ceiling cavities or crawlspaces
- Insulation materials inside fire doors

If encountered during renovation, demolition or other activities, any suspected ACMs not identified within this report should be presumed to contain asbestos and handled as such until otherwise proven, through analytical testing.

4.2 LEAD-CONTAINING PAINTS (LCPs) AND LEAD-CONTAINING MATERIALS

Assessment for the presence of lead or lead-containing materials was visual in nature, and was conducted pertaining to readily visible surfaces within accessible spaces of the subject facility only. The presence of lead or lead-containing materials in inaccessible areas not assessed includes, but is not limited to: ceiling spaces, wall cavities, crawlspaces, and buried materials.

With respect to paint, samples of suspected LCPs were collected within the subject facility only from surfaces of major paint applications where visually different paint colours and/or types

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were identified. Although the surfaces where samples were collected may be covered with more than one coat of paint, the paint samples are described by the surface (visible) colour only.

Attempts were made to represent all layers of paint in the samples collected. As analytical results are referenced to the surface paint colour only, the lead content of all painted surfaces similar to that represented by the surface paint colour will be presumed to be the same, regardless of differing sub surface paints, if any.

4.3 POLYCHLORINATED BIPHENYLS (PCBs)

Due to height restrictions and the risk of electrical shock in handling operational light fixtures, the ballasts present in the fixtures observed within the subject facility were not removed for comparison to the PCB Guide.

Conclusions and recommendations regarding the presence of PCBs within the subject facility are based on Stantec's limited observations in combination with information provided by staff regarding lighting renovations (where requested by Stantec based on observations) and is presented to provide guidance regarding the likelihood that PCB-containing equipment is or is not present within the subject facility. The exact extent and/or number of fluorescent lamp ballasts containing PCBs, if any, within the subject facility will not be commented on.

4.4 MOULD

Visual assessment for the presence of suspected visible mould and/or suitable conditions for mould growth (e.g., moist and/or water-stained building materials) were conducted in accessed portions of the subject facility only. The assessment was not intrusive in nature and included visual assessment of exposed surfaces and closer inspection of known problem areas.

The conclusions made in this report provide description(s) of the potential source(s) of moisture within the subject facility that may have led to suitable conditions for mould growth, only in those cases where potential source(s) of moisture were identified. These conclusions will not necessarily identify all sources of moisture leading to suitable conditions for mould growth within the subject facility or within the impacted area(s).

This assessment does not constitute a building envelope/building systems assessment, which would include an intrusive investigation to assess the internal condition, potential moisture sources, and expected remaining service life of the various components and systems comprising the envelope of a building.

4.5 MERCURY

Visual assessment for the presence of mercury-containing equipment within the subject facility was conducted in accessible areas only. The presence of mercury or mercury-containing

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equipment in inaccessible areas includes, but is not limited to: ceiling spaces, wall cavities, and crawlspaces, or as internal parts of HVAC mechanisms.

4.6 OZONE-DEPLETING SUBSTANCES (ODSs)

Visual assessment for the presence of ODSs within the subject facility was conducted in accessible areas only. The presence of ODS-containing equipment in inaccessible areas including, but not limited to, ceiling spaces, wall cavities and crawlspaces, was not assessed. In addition, portable equipment that may contain ODSs (refrigerators, drink coolers, etc.) was not considered as part of this assessment.

4.7 SILICA

Visual assessment for the presence of silica-containing materials within the subject facility was conducted in accessible areas only. The presence of potential silica-containing materials in inaccessible areas including, but not limited to, ceiling spaces, wall cavities and crawlspaces was not assessed.

5.0 RESULTS

Floor plans showing bulk sample locations and locations of identified hazardous materials (where practical) are provided in **Appendix A**.

The results of the assessment for each of the considered hazardous materials are provided in the following sub-sections.

5.1 ASBESTOS-CONTAINING MATERIALS (ACMs)

In addition to the materials identified during the North West Assessment and the Workplace Investigation, Stantec identified and sampled various suspected ACMs, including the following:

- Plasters
- Drywall joint compound
- Fire stop caulking
- Acoustical ceiling tiles
- Vinyl floor tile
- Sheet flooring
- Parging cement applied to mechanical pipe fittings
- Flex duct fabric
- Duct insulation
- Duct insulation inner liner
- Duct mastic/sealant
- Mechanical pipe wrap
- Mechanical insulation

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- Wall penetration parging
- Exterior stucco
- Exterior stone wall grout
- Fibre board
- Interior/exterior sealants and caulking
- Cementitious fire stop
- Fire proofing
- Tank insulation
- Cement board liner
- Cement panel
- Cement vent caps
- Cement pipe

326 samples of the above-noted suspected ACMs were collected within the subject facility and submitted to EMSL for analysis of asbestos content and nature. A summary of the sample types, locations and analytical results is presented in **Appendix B**. Copies of the certificates of analysis provided by EMSL for the suspected ACM samples submitted are included in **Appendix D**.

Based on observations of building construction (estimated vintage of interior finishes and uniformity of building material use) and on interpretations of the results of suspected ACM samples collected, the materials presented in Tables 5.1-1 (A Wing), 5.1-2 (B Wing), 5.1-3 (Header Building) and 5.1-4 (Annex Building), below were identified as ACMs within the subject facility.

No ACMs were identified through sampling conducted in the Workshop/Garages and Glasshouse, while no suspected ACMs were observed in the Equipment Shed or Shadehouse.

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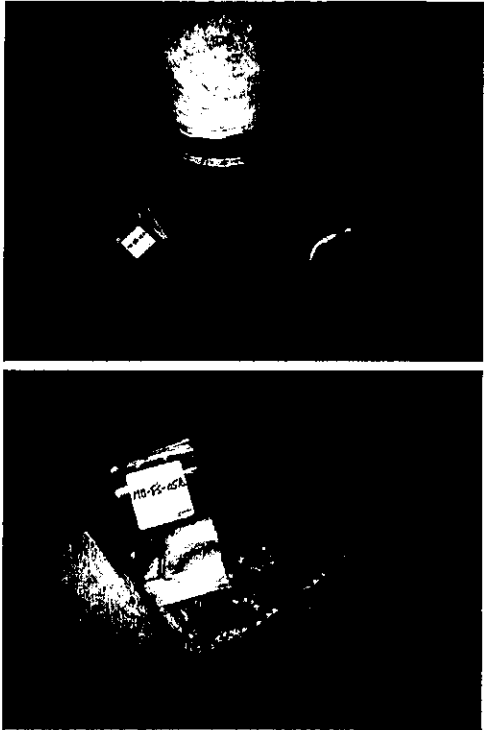
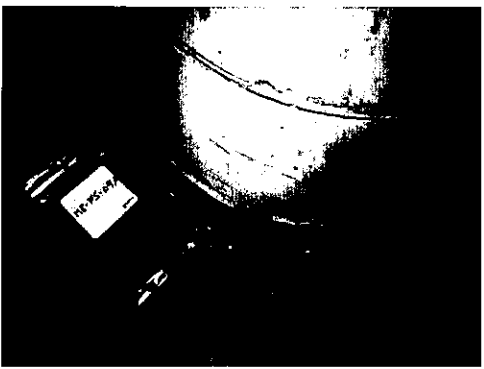
Table 5.1-1: Summary of Identified ACMs - A WING

Identified ACM Description		Photo
Skim coat plaster applied to the walls and ceilings of the north, south and west stairwells on all floors.		
Condition	GOOD	
% Type	8 - 10% Chrysotile Sampled in the north stairwell (2 nd floor), visually similar materials present in the south and west stairwells.	
Friability	Non-friable	
Black colour fire stop caulking applied to floor penetrations for mechanical pipes throughout the penthouse.		
Condition	GOOD	
% Type	3% Chrysotile	
Friability	Non-friable	

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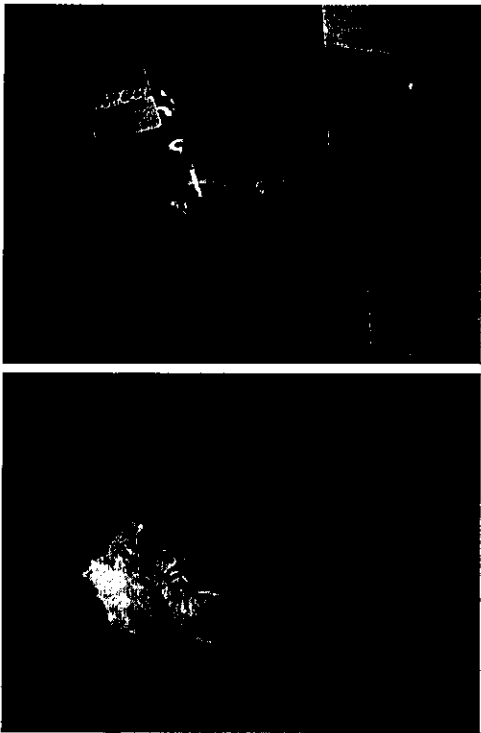
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Table 5.1-1: Summary of Identified ACMs – A WING		
Identified ACM Description		Photo
Grey colour fire stop caulking applied to floor penetrations for mechanical ductwork throughout the penthouse.		
Condition	GOOD	
% Type	5% Chrysotile	
Friability	Non-friable	
Silver colour fire stop caulking (rigid consistency) applied to floor penetrations for mechanical ductwork throughout the penthouse.		
Condition	GOOD	
% Type	5% Chrysotile	
Friability	Non-friable	

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Table 5.1-1: Summary of Identified ACMs – A WING		
Identified ACM Description		Photo
<p>Light grey colour chalk-like parging cement applied to pipe fittings observed in rooms 069, 073 and 045 on the ground floor and a fitting observed in the first floor east hallway.</p> <p>Presumed present in other locations throughout A Wing including inaccessible wall and ceiling cavities.</p>		
Condition	GOOD in general, the fitting (flange) shown here in room 069 was observed in POOR condition.	
% Type	8 – 10% Amosite, 2 - 8% Chrysotile Sampled in room 069 on the ground floor and in the first floor east hallway, visually similar materials present in rooms 073 and 045.	
Friability	Friable	

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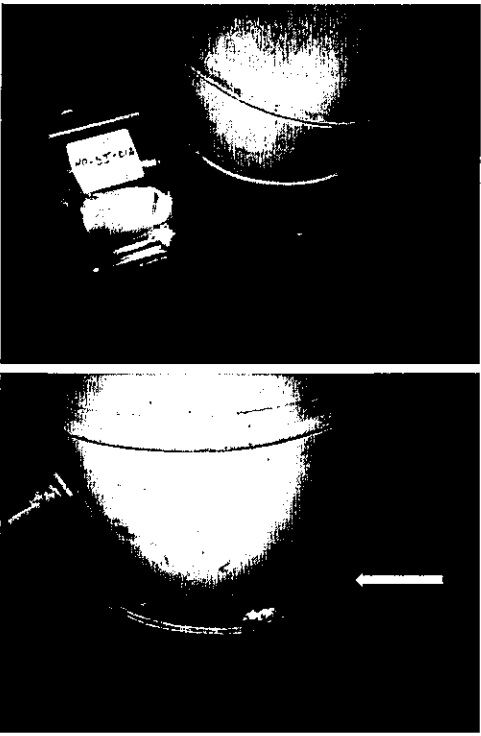
Table 5.1-1: Summary of Identified ACMs – A WING

Identified ACM Description		Photo
<p>Grey colour fibrous parging cement applied to pipe fittings observed to be present within the ceiling space above cold rooms on the ground floor (047, CR1, CR2, CR3, 044, CR4, CR5, and CR6).</p> <p>Presumed present in other locations throughout A wing including inaccessible wall and ceiling cavities.</p>		
Condition	<p>POOR – Fittings present within the ceiling space above rooms on the ground floor (047, CR1, CR2, CR3, 044, CR4, CR5 and CR6) were observed in POOR condition. These fittings are present above a solid plaster ceiling.</p>	
% Type	<p>45% Chrysotile</p> <p>Sampled within the ceiling space above room CR4, visually similar materials present within ceiling space of rooms 047, CR1, CR2, CR3, 044, CR5 and CR6.</p>	
Friability	<p>Friable</p>	

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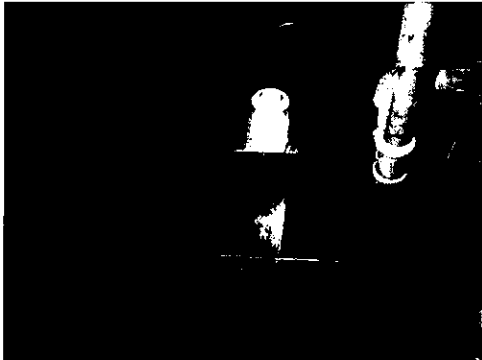


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Table 5.1-1: Summary of Identified ACMs – A WING		
Identified ACM Description		Photo
Flex duct fabric between mechanical ductwork in the penthouse.		
Condition	GOOD	
% Type	75 - 80% Chrysotile	
Friability	Friable	
White colour fibrous insulation between mechanical ductwork and floor penetrations in the penthouse. This material may be present, concealed in other areas of the building.		
Condition	GOOD	
% Type	50% Chrysotile	
Friability	Friable	

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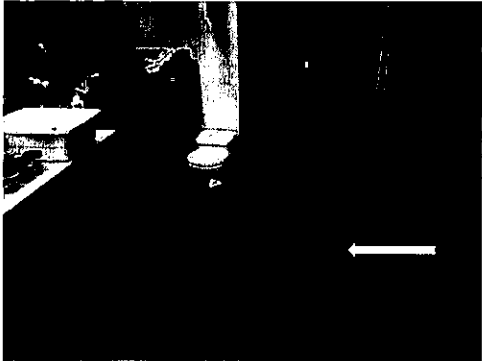
Table 5.1-1: Summary of Identified ACMs – <u>A WING</u>		Photo
Identified ACM Description Red colour duct mastic on mechanical ductwork joints throughout the building.		
Condition	GOOD	
% Type	4% Chrysotile	
Friability	Non-friable	
Identified ACM Description Cement products (including): <ul style="list-style-type: none"> • Cement board lining within fume hoods throughout. • Cement exhaust pipe leading from fume hoods to exhaust fans on the roof throughout. • Exhaust fans on the roof with cement vent caps (eight cement vent caps observed on the roof). 		 
Condition	GOOD	
% Type	Presumed asbestos-containing material – Not sampled to preserve its mechanical integrity.	
Friability	Non-friable	

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Table 5.1-1: Summary of Identified ACMs – A WING

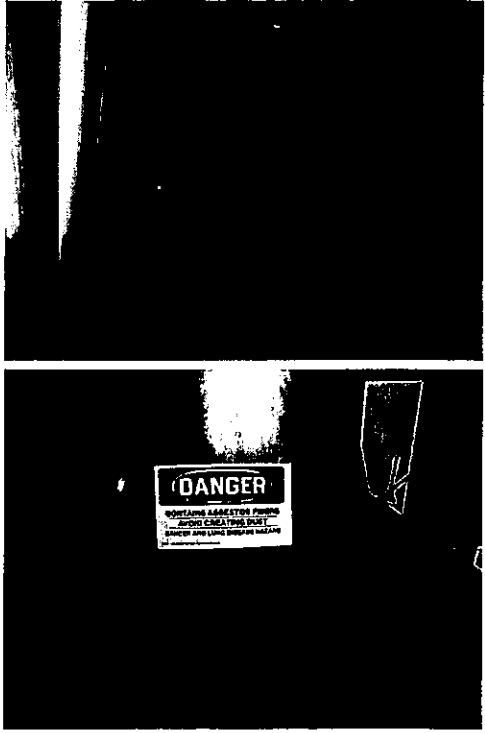
Identified ACM Description		Photo
Previously Identified ACMs (North West Assessment and Workplace Investigation)		
Inner lining material within herbarium storage cabinetry (ACM is not visible, it is reportedly present within the metal cabinet panels).		
Condition	GOOD	
% Type	90% Chrysotile (as indicated in the Workplace Investigation)	
Friability	Non-friable in-situ (contained within metal panels). Friable if panels are dismantled.	
Floor tile (9"x9" size) – Brown and blue colour tiles (brown colour tile shown here) present in various room areas on all floors.		
Condition	GOOD	
% Type	2 – 10% Chrysotile (as indicated in the North West Assessment)	
Friability	Non-friable	

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Table 5.1-2: Summary of Identified ACMs – B WING



Identified ACM Description		Photo
Red colour duct mastic on mechanical ductwork joints throughout (exhaust ducting and return ducting).		
Condition	GOOD	
% Type	4% Chrysotile	
Friability	Non-friable	

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Table 5.1-3: Summary of Identified ACMs – HEADER BUILDING

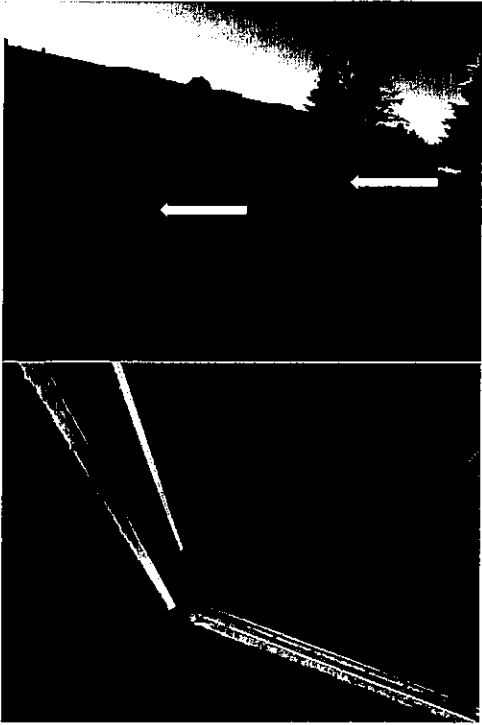
Identified ACM Description		Photo
Drywall joint compound applied to drywall walls and ceilings throughout the building.		
Condition	Generally in GOOD condition with some minor damage (POOR condition) to various wall areas.	
% Type	3% Chrysotile	
Friability	Non-friable in situ (friable once disturbed)	
Floor tile (9"x9" size) green colour present within workshop H05 and rooms H06, H07, H08 and H09.		
Condition	GOOD	
% Type	4% Chrysotile Sampled in workshop H05 and room H09, visually similar materials present in rooms H06, H07 and H08.	
Friability	Non-friable	

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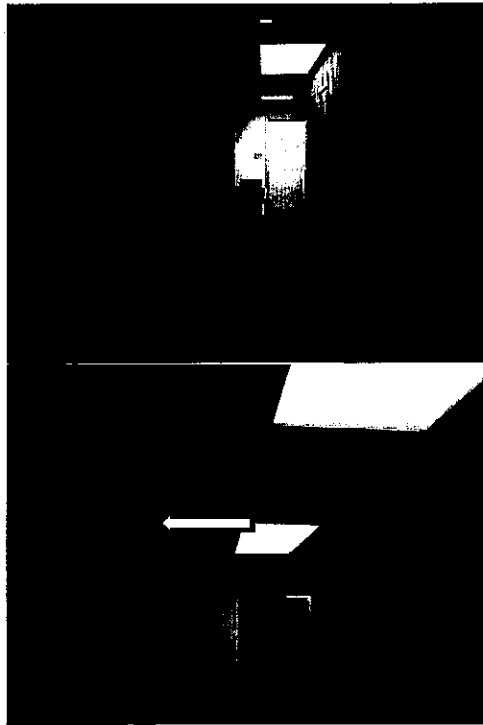
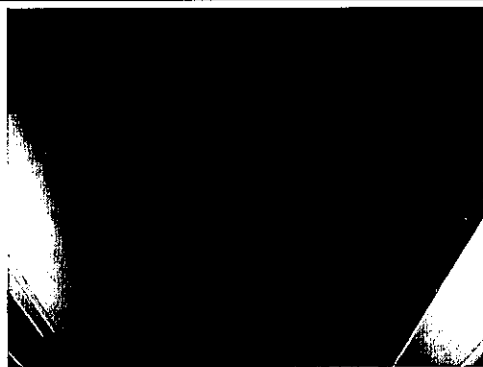
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Table 5.1-3: Summary of Identified ACMs – HEADER BUILDING

Identified ACM Description		Photo
Cement panels present beneath windows on the exterior of the building.		
Condition	GOOD	
% Type	15% Chrysotile	
Friability	Non-friable	
Cement board liner within a fume hood in room H08.		No photo
Condition	GOOD	
% Type	Presumed ACM – Not sampled	
Friability	Non-friable	

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Identified ACM Description		Photo
Drywall joint compound applied to drywall walls and ceilings throughout.		
Condition	Generally GOOD with some damaged (POOR condition) areas observed.	
% Type	< 1-3% Chrysotile	
Friability	Non-friable in situ (friable once disturbed)	
Floor tile (12"x12" size) beige with brown streaks present within the men's and women's washrooms.		
Condition	GOOD	
% Type	3% Chrysotile	
Friability	Non-friable	

5.1.1 Potential Asbestos-Containing Vermiculite Insulation

Vermiculite insulation was not observed in areas accessed during this assessment.

It should be noted that various interior walls throughout the ground floor of A Wing and the exterior walls of the Header Building are comprised of masonry blocks. As this assessment was non-intrusive (non-destructive) in nature, Stantec did not assess the content of the masonry

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blocks. As such, it is possible that the blocks may be filled with asbestos-containing vermiculite insulation.

5.2 LEAD-CONTAINING PAINTS (LCPs) AND LEAD CONTAINING MATERIALS

Lead may be present in the following materials throughout the subject facility:

- Solder used on copper domestic pipes
- Caulking on bell fittings for cast iron drainage pipes
- Electrical equipment (i.e., batteries for emergency lighting/signage)


With respect to paint, 37 paint chip samples of suspected LCPs were collected within the subject facility and submitted to EMSL for analysis of lead content. A summary of the sample types, locations and analytical results is presented in **Appendix C**.

A copy of the certificate of analysis provided by EMSL for the suspected LCP samples submitted is included in **Appendix E**.

Based on observations and interpretations of suspected LCP sample analytical results, the materials presented in Table Tables 5.2-1 (A Wing), 5.2-2 (B Wing), 5.2-3 (Header Building), 5.2-4 (Annex Building), 5.2-5 (Workshop/Garages) and 5.2-6 (Equipment Shed) were identified as LCPs within the subject facility.

No suspected LCPs were observed in the Glasshouse or Shadehouse.

Table 5.2-1: Summary of Identified LCPs – A WING

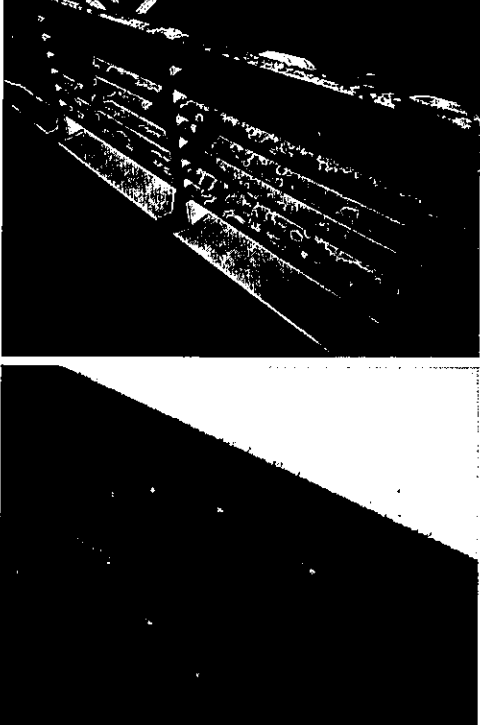
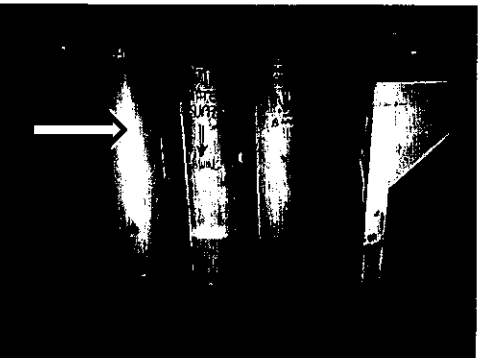
Lead-Containing Material Description	Photo
<p>Grey colour paint – Present on metal rooftop mechanical ductwork (1,700 ppm).</p> <p>This material was generally observed to be in GOOD condition with the exception of some peeling due to outdoor deterioration.</p>	

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Table 5.2-1: Summary of Identified LCPs – A WING

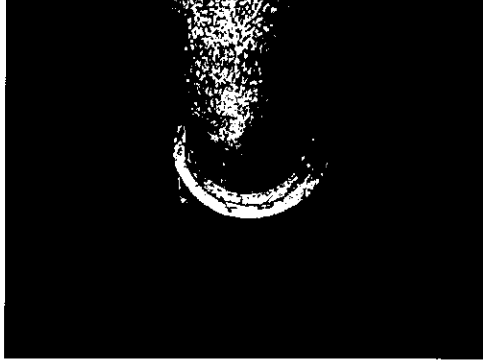

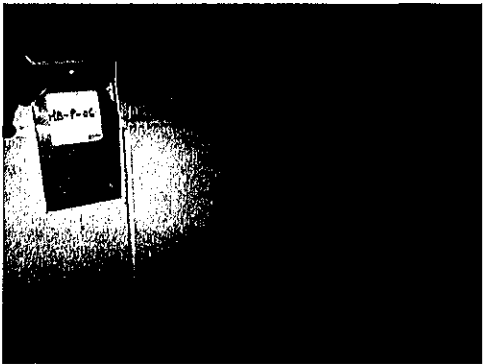
Lead-Containing Material Description	Photo
<p>White colour paint – Present on metal rooftop railing (18,000 ppm).</p> <p>This material was observed in POOR condition (rusting and flaking paint throughout railing structure) and paint chip debris was observed on the roof.</p>	
<p>Cream colour paint – Present on steel mechanical pipe within the penthouse (990 ppm).</p> <p>This material was generally observed to be in GOOD condition.</p>	

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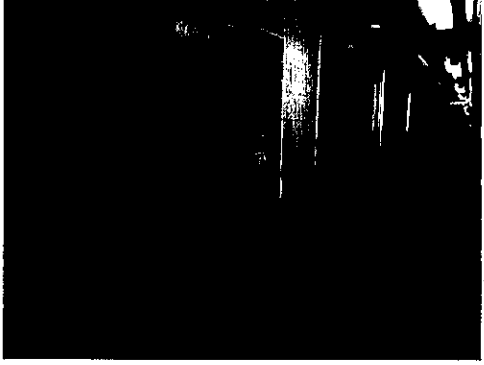
Table 5.2-1: Summary of Identified LCPs – A WING

Lead-Containing Material Description	Photo
<p>Silver colour paint – Present on cast iron drain pipe within the penthouse (960 ppm). This material was generally observed to be in GOOD condition.</p>	
<p>Red colour paint – Present on steel sprinkler pipe throughout the building (7,600 ppm). This material was generally observed to be in GOOD condition.</p>	
<p>Cream colour paint – Present on the walls and ceiling within the penthouse (940 ppm). This material was generally observed to be in GOOD condition.</p>	

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Table 5.2-1: Summary of Identified LCPs – A WING	
Lead-Containing Material Description	Photo
<p>Grey/blue colour paint – Present on the concrete floor in the east hallway on the 1st floor (630 ppm). This material was generally observed to be in GOOD condition.</p>	<p>No photo</p>
<p>White colour paint – Present on plaster walls and ceilings in stairwells (1,600 ppm). This material was generally observed to be in GOOD condition.</p>	
<p>Red colour paint (with yellow colour paint layer beneath) – Present on metal doors and door frames throughout the ground floor north and south hallways (2,800 ppm). No photo for the red colour door frame sampled, however this photo shows the yellow colour paint present beneath (which is present on the majority of doors/door frames throughout the ground floor north and south hallways). This material was generally observed to be in GOOD condition.</p>	

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Table 5.2-1: Summary of Identified LCPs – A WING


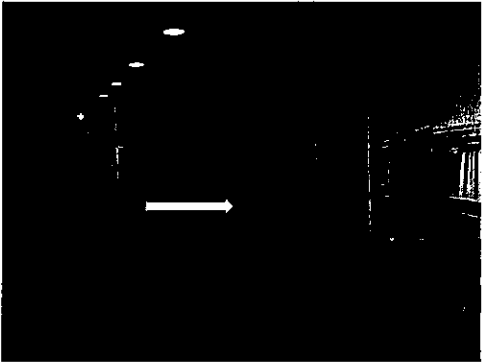
Lead-Containing Material Description	Photo
<p>Grey colour paint – Present on metal exterior trim and stucco siding on the building (2,800 ppm). This material was generally observed to be in GOOD condition with the exception of some peeling due to outdoor deterioration.</p>	

Table 5.2-2: Summary of Identified LCPs – B WING



Lead-Containing Material Description	Photo
<p>Off-white colour paint – Present on metal doors and door trim throughout the ground floor (2,000 ppm). This material was generally observed to be in GOOD condition.</p>	
<p>Green colour paint – Present on metal door trim throughout the ground floor (1,800 ppm). This material was generally observed to be in GOOD condition.</p>	<p>No photo</p>

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Table 5.2-2: Summary of Identified LCPs – B WING


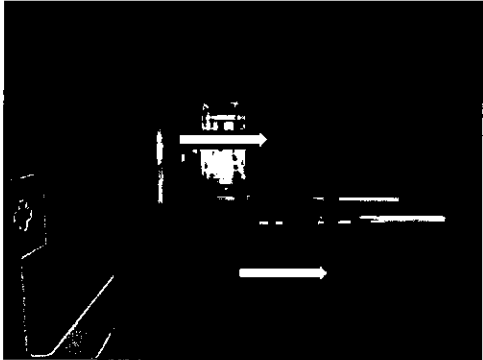

Lead-Containing Material Description	Photo
<p>Yellow colour paint – Present on metal door trim throughout the ground floor (1,100 ppm). This material was generally observed to be in GOOD condition.</p>	<p>No photo</p>
<p>Grey colour paint – Present on metal door trim on the entrance door to A Wing on the 3rd floor (2,400 ppm). This material was generally observed to be in GOOD condition.</p>	
<p>Grey colour paint – Present on metal siding on the exterior of the building (1,200 ppm). This material was generally observed to be in GOOD condition.</p>	

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Table 5.2-3: Summary of Identified LCPs – HEADER BUILDING

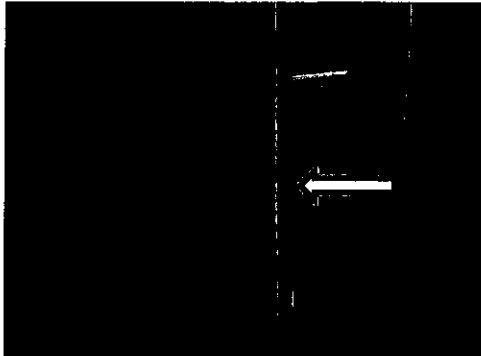
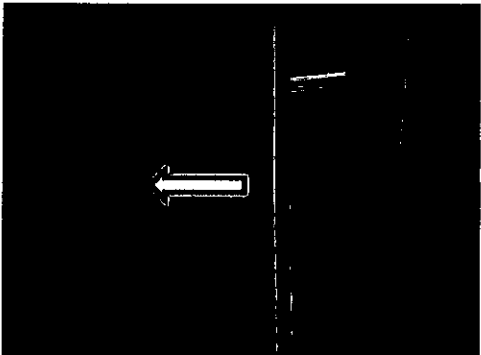
Lead-Containing Material Description	Photo
<p>Beige colour paint – Present on drywall interior walls and ceilings throughout (1,800 ppm). This material was generally observed to be in GOOD condition.</p>	
<p>Light green colour paint – Present on metal interior posts and doors throughout (3,800 ppm). This material was generally observed to be in GOOD condition.</p>	
<p>Dark green colour paint – Present on metal interior doors throughout (27,000 ppm). This material was generally observed to be in GOOD condition.</p>	

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Table 5.2-4: Summary of Identified LCPs – ANNEX BUILDING

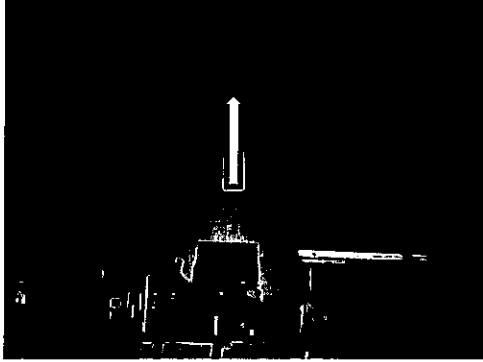

Lead-Containing Material Description	Photo
<p>Grey colour paint – Present on wood exterior trim on the building (1,200 ppm).</p> <p>This material was generally observed to be in GOOD condition with the exception of some peeling due to outdoor deterioration.</p>	
<p>White colour paint – Present on wood exterior siding on the building (2,300 ppm).</p> <p>This material was generally observed to be in GOOD condition with the exception of some peeling due to outdoor deterioration.</p>	

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Table 5.2-5: Summary of Identified LCPs – WORKSHOP/GARAGES

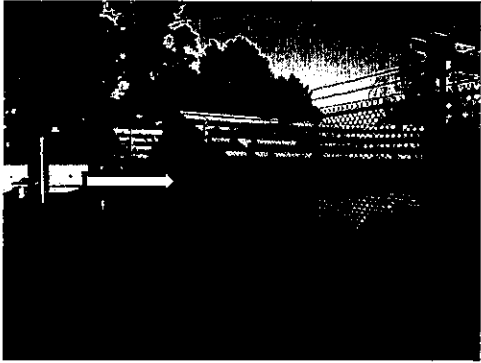
Lead-Containing Material Description	Photo
<p>Beige colour paint – Present on metal mechanical ductwork throughout (2,400 ppm). This material was generally observed to be in GOOD condition with the exception of some peeling.</p>	
<p>White colour paint – Present on drywall interior walls and ceilings throughout (680 ppm). This material was generally observed to be in GOOD condition.</p>	

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Table 5.2-6: Summary of Identified LCPs – EQUIPMENT SHED

Lead-Containing Material Description	Photo
<p>White colour paint – Present on wood shed structure (6,700 ppm).</p> <p>This material was generally observed to be in GOOD condition with the exception of some peeling due to outdoor deterioration.</p>	

5.3 POLYCHLORINATED BIPHENYLS (PCBs)

The following observations were made for PCB-containing equipment within the subject facility:

- **A Wing**
 - Fluorescent light fixtures with low voltage light tubes observed predominantly throughout the building, which are not expected to have ballasts that contain PCBs. Approximately 30-40 fluorescent light ballasts that appear to be of pre-1985 vintage, may have ballasts that contain PCBs.
 - Dry type transformers observed in electrical rooms throughout.
- **B Wing**
 - Fluorescent light fixtures with low voltage light tubes observed predominantly throughout the building, which are not expected to have ballasts that contain PCBs. Approximately 10-20 fluorescent light ballasts that appear to be of pre-1985 vintage, may have ballasts that contain PCBs.
 - Dry type transformers observed in electrical rooms throughout.
- **Header Building**
 - Fluorescent light fixtures with low voltage light tubes observed predominantly throughout the building, which are not expected to have ballasts that contain PCBs. Approximately 5-10 fluorescent light ballasts that appear to be of pre-1985 vintage, may have ballasts that contain PCBs.
 - Dry type transformer observed in electrical room.
- **Annex Building**
 - Fluorescent light fixtures with low voltage light tubes observed predominantly throughout the building, which are not expected to have ballasts that contain PCBs. Approximately 5-10 fluorescent light ballasts that appear to be of pre-1985 vintage, may have ballasts that contain PCBs.

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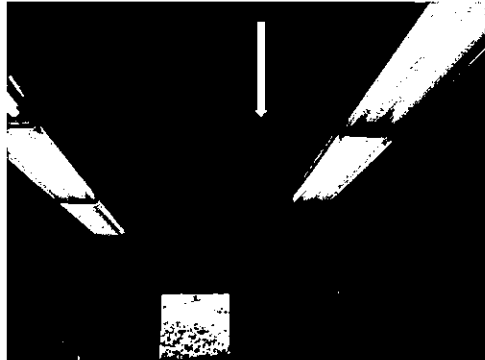
- Workshop/Garages
 - Fluorescent light fixtures with low voltage light tubes observed predominantly throughout the building, which are not expected to have ballasts that contain PCBs. Approximately 5 fluorescent light ballasts that appear to be of pre-1985 vintage, may have ballasts that contain PCBs.
- Equipment Shed
 - None observed.
- Glasshouse
 - None observed.
- Shadehouse
 - None observed.

5.4 MOULD

Mould and/or moisture-impacted building materials were observed as presented below in Tables 5.4.1 (Header Building) and 5.4.2 (Annex Building).

No mould and/or moisture-impacted building materials were observed within A Wing, B Wing, Workshop/Garages, Equipment Shed, Glasshouse and Shadehouse.


Table 5.4-1: Summary of Mould/Moisture Observations – HEADER BUILDING

Identified/Suspect Mould and/or Moisture Impacted Building Material Observed	Photo
<p>Suspect mould and moisture-impacted drywall was on the ceiling in room H9.</p> <ul style="list-style-type: none"> • NOTE: The above noted suspect mould/moisture-impacted material is an identified ACM. 	

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Identified/Suspect Mould and/or Moisture Impacted Building Material Observed	Photo
Moisture-impacted ceiling tiles were observed on the ceiling and within a light fixture near the alternate entrance to the building.	

5.5 MERCURY

The following observations were made for mercury-containing equipment within the subject facility:

- A Wing
 - One mercury-containing thermometer was observed within the penthouse.
- B Wing
 - Six mercury-containing thermometers were observed within the penthouse.
- Header Building
 - 10 mercury-containing thermometers were observed within the mechanical rooms (five in each mechanical room).
- Annex Building
 - None observed.
- Workshop/Garages
 - None observed.
- Equipment Shed
 - One mercury-containing thermostat was observed.
- Glasshouse
 - None observed.
- Shadehouse
 - None observed.

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In addition to the above, mercury vapour is expected to be present in fluorescent light tubes observed throughout the subject facility.

5.6 OZONE-DEPLETING SUBSTANCES (ODSs)

Various pieces of equipment with ODSs present were identified throughout the subject facility. A summary listing provided by Natural Resources Canada of the ODS-containing equipment identified, including location, refrigerant type and amount, is presented in **Appendix F**.

5.7 SILICA

Silica may be present in concrete, cement, mortar, ceramic wall and floor tiles, stucco finishes and acoustic ceiling tiles observed in various locations throughout the subject facility.

6.0 RECOMMENDATIONS

The recommendations pertaining to the requirements for each of the hazardous materials included in this assessment are presented in the sub-sections below.

6.1 ASBESTOS-CONTAINING MATERIALS (ACMs)

Due to the confirmed presence of asbestos within the subject facility, and in accordance with the Canada Labour Code and the provisions of the BC Reg. 296/97, Stantec recommends that an asbestos exposure control plan (also known as an "asbestos management plan" (AMP) or "asbestos operations and management plan") be developed and implemented for the subject facility. The AMP would serve to compile the available data, results, and reports regarding the presence, extent, handling, removal, and disposal of ACMs within the subject facility. The AMP would also provide sections for information regarding future sampling and analysis of suspected ACMs, if required, asbestos-abatement projects, if undertaken, and other information regarding the management of asbestos within the subject facility, including provisions for employees that require asbestos awareness training.

Identified ACMs that were observed in GOOD condition can be managed in place based on the limited potential for damage to these materials and/or release of airborne asbestos fibres.

If identified ACMs are to be impacted by renovation activities they should be handled in accordance with the procedures outlined in the current version of the WorkSafeBC document entitled "Safe Work Practices for Handling Asbestos", by a qualified asbestos abatement contractor, prior to the onset of renovation activities that may disturb them.

If materials that are visually similar to identified ACMs are discovered within the subject facility in locations not outlined in this report, these materials should be considered as asbestos-containing and handled as such, unless proven otherwise, through analytical testing.

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If encountered during renovation activities, any suspected ACMs not accessible during this assessment should be considered as asbestos-containing and handled as such, unless proven otherwise, through analytical testing.

Ensure asbestos containing waste is handled, stored, and disposed of in accordance with the requirements of the *Federal Transportation of Dangerous Goods Regulation* and the *British Columbia Hazardous Waste Regulation* (BC Reg. 63/88).

6.1.1 Asbestos-Containing Materials (ACMs) - POOR Condition

Various ACMs were observed in POOR condition within the subject facility and require action, as summarized below:

- A Wing
 - Remove or repair the light grey colour, chalk-like parging cement applied to a fitting (flange) present within room 069.
 - Remove or repair the grey colour, fibrous parging cement applied to fittings present within the ceiling space above rooms on the ground floor (047, CR1, CR2, CR3, 044, CR4, CR5 and CR6) were observed in POOR condition.
 - o As these fittings are present above a solid plaster ceiling, an alternative strategy would be to fully enclose that cavity, restrict access and post appropriate signage at any potential entry points (signage that indicates the presence of asbestos in poor condition within the ceiling space). This recommendation applies ONLY if the ceiling space is not part of the air handling system for that area of the facility (i.e., open-air return plenum). If the ceiling space is part of the air handling system, the above-noted abatement is required.
- Header Building
 - Repair areas of drywall joint compound observed to have minor damage (POOR condition) on various wall areas.
- Annex Building
 - Repair areas of drywall joint compound observed to have minor damage (POOR condition) on various wall areas.

The above noted work should be conducted by an experienced asbestos abatement contractor.

6.1.2 Potential for Asbestos-Containing Vermiculite Insulation

Destructive testing for the presence of potential asbestos-containing vermiculite insulation should precede any work that will require disturbance of masonry block walls within the subject facility (e.g., creating openings, drilling, otherwise damaging surfaces to expose the masonry block cavity).

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6.2 LEAD-CONTAINING PAINTS (LCPs) AND LEAD-CONTAINING MATERIALS

As identified LCPs and lead-containing materials were observed in GOOD condition, no action is currently required.

For LCPs and lead-containing materials that are to be disturbed and/or removed during renovation or other activities, ensure compliance with the following:

- The occupational exposure control requirements of the Canada Labour Code and BC OH&S Reg., including the provisions of the *Lead Guideline*
- The disposal requirements of the *British Columbia Hazardous Waste Regulation* (BC Reg. 63/88)
- The transportation requirements of the *Federal Transportation of Dangerous Goods Regulation*

Corrective action or remedial work on paint applications containing any concentration of lead should be undertaken in a manner so as to avoid generating fine particulate matter or dust (i.e., avoid sanding). Airborne lead dust or fumes should not exceed BC Reg. 296/97 8-hour Occupational Exposure Limit (OEL) of 0.05 milligram per cubic metre (mg/m³) during the removal of paints and products containing any concentration of lead. The use of personal protective equipment is recommended to reduce the potential for over-exposure to lead dust.

As it has been reported that employees at the subject facility are often required to conduct maintenance work that may require disturbances to surfaces coated with LCPs, consideration should be given to developing an Exposure Control Plan for lead at the subject facility, which should include provisions for the following:

- Awareness training for workers that may be required to disturb lead-containing materials or materials coated with LCPs
- Safe work practices for working with lead-containing materials or materials coated with LCPs during typical maintenance activities

6.3 POLYCHLORINATED BIPHENYLS (PCBs)

Some fluorescent light ballasts that appear to be of pre-1985 vintage, may contain PCBs. When removed as part of renovation activities fluorescent lamp ballasts within older fixtures should be assessed in reference to the PCB Guide prior to disposal.

If PCB-containing ballasts are identified, these items can be managed in place, where they are operating and in GOOD condition. No further action is currently required until such time that renovation or demolition activities are to be conducted, or until 2025, when PCB-containing items will require removal and disposal according to the *PCB Regulations* (SOR/2008-273).

PCB-containing items identified for removal and disposal should be handled, transported, stored and disposed of according to the *Federal Transportation of Dangerous Goods Regulation*, BC Reg. 63/88, and the *PCB Regulations* (SOR/2008-273).

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6.4 MOULD

Documents published by Health Canada, Ontario Ministry of Health, American Industrial Hygiene Association (AIHA), American Conference of Governmental Industrial Hygienists (ACGIH) and others, provide guidance for interpreting the results of mould investigations. The Health Canada Guide states that:

"Identifiable promoters of fungal growth require correction, and any visible fungi require removal."

To this end, Stantec recommends the following course of action within the subject facility:

- Header Building
 - Remove and dispose of approximately 10 square feet of suspect mould/moisture-impacted drywall from the ceiling in room H9 within the Header Building. Identify the source of moisture prior to re-instating with new building materials.
 - The above noted work will impact asbestos-containing drywall joint compound.
- Annex Building
 - Remove and dispose of approximately 5 square feet of moisture impacted ceiling tiles and the adjacent fluorescent light fixture from the ceiling near the alternate entrance to the building. Identify the source of moisture prior to re-instating with new building materials.
 - The above noted work may impact asbestos-containing drywall joint compound present on the ceiling behind ceiling tiles.

The above noted work should be completed by an experienced asbestos abatement contractor.

6.5 MERCURY

Mercury-containing items can be managed in place. No action is currently required.

If mercury-containing materials (e.g., thermometers, thermostats, fluorescent light tubes) are require removal and disposal for renovation or operations and maintenance activities, ensure all mercury waste is handled, stored and disposed of in accordance with the requirements of the BC Reg. 63/88 and the Federal *Transportation of Dangerous Goods Regulation*.

6.6 OZONE-DEPLETING SUBSTANCES (ODSs)

ODS-containing equipment/materials can be managed in place, and must be serviced by licensed refrigeration technicians (as defined in the Federal *Halocarbon Regulations*, 2003 [FHR 2003]).

If ODS-containing equipment is to be removed and disposed of, ODSs must be handled, recycled, stored, and/or disposed of in accordance with the requirements of the *British*

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Columbia Waste Management Act - Ozone Depleting Substances and Other Halocarbons Regulation (BC Reg. 387/99) and the FHR 2003.

6.7 SILICA

Silica-containing materials can be managed in place, no action is currently required.

If silica-containing materials are to be disturbed, ensure dust control measures are employed such that airborne silica dust concentrations do not exceed the exposure limit as stipulated by BC Reg. 296/97 (0.025 mg/m³). This would include, but not be limited to, the following:

- Providing workers with respiratory protection
- Wetting the surface of the materials to prevent dust emissions
- Providing workers with facilities to properly wash prior to exiting the work area
- Providing dust control to mitigate the potential for demolition dust to escape from the work area into public and/or adjacent areas.

7.0 CLOSURE

This report has been prepared by Stantec for the sole benefit of Public Works and Government Services Canada and Natural Resources Canada. Any use that a third party makes of this report, or any reliance on decisions to be made based on it, is the responsibility of such third parties. Stantec accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The conclusions presented represent the best judgment of the assessor based on current environmental standards and the site conditions observed on the date cited within this report. This report is based on, and limited by, circumstances and conditions stated herein, and on information available at the time of preparation of the report. Due to the limited nature of the investigation and the limited data available, Stantec cannot warrant against undiscovered environmental liabilities. It is possible that additional, concealed hazardous materials may become evident during renovation and/or demolition activities within the subject facility.

If any conditions become apparent that differ significantly from our understanding of conditions as presented in this report, we request that we be notified immediately to reassess the conclusions provided herein.

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We trust that the report meets your current requirements. Should you have any questions or concerns regarding the above, please do not hesitate to contact the undersigned.

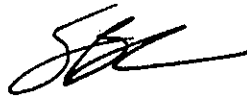
Respectfully submitted,

Stantec Consulting Ltd.

Reviewed by:



Zack Kranjec, Dipl. T.
Project Technologist

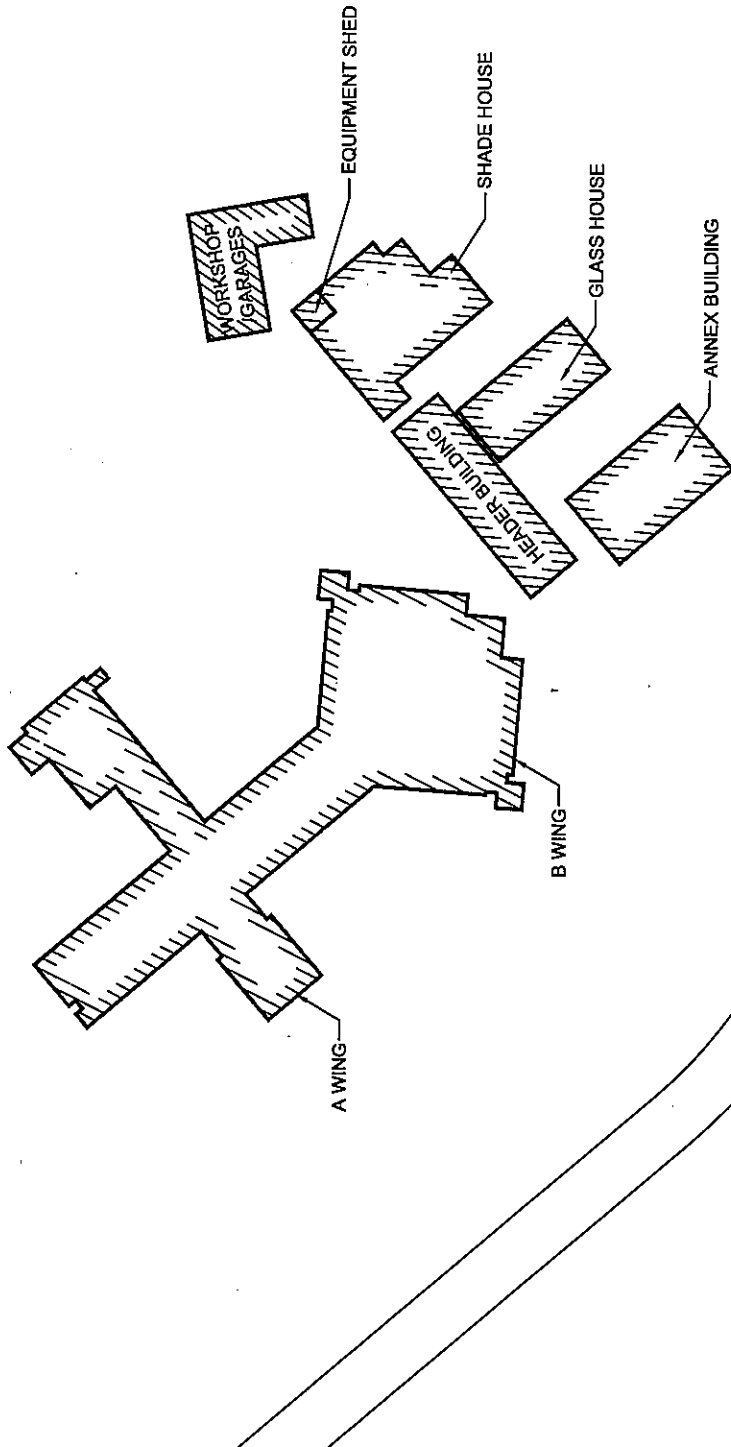


Sean Brigden, B.Sc., P.B.Dipl., CRSP
Senior Reviewer

ZK/SB/bd

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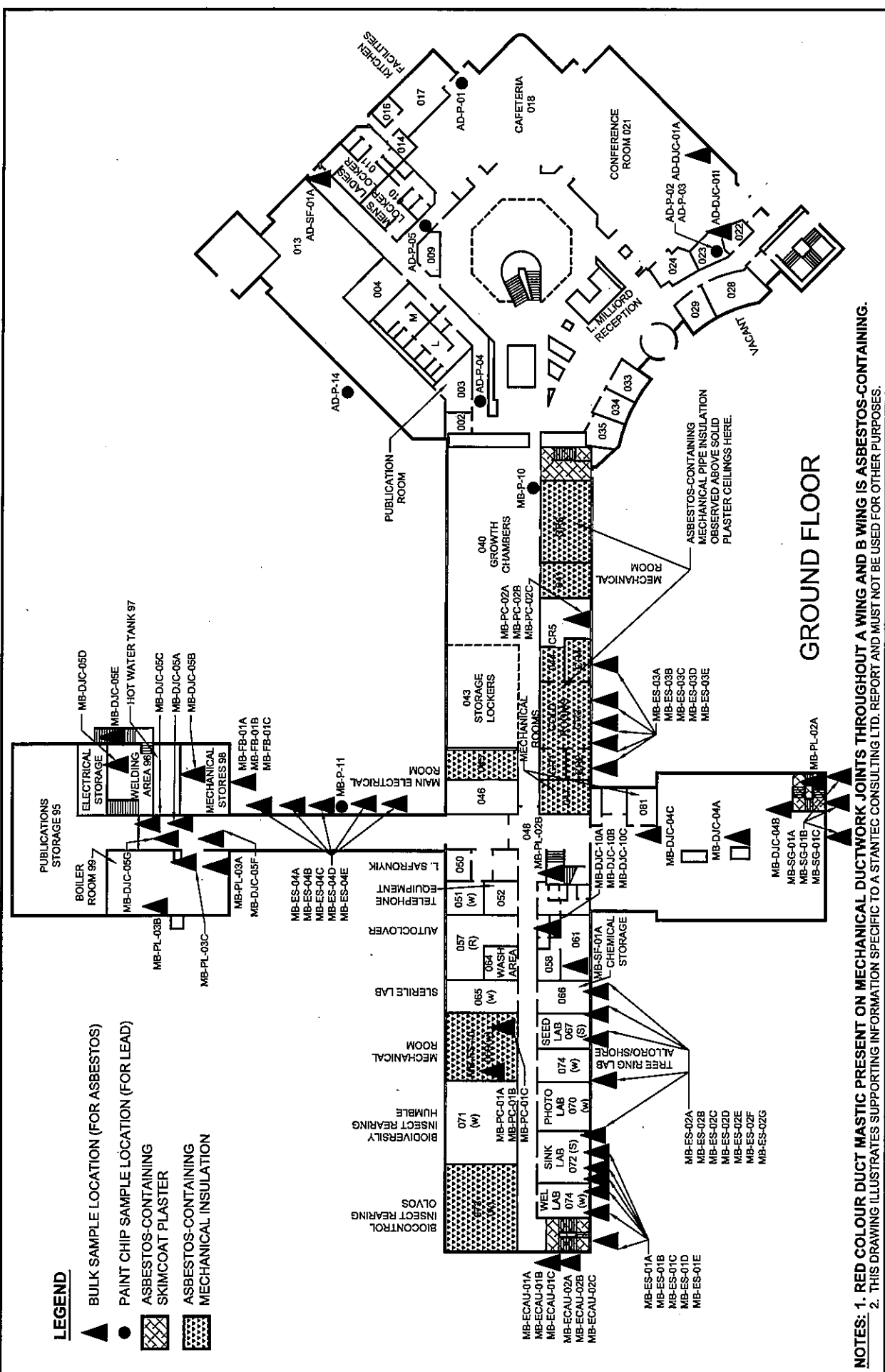
Appendix A
Floor Plans



NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

Project No.: 115614042		Dwg. No.:
Scale: 1 : 1500	1	
Date: 14/03/11		
Dwn. By: CD CS - SL2014030075		
App'd By: TW		
SITE PLAN		
PACIFIC FOREST SERVICE CENTRE, 506 WEST BURNSIDE ROAD, VICTORIA, BC		
Client:	PWGSC	

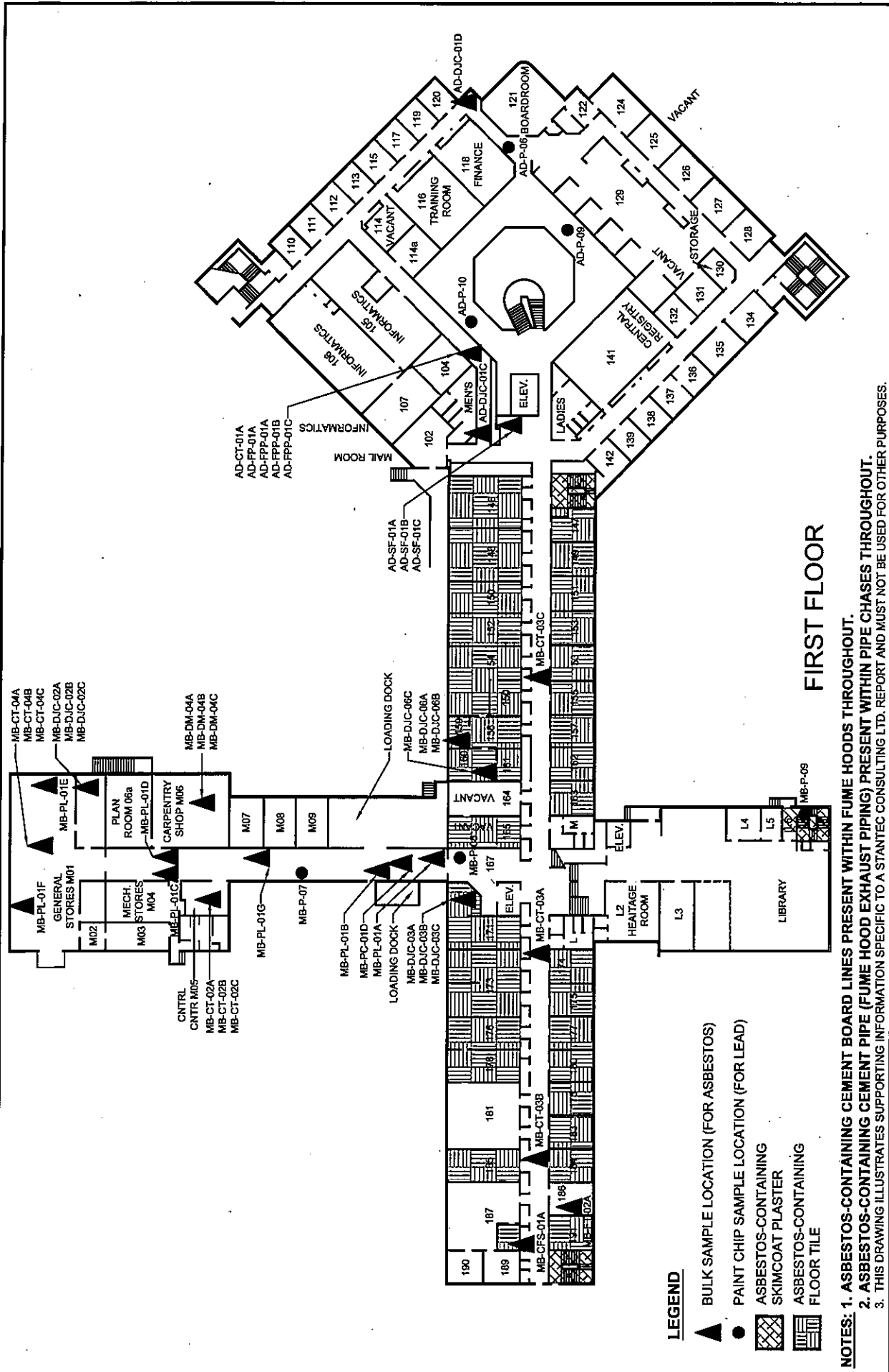




NOTES: 1. RED COLOUR DUCT MASTIC PRESENT ON MECHANICAL DUCTWORK JOINTS THROUGHOUT A WING AND B WING IS ASBESTOS-CONTAINING.
 2. THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

GROUND FLOOR

Project No.: 115614042 Scale: N.T.S. Date: 14/03/12 Dwn. By: CD CS SL2014030086 App'd By: TW		
Dwg. No.: 2		
FLOOR PLAN SHOWING HAZARDOUS BUILDING MATERIALS AND BULK SAMPLE LOCATIONS PACIFIC FOREST SERVICE CENTRE, 506 WEST BURNSIDE ROAD, VICTORIA, BC		
Client: PWGSC		



FIRST FLOOR

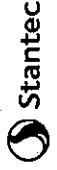
- LEGEND**
- ▲ BULK SAMPLE LOCATION (FOR ASBESTOS)
 - PAINT CHIP SAMPLE LOCATION (FOR LEAD)
 - ▨ ASBESTOS-CONTAINING SKIMCOAT PLASTER
 - ▩ ASBESTOS-CONTAINING FLOOR TILE

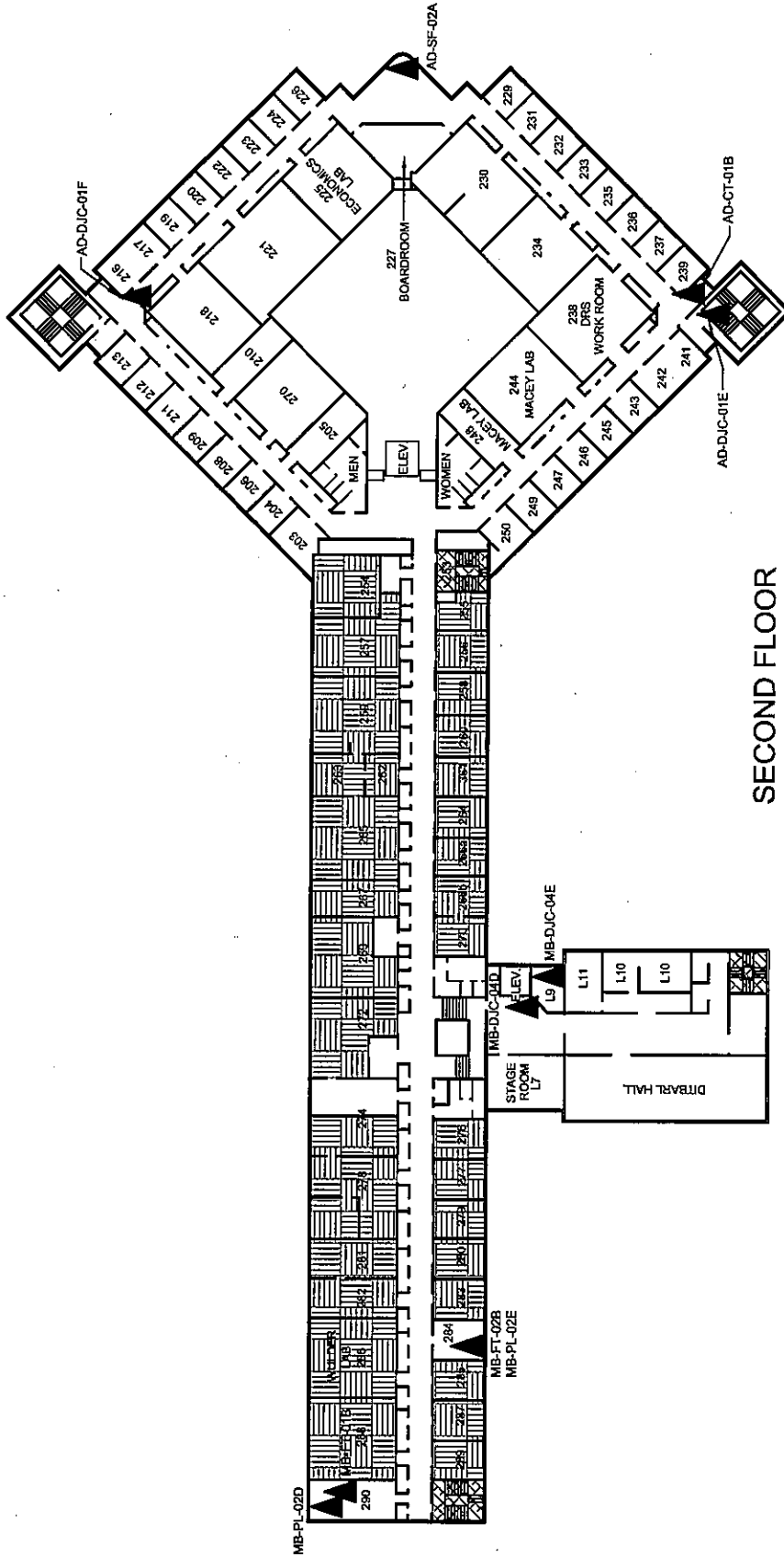
NOTES: 1. ASBESTOS-CONTAINING CEMENT BOARD LINES PRESENT WITHIN FUME HOODS THROUGHOUT.
 2. ASBESTOS-CONTAINING CEMENT PIPE (FUME HOOD EXHAUST PIPING) PRESENT WITHIN PIPE CHASES THROUGHOUT.
 3. THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

FLOOR PLAN SHOWING HAZARDOUS BUILDING MATERIALS AND BULK SAMPLE LOCATIONS

PACIFIC FOREST SERVICE CENTRE, 506 WEST BURNSIDE ROAD, VICTORIA, BC

Project No.: 115614042	Dwg. No.: 3
Scale: N.T.S.	
Date: 14/03/12	
Dwn. By: CD CS	
App'd By: TW	





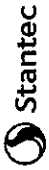
SECOND FLOOR

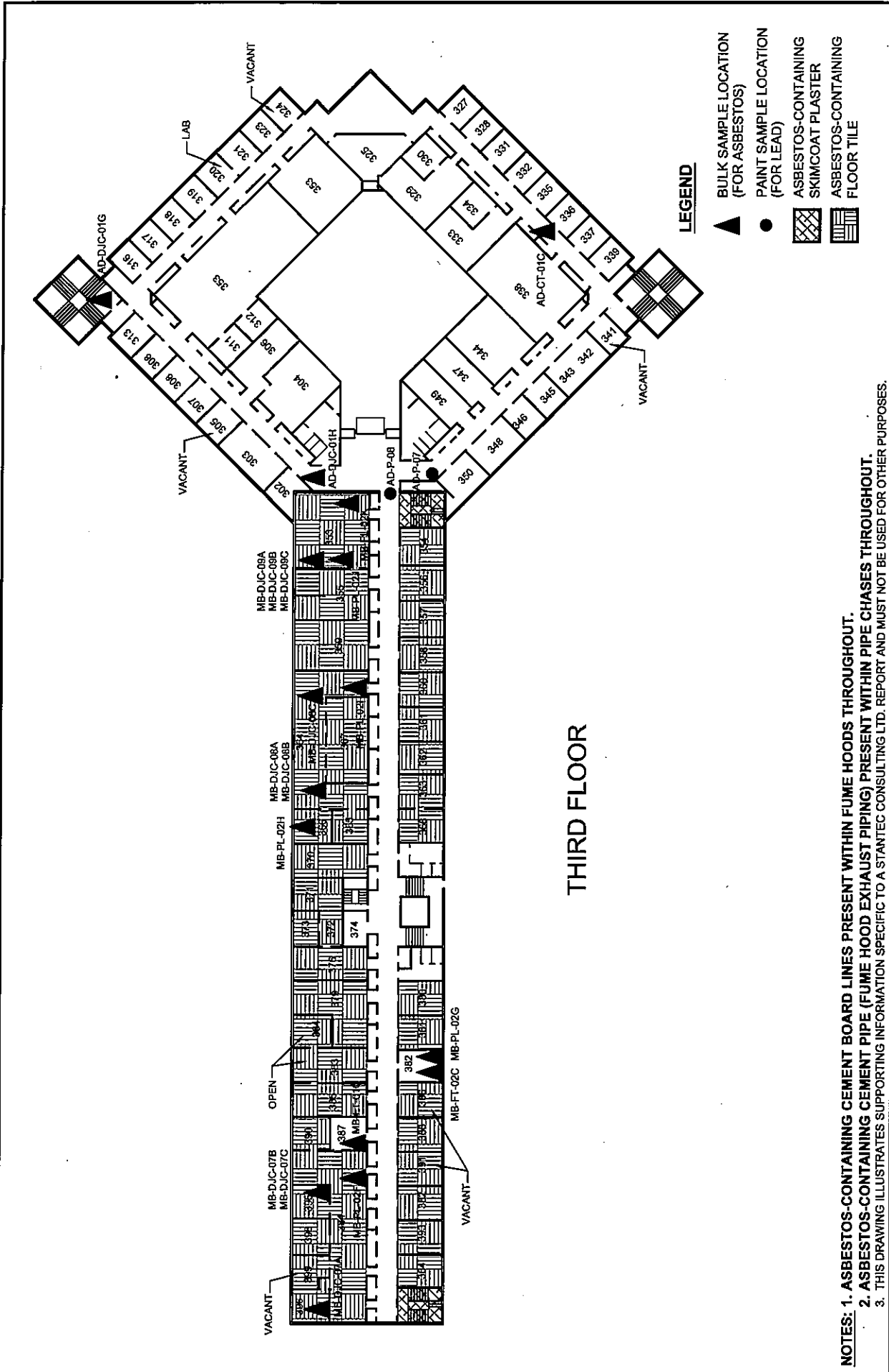
LEGEND

- ▲ BULK SAMPLE LOCATION (FOR ASBESTOS)
- ▨ ASBESTOS-CONTAINING SKIMCOAT PLASTER
- ▩ ASBESTOS-CONTAINING FLOOR TILE

- NOTES:**
1. ASBESTOS-CONTAINING CEMENT BOARD LINES PRESENT WITHIN FUME HOODS THROUGHOUT.
 2. ASBESTOS-CONTAINING CEMENT PIPE (FUME HOOD EXHAUST PIPING) PRESENT WITHIN PIPE CHASES THROUGHOUT.
 3. THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

Project No.: 115614042		Dwg. No.: 4	
Scale: N.T.S.			
Date: 14/03/12			
Dwn. By: CD CS, SL2014030088			
App'd By: TW			
<p>FLOOR PLAN SHOWING HAZARDOUS BUILDING MATERIALS AND BULK SAMPLE LOCATIONS</p> <p>PACIFIC FOREST SERVICE CENTRE, 506 WEST BURNSIDE ROAD, VICTORIA, BC</p>			
Client:	PWGSC		





NOTES:

1. ASBESTOS-CONTAINING CEMENT BOARD LINES PRESENT WITHIN FUME HOODS THROUGHOUT.
2. ASBESTOS-CONTAINING CEMENT PIPE (FUME HOOD EXHAUST PIPING) PRESENT WITHIN PIPE CHASES THROUGHOUT.
3. THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

Project No.:	115614042
Scale:	N.T.S.
Date:	14/03/12
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App'd By:	TW

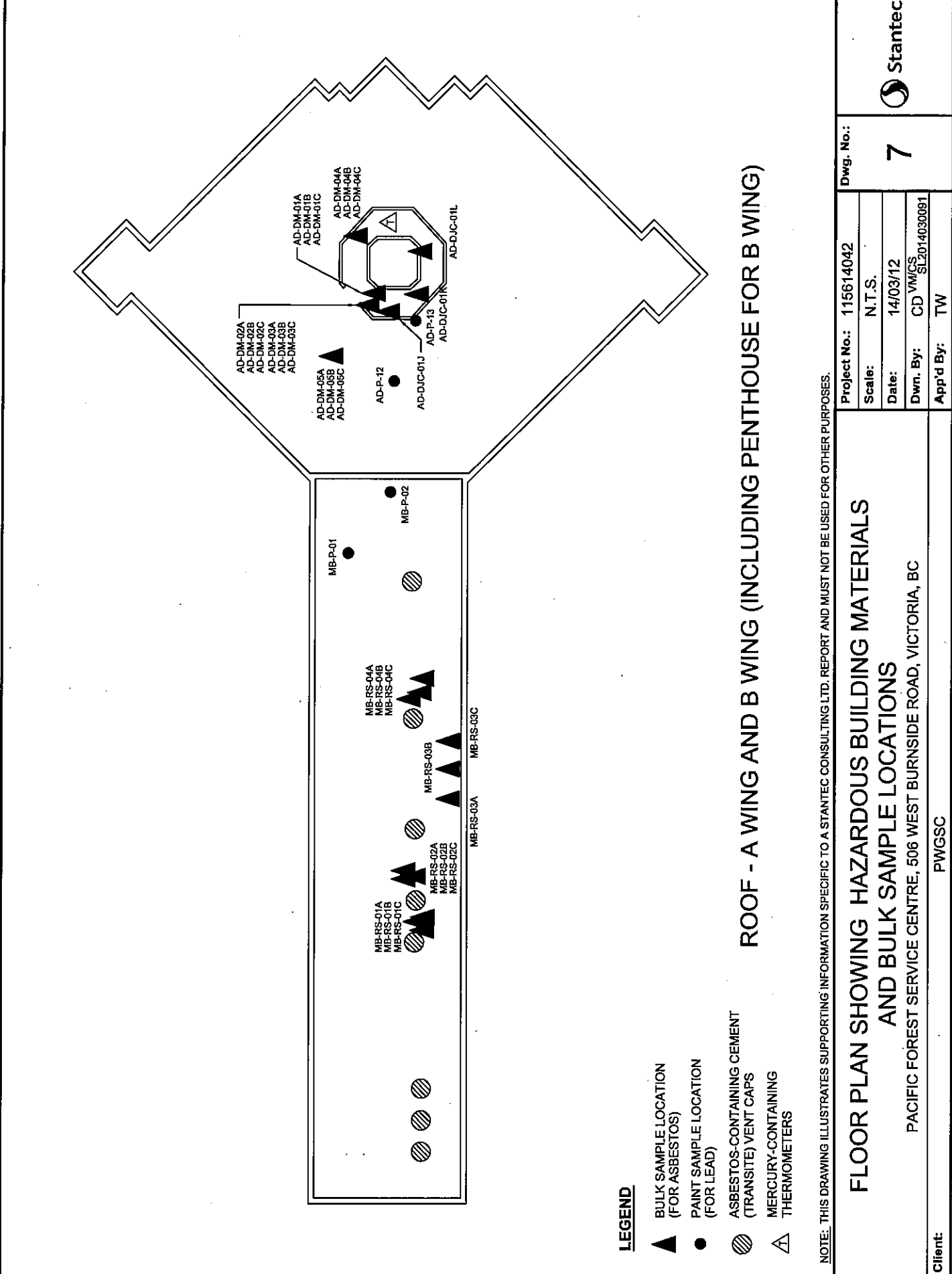
FLOOR PLAN SHOWING HAZARDOUS BUILDING MATERIALS AND BULK SAMPLE LOCATIONS

PACIFIC FOREST SERVICE CENTRE, 506 WEST BURNSIDE ROAD, VICTORIA, BC

Client: PWGSC

Dwg. No.: 5

Stantec



ROOF - A WING AND B WING (INCLUDING PENTHOUSE FOR B WING)

LEGEND

- ▲ BULK SAMPLE LOCATION (FOR ASBESTOS)
- PAINT SAMPLE LOCATION (FOR LEAD)
- ◐ ASBESTOS-CONTAINING CEMENT (TRANSITE) VENT CAPS
- ◑ MERCURY-CONTAINING THERMOMETERS

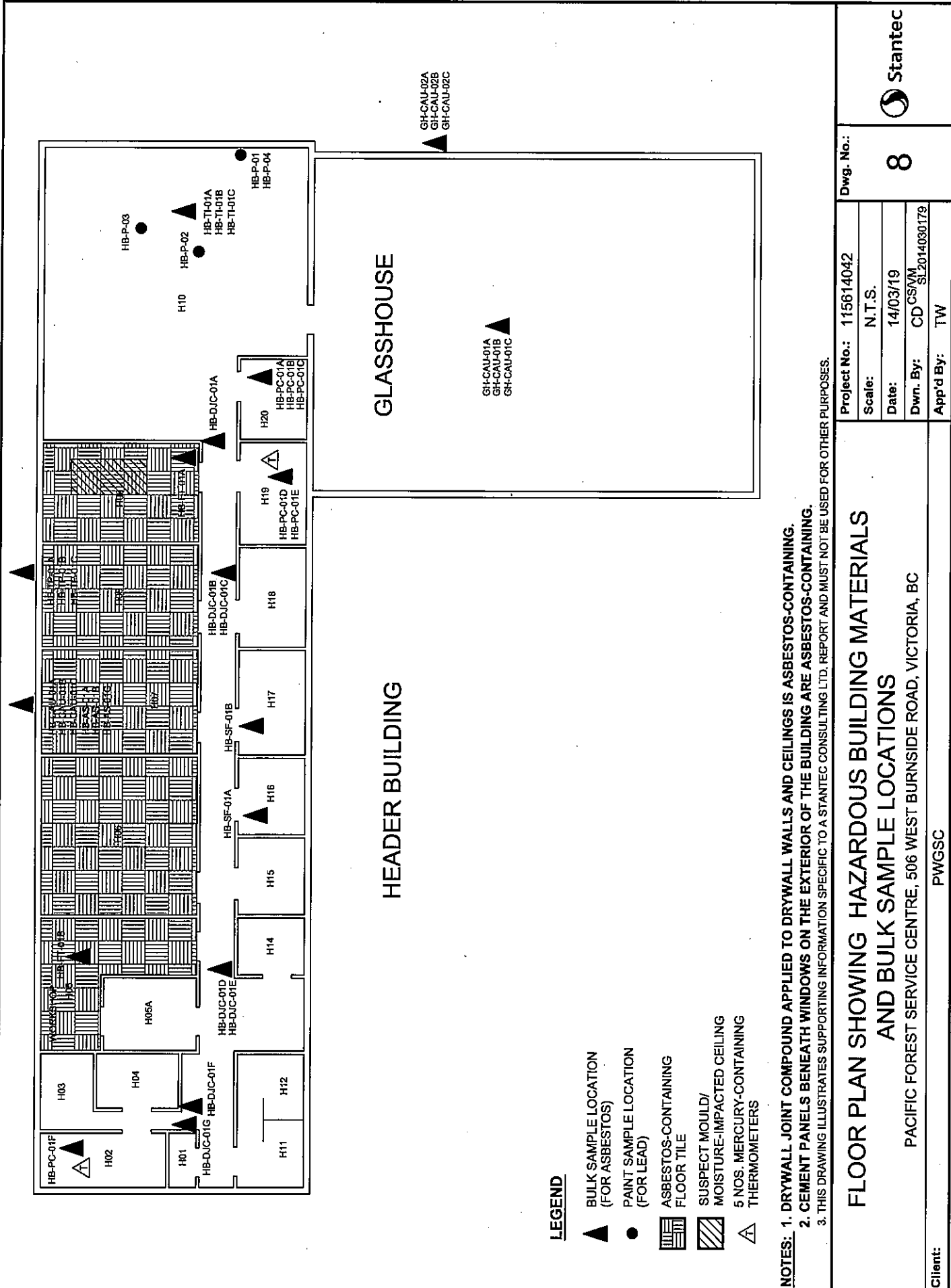
NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

Project No.:	115614042	Dwg. No.:	7
Scale:	N.T.S.		
Date:	14/03/12		
Dwn. By:	CD VM/GS SL2014030091		
App'd By:	TW		

FLOOR PLAN SHOWING HAZARDOUS BUILDING MATERIALS AND BULK SAMPLE LOCATIONS

PACIFIC FOREST SERVICE CENTRE, 506 WEST BURNSIDE ROAD, VICTORIA, BC

Client: PWGSC



LEGEND

- ▲ BULK SAMPLE LOCATION (FOR ASBESTOS)
- PAINT SAMPLE LOCATION (FOR LEAD)
- ▨ ASBESTOS-CONTAINING FLOOR TILE
- ▩ SUSPECT MOULD/ MOISTURE-IMPACTED CEILING
- 5 NOS. MERCURY-CONTAINING THERMOMETERS

NOTES: 1. DRYWALL JOINT COMPOUND APPLIED TO DRYWALL WALLS AND CEILINGS IS ASBESTOS-CONTAINING.
 2. CEMENT PANELS BENEATH WINDOWS ON THE EXTERIOR OF THE BUILDING ARE ASBESTOS-CONTAINING.
 3. THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

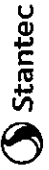
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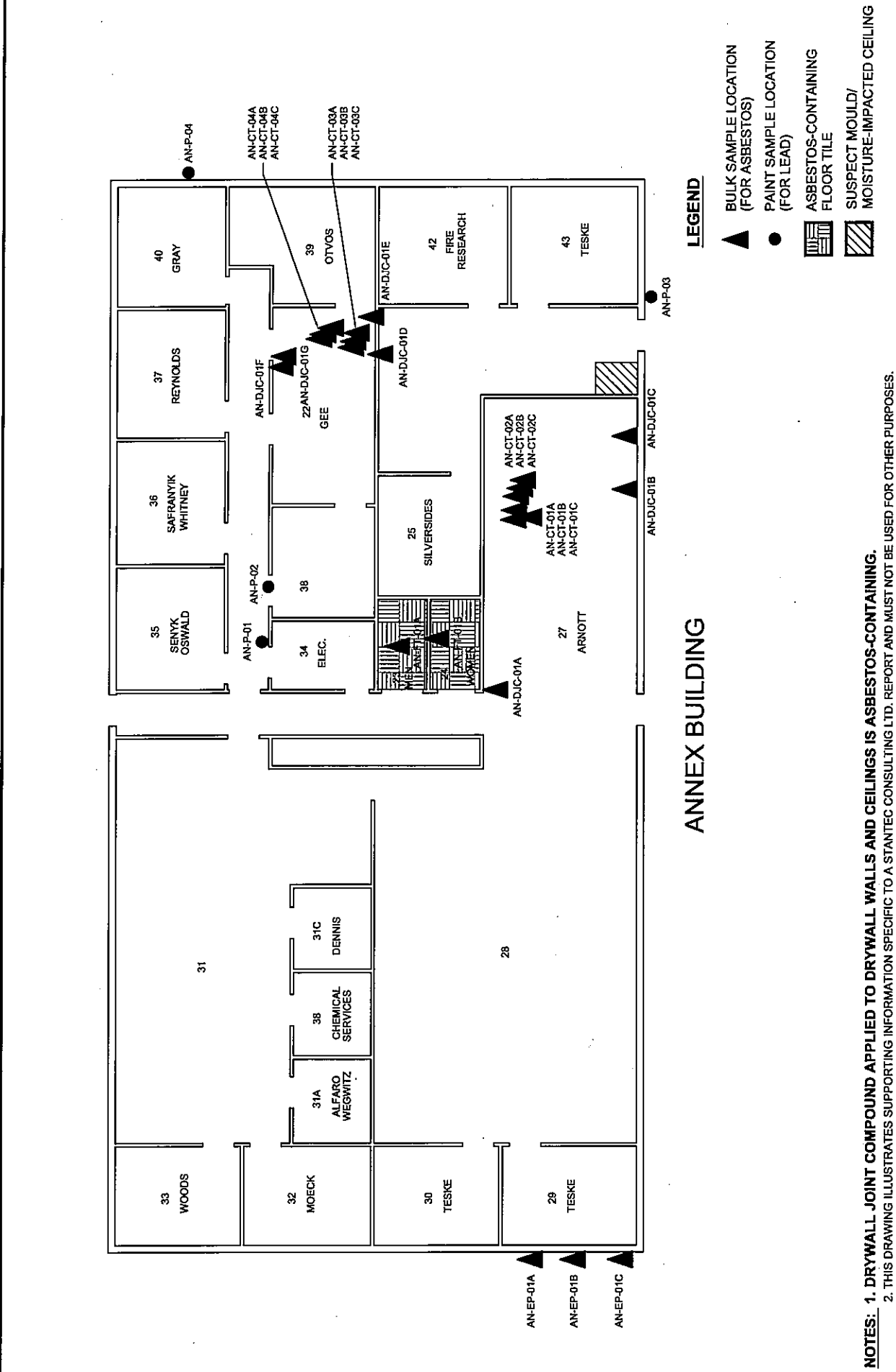
PACIFIC FOREST SERVICE CENTRE, 506 WEST BURNSIDE ROAD, VICTORIA, BC

Client:

PWGSC

Project No.: 115614042	Dwg. No.: 8
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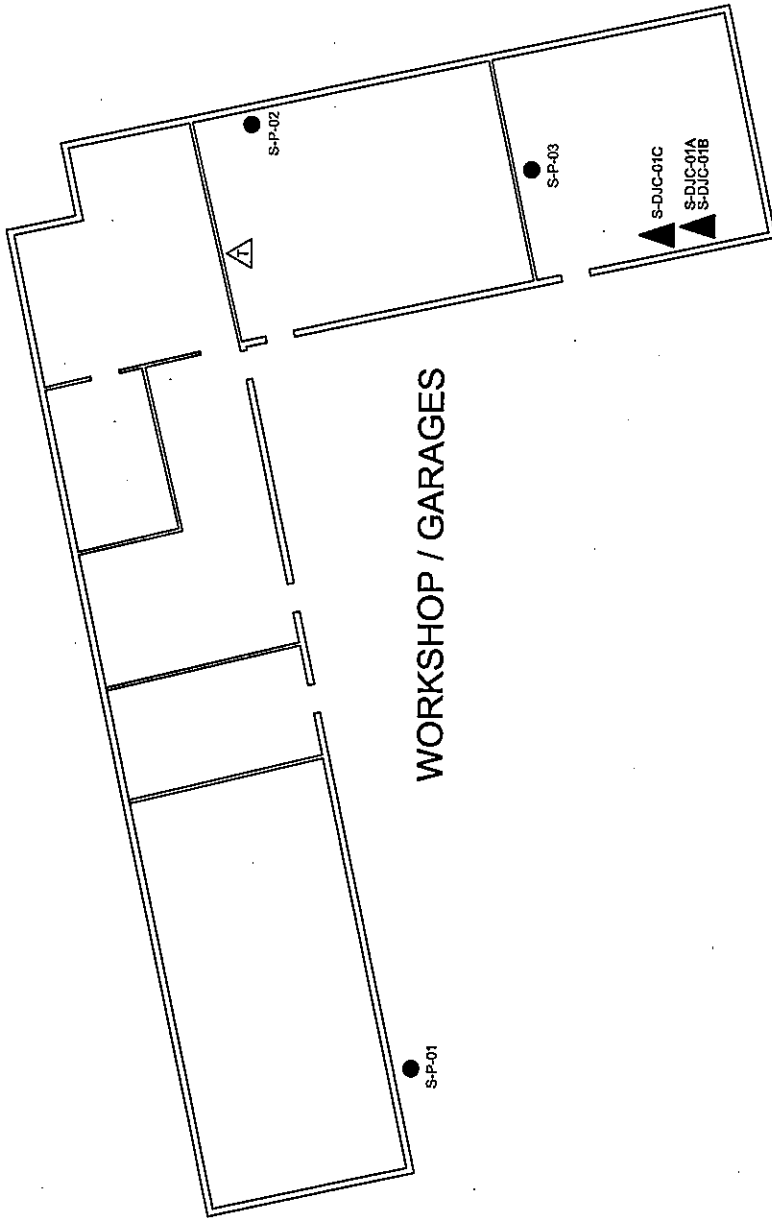
LEGEND

- ▲ BULK SAMPLE LOCATION (FOR ASBESTOS)
- PAINT SAMPLE LOCATION (FOR LEAD)
- ▨ ASBESTOS-CONTAINING FLOOR TILE
- ▩ SUSPECT MOULD/ MOISTURE-IMPACTED CEILING

ANNEX BUILDING

NOTES: 1. DRYWALL JOINT COMPOUND APPLIED TO DRYWALL WALLS AND CEILINGS IS ASBESTOS-CONTAINING.
 2. THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

FLOOR PLAN SHOWING HAZARDOUS BUILDING MATERIALS AND BULK SAMPLE LOCATIONS PACIFIC FOREST SERVICE CENTRE, 506 WEST BURNSIDE ROAD, VICTORIA, BC		Project No.: 115614042	Dwg. No.: 9	
		Scale: N.T.S.		
		Date: 14/03/12		
		Dwn. By: CD VMCS SL2014030093		
		App'd By: TW		
Client: PWGSC				



LEGEND

- ▲ BULK SAMPLE LOCATION (FOR ASBESTOS)
- PAINT SAMPLE LOCATION (FOR LEAD)
- △ MERCURY-CONTAINING THERMOSTAT

NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

FLOOR PLAN SHOWING HAZARDOUS BUILDING MATERIALS AND BULK SAMPLE LOCATIONS PACIFIC FOREST SERVICE CENTRE, 506 WEST BURNSIDE ROAD, VICTORIA, BC	Project No.: 115614042	Dwg. No.: 10	
	Scale: N.T.S.		
	Date: 14/03/11		
	Dwn. By: CD VM, SL2014030084	App'd By: TW	
Client: PWGSC			

Appendix B
Summary of Suspected ACM Bulk Samples

Hazardous Building Materials Assessment

506 West Burnside Road, Victoria, BC

Final Report

Appendix B: Summary Table – Suspected ACM Bulk Samples

Sample Number	Material Description	Sample Location	Result (% Asbestos)
A Wing			
MB-PL-01A	Plaster – Base layer	1 st floor East hallway Wall	None detected
MB-PL-01B	Plaster – Base layer	1 st floor East hallway Wall	None detected
MB-PL-01C	Plaster – Base layer	1 st floor East hallway Column	None detected
MB-PL-01D	Plaster – Base layer	1 st floor East hallway Ceiling	None detected
MB-PL-01E	Plaster – Base layer	1 st floor General Stores M01 Wall	None detected
MB-PL-01F	Plaster – Base layer	1 st floor General Stores M01 Wall	None detected
MB-PL-01G	Plaster – Base layer	1 st floor East hallway Wall	None detected
MB-PL-02A	Plaster – Skim and base layers	Ground floor West staircase Wall	None detected
MB-PL-02B	Plaster – Skim and base layers	Ground floor Central staircase Bulkhead	None detected
MB-PL-02C	Plaster – Skim and base layers	1 st floor Room 187 Wall	None detected
MB-PL-02D	Plaster – Skim and base layers	2 nd floor Room 290 Wall	None detected
MB-PL-02E	Plaster – Skim and base layers	2 nd floor Room 284 Wall	None detected

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Appendix B: Summary Table – Suspected ACM Bulk Samples

Sample Number	Material Description	Sample Location	Result (% Asbestos)
A Wing			
MB-PL-02F	Plaster – Skim and base layers	3 rd floor Room 389 Wall	None detected
MB-PL-02G	Plaster – Skim and base layers	3 rd floor Room 382 Wall	None detected
MB-PL-02H	Plaster – Skim and base layers	3 rd floor Insectary Wall	None detected
MB-PL-02I	Plaster – Skim and base layers	3 rd floor Insectary Wall	None detected
MB-PL-02J	Plaster – Skim and base layers	3 rd floor Herbarium Wall	None detected
MB-PL-02K	Plaster – Skim and base layers	3 rd floor Herbarium Wall	None detected
MB-PL-03A	Plaster – Base layer	Ground floor Boiler Room Wall	None detected
MB-PL-03B	Plaster – Base layer	Ground floor Boiler Room Wall	None detected
MB-PL-03C	Plaster – Base layer	Ground floor Boiler Room Wall	None detected
MB-PL-04A	Plaster – Skim layer	2nd floor North stairwell Wall	10% Chrysotile
MB-PL-04B	Plaster – Skim layer	2nd floor North stairwell Wall	10% Chrysotile
MB-PL-04C	Plaster – Skim layer	2nd floor North stairwell Wall	10% Chrysotile

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Appendix B: Summary Table – Suspected ACM Bulk Samples

Sample Number	Material Description	Sample Location	Result (% Asbestos)
A Wing			
MB-PL-04D	Plaster – Skim layer	2 nd floor North stairwell Wall	10% Chrysotile
MB-PL-04E	Plaster – Skim layer	2 nd floor North stairwell Wall	8% Chrysotile
MB-DJC-01A	Drywall joint compound	Penthouse Storage room	None detected
MB-DJC-01B	Drywall joint compound	Penthouse Storage room	None detected
MB-DJC-01C	Drywall joint compound	Penthouse Storage room	None detected
MB-DJC-01D	Drywall joint compound	Penthouse Storage room	None detected
MB-DJC-01E	Drywall joint compound	Penthouse Storage room	None detected
MB-DJC-02A	Drywall joint compound	1 st floor General stores M01 Wall	None detected
MB-DJC-02B	Drywall joint compound	1 st floor General stores M01 Wall	None detected
MB-DJC-02C	Drywall joint compound	1 st floor General stores M01 Wall	None detected
MB-DJC-03A	Drywall joint compound	1 st floor Room 167 Partition wall	None detected
MB-DJC-03B	Drywall joint compound	1 st floor Room 167 Partition wall	None detected
MB-DJC-03C	Drywall joint compound	1 st floor Room 167 Partition wall	None detected

Hazardous Building Materials Assessment

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Appendix B: Summary Table – Suspected ACM Bulk Samples

Sample Number	Material Description	Sample Location	Result (% Asbestos)
A Wing			
MB-DJC-04A	Drywall joint compound	Ground floor Library Column	None detected
MB-DJC-04B	Drywall joint compound	Ground floor Library Wall	None detected
MB-DJC-04C	Drywall joint compound	Ground floor Library Wall	None detected
MB-DJC-04D	Drywall joint compound	1 st floor Library Wall	None detected
MB-DJC-04E	Drywall joint compound	1 st floor Library Wall	None detected
MB-DJC-05A	Drywall joint compound	Ground floor East hallway Wall	None detected
MB-DJC-05B	Drywall joint compound	Ground floor Mechanical stores 98 Wall	None detected
MB-DJC-05C	Drywall joint compound	Ground floor Side hallway leading to staircase to outside building Wall	None detected
MB-DJC-05D	Drywall joint compound	Ground floor Welding area 96 Wall	None detected
MB-DJC-05E	Drywall joint compound	Ground floor Staircase to outside building Wall	None detected
MB-DJC-05F	Drywall joint compound	Ground floor East hallway Wall	None detected
MB-DJC-05G	Drywall joint compound	Ground floor East hallway Wall	None detected

Hazardous Building Materials Assessment

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Appendix B: Summary Table – Suspected ACM Bulk Samples

Sample Number	Material Description	Sample Location	Result (% Asbestos)
A Wing			
MB-DJC-06A	Drywall joint compound	1 st floor Room 159/160 Partition walls	None detected
MB-DJC-06B	Drywall joint compound	1 st floor Room 159/160 Partition walls	None detected
MB-DJC-06C	Drywall joint compound	1 st floor Room 159/160 Partition walls	None detected
MB-DJC-07A	Drywall joint compound	3 rd floor Room 396/397, 395 – 399 and 387 Partition walls	None detected
MB-DJC-07B	Drywall joint compound	3 rd floor Room 396/397, 395 – 399 and 387 Partition walls	None detected
MB-DJC-07C	Drywall joint compound	3 rd floor Room 396/397, 395 – 399 and 387 Partition walls	None detected
MB-DJC-08A	Drywall joint compound	3 rd floor Insectary Partition wall	None detected
MB-DJC-08B	Drywall joint compound	3 rd floor Insectary Partition wall	None detected
MB-DJC-08C	Drywall joint compound	3 rd floor Insectary Partition wall	None detected
MB-DJC-09A	Drywall joint compound	3 rd floor Herbarium Partition wall	None detected
MB-DJC-09B	Drywall joint compound	3 rd floor Herbarium Partition wall	None detected
MB-DJC-09C	Drywall joint compound	3 rd floor Herbarium Partition wall	None detected

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Appendix B: Summary Table – Suspected ACM Bulk Samples

Sample Number	Material Description	Sample Location	Result (% Asbestos)
A Wing			
MB-DJC-10A	Drywall joint compound	Ground floor Quarantine room Partition wall	None detected
MB-DJC-10B	Drywall joint compound	Ground floor Quarantine room Partition wall	None detected
MB-DJC-10C	Drywall joint compound	Ground floor Quarantine room Partition wall	None detected
MB-FS-01A	Fire stop caulking White colour	Penthouse Floor penetrations (mechanical pipe)	None detected
MB-FS-01B	Fire stop caulking White colour	Penthouse Floor penetrations (mechanical pipe)	None detected
MB-FS-01C	Fire stop caulking White colour	Penthouse Floor penetrations (mechanical pipe)	None detected
MB-FS-02A	Fire stop caulking Black colour	Penthouse Floor penetrations (mechanical pipe)	3% Chrysotile
MB-FS-02B	Fire stop caulking Black colour	Penthouse Floor penetrations (mechanical pipe)	Stop positive (not analyzed)
MB-FS-02C	Fire stop caulking Black colour	Penthouse Floor penetrations (mechanical pipe)	Stop positive (not analyzed)
MB-FS-03A	Fire stop caulking Red colour	Penthouse Floor penetrations (mechanical pipe)	None detected
MB-FS-03B	Fire stop caulking Red colour	Penthouse Floor penetrations (mechanical pipe)	None detected
MB-FS-03C	Fire stop caulking Red colour	Penthouse Floor penetrations (mechanical pipe)	None detected

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Appendix B: Summary Table – Suspected ACM Bulk Samples

Sample Number	Material Description	Sample Location	Result (% Asbestos)
A Wing			
MB-FS-04A	Fire stop caulking Red/brown (textured) colour	Penthouse Floor penetrations (mechanical pipe)	None detected
MB-FS-04B	Fire stop caulking Red/brown (textured) colour	Penthouse Floor penetrations (mechanical pipe)	None detected
MB-FS-04C	Fire stop caulking Red/brown (textured) colour	Penthouse Floor penetrations (mechanical pipe)	None detected
MB-FS-05A	Fire stop caulking Grey colour	Penthouse Floor penetrations (mechanical ductwork)	5% Chrysotile
MB-FS-05B	Fire stop caulking Grey colour	Penthouse Floor penetrations (mechanical ductwork)	Stop positive (not analyzed)
MB-FS-05C	Fire stop caulking Grey colour	Penthouse Floor penetrations (mechanical ductwork)	Stop positive (not analyzed)
MB-FS-06A	Fire stop caulking Light grey colour	Penthouse Floor penetrations (mechanical pipe)	None detected
MB-FS-06B	Fire stop caulking Light grey colour	Penthouse Floor penetrations (mechanical pipe)	None detected
MB-FS-06C	Fire stop caulking Light grey colour	Penthouse Floor penetrations (mechanical pipe)	None detected
MB-FS-07A	Fire stop caulking Dark grey colour	Penthouse Floor penetrations (mechanical pipe)	< 0.25% Chrysotile
MB-FS-07B	Fire stop caulking Dark grey colour	Penthouse Floor penetrations (mechanical pipe)	None detected
MB-FS-07C	Fire stop caulking Dark grey colour	Penthouse Floor penetrations (mechanical pipe)	None detected

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Appendix B: Summary Table – Suspected ACM Bulk Samples

Sample Number	Material Description	Sample Location	Result (% Asbestos)
A Wing			
MB-FS-08A	Fire stop caulking Silver colour – malleable	Penthouse Floor penetrations (mechanical ductwork)	None detected
MB-FS-08B	Fire stop caulking Silver colour – malleable	Penthouse Floor penetrations (mechanical ductwork)	None detected
MB-FS-08C	Fire stop caulking Silver colour – malleable	Penthouse Floor penetrations (mechanical ductwork)	None detected
MB-FS-09A	Fire stop caulking Silver colour - hardened	Penthouse Floor penetrations (mechanical ductwork)	5% Chrysotile
MB-FS-09B	Fire stop caulking Silver colour - hardened	Penthouse Floor penetrations (mechanical ductwork)	Stop positive (not analyzed)
MB-FS-09C	Fire stop caulking Silver colour - hardened	Penthouse Floor penetrations (mechanical ductwork)	Stop positive (not analyzed)
MB-FS-10A	Fire stop caulking Red/brown (textured) colour	Ground floor Room 069 Wall penetrations (mechanical pipe)	None detected
MB-FS-10B	Fire stop caulking Red/brown (textured) colour	Ground floor Room 069 Wall penetrations (mechanical pipe)	None detected
MB-FS-10C	Fire stop caulking Red/brown (textured) colour	Ground floor Room 069 Wall penetrations (mechanical pipe)	None detected
MB-CT-01A	Ceiling tile (2'x4' size) Textured with fibreglass core	Penthouse Storage room Suspended ceiling	None detected
MB-CT-01B	Ceiling tile (2'x4' size) Textured with fibreglass core	Penthouse Storage room Suspended ceiling	None detected

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Appendix B: Summary Table – Suspected ACM Bulk Samples

Sample Number	Material Description	Sample Location	Result (% Asbestos)
A Wing			
MB-CT-01C	Ceiling tile (2'x4' size) Textured with fibreglass core	Penthouse Storage room Suspended ceiling	None detected
MB-CT-02A	Ceiling tile (1'x1' size) Random fissures and pinholes	Room M05 Suspended ceiling	None detected
MB-CT-02B	Ceiling tile (1'x1' size) Random fissures and pinholes	Room M05 Suspended ceiling	None detected
MB-CT-02C	Ceiling tile (1'x1' size) Random fissures and pinholes	Room M05 Suspended ceiling	None detected
MB-CT-03A	Ceiling tile (2'x2' size) Random large and small holes	1 st floor Main hallway Suspended ceiling	None detected
MB-CT-03B	Ceiling tile (2'x2' size) Random large and small holes	1 st floor Main hallway Suspended ceiling	None detected
MB-CT-03C	Ceiling tile (2'x2' size) Random large and small holes	1 st floor Main hallway Suspended ceiling	None detected
MB-CT-04A	Ceiling tile (2'x4' size) Standard fissures and pinholes	1 st floor General stores M01 Suspended ceiling	None detected
MB-CT-04B	Ceiling tile (2'x4' size) Standard fissures and pinholes	1 st floor General stores M01 Suspended ceiling	None detected
MB-CT-04C	Ceiling tile (2'x4' size) Standard fissures and pinholes	1 st floor General stores M01 Suspended ceiling	None detected
MB-FT-01A	Floor tile (9"x9" size) Brown colour	1 st floor Room 187 Flooring	None detected
MB-FT-01A MASTIC	Floor tile mastic	1 st floor Room 187 Flooring	None detected
MB-FT-01B	Floor tile (9"x9" size) Brown colour	2 nd floor Room 290 Flooring	None detected

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Appendix B: Summary Table – Suspected ACM Bulk Samples

Sample Number	Material Description	Sample Location	Result (% Asbestos)
A Wing			
MB-FT-01B MASTIC	Floor tile mastic	2 nd floor Room 290 Flooring	None detected
MB-FT-01C	Floor tile (9"x9" size) Brown colour	3 rd floor Room 387 Flooring	None detected
MB-FT-01C MASTIC	Floor tile mastic	3 rd floor Room 387 Flooring	None detected
MB-FT-02A	Floor tile (9"x9" size) Green colour	1 st floor Room 186 Flooring	None detected
MB-FT-02A MASTIC	Floor tile mastic	1 st floor Room 186 Flooring	None detected
MB-FT-02B	Floor tile (9"x9" size) Green colour	2 nd floor Room 284 Flooring	None detected
MB-FT-02B MASTIC	Floor tile mastic	2 nd floor Room 284 Flooring	None detected
MB-FT-02C	Floor tile (9"x9" size) Green colour	3 rd floor Room 382 Flooring	None detected
MB-FT-02C MASTIC	Floor tile mastic	3 rd floor Room 382 Flooring	None detected
MB-SF-01	Sheet flooring Grey colour	Ground floor Quarantine room Flooring	None detected
MB-PC-01A	Parging cement applied to pipe fittings Light grey colour Chalk-like texture	Ground floor Room 069 Mechanical pipe	10% Amosite 8% Chrysotile

Appendix B: Summary Table – Suspected ACM Bulk Samples

Sample Number	Material Description	Sample Location	Result (% Asbestos)
A Wing			
MB-PC-01B	Parging cement applied to pipe fittings light grey colour, chalk-like texture	Ground floor Room 069 Mechanical pipe	10% Amosite 5% Chrysotile
MB-PC-01C	Parging cement applied to pipe fittings light grey colour, chalk-like texture	Ground floor Room 069 Mechanical pipe	10% Amosite 4% Chrysotile
MB-PC-01D	Parging cement applied to pipe fittings light grey colour, chalk-like texture	1 st floor East hallway Mechanical pipe fitting (at ceiling)	8% Amosite 2% Chrysotile
MB-PC-02A	Parging cement applied to pipe fittings Grey colour, fibrous	Room CR5 Within ceiling space (above plaster ceiling)	45% Chrysotile
MB-PC-02B	Parging cement applied to pipe fittings Grey colour, fibrous	Room CR5 Within ceiling space (above plaster ceiling)	45% Chrysotile
MB-PC-02C	Parging cement applied to pipe fittings Grey colour, fibrous	Room CR5 Within ceiling space (above plaster ceiling)	45% Chrysotile
MB-FD-01A	Flex duct fabric	Penthouse Mechanical ductwork	80% Chrysotile
MB-FD-01B	Flex duct fabric	Penthouse Mechanical ductwork	80% Chrysotile
MB-FD-01C	Flex duct fabric	Penthouse Mechanical ductwork	75% Chrysotile
MB-DI-01A	Duct insulation White colour, fibrous	Penthouse Between mechanical ductwork and floor penetrations	50% Chrysotile
MB-DI-01B	Duct insulation White colour, fibrous	Penthouse Between mechanical ductwork and floor penetrations	Stop positive (not analyzed)
MB-DI-01C	Duct insulation White colour, fibrous	Penthouse Between mechanical ductwork and floor penetrations	Stop positive (not analyzed)

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Appendix B: Summary Table – Suspected ACM Bulk Samples

Sample Number	Material Description	Sample Location	Result (% Asbestos)
A Wing			
MB-DL-01A	Duct insulation inner liner Black colour mastic and fibreglass insulation	Penthouse Mechanical ductwork	None detected
MB-DL-01B	Duct insulation inner liner Black colour mastic and fibreglass insulation	Penthouse Mechanical ductwork	None detected
MB-DL-01C	Duct insulation inner liner Black colour mastic and fibreglass insulation	Penthouse Mechanical ductwork	None detected
MB-DM-01A	Duct mastic Green colour	Penthouse Mechanical ductwork	None detected
MB-DM-01B	Duct mastic Green colour	Penthouse Mechanical ductwork	None detected
MB-DM-01C	Duct mastic Green colour	Penthouse Mechanical ductwork	None detected
MB-DM-02A	Duct mastic Red colour	Penthouse Mechanical ductwork	4% Chrysotile
MB-DM-02B	Duct mastic Red colour	Penthouse Mechanical ductwork	Stop positive (not analyzed)
MB-DM-02C	Duct mastic Red colour	Penthouse Mechanical ductwork	Stop positive (not analyzed)
MB-DM-03A	Duct mastic Dark grey colour	Penthouse Mechanical ductwork	None detected
MB-DM-03B	Duct mastic Dark grey colour	Penthouse Mechanical ductwork	None detected
MB-DM-03C	Duct mastic Dark grey colour	Penthouse Mechanical ductwork	None detected
MB-DM-04A	Duct mastic Light grey colour	Room M06 Mechanical ductwork	None detected
MB-DM-04B	Duct mastic Light grey colour	Room M06 Mechanical ductwork	None detected
MB-DM-04C	Duct mastic Light grey colour	Room M06 Mechanical ductwork	None detected
MB-PW-01A	Mechanical pipe wrap	Penthouse Mechanical pipe	None detected

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Appendix B: Summary Table – Suspected ACM Bulk Samples

Sample Number	Material Description	Sample Location	Result (% Asbestos)
A Wing			
MB-PW-01B	Mechanical pipe wrap	Penthouse Mechanical pipe	None detected
MB-PW-01C	Mechanical pipe wrap	Penthouse Mechanical pipe	None detected
MB-PW-02A	Mechanical pipe wrap	Penthouse Mechanical pipe	None detected
MB-PW-02B	Mechanical pipe wrap	Penthouse Mechanical pipe	None detected
MB-PW-02C	Mechanical pipe wrap	Penthouse Mechanical pipe	None detected
MB-WP-01A	Wall parging (at pipe penetrations) Light grey colour	3 rd floor Chase 318 Wall penetrations (mechanical pipe)	None detected
MB-WP-01B	Wall parging (at pipe penetrations) Light grey colour	3 rd floor Chase 318 Wall penetrations (mechanical pipe)	None detected
MB-WP-01C	Wall parging (at pipe penetrations) Light grey colour	3 rd floor Chase 318 Wall penetrations (mechanical pipe)	None detected
MB-WP-02A	Wall parging (at pipe penetrations) Medium grey colour	3 rd floor Chase 318 Wall penetrations (mechanical pipe)	None detected
MB-WP-02B	Wall parging (at pipe penetrations) Medium grey colour	3 rd floor Chase 318 Wall penetrations (mechanical pipe)	None detected
MB-WP-02C	Wall parging (at pipe penetrations) Medium grey colour	3 rd floor Chase 318 Wall penetrations (mechanical pipe)	None detected

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Appendix B: Summary Table – Suspected ACM Bulk Samples

Sample Number	Material Description	Sample Location	Result (% Asbestos)
A Wing			
MB-WP-03A	Wall parging (at pipe penetrations) Dark grey colour	3 rd floor Chase 318 Wall penetrations (mechanical pipe)	None detected
MB-WP-03B	Wall parging (at pipe penetrations) Dark grey colour	3 rd floor Chase 318 Wall penetrations (mechanical pipe)	None detected
MB-WP-03C	Wall parging (at pipe penetrations) Dark grey colour.	3 rd floor Chase 318 Wall penetrations (mechanical pipe)	None detected
MB-ES-01A	Exterior wall base stucco Grey with pebbles	Building exterior	None detected
MB-ES-01B	Exterior wall base stucco Grey with pebbles	Building exterior	None detected
MB-ES-01C	Exterior wall base stucco Grey with pebbles	Building exterior	None detected
MB-ES-01D	Exterior wall base stucco Grey with pebbles	Building exterior	None detected
MB-ES-01E	Exterior wall base stucco Grey with pebbles	Building exterior	None detected
MB-ES-02A	Exterior siding/column stucco White with pebbles	Building exterior	< 0.25% Chrysotile
MB-ES-02B	Exterior siding/column stucco White with pebbles	Building exterior	None detected
MB-ES-02C	Exterior siding/column stucco White with pebbles	Building exterior	None detected
MB-ES-02D	Exterior siding/column stucco White with pebbles	Building exterior	None detected
MB-ES-02E	Exterior siding/column stucco White with pebbles	Building exterior	None detected
MB-ES-02F	Exterior siding/column stucco White with pebbles	Building exterior	None detected
MB-ES-02G	Exterior siding/column stucco White with pebbles	Building exterior	None detected

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Appendix B: Summary Table – Suspected ACM Bulk Samples

Sample Number	Material Description	Sample Location	Result (% Asbestos)
A Wing			
MB-ES-03A	Exterior wall base stucco Dark grey colour, textured	Building exterior	None detected
MB-ES-03B	Exterior wall base stucco Dark grey colour, textured	Building exterior	None detected
MB-ES-03C	Exterior wall base stucco Dark grey colour, textured	Building exterior	None detected
MB-ES-03D	Exterior wall base stucco Dark grey colour, textured	Building exterior	None detected
MB-ES-03E	Exterior wall base stucco Dark grey colour, textured	Building exterior	None detected
MB-ES-04A	Exterior wall base stucco Grey colour, textured	Building exterior	None detected
MB-ES-04B	Exterior wall base stucco Grey colour, textured	Building exterior	None detected
MB-ES-04C	Exterior wall base stucco Grey colour, textured	Building exterior	None detected
MB-ES-04D	Exterior wall base stucco Grey colour, textured	Building exterior	None detected
MB-ES-04E	Exterior wall base stucco Grey colour, textured	Building exterior	None detected
MB-SG-01A	Exterior stone wall grout	Building exterior	< 0.25% Chrysotile
MB-SG-01B	Exterior stone wall grout	Building exterior	None detected
MB-SG-01C	Exterior stone wall grout	Building exterior	None detected
MB-FB-01A	Fibre board Red and grey colour	Building exterior Around alternate entrance door to storage room within general stores M01	None detected
MB-FB-01B	Fibre board Red and grey colour	Building exterior Around alternate entrance door to storage room within general stores M01	None detected

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Appendix B: Summary Table – Suspected ACM Bulk Samples

Sample Number	Material Description	Sample Location	Result (% Asbestos)
A Wing			
MB-FB-01C	Fibre board Red and grey colour	Building exterior Around alternate entrance door to storage room within general stores M01	None detected
MB-ECAU-01A	Exterior siding caulking Dark grey colour	Building exterior Siding	None detected
MB-ECAU-01B	Exterior siding caulking Dark grey colour	Building exterior Siding	None detected
MB-ECAU-01C	Exterior siding caulking Dark grey colour	Building exterior Siding	None detected
MB-ECAU-02A	Exterior window caulking Light grey colour	Building exterior Windows	None detected
MB-ECAU-02B	Exterior window caulking Light grey colour	Building exterior Windows	None detected
MB-ECAU-02C	Exterior window caulking Light grey colour	Building exterior Windows	None detected
MB-RS-01A	Exterior sealant Black colour	Rooftop Roof vent	None detected
MB-RS-01B	Exterior sealant Black colour	Rooftop Roof vent	None detected
MB-RS-01C	Exterior sealant Black colour	Rooftop Roof vent	None detected
MB-RS-02A	Exterior sealant (roofing tar) Black colour	Rooftop Mechanical	None detected
MB-RS-02B	Exterior sealant (roofing tar) Black colour	Rooftop Mechanical	None detected
MB-RS-02C	Exterior sealant (roofing tar) Black colour	Rooftop Mechanical	None detected
MB-RS-03A	Exterior sealant White colour	Rooftop Flashing/railing	None detected
MB-RS-03B	Exterior sealant White colour	Rooftop Flashing/railing	None detected
MB-RS-03C	Exterior sealant White colour	Rooftop Flashing/railing	None detected

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Appendix B: Summary Table – Suspected ACM Bulk Samples

Sample Number	Material Description	Sample Location	Result (% Asbestos)
A Wing			
MB-RS-04A	Exterior sealant White colour	Rooftop Mechanical	None detected
MB-RS-04A	Exterior sealant White colour	Rooftop Mechanical	None detected
MB-RS-04A	Exterior sealant White colour	Rooftop Mechanical	None detected
MB-CFS-01A	Fire stop Light grey, fibrous	1 st floor Pipe chase 130 Applied to wall area within the pipe chase	None detected
MB-CFS-01B	Fire stop Light grey, fibrous	1 st floor Pipe chase 130 Applied to wall area within the pipe chase	None detected
MB-CFS-01C	Fire stop Light grey, fibrous	1 st floor Pipe chase 130 Applied to wall area within the pipe chase	None detected

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Appendix B: Summary Table – Suspected ACM Bulk Samples

Sample Number	Material Description	Sample Location	Result (% Asbestos)
B Wing			
AD-DJC-01A	Drywall joint compound	Ground floor Conference room 021 Wall	None detected
AD-DJC-01B	Drywall joint compound	Ground floor Hallway in front of room 008 Wall	None detected
AD-DJC-01C	Drywall joint compound	1 st floor Hallway (outside men's washroom) Wall	None detected
AD-DJC-01D	Drywall joint compound	1 st floor Hallway (outside room 120)	None detected
AD-DJC-01E	Drywall joint compound	2 nd floor West stairwell Wall	None detected
AD-DJC-01F	Drywall joint compound	2 nd floor Hallway (outside room 216) Wall	None detected
AD-DJC-01G	Drywall joint compound	2 nd floor East stairwell Wall	None detected
AD-DJC-01H	Drywall joint compound	3 rd floor Hallway (outside room 302) Wall	None detected
AD-DJC-01I	Drywall joint compound	3 rd floor Hallway Wall	None detected
AD-DJC-01J	Drywall joint compound	Penthouse Wall	None detected
AD-DJC-01K	Drywall joint compound	Penthouse Wall	None detected
AD-DJC-01L	Drywall joint compound	Penthouse Wall	None detected
AD-SF-01A	Sheet flooring Grey colour	Ground floor Hallway (at rear entrance door) Flooring	None detected

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Appendix B: Summary Table – Suspected ACM Bulk Samples

Sample Number	Material Description	Sample Location	Result (% Asbestos)
B Wing			
AD-SF-01A MASTIC	Sheet flooring mastic	Ground floor Hallway (at rear entrance door) Flooring	None detected
AD-SF-01B	Sheet flooring Grey colour	Ground floor Hallway (at rear entrance door) Flooring	None detected
AD-SF-01B MASTIC	Sheet flooring mastic	Ground floor Hallway (at rear entrance door) Flooring	None detected
AD-SF-01C	Sheet flooring Grey colour	Ground floor Hallway (at rear entrance door) Flooring	None detected
AD-SF-01C MASTIC	Sheet flooring mastic	Ground floor Hallway (at rear entrance door) Flooring	None detected
AD-SF-02A	Sheet flooring Blue colour	2 nd floor Hallway (south end lobby area) Flooring	None detected
AD-SF-02A MASTIC	Sheet flooring mastic	2 nd floor Hallway (south end lobby area) Flooring	None detected
AD-CAU-01A	Duct sealant Grey colour	Penthouse Mechanical ductwork	None detected
AD-CAU-01B	Duct sealant Grey colour	Penthouse Mechanical ductwork	None detected
AD-CAU-01C	Duct sealant Grey colour	Penthouse Mechanical ductwork	None detected
AD-CAU-02A	Caulking/sealant Silver colour	Rooftop	None detected
AD-CAU-02B	Caulking/sealant Silver colour	Rooftop	None detected
AD-CAU-02C	Caulking/sealant Silver colour	Rooftop	None detected
AD-CAU-03A	Caulking/sealant Grey colour	Rooftop	None detected

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Appendix B: Summary Table – Suspected ACM Bulk Samples

Sample Number	Material Description	Sample Location	Result (% Asbestos)
B Wing			
AD-CAU-03B	Caulking/sealant Grey colour	Rooftop	None detected
AD-CAU-03C	Caulking/sealant Grey colour	Rooftop	None detected
AD-CAU-04A	Caulking/sealant White colour	Rooftop	None detected
AD-CAU-04B	Caulking/sealant White colour	Rooftop	None detected
AD-CAU-04C	Caulking/sealant White colour	Rooftop	None detected
AD-CT-01A	Ceiling tile (2'x2' size) Random large and small holes	1 st floor Hallway (outside room 104) Suspended ceiling	None detected
AD-CT-01B	Ceiling tile (2'x2' size) Random large and small holes	1 st floor Hallway (outside room 104) Suspended ceiling	None detected
AD-CT-01C	Ceiling tile (2'x2' size) Random large and small holes	1 st floor Hallway (outside room 104) Suspended ceiling	None detected
AD-DM-01A	Duct mastic Red colour	Penthouse Exhaust ducting	4% Chrysotile
AD-DM-01B	Duct mastic Red colour	Penthouse Exhaust ducting	Stop positive (not analyzed)
AD-DM-01C	Duct mastic Red colour	Penthouse Exhaust ducting	Stop positive (not analyzed)
AD-DM-02A	Duct mastic Red colour	Penthouse Return ducting	4% Chrysotile
AD-DM-02B	Duct mastic Red colour	Penthouse Return ducting	Stop positive (not analyzed)
AD-DM-02C	Duct mastic Red colour	Penthouse Return ducting	Stop positive (not analyzed)
AD-DM-03A	Duct mastic Grey colour	Penthouse Return ducting	None detected
AD-DM-03B	Duct mastic Grey colour	Penthouse Return ducting	None detected

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Sample Number	Material Description	Sample Location	Result (% Asbestos)
DWing			
AD-DM-03C	Duct mastic Grey colour	Penthouse Return ducting	None detected
AD-DM-04A	Duct mastic Brown colour	Penthouse Return ducting (fire damper doors)	None detected
AD-DM-04B	Duct mastic Brown colour	Penthouse Return ducting (fire damper doors)	None detected
AD-DM-04C	Duct mastic Brown colour	Penthouse Return ducting (fire damper doors)	None detected
AD-DM-05A	Duct mastic Light grey colour	Rooftop Exterior ducting	None detected
AD-DM-05B	Duct mastic Light grey colour	Rooftop Exterior ducting	None detected
AD-DM-05C	Duct mastic Light grey colour	Rooftop Exterior ducting	None detected
AD-FP-01A	Fire proofing White colour, fibrous	1 st floor Hallway (outside room 104) Suspended ceiling	None detected
AD-FP-01B	Fire proofing White colour, fibrous	1 st floor Hallway (outside room 104) Suspended ceiling	None detected
AD-FP-01C	Fire proofing White colour, fibrous	1 st floor Hallway (outside room 104) Suspended ceiling	None detected
AD-FP-01D	Fire proofing White colour, fibrous	1 st floor Hallway (outside room 104) Suspended ceiling	None detected
AD-FP-01E	Fire proofing White colour, fibrous	1 st floor Hallway (outside room 104) Suspended ceiling	None detected
AD-FP-01F	Fire proofing White colour, fibrous	1 st floor Hallway (outside room 104) Suspended ceiling	None detected

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Sample Number	Material Description	Sample Location	Result (% Asbestos)
D Wing			
AD-FP-01G	Fire proofing White colour, fibrous	1 st floor Hallway (outside room 104) Suspended ceiling	None detected
AD-FPP-01A	Fire proofing patch Grey colour, cementitious	Above suspended ceiling	None detected (15 - 20% Vermiculite detected in sample)
AD-FPP-01B	Fire proofing patch Grey colour, cementitious	Above suspended ceiling	None detected (15 - 20% Vermiculite detected in sample)
AD-FPP-01C	Fire proofing patch Grey colour, cementitious	Above suspended ceiling	None detected (15 - 20% Vermiculite detected in sample)

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Appendix B: Summary Table – Suspected ACM Bulk Samples

Sample Number	Material Description	Sample Location	Result (% Asbestos)
Header Building			
HB-DJC-01A	Drywall joint compound	Interior wall	3% Chrysotile
HB-DJC-01B	Drywall joint compound	Interior wall	None detected
HB-DJC-01C	Drywall joint compound	Interior wall	None detected
HB-DJC-01D	Drywall joint compound	Interior wall	None detected
HB-DJC-01E	Drywall joint compound	Interior wall	None detected
HB-DJC-01F	Drywall joint compound	Interior wall	None detected
HB-DJC-01G	Drywall joint compound	Interior wall	3% Chrysotile
HB-PC-01A	Parging cement applied to pipe fittings Light grey colour, chalk-like	Room H20	None detected
HB-PC-01B	Parging cement applied to pipe fittings Light grey colour, chalk-like	Room H20	None detected
HB-PC-01C	Parging cement applied to pipe fittings Light grey colour, chalk-like	Room H20	None detected
HB-PC-01D	Parging cement applied to pipe fittings Light grey colour, chalk-like	Room H19	None detected
HB-PC-01E	Parging cement applied to pipe fittings Light grey colour, chalk-like	Room H19	None detected
HB-PC-01F	Parging cement applied to pipe fittings Light grey colour, chalk-like	Room H02	None detected
HB-TI-01A	Tank insulation Grey colour, fibrous	Autoclaving tank	None detected
HB-TI-01B	Tank insulation Grey colour, fibrous	Autoclaving tank	None detected
HB-TI-01C	Tank insulation Grey colour, fibrous	Autoclaving tank	None detected
HB-FT-01A	Floor tile (9"x9" size) Green colour	Room H09	4% Chrysotile

Hazardous Building Materials Assessment

506 West Burnside Road, Victoria, BC

Final Report

Appendix B: Summary Table – Suspected ACM Bulk Samples

Sample Number	Material Description	Sample Location	Result (% Asbestos)
Header Building			
HB-FT-01A MASTIC	Floor tile mastic	Room H09	None detected
HB-FT-01B	Floor tile (9"x9" size) Green colour	Workshop H05	4% Chrysotile
HB-FT-01B MASTIC	Floor tile mastic	Workshop H05	None detected
HB-SF-01A	Sheet flooring Brown colour	Room H16	None detected
HB-SF-01A MASTIC	Sheet flooring mastic	Room H16	None detected
HB-SF-01B	Sheet flooring Brown colour	Room H17	None detected
HB-SF-01B MASTIC	Sheet flooring mastic	Room H17	None detected
HB-AS-01A	Liner between cement panels and trim White colour, rigid	Building exterior	None detected
HB-AS-01B	Liner between cement panels and trim White colour, rigid	Building exterior	None detected
HB-AS-01C	Liner between cement panels and trim White colour, rigid	Building exterior	None detected
HB-CAU-01A	Exterior caulking around windows/cement panels	Building exterior	None detected
HB-CAU-01B	Exterior caulking around windows/cement panels	Building exterior	None detected
HB-CAU-01C	Exterior caulking around windows/cement panels	Building exterior	None detected
HB-TP-01A	Cement (Transite) panels	Building exterior	15% Chrysotile
HB-TP-01B	Cement (Transite) panels	Building exterior	Stop positive (not analyzed)
HB-TP-01C	Cement (Transite) panels	Building exterior	Stop positive (not analyzed)

Hazardous Building Materials Assessment

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Appendix B: Summary Table – Suspected ACM Bulk Samples

Sample Number	Material Description	Sample Location	Result (% Asbestos)
Annex Building			
AN-DJC-01A	Drywall joint compound	Interior wall	<1% Chrysotile
AN-DJC-01B	Drywall joint compound	Interior wall	2% Chrysotile
AN-DJC-01C	Drywall joint compound	Interior wall	3% Chrysotile
AN-DJC-01D	Drywall joint compound	Interior wall	None detected
AN-DJC-01E	Drywall joint compound	Interior wall	None detected
AN-DJC-01F	Drywall joint compound	Interior wall	None detected
AN-DJC-01G	Drywall joint compound	Interior wall	None detected
AN-FT-01A	Floor tile (12"x12" size) Beige with brown streaks	Flooring	3% Chrysotile
AN-FT-01A MASTIC	Floor tile mastic	Flooring	None detected
AN-FT-01B	Floor tile (12"x12" size) Beige with brown streaks	Flooring	3% Chrysotile
AN-FT-01B MASTIC	Floor tile mastic	Flooring	None detected
AN-EP-01A	Exterior stucco Grey colour	Building exterior	None detected
AN-EP-01B	Exterior stucco Grey colour	Building exterior	None detected
AN-EP-01C	Exterior stucco Grey colour	Building exterior	None detected
AN-CT-01A	Ceiling tile (1'x1' size) Random fissures and pinholes – grey core	Ceiling	None detected
AN-CT-01B	Ceiling tile (1'x1' size) Random fissures and pinholes – grey core	Ceiling	None detected
AN-CT-01C	Ceiling tile (1'x1' size) Random fissures and pinholes – grey core	Ceiling	None detected
AN-CT-02A	Ceiling tile (1'x1' size) Random large fissures and pinholes – light brown core	Ceiling	None detected

Hazardous Building Materials Assessment

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Appendix B: Summary Table – Suspected ACM Bulk Samples

Sample Number	Material Description	Sample Location	Result (% Asbestos)
Annex Building			
AN-CT-02B	Ceiling tile (1'x1' size) Random large fissures and pinholes – light brown core	Ceiling	None detected
AN-CT-02C	Ceiling tile (1'x1' size) Random large fissures and pinholes – light brown core	Ceiling	None detected
AN-CT-03A	Ceiling tile (1'x1' size) Random flecks and pinholes – grey core	Ceiling	None detected
AN-CT-03B	Ceiling tile (1'x1' size) Random flecks and pinholes – grey core	Ceiling	None detected
AN-CT-03C	Ceiling tile (1'x1' size) Random flecks and pinholes – grey core	Ceiling	None detected
AN-CT-04A	Ceiling tile (1'x1' size) Random small fissures and pinholes – light brown core	Ceiling	None detected
AN-CT-04B	Ceiling tile (1'x1' size) Random small fissures and pinholes – light brown core	Ceiling	None detected
AN-CT-04C	Ceiling tile (1'x1' size) Random small fissures and pinholes – light brown core	Ceiling	None detected

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Appendix C: Summary Table – Suspected LCP Bulk Samples

Sample Number	Paint Description	Location	Analysis (Lead – ppm)
Equipment Shed			
Sh-P-01	White colour	Building exterior/interior Siding	6,700
Glasshouse – no suspected LCPs observed			
Equipment Shed – no suspected LCPs observed			

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Appendix B: Summary Table – Suspected ACM Bulk Samples

Sample Number	Material Description	Sample Location	Result (% Asbestos)
Workshop/Garages			
S-DJC-01A	Drywall joint compound	Interior wall	None detected
S-DJC-01B	Drywall joint compound	Interior wall	None detected
S-DJC-01C	Drywall joint compound	Interior wall	None detected
S-DJC-01D	Drywall joint compound	Interior wall	None detected
S-DJC-01E	Drywall joint compound	Interior wall	None detected
Glasshouse			
GH-CAU-01A	Caulking/sealant Silver colour	On mechanical pipe covering (tin covering)	None detected
GH-CAU-01B	Caulking/sealant Silver colour	On mechanical pipe covering (tin covering)	None detected
GH-CAU-01C	Caulking/sealant Silver colour	On mechanical pipe covering (tin covering)	None detected
GH-CAU-02A	Caulking/sealant White colour	On wall base/mechanical ducting	None detected
GH-CAU-02B	Caulking/sealant White colour	On wall base/mechanical ducting	None detected
GH-CAU-02C	Caulking/sealant White colour	On wall base/mechanical ducting	None detected
Equipment Shed			
No suspected ACMs observed			
Shadehouse			
No suspected ACMs observed			

Appendix C
Summary of Suspected LCP Bulk Samples

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Appendix C: Summary Table – Suspected LCP Bulk Samples

Sample Number	Paint Description	Location	Analysis (Lead – ppm)
A Wing			
MB-P-01	Grey colour	Rooftop Mechanical ductwork	1700
MB-P-02	White colour	Rooftop Railing	18000
MB-P-03	Cream colour	Penthouse Pipe	990
MB-P-04	Silver colour	Penthouse Cast iron drain pipe	960
MB-P-05	Red colour	Penthouse Sprinkler pipe	7600
MB-P-06	Cream colour	Penthouse Wall	940
MB-P-07	Grey/blue colour	1 st floor east hallway Floor	630
MB-P-08	Cream colour	1 st floor Walls/ceiling	560
MB-P-09	White colour	1 st floor west stairwell Walls	1600
MB-P-10	Red colour (yellow colour beneath)	Ground floor Doors/door frames	2800
MB-P-11	Grey colour	Building exterior Trim	2800
B Wing			
AD-P-01	Beige colour	Cafeteria 018 Walls	< 90
AD-P-02	White colour	Room 023 Walls	< 90
AD-P-03	Off-white colour	Room 023 Door trim	2000
AD-P-04	Green colour	Hallway outside room 003 Door trim	1800
AD-P-05	Yellow colour	Hallway outside room 009 Door trim	1100

Hazardous Building Materials Assessment

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Appendix C: Summary Table – Suspected LCP Bulk Samples

Sample Number	Paint Description	Location	Analysis (Lead – ppm)
AD-P-06	Beige colour	Hallway outside boardroom 121 Walls	< 90
AD-P-07	Grey colour	Walls	< 90
AD-P-08	Grey colour	3rd floor entrance doors to A Wing Door trim	2,400
AD-P-09	Beige colour	1 st floor atrium Vertical ducts	460
AD-P-10	Grey colour	1 st floor atrium Vertical ducts	< 470
AD-P-11	White colour	Penthouse Interior wall	210
AD-P-12	White colour	Rooftop Exterior staircase	< 90
AD-P-13	Grey colour	Rooftop Exterior siding	1,200
AD-P-14	Grey colour	Ground floor Exterior structural steel	520
Header Building			
HB-P-01	Beige colour	Interior walls	1,800
HB-P-02	Light grey colour	Floor	<90
HB-P-03	Light green colour	Interior posts and doors	3,800
HB-P-04	Dark green colour	Interior doors	27,000
Annex Building			
AN-P-01	Beige colour	Interior walls	< 90
AN-P-02	Yellow colour	Interior doors and door frames	< 130
AN-P-03	Grey colour	Building exterior Trim	1,200
AN-P-04	White colour	Building exterior Siding	2,300
Workshop/Garages			
S-P-01	Brown colour	Building exterior Siding	130
S-P-02	Beige colour	Mechanical ductwork	2,400
S-P-03	White colour	Interior Walls	680

Appendix D
Certificate of Analysis – Suspected ACM Samples



EMSL Canada Inc.

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EMSL Canada Order 551400515
Customer ID: 55JACQ30L
Customer PO: 115614042
Project ID:

Attn: Zack Kranjec
Stantec Consulting, Ltd.
1100- 111 Dunsmuir Street
Vancouver, BC V6B 6A3

Phone: (604) 696-8272
Fax:
Collected:
Received: 1/29/2014
Analyzed: 3/11/2014

Proj: 115614042

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: MB-PL-01A

Lab Sample ID: 551400515-0001

Sample Description: Wall/plaster-base layer

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/Various	0%	100%	None Detected	

Client Sample ID: MB-PL-01B

Lab Sample ID: 551400515-0002

Sample Description: Wall/plaster-base layer

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/Various	0%	100%	None Detected	

Client Sample ID: MB-PL-01C

Lab Sample ID: 551400515-0003

Sample Description: Column/plaster-base layer

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/Various	0%	100%	None Detected	

Client Sample ID: MB-PL-01D

Lab Sample ID: 551400515-0004

Sample Description: Ceiling/plaster-base layer

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/Various	0%	100%	None Detected	

Client Sample ID: MB-PL-01E

Lab Sample ID: 551400515-0005

Sample Description: Wall/plaster-base layer

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/Various	0%	100%	None Detected	

Client Sample ID: MB-PL-01F

Lab Sample ID: 551400515-0006

Sample Description: Wall/plaster-base layer

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/White/Various	0%	100%	None Detected	

Client Sample ID: MB-PL-01G

Lab Sample ID: 551400515-0007

Sample Description: Wall/plaster-base layer

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/White/Various	0%	100%	None Detected	



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EMSL Canada Order 551400515
Customer ID: 55JACQ30L
Customer PO: 115614042
Project ID:

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: MB-PL-02A **Lab Sample ID:** 551400515-0008
Sample Description: Wall/plaster-skim & base layers

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/White/Variou	0%	100%	None Detected	

Client Sample ID: MB-PL-02B **Lab Sample ID:** 551400515-0009
Sample Description: Wall/plaster-skim & base layers

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/White/Variou	0%	100%	None Detected	

Client Sample ID: MB-PL-02C **Lab Sample ID:** 551400515-0010
Sample Description: Wall/plaster-skim & base layers

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/White/Variou	0%	100%	None Detected	

Client Sample ID: MB-PL-02D **Lab Sample ID:** 551400515-0011
Sample Description: Wall/plaster-skim & base layers

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/White/Variou	0%	100%	None Detected	

Client Sample ID: MB-PL-02E **Lab Sample ID:** 551400515-0012
Sample Description: Wall/plaster-skim & base layers

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/White/Variou	0%	100%	None Detected	

Client Sample ID: MB-PL-02F **Lab Sample ID:** 551400515-0013
Sample Description: Wall/plaster-skim & base layers

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/White/Variou	0%	100%	None Detected	

Client Sample ID: MB-PL-02G **Lab Sample ID:** 551400515-0014
Sample Description: Wall/plaster-skim & base layers

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/White/Variou	0%	100%	None Detected	

Client Sample ID: MB-PL-02H **Lab Sample ID:** 551400515-0015
Sample Description: Wall/plaster-skim & base layers

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/White/Variou	0%	100%	None Detected	



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EMSL Canada Order 551400515
Customer ID: 55JACQ30L
Customer PO: 115614042
Project ID:

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: MB-PL-02I **Lab Sample ID:** 551400515-0016
Sample Description: Wall/plaster-skim & base layers

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/White/Various	0%	100%	None Detected	

Client Sample ID: MB-PL-02J **Lab Sample ID:** 551400515-0017
Sample Description: Wall/plaster-skim & base layers

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/White/Various	0%	100%	None Detected	

Client Sample ID: MB-PL-02K **Lab Sample ID:** 551400515-0018
Sample Description: Wall/plaster-skim & base layers

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/White/Various	0%	100%	None Detected	

Client Sample ID: MB-PL-03A **Lab Sample ID:** 551400515-0019
Sample Description: Boiler room wall/plaster-base layer

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/Various	0%	100%	None Detected	

Client Sample ID: MB-PL-03B **Lab Sample ID:** 551400515-0020
Sample Description: Boiler room wall/plaster-base layer

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/Various	0%	100%	None Detected	

Client Sample ID: MB-PL-03C **Lab Sample ID:** 551400515-0021
Sample Description: Boiler room wall/plaster-base layer

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray	0%	100%	None Detected	

Client Sample ID: MB-PL-04A **Lab Sample ID:** 551400515-0022
Sample Description: Boiler room wall/plaster-base layer

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/Various	0%	90%	10% Chrysotile	

Client Sample ID: MB-PL-04B **Lab Sample ID:** 551400515-0023
Sample Description: Stairwell wall/plaster-base layer

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/Various	0%	90%	10% Chrysotile	



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EMSL Canada Order: 551400515
Customer ID: 55JACQ30L
Customer PO: 115614042
Project ID:

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: MB-PL-04C **Lab Sample ID:** 551400515-0024
Sample Description: Stairwell wall/plaster-base layer

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/Various	0%	90%	10% Chrysotile	

Client Sample ID: MB-PL-04D **Lab Sample ID:** 551400515-0025
Sample Description: Stairwell wall/plaster-base layer

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray	0%	90%	10% Chrysotile	

Client Sample ID: MB-PL-04E **Lab Sample ID:** 551400515-0026
Sample Description: Stairwell wall/plaster-base layer

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray	0%	92%	8% Chrysotile	

Client Sample ID: MB-DJC-01A **Lab Sample ID:** 551400515-0027
Sample Description: Penthouse storage room/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DJC-01B **Lab Sample ID:** 551400515-0028
Sample Description: Penthouse storage room/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DJC-01C **Lab Sample ID:** 551400515-0029
Sample Description: Penthouse storage room/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DJC-01D **Lab Sample ID:** 551400515-0030
Sample Description: Penthouse storage room/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DJC-01E **Lab Sample ID:** 551400515-0031
Sample Description: Penthouse storage room/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	



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Project ID:

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: MB-DJC-02A **Lab Sample ID:** 551400515-0032
Sample Description: 1st floor stores/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DJC-02B **Lab Sample ID:** 551400515-0033
Sample Description: 1st floor stores/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DJC-02C **Lab Sample ID:** 551400515-0034
Sample Description: 1st floor stores/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DJC-03A **Lab Sample ID:** 551400515-0035
Sample Description: 1st floor lobby elevators/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DJC-03B **Lab Sample ID:** 551400515-0036
Sample Description: 1st floor lobby elevators/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DJC-03C **Lab Sample ID:** 551400515-0037
Sample Description: 1st floor lobby elevators/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DJC-04A **Lab Sample ID:** 551400515-0038
Sample Description: Library lower level/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DJC-04B **Lab Sample ID:** 551400515-0039
Sample Description: Library lower level/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	



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Customer PO: 115614042
Project ID:

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: MB-DJC-04C **Lab Sample ID:** 551400515-0040
Sample Description: Library lower level/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DJC-04D **Lab Sample ID:** 551400515-0041
Sample Description: Library lower level/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DJC-04E **Lab Sample ID:** 551400515-0042
Sample Description: Library lower level/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DJC-05A **Lab Sample ID:** 551400515-0043
Sample Description: Mech/shops/hallway lower level/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DJC-05B **Lab Sample ID:** 551400515-0044
Sample Description: Mech/shops/hallway lower level/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DJC-05C **Lab Sample ID:** 551400515-0045
Sample Description: Mech/shops/hallway lower level/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DJC-05D **Lab Sample ID:** 551400515-0046
Sample Description: Mech/shops/hallway lower level/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DJC-05E **Lab Sample ID:** 551400515-0047
Sample Description: Mech/shops/hallway lower level/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	



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Client Sample ID: MB-DJC-05F

Lab Sample ID: 551400515-0048

Sample Description: Mech/shops/hallway lower level/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DJC-05G

Lab Sample ID: 551400515-0049

Sample Description: Mech/shops/hallway lower level/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DJC-06A

Lab Sample ID: 551400515-0050

Sample Description: Room 159/160 partitions/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DJC-06B

Lab Sample ID: 551400515-0051

Sample Description: Room 159/160 partitions/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DJC-06C

Lab Sample ID: 551400515-0052

Sample Description: Room 159/160 partitions/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DJC-07A

Lab Sample ID: 551400515-0053

Sample Description: Room 396/397,395-399 & 387 partitions/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DJC-07B

Lab Sample ID: 551400515-0054

Sample Description: Room 396/397,395-399 & 387 partitions/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DJC-07C

Lab Sample ID: 551400515-0055

Sample Description: Room 396/397,395-399 & 387 partitions/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	



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Client Sample ID: MB-DJC-08A **Lab Sample ID:** 551400515-0056
Sample Description: Insectary partitons/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DJC-08B **Lab Sample ID:** 551400515-0057
Sample Description: Insectary partitons/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DJC-08C **Lab Sample ID:** 551400515-0058
Sample Description: Insectary partitons/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DJC-09A **Lab Sample ID:** 551400515-0059
Sample Description: Herbarium partiton/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DJC-09B **Lab Sample ID:** 551400515-0060
Sample Description: Herbarium partiton/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DJC-09C **Lab Sample ID:** 551400515-0061
Sample Description: Herbarium partiton/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DJC-10A **Lab Sample ID:** 551400515-0062
Sample Description: Quarantime room partition/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-DJC-10B **Lab Sample ID:** 551400515-0063
Sample Description: Quarantime room partition/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	



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Client Sample ID: MB-DJC-10C **Lab Sample ID:** 551400515-0064
Sample Description: Quarantine room partition/drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-FS-01A **Lab Sample ID:** 551400515-0065
Sample Description: White colour/fire stop caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-FS-01B **Lab Sample ID:** 551400515-0066
Sample Description: White colour/fire stop caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-FS-01C **Lab Sample ID:** 551400515-0067
Sample Description: White colour/fire stop caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-FS-02A **Lab Sample ID:** 551400515-0068
Sample Description: Black colour/fire stop caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Brown/Black	0%	97%	3% Chrysotile	

Client Sample ID: MB-FS-02B **Lab Sample ID:** 551400515-0069
Sample Description: Black colour/fire stop caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014					Stop Positive (Not Analyzed)

Client Sample ID: MB-FS-02C **Lab Sample ID:** 551400515-0070
Sample Description: Black colour/fire stop caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014					Stop Positive (Not Analyzed)

Client Sample ID: MB-FS-03A **Lab Sample ID:** 551400515-0071
Sample Description: Red colour/fire stop caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Brown/Red	2%	98%	None Detected	



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Client Sample ID: MB-FS-03B **Lab Sample ID:** 551400515-0072
Sample Description: Red colour/fire stop caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Brown/Red/Silver	2%	98%	None Detected	

Client Sample ID: MB-FS-03C **Lab Sample ID:** 551400515-0073
Sample Description: Red colour/fire stop caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Brown/Silver	4%	96%	None Detected	

Client Sample ID: MB-FS-04A **Lab Sample ID:** 551400515-0074
Sample Description: Red/brown (textured) colour/fire stop caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Brown/Gray	0%	100%	None Detected	

Client Sample ID: MB-FS-04B **Lab Sample ID:** 551400515-0075
Sample Description: Red/brown (textured) colour/fire stop caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Brown/Gray	0%	100%	None Detected	

Client Sample ID: MB-FS-04C **Lab Sample ID:** 551400515-0076
Sample Description: Red/brown (textured) colour/fire stop caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Brown/Gray	0%	100%	None Detected	

Client Sample ID: MB-FS-05A **Lab Sample ID:** 551400515-0077
Sample Description: Grey colour/fire stop caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/Various	0%	95%	5% Chrysotile	

Client Sample ID: MB-FS-05B **Lab Sample ID:** 551400515-0078
Sample Description: Grey colour/fire stop caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014					Stop Positive (Not Analyzed)

Client Sample ID: MB-FS-05C **Lab Sample ID:** 551400515-0079
Sample Description: Grey colour/fire stop caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014					Stop Positive (Not Analyzed)



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Client Sample ID: MB-FS-06A **Lab Sample ID:** 551400515-0080
Sample Description: Light grey colour/fire stop caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray	0%	100%	None Detected	

Client Sample ID: MB-FS-06B **Lab Sample ID:** 551400515-0081
Sample Description: Light grey colour/fire stop caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray	0%	100%	None Detected	

Client Sample ID: MB-FS-06C **Lab Sample ID:** 551400515-0082
Sample Description: Light grey colour/fire stop caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray	0%	100%	None Detected	

Client Sample ID: MB-FS-07A **Lab Sample ID:** 551400515-0083
Sample Description: Dark grey colour/fire stop caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray	0%	100%	<1% Chrysotile	
400 PLM Pt Ct	3/11/2014	Gray	0%	100%	<0.25% Chrysotile	

Client Sample ID: MB-FS-07B **Lab Sample ID:** 551400515-0084
Sample Description: Dark grey colour/fire stop caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray	0%	100%	None Detected	

Client Sample ID: MB-FS-07C **Lab Sample ID:** 551400515-0085
Sample Description: Dark grey colour/fire stop caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/Various/Silver	0%	100%	None Detected	

Client Sample ID: MB-FS-08A **Lab Sample ID:** 551400515-0086
Sample Description: Silver colour-malleable/fire stop caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray	0%	100%	None Detected	

Client Sample ID: MB-FS-08B **Lab Sample ID:** 551400515-0087
Sample Description: Silver colour-malleable/fire stop caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray	0%	100%	None Detected	



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Client Sample ID: MB-FS-08C **Lab Sample ID:** 551400515-0088
Sample Description: Silver colour-malleable/fire stop caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/Silver	0%	100%	None Detected	

Client Sample ID: MB-FS-09A **Lab Sample ID:** 551400515-0089
Sample Description: Silver colour-hardened/fire stop caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Brown/Various	0%	95%	5% Chrysotile	

Client Sample ID: MB-FS-09B **Lab Sample ID:** 551400515-0090
Sample Description: Silver colour-hardened/fire stop caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014					Stop Positive (Not Analyzed)

Client Sample ID: MB-FS-09C **Lab Sample ID:** 551400515-0091
Sample Description: Silver colour-hardened/fire stop caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014					Stop Positive (Not Analyzed)

Client Sample ID: MB-FS-10A **Lab Sample ID:** 551400515-0092
Sample Description: Red/brown (textured) colour ground fl @ wallpipe/fire stop caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Brown/Various	0%	100%	None Detected	

Client Sample ID: MB-FS-10B **Lab Sample ID:** 551400515-0093
Sample Description: Red/brown (textured) colour ground fl @ wallpipe/fire stop caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Brown/Various	0%	100%	None Detected	

Client Sample ID: MB-FS-10C **Lab Sample ID:** 551400515-0094
Sample Description: Red/brown (textured) colour ground fl @ wallpipe/fire stop caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Brown	4%	96%	None Detected	

Client Sample ID: MB-CT-01A **Lab Sample ID:** 551400515-0095
Sample Description: Penthouse storage rm suspended ct/ceiling 2'x4' size textured w/fiberglass core

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray/White	60%	40%	None Detected	



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Client Sample ID: MB-CT-01B **Lab Sample ID:** 551400515-0096
Sample Description: Penthouse storage rm suspended ct/ceiling 2'x4' size textured w/fiberglass core

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray/White	60%	40%	None Detected	

Client Sample ID: MB-CT-01C **Lab Sample ID:** 551400515-0097
Sample Description: Penthouse storage rm suspended ct/ceiling 2'x4' size textured w/fiberglass core

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	White	45%	55%	None Detected	

Client Sample ID: MB-CT-02A **Lab Sample ID:** 551400515-0098
Sample Description: Room M05 suspended ct/ceiling 1'x1' size random fissures & pinholes

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Brown/Gray/White	80%	20%	None Detected	

Client Sample ID: MB-CT-02B **Lab Sample ID:** 551400515-0099
Sample Description: Room M05 suspended ct/ceiling 1'x1' size random fissures & pinholes

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Brown/Gray/White	80%	20%	None Detected	

Client Sample ID: MB-CT-02C **Lab Sample ID:** 551400515-0100
Sample Description: Room M05 suspended ct/ceiling 1'x1' size random fissures & pinholes

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray/White	80%	20%	None Detected	

Client Sample ID: MB-CT-03A **Lab Sample ID:** 551400515-0101
Sample Description: 1st floor suspended/ceiling tile 2'x2' size random large & small hols

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Brown/Gray/White	85%	15%	None Detected	

Client Sample ID: MB-CT-03B **Lab Sample ID:** 551400515-0102
Sample Description: 1st floor suspended/ceiling tile 2'x2' size random large & small hols

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Brown/Gray/White	85%	15%	None Detected	

Client Sample ID: MB-CT-03C **Lab Sample ID:** 551400515-0103
Sample Description: 1st floor suspended/ceiling tile 2'x2' size random large & small hols

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray	80%	20%	None Detected	



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Client Sample ID: MB-CT-04A **Lab Sample ID:** 551400515-0104
Sample Description: 1st floor stores suspended/ceiling tile 2'x4' size standard fissures & pinholes

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Brown/Gray/White	80%	20%	None Detected	

Client Sample ID: MB-CT-04B **Lab Sample ID:** 551400515-0105
Sample Description: 1st floor stores suspended/ceiling tile 2'x4' size standard fissures & pinholes

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Brown/Gray/White	80%	20%	None Detected	

Client Sample ID: MB-CT-04C **Lab Sample ID:** 551400515-0106
Sample Description: 1st floor stores suspended/ceiling tile 2'x4' size standard fissures & pinholes

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray/White	80%	20%	None Detected	

Client Sample ID: MB-FT-01A **Lab Sample ID:** 551400515-0107
Sample Description: Flooring/floor tile 9"x9" size brown colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Brown/Various	0%	100%	None Detected	

Client Sample ID: MB-FT-01A MASTIC **Lab Sample ID:** 551400515-0107A
Sample Description: Flooring

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/11/2014	Tan	0%	100%	None Detected	

Client Sample ID: MB-FT-01B **Lab Sample ID:** 551400515-0108
Sample Description: Flooring/floor tile 9"x9" size brown colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Brown/Various	0%	100%	None Detected	

Client Sample ID: MB-FT-01B MASTIC **Lab Sample ID:** 551400515-0108A
Sample Description: Flooring

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/11/2014	Tan	0%	100%	None Detected	

Client Sample ID: MB-FT-01C **Lab Sample ID:** 551400515-0109
Sample Description: Flooring/floor tile 9"x9" size brown colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Brown	0%	100%	None Detected	



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Client Sample ID: MB-FT-01C MASTIC **Lab Sample ID:** 551400515-0109A
Sample Description: Flooring

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/11/2014	Tan	0%	100%	None Detected	

Client Sample ID: MB-FT-02A **Lab Sample ID:** 551400515-0110
Sample Description: Flooring/floor tile 9"x9" size green colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Various/Green	0%	100%	None Detected	

Client Sample ID: MB-FT-02A MASTIC **Lab Sample ID:** 551400515-0110A
Sample Description: Flooring

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/11/2014	Tan	0%	100%	None Detected	

Client Sample ID: MB-FT-02B **Lab Sample ID:** 551400515-0111
Sample Description: Flooring/floor tile 9"x9" size green colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Various/Green	0%	100%	None Detected	

Client Sample ID: MB-FT-02B MASTIC **Lab Sample ID:** 551400515-0111A
Sample Description: Flooring

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/11/2014	Tan	0%	100%	None Detected	

Client Sample ID: MB-FT-02C **Lab Sample ID:** 551400515-0112
Sample Description: Flooring/floor tile 9"x9" size green colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Various/Green	0%	100%	None Detected	

Client Sample ID: MB-FT-02C MASTIC **Lab Sample ID:** 551400515-0112A
Sample Description: Flooring

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/11/2014	Tan	0%	100%	None Detected	

Client Sample ID: MB-SF-01 **Lab Sample ID:** 551400515-0113
Sample Description: Quarantine room flooring/sheet flooring grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray/Various	0%	100%	None Detected	



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Client Sample ID: MB-SF-01 MASTIC **Lab Sample ID:** 551400515-0113A
Sample Description: Quarantine room flooring

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/11/2014	Brown	0%	100%	None Detected	

Client Sample ID: MB-PC-01A **Lab Sample ID:** 551400515-0114
Sample Description: Room 069/parging cement applied to pipe fittings It grey colour chalk like texture

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray	45%	37%	10% Amosite 8% Chrysotile	

Client Sample ID: MB-PC-01B **Lab Sample ID:** 551400515-0115
Sample Description: Room 069/parging cement applied to pipe fittings It grey colour chalk like texture

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray/White	45%	40%	10% Amosite 5% Chrysotile	

Client Sample ID: MB-PC-01C **Lab Sample ID:** 551400515-0116
Sample Description: Room 069/parging cement applied to pipe fittings It grey colour chalk like texture

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray/White	45%	41%	10% Amosite 4% Chrysotile	

Client Sample ID: MB-PC-01D **Lab Sample ID:** 551400515-0117
Sample Description: 1st floor hallway to general stores/shops/parging cement applied to pipe fittings It grey colour chalk like texture

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray/White	40%	50%	8% Amosite 2% Chrysotile	

Client Sample ID: MB-PC-02A **Lab Sample ID:** 551400515-0118
Sample Description: Room CR5 w/in ceiling space above plaster ceiling/parging cement applied to pipe fittings grey colour fibrous

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Brown/Gray/Various	0%	55%	45% Chrysotile	

Client Sample ID: MB-PC-02B **Lab Sample ID:** 551400515-0119
Sample Description: Room CR5 w/in ceiling space above plaster ceiling/parging cement applied to pipe fittings grey colour fibrous

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Brown/Gray/Various	20%	35%	45% Chrysotile	



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Client Sample ID: MB-PC-02C **Lab Sample ID:** 551400515-0120
Sample Description: Room CR5 w/in ceiling space above plaster ceiling/parging cement applied to pipe fittings grey colour fibrous

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray/White/Various	0%	55%	45% Chrysotile	

Client Sample ID: MB-FD-01A **Lab Sample ID:** 551400515-0121
Sample Description: Penthouse mechanical ducting/flex duct fabric

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Brown/Black	0%	20%	80% Chrysotile	

Client Sample ID: MB-FD-01B **Lab Sample ID:** 551400515-0122
Sample Description: Penthouse mechanical ducting/flex duct fabric

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Brown/Gray	0%	20%	80% Chrysotile	

Client Sample ID: MB-FD-01C **Lab Sample ID:** 551400515-0123
Sample Description: Penthouse mechanical ducting/flex duct fabric

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray/Black	0%	25%	75% Chrysotile	

Client Sample ID: MB-DI-01A **Lab Sample ID:** 551400515-0124
Sample Description: Penthouse mechanical ducting/Penthouse Mechanical ducting

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray/White	30%	20%	50% Chrysotile	

Client Sample ID: MB-DI-01B **Lab Sample ID:** 551400515-0125
Sample Description: Penthouse mechanical ducting/Penthouse Mechanical ducting

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014					Stop Positive (Not Analyzed)

Client Sample ID: MB-DI-01C **Lab Sample ID:** 551400515-0126
Sample Description: Penthouse mechanical ducting/Penthouse Mechanical ducting

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014					Stop Positive (Not Analyzed)

Client Sample ID: MB-DL-01A **Lab Sample ID:** 551400515-0127
Sample Description: Penthouse mechanical ducting/Penthouse Mechanical ducting

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Black/Yellow	40%	60%	None Detected	



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Client Sample ID: MB-DL-01B **Lab Sample ID:** 551400515-0128
Sample Description: Penthouse mechanical ducting/Penthouse Mechanical ducting

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Black/Yellow	40%	60%	None Detected	

Client Sample ID: MB-DL-01C **Lab Sample ID:** 551400515-0129
Sample Description: Penthouse mechanical ducting/Penthouse Mechanical ducting

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Black	50%	50%	None Detected	

Client Sample ID: MB-DM-01A **Lab Sample ID:** 551400515-0130
Sample Description: Penthouse mechanical ducting/Penthouse Mechanical ducting

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Black/Green	0%	100%	None Detected	

Client Sample ID: MB-DM-01B **Lab Sample ID:** 551400515-0131
Sample Description: Penthouse mechanical ducting/Penthouse Mechanical ducting

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Black/Green	0%	100%	None Detected	

Client Sample ID: MB-DM-01C **Lab Sample ID:** 551400515-0132
Sample Description: Penthouse mechanical ducting/Penthouse Mechanical ducting

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Black	0%	100%	None Detected	

Client Sample ID: MB-DM-02A **Lab Sample ID:** 551400515-0133
Sample Description: Penthouse mechanical ducting/Penthouse Mechanical ducting

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Red	0%	96%	4% Chrysotile	

Client Sample ID: MB-DM-02B **Lab Sample ID:** 551400515-0134
Sample Description: Penthouse mechanical ducting/Penthouse Mechanical ducting

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014					Stop Positive (Not Analyzed)

Client Sample ID: MB-DM-02C **Lab Sample ID:** 551400515-0135
Sample Description: Penthouse mechanical ducting/Penthouse Mechanical ducting

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014					Stop Positive (Not Analyzed)



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Client Sample ID: MB-DM-03A **Lab Sample ID:** 551400515-0136
Sample Description: Penthouse mechanical ducting/Penthouse Mechanical ducting

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray	0%	100%	None Detected	

Client Sample ID: MB-DM-03B **Lab Sample ID:** 551400515-0137
Sample Description: Penthouse mechanical ducting/Penthouse Mechanical ducting

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray	0%	100%	None Detected	

Client Sample ID: MB-DM-03C **Lab Sample ID:** 551400515-0138
Sample Description: Penthouse mechanical ducting/Penthouse Mechanical ducting

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray	0%	100%	None Detected	

Client Sample ID: MB-DM-04A **Lab Sample ID:** 551400515-0139
Sample Description: Room M06 Mechanical ducting/Duct mastic Light grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray	0%	100%	None Detected	

Client Sample ID: MB-DM-04B **Lab Sample ID:** 551400515-0140
Sample Description: Room M06 Mechanical ducting/Duct mastic Light grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray	0%	100%	None Detected	

Client Sample ID: MB-DM-04C **Lab Sample ID:** 551400515-0141
Sample Description: Room M06 Mechanical ducting/Duct mastic Light grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray	0%	100%	None Detected	

Client Sample ID: MB-PW-01A **Lab Sample ID:** 551400515-0142
Sample Description: Penthouse Mechanical Pipe/Mechanical pipe wrap

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	White/Various/Black	35%	65%	None Detected	

Client Sample ID: MB-PW-01B **Lab Sample ID:** 551400515-0143
Sample Description: Penthouse Mechanical Pipe/Mechanical pipe wrap

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	White/Various/Black	35%	65%	None Detected	



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Client Sample ID: MB-PW-01C **Lab Sample ID:** 551400515-0144
Sample Description: Penthouse Mechanical Pipe/Mechanical pipe wrap

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	rown/Various/Blac	40%	60%	None Detected	

Client Sample ID: MB-PW-02A **Lab Sample ID:** 551400515-0145
Sample Description: Penthouse Mechanical Pipe/Mechanical pipe wrap

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	rown/Various/Blac	60%	40%	None Detected	

Client Sample ID: MB-PW-02B **Lab Sample ID:** 551400515-0146
Sample Description: Penthouse Mechanical Pipe/Mechanical pipe wrap

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	rown/Various/Blac	60%	40%	None Detected	

Client Sample ID: MB-PW-02C **Lab Sample ID:** 551400515-0147
Sample Description: Penthouse Mechanical Pipe/Mechanical pipe wrap

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	rown/Various/Blac	55%	45%	None Detected	

Client Sample ID: MB-WP-01A **Lab Sample ID:** 551400515-0148
Sample Description: Chase 318/Wall parging (at pipe penetrations) Light grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray/Various	0%	100%	None Detected	

Client Sample ID: MB-WP-01B **Lab Sample ID:** 551400515-0149
Sample Description: Chase 318/Wall parging (at pipe penetrations) Light grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray/Various	0%	100%	None Detected	

Client Sample ID: MB-WP-01C **Lab Sample ID:** 551400515-0150
Sample Description: Chase 318/Wall parging (at pipe penetrations) Light grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray	0%	100%	None Detected	

Client Sample ID: MB-WP-02A **Lab Sample ID:** 551400515-0151
Sample Description: Chase 318/Wall parging (at pipe penetrations) Medium grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray/Various	0%	100%	None Detected	



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Client Sample ID: MB-WP-02B **Lab Sample ID:** 551400515-0152
Sample Description: Chase 318/Wall parging (at pipe penetrations) Medium grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray/Variou	0%	100%	None Detected	

Client Sample ID: MB-WP-02C **Lab Sample ID:** 551400515-0153
Sample Description: Chase 318/Wall parging (at pipe penetrations) Medium grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray	0%	100%	None Detected	

Client Sample ID: MB-WP-03A **Lab Sample ID:** 551400515-0154
Sample Description: Chase 318/Wall parging (at pipe penetrations) Dark grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray/Variou	0%	100%	None Detected	

Client Sample ID: MB-WP-03B **Lab Sample ID:** 551400515-0155
Sample Description: Chase 318/Wall parging (at pipe penetrations) Dark grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray/Variou	0%	100%	None Detected	

Client Sample ID: MB-WP-03C **Lab Sample ID:** 551400515-0156
Sample Description: Chase 318/Wall parging (at pipe penetrations) Dark grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray	0%	100%	None Detected	

Client Sample ID: MB-ES-01A **Lab Sample ID:** 551400515-0157
Sample Description: Building Exterior/Exterior wall base stucco Grey with pebbles

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/White/Variou	0%	100%	None Detected	

Client Sample ID: MB-ES-01B **Lab Sample ID:** 551400515-0158
Sample Description: Building Exterior/Exterior wall base stucco Grey with pebbles

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/White	0%	100%	None Detected	

Client Sample ID: MB-ES-01C **Lab Sample ID:** 551400515-0159
Sample Description: Building Exterior/Exterior wall base stucco Grey with pebbles

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray	0%	100%	None Detected	



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Client Sample ID: MB-ES-01D **Lab Sample ID:** 551400515-0160
Sample Description: Building Exterior/Exterior wall base stucco Grey with pebbles

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/Various	0%	100%	None Detected	

Client Sample ID: MB-ES-01E **Lab Sample ID:** 551400515-0161
Sample Description: Building Exterior/Exterior wall base stucco Grey with pebbles

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/Various	0%	100%	None Detected	

Client Sample ID: MB-ES-02A **Lab Sample ID:** 551400515-0162
Sample Description: Building Exterior/Exterior siding/column stucco White with pebbles

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	<1% Chrysotile	
400 PLM Pt Ct	3/11/2014	Gray/White/Various	0%	100%	<0.25% Chrysotile	

Client Sample ID: MB-ES-02B **Lab Sample ID:** 551400515-0163
Sample Description: Building Exterior/Exterior siding/column stucco White with pebbles

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-ES-02C **Lab Sample ID:** 551400515-0164
Sample Description: Building Exterior/Exterior siding/column stucco White with pebbles

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-ES-02D **Lab Sample ID:** 551400515-0165
Sample Description: Building Exterior/Exterior siding/column stucco White with pebbles

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-ES-02E **Lab Sample ID:** 551400515-0166
Sample Description: Building Exterior/Exterior siding/column stucco White with pebbles

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White/Various	0%	100%	None Detected	

Client Sample ID: MB-ES-02F **Lab Sample ID:** 551400515-0167
Sample Description: Building Exterior/Exterior siding/column stucco White with pebbles

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White/Various	0%	100%	None Detected	



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Client Sample ID: MB-ES-02G **Lab Sample ID:** 551400515-0168
Sample Description: Building Exterior/Exterior siding/column stucco White with pebbles

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White/Various	0%	100%	None Detected	

Client Sample ID: MB-ES-03A **Lab Sample ID:** 551400515-0169
Sample Description: Building Exterior/Exterior wall base stucco Dark grey colour, textured

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/White	0%	100%	None Detected	

Client Sample ID: MB-ES-03B **Lab Sample ID:** 551400515-0170
Sample Description: Building Exterior/Exterior wall base stucco Dark grey colour, textured

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/White	0%	100%	None Detected	

Client Sample ID: MB-ES-03C **Lab Sample ID:** 551400515-0171
Sample Description: Building Exterior/Exterior wall base stucco Dark grey colour, textured

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/White	0%	100%	None Detected	

Client Sample ID: MB-ES-03D **Lab Sample ID:** 551400515-0172
Sample Description: Building Exterior/Exterior wall base stucco Dark grey colour, textured

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/White/Various	0%	100%	None Detected	

Client Sample ID: MB-ES-03E **Lab Sample ID:** 551400515-0173
Sample Description: Building Exterior/Exterior wall base stucco Dark grey colour, textured

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/White/Various	0%	100%	None Detected	

Client Sample ID: MB-ES-04A **Lab Sample ID:** 551400515-0174
Sample Description: Building Exterior/Exterior wall base stucco Grey colour, textured

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray	0%	100%	None Detected	

Client Sample ID: MB-ES-04B **Lab Sample ID:** 551400515-0175
Sample Description: Building Exterior/Exterior wall base stucco Grey colour, textured

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray	0%	100%	None Detected	



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EMSL Canada Order 551400515
Customer ID: 55JACQ30L
Customer PO: 115614042
Project ID:

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: MB-ES-04C **Lab Sample ID:** 551400515-0176
Sample Description: Building Exterior/Exterior wall base stucco Grey colour, textured

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray	0%	100%	None Detected	

Client Sample ID: MB-ES-04D **Lab Sample ID:** 551400515-0177
Sample Description: Building Exterior/Exterior wall base stucco Grey colour, textured

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/Various	0%	100%	None Detected	

Client Sample ID: MB-ES-04E **Lab Sample ID:** 551400515-0178
Sample Description: Building Exterior/Exterior wall base stucco Grey colour, textured

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/Various	0%	100%	None Detected	

Client Sample ID: MB-SG-01A **Lab Sample ID:** 551400515-0179
Sample Description: Building Exterior/Exterior stone wall grout

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray	0%	100%	<1% Chrysotile	
400 PLM Pt Ct	3/11/2014	Gray/White/Various	0%	100%	<0.25% Chrysotile	

Client Sample ID: MB-SG-01B **Lab Sample ID:** 551400515-0180
Sample Description: Building Exterior/Exterior stone wall grout

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray	0%	100%	None Detected	

Client Sample ID: MB-SG-01C **Lab Sample ID:** 551400515-0181
Sample Description: Building Exterior/Exterior stone wall grout

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/Various	0%	100%	None Detected	

Client Sample ID: MB-FB-01A **Lab Sample ID:** 551400515-0182
Sample Description: Building Exterior/Fibre board Red and grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/White	25%	75%	None Detected	

Client Sample ID: MB-FB-01B **Lab Sample ID:** 551400515-0183
Sample Description: Building Exterior/Fibre board Red and grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/White	40%	60%	None Detected	



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Customer PO: 115614042
Project ID:

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: MB-FB-01C **Lab Sample ID:** 551400515-0184
Sample Description: Building Exterior/Fibre board Red and grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Brown/Tan	30%	70%	None Detected	

Client Sample ID: MB-ECAU-01A **Lab Sample ID:** 551400515-0185
Sample Description: Building Exterior Siding/Exterior siding caulking Dark grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray	0%	100%	None Detected	

Client Sample ID: MB-ECAU-01B **Lab Sample ID:** 551400515-0186
Sample Description: Building Exterior Siding/Exterior siding caulking Dark grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray	0%	100%	None Detected	

Client Sample ID: MB-ECAU-01C **Lab Sample ID:** 551400515-0187
Sample Description: Building Exterior Siding/Exterior siding caulking Dark grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Brown	0%	100%	None Detected	

Client Sample ID: MB-ECAU-02A **Lab Sample ID:** 551400515-0188
Sample Description: Building Exterior Windows/Exterior window caulking Light grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray	0%	100%	None Detected	

Client Sample ID: MB-ECAU-02B **Lab Sample ID:** 551400515-0189
Sample Description: Building Exterior Windows/Exterior window caulking Light grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray	0%	100%	None Detected	

Client Sample ID: MB-ECAU-02C **Lab Sample ID:** 551400515-0190
Sample Description: Building Exterior Windows/Exterior window caulking Light grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray	0%	100%	None Detected	

Client Sample ID: MB-RS-01A **Lab Sample ID:** 551400515-0191
Sample Description: Rooftop/Exterior sealant Roof vent black colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Black	0%	100%	None Detected	



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EMSL Canada Order 551400515
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Customer PO: 115614042
Project ID:

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: MB-RS-01B **Lab Sample ID:** 551400515-0192
Sample Description: Rooftop/Exterior sealant Roof vent black colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Black	0%	100%	None Detected	

Client Sample ID: MB-RS-01C **Lab Sample ID:** 551400515-0193
Sample Description: Rooftop/Exterior sealant Roof vent black colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Brown	0%	100%	None Detected	

Client Sample ID: MB-RS-02A **Lab Sample ID:** 551400515-0194
Sample Description: Rooftop/Exterior sealant (roofing tar) Mechanical Black colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Black	0%	100%	None Detected	

Client Sample ID: MB-RS-02B **Lab Sample ID:** 551400515-0195
Sample Description: Rooftop/Exterior sealant (roofing tar) Mechanical Black colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Black	0%	100%	None Detected	

Client Sample ID: MB-RS-02C **Lab Sample ID:** 551400515-0196
Sample Description: Rooftop/Exterior sealant (roofing tar) Mechanical Black colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Black	0%	100%	None Detected	

Client Sample ID: MB-RS-03A **Lab Sample ID:** 551400515-0197
Sample Description: Rooftop/Exterior sealant Flashing/railing White Colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/White	0%	100%	None Detected	

Client Sample ID: MB-RS-03B **Lab Sample ID:** 551400515-0198
Sample Description: Rooftop/Exterior sealant Flashing/railing White Colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/White	0%	100%	None Detected	

Client Sample ID: MB-RS-03C **Lab Sample ID:** 551400515-0199
Sample Description: Rooftop/Exterior sealant Flashing/railing White Colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/White	0%	100%	None Detected	



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EMSL Canada Order 551400515
Customer ID: 55JACQ30L
Customer PO: 115614042
Project ID:

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: MB-RS-04A

Lab Sample ID: 551400515-0200

Sample Description: Rooftop/Exterior Sealant Mechanical White Colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-RS-04B

Lab Sample ID: 551400515-0201

Sample Description: Rooftop/Exterior Sealant Mechanical White Colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: MB-RS-04C

Lab Sample ID: 551400515-0202

Sample Description: Rooftop/Exterior Sealant Mechanical White Colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Analyst(s)

Arabee Sathiseelan	PLM	(49)
Kevin Pang	PLM	(48)
	400 PLM Pt Ct	(3)
Lama Mohammad	PLM	(102)

Kevin Pang
or other Approved Signatory

Any questions please contact Kevin Pang.

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Samples analyzed by EMSL Canada Inc. Mississauga, ON NVLAP Lab Code 200877-0

Initial report from: 02/04/2014 22:36:47



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EMSL Canada Order 551400633
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Customer PO: 115614042
Project ID:

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Collected:
Received: 2/03/2014
Analyzed: 2/07/2014
Proj: 115614042

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: MB-CFS-01A **Lab Sample ID:** 551400633-0001
Sample Description: CHASE FIRE STOP-GREY COLOUR, FIBROUS

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/07/2014	Gray	15%	85%	None Detected	

Client Sample ID: MB-CFS-01B **Lab Sample ID:** 551400633-0002
Sample Description: CHASE FIRE STOP-GREY COLOUR, FIBROUS

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/07/2014	Gray	15%	85%	None Detected	

Client Sample ID: MB-CFS-01C **Lab Sample ID:** 551400633-0003
Sample Description: CHASE FIRE STOP-GREY COLOUR, FIBROUS

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/07/2014	Gray	15%	85%	None Detected	

Analyst(s)
Lisa Podzyhun PLM (3)

Kevin Pang
or other Approved Signatory

Any questions please contact Kevin Pang.

None Detected = <0.5%. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted. This report must not be used to claim product endorsement by NVLAP of any agency of the U.S. Government.

Samples analyzed by EMSL Canada Inc. Mississauga, ON NVLAP Lab Code 200877-0

Initial report from: 02/10/2014 10:16:28



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EMSL Canada Order 551400515
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Customer PO: 115614042
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Received: 1/29/2014
Analyzed: 3/11/2014

Proj: 115614042

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: AD-DJC-01A

Lab Sample ID: 551400515-0203

Sample Description: Wall/Drywall Joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	White	0%	100%	None Detected	

Client Sample ID: AD-DJC-01B

Lab Sample ID: 551400515-0204

Sample Description: Wall/Drywall Joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	White	0%	100%	None Detected	

Client Sample ID: AD-DJC-01C

Lab Sample ID: 551400515-0205

Sample Description: Wall/Drywall Joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	White	0%	100%	None Detected	

Client Sample ID: AD-DJC-01D

Lab Sample ID: 551400515-0206

Sample Description: Wall/Drywall Joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	White	0%	100%	None Detected	

Client Sample ID: AD-DJC-01E

Lab Sample ID: 551400515-0207

Sample Description: Wall/Drywall Joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	White	0%	100%	None Detected	

Client Sample ID: AD-DJC-01F

Lab Sample ID: 551400515-0208

Sample Description: Wall/Drywall Joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	White	0%	100%	None Detected	

Client Sample ID: AD-DJC-01G

Lab Sample ID: 551400515-0209

Sample Description: Wall/Drywall Joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	White	0%	100%	None Detected	



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Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: AD-DJC-01H **Lab Sample ID:** 551400515-0210
Sample Description: Wall/Drywall Joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	White	0%	100%	None Detected	

Client Sample ID: AD-DJC-01I **Lab Sample ID:** 551400515-0211
Sample Description: Wall/Drywall Joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	White	0%	100%	None Detected	

Client Sample ID: AD-DJC-01J **Lab Sample ID:** 551400515-0212
Sample Description: Wall/Drywall Joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	White	0%	100%	None Detected	

Client Sample ID: AD-DJC-01K **Lab Sample ID:** 551400515-0213
Sample Description: Wall/Drywall Joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	White	0%	100%	None Detected	

Client Sample ID: AD-DJC-01L **Lab Sample ID:** 551400515-0214
Sample Description: Wall/Drywall Joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	White	0%	100%	None Detected	

Client Sample ID: AD-SF-01A **Lab Sample ID:** 551400515-0215
Sample Description: Flooring/Sheet flooring Grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray/Various	0%	100%	None Detected	

Client Sample ID: AD-SF-01A MASTIC **Lab Sample ID:** 551400515-0215A
Sample Description: Flooring

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/11/2014	Tan	0%	100%	None Detected	

Client Sample ID: AD-SF-01B **Lab Sample ID:** 551400515-0216
Sample Description: Flooring/Sheet flooring Grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray/Various	30%	70%	None Detected	



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Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: AD-SF-01B MASTIC **Lab Sample ID:** 551400515-0216A
Sample Description: Flooring

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/11/2014	Tan	0%	100%	None Detected	

Client Sample ID: AD-SF-01C **Lab Sample ID:** 551400515-0217
Sample Description: Flooring/Sheet flooring Grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray/Various	0%	100%	None Detected	

Client Sample ID: AD-SF-01C MASTIC **Lab Sample ID:** 551400515-0217A
Sample Description: Flooring

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/11/2014	Tan	0%	100%	None Detected	

Client Sample ID: AD-SF-02A **Lab Sample ID:** 551400515-0218
Sample Description: Flooring/Sheet flooring Blue colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray/Various/Blue	30%	70%	None Detected	

Client Sample ID: AD-SF-02A MASTIC **Lab Sample ID:** 551400515-0218A
Sample Description: Flooring

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/11/2014	Clear	0%	100%	None Detected	

Client Sample ID: AD-CAU-01A **Lab Sample ID:** 551400515-0219
Sample Description: Mechanical ducting/Duct sealant Grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray	0%	100%	None Detected	

Client Sample ID: AD-CAU-01B **Lab Sample ID:** 551400515-0220
Sample Description: Mechanical ducting/Duct sealant Grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray	0%	100%	None Detected	

Client Sample ID: AD-CAU-01C **Lab Sample ID:** 551400515-0221
Sample Description: Mechanical ducting/Duct sealant Grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray	0%	100%	None Detected	



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Client Sample ID: AD-CAU-02A **Lab Sample ID:** 551400515-0222
Sample Description: Rooftop/Caulking/sealant Silvery colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray	0%	100%	None Detected	

Client Sample ID: AD-CAU-02B **Lab Sample ID:** 551400515-0223
Sample Description: Rooftop/Caulking/sealant Silvery colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray	0%	100%	None Detected	

Client Sample ID: AD-CAU-02C **Lab Sample ID:** 551400515-0224
Sample Description: Rooftop/Caulking/sealant Silvery colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray	0%	100%	None Detected	

Client Sample ID: AD-CAU-03A **Lab Sample ID:** 551400515-0225
Sample Description: Rooftop/Caulking/sealant Grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray	0%	100%	None Detected	

Client Sample ID: AD-CAU-03B **Lab Sample ID:** 551400515-0226
Sample Description: Rooftop/Caulking/sealant Grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray	0%	100%	None Detected	

Client Sample ID: AD-CAU-03C **Lab Sample ID:** 551400515-0227
Sample Description: Rooftop/Caulking/sealant Grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray	0%	100%	None Detected	

Client Sample ID: AD-CAU-04A **Lab Sample ID:** 551400515-0228
Sample Description: Rooftop/Caulking/sealant White colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	White	0%	100%	None Detected	

Client Sample ID: AD-CAU-04B **Lab Sample ID:** 551400515-0229
Sample Description: Rooftop/Caulking/sealant White colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	White	0%	100%	None Detected	



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Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: AD-CAU-04C **Lab Sample ID:** 551400515-0230
Sample Description: Rooftop/Caulking/sealant White colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	White	0%	100%	None Detected	

Client Sample ID: AD-CT-01A **Lab Sample ID:** 551400515-0231
Sample Description: Suspended ceiling/Ceiling tile (2'X 2' size) Random large and small holes

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Tan/White	80%	20%	None Detected	

Client Sample ID: AD-CT-01B **Lab Sample ID:** 551400515-0232
Sample Description: Suspended ceiling/Ceiling tile (2'X 2' size) Random large and small holes

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Tan/White	80%	20%	None Detected	

Client Sample ID: AD-CT-01C **Lab Sample ID:** 551400515-0233
Sample Description: Suspended ceiling/Ceiling tile (2'X 2' size) Random large and small holes

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Tan/White	80%	20%	None Detected	

Client Sample ID: AD-DM-01A **Lab Sample ID:** 551400515-0234
Sample Description: Penthouse Exhaust ducting/Duct mastic Red colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Red	0%	96%	4% Chrysotile	

Client Sample ID: AD-DM-01B **Lab Sample ID:** 551400515-0235
Sample Description: Penthouse Exhaust ducting/Duct mastic Red colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014					Stop Positive (Not Analyzed)

Client Sample ID: AD-DM-01C **Lab Sample ID:** 551400515-0236
Sample Description: Penthouse Exhaust ducting/Duct mastic Red colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014					Stop Positive (Not Analyzed)

Client Sample ID: AD-DM-02A **Lab Sample ID:** 551400515-0237
Sample Description: Penthouse Return ducting/Duct mastic Red colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Red	0%	96%	4% Chrysotile	



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EMSL Canada Order 551400515
Customer ID: 55JACQ30L
Customer PO: 115614042
Project ID:

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Client Sample ID: AD-DM-02B **Lab Sample ID:** 551400515-0238
Sample Description: Penthouse Return ducting/Duct mastic Red colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014					Stop Positive (Not Analyzed)

Client Sample ID: AD-DM-02C **Lab Sample ID:** 551400515-0239
Sample Description: Penthouse Return ducting/Duct mastic Red colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014					Stop Positive (Not Analyzed)

Client Sample ID: AD-DM-03A **Lab Sample ID:** 551400515-0240
Sample Description: Penthouse Return ducting/Duct mastic Grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray	0%	100%	None Detected	

Client Sample ID: AD-DM-03B **Lab Sample ID:** 551400515-0241
Sample Description: Penthouse Return ducting/Duct mastic Grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray	0%	100%	None Detected	

Client Sample ID: AD-DM-03C **Lab Sample ID:** 551400515-0242
Sample Description: Penthouse Return ducting/Duct mastic Grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray	0%	100%	None Detected	

Client Sample ID: AD-DM-04A **Lab Sample ID:** 551400515-0243
Sample Description: Penthouse Return ducting (fire damper doors)/Duct mastic Brown colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Brown	5%	95%	None Detected	

Client Sample ID: AD-DM-04B **Lab Sample ID:** 551400515-0244
Sample Description: Penthouse Return ducting (fire damper doors)/Duct mastic Brown colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Brown	5%	95%	None Detected	

Client Sample ID: AD-DM-04C **Lab Sample ID:** 551400515-0245
Sample Description: Penthouse Return ducting (fire damper doors)/Duct mastic Brown colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Brown	5%	95%	None Detected	



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Client Sample ID: AD-DM-05A **Lab Sample ID:** 551400515-0246
Sample Description: Rooftop Exterior ducting/Duct mastic Light grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray	0%	100%	None Detected	

Client Sample ID: AD-DM-05B **Lab Sample ID:** 551400515-0247
Sample Description: Rooftop Exterior ducting/Duct mastic Light grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray	0%	100%	None Detected	

Client Sample ID: AD-DM-05C **Lab Sample ID:** 551400515-0248
Sample Description: Rooftop Exterior ducting/Duct mastic Light grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray	0%	100%	None Detected	

Client Sample ID: AD-FP-01A **Lab Sample ID:** 551400515-0249
Sample Description: Above suspended ceiling/Fire proofing White colour, fibrous

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray	65%	35%	None Detected	Labeled as AN-FP-01A on sample bag.

Client Sample ID: AD-FP-01B **Lab Sample ID:** 551400515-0250
Sample Description: Above suspended ceiling/Fire proofing White colour, fibrous

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray	65%	35%	None Detected	Labeled as AN-FP-01B on sample bag.

Client Sample ID: AD-FP-01C **Lab Sample ID:** 551400515-0251
Sample Description: Above suspended ceiling/Fire proofing White colour, fibrous

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray	65%	35%	None Detected	Labeled as AN-FP-01C on sample bag.

Client Sample ID: AD-FP-01D **Lab Sample ID:** 551400515-0252
Sample Description: Above suspended ceiling/Fire proofing White colour, fibrous

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Brown/Gray	65%	35%	None Detected	Labeled as AN-FP-01D on sample bag.

Client Sample ID: AD-FP-01E **Lab Sample ID:** 551400515-0253
Sample Description: Above suspended ceiling/Fire proofing White colour, fibrous

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray	65%	35%	None Detected	Labeled as AN-FP-01E on sample bag.



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Client Sample ID: AD-FP-01F **Lab Sample ID:** 551400515-0254
Sample Description: Above suspended ceiling/Fire proofing White colour, fibrous

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray	65%	35%	None Detected	Labeled as AN-FP-01F on sample bag.

Client Sample ID: AD-FP-01G **Lab Sample ID:** 551400515-0255
Sample Description: Above suspended ceiling/Fire proofing White colour, fibrous

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray	65%	35%	None Detected	Labeled as AN-FP-01G on sample bag.

Client Sample ID: AD-FPP-01A **Lab Sample ID:** 551400515-0256
Sample Description: Above suspended ceiling/Fire proofing Grey colour, fibrous

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray/White	40%	60%	None Detected	VERMICULITE PRESENT.

Client Sample ID: AD-FPP-01B **Lab Sample ID:** 551400515-0257
Sample Description: Above suspended ceiling/Fire proofing Grey colour, fibrous

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray/White	40%	60%	None Detected	VERMICULITE PRESENT.

Client Sample ID: AD-FPP-01C **Lab Sample ID:** 551400515-0258
Sample Description: Above suspended ceiling/Fire proofing Grey colour, fibrous

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray/White	40%	60%	None Detected	VERMICULITE PRESENT.

Analyst(s)

Alice Feng	PLM	(5)
Kevin Pang	PLM	(4)
Lama Mohammad	PLM	(2)
Lisa Podzyhun	PLM	(45)

Kevin Pang
or other Approved Signatory

Any questions please contact Kevin Pang.

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Received: 1/29/2014
Analyzed: 3/11/2014

Proj: 115614042

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: HB-DJC-01A

Lab Sample ID: 551400515-0259

Sample Description: Wall/Drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Tan	0%	97%	3% Chrysotile	

Client Sample ID: HB-DJC-01B

Lab Sample ID: 551400515-0260

Sample Description: Wall/Drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: HB-DJC-01C

Lab Sample ID: 551400515-0261

Sample Description: Wall/Drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: HB-DJC-01D

Lab Sample ID: 551400515-0262

Sample Description: Wall/Drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: HB-DJC-01E

Lab Sample ID: 551400515-0263

Sample Description: Wall/Drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: HB-DJC-01F

Lab Sample ID: 551400515-0264

Sample Description: Wall/Drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	White	0%	100%	None Detected	

Client Sample ID: HB-DJC-01G

Lab Sample ID: 551400515-0265

Sample Description: Wall/Drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray	0%	97%	3% Chrysotile	



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Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: HB-PC-01A **Lab Sample ID:** 551400515-0266
Sample Description: Room H19/Parging cement applied to pipe fittings Light grey colour, chalk-like

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Brown/Various	5%	95%	None Detected	

Client Sample ID: HB-PC-01B **Lab Sample ID:** 551400515-0267
Sample Description: Room H19/Parging cement applied to pipe fittings Light grey colour, chalk-like

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Brown/Various	5%	95%	None Detected	

Client Sample ID: HB-PC-01C **Lab Sample ID:** 551400515-0268
Sample Description: Room H19/Parging cement applied to pipe fittings Light grey colour, chalk-like

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Brown	5%	95%	None Detected	

Client Sample ID: HB-PC-01D **Lab Sample ID:** 551400515-0269
Sample Description: Mechanical room/Parging cement applied to pipe fittings Light grey colour, chalk-like

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Brown/Various	5%	95%	None Detected	

Client Sample ID: HB-PC-01E **Lab Sample ID:** 551400515-0270
Sample Description: Mechanical room/Parging cement applied to pipe fittings Light grey colour, chalk-like

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Tan	8%	92%	None Detected	

Client Sample ID: HB-PC-01F **Lab Sample ID:** 551400515-0271
Sample Description: Mechanical room/Parging cement applied to pipe fittings Light grey colour, chalk-like

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/Tan	10%	90%	None Detected	

Client Sample ID: HB-TI-01A **Lab Sample ID:** 551400515-0272
Sample Description: Autoclaving tank/Tank insulation Grey colour, fibrous

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray	0%	100%	None Detected	

Client Sample ID: HB-TI-01B **Lab Sample ID:** 551400515-0273
Sample Description: Autoclaving tank/Tank insulation Grey colour, fibrous

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray	0%	100%	None Detected	



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Client Sample ID: HB-TI-01C **Lab Sample ID:** 551400515-0274
Sample Description: Autoclaving tank/Tank insulation Grey colour, fibrous

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/Tan	8%	92%	None Detected	

Client Sample ID: HB-FT-01 **Lab Sample ID:** 551400515-0275
Sample Description: Room H09/Floor tile (9"x9" size) Green colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/Green	0%	96%	4% Chrysotile	

Client Sample ID: HB-FT-01 MASTIC **Lab Sample ID:** 551400515-0275A
Sample Description: Room H09

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/11/2014	Black	0%	100%	None Detected	

Client Sample ID: HB-FT-01B **Lab Sample ID:** 551400515-0276
Sample Description: Workshop/Floor tile (9"x9" size) Green colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/Green	0%	96%	4% Chrysotile	

Client Sample ID: HB-FT-01B MASTIC **Lab Sample ID:** 551400515-0276A
Sample Description: Workshop

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/11/2014	Black	0%	100%	None Detected	

Client Sample ID: HB-SF-01A **Lab Sample ID:** 551400515-0277
Sample Description: H16/Sheet flooring Brown colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Brown/Tan	40%	60%	None Detected	

Client Sample ID: HB-SF-01A MASTIC **Lab Sample ID:** 551400515-0277A
Sample Description: H16

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/11/2014	Brown	0%	100%	None Detected	

Client Sample ID: HB-SF-01B **Lab Sample ID:** 551400515-0278
Sample Description: H17/Sheet flooring Brown colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Brown/Tan	35%	65%	None Detected	



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Client Sample ID: HB-SF-01B MASTIC **Lab Sample ID:** 551400515-0278A
Sample Description: H17

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/11/2014	Brown/Black	0%	100%	None Detected	

Client Sample ID: HB-AS-01A **Lab Sample ID:** 551400515-0279
Sample Description: Building exterior/Liner between cement panels and trim White colour, rigid

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/Various	0%	100%	None Detected	

Client Sample ID: HB-AS-01B **Lab Sample ID:** 551400515-0280
Sample Description: Building exterior/Liner between cement panels and trim White colour, rigid

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray	0%	100%	None Detected	

Client Sample ID: HB-AS-01C **Lab Sample ID:** 551400515-0281
Sample Description: Building exterior/Liner between cement panels and trim White colour, rigid

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray	0%	100%	None Detected	

Client Sample ID: HB-CAU-01A **Lab Sample ID:** 551400515-0282
Sample Description: Building exterior/Exterior caulking around windows/cement panels

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/Various	0%	100%	None Detected	

Client Sample ID: HB-CAU-01B **Lab Sample ID:** 551400515-0283
Sample Description: Building exterior/Exterior caulking around windows/cement panels

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/Various	0%	100%	None Detected	

Client Sample ID: HB-CAU-01C **Lab Sample ID:** 551400515-0284
Sample Description: Building exterior/Exterior caulking around windows/cement panels

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray	0%	100%	None Detected	

Client Sample ID: HB-TP-01A **Lab Sample ID:** 551400515-0285
Sample Description: Building exterior/Cement (Transite) panels

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014	Gray/White	0%	85%	15% Chrysotile	



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Client Sample ID: HB-TP-01B **Lab Sample ID:** 551400515-0286
Sample Description: Building exterior/Cement (Transite) panels

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014					Stop Positive (Not Analyzed)

Client Sample ID: HB-TP-01C **Lab Sample ID:** 551400515-0287
Sample Description: Building exterior/Cement (Transite) panels

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/03/2014					Stop Positive (Not Analyzed)

Analyst(s)

Alice Feng	PLM	(17)
Kevin Pang	PLM	(14)

Kevin Pang
or other Approved Signatory

Any questions please contact Kevin Pang.

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Proj: 115614042

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: AN-DJC-01A **Lab Sample ID:** 551400515-0288
Sample Description: Wall/Drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	White	0%	100%	<1% Chrysotile	

Client Sample ID: AN-DJC-01B **Lab Sample ID:** 551400515-0289
Sample Description: Wall/Drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	White	0%	98%	2% Chrysotile	

Client Sample ID: AN-DJC-01C **Lab Sample ID:** 551400515-0290
Sample Description: Wall/Drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	White	0%	97%	3% Chrysotile	

Client Sample ID: AN-DJC-01D **Lab Sample ID:** 551400515-0291
Sample Description: Wall/Drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	White	2%	98%	None Detected	

Client Sample ID: AN-DJC-01E **Lab Sample ID:** 551400515-0292
Sample Description: Wall/Drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	White	0%	100%	None Detected	

Client Sample ID: AN-DJC-01F **Lab Sample ID:** 551400515-0292A
Sample Description: Wall/Drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	White	0%	100%	None Detected	Sample not on COC

Client Sample ID: AN-DJC-01G **Lab Sample ID:** 551400515-0292B
Sample Description: Wall/Drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	White	1%	99%	None Detected	Sample not on COC



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EMSL Canada Order 551400515
Customer ID: 55JACQ30L
Customer PO: 115614042
Project ID:

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: AN-FT-01A **Lab Sample ID:** 551400515-0293
Sample Description: Flooring/Floor tile (12"x12") Beige with brown streaks

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Tan	0%	97%	3% Chrysotile	

Client Sample ID: AN-FT-01A MASTIC **Lab Sample ID:** 551400515-0293A
Sample Description: Flooring

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/11/2014	Black	0%	100%	None Detected	

Client Sample ID: AN-FT-01B **Lab Sample ID:** 551400515-0294
Sample Description: Flooring/Floor tile (12"x12") Beige with brown streaks

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Tan	0%	97%	3% Chrysotile	

Client Sample ID: AN-FT-01B MASTIC **Lab Sample ID:** 551400515-0294A
Sample Description: Flooring

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/11/2014	Black	0%	100%	None Detected	

Client Sample ID: AN-EP-01A **Lab Sample ID:** 551400515-0295
Sample Description: Building exterior/Exterior stucco Grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray/Various	0%	100%	None Detected	

Client Sample ID: AN-EP-01B **Lab Sample ID:** 551400515-0296
Sample Description: Building exterior/Exterior stucco Grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray/Various	0%	100%	None Detected	

Client Sample ID: AN-EP-01C **Lab Sample ID:** 551400515-0297
Sample Description: Building exterior/Exterior stucco Grey colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray/White/Various	0%	100%	None Detected	

Client Sample ID: AN-CT-01A **Lab Sample ID:** 551400515-0298
Sample Description: Ceiling/Ceiling tile (1'x1' size) Randon fissures and pinholes - grey core

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Tan/White	80%	20%	None Detected	



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Customer ID: 55JACQ30L
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Project ID:

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: AN-CT-01B **Lab Sample ID:** 551400515-0299
Sample Description: Ceilling/Ceiling tile (1'x1' size) Randon fissures and pinholes - grey core

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Tan/White	80%	20%	None Detected	

Client Sample ID: AN-CT-01C **Lab Sample ID:** 551400515-0300
Sample Description: Ceilling/Ceiling tile (1'x1' size) Randon fissures and pinholes - grey core

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Brown/Gray/White	80%	20%	None Detected	

Client Sample ID: AN-CT-02A **Lab Sample ID:** 551400515-0301
Sample Description: Ceilling/Ceiling tile (1'x1' size) Randon large fisures and pinholes - light brown core

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Brown/White	85%	15%	None Detected	

Client Sample ID: AN-CT-02B **Lab Sample ID:** 551400515-0302
Sample Description: Ceilling/Ceiling tile (1'x1' size) Randon large fisures and pinholes - light brown core

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Brown/White	85%	15%	None Detected	

Client Sample ID: AN-CT-02C **Lab Sample ID:** 551400515-0303
Sample Description: Ceilling/Ceiling tile (1'x1' size) Randon large fisures and pinholes - light brown core

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Brown/White	85%	15%	None Detected	

Client Sample ID: AN-CT-03A **Lab Sample ID:** 551400515-0304
Sample Description: Ceilling/Ceiling tile (1'x1' size) Random flecks and pinholes - grey core

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray/White	80%	20%	None Detected	

Client Sample ID: AN-CT-03B **Lab Sample ID:** 551400515-0305
Sample Description: Ceilling/Ceiling tile (1'x1' size) Random flecks and pinholes - grey core

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray/White	80%	20%	None Detected	

Client Sample ID: AN-CT-03C **Lab Sample ID:** 551400515-0306
Sample Description: Ceilling/Ceiling tile (1'x1' size) Random flecks and pinholes - grey core

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray/White	80%	20%	None Detected	



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EMSL Canada Order 551400515
Customer ID: 55JACQ30L
Customer PO: 115614042
Project ID:

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: AN-CT-04A **Lab Sample ID:** 551400515-0307

Sample Description: Ceiliing/Ceiling tile (1'x1' size) Random small fissures and pinholes - light brown core

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Brown/White	85%	15%	None Detected	

Client Sample ID: AN-CT-04B **Lab Sample ID:** 551400515-0308

Sample Description: Ceiliing/Ceiling tile (1'x1' size) Random small fissures and pinholes - light brown core

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Brown/White	85%	15%	None Detected	

Client Sample ID: AN-CT-04C **Lab Sample ID:** 551400515-0309

Sample Description: Ceiling/Ceiling tile (1'x1' size) Random small fissures and pinholes - light brown core

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Brown/White	85%	15%	None Detected	

Analyst(s)

Alice Feng	PLM	(16)
Kevin Pang	PLM	(2)
Lama Mohammad	PLM	(8)

Kevin Pang
or other Approved Signatory

Any questions please contact Kevin Pang.

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Initial report from: 02/04/2014 22:55:44



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EMSL Canada Order 551400515
Customer ID: 55JACQ30L
Customer PO: 115614042
Project ID:

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Collected:
Received: 1/29/2014
Analyzed: 2/04/2014
Proj: 115614042

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: S-DJC-01A **Lab Sample ID:** 551400515-0310
Sample Description: Wall/Drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	White	0%	100%	None Detected	

Client Sample ID: S-DJC-01B **Lab Sample ID:** 551400515-0311
Sample Description: Wall/Drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	White	0%	100%	None Detected	

Client Sample ID: S-DJC-01C **Lab Sample ID:** 551400515-0312
Sample Description: Wall/Drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	White	0%	100%	None Detected	

Client Sample ID: S-DJC-01D **Lab Sample ID:** 551400515-0313
Sample Description: Wall/Drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	White	0%	100%	None Detected	

Client Sample ID: S-DJC-01E **Lab Sample ID:** 551400515-0314
Sample Description: Wall/Drywall joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	White	0%	100%	None Detected	

Analyst(s)
Alice Feng PLM (2)
Kevin Pang PLM (3)

Kevin Pang
or other Approved Signatory

Any questions please contact Kevin Pang.

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Initial report from: 02/04/2014 22:56:54



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Customer PO: 115614042
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Collected:
Received: 1/29/2014
Analyzed: 2/04/2014

Proj: 115614042

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: GH-CAU-01A **Lab Sample ID:** 551400515-0315
Sample Description: On pipe covering (tin covering)/Caulking/sealant Silver colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray/Silver	0%	100%	None Detected	

Client Sample ID: GH-CAU-01B **Lab Sample ID:** 551400515-0316
Sample Description: On pipe covering (tin covering)/Caulking/sealant Silver colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray/Silver	0%	100%	None Detected	

Client Sample ID: GH-CAU-01C **Lab Sample ID:** 551400515-0317
Sample Description: On pipe covering (tin covering)/Caulking/sealant Silver colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	Gray/Silver	0%	100%	None Detected	

Client Sample ID: GH-CAU-02A **Lab Sample ID:** 551400515-0318
Sample Description: On wall basement/mechanical ducting/Caulking/sealant White colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	White	0%	100%	None Detected	

Client Sample ID: GH-CAU-02B **Lab Sample ID:** 551400515-0319
Sample Description: On wall basement/mechanical ducting/Caulking/sealant White colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	White	0%	100%	None Detected	

Client Sample ID: GH-CAU-02C **Lab Sample ID:** 551400515-0320
Sample Description: On wall basement/mechanical ducting/Caulking/sealant White colour

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/04/2014	White	0%	100%	None Detected	



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Customer ID: 55JACQ30L
Customer PO: 115614042
Project ID:

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Analyst(s)

Alice Feng	PLM	(2)
Kevin Pang	PLM	(4)

Kevin Pang
or other Approved Signatory

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Appendix E
Certificate of Analysis – Suspected LCP Samples

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Phone: (604) 696-8272
 Fax:
 Received: 01/29/14 11:37 AM
 Collected:

Project: 115614042

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B*/7000B)

<i>Client Sample Description</i>	<i>Lab ID</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Lead Concentration</i>
MB-P-01 Site: ROOFTOP Desc: GREY COLOUR	0001		1/31/2014	1700 ppm
MB-P-02 Site: ROOFTOP Desc: WHITE COLOUR	0002		1/31/2014	18000 ppm
MB-P-03 Site: PENTHOUSE Desc: CREAM COLOUR	0003		1/31/2014	990 ppm
MB-P-04 Site: PENTHOUSE Desc: SILVER COLOUR	0004		1/31/2014	960 ppm
MB-P-05 Site: PENTHOUSE Desc: RED COLOUR	0005		1/31/2014	7600 ppm
MB-P-06 Site: PENTHOUSE Desc: CREAM COLOUR	0006		1/31/2014	940 ppm
MB-P-07 Site: FLOOR Desc: GREY/BLUE COLOUR	0007		1/31/2014	630 ppm
MB-P-08 Site: WALLS/CEILING Desc: CREAM COLOUR	0008		1/31/2014	560 ppm
MB-P-09 Site: WALLS Desc: WHITE COLOUR	0009		1/31/2014	1600 ppm
MB-P-10 Site: DOORS/DOOR FRAMES Desc: RED COLOUR (YELLOW COLOUR BENEATH)	0010		1/31/2014	2800 ppm
MB-P-11 Site: BUILDING EXTERIOR Desc: GREY COLOUR	0011		1/31/2014	2800 ppm

Kevin Pang
 or other approved signatory

Reporting limit is 0.010 % wt based on the minimum sample weight per our SOP. The QC data associated with these results included in this report meet the method QC requirements, unless specifically indicated otherwise. Unless noted, results in this report are not blank corrected. EMSL bears no responsibility for sample collection activities. Samples received in good condition unless otherwise noted. * slight modifications to methods applied. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request.
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Initial report from 02/04/2014 17:48:50



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CustomerID: 55JACQ30L
CustomerPO: 115614042
ProjectID:

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Phone: (604) 696-8272
Fax:
Received: 01/29/14 11:37 AM
Collected:

Project: 115614042

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B*/7000B)

<i>Client Sample Description</i>	<i>Lab ID</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Lead Concentration</i>
----------------------------------	---------------	------------------	-----------------	---------------------------

Kevin Pang
or other approved signatory

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Initial report from 02/04/2014 17:48:50

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Phone: (604) 696-8272
 Fax:
 Received: 01/29/14 11:37 AM
 Collected:

Project: 115614042

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B*/7000B)

<i>Client Sample Description</i>	<i>Lab ID</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Lead Concentration</i>
AD-P-01 Site: WALLS Desc: BEIGE COLOUR	0012		1/31/2014	<90 ppm
AD-P-02 Site: WALLS Desc: WHITE COLOUR	0013		1/31/2014	<90 ppm
AD-P-03 Site: DOOR TRIM Desc: OFF-WHITE COLOUR	0014		1/31/2014	2000 ppm
AD-P-04 Site: DOOR TRIM Desc: GREEN COLOUR	0015		1/31/2014	1800 ppm
AD-P-05 Site: DOOR TRIM Desc: YELLOW COLOUR	0016		1/31/2014	1100 ppm
AD-P-06 Site: WALLS Desc: BEIGE COLOUR	0017		1/31/2014	<90 ppm
AD-P-07 Site: WALLS Desc: GREY COLOUR	0018		1/31/2014	<90 ppm
AD-P-08 Site: DOOR TRIM Desc: GREY COLOUR	0019		1/31/2014	2400 ppm
AD-P-09 Site: VERTICAL DUCTS Desc: BEIGE COLOUR	0020		1/31/2014	460 ppm
AD-P-10 Site: VERTICAL DUCTS Desc: GREY COLOUR INSUFFICIENT SAMPLE TO REACH REPORTING LIMIT.	0021		1/31/2014	<470 ppm
AD-P-11 Site: PENTHOUSE Desc: WHITE COLOUR	0022		1/31/2014	210 ppm

Kevin Pang
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Initial report from 02/04/2014 17:52:05



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CustomerID: 55JACQ30L
CustomerPO: 115614042
ProjectID:


Attn: **Zack Kranjec**
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Phone: (604) 696-8272
Fax:
Received: 01/29/14 11:37 AM
Collected:

Project: 115614042

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B*/7000B)

<i>Client Sample Description</i>	<i>Lab ID</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Lead Concentration</i>
AD-P-12 Site: EXTERIOR STAIRS-ROOFTOP Desc: WHITE COLOUR	0023		1/31/2014	<90 ppm
AD-P-13 Site: EXTERIOR SIDING Desc: GREY COLOUR	0024		1/31/2014	1200 ppm
AD-P-14 Site: EXTERIOR STRUCTURAL STEEL Desc: GREY COLOUR	0025		1/31/2014	520 ppm


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Initial report from 02/04/2014 17:52:05

**EMSL Canada Inc.**

10 Falconer Drive, Unit #3, Mississauga, ON L5N 3L8
 Phone/Fax: 289-997-4602 / (289) 997-4607
<http://www.EMSL.com> torontolab@emsl.com

EMSL Canada Or 551400528
 CustomerID: 55JACQ30L
 CustomerPO: 115614042
 ProjectID:

Attn: **Zack Kranjec**
Stantec Consulting, Ltd.
1100- 111 Dunsmuir Street
Vancouver, BC V6B 6A3

Phone: (604) 696-8272
 Fax:
 Received: 01/29/14 11:37 AM
 Collected:

Project: 115614042

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B*/7000B)

<i>Client Sample Description</i>	<i>Lab ID</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Lead Concentration</i>
HB-P-01 Site: WALLS Desc: BEIGE COLOUR	0026		1/31/2014	1800 ppm
HB-P-02 Site: FLOOR Desc: LIGHT GREY COLOUR	0027		1/31/2014	<90 ppm
HB-P-03 Site: POSTS/DOORS Desc: LIGHT GREEN COLOUR	0028		1/31/2014	3800 ppm
HB-P-04 Site: DOORS Desc: DARK GREEN COLOUR	0029		1/31/2014	27000 ppm

Kevin Pang
 or other approved signatory

Reporting limit is 0.010 % wt based on the minimum sample weight per our SOP. The QC data associated with these results included in this report meet the method QC requirements, unless specifically indicated otherwise. Unless noted, results in this report are not blank corrected. EMSL bears no responsibility for sample collection activities. Samples received in good condition unless otherwise noted. * slight modifications to methods applied. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request.
 Samples analyzed by EMSL Canada Inc. Mississauga, ON A2LA Accredited Environmental Testing Cert #2845.08

Initial report from 02/04/2014 17:55:04



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Project: 115614042

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B*/7000B)

<i>Client Sample Description</i>	<i>Lab ID</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Lead Concentration</i>
AN-P-01 Site: WALLS Desc: BEIGE COLOUR	0030		1/31/2014	<90 ppm
AN-P-02 Site: DOORS/FRAMES Desc: YELLOW COLOUR INSUFFICIENT SAMPLE TO REACH REPORTING LIMIT.	0031		1/31/2014	<130 ppm
AN-P-03 Site: BUILDING EXTERIOR TRIM Desc: GREY COLOUR	0032		1/31/2014	1200 ppm
AN-P-04 Site: BUILDING EXTERIOR SIDING Desc: WHITE COLOUR	0033		1/31/2014	2300 ppm


Kevin Pang
or other approved signatory

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Samples analyzed by EMSL Canada Inc. Mississauga, ON A2LA Accredited Environmental Testing Cert #2845.08

Initial report from 02/04/2014 18:03:29



EMSL Canada Inc.

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Phone: (604) 696-8272
Fax:
Received: 01/29/14 11:37 AM
Collected:

Project: 115614042

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B*/7000B)

<i>Client Sample Description</i>	<i>Lab ID</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Lead Concentration</i>
S-P-01 Site: BUILDING EXTERIOR SIDING Desc: BROWN COLOUR	0034		1/31/2014	130 ppm
S-P-02 Site: MECHANICAL DUCTING Desc: BEIGE COLOUR	0035		1/31/2014	2400 ppm
S-P-03 Site: WALLS Desc: WHITE COLOUR	0036		1/31/2014	680 ppm

Kevin Pang
or other approved signatory

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Samples analyzed by EMSL Canada Inc. Mississauga, ON A2LA Accredited Environmental Testing Cert #2845.08

Initial report from 02/04/2014 18:03:29



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Collected:

Project: 115614042

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B*/7000B)

<i>Client Sample Description</i>	<i>Lab ID</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Lead Concentration</i>
SH-P-01	0037		1/31/2014	6700 ppm
Site: BUILDING EXTERIOR/INTERIOR SIDING Desc: WHITE COLOUR				

Kevin Pang
or other approved signatory

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Samples analyzed by EMSL Canada Inc. Mississauga, ON A2LA Accredited Environmental Testing Cert #2845.08

Initial report from 02/04/2014 18:06:13

Appendix F
ODS-Containing Equipment List

NRCan's Ozone Depleting Substance Inventory (CFC/HCFC, Halon)

Last Updated: Feb. 26 2009

replaced or out of service

Location Type	Room # /Area	Model	Equipment Type	Manufacturer	Year Installed	Refrigerant Type	Refrigerant Quantity (kg)	Charging Capacity	Serial Number	asset #	Comments
Room	14	401200Q	Freezer	KENMORE		R-12	245 Grams		723652FO		
Room	17	WL-48-W		FOSTER		R-12	24 OZ		65535 /		
Room	17	WL-48-F		FOSTER		R-12	20 OZ		65536 /		
Room	17	WL-38-C		FOSTER		R-12	14 OZ		65535 /		
Room	18	406837	Freezer	CELCOLD		R-134A	210 Grams		95164116		
Room	18	N/A	Cooler	TRUE		?	?		N/A		
Room	18	QFDRT		QUEST		R-12	18 OZ		139 /		
Room	40	G 30	GC8	CONVIRON		R-12	18 OZ		8B6048U		
Room	40	G 30	GC9	CONVIRON		R-12	18 OZ		9B0055U		
Room	40	G 30	GC16	CONVIRON		R-401A	13 OZ		7F7097U		
Room	40	G 30	GC15	CONVIRON		R-12	18 OZ		7F6178U		
Room	40	FV001		COPELAND		R-22	80 OZ		11D97		
Room	40	SL27-17	GC17	HOFFMAN		R-12	18OZ		C1322361		
Room	40	ST-181	GC22	HOFFMAN		401-A	18 OZ		2001010441		
Room	40	SL27-17	GC18	HOFFMAN		R-12	18 OZ		C1322239		
Room	40	82210-20		KENMORE		R-12	280 Grams		625430LP		
Room	40	82210-20		KENMORE		R-12	305 Grams		393559-MN		
Room	40	QEA060		KENMORE		R-12	10 OZ		625451LP		
Room	40	255-21741100	Freezer	KENMORE		R-134A	7.3 OZ		WB12002205		
Room	40	QF0406A		MANITOWAC		R-404A	16 OZ		20464447		
Room	40		GC (Red)	HOTPACK					73929		
Room	40	815		PRECISION		R-12	9 OZ		29AS/3		

Location Type	Room #/Area	Model	Equipment Type	Manufacturer	Year Installed	Refrigerant Type	Refrigerant Quantity (kg)	Charging Capacity	Serial Number	asset #	Comments
Room	40	ULT-1386-9-D35	ULT5	REVCO		BLENDED	32 OZ		P08M572231-PM		
Room	40	ULT-1386-9-D36	ULT3	REVCO		BLENDED	32 OZ		019N622234-ON		
Room	40	ULT-1386D-O-B	ULT1	REVCO		BLENDED	32 OZ		V V 3706		
Room	40	ULT-1386-9-D34	ULT4	REVCO		BLENDED	32 OZ		P05L519986-PL		
Room	40	ULT-13867-D12	ULT2	REVCO		BLENDED	32 OZ		P02D-158965-PD		
Room	41	6D21-929	Cold Room 5	Carrier	1963	CFC-12	22.00	2.00	4527074	Updated	
Room	41	CF06K9E-TF5-253	Cold Room 4	Copeland	2002	R401A	5.00	3	04J64285H	Updated	
Room	41	3RK1-310-TAC	Cold Room 6	Copeland	1963	R401A	7.00	3	79D375100	Updated	
Room	43	PGV-36	GC1	Convion	1990	HCFC-22	12.00	10	9J0273	Updated	
Room	43	E8VH	GC11	Convion	1970	R401A	5.00	3.00	781045F	Updated	
Room	43	E8VH	GC12	Convion	1970	R401A	10.00	10.00	781044F	Updated	
Room	43	E8VH	GC13	Convion	1970	R401A	10.00	10.00	713179U	Updated	
Room	43	E8VH	GC14	Convion	1970	R401A	10.00	10.00	783891U	Updated	
Room	43	PGV-36	GC2	Convion	1991	R404A	5.00	5.50	9J0292	Updated	
Room	43	PGV-36	GC3	Convion	1989	HCFC-22	12.00	10	8C9085	Updated	
Room	43	PGV-36	GC4	Convion	1990	HCFC-22	10.00	10.00	8C9084	Updated	
Room	43	PGV-36	GC5	Convion	1990	HCFC-22	7.00	7.30	8K9509	Updated	
Room	43	PGV-36	GC6	Convion	1990	HCFC-22		10.00	8B9035	Updated	
Room	43	PGV-36	GC7	Convion	1990	HCFC-22		10.00	8C0066	Updated	
Room	47	EWVA-021ETAC	Cold Room 1	Copeland	1995	R404A	15.00	3	CCH9513353	Updated	
Room	47	EWVA-021ETAC	Cold Room 2	Copeland	1996	R404A	15.00	3	CCI9413992	Updated	
Room	47	CS14K9E	Cold Room 3	Copeland	2005	R404A	5.00	2.00	04C16897H	Updated	
Room	51	CRA-105-OPFV270	Cold Room 7	Copeland	2006	R-404A	?		92F33892	Updated	
Room	64	CRTW-4800-TL		CONCEPT		R-134A	3.5 OZ		2R322120Y		
Room	65	31213		PRECISION		R-12	8 OZ		28AK-3		
Room	67	WL183NRW7		WESTING H		R-12	6.5 OZ		860406129		
Room	69	F3WD-0151TFC		COPELAND		R-22	128 OZ		26C85		
Room	69	F3WD-0201TFC		COPELAND		R-22	96 OZ		04J91		

Location Type	Room #/Area	Model	Equipment Type	Manufacturer	Year Installed	Refrigerant Type	Refrigerant Quantity (kg)	Charging Capacity	Serial Number	asset #	Comments
Room	72	C106-7391080		KENMORE		R-12	8.0 OZ		LE-10275		
Room	73	125L	GC	CONVIRON		R-12	24 OZ		9L0221		
Room	73	123L	GC	CONVIRON		R-12	24 OZ		8B8034U		
Room	73	123L	GC	CONVIRON		R-12	24 OZ		8F1876U		
Room	73	118L	GC	CONVIRON		R-12	24 OZ		7J0284F		
Room	73	AB00146	Fridge	VIKING		R-12	8 OZ		FR-1FV1314-W		
Room	74	31213-35	GC	PRECISION		R-12	8 OZ		35AY-3		
Room	104	DCR41WE	Bar Fridge	DANBY		R-22	3.4 OZ		C9800412		
Room	129	YRF1712W-M1	Fridge	McCLARY		R-12	4.25 OZ		KG16b599		
Room	146	970-22204140		KENMORE		R-134A	8.0 OZ		WB-3401-21933		
Room	148	D1705AR	Fridge	DANBY		R-12	8.0 OZ		01329450DT		
Room	150	N/A		LAB LINE		R-12	10 OZ		N/A		
Room	154	TLJ30		WESTING H		R-12	6.0 OZ		745D180A12		
Room	165	L8M-70	Centrifuge	BECKMAN		R-12	15 OZ		7C421		
Room	171	LT755925		INGLIS		R-12	8.0 OZ		KM1053		
Room	173	ET-73000R		INGLIS		R-12	8.0 OZ		369100		
Room	173	K-500		KELVINATOR		R-12	6.0 OZ		ZA-09501		
Room	176	R080	Bar Fridge	WOODS		R-22	6.0 OZ		NA00A0		
Room	181	N/A		ADMIRAL		R-12	8.5 OZ		N/A		
Room	187	K500R		KELVINATOR		R-12	8.5 OZ		2A-08283		
Room	207	815		PRECISION		R-12	16 OZ		29AU-11		
Room	207	N/A		VIKING		R-12	8.0 OZ		N/A		
Room	207	P146N1R05		WESTING H		R-12	8.0 OZ		870404677		
Room	221	DCR412W	Bar Fridge	DANBY		R134A	1.58 OZ		1.0306E+11		
Room	225	51832-0L	Bar Fridge	BIG ROCK		R-12	8.0 OZ		800016-LI		Alec McBeath
Room	230	307		FISHER		R-134A	7.0 OZ		3288		
Room	230	FFU2059FW0		FISHER		R-134A	9 OZ		WB70610520		
Room	230	0646-60860800		KENMORE		R-12	10 OZ		6DB03379		

Location Type	Room #/Area	Model	Equipment Type	Manufacturer	Year Installed	Refrigerant Type	Refrigerant Quantity (kg)	Charging Capacity	Serial Number	asset #	Comments
Room	234	DMR1706WE		DANBY		R-12	8.0 OZ		03779293KA		
Room	234	F10102000		EDWARDS		R-502	16 OZ		5222		
Room	234	75003641-01	Centrifuge	HERAEUS		R-12	10 OZ		232641		
Room	234	N/A		KENMORE		R-12	10 OZ		N/A		
Room	234	N/A		LAB LINE		R-12	24 OZ		N/A		
Room	234	FV01512		VIKING		R-12	4.0 OZ		805901LQ		
Room	234	VCR449A20	2 Glass Doors	VWR		R-134A	20 OZ		N25M1566568-01		
Room	234	103NBR		W.S.		R-12	8.0 OZ		84728		
Room	234	YET20GKXBW00		WHIRLPOOL		R-12	8.0 OZ		ED1733684		
Room	242	YET18SKXBW00		WHIRLPOOL		R-12	10 OZ		EC4132679		
Room	244	3551		LAB LINE		R-12	7.0 OZ		N/A		Explosion Safe
Room	244	ET14MNXSW00		VWR		R-12	8.0 OZ		ST3225683		
Room	248	970-602120		KENMORE		R-134A	4.5 OZ		BA94807254		
Room	248	N/A		VWR		R-12	2.6 OZ		N/A		
Room	265	DC12-032W		DIPLOMAT		R-12	4.0 OZ		4AFTA-00249		
Room	268	N/A		KENMORE		R-12	8.0 OZ		N/A		
Room	268	N/A		PRECISION		R-12	14 OZ		N/A		
Room	268	R411FA16		VWR		R134A	5.5 OZ		N/A		
Room	272	VLITSMGL05911		GE		R-12	8.0 OZ		BY5-99497		
Room	274			KENMORE		R-134A	4.25 OZ				
Room	274			KENMORE		R-134A	4.25 OZ				
Room	281	N/A		FOSTER		R-12	32 OZ		p06S-618375-PS		Explosion Safe
Room	281	N/A		FRIGIDAIR		R-12	8.0 OZ		N/A		
Room	281	46042 /		GE		R-12	16 OZ		1086 /		

Location Type	Room # /Area	Model	Equipment Type	Manufacturer	Year Installed	Refrigerant Type	Refrigerant Quantity (kg)	Charging Capacity	Serial Number	asset #	Comments
Room	281	46042		GE		R-12	16 OZ		1273		
Room	281	N/A		J S		R-12	16 OZ		N/A		
Room	281	815		PRECISION		R-12	14 OZ		29-AS-2		
Room	281	815		PRECISION		R-12	14 OZ		29-AS-6		
Room	281	815		PRECISION		R-12	14 OZ		29-AS-61		
Room	281	815 /		PRECISION		R-12	10 OZ		29-AS-63		
Room	281	815 /		PRECISION		R-12	10 OZ		29-AS-34		
Room	286	DCR-1216E4		DANBY		R-12	4.0 OZ		11970300		
Room	288	31213 /		PRECISION		R-12	14 OZ		2/14/2012		
Room	303	RM0511	Fridge	VIKING		R-12	3.8 OZ		04291902AX		
Room	304	ML-13-B-B-2-T1		McCLARY		R-12	8.0 OZ		L-239918-7		
Room	307	U-35-P		DANBY		R-12	8.5 OZ		720531FQ		
Room	310	N/A		COLDSPOT		R-134A	6.5 OZ		N/A		
Room	310	61912101 /		KENMORE		R-134A	4.5 OZ		EL5124322 /		
Room	310	67563682 /		KENMORE		R-134A	4.5 OZ		06281173 /		
Room	322	LW18JYRRW-1		G E		R-12	4.25 OZ		AM383330V		
Room	328	46190482	Fridge	KENMORE		R-134A	1.41 OZ		1.0512E+11		
Room	329	SVC100L		SAVANT		N/A	N/A		84-116-115		
Room	329	U2020GA-14		REVCO		R-134A	9.0 OZ		Y08K-504045-YK		
Room	330	WJN-84H		FOSTER		R-12	112 OZ		65874 /		
Room	338	N/A		ADMIRAL		R-12	10 OZ		N/A		
Room	347	C675265331M	Fridge	KENMORE		R-134A	3.2 OZ				
Room	349	OOO-6895		HAAK A81		R-12	12 OZ		860338 /		
Room	353	C12NAA	Freezer	WOODS		R-134A	10 OZ		07107141AG		
Room	367	P158N11205	Fridge	KELVINATOR		R-12	10 OZ		870805080		
Room	367	CC-100	Fridge	NES LAB		N/A	N/A		83A-10926-2		
Room	371	46042 /	Fridge	G E		R-12	6.5 OZ		1266 /		
Room	371	46042 /	Fridge	G E		R-12	6.5 OZ		1082 /		

Location Type	Room # /Area	Model	Equipment Type	Manufacturer	Year Installed	Refrigerant Type	Refrigerant Quantity (kg)	Charging Capacity	Serial Number	asset #	Comments
Room	379	2010	Fridge	VWR		R-12	4.0 OZ		2010786		
Room	384	RPJ31L	Fridge	WESTING H		R-22	8.0 OZ		371181		
Room	"B" PENTHOUSE	F3MM-C105TFC020	Walk In 329	COPELAND	1985	R-22			06J07241D	Updated	Once Thru Water
Greenhouse	GH7	FFC07C3AWZ	Propagator Unit 1	ELECTROLU		R-134A	6.5 OZ		WB24140269		
Greenhouse	GH7	FFC07C3AWZ	Propagator Unit 2	ELECTROLU		R-134A	6.5 OZ		WB14633159		
Greenhouse	GH7	FFC07C3AWZ	Propagator Unit 4	ELECTROLU		R-134A	6.5 OZ		WB14633109		
Greenhouse	GH7	FFC07C3AWZ	Propagator Unit 5	ELECTROLU		R-134A	6.5 OZ		WB24140284		
Greenhouse	GH7	FFC07C3AWZ	Propagator Unit 6	ELECTROLU		R-134A	6.5 OZ		WB20541575		
Greenhouse	GH7	FFC07C3AWZ	Propagator Unit 7	ELECTROLU		R-134A	6.5 OZ		WB20541577		
Greenhouse	GH7	FFC07C3AWZ	Propagator Unit 8	ELECTROLU		R-134A	6.5 OZ		WB24524232		
Greenhouse	GH7	FFC07C3AWZ	Propagator Unit 11	ELECTROLU		R-134A	6.5 OZ		WB20633204		
Greenhouse	GH7	FFC07C3AWZ	Propagator Unit 12	ELECTROLU		R-134A	6.5 OZ		WB10714132		
Room	H 09	83 /		FISHER		R-12	14.5 OZ		10AL-0458		
Room	H 09	83 /		FISHER		R-12	14.5 OZ		10AL-0459		
Room	H 09	83 /		FISHER		R-12	14.5 OZ		10AL-0460		
Room	H 09	83 /		FISHER		R-12	14.5 OZ		10AL-0461		
Room	H 09	8359 /		FORMA		BLENDED	48 OZ		D8463 /		
Room	H 09	31213 /		GCA		R-12	10 OZ		21-AC-11		
Room	H 09	31213 /		GCA		R-12	10 OZ		21-AC-14		
Room	H 09	1-35D		PERCIVAL		R-12	13 OZ		88G3360-15		
Room	H 09	N/A		PSYGRO		R-12	45 OZ		N/A		
Room	H 11	RDA-13		WESTINGHOUSE		R-12	10 OZ		36299 /		
Room	H 14	RVG-01M	Fridge	G E		R-12	12 OZ		D65239 /		
Room	H 16	RDA-13	Fridge	WESTINGH		R-12	10 OZ		36884 /		
Room	H10	E-15		CONVIRON		R-22	88 OZ		9C-2073		

NRCan's Ozone Depleting Substance Inventory (CFC/HCFC, Halon)										2014	Jan			
Location Type	Room # /Area	Model	Equipment Type	Manufacturer	Comm/Decomm Date	Refrigerant Type	Number of Cylinders (As used)	Refrigerant Quantity (kg) (As used)	Charging Capacity (kg)	Serial Number	Asset number	Comments		
Room	4	FWCS	Water Cooler	SUNROC		R134A		405g		95334850		SCRAPPED		
Room	4	ECHB 11	Water Cooler	ELKAY	10/4/2012	R134a		41 OZ		90518578				
Room	14	4012000	Freezer	KENMORE		R12		245g		723652FO	A066837	SCRAPPED		
Room	17	WL48W	Fridge	FOSTER		R-12		24 OZ		655937	A066834	SCRAPPED		
Room	17	WL48-F	Fridge	FOSTER		414b		11 oz		65536 /	A066835			
Room	17	WL38-C	Fridge	FOSTER		R-12		14 OZ		65539 /	A066834	SCRAPPED		
Room	17	2RF	FRIDGE/FREEZER	CONTINENTAL	1/31/2012	R134A/401		8.5 / 9.0 OZ		151A9701	105162	1 unit, 2 systems		
Room	18	V540VM	Pop Machine	VENDCO		134A		10.7 oz		S734640	A066838			
Room	18	406937	Freezer	CELCOLD		R134A		210g		95164116	A066838			
Room	18	QFDRT	Freezer	QUEST		R-12		18 OZ		139 /	A066833			
Room	18	GDM 12	Cooler	TRUE		134A		9oz		6644911				
Room	40	GC515R210	FREEZER	KENMORE	2/5/2010	R12		280 Grams		325430LP	A066401	Decommissioned		
Room	40	GC21020	FREEZER	KENMORE	2/5/2010	R-12		305 Grams		393559-MN	A066400	Decommissioned		
Room	40	GEA060	FREEZER	KENMORE		R-12		10 OZ		625451LP	A066393	Scrapped		
Room	40	253217A1100	Freezer	KENMORE		R134A		7.3 OZ		WB12002209	A066394	SCRAPPED		
Room	40	G 30	GC15	CONVIRON		R-12		18 OZ		7F6178U	A066403	SCRAPPED		
Room	40	G 30	GC16	CONVIRON		R-401A		13 OZ		7F7097U	A0066402			
Room	40	B15	GC8	REFRIGISION		R-12		6oz		29AS63	A066788	SCRAPPED		
Room	40	317312	GC9	HOTPACK		R-12				73929	A064099	Scrapped		
Room	40	SL27517	GC17	HOFFMAN	12/17/2009	R-12		18OZ		61922361	A066399	SCRAPPED		
Room	40	SL27-17	GC18	HOFFMAN	3/24/2010	R-12		18 OZ		C1322239	A066405	scrapped		
Room	40	ST-181	GC22	HOFFMAN		401-A		18 OZ		2001010441	A066404			
Room	40	G 30	GC18	CONVIRON		R-12		18 OZ		8B6048U	A064037			
Room	40	G 30	GC17	CONVIRON		R-12		18 OZ		9B0055U	A064038			

Room	40	ULT-1386D-O-B	ULT1	REVO	3/24/2010	BLEND		32 OZ		V.V 3706	A066392	scrapped
Room	40	ULT-1367-D12		REVO		BLEND		32 OZ		P02D-158865-PD	A064100	Scrapped
Room	40	ULT-1386-9-D36	ULT3	REVO		BLEND		32 OZ		019N622234-ON	A064918	Scrapped
Room	40	ULT-1386-9-D34	ULT4	REVO		BLEND		32 OZ		P05L518986-PL	A064122	
Room	40	UXF40086D63	ULT3	REVO	2/17/2014	BLEND		32OZ		13289101140121	A105314	
Room	40	UXF40086D60	ULT2	Thermo /Scient	5/23/2012	Blended		32 oz		123948701120106	A105161	
Room	40	ULT-1366-9-D35	ULT5	REVO		BLEND		32 OZ		P06M572231-PM	A066395	Scrapped
Room	40	ULT-1386-5-D42	ULT	VWR/THERMIO		BLEND		29.65 OZ		129628701110209	A105090	
Room	40	DW 86L628A	ULT1	VWR	12/1/2010	BLEND		790 Grams		BED6Q1E0200B294D0032	A066884	
Room	40	UXF40086D60	ULT	THERMO SC.	1/31/2012	BLEND		31.7 OZ		123948701120106	A105161	
Room	40	F3AHA101CFU001	Chiller	COPELAND		R-22		1lbs 7 oz				
Room	40	QF0406A	Ice maker	MANITOMAC	8/1/2002	R-404A		16 OZ		20464447	A066406	
Room	40	FFHT1826W5	Fridge	Frigidaire	12/7/2011	R134A		4.5 OZ		BA14239056	A105142	
Room	41	A6D24E7A-K	AC	FEDDERS		R22		36OZ		BS521588048F		Window Shaker
Room	41	AC067N1D1	AC	WESTING H		R22		13.5OZ				Window Shaker
Room	41	FJWL_C200TFC020	Cold Room 4	Copeland	2002	R 404a		10 LBS	3	B24A05		
Room	41	6D21-104	Cold Room 5	Carrier	1963	R 414b		7 kg	2.00	40011		
Room	41	WDWM_0300-TFC-001	Cold Room 6	Copeland	1963	R401A		22kg	3	11D79		
Room	43	PGV-36	GC1	Convion	1990	HCFC-22		12.00	10	9J0273	A064007	
Room	43	E8VH	GC11	Convion	1970	R401A		5.00	3.00	7B1045F	A066396	
Room	43	E8VH	GC12	Convion	1970	R401A		10.00	10.00	7B1044F	A066397	
Room	43	E8VH	GC13	Convion	1970	R401A		10.00	10.00	713179U	A066398	
Room	43	E8VH	GC14	Convion	1970	R401A		10.00	10.00	713198U	A066407	
Room	43	PGV-36	GC2	Convion	1991	R404A		25KG	5.50	9J0292	A064008	
Room	43	PGV-36	GC3	Convion	1989	HCFC-22		20KG	10	8C9085	A064004	
Room	43	PGV-36	GC4	Convion	1990	HCFC-22		20KG	10.00	8C9084	A064005	
Room	43	PGV-36	GC5	Convion	1990	HCFC-22		25 KG	7.30	8K9505	A064006	
Room	43	PGV-36	GC6	Convion	1990	HCFC-22		20KG	10.00	5B9035	A064010	
Room	43	PGV-36	GC7	Convion	1990	HCFC-22		20KG	10.00	8C0066	A064009	

Room	43	FFU21M7HMM	FREEZER	FRIGIDAIRE	41114	R134A	6.7OZ			WB20771530	A105222	
Room	47	EWWA-021ETAC	Cold Room 1	Copeland	1995	R404A	22 KG	3		CCH9513353	N/A	
Room	47	KM24L30-A	AC Unit	FRIEDRICH		R-22	53 OZ			LEBR12937		Window Shaker
Room	47	K20DF	AC	KOLDWAVE		R22	26OZ			F108654		
Room	47	WJWL0200TAC001	Cold Room 2	Copeland	1996	R404A	15KG	3		20194	N/A	
Room	47	FPWN-C225TFC020	Cold Room 3	Copeland	2005	R404A	22KG	2.00		B30C04	N/A	
Room	51	CRA-105-OPFV270	Cold Room 7	Copeland	2006	R-404A	3lbs 6oz			92F33892	A066769	
Room	60	INT34090	FRIDGE	INGLIS		R12	7.5OZ			3BD30229		
Room	60	FJWMC125CFV020	FRIDGE/UNIT	COPLAND		R404A	3lbs 4 oz			10A204214		FOSTER WALK IN
Room	60	OCH-024AA1	AC	THERMO P		R-22	81 OZ			W1557769D		Quarantine Room AC
Room	64	CRTW4800JLN	FRIDGE	CONCEPT		R-134A	3.5 OZ			2R32120Y	A066772	SCRAPPED
Room	65	31213	GC 21	PRECISION		R-12	8 OZ			28AK-3	A066773	
Room	67	106.6797802	FRIDGE	KENMORE	3/2/2011	R134A	4OZ			EY4502121	A105089	
Room	67	W183NRW7	FRIDGE	WESTINGH		R-12	6.5 OZ			860406129	A066776	
Room	68	F3WD-0201CFV001	AIR HANDLER 9	COPELAND		R-22	4lbs 8oz					
Room	70	970-420624	FRIDGE	KENMORE	7/24/2012	R134a	4.25 OZ			BA22521624	A105219	
Room	71	KAC-030-H-4B	AC	THERMO P		R-22	40 OZ			B2003050132		
Room	72	106.6797802	FRIDGE	KENMORE	2011-0302	R134A	4OZ			EY4502389	A105085	
Room	72	C106-57391080	FRIDGE	KENMORE		R-12	8.0 OZ			LEE10275	A066783	SCRAPPED
Room	73	KAC-030-H-4B	AC Unit	THERMO P	8/15/2003	R-22	40 OZ			B2003035225		Ceiling
Room	73	AB001746	Fridge	VIKING		R-12	8 OZ			ER11EV131AW	A066097	SCRAPPED
Room	73	125L	GC10	CONVIRON		R12	24 OZ			910221	A064039	Scrapped
Room	73	123L	GC18	CONVIRON		R12	210Z			BB6034U	A065735	Scrapped
Room	73	123L	GC20	CONVIRON		R-12	24 OZ			9F1876U	A065736	Scrapped
Room	73	FFHT1826W5	FRIDGE	FRIGIDAIRE	12/7/2011	R134A	4.25OZ			BA14235089	A105145	
Room	73	11BL	GC	CONVIRON	12/17/2009	R-12	24 OZ			7J0264F	A065737	SCRAPPED
Room	73	A1000-ADAPTIS	GC 31	CONVIRON	9/28/2009	R134a	4.6 LBS			99255	A066841	
Room	73	A1000-ADAPTIS	GC 32	CONVIRON	2/10/2010	R134a	4.6 LBS			99504	A066906	
Room	73	A1000-ADAPTIS	GC 33	CONVIRON	2/10/2010	R134a	4.6 LBS			99445	A066908	

Room	73	A1000- ADAPTIS	GC 34	CONVIRON	2/10/2010	R134a	4.6 LBS	99444	A066907
Room	74	31213-35	GC 23	PRECISION		R-12	8 OZ	35AY-3	A066350
Room	First Flr. Alcove	481-90192	Food Fridge	KENMORE	7/24/2012	R134a	4.08 OZ	1.1205E+11	A105216
Room	104	HAC-013	AC UNIT	THERMO PLUS		R-22	2 lbs 6oz	840920778	Ceiling
Room	104	HAC-013	AC UNIT	THERMO PLUS		R-22	2lbs 6oz	840920775	Ceiling
Room	106	DAG-0832	AC1	Data Air	1995	R-22	9lbs 10oz	841114	Updated
Room	106	DAG-0832	AC2	Data Air	1995	R-22	15lbs	841115	Updated
Room	114A	KAC012H4B	AC -UNIT	THERMO-PLUS		R-22	14oz	2001-10192	In Ceiling
Room	116	OCH-018AA1	AC	THERMO P		R-22	38.5 OZ	91W32516AA	In Ceiling
Room	118	KHC-012H4C	AC	THERMO P		R-22	42.5 OZ	0041B1294	In Ceiling
Room	120	Climate Master 024AA1	AC	TRANE		R-22	36 OZ	N/A	
Room	129	YRF1712W-M1	Fridge	McGLARY		R-12	4.25 OZ	KG160599	A066810 SCRAPPED
Room	130	KPC-8000	AC	KOLDWAVE		R-22	27.5oz	01-403389	
Room	140	KHC-024AA1	AC	MARKHOT		R-22	42.5 OZ	8812B1352	In Ceiling
Room	146	970-22204140	FRIDGE	KENMORE		R-134A	8.0 OZ	WB-3401-21933	A066095
Room	148	D1705AR	FRIDGE	DANBY		R-12	8.0 OZ	013294500J	A066078
Room	148	FFHT1828W5	FRIDGE	FRIGIDAIRE		R134A	4.5OZ	BA14239079	A105143
Room	150	A1201C1	AC	ELECTROHOME		R-22	24.5 OZ	J960904697	Window Shaker
Room	150	3659	Freezer	LAB LINE		R-12	10 OZ	1285-013	A066051
Room	150	47747-222	FRIDGE	VWR/THERMO		R134A	4.9OZ	14600010111121	A105123
Room	152	A1201B1	AC	ELECTROHOME		R-22	29 OZ	J931000907	Window Shaker
Room	154	106.6797802	FRIDGE	KENMORE	4/11/2011	R134A	4.0OZ	EY4502416	A105119
Room	154	TLJ30	Fridge	WESTINGH		R12	6.0 OZ	745D180A12	A066063 SCRAPPED
Room	160	51ME1501	AC	CARRIER		R-22	40 OZ	4289724 /	
Room	165	2K16BF11	AC	KOLDWAVE		R-22	22oz	NZ_142218	
Room	165	L8M-70	CENTRIFUGE	BECKMAN		R-22	15oz	7C421	A064056

Room	171	970447820	Fridge	KENMORE	10/29/2009	R134A	3.8oz /107g	WA92802177	A066846	
Room	174	E1755925		INGLIS	12/17/2009	R-12	8.0 OZ	KM1053	A066808	SCRAPPED
Room	173	E173000R		INGLIS	12/17/2009	R-12	8.0 OZ	369100	A066806	SCRAPPED
Room	173	K-500		KELVINATOR	12/17/2009	R-12	6.0 OZ	7A-09501	A066807	SCRAPPED
Room	173	970447820	Fridge	KENMORE	10/22/2009	R134A	3.8oz /107g	WA92802235	A066848	
Room	173	970429022	Fridge	KENMORE	10/22/2009	R134A	4.25oz	BA94016088	A066847	
Room	176	R090	Bar Fridge	WOODS		R-12	90G	NA00A0	A066870	
Room	178	2K14DB11	AC	KOLDWAVE		R-22	24 OZ	Q1-15-205G		
Room	181	NTD14740		ADMIRAL	3/24/2010	R-12	8.5 OZ	523852	A066111	SCRAPPED
Room	181	970 429122	Fridge	Kenmore		R134A	4.25oz	BA00919924	A066956	
Room	185	2K16DF11	AC #27	KOLDWAVE		R-22	22 oz	L3134338		
Room	187	970429122	Fridge	Kenmore		R134A	4.25oz	BA94123445	A066849	
Room	187	K500R		KELVINATOR	12/17/2009	R-12	8.5 OZ	7A-06293	A066805	SCRAPPED
ROOM	2ND ALCOVE	461.90192	FOOD FRIDGE	KENMORE	7/24/2012	R134a	4.06 OZ	112050200006	A105217	
CHASE	204	RWC8	WATER COOLER	SUNROC		R12	5.5OZ	94350297		
Room	205	K20DF	AC	KOLDWAVE		R-22	28 OZ	F106694		Wall Mounted
Room	205	RF11700FW1	Fridge	VIKING		R-12	8.0 OZ	NA94106094	A066804	SCRAPPED
Room	205	D46M40242	Refrigerator	KENMORE	3/2/2011	R134A	4.25OZ	4A01802285	A105082	
Room	207	CCHWFHW015	AC	McQUAY		R-22	24 OZ	75-G01415		IN CEILING
Room	207	ATB2232MRW00	Fridge	Amana	3/1/2009	R-134a	4 OZ	EM3803777	A066511	
Room	207	815	GC 41- LTI	PRECISION		R12	9 OZ	29-AS-62	A064420	
Room	207	ATB2232MRW00	Fridge	Amana	3/1/2009	R-134a	4 OZ	EW3803778	A066510	
Room	207	815		PRECISION	3/24/2009	R-12	16.0Z	29AU-11	A064220	SCRAPPED
Room	210	HS019G222R	AC	CLIMATE		R-22	30 OZ	92DW755		IN CEILING
CHASE	212	RWC8	WATER COOLER	SUNROC		R12	5.5OZ	94528276		
Room	218	HS014G222R	AC	CLIMATE		R-22	28 OZ	92JW702		IN CEILING
Room	221	KAC007A070	AC	THERMO P	4/29/2003	R-22	60.8 OZ	B20030010213		IN CEILING
Room	221	DCR412W	Bar Fridge	DANBY		134a	1.59oz	1030600000000		
Room	225	CCHWFHW024	AC	McQUAY		R-22	42 OZ	72H962305		IN CEILING

Room	225	51832-0L	Bar Fridge	BIG ROCK	R-12	8.0 OZ	800016-LL	Alec McBeath
Room	230	WCDO02611J00AA01	AC	TRANE	R-22	48 OZ	W96B02960	IN CEILING
Room	230	307	GC 24	FISHER	R-134A	7.0 OZ	3288	A066550
Room	230	FFU20F9FW0	GC 25	FISHER	R-134A	9 OZ	WB70610520	A066536
Room	230	0846-6086080		KENMORE	R-12	10 OZ	6DB03379	A066535 SCRAPPED
Room	230	106.8797802	FRIDGE	KENMORE	R134A	4OZ	EY4502396	A105086
Room	234	28042	FREEZER	KENMORE	R134A	6.7OZ	WB04161561	A105081
Room	234	VCR449A20	2 Glass Doors	VWR	R-134A	20 OZ	N25M1566568-01	A064486 COOLER
Room	234	CCHWHW024	AC	McQUAY	R-22	42 OZ	72H0962205	IN CEILING
Room	234	75003641-01	Centrifuge	HERAEUS	R-12	10 OZ	232641	A064050
Room	234	D123LGGAA	Freezer	KENMORE	R-12	10 OZ	SOH5681650	A066200 SCRAPPED
Room	234	DMRT106WE	Fridge	DANBY	R-12	8.0 OZ	03775289KA	A066199 SCRAPPED
Room	234	F10102000		EDWARDS	R-502	16 OZ	5222	A064053
Room	234	3752FS	FREEZER	FISHER	R134A	3.5OZ	168835901110128	A105139
Room	234	N/A	GC 26	LAB LINE	R-12	24 OZ	N/A	A064786
Room	234	FV01512		VIKING	R-12	4.0 OZ	805901LQ	A066803 SCRAPPED
Room	234	103NBR	CENTRIFUGE	WESTERN S.	R-12	8.0 OZ	84728	A064777
Room	234	FF421M7HW	FREEZER	FRIGIDAIRE	R134A	6.7OZ	WB13862409	A105141
Room	234	FFHT1826W5	FRIDGE	FRIGIDAIRE	R134A	4.5OZ	BA14239080	A105140
Room	234	YET20GKXBW00		WHIRLPOOL	R-12	8.0 OZ	ED1733884	A066201 SCRAPPED
Room	235	DCR94W	FRIDGE	DANBY	134a	1.84OZ	1061001...	A066232
Room	238	WCHD02611J00AA01	AC	TRANE	R-22	48 OZ	3	IN CEILING
Room	241	WCHD0191J10AA01	AC	TRANE	R-22	34 OZ	W95L38877	IN CEILING
Room	241	970-415324	FRIDGE	KENMORE	R134A	4.25OZ	BA21414883	A105226
Room	242	YET18SKXBW00		WHIRLPOOL	R-12	10 OZ	EC4132679	A066802 SCRAPPED
Room	244	28042	FREEZER	KENMORE	R134A	6.7OZ	WB04161544	A105080
Room	244	CCHWHW030	AC	McQUAY	R-22	54 OZ	72H0671705	IN CEILING
Room	244	3551-10	FRIDGE	Thermo scientific	R134a	4.9oz	1440100252142	A105035 Explosion Safe
Room	244	3551	FREEZER	LAB LINE	R-12	7.0 OZ	FE91602071	A066608 SCRAPPED

Room	244	ET14MNXSW00		VWR		R-12	8.0 OZ			A066609	SCRAPPED
Room	248	970-602120	fridge	KENMORE		R-134A	4.5 OZ			A066621	SCRAPPED
Room	248	2005	GC 29 - LTI	VWR/Sheldon		R-12	2.6 OZ		1200299	A066640	
Room	248	970-420624	FRIDGE	KONMORE	7/24/2012	R134A	4.25OZ		BA22521620	A105223	
Room	253	KAC-024-V-L4	AC	THERMO-PLUS		R-22	25OZ		99120061		
Room	257	WCHD019T1J10AA01	AC	TRANE		R-22	34 OZ		W95L38882		IN CEILING
Room	259	WCHD02611J00AA01	AC	TRANE		R-22	48 OZ		W9BB02962		IN CEILING
Room	265	DC12-032W	MINI FRIDGE	DIPLOMAT		R-12	4.0 OZ		4AFTA-00249	A066801	Food
Room	268	42005GA14	FREEZER	VWR		R134a	2.5OZ		S12H-381938	A066302	
Room	268	N/A	Fridge	KENMORE		R-12	8.0 OZ		NA93703093	A066306	SCRAPPED
Room	268	N/A	GC30 - LTI	PRECISION		R-12	14 OZ		29AU-1	A066307	
Room	269	50GXH018-311	AC	CARRIER		R-22	40OZ		4493V09511		SCRAPPED
Room	269	KAC018FHC	AC	Thermoptus		R22	20OZ		B2009050048		IN CEILING
Room	272	VLITSMCL05911	Fridge	GE		R-12	8.0 OZ		BY5-99497	A066323	
Room	272	106.6797802	FRIDGE	KENMORE	3/2/2011	R134A	4.0OZ		EY4502425	A105084	
Room	274	A6D24E7AK	AC	FEDDERS		R22	36OZ		BS521682049F		
Room	274	660320000W1	FRIDGE	KENMORE		R-134A	4.25 OZ		KW4928194	A066324	
Room	274	50165012	FRIDGE	KENMORE		R-134A	4.25 OZ		802MRXX17850	A066285	
Room	281	TH-6-B-C	FRIDGE	FOSTER		R12	32OZ		8613	A066600	scrapped
Room	281	815	GC 35 - LTI	PRECISION		R-12	14 OZ		29-AS-2	A066799	
Room	281	815	GC 36 - LTI	PRECISION		R-12	14 OZ		29-AS-6	A066798	
Room	281	815	GC 37 - LTI	PRECISION		R-12	14 OZ		29-AS-61	A066797	
Room	281	815 /	GC 38 - LTI	PRECISION		R-12	10 OZ		29-AS-63	A064422	
Room	281	GBS0HBXCRWW	Fridge	GE		R-134a	5.4 oz		304405	A066927	
Room	281	FD131L	FRIDGE	FRIGIDAIR	3/24/2010	R-12	8.0 OZ		IC-15864	A066795	scrapped
Room	281	460427	FRIDGE	G-E		R-12	16 OZ		10867	A066794	scrapped
Room	281	46042	FRIDGE	GE		R-12	16 OZ		1213	A066795	Scrapped
Room	281	21520	GC 39 - LTI	J S		R-12	16 OZ		1000988	A064419	
Room	286	DAR-340W	FRIDGE	DANBY		R-12	4.0 OZ		110040100270		

Room:	288	31213		PRECISION	3/24/2010	R12				40951	A066590	scrapped
ROOM	3rd ALCOVE	461.90192	FOOD FRIDGE	KENMORE	7/24/2012	R134a		14OZ		112030201243	A105218	
Room	303	RM-0511	Fridge	Viking		R12		4.06 OZ		2491902AX	A066790	SCRAPPED
Room	304	R411FA16	FRIDGE	VWR		R134A		3.8 OZ			A065625	
Room	304	KAC024B*	A/C	Thermoplus		R22		5.5OZ				IN CEILING
Room	304	ML-13-6B-2-T1		McCLARY	3/24/2010	R-12		2lbs 6oz		L-239918-7	A066789	Scrapped
Room	304	106.6797802	FRIDGE	KENMORE	3/2/2011	R134A		8.0 OZ		EY4502397	A105088	
Room	306	N/A	AC	KOLDWAVE		R-22		4OZ		N/A		WALL MOUNT
Room	306	N/A	AC	KOLDWAVE		R22		24OZ		N/A		WALLMOUNT
Room	310	N/A		COLDSPOT	12/17/2009	R-134A		6.5 OZ		N/A	A065904	SCRAPPED
Room	310	KAC048-H4B	AC	THERMOPLUS		R-22		46 OZ		E2004-100064		In Ceiling
Room	310	675636827		KENMORE		R-134A		4.5 OZ		08281173/	A065906	SCRAPPED
Room	310	LW18JYRRW-1	Freezer	G.E.	2/10/2010	R-12		4.25 OZ		AM383330V	A065974	SCRAPPED
Room	310	3566-10A	Freezer	VWR		R134a		8OZ		201709124908	A066905	SCRAPPED
Room	310	10660912101	FRIDGE	KENMORE		R134A		4OZ		EL5124322 /	A065905	
Room	310	1.110JE+13	CHILLER	THERNO S.		R134A		19OZ		108032015	A065874	
Room	310	970-447823	FRIDGE	KENMORE	7/24/2012	R134A		3.8oz		WA21102417	A105220	
Room	310	FFU21M7HWM	FREEZER	FRIGIDAIRE	7/24/2012	R134A		6.7OZ		WB21265242	A105224	
Room	322	FFHT1826W5	FRIDGE	FRIGIDAIRE	12/7/2011	R134A		4.5OZ		BA14239060	A105144	
Room	322	KAC-018-H-4C	AC	THERMOPLUS		R22		20OZ		B2008080141		In Ceiling
Room	328	46190482	Fridge	KENMORE		R-134A		1.41 OZ		105120100315	A066125	
Room	329	RT100L	CONDENSOR	SAVANT		R12		N/A		84-098-115	A066148	
Room	329	FFU21M7HWM	FREEZER	FRIGIDAIRE	2012/05/16	R134a		6.7 oz		WB21655917	A105214	
Room	329	U2020GA-14	FREEZER	VWR		R-134a		9 OZ		Y08K-504045-YK	A066151	SCRAPPED
Room	338	970 429122	Fridge	KENMORE	3/22/2010	R134a		4.25oz/121g		BA00919930	A066955	
Room	338	KAC030H4B	A/C	THERMOPLUS	7/8/2004	R22		34OZ		BZ003050139		In Ceiling
Room	338	N/A		ADMIRAL	3/24/2010	R-12		10 OZ		N/A	A066675	scrapped
Room	347	C67526531M	Fridge	KENMORE		R-134A		3.2 OZ		600935291M	A066788	

Greenhouse	GH 7	FFC07C3AMZ	Propagator Unit 6	ELECTROLU					R-134A	6.5 OZ		WB20541575	A066826
Greenhouse	GH 7	FFC07C3AMZ	Propagator Unit 7	ELECTROLU					R-134A	6.5 OZ		WB20541577	A066827
Greenhouse	GH 7	FFC07C3AMZ	Propagator Unit 9	ELECTROLU					R-134A	6.5 OZ		WB24524232	A066828
Room	H09	D116S	Low Temp Inc	FISHER					R-12	14.5 OZ		22AB2486	A066812 scrapped
Room	H09	D116S	Low Temp Inc	FISHER					R-12	14.5 OZ		10AL-0459	A066813 scrapped
Room	H09	Cancel lever	Fridge	Canico	3/24/2010				R-12	12 OZ		N8HB	A066821 scrapped
Room	H09	D116S	Low Temp Inc	FISHER					R-12	14.5 OZ		10AL-0460	A066814 scrapped
Room	H09	D116S	Low Temp Inc	FISHER					R-12	14.5 OZ		22AB2866	A066816 scrapped
Room	H09	8458	ULT	FORMA	3/24/2010			BLEND		48 OZ		83175-429	A064109 scrapped
Room	H09	FU178RRW2	L.T.Inc	Westinghouse					R-12	10 OZ		B11210	A066815 scrapped
Room	H09	FU017RRW6	L.T.Inc	Westinghouse					R-12	10 OZ		21-AC-14	A066817 scrapped
Room	H09	1-35D	GC54	PERCIVAL					R-12	13 OZ		8803360	A066811
Room	H09	G-27	GC43	PSYCRO					R-12	45 OZ		66207	A066818
Room	H16	RVG-13	WESTINGHOUSE	WESTINGHOUSE	3/24/2010				R-12	10 OZ		36299 /	A066819 scrapped
Room	H11	RDA-13	Fridge	WESTING	3/24/2010				R-12	10 OZ		36884 /	A066820 scrapped
Room	H11	970 429122	Fridge	Kenmore	3/22/2010				R134a	4.25oz/121g		BA00919925	A066953
Room	H10	E-15	GC44	CONVIRON					R-22	88 OZ		9C-2073	A064137
Room	H16	970 429122	Fridge	Kenmore	3/22/2010				R134a	4.25oz/121g		BA00919923	A066954
Room	Mo HALLWAY	EW44-1G	Water Cooler	ELKAY	10/4/2012				R134a	4.3oz		120211451	
Room	M01	DCR41WE	Bar Fridge	DANBY					R-22	3.4OZ		C9300412	A066809
Room	M07	GHGD24S21S1	Heat Pump	JOHNSON	7/17/2013				R22	85 oz		W1D3613957	N/A
Room	M06	MCBR360WF	food Bar Fridge	Magic Chef					R-134a	1.4 oz			
Room	Library	50T FQ012-A-121	Heat Pump	CARRIER					R-22	7.3 KG		0806G50739	Roof Mount
Room	Library	RM023	Bar Fridge	Viking					R-12	1.94 OZ.		30905111	
GYM	ANNEX	DCR29WE	BAR FRIDGE	DANBY					R12	2.65OZ		J9306323	