



Public Works and Government Services Canada

Requisition No. EZ899-171070/A

MERX I.D. No. _____

SPECIFICATIONS

For Sandspit, B.C. Airport
Combined Services Building
Roof Restoration
R.077015.001

Issued for Bid - August 3, 2016

APPROVED BY:

[Signature]
Regional Manager, AES

2016-08-08
Date

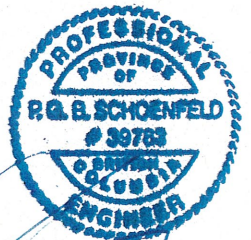
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Project Manager

08AUG16
Date



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END OF SECTION

1.0 GENERAL

The drawings listed below will be included in the General Contractor/ Owner agreement and will become part of the contract.

Drawing No.	Drawing Title	Date
R-1.1	Site Plan and General Notes	Aug. 3, 2016
R-2.1	Roof Plan	Aug. 3, 2016
R-3.1	Exterior Elevations	Aug. 3, 2016
R-4.1	Cross-Sections and Wall Sections	Aug. 3, 2016
R-5.1	Details	Aug. 3, 2016
R-5.2	Details	Aug. 3, 2016
R-5.3	Details	Aug. 3, 2016
S-1.1	Structural Details	Aug. 3, 2016

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 06 10 00 – Rough Carpentry
- .2 Section 07 52 00 – Modified Bituminous Membrane Roofing.
- .3 Section 07 62 00 – Sheet Metal Flashing and Trim.
- .4 Section 07 92 00 – Joint Sealants

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- .1 Work under this Contract covers roof restoration at the Combined Services Building (CSB) at the Sandspit Airport, located in Sandspit, B.C.
- .2 Work to be performed under this Contract includes, but is not limited to, the following items covered further in the Contract documents:
 - .1 Removal and disposal of roofing assembly materials installed on top of the plywood decking at the lower and upper roof as indicated on drawings.
 - .2 Removal of hazardous materials within the areas of work as defined in the drawings. Refer to the “Pre-renovation Hazardous Material Survey” prepared by PHH ARC Environmental Ltd. (Appendix B) and the “Hazardous Materials Test Results” report prepared by Pinchin West Ltd. (Appendix D).
- .3 Existing fixtures, devices, and equipment mounted on the existing roof are to be removed and reinstalled as required to accommodate the work. Relocate existing antennae and lights and maintain in service at all times, and reinstall at completion. Contractor to engage telecommunication Contractor for the temporary relocation of roof antennae.
- .4 All Mechanical, Electrical, and other items that are affected by the roof restoration must be replaced in accordance with current applicable codes and using good practice. Modify as required.
- .5 Confirm the existence of the original air and vapour barriers during construction. Notify Departmental Representative of inadequacies or deterioration so that issues may be addressed. Area of the air and vapour barriers that are compromised to accommodate construction must be reinstated to meet the original design intent, or altered as instructed by Departmental Representative.
- .6 Supply and installation of wood curbs where required at base of mechanical equipment and access hatch. Replace deteriorated plywood sheathing where indicated by the Departmental Representative, with pressure treated plywood sheathing.
- .7 Supply and installation of air and vapour barrier membrane, rigid insulation, protection board and two ply of modified bituminous roofing membrane, walkways and perimeter warning zone materials. Remove and reinstall existing cap flashing and drainage mat, remove and replace counter-flashings.
- .8 Replace corroded sections of mechanical exhaust flues with size and type to match existing.
- .9 Replace existing roof hatch and modify roof access as indicated on the drawings.
- .10 Install portable ladder bracket at access point to lower roof area.

- .11 Clean all work to the satisfaction of the Departmental Representative.
- .12 All other work specified herein or noted on drawings.

1.3 CONTRACT METHOD

- .1 Construct Work under stipulated price contract.

1.4 WORK SEQUENCE

- .1 Co-ordinate Progress Schedule and co-ordinate with Owner Occupancy during construction.
- .2 Maintain fire access/control.

1.5 OCCUPANCY

- .1 Owner will occupy premises during entire construction period for execution of normal operations.
- .2 Co-operate with Transport Canada airport staff and schedule operations to minimize conflict and to facilitate Owner usage.
- .3 Maintain unobstructed access to airport maintenance equipment and facilities.

1.6 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

- .1 Execute work with least possible interference or disturbance to building operations, occupants, and normal use of premises. Arrange with Consultant to facilitate execution of work.

1.7 EXISTING SERVICES

- .1 Notify Departmental Representative and utility companies of intended interruption of services and obtain required permission.
- .2 Where Work involves breaking into or connecting to existing services, give Departmental Representative 48 hours notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize duration of interruptions. Carry out work at times as directed by governing authorities with minimum disturbance to vehicular traffic and occupant operation.
- .3 Provide alternative routes for personnel and vehicular traffic.
- .4 Establish location and extent of service lines in area of work before starting Work. Notify Consultant of findings.
- .5 Submit schedule to and obtain approval from Departmental Representative for any shut-down or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.
- .6 Provide temporary services when directed by Departmental Representative to maintain critical building and tenant systems.
- .7 Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.

- .8 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.
- .9 Record locations of maintained, re-routed and abandoned service lines.
- .10 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

1.8 DOCUMENTS REQUIRED

- .1 Refer to Specification 01 11 55 – General Instruction, Paragraph 1.10.

Part 2 Products

2.1 NOT USED

- .1 Not used.

Part 3 Execution

3.1 NOT USED

- .1 Not used.

END OF SECTION

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 See Specification 01 11 00 – Summary of Work, Paragraph 1.2.

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 CSB Roof Restoration Project within 10 weeks of beginning the Work.

1.6 HOURS OF WORK

- .1 Restrictive as follows:
 - .1 Schedule deconstruction, removal and construction work during normal working hours of the building. Monday to Friday between 07:30 and 17:00 hours unless it has been approved by the Departmental Representative.
 - .2 Work will be permitted after hours, weekends and holidays providing that it has been approved by the Departmental Representative and requirements for security have been met.

- .3 Obtain and pay for a security guard acceptable to the Departmental Representative for any work performed outside of the normal working hours.

1.7 WORK SCHEDULE

- .1 Carry out work 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. Departmental Representative may or may not accept changes in schedule in their sole discretion.
 - .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 current edition of 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 Up-to-date 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 "record drawing" purposes.
- .12 Site Specific Health and Safety Plan and all other mandatory legislated federal and provincial safety documentation.
- .13 Emergency procedures.
- .14 Building Safety Plan.

1.11 REGULATORY REQUIREMENTS

- .1 Obtain and pay for 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 The Sandspit Airport Combined Services Building (CSB) will remain in full operation during the course of work. The contractor shall coordinate and schedule the work so as not to impair normal functions of the CSB.
 - .2 Assume responsibility for assigned premises for performance of this work.
 - .3 Be responsible for coordination of all work activities on site, including the work of other contractors engaged by the Departmental Representative such as moving contractors and installers.
 - .4 Assume that the building will have no equipment or materials in the "Area of Work" that will hinder the work that is to be performed. The Departmental Representative will be responsible for removing any items that the contractor has indicated are interfering with the Work.
- .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 Accept liability for damage, safety of equipment and overloading of existing equipment.

1.13 EXAMINATION

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

1.14 EXISTING SERVICES

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

1.15 LOCATION OF EQUIPMENT AND FIXTURES

- .1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.
- .2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space, and in accordance with manufacturer's recommendations for safety, access and maintenance.
- .3 Inform Departmental Representative of impending installation and obtain their 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 airtight to pipes, sleeves, ducts and conduits.
- .6 Conceal pipes, ducts and wiring in raised floors, wall and ceiling construction of finished areas except where indicated otherwise.
- .7 Patch and make good surfaces cut, damaged or disturbed, to Departmental Representative's approval. Match existing material, colour, finish and texture.

- .8 Install firestops and smoke seals in accordance with ULC-S115, around pipe, ductwork, cables and other objects penetrating fire separations to provide fire resistance not less than the fire resistance of surrounding floor, ceiling, and wall assembly.
- .9 Making good is defined as matching construction and finishing materials and the adjacent surfaces such that there is no visible difference between existing and new surfaces when viewed from 1.5 metres in ambient light, and includes painting the whole surface to the next change in plane.

1.17 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 SUBSTRATES

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

1.19 QUALITY OF WORK

- .1 Ensure that quality workmanship is performed through use of skilled tradesmen, under supervision of qualified journeyman.
- .2 The workmanship, erection methods and procedures to meet minimum standards set out in the current edition of the National Building Code of Canada.
- .3 In cases of dispute, decisions as to standard or quality of work rest solely with the Departmental Representative, whose decision is final.

1.20 WORKS COORDINATION

- .1 Coordinate work of subtrades:
 - .1 Designate one person to be responsible for review of contract documents and shop drawings and managing coordination of Work.
- .2 Convene meetings between subcontractors whose work interfaces and ensure awareness of areas and extent of interface required.
 - .1 Provide each subcontractor with complete plans and specifications for Contract, to assist them in planning and carrying out their respective work.
 - .2 Develop coordination drawings when required, illustrating potential interference between work of various trades and distribute to affected parties.

- .1 Pay particularly close attention to overhead work above ceilings and within or near to building structural elements.
 - .2 Identify on coordination drawings, building elements, services lines, rough-in points and indicate location services entrance to site.
 - .3 Facilitate meeting and review coordination drawings.
 - .4 Plan and coordinate work in such a way to minimize quantity of service line offsets.
- .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 SAMPLES

- .1 In accordance with Section 01 33 00, submit the requested shop drawings, product data, MSDS sheets and samples indicated in each of the technical Sections.
- .2 Allow sufficient time for the following:
 - .1 Review of product data.
 - .2 Approval of shop drawings.
 - .3 Review of re-submission.
 - .4 Ordering of approved material and/or products - refer to Sections of Divisions 2 to 26.

1.22 PRE-CONSTRUCTION MEETING

- .1 Prior to start of work, Departmental Representative and Contractor will perform walk-through review of site, including any areas affected by the work, to review and document existing conditions.
- .2 Contractor is to perform a thorough review of the site prior to start of work and provide written notice to Departmental Representative detailing any damaged property. Departmental Representative will verify damage. If written notice is not given within five days of commencement of work, it will be assumed that the Contractor has reviewed the site and accepted the condition of the property as being free of damage.
- .3 Any damages not listed as part of written notice mentioned above, found after the completion of the work will be the sole responsibility of the Contractor to rectify. Rectifications shall be completed in a timely and satisfactory manner.

1.23 PROJECT MEETINGS

- .1 Refer to Specification 01 31 19 – Project Meetings.

1.24 TESTING AND REVIEW

- .1 Particular requirements for review and testing to be carried out by testing service or laboratory approved by the Departmental Representative are specified in under various sections.
- .2 Refer to Specification 01 45 00 – Quality Control.

1.25 RECORD DOCUMENTS

- .1 The Departmental Representative will provide 2 sets of full size drawings, and 2 sets of specifications for "Record" purposes.
- .2 As work progresses, maintain accurate records to show all deviations from the Contract documents. Note on record specifications, drawings and shop drawings as changes occur. Departmental Representative may review progress periodically. Provide 'working' as built drawings promptly upon request.
- .3 Refer to Specification 01 78 00 – Close Out Submittals.

1.26 DUST CONTROL

- .1 When performing dust generating activities, provide temporary dust tight screens for protection of workers, finished areas of work and public.

1.27 ENVIRONMENTAL PROTECTION

- .1 Removal of disposal of hazardous materials is to be in accordance with federal, provincial and municipal regulations. Refer to attached Appendix B: "Pre-renovation Hazardous Building Materials Survey Report", prepared by PHH ARC Environmental and Appendix D: "Hazardous Materials Test Results" report prepared by Pinchin West Ltd.
- .2 Prevent extraneous materials from contaminating air beyond construction area, by providing temporary enclosures during work.
- .3 Do not dispose of waste or volatile materials into water courses, storm or sanitary sewers.
- .4 Ensure proper disposal procedures in accordance with all applicable federal, provincial and municipal 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.
- .2 Refer to Specification 01 78 00 – Closeout Submittals.

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 2 sets of Contract documents for use by the Contractor at no additional cost. Should more than 2 sets of documents be required the Departmental Representative will provide them at additional cost.

1.30 BUILDING SMOKING ENVIRONMENT

- .1 Smoking on site is not permitted.

1.31 SYSTEM OF MEASUREMENT

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

1.32 SUBMISSION OF TENDER

- .1 Before submitting tender, become familiar with all conditions likely to affect the cost of the work.

1.33

WEATHER

- .1 The work is to be performed at Sandspit Airport. Weather at the site can be adverse. Refer to Climate Normals in Appendix C of this Specification. Contractor shall explicitly consider weather in their schedule.

END OF SECTION

Part 1 General

1.1 ACCESS AND EGRESS

- .1 Design, construct and maintain temporary "access to" and "egress from" work areas, including stairs, ladders and scaffolding, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.

1.2 USE OF SITE AND FACILITIES

- .1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Departmental Representative to facilitate work as stated.
- .2 Maintain existing services to building and provide for personnel and vehicle access.
- .3 Where security is reduced by work provide temporary means to maintain security.
- .4 Contractor to provide temporary sanitary facilities for crew. Keep facilities clean. Arrange location of facilities with Departmental Representative prior to mobilization.
- .5 Closures: protect work temporarily until permanent enclosures are completed.

1.3 EXISTING SERVICES

- .1 Notify, Departmental Representative and utility companies of intended interruption of services and obtain required permission.
- .2 Where Work involves breaking into or connecting to existing services, give Departmental Representative 48 hours of notice for necessary interruption of mechanical or electrical service throughout course of work. Keep duration of interruptions minimum.
- .3 Provide for personnel, pedestrian and vehicular traffic.
- .4 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

1.4 SPECIAL REQUIREMENTS

- .1 Carry out noise generating Work within the hours of (8:00AM to 5:00PM), Monday to Friday.
- .2 Submit schedule for review by Department Representative.
- .3 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.
- .4 Keep within limits of work and avenues of ingress and egress.
- .5 Ingress and egress of Contractor vehicles at site is to be organized with Department Representative prior to coming to site.

1.5 SECURITY

- .1 Where security has been reduced by Work of Contract, provide temporary means to maintain security.
- .2 Security clearances:

- .1 Personnel employed on this project will be subject to security check. Obtain clearance, as instructed, for each individual who will require to enter premises.
 - .2 Obtain requisite clearance, as instructed, for each individual required to enter premises.
 - .3 Personnel will be checked daily at start of work shift and provided with pass which must be worn at all times. Pass must be returned at end of work shift and personnel checked out.
 - .4 Contractor's personnel will require satisfactory RCMP initiated security screening in order to complete Work in premises and on site.
- .3 Security escort:
- .1 Personnel employed on this project must be escorted when executing work in non-public areas during normal working hours. Personnel must be escorted in all areas after normal working hours.
 - .2 Submit an escort request to Departmental Representative at least 3 days before service is needed. For requests submitted within time noted above, costs of security escort will be paid for by Departmental Representative. Cost incurred by late request will be Contractor's responsibility.
 - .3 Any escort request may be cancelled free of charge if notification of cancellation is given at least 4 hours before scheduled time of escort. Cost incurred by late request will be Contractor's responsibility.
 - .4 Calculation of costs will be based on average hourly rate of security officer for minimum of 8 hours per day for late service request and of 4 hours for late cancellations.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Refer to General Conditions.

1.2 REQUEST FOR APPROVAL OF ALTERNATIVES

- .1 Contractors and suppliers of products or systems, which have not been specified, may apply for approval of their product/system as "alternative".
- .2 Requests for approval must reach the Departmental Representative at least seven (7) working days prior to the price submission. The Departmental Representative shall advise applicants of the status of their request three (3) working days prior to price submission.
- .3 Request for approval shall include:
 - .1 Project name and number.
 - .2 Specification sections to which the product/system applied.
 - .3 Description of proposed substitution including manufacturer's material specifications, manufacturer's preparation and application requirements and manufacturer's warranties.
 - .4 Sample product indicating surface finish and material thickness to be applied under Contract.
 - .5 Installation history of proposed alternative including:
 - .1 Projects and locations
 - .2 Approximate value of contract
 - .3 Approximate size of projects
 - .4 Number of years in use
 - .5 Type of usage
 - .6 Name of Departmental Representative involved.
 - .6 Where a specified product or system is not available at the time of price submission, the Contractor must inform the Departmental Representative in writing. In the event that the Contractor fails to do so, the Departmental Representative will choose a substitute product suitable for the application at the time of construction.
- .4 When submitting alternatives to materials or equipment specified, Contractor shall include in their Price any changes in the work required to accommodate such alternatives. A later claim for addition to the Contract Price because of changes in the work necessitated by the use of alternatives will not be considered.

1.3 APPROVAL OF ALTERNATIVES

- .1 An addendum will be issued prior to proposal submission if an alternative is approved. No alternative materials or equipment will be considered after closing of tender.
- .2 Products/systems that have been approved as alternatives may be substituted for specified products/systems.

- .3 Should any proposed alternative be accepted either in part or in whole, the Contractor shall assume full responsibility and bear the costs when substitution affects other work of the Project and pay for any drawing changes required as a result of the substitution.
- .4 All cost savings arising from approved substitutions will be credited to the Contract in such amounts as may be determined by the Departmental Representative and Contract Price will be adjusted accordingly. No substitutions will be permitted without the prior written approval of the Departmental Representative.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 PRECONSTRUCTION MEETING

- .1 Within 10 working days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.
- .2 Departmental Representatives and Contractor will be in attendance.
- .3 Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.
- .4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.
- .5 Agenda to include:
 - .1 Appointment of official representative of participants in the Work.
 - .2 Detailed schedule of Work
 - .3 Schedule of submission of shop drawings, samples, colour chips. Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.
 - .4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 51 00 – Temporary Utilities.
 - .5 Delivery schedule of specified equipment and materials.
 - .6 Site security in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.
 - .7 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
 - .8 Record drawings in accordance with Section 01 33 00 - Submittal Procedures.
 - .9 Maintenance manuals in accordance with Section 01 78 00 - Closeout Submittals.
 - .10 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 - Closeout Submittals.
 - .11 Monthly progress claims, administrative procedures, photographs, hold backs.
 - .12 Appointment of review and testing agencies or firms.
 - .13 Insurances, transcript of policies.
 - .14 Occupational Health and Safety.

1.2 PROGRESS MEETINGS

- .1 During course of Work schedule bi-weekly progress meeting.
- .2 Contractor, major Subcontractors involved in Work, Departmental Representative, and Consultant are to be in attendance.
- .3 Notify parties minimum four days prior to meetings.
- .4 Consultant shall record minutes of meetings and circulate to attending parties and affected parties not in attendance within three days after meeting.

Part 2 **Products**

2.1 **NOT USED**

.1 Not Used.

Part 3 **Execution**

3.1 **NOT USED**

.1 Not Used.

END OF SECTION

Part 1 General

1.1 GENERAL

- .1 Use new material and equipment unless otherwise specified, equipment and systems.
- .2 Within seven (7) days of written request by Departmental Representative, submit following information for any and all materials and products proposed for supply
 - .1 Name and address of manufacturer
 - .2 Trade name, model, and catalogue number
 - .3 Performance, descriptive, and test data
 - .4 Manufacturer's installation or application instructions

1.2 MANUFACTURER'S INSTRUCTIONS

- .1 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods.
- .2 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.

1.3 DELIVERY AND STORAGE

- .1 Refer to Section 01 61 00 – Common Product Requirements.

1.4 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, will result in a credit to the Contract amount.
- .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 ADMINISTRATIVE

- .1 Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Do not proceed with Work affected by submittal until review is complete.
- .3 Present shop drawings, product data, samples and mock-ups in SI Metric units.
- .4 Where items or information is not produced in SI Metric units converted values are acceptable.
- .5 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
- .6 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .7 Verify field measurements and affected adjacent Work are co-ordinated.
- .8 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.
- .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.
- .10 Keep one reviewed copy of each submission on site.

1.2 SHOP DRAWINGS AND PRODUCT DATA

- .1 Refer to General Conditions.
- .2 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .3 Submit shop drawings stamped and signed by Professional Engineer registered or licenses in British Columbia.
- .4 Shop drawing illustrations and diagrams and adjacent building components are to be drawn to scale with appropriate scale noted on each page.
- .5 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .6 Allow five (5) days for Departmental Representative's review of each submission.

- .7 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
- .8 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.
- .9 Accompany submissions with transmittal letter, 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.
- .10 Submissions 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 Single line and schematic diagrams.
 - .9 Relationship to adjacent work.
- .11 After Departmental Representative's review, distribute copies.
- .12 Submit electronic copy of shop drawings for each requirement requested in specification Sections and hard copies of these shop drawings as Departmental Representative may reasonably request.
- .13 Submit electronic copies of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.

- .14 Submit electronic copies of test reports for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
 - .2 Testing must have been within 3 years of date of contract award for project.
- .15 Submit electronic copies of certificates for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
 - .2 Certificates must be dated after award of project contract complete with project name.
- .16 Submit electronic copies of manufacturer's instructions for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
- .17 Submit electronic copies of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative.
- .18 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
- .19 Submit copies of Operation and Maintenance Data as required in Specification Sections and as requested by Departmental Representative.
- .20 Delete information not applicable to project.
- .21 Supplement standard information to provide details applicable to project.
- .22 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.
- .23 The review of shop drawings by the Departmental Representatives is for sole purpose of ascertaining conformance with general concept.
 - .1 This review shall not mean that the Departmental Representative approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.
 - .2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

- .24 Refer to Section 01 35 22 – Health and Safety Requirements for additional submittals.

1.3 SAMPLES

- .1 Submit for review samples as requested in respective specification Sections. Label samples with origin and intended use.
- .2 Deliver samples to Departmental Representative.
- .3 Notify Departmental Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.
- .4 Where colour, pattern or texture is criterion, submit full range of samples.
- .5 Adjustments made on samples by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
- .6 Make changes in samples which Departmental Representative may require, consistent with Contract Documents.
- .7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.4 MOCK-UPS

- .1 Erect mock-ups in accordance with 01 45 00 - Quality Control and individual Specification Sections.

1.5 PHOTOGRAPHIC DOCUMENTATION

- .1 Submit electronic copy of colour digital photography in standard resolution as directed by Departmental Representative.

1.6 CERTIFICATES AND TRANSCRIPTS

- .1 Immediately after award of Contract, submit Workers' Compensation Board status.
- .2 Submit transcription of insurance immediately after award of Contract.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 51 00 – Temporary Facilities
- .2 Section 01 56 00 – Temporary Airside Traffic Markers, Barriers and Delineators.

1.2 GENERAL PROTECTION

- .1 Copy will be returned with Departmental Representative's comments.
- .2 Coordinate work so as not to interfere with on-going and regular maintenance activities.
- .3 Provide temporary protection for safe handling of public, personnel, pedestrians, and vehicular traffic. See Specifications 01 51 00 – Temporary Facilities, and 01 56 00 - Temporary Airside Traffic Markers, Barriers and Delineators.)
- .4 Provide radio operator, radio, and vehicle as defined in this Section.

1.3 WORK PLAN

- .1 Work of this Contract shall be conducted in phases to ensure no interruption to the Airport operations.
- .2 Work will be performed during normal working hours.
- .3 Contractor vehicles shall not be run on runway pavement.
- .4 Contractor shall submit a work plan and obtain Departmental Representative's approval before commencing work. Work plan shall detail sequencing, scheduling, and work method for all of the Work of this Contract.

1.4 MOVEMENT OF EQUIPMENT AND PERSONNEL

- .1 The Airport will remain open to all Airport operations. In areas on the airside of the Airport security fence
 - .1 Obtain Airport Manager's approval on scheduling of work.
 - .2 Control movement of equipment and personnel as directed by Departmental Representative.
 - .1 The apron will be operational for aircraft use at all times. Special precautions and clearances must be observed during construction to ensure safety. Work stoppages or removal of construction equipment from certain areas may be required from time to time to permit safe movement of aircraft on the live portion of the apron.
 - .2 No equipment or personnel shall infringe within the wingtip clearance line while an aircraft is manoeuvring in the area.

- .3 All personnel and light equipment should be clear of jet blast during taxiing of aircraft.
- .2 In areas of airport not closed to airport traffic
 - .1 Obtain Departmental Representative's and Airport Manager's approval on scheduling of Work.
 - .2 Control movements of equipment and personnel as directed by Departmental Representative.
 - .3 All movement on or near (45 metres from runway edge and 17 metres from taxiway) aircraft operational areas are controlled by, and require communication by Airport escort with, Flight Service Station (FSS).
 - .4 Provide an escort vehicle controlled by a licensed radio operator maintaining radio contact with FSS and visual watch for aircraft traffic.
 - .5 Prior to the first vehicle entering any manoeuvring area that has been closed, in whole or in part, by a NOTAM, radio operator must notify and obtain permission and instructions from FSS, and also must notify FSS upon the last vehicle leaving the closed area. No contact is required for each individual intervening movement provided that
 - .1 Vehicles do not proceed onto or near open sections of manoeuvring area.
 - .2 FSS is notified prior to the first vehicle entering and upon the last vehicle leaving closed area.
 - .6 **Instantly obey all signals from FSS.**
 - .7 Qualified, competent flagpersons, radio operators, and operators of escort vehicles must conform to the following requirements
 - .1 Possess a valid radio operator's licence.
 - .2 Possess a thorough knowledge, as determined by Airport Manager or his representative, of airside safety and procedures of Sandspit Airport.
 - .3 Possess an Airport Operator's Vehicle Permit for Sandspit Airport and a valid driver's licence.

1.5 UNSERVICEABLE AREAS

- .1 Park equipment not in use and stockpile materials so that their tops are below a 50 to 1 ratio from ends of usable landing strip and below 20 to 1 ratio from sides of aircraft traffic areas. Where directed, mark tops with red lights.

1.6 TRENCHING

- .1 Obtain Departmental Representative's written permission to undertake trenching which cannot be completed, backfilled, and sealed within one working day.

1.7 AIRPORT FACILITIES

- .1 Departmental Representative will inform as to any knowledge regarding the location of underground facilities such as cables, pipes, and ducts. Contractor will be responsible for carefully exposing underground facilities without risking damage to facilities prior to commencing excavations. Any facilities damaged will be repaired immediately at Contractor's expense.

1.8 OPERATIONAL REQUIREMENTS

- .1 Sandspit Airport must remain operational throughout the duration of this Contract.
- .2 Access to and from Operational and Emergency Equipment must remain operational during duration of this contract.

1.9 FOREIGN OBJECT DEBRIS

- .1 Take steps to secure or contain all materials, debris and equipment to ensure that items do not blow onto the operation areas of the airport.
- .2 Construction materials, waste, tools or equipment must not be able permitted to leave the work area or enter portions of the airport open to operations under any circumstances. Such materials shall be considered foreign object debris (FOD) and shall be **IMMEDIATELY** reported to the airport manager. Contractor will be liable for any costs associated with FOD discharge including investigation and clean-up.

END OF SECTION

Part 1 General

1.1 REFERENCE

- .1 Government of Canada.
 - .1 Canada Labour Code - Part II
 - .2 Canada Occupational Health and Safety Regulations.
- .2 National Building Code of Canada (NBC):
 - .1 Part 8, Safety Measures at Construction and Demolition Sites.
- .3 Canadian Standards Association (CSA) as amended:
 - .1 CSA Z797-2009 Code of Practice for Access Scaffold
 - .2 CSA S269.1-1975 (R2003) Falsework for Construction Purposes
 - .3 CSA S350-M1980 (R2003) Code of Practice for Safety in Demolition of Structures
- .4 National Fire Code of Canada 2010 (as amended)
 - .1 Part 5 – Hazardous Processes and Operations and Division B as applicable and required.
- .5 Province of British Columbia:
 - .1 Workers Compensation Act Part 3-Occupational Health and Safety.
 - .2 Occupational Health and Safety Regulations

1.2 RELATED SECTIONS

- .1 Refer to the following current sections as required:
 - .1 Section 01 14 00 – Work Restrictions
 - .2 Section 01 33 00 – Submittals
 - .3 Section 01 51 00 – Temporary Utilities
 - .4 Section 01 56 00 – Temporary Barriers and Enclosures
 - .5 Section 06 10 00 – Rough Carpentry
 - .6 Section 07 52 00 – Modified Bituminous Membrane Roofing
 - .7 Section 07 62 00 – Metal Flashings and Trim
 - .8 Section 07 92 00 – Joint Sealants

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

1.5 SUBMITTALS

- .1 Submit to Departmental Representative submittals listed for Review in accordance with Section 01 33 00 – Submittals.
- .2 Submit the following:
 - .1 Site Specific 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 current Material Safety Data Sheets (MSDS), and all other documentation required by Workplace Hazardous Materials Information System (WHMIS) requirements.
- .3 The Departmental Representative will review the Contractor's Site Specific Health and Safety Plan and emergency procedures, and provide comments to the Contractor within 5 days after receipt of the plan. Revise the plan as appropriate and resubmit to Departmental Representative.
- .4 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.
- .5 Submission of the Site Specific 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, pertaining to safety at the work site, 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:
 - .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, revising, 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.
- .3 Refer to Section 01 51 00 – Temporary Utilities and Section 01 56 00 – Temporary Barriers and Enclosures

1.9 PROJECT/SITE CONDITIONS

- .1 Work at site will involve contact with:
 - .1 Multi-employer work site.
 - .2 Federal employees and general public.
 - .3 See Preliminary Hazard Assessment Form Appendix A.

1.10 UTILITY CLEARANCES

- .1 The Contractor is solely responsible for all utility detection and clearances prior to starting the work
- .2 The Contractor will not rely solely upon the Reference Drawings or other information provided for utility locations.

1.11 REGULATORY REQUIREMENTS

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

1.12 WORK PERMITS

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

1.13 FILING OF NOTICE

- .1 The General Contractor is to complete and submit a Notice of Project as required by Provincial authorities.
- .2 Provide copies of all notices to the Departmental Representative.

1.14 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 The review of Health and Safety Plan by the Departmental Representative 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.

1.15 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 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.

1.16 HAZARDOUS PRODUCTS

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

- .2 Where use of hazardous and toxic products cannot be avoided:
 - .1 Provide adequate means of ventilation in accordance with Section 01 51 00.
 - .2 The contractor shall ensure that the product is applied as per manufacturers recommendations.
 - .3 The contractor shall ensure that only pre-approved products are brought onto the work site in an adequate quantity to complete the work.

1.17 HAZARDOUS MATERIAL

- .1 Carry out any activities involving hazardous material in accordance with applicable Provincial regulations.
- .2 Removal and handling of hazardous materials in accordance with provincial regulation and WorkSafe BC. Refer to the Hazardous Assessment Reports in Appendices B and D.
- .3 Contractor to assume all paint on site contains lead and to follow WorkSafe BC procedures when disturbing any painted surface.
- .4 If any other such materials are detected on site, the Contractor is to immediately notify the Department Representatives so that the appropriate measures can be determined and implemented.

1.18 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.

1.19 OVERLOADING

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

1.20 FALSEWORK

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

1.21 SCAFFOLDING

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

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

1.24 FIRE PROTECTION AND ALARM SYSTEM

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

1.25 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 MEETINGS

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

1.27 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".

Part 2 Products

2.1 NOT USED

- .1 Not used.

Part 3 Execution

3.1 NOT USED

- .1 Not used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 33 00 – Submittals.

1.2 REFERENCES

- .1 Refer to General Conditions.

1.3 FIELD REVIEW

- .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 at no additional cost.

1.4 INDEPENDENT REVIEW 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 at no cost to Departmental Representative. Contractor is responsible for costs of retesting and additional reviews.

1.5 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.

1.6 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.

1.7 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, Department Representative will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by the Departmental Representative.

1.8 REPORTS

- .1 Submit one copy of field review and test reports to Departmental Representative.
- .2 Provide copies to subcontractor of work being reviewed or tested, manufacturer or fabricator of material being reviewed or tested.

1.9 MOCK-UPS

- .1 Prepare mock-ups for Work specifically requested in specifications. Include for Work of Sections required to provide mock-ups.
- .2 Construct in locations acceptable to Departmental Representative.
- .3 Prepare mock-ups for Departmental Representative review with reasonable promptness and in orderly sequence, to not cause delays in Work.
- .4 Failure to prepare mock-ups in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .5 Mock-ups may remain as part of Work, if acceptable to Departmental Representative.

1.10 MILL TESTS

- .1 Submit mill test certificates as required of specification Sections.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 PRECEDENCE

- .1 For Federal Government Projects, Division 01 Sections take precedence over technical specifications in other Divisions of this Project Manual.

1.2 RELATED REQUIREMENTS

- .1 Section 06 10 00 – Rough Carpentry
- .2 Section 07 52 00 – Modified Bituminous Membrane Roofing
- .3 Section 07 62 00 – Metal Flashing and Trim
- .4 Section 07 92 00 – Joint Sealants

1.3 REFERENCES

- .1 CSA Group
 - .1 CAN/CSA-Z809-[08], Sustainable Forest Management.
- .2 Environmental Choice Program
 - .1 CCD-016-97(R2005), Thermal Insulation Materials.
 - .2 CCD-045-95, Sealant and Caulking Compounds.
 - .3 CCD-046-95, Adhesives.
 - .4 CCD-047-98(R2005), Architectural Surface Coatings.
 - .5 CCD-048-95(R2006), Surface Coatings - Recycled Water-Borne.
 - .6 CCD-127-95, Recycled Plastic Products.
 - .7 CCD-144-2003, Naturally-Derived Phenol Substitutes.
 - .8 CCD-150-2004, Steel for Use in Construction Products.
- .3 Forest Stewardship Council (FSC)
 - .1 FSC-STD-01-001-2004, FSC Principle and Criteria for Forest Stewardship.
- .4 Green Seal Environmental Standards (GS)
 - .1 GS-03-97, Environmental Criteria for Anti-Corrosive Paints.
 - .2 GS-11-11, Standard for Paints and Coatings.
- .5 Sustainable Forestry Initiative (SFI)
 - .1 SFI-2010-2014 Standard.

1.4 SUBMITTALS

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

1.5 HAZARDOUS MATERIALS

- .1 Refer to Section 01 35 33, Appendix B, and Appendix D for Hazardous Material Assessment Reports.

1.6 GENERAL CONSTRUCTION MATERIALS/PRACTICES

- .1 Materials and Resources
 - .1 Incorporate reused building materials, where possible, and as indicated.
 - .2 Provide list of non-endorsed products and services, provided the green labelled product or services are capable of meeting specified performance requirements.
- .2 Construction Waste Management
 - .1 Follow recommendations and requirements of this projects construction, renovation and demolition (CRD) waste management plan in accordance with Section 01 74 19 - Waste Management And Disposal.
 - .2 Recycled Content
 - .1 Use materials with post-consumer and post-industrial recycled content, where possible.
 - .3 Local/Regional Materials
 - .1 Use local systems and materials, where possible.
 - .4 Rapidly Renewable Materials
 - .1 Use systems and materials that originate from renewable sources, where possible.
 - .5 Wood
 - .1 Use lumber sourced from independently certified well-managed forests in accordance with CAN/CSA-Z809 or FSC or SFI
 - .2 Materials made from composite wood materials or agricultural products: must not contain urea-formaldehyde resins.

1.7 PAINTS, STAINS, AND VARNISHES

- .1 Use paints and coatings with low VOC.

1.8 SEALANTS, ADHESIVES AND COMPOUNDS

- .1 Refer to Specification 07 92 00 – Sealants.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 SUBMITTALS

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

1.2 INSTALLATION AND REMOVAL

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

1.3 WATER SUPPLY

- .1 Departmental Representative will provide continuous supply of potable water for construction use.
- .2 Arrange for connection with appropriate utility company and pay costs for installation, maintenance and removal.

1.4 TEMPORARY HEATING AND VENTILATION

- .1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.
- .2 Provide temporary heat and ventilation in enclosed areas as required to:
 - .1 Facilitate progress of Work.
 - .2 Protect Work and products against dampness and cold.
 - .3 Prevent moisture condensation on surfaces.
 - .4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
 - .5 Provide adequate ventilation to meet health regulations for safe working environment.
- .3 Maintain temperatures of minimum 10 degrees C in areas where construction is in progress.
- .4 Ventilating:
 - .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
 - .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
 - .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
 - .4 Ventilate storage spaces containing hazardous or volatile materials.
 - .5 Ventilate temporary sanitary facilities.
 - .6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.

- .5 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
 - .1 Conform with applicable codes and standards.
 - .2 Enforce safe practices.
 - .3 Prevent abuse of services.
 - .4 Prevent damage to finishes.
 - .5 Vent direct-fired combustion units to outside.
- .6 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

1.5 TEMPORARY POWER AND LIGHT

- .1 Departmental Representative will pay for temporary power during construction for temporary lighting and operating of power tools, to a maximum supply of 230 volts.
- .2 Arrange for connection with appropriate utility company. Contractor to pay costs for installation, maintenance and removal.
- .3 Provide and maintain temporary lighting throughout project, where required.
- .4 Connect to existing power supply in accordance with Canadian Electrical Code.
- .5 Electrical power and lighting systems installed under this Contract may be used for construction requirements only with prior approval of Departmental Representative provided that guarantees are not affected. Make good damage to electrical system caused by use under this Contract.

1.6 FIRE PROTECTION

- .1 Provide and maintain temporary fire protection equipment during performance of Work required by governing codes, regulations and bylaws.
- .2 Burning rubbish and construction waste materials is not permitted on site.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Public Works Government Services Canada (PWGSC) Standard Acquisition Clauses and Conditions (SACC).

1.2 INSTALLATION AND REMOVAL

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

1.3 GUARD RAILS AND BARRICADES

- .1 Provide secure, rigid guard rails and barricades around open edges of floors and roofs.

1.4 ACCESS TO SITE

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

1.5 PUBLIC TRAFFIC FLOW

- .1 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect public.

1.6 FIRE ROUTES

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

1.7 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

- .1 Protect surrounding private and public property from damage during performance of Work.
- .2 Be responsible for damage incurred.

1.8 PROTECTION OF BUILDING FINISHES

- .1 Provide protection for finished and partially finished building finishes and equipment during performance of Work.
- .2 Provide necessary screens, covers, and hoardings.
- .3 Confirm with Departmental Representative prior to installation.
- .4 Be responsible for damage incurred due to lack of or improper protection.

1.9 WASTE MANAGEMENT AND DISPOSAL

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

Part 2 **Products**

2.1 **NOT USED**

 .1 Not Used.

Part 3 **Execution**

3.1 **NOT USED**

 .1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Refer to General Conditions.
- .2 Within text of each specifications section, reference may be made to reference standards.
- .3 Conform to these reference standards, in whole or in part as specifically requested in specifications.
- .4 If there is question as to whether products or systems are in conformance with applicable standards, Departmental Representative reserves right to have such products or systems tested to prove or disprove conformance.
- .5 Cost for such testing will be born by Departmental Representative in event of conformance with Contract Documents or by Contractor in event of non-conformance.

1.2 QUALITY

- .1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.
- .2 Procurement policy is to acquire, in cost effective manner, items containing highest percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition. Make reasonable efforts to use recycled and recovered materials and in otherwise utilizing recycled and recovered materials in execution of work.
- .3 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.
- .4 Should disputes arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.
- .5 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.
- .6 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.3 AVAILABILITY

- .1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify Departmental Representative of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.
- .2 In event of failure to notify Departmental Representative at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Departmental Representative reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.4 STORAGE, HANDLING AND PROTECTION

- .1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
- .2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.
- .3 Store products subject to damage from weather in weatherproof enclosures.
- .4 Store sheet materials, lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .5 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.
- .6 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.
- .7 Touch-up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.5 TRANSPORTATION

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

1.6 MANUFACTURER'S INSTRUCTIONS

- .1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.
- .2 Notify Departmental Representative in writing, of conflicts between specifications and manufacturer's instructions, so that Departmental Representative will establish course of action.
- .3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Departmental Representative to require removal and re-installation at no increase in Contract Price or Contract Time.

1.7 QUALITY OF WORK

- .1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Departmental Representative if required Work is such as to make it impractical to produce required results.
- .2 Do not employ anyone unskilled in their required duties. Departmental Representative reserves right to require dismissal from site, workers deemed incompetent or careless.
- .3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Departmental Representative, whose decision is final.

1.8 CO-ORDINATION

- .1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.
- .2 Be responsible for coordination and placement of openings, sleeves and accessories.

1.9 REMEDIAL WORK

- .1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Co-ordinate adjacent affected Work as required.
- .2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.10 LOCATION OF FIXTURES

- .1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.
- .2 Inform Departmental Representative of conflicting installation. Install as directed.

1.11 FASTENINGS

- .1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.
- .2 Prevent electrolytic action between dissimilar metals and materials.
- .3 Use non-corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification Section.
- .4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.
- .5 Keep exposed fastenings to a minimum, space evenly and install neatly.
- .6 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

1.12 FASTENINGS - EQUIPMENT

- .1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.
- .2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use No. 304 stainless steel for exterior areas.
- .3 Bolts may not project more than one diameter beyond nuts.
- .4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

1.13 EXISTING UTILITIES

- .1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, and/or building occupants and pedestrian and vehicular traffic.
- .2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 BONDS

- .1 Within fourteen (14) days after award of the Contract, the Contractor shall, at his/her own expense, provide the following surety bonds each in the amount of 50% of the estimated Contract price.
 - .1 A Performance Bond to secure the due and proper performance by the Contractor of his/her obligations under the Contract.
 - .2 Provide as a Separate Price Item a Labour and Material Payment Bond to secure:
 - .1 The due and proper payment of those having direct contracts with the Contractor for labour, material and/or services.
 - .2 Removal of registered lien claims and certificates of action from the title of the lands on which the work or any part thereof is performed.
 - .3 Full reimbursement to the Departmental Representative for all liability and payments to those having direct contracts with the Contractor for labour, material, and/or services in connections with the Contract.
 - .3 All Bonds shall name the Departmental Representative as Obligee.
 - .4 All Bonds shall be issued by a properly licensed surety company registered and duly authorized to transact the business of suretyship in the Province of British Columbia.
 - .5 The bonding period shall commence on the date of contract execution and end two (2) years from the Final Holdback release due date.

1.2 WARRANTY/GUARANTY PERIOD

- .1 All of the Work of the Contract: Five (5) year guaranty, secured by Performance Bond, for the first two (2) years and unsecured for the remaining three (3), commencing on the completion date as verified by the Departmental Representative.
- .2 Refer to applicable specification sections for required warranty/guarantee submissions.

Part 2 Products

2.1 NOT USED

- .1 Not used.

Part 3 Execution

3.1 REMEDIAL WORK UNDER GUARANTY/WARRANTY

- .1 The Departmental Representative shall provide written notice to the Contractor, within thirty (30) days of the discovery of any defect in the system under normal usage. The Contractor shall immediately take necessary steps to protect the area against further damage and shall take corrective action to make good any damage incurred. The Contractor shall schedule all repair work with the Departmental Representative and shall make every attempt to make good the defects in a timely manner.
- .2 Remedy is to include, at no cost to the Departmental Representative, labour, materials, equipment, services required to make good defective areas of the work, and to make good damages incurred in obtaining access to defective areas. The Contractor will reimburse the Departmental Representative for any resulting investigation costs to define the extent of defective areas and to retest to confirm acceptability of repairs.
- .3 Warranty periods for areas requiring repair are to be extended by the amount of time between notification that the remedial work is necessary and the completion of the remedial work, thereafter the warranty/guaranty period will recommence upon completion of the remedial work.
- .4 Warranties/Guaranties are not to be deemed to restrict any liability of the Contractor arising out of any applicable law.
- .5 The more stringent requirements between this specification and the thir party warranty provider shall be adhered to.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Refer to General Conditions.

1.2 PROJECT CLEANLINESS

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by Departmental Representative or other Contractors.
- .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, if required.
- .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 - Waste Management and Disposal.
- .7 Dispose of waste materials and debris off site.
- .8 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .9 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
- .10 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .11 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 construction debris, dirt, and other disfiguration from exterior surfaces.
- .5 Clean roofs and roof drains.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 33 00 – Submittal Procedures.

1.2 REFERENCES

- .1 Definitions:
 - .1 Materials Source Separation Program (MSSP): consists of a series of ongoing activities to separate reusable and recyclable waste material into material categories from other types of waste at point of generation.
- .2 Reference Standards:
 - .1 Public Works and Government Services Canada (PWGSC)
 - .1 2002 National Construction, Renovation and Demolition Non-Hazardous Solid Waste Management Protocol.
 - .2 CRD Waste Management Market Research Report (available from PWGSC's Environmental Services).
 - .3 Sustainable Development Strategy 2007-2009: Target 2.1 Environmentally Sustainable Use of Natural Resources.

1.3 MATERIAL SOURCE SEPARATION PROGRAM (MSSP)

- .1 Before project start-up, prepare Material Source Separation Program and provide separate containers to deposit reusable and/or recyclable materials of the following:
 - .1 Metals.
 - .2 Wood.
 - .3 Rigid insulation.
 - .4 Protection board and roofing membranes.
 - .5 Other materials as indicated in technical sections.
- .2 Provide sufficient on-site facilities and containers for collection, handling, and storage of anticipated quantities of reusable and recyclable materials.
- .3 Locate containers to facilitate deposit of materials without hindering daily operations.

1.4 STORAGE, HANDLING AND PROTECTION

- .1 Protect surface drainage, mechanical and electrical from damage and blockage.
- .2 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated processing facilities.
 - .1 On-site source separation is recommended.
 - .2 Remove co-mingled materials to off site processing facility for separation.
 - .3 Obtain waybills, receipts and/or scale tickets for separated materials removed from site.
 - .4 Materials reused on-site are considered to be diverted from landfill and as such are to be included in all reporting.

1.5 DISPOSAL OF WASTES

- .1 Do not bury rubbish or waste materials.
- .2 Do not dispose of waste into waterways, storm, or sanitary sewers.
- .3 Keep records of construction waste including:
 - .1 Number and size of bins.
 - .2 Waste type of each bin.
 - .3 Total tonnage generated.
 - .4 Tonnage reused or recycled.
 - .5 Reused or recycled waste destination.
- .4 Remove materials on-site as Work progresses.

1.6 SCHEDULING

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

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 APPLICATION

- .1 Materials in separate condition: collect, handle, store on site, and transport off site to an approved and authorized recycling facility. Provide documentation to Departmental Representative to confirm transfer. Provide documentation to confirm that debris that cannot be recycled has gone to an approved landfill. Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

3.2 CLEANING

- .1 Remove tools and waste materials on completion of Work, and leave work area in clean and orderly condition.
- .2 Clean up work area as work progresses.
- .3 Source separate materials to be reused/recycled into specified sort areas.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 31 19 – Project Meetings.
- .2 Section 01 33 00 – Submittal Procedures.
- .3 Section 01 45 00 – Quality Control.

1.2 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-warranty Meeting:
 - .1 Convene meeting one week prior to contract completion with contractor's representative, Departmental Representative, and Consultant, in accordance with Section 01 31 19 - Project Meetings to:
 - .1 Verify Project requirements.
 - .2 Review warranty requirements, and manufacturer's installation instructions.
 - .2 Departmental Representative to establish communication procedures for:
 - .1 Notifying construction warranty defects.
 - .2 Determine priorities for type of defects.
 - .3 Determine reasonable response time.
 - .3 Contact information for bonded and licensed company for warranty work action: provide name, telephone number and address of company authorized for construction warranty work action.
 - .4 Ensure contact is located within local service area of warranted construction, is continuously available, and is responsive to inquiries for warranty work action.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Two weeks prior to Substantial Performance of the Work, submit to the Consultant, four final copies of operating and maintenance manuals in English.
- .3 Provide spare parts, maintenance materials and special tools of same quality and manufacture as products provided in Work.
- .4 Provide evidence, if requested, for type, source and quality of products supplied.

1.4 FORMAT

- .1 Organize data as instructional manual and provide two (2) hard copies as well as in electronic PDF format.
- .2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.
- .3 When multiple binders are used correlate data into related consistent groupings.
 - .1 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 system 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.
 - .1 Bind in with text; fold larger drawings to size of text pages.

1.5 CONTENTS - PROJECT RECORD DOCUMENTS

- .1 Table of Contents for Each Volume: 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.
 - .1 Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.

1.6 PROJECT RECORD DOCUMENTS AND SAMPLES

- .1 Maintain, in addition to requirements in General Conditions, at site for the 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.
 - .1 Provide files, racks, and secure storage.
- .3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual.
 - .1 Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition.
 - .1 Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by Departmental Representative.

1.7 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

- .1 Record information on set of black line opaque drawings, provided by Departmental Representative.
- .2 Provide felt tip marking pens for recording information, maintaining separate colours for each major system.
- .3 Record information concurrently with construction progress.
 - .1 Do not conceal Work until required information is recorded.
- .4 Contract Drawings and shop drawings: legibly mark each item to record actual construction, including:
 - .1 Measured depths of elements of foundation in relation to finish first floor datum.
 - .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
 - .4 Field changes of dimension and detail.
 - .5 Changes made by change orders.
 - .6 Details not on original Contract Drawings.
 - .7 References to related shop drawings and modifications.
- .5 Specifications: mark each item to record actual construction, including:
 - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
 - .2 Changes made by Addenda and change orders.
- .6 Other Documents: maintain manufacturer's certifications, inspection certifications, and field test records, required by individual specifications sections.
- .7 Provide digital photos, if requested, for site records.

1.8 EQUIPMENT AND SYSTEMS

- .1 For each item of equipment and each system include description of unit or system, and component parts.
 - .1 Give function, normal operation characteristics and limiting conditions.
- .2 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- .3 Include manufacturer's printed maintenance instructions.
- .4 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- .5 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- .6 Include test reports as specified in Section 01 45 00 - Quality Control.
- .7 Additional requirements: as specified in individual specification sections.

1.9 MATERIALS AND FINISHES

- .1 Building products, applied materials, and finishes: include product data, with catalogue number, size, composition, and colour and texture designations.
 - .1 Provide information for re-ordering custom manufactured products.
- .2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .3 Moisture-protection and weather-exposed products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .4 Additional requirements: as specified in individual specifications sections.

1.10 MAINTENANCE MATERIALS

- .1 Extra 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 where directed.
 - .4 Receive and catalogue items.
 - .1 Submit inventory listing to Departmental Representative.
 - .2 Include approved listings in Maintenance Manual.
 - .5 Obtain receipt for delivered products and submit prior to final payment.

1.11 WARRANTIES AND BONDS

- .1 Submit, warranty information made available during construction phase, to Departmental Representative for approval prior to each monthly pay estimate.

- .2 Assemble approved information in binder, submit upon acceptance of work and 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 (10) 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.
- .3 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.
- .4 Include information contained in warranty management plan as follows:
 - .1 Provide list for each warranted system indicating:
 - .1 Name of system.
 - .2 Location where installed.
 - .3 Name and phone numbers of manufacturers or suppliers.
 - .4 Warranties and terms of warranty: include five (5) year overall warranty of construction, as described in Section 01 74 00 – Warranties and Bonds. Indicate items that have extended warranties and show separate warranty expiration dates.
 - .5 Cross-reference to warranty certificates as applicable.
 - .6 Starting point and duration of warranty period.
 - .7 Summary of maintenance procedures required to continue warranty in force.
 - .8 Cross-Reference to specific pertinent Operation and Maintenance manuals.
 - .9 Organization, names and phone numbers of persons to call for warranty service.
- .5 Respond in timely manner to oral or written notification of required construction warranty repair work.
- .6 Written verification to follow oral instructions.
 - .1 Failure to respond will be cause for the Departmental Representative to proceed with action against Contractor.

1.12 COMPLETION

- .1 Submit a written certificate that the following have been performed
 - .1 Work has been completed and inspected for compliance with the Contract Documents.

- .2 Defects have been corrected and deficiencies have been completed.
- .3 Equipment and systems have been tested, adjusted, and balanced and are fully operational.
- .4 Operation of systems has been demonstrated to the personnel indicated by the Departmental Representative.
- .5 Work is complete and ready for final inspection.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 11 55 – General Instructions.
- .2 Section 01 47 15 – Sustainable Requirements: Construction.
- .3 Section 01 61 00 - Common Product Requirements.
- .4 Section 01 74 19 – Waste Management and Disposal.
- .5 Section 07 52 00 – Modified Bitumen Membrane Roofing and Waterproofing.
- .6 Section 07 92 00 – Joint Sealants.

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM A123/A123M-[09], Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .2 ASTM D1761-06, Standard Test Methods for Mechanical Fasteners in Wood.
- .2 CSA International
 - .1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
 - .2 CSA O112.9-10, Evaluation of Adhesives for Structural Wood Products (Exterior Exposure).
 - .3 CSA O121-08, Douglas Fir Plywood.
 - .4 CSA O141-05(R2009), Softwood Lumber.
 - .5 CSA O325-07, Construction Sheathing.
 - .6 CAN/CSA-Z809-08, Sustainable Forest Management.
- .3 Forest Stewardship Council (FSC)
 - .1 FSC-STD-01-001-2004, FSC Principle and Criteria for Forest Stewardship.
- .4 National Lumber Grades Authority (NLGA)
 - .1 Standard Grading Rules for Canadian Lumber 2010.
- .5 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
 - .1 SCAQMD Rule 1113-A2011, Architectural Coatings.
 - .2 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.
- .6 Sustainable Forestry Initiative (SFI)
 - .1 SFI-2010-2014 Standard.

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 wood products and accessories, and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Sustainable Design Submittals:
 - .1 Submit in accordance with Section 01 74 15 – Sustainable Requirements: Construction.

1.4 QUALITY ASSURANCE

- .1 Lumber by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
- .2 Plywood, particleboard, OSB and wood based composite panels in accordance with CSA and ANSI standards.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Develop Construction Waste Management Plan related to Work of this Section and in accordance with Section 01 74 19 – Construction Waste Management and Disposal.

Part 2 Products

2.1 FRAMING STRUCTURAL AND PANEL MATERIALS

- .1 Description:
 - .1 Sustainability Characteristics:
 - .1 Lumber, CAN/CSA-Z809 or FSC or SFI certified.
 - .2 Plywood, urea-formaldehyde free, CAN/CSA-Z809 or FSC or SFI certified.
 - .2 Lumber: softwood, S4S, moisture content 19% (S-dry) or less in accordance with following standards:
 - .1 CSA O141.
 - .2 NLGA Standard Grading Rules for Canadian Lumber.
 - .3 Glued end-jointed (finger-jointed) lumber is not acceptable.
 - .4 Framing and board lumber: in accordance with NBC.
 - .5 Furring, blocking, nailing strips, grounds, rough bucks, curbs, fascia backing and sleepers: refer to Wood Framing Notes on Drawings.
 - .1 Board sizes: "Standard" or better grade.
 - .2 Dimension sizes: "Standard" light framing or better grade.
 - .3 Post and timbers sizes: "Standard" or better grade.
 - .6 Plywood, OSB and wood based composite panels: to CSA O325.

- .7 Douglas fir plywood (DFP): to CSA O121, standard construction.

2.2 ACCESSORIES

- .1 Sealants: in accordance with Section 07 92 00 - Joint Sealants:
- .2 General purpose adhesive: to CSA O112.9.
- .3 Nails, spikes and staples: to CSA B111.
 - .1 Use common spiral nails and spiral spikes, except where specified otherwise, for interior work.
 - .2 Fasteners in contact with borate treated lumber: hot-dipped galvanized finished steel.
 - .3 Fasteners in contact with ACQ treated lumber: stainless steel.
- .4 Bolts: complete with nuts and washers. Hot-dipped galvanized finished steel for all fasteners in contact with borate treated lumber or stainless steel for all fasteners in contact with ACQ treated lumber, unless specified otherwise.
- .5 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, recommended for purpose by manufacturer. Refer to notes on Drawings.
- .6 Joist hangers/clips/tie plates: minimum 1 mm thick sheet steel, galvanized ZF001 coating designation. Refer to Wood Framing Notes on Drawings.
- .7 Fastener Finishes:
 - .1 Galvanizing: to ASTM A123/A123M, use galvanized fasteners for exterior work, interior highly humid areas, pressure-preservative, and treated lumber.
 - .2 Stainless steel: use stainless steel for pressure treated wood blocking.
 - .3 Use wood screws into wood substrate.
 - .4 Use self-drilling, self-tapping screws into metal substrate.
- .8 Wood Preservative:
 - .1 Preservative Coating: in accordance with manufacturer's recommendations for surface conditions:
 - .1 Preservative: VOC limit 350 g/L maximum to SCAQMD Rule 1113.
 - .2 Coatings: VOC limit 350 g/L maximum to SCAQMD Rule 1113.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for product 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 Departmental Representative.

3.2 PREPARATION

- .1 Treat surfaces of material with wood preservative, before installation.
- .2 Apply preservative by dipping, or by brush to completely saturate and maintain wet film on surface for minimum 3 minute soak on lumber and one minute soak on plywood.
- .3 Re-treat surfaces exposed by cutting, trimming or boring with liberal brush application of preservative before installation.
- .4 Treat material as follows:
 - .1 Wood fascia backing, curbs, nailers, sleepers on roof deck.

3.3 MATERIAL USAGE

- .1 Roof sheathing:
 - .1 Plywood, DFP sheathing grade, square edge, 16 mm thick, preservative treated.
- .2 Exterior wall sheathing:
 - .1 Plywood, DFP sheathing grade, square edge, 12 mm thick, preservative treated.

3.4 INSTALLATION

- .1 Install members true to line, levels and elevations, square and plumb.
- .2 Construct continuous members from pieces of longest practical length.
- .3 Install spanning members with "crown-edge" up.
- .4 Install wall sheathing in accordance with manufacturer's printed instructions.
- .5 Install roof sheathing as may be required, and in accordance with requirements of NBC.
- .6 Install furring and blocking as required to space-out and support casework, roof finishes, facings, fascia, siding, electrical equipment mounting boards, and other work as required.
- .7 Install nailers, curbs and other wood supports as required and secure using galvanized fasteners.
- .8 Install sleepers as may be required.
- .9 Use dust collectors and high quality respirator masks when cutting or sanding wood panels.
- .10 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
- .11 Countersink bolts where necessary to provide clearance for other work.

3.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 11 55 – General Instructions.
 - .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 11 55 – General Instructions.

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

3.6 PROTECTION

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

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 06 10 00 – Rough Carpentry.
- .2 Section 07 62 00 – Metal Flashing and Trim.
- .3 Section 07 92 00 – Joint Sealants.

1.2 REFERENCES

- .1 Use most recent additions and revisions.
- .2 ASTM International Inc.
 - .1 ASTM D6162-00a, Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fibre Reinforcements.
 - .2 ASTM D6163-00e1, Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fibre Reinforcements.
 - .3 ASTM D6164-05, Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.
- .3 Canadian General Standards Board (CGSB)
 - .1 CGSB 37-GP-9Ma-83, Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing.
 - .2 CGSB 37-GP-56M-80b(A1985), Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing.
 - .3 CAN/CGSB-51.33-M89, Vapour Barrier Sheet, Excluding Polyethylene, for Use in Building Construction.
- .4 Roofing Contractors Association of BC (RCABC)
 - .1 Roofing Practices Manual.
- .5 Canadian Standards Association (CSA International)
 - .1 CSA A123.21-04, Standard Test Method for the Dynamic Wind Uplift Resistance of Mechanically Attached Membrane-Roofing Systems
 - .2 CSA O121-08, Douglas Fir Plywood.
- .6 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .7 Underwriters Laboratories' of Canada (ULC)
 - .1 CAN/ULC-S701-05, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.
- .8 National Building Code of Canada (2010).

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Convene pre-installation meeting one week prior to beginning waterproofing Work, with roofing contractor's representative and Departmental Representative, in accordance with Section 01 33 00 – Submittal Procedures to:
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions.
 - .3 Co-ordination with other building subtrades.
 - .4 Review manufacturer's installation instructions and warranty requirements.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Provide two copies of most recent technical roofing components data sheets describing materials' physical properties and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Provide two copies of WHMIS MSDS in accordance with Section 01 47 15 - Sustainable Requirements: Construction, and indicate VOC content for:
 - .1 Primers.
 - .2 Asphalt.
 - .3 Sealers.
- .3 Provide shop drawings:
 - .1 Indicate flashing details.
 - .2 Provide layout for tapered insulation.
- .4 Samples: submit two (2) sample 304.8 mm (12") long pieces of granulated cap sheet.
- .5 Mock-up:
 - .1 Assemble mock-up of roof system in location acceptable to Departmental Representative showing typical details and all roofing components for review by Departmental Representative.
 - .2 Do not commence roof installation until Departmental Representative has reviewed and approved the mock-up.
 - .3 Upon acceptance, mock-up shall serve as a minimum standard of quality for the balance of the work.
- .6 Manufacturer's Certificate: certify that products meet or exceed specified requirements.
- .7 Test and Evaluation Reports: submit laboratory test reports certifying compliance of membranes with specification requirements.
- .8 Manufacturer's Installation Instructions: indicate special precautions required for seaming the membrane.
- .9 Manufacturer's field report: in accordance with Section 01 45 00 - Quality Control.
- .10 Maintenance Data: Submit data covering the care, cleaning and maintenance as per Section 01 78 23 Maintenance and Renewal Manual.

1.5 QUALITY ASSURANCE

- .1 Installer qualifications: company or person specializing in application of modified bituminous roofing systems with 5 years documented experience.
- .2 Installation of membranes is to be in accordance with manufacturer's written instructions and following Roofing Contractors Association of BC Roofing Practices Manual.
- .3 Sustainability Standards Certification:
 - .1 Refer to Section 01 47 15 – Sustainable Requirements: Construction.

1.6 FIRE PROTECTION

- .1 Fire Extinguishers:
 - .1 Maintain one stored pressure rechargeable type with hose and shut-off nozzle,
 - .2 ULC labelled for A, B and C class protection.
 - .3 Size 9 kg on roof per torch applicator, within 6 m of torch applicator.
- .2 Strictly adhere to all safety guidelines for the torching of modified bituminous membrane.
- .3 Maintain fire watch for 2 hours after each day's roofing operations cease.

1.7 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions and Section 01 61 00 - Common Product Requirements.
- .2 Storage and Handling Requirements:
 - .1 Safety: comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of asphalt, sealing compounds, primers and caulking materials.
 - .2 Provide and maintain dry, off-ground weatherproof storage.
 - .3 Store membrane rolls with salvage edge up.
 - .4 Remove only in quantities required for same day use.
 - .5 Place plywood runways over completed Work to enable movement of material and other traffic.
 - .6 Store insulation protected from daylight, weather, and deleterious materials.

1.8 PRECAUTIONS

- .1 Ambient Conditions
 - .1 Do not install roofing when temperatures remain below -5 degrees C for torch application, or to manufacturers' recommendations.
 - .2 Minimum temperature for solvent-based adhesive is -5 degrees C.
- .2 Install roofing on dry deck, free of snow and ice, use only dry materials and apply only during weather that will not introduce moisture into roofing system.
- .3 All adjacent parts of the building shall be protected from damage caused by roofing operations. Cover walls and other surfaces in the vicinity of hoisting apparatus with

heavy canvas or other suitable protective material. Any damage caused under this contract shall be repaired to match the original materials and appearance.

- .4 Conduct operations so as to leave deck exposed for minimum period of time. Protect, as required, to prevent water infiltration or environmental damage to building interior.
- .5 Where work must continue over finished roofing membrane, protect surface with minimum 12.5 mm thick plywood sheets. Provide plywood runways where required to protect roofing assembly.
- .6 Any sharp projections, that in the opinion of the Departmental Representative may penetrate the membrane, shall be grounded smooth and flush.

1.9 STANDARDS

- .1 In the event that the drawings and specifications differ from the manufacturer's printed instruction, to such a degree that the specified warranties may be affected, consult the Departmental Representatives for their written instructions.

1.10 WARRANTY

- .1 Roofing System Installer Warranty
 - .1 The roof system installer must warrant for a period of five (5) years from the date of Substantial Completion, secured by bond for the first two (2) years. The roof system, as installed, is free from defects in installation workmanship, to include the roof membranes, flashing, insulation, accessories, adhesives, attachments, and sheet metal installation integral to a complete watertight roof system assembly.
 - .2 Provide a written warranty directly to the Departmental Representatives issued on the corporate letterhead, signed and sealed by an authorized signing officer for roof system material and workmanship meeting the following requirements.
 - .3 Make all necessary repairs and replacements, within 48 hours of receipt of written notification, of all defective workmanship and replacement of damaged or affected materials are the responsibility of the roof system installer. All costs associated with the repair or replacement work are the responsibility of the installer.
 - .4 Defects include but are not limited to: : ponding (maximum 2 square meters, maximum 10 mm deep), open seams, lap edges, fishmouths at laps, blisters, splits, delamination, granule loss, excessive weathering due to defective materials or installation workmanship, unbonded areas of the membrane and areas where overheating has resulted in distortion to the reinforcing. Contractor to verify that slope package provides adequate slope before covering with cap sheet.
 - .5 Nothing contained in this article shall be construed as in any way restricting or limiting the liability in common law and statutory liability of the Contractor.
- .2 Roof Membrane Manufactures Warranty
 - .1 Obtain from the membrane manufacturer for and on behalf of the Departmental Representatives a written material warranty stating that the roofing membrane, membrane flashings and adhesives shall: be free of manufacturing defects, not prematurely deteriorate, not debond, degranulate and will not leak for a ten (10)

- year warranty period. Separate Price Items for extended fifteen (15) and twenty (20) year warranty periods covering material, installation and workmanship.
- .2 Warranty shall be issued in the joint names of the Departmental Representatives and Contractor. Contractor to confirm names prior to issuance of warranty.
 - .3 RCABC Members please provide an RCABC Guarantee Request (Separate Price Item):
 - .1 Quality Assurance
 - .1 Workmanship Standards:
 - .1 Conform to latest Guarantee Standards of Roofing Contractors Association of British Columbia (RCABC) as published in the "RGC Roofing Practices Manual", unless modified by contract documents to exceed those minimums.
 - .2 Independent Roof Review:
 - .1 RGC Roof Reviews to be performed by design authority.
 - .2 Perform as required by RCABC under the ten (10) year Guarantee Program.
 - .3 Inspection costs are to be included in the Contract price.
 - .2 Guarantee (If Applicable):
 - .1 Provide the standard Roofing Contractors Association of British Columbia (RCABC) ten (10) year Guarantee.

Part 2 Products

2.1 PERFORMANCE CRITERIA

- .1 Compatibility between components of roofing system is essential. Provide written declaration to Consultant stating that materials and components, as assembled in system, meet this requirement.
- .2 The roofing system shall be installed to resist wind uplift values in accordance with the National Building Code of Canada and shall meet the requirements of CSA A123.21 for wind uplift resistance.

2.2 DECK COVERING

- .1 Plywood:
 - .1 As specified in Section 06 10 00 - Rough Carpentry.

2.3 DECK PRIMER

- .1 Asphalt primer: to CGSB 37-GP-9Ma.
- .2 Primers as recommended by membrane manufacturer for vapour retarder membrane.

2.4 VAPOUR RETARDER

- .1 Self adhesive air/vapour barrier, SBS modified bitumen membrane, laminated to polyethylene facer, with silicone release film, minimum 0.8mm thickness.
- .2 Air leakage through air vapour barrier system within roof area: not to exceed 0.15 l/s*m2 @ 75 Pa.

2.5 INSULATION

- .1 Polyisocyanurate Insulation to CAN/ULC-S704-11, Type 2, Class 3 manufactured using HCFC-free blowing agents and integrally laminated to heavy, non-asphaltic, fiber reinforced, non-organic glass fibre facers. Maximum panel dimension shall be 1219mm.

2.6 FACTORY TAPERED INSULATION AND CRICKETS

- .1 Tapered Polyisocyanurate Insulation to CAN/ULC-S704-11, Type 2, Class 3 manufactured using HCFC-free blowing agents and integrally laminated to heavy, non-asphaltic, fiber reinforced, non-organic glass fibre facers. Maximum panel dimension shall be 1219mm.
- .2 Modules shall be factory cut to correct slopes and clearly marked to match shop drawings.
 - .1 All valley corners shall be factory mitered.
 - .2 Supply factory tapers at all transitions. Leave no steps in insulation due to stepped ends of tapered insulation.
 - .3 Crickets and back slopes shall have a minimum of 2% slope to drain.
 - .4 Slope to zero insulation to be used at all slope transitions. Rigid mineral wool insulation to be used at drain sumps.

2.7 OVERLAY BOARD

- .1 Overlay Board: 4.8 mm thick asphalt based recovery board consisting of asphalt core, between asphalt saturated, non-woven fibreglass facers to CAN/CSA-A247-M, as recommended by the membrane manufacturer.
 - .1 Install one layer of specified overlay board over insulation to provide torch safe surface.

2.8 MEMBRANES

- .1 Base sheet: to CGSB 37-GP-56M, combination of polyester and glass fibres to ASTM D6162.
 - .1 Styrene-Butadiene-Styrene (SBS) elastomeric polymer, prefabricated sheet, fibreglass reinforcement.
 - .2 Type 2, torch applied.
 - .3 Class C - plain surfaced.
 - .4 Grade 2 - heavy duty service.
 - .5 Top and bottom surfaces:
 - .1 Thermofusible film.
 - .6 Base sheet membrane properties: to ASTM D5147.
 - .1 Minimum thickness: 2.5 mm
 - .2 Ultimate elongation (longitudinal/transversal): 50-65 %.
 - .3 Tear resistance (longitudinal/transversal): 125 N min.
 - .4 Cold bending at -26 degrees C : no cracking.
 - .5 Softening point: \geq 110 degrees C.

- .6 Dimensional Stability (longitudinal/transversal): 0.2 % max.
- .2 Cap sheet membrane: to CGSB 37-GP-56M, combination of polyester and glass fibres.
 - .1 Styrene-Butadiene-Styrene(SBS) elastomeric polymer, prefabricated sheet, composite reinforcement.
 - .2 Type 1, torch applied.
 - .3 Class A-granule surfaced.
 - .1 Colour for granular surface: to be selected by Departmental Representative from manufacturer's range of standard colours.
 - .4 Grade 2 - heavy duty service.
 - .5 Bottom surface thermofusible film.
 - .6 Cap sheet membrane properties: to ASTM D5147.
 - .1 Minimum thickness: 4.0 mm.
 - .2 Tensile Strength: 11.4 kN/m min.
 - .3 Ultimate elongation (longitudinal/transversal): 60-65 %.
 - .4 Cold bending at -30 degrees C: No cracking.
 - .5 Static puncture resistance: > 245 N.
 - .6 Dimensional Stability: -0.5 / 0.5 %.
- 2.9 WALKWAYS AND PERIMETER WARNING STRIP**
 - .1 Walkways to consist of one additional ply of cap sheet membrane. Colour to be different from field membrane as selected by Departmental Representative from manufacturer's standard colour range.
 - .2 Perimeter Warning Strip to consist of one additional ply of cap sheet membrane. Colour to be red.
- 2.10 ROOF DRAINS**
 - .1 Roof drains: epoxy coated, cast iron roof drain, with deep sump, membrane clamping ring, and self-locking, vandal-proof aluminum dome strainer.
 - .1 Roof drains to be of same diameter as existing.
- 2.11 REINFORCED PMMA FLASHING**
 - .1 Polymethyl methacrylate (PMMA) based liquid membrane flashing system complete with non-woven, needle punched, polyester fleece reinforcing fabric.
 - .1 Flashing resins and reinforcing fleece shall be made by the same manufacturer and shall be compatible with each other.
 - .2 Contractor to ensure PMMA flashing system is compatible with the membranes onto which they are applied, as well as all other adjacent products.
- 2.12 ROOF HATCH**
 - .1 Roof Hatch: single leaf, steep stair access roof hatch constructed of 2.0 mm (14ga.) steel cover and curb, for roof opening of 762 x 1372 mm (30" x 54").

- .1 Hatch Materials: Cover and frame to be 2 mm (14 gauge) G-90 galvanized steel, shop primed and painted. Paint colour to be selected by Departmental Representative from manufacturer's line of standard colour finishes.
- .2 Cover: Brake-formed, hollow-metal design with 25 mm concealed fiberglass insulation, 76 mm beaded, overlapping flange, fully welded at corners, and internally reinforced for 1.9 kPa live load.
- .3 Curb: Curb to be min. 305 mm in height with integral cap flashing, fully welded corners, and 89 mm mounting flange. Curb to be fully insulated with 25mm rigid insulation board.
- .4 Hardware:
 - .1 Lift Hardware: Engineered composite compression spring tubes and steel compression springs packed in grease. Compression spring operators enclosed in telescopic tubes. Automatic hold-open arm with grip handle release.
 - .2 Hinges: Heavy-duty pintle hinges with 9 mm Type 316 stainless steel hinge pins.
 - .3 Latch: Slam latch with interior and exterior turn handles and padlock hasps.
 - .4 All hardware is zinc plated/chromate sealed.
- .5 Gasket: Extruded EPDM rubber gasket permanently adhered to cover.

2.13 PENETRATION FLASHINGS

- .1 Vent Stack Flashings: spun aluminum sleeve to fit over the vent stack with sufficient space to insulate, spun aluminum cap to fit outside the sleeve and inside the vent stack.
 - .1 The cap is not to restrict the vent stack inside diameter.
- .2 Spray Foam: low expansion, closed cell, polyurethane spray foam insulation intended for use in filling small void spaces, cracks, and joints.

2.14 SEALERS

- .1 Plastic cement: asphalt.
- .2 Sealing compound: rubber asphalt type.
- .3 Sealants: see Section 07 92 00 - Joint Sealants.

2.15 CARPENTRY

- .1 Refer to Section 06 10 00 - Rough Carpentry.

2.16 FASTENERS

- .1 Insulation and overlay board to deck: coated insulation fasteners and galvanized plates must meet CSA A123.21 standard for wind uplift and corrosion resistance.

Part 3 Execution

3.1 QUALITY OF WORK

- .1 Do examination, preparation and roofing Work in accordance with Roofing Manufacturer's Specification Manual and RCABC Roofing Practices Manual, particularly for fire safety precautions, and to CSA A123.21 standards.
- .2 Do priming in accordance with manufacturers written recommendations.
- .3 The interface of the walls and roof assemblies will be fitted with durable rigid material sheet metal providing connection point for continuity of air barrier.
- .4 Assembly, component and material connections will be made in consideration of appropriate design loads, with reversible mechanical attachments.
- .5 Patching of the cap sheet membrane shall be carried out utilizing patches with a minimum size of the roll width by 1000 mm.
- .6 Minimum length of cap sheet on flat run of roof shall not be less than 3000 mm.
- .7 Wrinkled or deformed ends of cap sheet rolls will not be tolerated and therefore must be discarded prior to application.
- .8 Following completion of new roofing, torch soften and apply a liberal application of approved bulk type mineral granules to cap sheet membrane edges where asphalt has extruded or flowed beyond clean lines and to all surface damage.
- .9 Splices in delivered rolls of membrane are to be removed. Cut back the roll 450 mm on both sides of the splices and remove prior to installation.

3.2 EXAMINATION OF ROOF DECKS

- .1 Verification of Conditions:
 - .1 Review deck conditions including parapets, construction joints, roof drains, plumbing vents and ventilation outlets with Departmental Representative, to determine readiness to proceed.
- .2 Evaluation and Assessment:
 - .1 Prior to beginning of work ensure:
 - .1 Decks are firm, straight, smooth, dry, free of snow, ice or frost, and swept clean of dust and debris. Do not use calcium or salt for ice or snow removal.
 - .2 Curbs have been built.
 - .3 Roof drains have been installed at proper elevations relative to finished roof surface.
 - .4 Plywood and lumber nailer plates have been installed to deck, walls and parapets as indicated.
- .3 Do not install roofing materials during rain or snowfall.

3.3 PROTECTION OF IN-PLACE CONDITIONS

- .1 Cover walls and adjacent work where materials hoisted or used.
- .2 Use warning signs and barriers. Maintain in good order until completion of Work.
- .3 Clean off drips and smears of bituminous material immediately.
- .4 Dispose of rain water off roof and away from face of building until roof drains or hoppers installed and connected.
- .5 Protect roof from traffic and damage. Comply with precautions deemed necessary by Departmental Representative.
- .6 At end of each day's work or when stoppage occurs due to inclement weather, provide protection for completed Work and materials out of storage.
- .7 Metal connectors and decking will be treated with rust proofing or galvanization.

3.4 PRIMING DECK

- .1 Apply deck primer to wood deck roofing substrate at the rate recommended by manufacturer.

3.5 VAPOUR RETARDER

- .1 Prime deck as recommended by the membrane manufacturer.
- .2 Install membrane with minimum 75mm side laps and 150mm end laps.
- .3 Apply pressure to membrane surface to ensure adequate adhesion. Avoid fish mouths, buckles, or any other application defect. Stagger end laps by a minimum of 300mm.
- .4 Roll membrane per manufacturer's requirements.
- .5 Overhang vapour retarder at all edges and extend up verticals 400mm minimum or as detailed. Wrap over ends of insulation boards at roof perimeter and penetrations.
- .6 Ensure that vapour retarder at roof edges and vertical building surfaces maintains, together with wall vapour retarder, integrity of vapour retarder system for the building.

3.6 INSULATION

- .1 Insulation:
 - .1 Install insulation in two layers, with joints offset from adjacent layers by min. 300 mm.
 - .2 Place boards in parallel rows with ends staggered, and in firm contact with one another.
 - .3 Cut end boards to suit.
- .2 Tapered insulation application:
 - .1 Install tapered insulation above flat insulation, in accordance with shop drawings. Stagger joints between layers 150 mm minimum.
 - .2 Assess final slope of installed slope package after installation but before installation of roofing materials. Add any sloped insulation materials required to maintain conformity to slopes shown on shop drawings.

- .3 Limit ponding to a maximum 2 square meters, maximum 10 mm deep.
- .4 Final insulation installation to provide complete support to the roof membrane. No tenting or unsupported protection board or roof membrane is permitted. Provide slope to zero tapers, refasten insulation, or remove and reinstall insulation to provide complete and even support to the membrane system.
- .3 Insulation Overlay Board: mechanically fastened:
 - .1 Cap all insulation as detailed with one layer of specified insulation overlay board, mechanically fastened as specified.
 - .2 Install overlay board with joints offset from joints in insulation below by min. 300 mm.
 - .3 Place boards in parallel rows with end joints staggered min. 300 mm.
 - .4 Cut ends to suit.
 - .5 Mechanically fasten overlay board through insulation and into deck using screws and pressure distribution plates.
 - .6 Fasten overlay board and insulation as per manufacturer's written recommendations.
 - .7 Number and pattern of screws per board to meet CSA A123.21 requirements.

3.7 MEMBRANE APPLICATION

- .1 Base sheet application (Torch-applied):
 - .1 Starting at low point of roof, perpendicular to slope, unroll base sheet, align and reroll from both ends.
 - .2 Ensure base sheet is unrolled to enable membrane to relax prior to installation. Time required for relaxation will vary with weather conditions.
 - .3 Unroll and torch base sheet onto substrate taking care not to burn membrane or its reinforcement or substrate.
 - .4 Lap sheets 75 mm minimum for side and 150 mm minimum for end laps.
 - .5 At all head laps where "T" joints occur, cut corner of membrane to be overlapped, on a 45 degree angle.
 - .6 Reinforce around projections and drains using additional ply of base sheet as per manufacturer's instructions.
 - .7 Application to be free of blisters, wrinkles and fishmouths.
 - .8 Seal all joints and adhered all laps as recommended by manufacturer.
- .2 Cap sheet application (Torch-applied):
 - .1 Plan membrane application so that laps are not superimposed over laps of the base sheet. Mark a chalk line where the first course is to start. Unroll 2.0 m to 3.0 m of the membrane and line it up to the chalk line or to selvage edge. Reroll and commence application. If the roll goes out of line by more than 12 mm, cut and realign.
 - .2 With a torch, adhere one-ply of the membrane, granule side up. Carefully heat underside of membrane and slowly unroll. Constantly check adhesion to ensure proper bonding is achieved. Take care not to burn membrane or its reinforcement.

- .3 Side laps shall cover the selvage edge and be a minimum of 75 mm. End laps must be 150 mm.
 - .4 Using a torch and round nosed roofing trowel, embed surface granules into heated and soft bitumen, from the chalk line to the edge of the cap sheet at the top of the horizontal surface (a minimum distance of 200 mm from the edge of the cap sheet).
 - .5 Application to be free of blisters, fishmouths and wrinkles.
 - .6 Do membrane application in accordance with manufacturer's recommendations.
- .3 Membrane Flashings:
- .1 Complete installation of flashing base sheet stripping prior to installing membrane cap sheet.
 - .2 Plan two-ply membrane stripping application so that laps are not superimposed over the laps on the underlying membrane.
 - .3 Install membrane stripping with full roll widths perpendicular to the deck.
 - .4 Install reinforcing gussets at all inside and outside corners as per the manufacturer's recommendations.
 - .5 Install base sheet stripping prior to horizontal cap sheet application. Extend base sheet membrane stripping 150 mm onto horizontal surface and seal by torch weld. Extend base sheet flashing up verticals as indicated on the detail drawings. Set base sheet membrane by adhering for material specified previously.
 - .6 Install cap sheet stripping after application of horizontal cap sheet. Using a chalk line, lay out a straight line on the cap sheet surface. Set line parallel to the roof edge and 250 mm from the base of the wall.
 - .7 Extend cap sheet membrane stripping 250 mm onto horizontal surface and seal by torch weld. Extend cap sheet stripping up verticals as indicated on the detail drawings.
 - .8 Where membrane stripping will overlap onto a granulated membrane surface, first prepare selvage edge of the underlying granulated membrane by embedding the granules.
 - .9 Use a roller to press the membrane stripping for full and continuous contact to the substrate. Ensure air bubbles are removed and ensure wrinkles and fishmouths are not present.
 - .10 At all head laps, where "T" joints occur, cut corner of membrane to be overlapped, on a 45 degree angle. Apply manufacturer approved mastic seal to cover granule portion at overlap areas and to fill the step where the membrane "T" overlaps.
 - .11 Secure all membrane strippings to verticals with continuous securement strips installed along the top edge of membrane strippings and fastened at 225 mm (9") o.c. or as detailed. Lap all strips to the selvage a minimum of 75 mm and seal the laps securely.
 - .12 Properly secure flashings to their support, without sags, blisters, fishmouths or wrinkles.
 - .13 Do work in accordance with manufacturer's recommendations and Section 07 62 00 - Sheet Metal Flashing and Trim.

- .4 Membrane walkways and perimeter warning zone (Cold-adhered):
 - .1 Install walkway membranes in accordance with manufacturer's instructions, and as indicated.
 - .2 Apply primer to cap sheet membrane and torch apply, ensuring selvage edge is removed.
 - .3 Walkways and perimeter warning zone shall be a distinct, additional third ply of membrane, and shall not be incorporated into the 2-ply membrane system.
 - .4 Plan membrane application prior to application of membrane. Mark a chalk line where the first course is to start. Unroll 2.0 m to 3.0 m of the membrane and line it up to the chalk line. Reroll and commence application. If the roll goes out of line by more than 12 mm (½"), cut and realign.
 - .5 Width of walkways and perimeter warning strip to be as indicated on drawings.
 - .6 Provide 150mm (6") breaks in walkways where walkway crosses perpendicular to slope, so as not to impede drainage.
 - .7 Take care to minimize bitumen bleed out at edges of walkways and warning strip. Cast appropriate colour granules in areas with excessive bleed out.
 - .8 Ensure all corners and edges of walkways and warning strips are well adhered to the substrate. Heat weld corners and edges of walkways and warning strips as necessary to achieve good adhesion.

3.8 **STACK VENT PENETRATIONS**

- .1 Install spun aluminum vent stack covers at all existing vent pipes. Extend existing vent pipes as required to a minimum height of 300 mm (12") above the completed membrane surface. Provide sufficient allowance for pipe expansion or contraction.
- .2 Prime aluminum flange, centre over existing vent stack and set into heated base sheet membrane. Flash with one-ply of base sheet membrane for reinforcement, to extend a minimum of 200 mm beyond flange. Complete installation with the application of the cap sheet membrane.
- .3 Seal as detailed.
- .4 Secure caps with self-tapping screws.

3.9 **REINFORCED PMMA FLASHING**

- .1 Preparation of substrates to be in strict accordance with the requirements of the system manufacturer's recommendations and these Contract Documents, whichever is more stringent.
- .2 Surfaces shall be cleaned of all grease and oil with an emulsifier or degreaser where necessary, to ensure that surface contaminants have been removed.
- .3 The coating shall be turned up all vertical surfaces as detailed. Mask top of upturn to ensure neat straight finish to coating.
- .4 Pre-cut fleece to ensure a proper fit at transitions and corners prior to base coat application. Embed fleece reinforcement into base coat with minimum overlap of 50mm (2"). Apply additional lift of base coat between layers of fleece reinforcement.

- .5 Finished surfaces shall be of uniform appearance, with minimal variations in surface roughness.

3.10 ROOF DRAINS

- .1 Set to permit proper drainage and not retard water flow after completion of roof membrane flashings plies.
- .2 Install base sheet, a reinforcing ply of base sheet flashing material to extend 250 mm (10") beyond drain limits and then complete the operation with the cap sheet application over the first two (2) plies.
- .3 Trim roofing membrane and set clamping ring.
- .4 New roof drains to be installed with mechanical compression seal joints to existing plumbing. U-flow seals may be used as temporary drain connectors only, and shall not remain in place for more than five (5) business days.

3.11 COMPLETION OF DAY'S WORK

- .1 Install water cut-offs at the end of each day's work; Construct water cut-off as a permanent insulation cell wall. Note location of each insulation cell on record drawings. Where a day's work is more than 200m², construct additional cell walls in order to keep insulation cells to 200 m² maximum.
- .2 Construct cell dividers using self-adhered or cold applied adhesive base sheet or vapour barrier materials.
- .3 Inspect all laps of the membrane application to ensure they are properly bonded. Repair any deficiencies prior to leaving the site for the day.
- .4 Base sheet applications should not be left exposed overnight unless all seams are sealed prior to leaving the work site.
- .5 Provide a two (2) hour fire watch at the end of each day when torching membrane. Walk the day's entire production area to check for smoke and hot spots.
- .6 Remove progressively from the site all debris created by the execution of Work and dispose of same at certified disposal location. Contractor may be asked to produce proof of disposal location.

3.12 FIELD QUALITY CONTROL

- .1 Inspections:
 - .1 Inspection and testing of roofing application will be carried out by independent inspectors approved by the Roofing Contractors Association of BC and the Departmental Representative.
 - .2 The Departmental Representative reserves the right to have cut tests made to establish quality of work. Such tests shall be made in the presence of the Contractor. Cost of tests and subsequent repairs shall be borne by the Contractor.

3.13 CLEANING

- .1 Remove bituminous markings from finished surfaces.

- .2 In areas where finished surfaces are soiled caused by work of this section, consult manufacturer of surfaces for cleaning advice and complying with their documented instructions.
- .3 Repair or replace defaced or disfigured finishes caused by work of this section.
- .4 Refer to Section 01 74 11 – Cleaning.
- .5 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 – Construction Waste Management and Disposal.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 06 10 00 – Rough Carpentry.
- .2 Section 07 52 00 – Modified Bituminous Membrane Roofing.
- .3 Section 07 92 00 – Joint Sealants.

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A653/A653M-07, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .2 ASTM B32-04, Standard Specification for Solder Metal.
 - .3 ASTM B370-03, Standard Specification for Copper Sheet and Strip for Building Construction.
 - .4 ASTM D822-[01(2006)], Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.
- .2 Roofing Contractors Association of BC (RCABC)
 - .1 Roofing Practices Manual.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .5 Architectural Sheet metal Manual, Sheet metal and Air Conditioning Contractors National Association, Inc (SMACNA).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature for sheet metal flashing systems materials, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Samples:
 - .1 Submit duplicate 50 x 50 mm samples of each type of sheet metal material, finishes and colours.
- .4 Quality assurance submittals: submit following in accordance with Section 01 45 00 - Quality Control.
 - .1 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, and cleaning 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 reuse and recycling, in accordance with Section 01 74 21 - Construction Waste Management Plan.

1.5 MOCK-UP

- .1 Construct mock-up in accordance with Section 01 45 00 – Quality Control.
- .2 Assemble a mock-up of each condition (i.e., cap, saddle, counter-flashings, etc.) on the project site for review and acceptance by the Departmental Representative. Mock-up shall include all components of the system, including typical joints and connection hardware, and typical tie-ins to adjoining systems, all finished as specified.
- .3 Modify the mock-ups at no additional cost to the contract as may be required to meet design and performance requirements.
- .4 Mock-up may be part of finished work upon acceptance by the Departmental Representative.

Part 2 Products

2.1 SHEET METAL MATERIALS

- .1 Sheet copper to ASTM B370, cold rolled temper, weighing not less than 13.4 kg/sq m unless otherwise specified herein.
- .2 G90 galvanized steel sheet: 0.6070 mm (24 gauge) thickness, commercial quality to ASTM A653/A653M, with Z275 designation zinc coating.

2.2 PREFINISHED STEEL SHEET

- .1 Prefinished steel with factory applied silicone modified polyester.
 - .1 Class F1S.
 - .2 Colour and gloss to match existing.
 - .3 Coating thickness: not less than 25 micrometres.
 - .4 Resistance to accelerated weathering for chalk rating of 8, colour fade 7 units or less to ASTM D822 as follows:
 - .1 Outdoor exposure period 1000 hours.
 - .2 Humidity resistance exposure period 1000 hours.

2.3 ACCESSORIES

- .1 Isolation coating: alkali resistant bituminous paint.
- .2 Plastic cement: to CAN/CGSB 37.5.
- .3 Underlay for metal flashing:

- .1 Membrane: 2-ply modified bitumen roofing, or self-adhered, high temperature membrane as recommended by manufacturer with compatible primers and sealants as required.
- .2 Drainage Mat: remove and retain existing drainage mat for reinstallation beneath metal cap flashings, as detailed on the drawings.
- .4 Sealants: refer to Section 07 92 00 – Joint Sealants.
- .5 Cleats and starter strips: of same material, and temper as sheet metal, minimum 50 mm wide. Thickness same as sheet metal being secured.
- .6 Fasteners: of same material as sheet metal, to CSA B111, flat head roofing nails of length and thickness suitable for metal flashing and trim application.
- .7 Washers: of same material as sheet metal, 1 mm thick with rubber packings.
- .8 Touch-up paint: as recommended by prefinished material manufacturer.

2.4 FABRICATION

- .1 Fabricate metal flashings and other sheet metal work in accordance with applicable RCABC and SMACNA details.
- .2 Form flashings, copings and fascias to profiles indicated and as required to complement and finish the membrane installation, with pre-finished sheet steel flashings.
- .3 Form pieces in 2400 mm maximum lengths, using one (1) piece for each flashing section. Make allowance for expansion at joints.
- .4 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.
- .5 Metal flashing shall be formed on a bending brake with shaping trimmed.
- .6 Hand seaming shall be done on a bench, as far as practicable, with proper sheet metal working tools. Angles of bends and folds for interlocking metal shall be made with full regard to expansion and contraction to avoid buckling and damage to metal.

2.5 SADDLE FLASHINGS

- .1 Complete saddle flashing to be shop fabricated, one piece constructed with soldered seams. Seams to be ground smooth, primed and shop painted to match sheet stock.

2.6 COUNTER FLASHINGS

- .1 Form metal counter flashings from pre-finished sheet steel in accordance with RCABC details.
- .2 Counter flashing shall have crimped bottom edge, stiffening break and shall extend up verticals as detailed and extend down to minimum 12 mm above the horizontal plane of the roof surface.

2.7 CAP FLASHINGS

- .1 Remove and retain existing cap flashings for reinstallation, as detailed on the drawings.
- .2 If required to form new metal cap flashings, form cap flashings from pre-finished sheet steel in accordance with RCABC details.

- .3 Form cap flashings to profiles as shown on the detail drawings and ensure positive drainage to the interior (roof surface) areas.

2.8 SCUPPERS

- .1 Form scuppers from copper sheet metal.
- .2 Sizes and profiles as indicated.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 INSTALLATION

- .1 Install sheet metal work in accordance with applicable RCABC specifications.
- .2 Use concealed fastenings throughout, except where approved by the Departmental Representative prior to start of the work.
- .3 Provide underlay beneath sheet metal flashings as detailed.
- .4 Mechanically fasten flashings in place with continuous cleats.
- .5 Use flat-lock folded seams for all joints and splices of thru-cavity flashings. Contractor may use S-lock joints if all surfaces of flashings are sloped greater than 3:1.
- .6 Use standing seams for all corner joints and splices for cap flashings. Flat-lock or S-pocket joints to be used where cap flashings are accessible to occupants.
- .7 Hem exposed edges on underside 12 mm. Mitre and seal corners with sealant.
- .8 Ends of thru-cavity flashing to have 12 mm folded upturn, creating an end dam. Cutting and caulking of upturns will not be accepted.
- .9 Insert metal counter flashing under cap flashing, to form weather tight junction.

3.3 METAL FLASHINGS

- .1 Secure metal flashing with continuous cleats fastened at 300 mm o/c. Use fasteners of sufficient length to penetrate at least 25 mm into substrate.

3.4 COUNTER FLASHINGS

- .1 Install metal counter flashings as soon as possible after membrane flashings are in place and reviewed by the Departmental Representative.
- .2 Secure sections in S-pocket joints and allow sufficient tolerance for expansion and contraction between each piece.
- .3 Secure metal counter flashing a minimum of 300mm above roof membrane or as detailed. Use fasteners of sufficient length to penetrate at least 25mm into substrate.

3.5 CAP FLASHINGS

- .1 Remove and retain metal cap flashings for reinstallation as much as practical. Reinstall metal flashings using existing cleats.
- .2 Where required to replace clips and cleats for cap flashings, supply and install continuous metal cleats, secured at 300 mm o.c., maximum of 50mm above drip edge, with fastener of sufficient length to penetrate a minimum of 25mm into the substrate.

3.6 SCUPPERS

- .1 Install scuppers in accordance with applicable RCABC specifications.
- .2 Provide necessary fastenings.

3.7 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.
- .3 Leave work areas clean, free from grease, finger marks and stains.
- .4 Remove and replace all dented and damaged materials

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 06 10 00 – Rough Carpentry.
- .2 Section 07 52 00 – Modified Bituminous Membrane Roofing.
- .3 Section 07 62 00 – Metal Flashing and Trim.

1.2 REFERENCES

- .1 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-19.13-M87, Sealing Compound, One-component, Elastomeric, Chemical Curing.
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).

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 joint sealants and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Manufacturer's product to describe:
 - .1 Sealant compound.
 - .2 Primers.
 - .3 Submit one copy of WHMIS MSDS in accordance with Section 01 35 33 - Health and Safety Requirements.
- .3 Samples:
 - .1 Submit 2 samples of each type of material and colour.
 - .2 Cured samples of exposed sealants for each colour where required to match adjacent material.
- .4 Manufacturer's Instructions:
 - .1 Submit instructions to include installation instructions for each product used.
- .5 Sustainable Design Submittals:
 - .1 Construction Waste Management:
 - .1 Submit project Waste Management Plan highlighting recycling and salvage requirements.
 - .2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating quantity of construction wastes recycled or salvaged.

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 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.

1.6 SITE CONDITIONS

- .1 Ambient Conditions:
 - .1 Proceed with installation of joint sealants only when:
 - .1 Ambient and substrate temperature conditions are within limits permitted by joint sealant manufacturer or are above 5 degrees C. Should it become necessary to apply sealants below 5 degrees C, consult with the sealant manufacturer and follow their recommendations.
 - .2 Joint substrates are dry.
 - .3 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.
 - .2 Joint-Substrate Conditions:
 - .1 Proceed with installation of joint sealants only after contaminants capable of interfering with adhesion are removed from joint substrates.

Part 2 Products

2.1 SEALANT MATERIALS

- .1 Do not use sealant that emits strong odours, contains toxic chemicals or is not certified as mould resistant in air handling units.
- .2 When low toxicity sealants are not possible, confine usage to areas which off gas to exterior, or are contained behind air barriers.
- .3 Where sealants are qualified with primers use only these primers.

2.2 SEALANT MATERIAL DESIGNATIONS

- .1 Silicones and polyurethane one part: to CAN/CGSB-19.13.
- .2 Preformed compressible and non-compressible back-up materials:
 - .1 Polyethylene, urethane, neoprene or vinyl foam:
 - .1 Extruded closed cell foam backer rod.
 - .2 Size: oversize 30 to 50 %.

- .2 Bond breaker materials:
 - .1 Polyethylene bond breaker tape which will not bond to sealant.
 - .2 Silicone sealant as bond break where polyurethane sealant is to be used.

2.3 SEALANT SELECTION

- .1 Apply one part silicone or polyurethane sealant to the following exterior locations:
 - .1 Metal flashing joints and flashing-to facade joints
 - .2 Penetration flashings and storm collars
 - .3 At junctions of dissimilar material

2.4 JOINT CLEANER

- .1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant in accordance with sealant manufacturer's written recommendations.
- .2 Primer: in accordance with sealant manufacturer's written recommendations.

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 joint sealants 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 SURFACE PREPARATION

- .1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.
- .2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair Work.
- .3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.
- .4 Ensure environmental and site conditions, as recommended by the manufacturer, are suitable for installation of work of this section. .
- .5 Ensure joint surfaces are dry and frost free.
- .6 Prepare surfaces in accordance with manufacturer's directions.

- .7 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.
- .8 Apply bond breaker tape where required to manufacturer's instructions.

3.3 PRIMING

- .1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.
- .2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

3.4 BACKUP MATERIAL

- .1 Apply bond breaker tape where required to manufacturer's instructions.
- .2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

3.5 APPLICATION

- .1 Sealant:
 - .1 Apply sealant in accordance with manufacturer's written instructions.
 - .2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.
 - .3 Apply sealant in continuous beads.
 - .4 Apply sealant using gun with proper size nozzle.
 - .5 Use sufficient pressure to fill voids and joints solid.
 - .6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.
 - .7 Tool exposed surfaces before skinning begins to give slightly concave shape.
 - .8 Remove excess compound promptly as work progresses and upon completion.
- .2 Curing:
 - .1 Cure sealants in accordance with sealant manufacturer's instructions. Sealed joints shall be protected by the Contractor until sealant has sufficiently cured.
 - .2 Do not cover up sealants until proper curing has taken place.

3.6 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
 - .2 Clean adjacent surfaces immediately.
 - .3 Remove excess and droppings, using recommended cleaners as work progresses.
 - .4 Remove masking tape after initial set of sealant.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction Waste Management Plan.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.7 PROTECTION

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

END OF SECTION

APPENDIX A
PRELIMINARY HAZARD ASSESSMENT
FORM



PRELIMINARY HAZARD ASSESSMENT FORM

Project Number:	EZ899-161344/001/TPV
Location:	Sandspit Airport
Date:	July 25, 2016
Name of Departmental Representative:	Jimmy Wong
Name of Client:	PWGSC
Name of Client Project Co-ordinator	PH: ()- -

Site Specific Orientation Provided at Project Location Yes No

Notice of Project Required Yes No

NOTE:
PWGSC REQUIRES A Notice of Project FOR ALL CONSTRUCTION WORK RELATED ACTIVITIES

NOTE:
OHS law is made up of many municipal, provincial, and federal acts, regulations, bylaws and codes. There are also many other pieces of legislation in British Columbia that impose OHS obligations.

Important Notice: This hazard assessment has been prepared by PWGSC for its own project planning process, and to inform the service provider of actual and potential hazards that may be encountered in performance of the work. PWGSC does not warrant the completeness or adequacy of this hazard assessment for the project and the paramount responsibility for project hazard assessment rests with the service provider.

TYPES OF HAZARDS TO CONSIDER	Potential Risk for:				COMMENTS
	PWGSC, OGD's, or tenants		General Public or other contractors		
Examples: Chemical, Biological, Natural, Physical, and Ergonomic					Note: When thinking about this pre-construction hazard assessment, remember a hazard is anything that may cause harm, such as chemicals, electricity, working from heights, etc; the risk is the chance, high or low, that somebody could be harmed by these and other hazards, together with an indication of how serious the harm could be.
Listed below are common construction related hazards. Your project may include pre-existing hazards that are not listed. Contact the Regional Construction Safety Coordinator for assistance should this issue arise.	Yes	No	Yes	No	

Typical Construction Hazards					
Concealed/Buried Services (electrical, gas, water, sewer etc)		X		X	
Slip Hazards or Unsound Footing		Y		X	
Working at Heights		X		X	
Working Over or Around Water		X		Y	
Heavy overhead lifting operations, mobile cranes etc.		Y		Y	
Marine and/or Vehicular Traffic (site		X		Y	



vehicles, public vehicles, etc.					
Fire and Explosion Hazards		X		X	
High Noise Levels		✓		X	
Excavations		X		X	
Blasting		✓		X	
Construction Equipment		X		X	
Pedestrian Traffic (site personnel, tenants, visitors, public)		X		X	
Multiple Employer Worksite		✓		X	Example: Contractor working in an occupied Federal Employee space.

Electrical Hazards					Comments
Contact With Overhead Wires		X		X	
Live Electrical Systems or Equipment		✓		X	
Other:					
Physical Hazards					
Equipment Slippage Due To Slopes/Ground Conditions		X		X	
Earthquake		X		X	
Tsunami		✓		X	
Avalanche		X		X	
Forest Fires		✓		X	
Fire and Explosion Hazards		X		X	
Working in Isolation		X		X	
Working Alone		X		X	
Violence in the Workplace		X		X	
High Noise Levels		X		X	
Inclement weather		X		X	
High Pressure Systems		✓		X	
Other:					
Hazardous Work Environments					
Confined Spaces / Restricted Spaces		X		X	Review and provide confined space assessment(s) from PWGSC or client confined space inventories. Refer to PWGSC Standard on Entry into Confined Spaces. Contact the Regional Construction Safety Coordinator.
Suspended / Mobile Work Platforms		X		X	
Other:					
Biological Hazards					
Mould Proliferations		X		X	
Accumulation of Bird or Bat Guano		X		X	
Bacteria / Legionella in Cooling Towers / Process Water		✓		X	
Rodent / Insect Infestation		X		X	
Poisonous Plants		X		X	
Sharp or Potentially Infectious Objects in Wastes		X		X	



Wildlife					X	
Chemical Hazards						
Asbestos Materials on Site	X		X			If "yes" a pre-project asbestos survey report is required. Provide Contractor with DP – 057 ELF Form 16 "Contractor Notification and Acknowledgement"
Designated Substance Present		X			X	If "yes" a pre-project designated substance survey report is required.
Chemicals Used in work		X			X	
Lead in paint	X		X			If "yes" a pre-project lead survey report is required.
Mercury in Thermostats or Switches		X			X	If "yes" a pre-project mercury survey report is required.
Application of Chemicals or Pesticides		X			X	
PCB Liquids in Electrical Equipment		X			X	
Radioactive Materials in Equipment		X			X	
Other:						
Contaminated Sites Hazards						
Hazardous Waste		X			X	
Hydrocarbons		X			X	
Metals					X	
Other:						

Security Hazards					Comments
Risk of Assault				X	
Other:					
Other Hazards					

Other Compliance and Permit Requirements ¹	YES	NO	Notes / Comments ²
Is a Building Permit required?		X	
Is an Electrical permit required?		X	
Is a Plumbing Permit required?		X	
Is a Sewage Permit required?		X	
Is a Dumping Permit required?		X	
Is a Hot Work Permit required?		X	
Is a Permit to Work required?		X	Mandatory for ALL AFD managed work sites.
Is a Confined Space Entry Permit required?		X	Mandatory
Is a Confined Space Entry Log required		X	Mandatory for all Confined Spaces
Discharge Approval for treated water required		X	

Notes:

(1) Does not relieve Service Provider from complying with all applicable federal, provincial, and municipal laws and regulations.



(2) TBD means To Be Determined by Service Provider.

Service Provider Acknowledgement: We confirm receipt and review of this Pre-Project Hazard Assessment and acknowledge our responsibility for conducting our own assessment of project hazards, and taking all necessary protective measures (which may exceed those cited herein) for performance of the work.			
Service Provider Name	GORDON WATKINS		
Signatory for Service Provider	<i>Gordon Watkins</i>	Date Signed	<i>July 26/16</i>
RETURN EXECUTED DOCUMENT TO PWGSC DEPARTMENTAL REPRESENTATIVE PRIOR TO ANY WORK COMMENCING			

APPENDIX B

PHH ARC ENVIRONMENTAL LTD. REPORT & TESTING RESULTS

The Following report may include information on materials found in the facility that are outside of the Contract Area. Any removal of the hazardous materials that are mentioned in the report is limited to the Contract Area only unless noted elsewhere.



Pre-renovation Hazardous Building Materials Survey Report

**Combined Services Building
Sandspit Airport
Sandspit, BC**



Prepared for:
Public Works and Government Services Canada
641 – 800 Burrard Street
Vancouver, BC V6Z 2V8

Attention: Mr. David Mower
Architectural Technologist

September 21, 2011

PHH ARC Project No. 12166C

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EXECUTIVE SUMMARY

PHH ARC Environmental Ltd. (PHH ARC) was retained by Public Works & Government Services Canada (PWGSC) to conduct a pre-renovation hazardous building materials survey of the Combined Services Building located at the Sandspit Airport, Sandspit, BC. The survey was performed by Hien Nguyen, *Senior Project Coordinator* on September 8, 2011.

The objective of the survey was to identify specified hazardous building materials in preparation for building renovation. The results of this survey are intended to be used in conjunction with a properly developed specification.

Summary of Findings

Hazardous Material	Type / Location
Asbestos-containing building materials (ACMs)	<p>Black window putty applied to the glazing of the man doors.</p> <p>Black window putty applied to the glazing of the overhead sectional doors.</p> <p>Black window putty applied to the glazing of the windows on the North and South facades.</p>
Lead in paints	<p>Cream paint applied to metal man door frames within Stair #2 (Loc. 7) was determined to contain 0.28% lead.</p> <p>Grey paint applied to fire man doors within Stair #2 (Loc. 7) was determined to contain 0.097%.</p> <p>Blue paint applied to metal corrugated panels was determined to contain 0.92% lead.</p> <p>White paint applied to drywall throughout renovation zone was determined to contain 0.19% lead.</p>
Lead products	Solid lead is present in emergency light batteries throughout the building.
Crystalline Silica	Concrete floor throughout the building contains crystalline silica.
Mercury	Mercury vapour is present in light tubes located throughout the building.
Polychlorinated biphenyls (PCBs)	The building has not been re-lamp with new energy efficient light ballast and lamps. Assume all light ballasts throughout the building to contain PCBs.
Halocarbons	Halocarbons were not observed.
Mould	Visible mould was not observed.

EXECUTIVE SUMMARY – CONTINUED

Summary of Recommendations

1. The hazardous materials identified must be safely contained, treated or removed if disturbed by renovation activity.
2. Prior to renovation work, prepare specifications for hazardous material removal. The specifications should include and address the scope of work, safe work practices, risk assessments and personal protective equipment and respiratory protection.
3. Retain a qualified consultant to specify, inspect and verify the successful handling and/or removal of all hazardous materials.
4. Prior to renovation work, remove, transport and dispose of ACMs, lead products, mercury, halocarbons, and PCBs in accordance with all federal and provincial regulations as listed in Appendix I.
5. During renovation work, follow safe work procedures when disturbing leaded paint, cutting or grinding concrete and other items containing crystalline silica in accordance with all federal and provincial regulations as listed in Appendix I.

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1.0 INTRODUCTION AND SCOPE

PHH ARC Environmental Ltd. (PHH ARC) was retained by Public Works & Government Services Canada (PWGSC) to conduct a pre-renovation hazardous building materials survey of the Combined Services Building located at the Sandspit Airport in Sandspit, BC. This report fulfills the requirements of Section 119 of the Workers' Compensation Act and Section 20.112 of the Occupational Health and Safety Regulation. This requires that the Owner report the presence of hazardous materials to the Prime Contractor to identify and eliminate or control hazards at the workplace.

The survey was performed by Hien Nguyen, *Senior Project Coordinator* on September 8, 2011. The surveyor was accompanied by Mr. Warren Foster of Transport Canada during the site work.

The hazardous materials included in this survey were;

- asbestos-containing building materials (ACMs)
- lead in paints and other lead products
- crystalline silica
- mercury
- polychlorinated biphenyls (PCBs)
- halocarbons
- mould

The scope of work was limited to the areas, items and materials designated for renovation ("the renovation zone"). The renovation zone is detailed in the email received from Mr. David Mower of PWGSC on August 31, 2011. The renovation zone included the following areas only:

- Roof including caulking and mastics;
- Exterior man doors including adjacent drywall taping compound on walls only;
- Overhead sectional doors including adjacent drywall taping compound on walls and pipe insulation on pipe fittings only;
- Exterior windows including adjacent drywall taping compound on walls only; and
- Exterior metal corrugated panels.

The objective of the survey was to identify specified hazardous building materials in preparation for building renovation. The results of this survey are intended to be used in conjunction with a properly developed building renovation specification.

2.0 GENERAL METHODOLOGY

A room-by-room survey (rooms, corridors, service areas, exterior, etc) of the renovation zone was conducted to identify the hazardous materials listed in the scope of work. This survey included an intrusive investigation to view concealed conditions behind solid walls, enclosures, shafts and chases.

Representative samples were collected and/or visual observation of the hazardous materials was conducted.

This survey excludes the following:

- owner or occupant articles (e.g. stored items, furniture, appliances, etc.);
- underground materials or equipment (e.g. vessels, drums, underground storage tanks, pipes, etc.); and
- areas, items, building materials outside of the renovation zone.

A unique location number was assigned to each room or homogenous area within the renovation zone. For further information on specific methodologies refer to Appendix V.

3.0 BUILDING INFORMATION

3.1 Description

Item	Details
Construction Date	Circa 1970
Number of Phases	1
Number of Floors	1
Use and Size of Building	Combined Services Building ~11,000 ft ²
Structure	Wood
Exterior Cladding	Metal corrugated panels
HVAC	Ceiling mounted heaters, baseboard electric heaters
Roof	Built-up roofing
Flooring	Vinyl tile, concrete
Interior Walls	Drywall, plywood
Ceilings	Drywall

3.2 Inaccessible Areas

The following areas, locations or systems within the renovation zone were not accessible, operational or energized and were therefore not evaluated or tested as part of this survey.

Area or Room or Systems	Reason
No inaccessible areas or systems encountered	NA

4.0 FINDINGS - IDENTIFIED HAZARDOUS MATERIALS

The following tables describe the hazardous materials identified in this survey. For complete test results (including materials determined to be a non-hazardous material), refer to Appendix II.

Table 1 Asbestos-containing Materials

System / Material	Locations	Sample #s)	Asbestos Content / Type	Estimated Quantity
Other: Black window putty applied to the glazing of the man doors.	Throughout the renovation zone.	S006	5% Chrysotile	4 each
Other: Black window putty applied to glazing of the overhead sectional doors.	Throughout the renovation zone.	S007	5% Chrysotile	5 each
Other: Black window putty applied to glazing of the windows on the North and South facades.	Throughout the renovation zone.	VS007	5% Chrysotile	23 each

Table 2 Lead in Paint¹

Component or Substrate and Colour	Location(s)	Sample #s)	Test Result (%)	Estimated Quantity
Metal man door frame, cream	Stair #2	LB02	0.28	7 each 175 ft ²
Metal fire man door, grey	Stair #2	LB04	0.097	7 each 224 ft ²
Metal corrugated panels, blue	Exterior	LB05	0.92	Throughout renovation zone.

¹ WorkSafe BC has stated that lead concentrations as low as 0.009% (90 mg/kg) may present a risk to pregnant women and children. For lead in paints greater than or equal to 0.009%, refer to Appendix II-D.

Component or Substrate and Colour	Location(s)	Sample #(s)	Test Result (%)	Estimated Quantity
Drywall, white	Throughout the renovation zone.	LB08	0.19	Throughout renovation zone.

Table 3 Lead Products

Component	Estimated Quantity	Locations
Back-up emergency lights, lead-acid batteries.	All	Throughout the building.

Table 4 Crystalline Silica

Component	Locations
Concrete floor.	Throughout the building.

Table 5 Mercury

Component	Estimated Quantity	Locations
Light tubes	All	Throughout the building.

Table 6 Polychlorinated Biphenyls

Type	Estimated Quantity	Locations	Conclusions
Ballasts within light fixtures.	All	Throughout renovation zone.	The building has not been re-lamp with new energy efficient light ballast and lamps. Assume all light ballasts throughout the building to contain PCBs.

5.0 RECOMMENDATIONS

1. The hazardous materials identified must be safely contained, treated or removed if disturbed by renovation activity.
2. Prior to renovation work, prepare specifications for hazardous material removal. The specifications should include and address the scope of work, safe work practices, risk assessments and personal protective equipment and respiratory protection.
3. Retain a qualified consultant to specify, inspect and verify the successful handling and/or removal of all hazardous materials.
4. Prior to renovation work, remove, transport and dispose of ACMs, lead products, mercury and PCBs in accordance with all federal and provincial regulations as listed in Appendix I.
5. During renovation work, follow safe work procedures when disturbing leaded paint, cutting or grinding concrete and other items containing crystalline silica in accordance with all federal and provincial regulations as listed in Appendix I.

6.0 STANDARD LIMITATIONS

The work performed by PHH ARC was conducted in accordance with generally accepted engineering or scientific practices current in this geographical area at the time the work was performed. No warranty is either expressed or implied by furnishing written reports or findings. The Client acknowledges that subsurface and concealed conditions may vary from those encountered or inspected. PHH ARC can only comment on the environmental conditions observed on the date(s) the survey is performed. The work is limited to those materials or areas of concern identified by the Client or outlined in our proposal. Other areas of concern may exist but were not investigated within the scope of this assignment.

PHH ARC makes no other representations whatsoever, including those concerning the legal significance of its findings, or as to other legal matters touched on in this report, including, but not limited to, ownership of any property, or the application of any law to the facts set forth herein. With respect to regulatory compliance issue, regulatory statutes are subject to interpretation and these interpretations may change over time. PHH ARC accepts no responsibility for consequential financial effects on transactions or property values, or requirements for follow-up actions and costs.

The liability of PHH ARC, or its staff, will be limited to the lesser of the fees paid or actual damages incurred by the Client. PHH ARC will not be responsible for any consequential or indirect damages. PHH ARC is only liable for damages resulting from negligence of PHH ARC. All claims by the Client shall be deemed relinquished if not made within two years after last date of services provided.

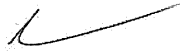
Information provided by PHH ARC is intended for Client use only. PHH ARC will not provide results or information to any party unless disclosure by PHH ARC is required by law. Any use by a third party of reports or documents authored by PHH ARC or any reliance by a third party on or decisions made by a third party based on the findings described in said documents, is the sole responsibility of such third parties. PHH ARC accepts no responsibility for damages suffered by any third party as a result of decisions made or actions conducted. No other warranties are implied or expressed.

7.0 CLOSURE

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APPENDIX I
REFERENCES

1. Occupational Health and Safety Regulation, (B.C. Reg. 296/97, as amended), under WorkSafe BC.
2. Safe Work Practices for Handling Asbestos, WorkSafe BC, 2006 Edition.
3. Hazardous Waste Regulation, BC Ministry of Environment; including amendments up to B.C. Reg. 261/2006, September 21, 2006.
4. Ozone Depleting Substances and Other Halocarbons Regulation, B.C. Reg. 220/2006, Environmental Management Act.
5. PCB Regulations, SOR/2008-273, Canadian Environmental Protection Act.
6. Lead-Containing Paint and Coatings, Preventing Exposure in the Construction Industry, Worksafe BC, June 2011.
7. Transportation of Dangerous Goods Regulations SOR/2008-34, Transportation of Dangerous Goods Act.
8. Federal Register, 40 CFR Part 745 Lead; Identification of Dangerous Levels of Lead; Final Rule, Environmental Protection Agency, January 5, 2001.

APPENDIX II

HAZARDOUS MATERIALS TESTING RESULTS

APPENDIX II-A
SUMMARY OF NON-ASBESTOS MATERIALS

Summary of Non-asbestos Materials

Material	Sample #(s)	Locations
Floor: Vinyl floor tiles.	S005	Stair #2 (Loc. 7)
Floor: Mastic on underside of floor tiles.* * The results apply to only the areas in which mastic was sampled, and cannot be extrapolated to areas where similar vinyl floor tile is present.	S005	Stair #2 (Loc. 7)
Ceiling: Drywall.	VS009A-E	Stair #1 (Loc.2) and Stair #2 (Loc.7)
Wall: Perimeter drywall.	S009A-F	Throughout renovation zone.
Structure: Firestop material at wall and floor penetrations.	NA	None observed.
Pipe: Parging cement on pipe fittings.	S012A-B	Maintenance Garage (Loc. 1) and Fire Hall (Loc. 5)
Pipe: Parging cement on pipe fittings.	S013A-B	Maintenance Garage (Loc. 1)
Pipe: Preformed insulation on straight sections of hot and cold water system pipes.	Fibreglass Insulation	Throughout renovation zone.
Pipe: Cement.	NA	None Observed
Pipe: Tar mastic.	NA	None Observed
Duct: Paper wrap.	NA	None Observed
Mechanical: Preformed insulation.	NA	None Observed
Other: Roofing material.	S001	Rooftop (Loc. 8)
Other: Roofing material	S002	Lower level Rooftop (Loc. 9)
Other: Grey caulking	S003	Rooftop (Loc. 8)
Other: Yellow caulking.	S004	Rooftop (Loc. 8)
Other: Black mastic	S008	Rooftop (Loc. 8)

Material	Sample #(s)	Locations
Other: Grey window caulking	S010	ECG/Lecture Office (Loc. 3)
Other: Black window putty	S011	Chief Office (Loc. 4)

APPENDIX II-B
ASBESTOS SAMPLING LOG

Asbestos Sampling Log / Homogeneous Materials

Homogeneous Material*	Sample No.	Location
Other: Roofing material	S001	Rooftop (Loc. 8)
Other: Roofing material	S002	Rooftop (Loc. 9)
Other: Grey caulking (on heater vent on roof)	S003	Rooftop (Loc. 8)
Other: Yellow caulking (on heater vent on roof)	S004	Rooftop (Loc. 8)
Flooring: Vinyl floor tile, 12x12, beige with grey streaks	S005	Stair #2 (Loc. 7)
Other: Black window putty	S006	Stair #2 (Loc. 7)
Other: Black window putty	S007	Maintenance Garage Door #2 (Loc. 1)
Other: Black Mastic (around roof hatch)	S008	Rooftop (Loc. 8)
Wall: Perimeter drywall	S009A-F	Throughout renovation zone
Other: Grey window caulking	S010	ECG/Lecture Office (Loc. 3)
Other: Black window putty	S011	Chief Office (Loc. 4)
Pipe: Parging cement on drain water pipe	S012A-B	Maintenance Garage Door #1 (Loc. 1)
Pipe: Parging cement on hot and cold water	S013A-B	Maintenance Garage (Loc. 1)

* A homogenous material is defined as material that is uniform in texture and appearance, was installed at one time, and is unlikely to consist of more than one type or formulation of material.

APPENDIX II-C

ASBESTOS LABORATORY CERTIFICATE



Bulk Asbestos Analysis

By Polarized Light Microscopy
EPA Method: 600/R-93/116 and 600/M4-82-020



NVLAP Lab Code: 200664-0

Customer: PHH ARC Environmental
Suite 406-13251 Delf Place
Richmond, BC V6V2A2

Attn: Hien Nguyen
Bryan Zecchel

Lab Order ID: 1112881

Analysis ID: 1112881PLM

Date Received: 9/13/2011

Date Reported: 9/14/2011

Project: Combined Services Building Sands

Sample ID	Description	Asbestos	Fibrous Components	Non-Fibrous Components	Attributes
Lab Sample ID	Lab Notes				Treatment
S001 - A	Roofing material, Combined Services Building	None Detected	10% Fiber Glass	90% Other	Gray, Black Non Fibrous Heterogeneous
1112881PLM_1	shingle				Dissolved
S001 - B	Roofing material, Combined Services Building	None Detected	98% Cellulose	2% Other	Brown Fibrous Homogeneous
1112881PLM_21	insulation				Teased
S001 - C	Roofing material, Combined Services Building	None Detected	70% Cellulose	30% Other	Black Non Fibrous Heterogeneous
1112881PLM_22	felt				Dissolved
S001 - D	Roofing material, Combined Services Building	None Detected		100% Other	White Non Fibrous Homogeneous
1112881PLM_23	foam				Ashed
S002 - A	Roofing material, lower level front roof, Combined Services Building	None Detected	10% Fiber Glass	90% Other	Gray, Black Non Fibrous Heterogeneous
1112881PLM_2	shingle				Dissolved
S002 - B	Roofing material, lower level front roof, Combined Services Building	None Detected	98% Cellulose	2% Other	Brown Fibrous Homogeneous
1112881PLM_24	insulation				Teased
S002 - C	Roofing material, lower level front roof, Combined Services Building	None Detected	70% Cellulose	30% Other	Black Non Fibrous Heterogeneous
1112881PLM_25	felt				Dissolved
S002 - D	Roofing material, lower level front roof, Combined Services Building	None Detected		100% Other	White Non Fibrous Homogeneous
1112881PLM_26	foam				Ashed

Disclaimer: Due to the nature of the EPA 600 method, asbestos may not be detected in samples containing low levels of asbestos. We strongly recommend that analysis of floor tiles, vermiculite, and/or heterogeneous soil samples be conducted by TEM for confirmation of "None Detected" by PLM. This report relates only to the samples tested and may not be reproduced, except in full, without the written approval of SAL. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. government. Estimated MDL is 0.1%.

Bart Huber (27)

Analyst

Nathaniel Durham, MS or Approved Signatory



Bulk Asbestos Analysis

By Polarized Light Microscopy
EPA Method: 600/R-93/116 and 600/M4-82-020



NVLAP Lab Code: 200664-0

Customer: PHH ARC Environmental
Suite 406-13251 Delf Place
Richmond, BC V6V2A2

Attn: Hien Nguyen
Bryan Zecchel

Lab Order ID: 1112881

Analysis ID: 1112881PLM

Date Received: 9/13/2011

Date Reported: 9/14/2011

Project: Combined Services Building Sands

Sample ID	Description	Asbestos	Fibrous Components	Non-Fibrous Components	Attributes
Lab Sample ID	Lab Notes				Treatment
S003	Grey caulking on infrared heater vent on the roof, Combined Services Bldg	None Detected	5% Fiber Glass	95% Other	Gray Non Fibrous Homogeneous
1112881PLM_3					Dissolved
S004	Yellow caulking on infrared heater vent on the roof, Combined Services Bldg	None Detected		100% Other	Yellow Non Fibrous Homogeneous
1112881PLM_4					Dissolved
S005 - A	VFT (12x12 beige w/grey streaks) + black mastic within stair #2, Combined Services	None Detected		100% Other	Beige Non Fibrous Homogeneous
1112881PLM_5	tile				Dissolved
S005 - B	VFT (12x12 beige w/grey streaks) + black mastic within stair #2, Combined Services	None Detected		100% Other	Black Non Fibrous Homogeneous
1112881PLM_27	mastic				Dissolved
S006	Black Window Putty Loc. Exterior Door to Stair #2	5% Chrysotile	5% Cellulose	90% Other	Black Non Fibrous Heterogeneous
1112881PLM_6					Dissolved
S007	Window Putty Loc. Exterior Garage #2 Door	5% Chrysotile		95% Other	Gray Non Fibrous Heterogeneous
1112881PLM_7					Dissolved
S008	Black Mastic Loc. Around Roof Hatch	None Detected		100% Other	Black Non Fibrous Homogeneous
1112881PLM_8					Dissolved
S009A	DTC Perimeter Wall Loc. Above Exit Door at the Stair	None Detected		100% Other	White Non Fibrous Homogeneous
1112881PLM_9					Crushed

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Bart Huber (27)

Analyst

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Nathaniel Durham, MS or Approved Signatory

Page 2 of 4



Bulk Asbestos Analysis

By Polarized Light Microscopy
EPA Method: 600/R-93/116 and 600/M4-82-020



NVLAP[®]
NVLAP Lab Code: 200664-0

Customer: PHH ARC Environmental
Suite 406-13251 Delf Place
Richmond, BC V6V2A2

Attn: Hien Nguyen
Bryan Zecchel

Lab Order ID: 1112881

Analysis ID: 1112881PLM

Date Received: 9/13/2011

Date Reported: 9/14/2011

Project: Combined Services Building Sands

Sample ID	Description	Asbestos	Fibrous Components	Non-Fibrous Components	Attributes
Lab Sample ID	Lab Notes				Treatment
S009B	DTC Perimeter Wall Loc. Maintenance Garage	None Detected		100% Other	White Non Fibrous Homogeneous
1112881PLM_10					Crushed
S009C	DTC Perimeter Wall Loc. Chief Office	None Detected		100% Other	White Non Fibrous Homogeneous
1112881PLM_11					Crushed
S009D	DTC South Perimeter Wall Loc. Fire Hall	None Detected		100% Other	White Non Fibrous Homogeneous
1112881PLM_12					Crushed
S009E	DTC Perimeter Wall Loc. Staircase #1	None Detected		100% Other	White Non Fibrous Homogeneous
1112881PLM_13					Crushed
S009F	DTC Perimeter Wall Loc. Garage	None Detected		100% Other	White Non Fibrous Homogeneous
1112881PLM_14					Crushed
S010	Exterior Grey Window Caulking Loc. ECG/Liture Office	None Detected		100% Other	Gray Non Fibrous Homogeneous
1112881PLM_15					Ashed
S011	Black Window Putty Loc. Chief Office	None Detected		100% Other	Black Non Fibrous Heterogeneous
1112881PLM_16					Dissolved
S012A	Parging Cement On Drain Water Pipe Elbow Loc. Above Garage Door #1	None Detected	10% Cellulose 5% Fiber Glass	85% Other	Gray Non Fibrous Homogeneous
1112881PLM_17					Crushed

Disclaimer: Due to the nature of the EPA 600 method, asbestos may not be detected in samples containing low levels of asbestos. We strongly recommend that analysis of floor tiles, vermiculite, and/or heterogeneous soil samples be conducted by TEM for confirmation of "None Detected" by PLM. This report relates only to the samples tested and may not be reproduced, except in full, without the written approval of SAL. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. government. Estimated MDL is 0.1%.

Bart Huber (27)

Analyst

Nathaniel Durham, MS or Approved Signatory



Bulk Asbestos Analysis

By Polarized Light Microscopy
EPA Method: 600/R-93/116 and 600/M4-82-020



NVLAP Lab Code: 200664-0

Customer: PHH ARC Environmental
Suite 406-13251 Delf Place
Richmond, BC V6V2A2

Attn: Hien Nguyen
Bryan Zecchel

Lab Order ID: 1112881

Analysis ID: 1112881PLM

Date Received: 9/13/2011

Date Reported: 9/14/2011

Project: Combined Services Building Sands

Sample ID	Description	Asbestos	Fibrous Components		Non-Fibrous Components		Attributes
Lab Sample ID	Lab Notes						Treatment
S012B	Parging Cement On Drain Water Elbow Loc. Above Garage Door #1	None Detected	10%	Cellulose	85%	Other	Gray Non Fibrous Homogeneous
1112881PLM_18			5%	Fiber Glass			Crushed
S013A	Parging Cement On Hot and Cold Water Loc. Garage	None Detected	10%	Cellulose	85%	Other	Gray Non Fibrous Homogeneous
1112881PLM_19			5%	Fiber Glass			Crushed
S013B	Parging Cement On Hot and Cold Water Loc. Garage	None Detected	10%	Cellulose	85%	Other	Gray Non Fibrous Homogeneous
1112881PLM_20			5%	Fiber Glass			Crushed

Disclaimer: Due to the nature of the EPA 600 method, asbestos may not be detected in samples containing low levels of asbestos. We strongly recommended that analysis of floor tiles, vermiculite, and/or heterogeneous soil samples be conducted by TEM for confirmation of "None Detected" by PLM. This report relates only to the samples tested and may not be reproduced, except in full, without the written approval of SAL. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. government. Estimated MDL is 0.1%.

Bart Huber (27)

Analyst

Nathaniel Durham, MS or Approved Signatory

APPENDIX II-D

LEAD LABORATORY CERTIFICATE



Analysis for Lead Concentration in Paint Chips



by Flame Atomic Absorption Spectroscopy
EPA SW-846 3rd Ed. Method No. 3050B/Method No. 7420

Customer: PHH ARC Environmental
Suite 406-13251 Delf Place
Richmond BC V6V2A2

Attn: Hien Nguyen

Lab Order ID: 1112886

Analysis ID: 1112886_PBP

Date Received: 9/13/2011

Date Reported: 9/15/2011

Project: 12166C Combined Services Building

Sample ID	Description	Mass	Analytical Sensitivity	Concentration
Lab Sample ID	Lab Notes	(g)	(% by weight)	(% by weight)
LB01	Cap flashing loc roof top	0.0253	0.002%	0.006%
1112886PBP_1				
LB02	Cream on metal door frame loc stair #2	0.0639	0.002%	0.28%
1112886PBP_2				
LB03	Blue on fire door loc stair #2	0.0543	0.002%	0.048%
1112886PBP_3				
LB04	Grey on fire door loc stair #2	0.0278	0.005%	0.097%
1112886PBP_4				
LB05	Blue/white exterior metal ladding loc outside exterior	0.0502	0.003%	0.92%
1112886PBP_5				
LB06	White on garage metal door frame loc garage door #1	0.0644	0.002%	0.049%
1112886PBP_6				
LB07	White on galvanized garage door loc garage door #2	0.0539	0.002%	<0.007%
1112886PBP_7				
LB08	White on DTC perimeter wall loc stair #2	0.0505	0.003%	0.19%
1112886PBP_8				
LB09	Off white exterior metal cladding loc exterior combined building	0.1051	0.001%	0.007%
1112886PBP_9				

Scientific Analytical Institute successfully participates in the AIHA ELPAT for Lead program. ELPAT Laboratory ID: 173190 (R.L. = 0.01 wt.%)
The quality control samples run with the samples in this report have passed all AIHA required specifications unless otherwise noted.

Robert Duke (9)

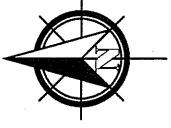
Analyst

Approved Signatory

Scientific Analytical Institute, Inc. 302-L Pomona Dr. Greensboro, NC 27407 (336) 292-3888

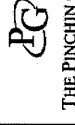
APPENDIX III

DRAWINGS



LEGEND

- XX LOCATION NUMBER
- ASBESTOS BULK SAMPLE NUMBER
- LEAD BULK SAMPLE NUMBER



THE PINCHIN GROUP

CLIENT:

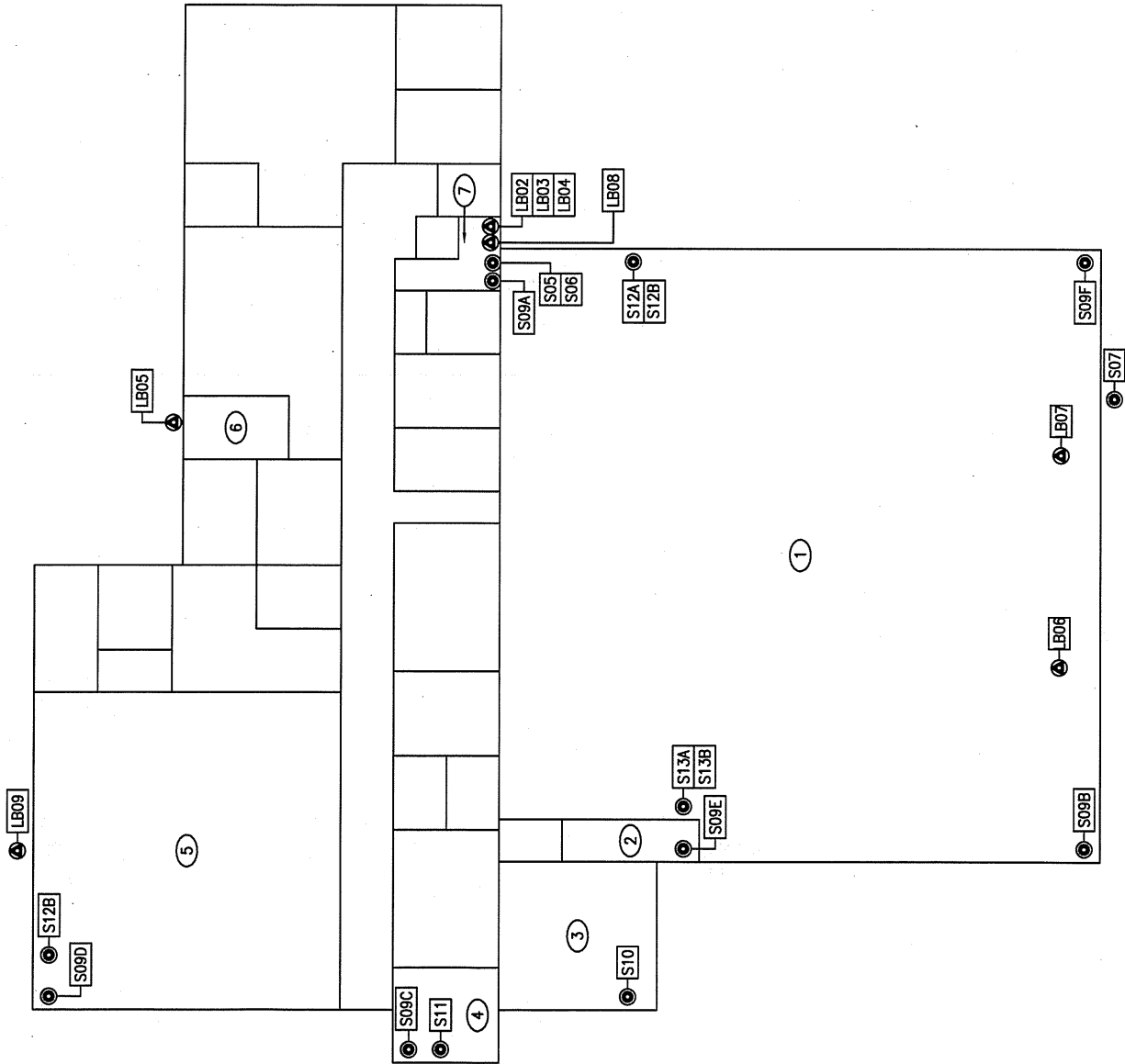
PUBLIC WORKS AND
GOVERNMENT SERVICES
CANADA

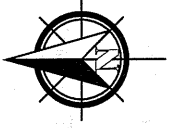
641 - 800 BARRARD ST
VANCOUVER, BC V6Z 2V8

DRAWING NAME:

MAIN LEVEL
#18 COMBINED SERVICES BUILDING
SANDSPIT, BC

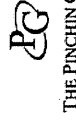
SCALE: N/S	DRAWN BY: RUB	PROJECT NO: 12166C
DATE: SEP 2011	CHECKED BY: HN	DRAWING NO: 1 of 2





LEGEND

- XX LOCATION NUMBER
- ⊙ ASBESTOS BULK SAMPLE NUMBER
- ⊙ LEAD BULK SAMPLE NUMBER



THE PINCHIN GROUP



CLIENT:

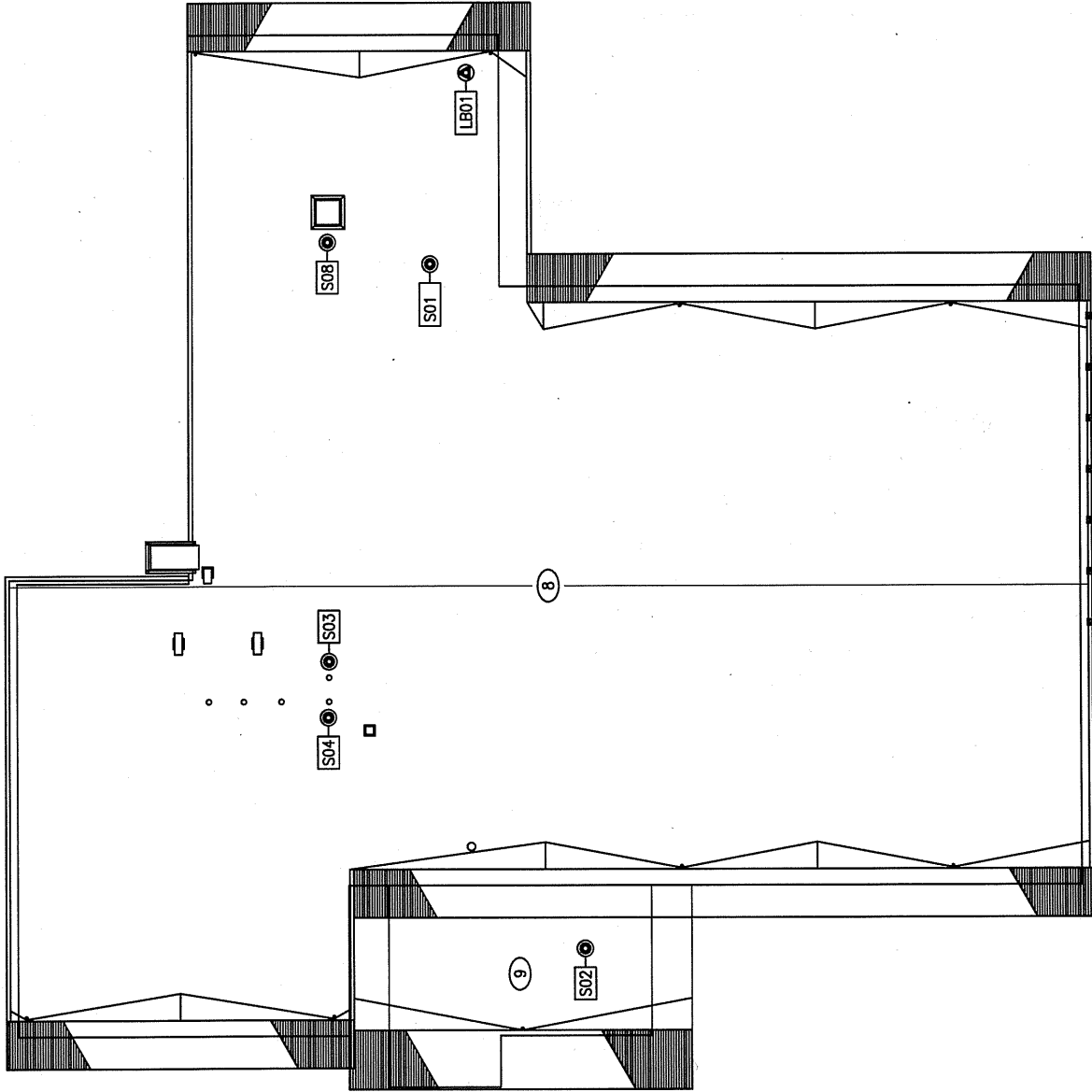
PUBLIC WORKS AND
GOVERNMENT SERVICES
CANADA

641 - 800 BARRARD STREET
VANCOUVER, BC V6Z 2V8

DRAWING NAME:

ROOF
#18 COMBINED SERVICES BUILDING
SANDESPIT, BC

SCALE:	DRAWN BY:	PROJECT NO:
NTS	RJB	12166C
DATE:	CHECKED BY:	DRAWING NO:
SEP 2011	HN	2 of 2



APPENDIX IV

PHOTOGRAPHS



Typical asbestos-containing black window putty applied to glazing of the exterior man doors.



Typical asbestos-containing black window putty applied to glazing of the exterior overhead sectional doors.



Typical asbestos-containing black window putty applied to the glazing of windows on the North and South facades

APPENDIX V

SPECIFIC METHODOLOGIES

ASBESTOS-CONTAINING MATERIALS (ACMs)

Each room or area was categorized into system groups and was further sub-categorized into building materials suspected to contain asbestos as follows:

Systems and Materials	
Floor (e.g. floor tiles, vinyl sheet flooring)	Pipe (e.g. pipe insulation, insulating cement)
Ceiling (e.g. texture coat, ceiling tiles, drywall)	Duct (e.g. insulating cement)
Wall (e.g. drywall, plaster)	Mechanical (e.g. pre-formed insulation, insulating cement)
Structure (e.g. fireproofing, thermal insulation)	Miscellaneous (e.g. debris, cement board)

A separate set of samples was collected of each type of homogenous material suspected to contain asbestos. A homogenous material is defined as material that is uniform in texture and appearance, was installed at one time, and is unlikely to consist of more than one type or formulation of material. Samples were collected at a rate that was in compliance with the requirements of local regulations and guidelines. A sample log of homogeneous materials has been included in Appendix II-B.

The approximate quantity, location and sample locations of suspect ACMs were recorded. Available information on the phases of the construction/renovation and as-built drawings was utilized. Historical information on the use of asbestos in building materials and time frames for the likely presence of asbestos in these materials was taken into consideration.

All bulk samples were submitted to a National Voluntary Laboratory Accreditation Program (NVLAP) accredited laboratory for analysis. The asbestos analysis was completed using a stop positive approach. Stop positive means samples in a homogenous material sample set were analyzed consecutively and when a sample was identified as asbestos-containing, further sample analysis within that sample set was not completed.

Table A - Definitions of Asbestos

Jurisdiction	Percent of asbestos in material
British Columbia	1% (some material with <1% may still require special handling).

LEAD IN PAINT

Paints were either tested with a direct reading X-ray Fluorescence Analyzer (XRF) or by bulk sampling and laboratory analysis.

Table B - Criteria for Lead in Paint

Jurisdiction	Lead by Weight (%)	Lead by Weight (mg/kg)	Lead by Unit Area (mg/cm ²)
British Columbia	0.06*	600*	0.08**
Alberta	0.5	5,000	1.0
Saskatchewan	0.5	5,000	1.0
Yukon	0.5	5,000	1.0
North West Territories	0.06	600	0.08**
Federal	0.5	5,000	1.0

* Worksafe BC has adopted the position that the removal of paint with a lead concentration as low as 0.06% (600 mg/kg) by aggressive techniques (i.e. abrasive blasting) can approach the occupational exposure limit. Worksafe BC has also stated that lead concentrations as low as 0.009% (90 mg/kg) may present a risk to pregnant women and children.

** Based on internal studies performed by PHH ARC.

LEAD PRODUCTS

Lead building products (e.g. batteries, lead sheeting, flashings) are assumed to contain lead and sampling for laboratory analysis was not performed. Glazing on ceramic tiles and pointing mortar on exterior masonry was tested by sampling and laboratory analysis.

CRYSTALLINE SILICA

Building materials suspected of containing crystalline silica (e.g. concrete, cement, tile, brick, masonry, mortar) were identified by knowledge of current and historic applications

and visual inspection only. Sampling of these materials for laboratory analysis of crystalline silica content was not performed.

MERCURY

Building materials/products/equipment (e.g. thermostats, barometers, pressure gauges, light tubes), suspected to contain mercury were identified by visually inspection only. Sampling of these materials for laboratory analysis of mercury content was not performed.

POLYCHLORINATED BIPHENYLS (PCBs)

Light ballast and wet transformers suspected to contain PCB's were determined based on the age of the building, a review of maintenance records and examination of labels on equipment where present and accessible. Light ballasts and wet transformers installed prior the manufacture end date (1980) of PCBs have been detailed in Section 4.0 of this report. Any light ballasts and wet transformers are presumed to be non-PCB if installed after the manufacture end date (1980). Dry transformers are presumed to be free of fluids and hence non-PCB. Sampling of suspect PCB-containing materials for laboratory analysis of PCB content was not performed.

HALOCARBONS

Air conditioning units, chillers and fire suppression systems (fixed and portable) suspected of containing halocarbons was determined by visual inspection of manufactures labels and maintenance records only.

MOULD

Building materials suspected of mould growth were determined through visual observation only. Suspect visible mould was quantified.

APPENDIX C

CANADIAN CLIMATE NORMALS
SANDSPIT AIRPORT, SANDSPIT, BC



Climate

Home > Data > Climate Normals & Averages

Canadian Climate Normals 1981-2010 Station Data

Temperature and Precipitation Charts Normals Data Station / Element Metadata Calculation Information

The minimum number of years used to calculate these Normals is indicated by a code for each element. A "+" beside an extreme date indicates that this date is the first occurrence of the extreme value. Values and dates in bold indicate all-time extremes for the location.

Data used in the calculation of these Normals may be subject to further quality assurance checks. This may result in minor changes to some values presented here.

SANDSPIT A BRITISH COLUMBIA

Latitude: 53°15'14.000" N **Longitude:** 131°48'47.000" W **Elevation:** 6.40 m
Climate ID: 1057050 **WMO ID:** **TC ID:** YZP

▼ Temperature

	Temperature												Year	Code
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Daily Average (°C)	4.0	4.1	4.9	6.6	9.4	12.2	14.5	15.2	13.2	9.4	5.7	4.2	8.6	A
Standard Deviation	1.6	1.4	1.2	0.8	1.1	1.0	0.7	0.8	0.9	0.9	1.7	1.4	1.2	A
Daily Maximum (°C)	6.4	6.7	7.8	9.7	12.3	15.0	17.3	18.1	16.1	12.2	8.4	6.7	11.4	A
Daily Minimum (°C)	1.6	1.5	1.9	3.4	6.4	9.3	11.6	12.2	10.2	6.6	3.0	1.7	5.8	A
Extreme Maximum (°C)	12.4	13.4	13.9	18.9	21.7	26.7	27.8	26.7	24.1	20.6	16.3	13.4		
Date (yyyy/dd)	1981/18	1977/19	1965/12	1958/29	1958/25	2004/19	1971/28	1952/05	1980/15	1986/04	1985/02	1980/15		
Extreme Minimum (°C)	-13.9	-12.3	-12.2	-5.1	-1.1	2.2	5.0	1.9	-0.6	-3.1	-15.5	-12.8		
Date (yyyy/dd)	1954/26	1989/01	1951/05	1996/02	1965/04	1950/04	1971/01	1992/11	1948/22	1984/30	1985/26	1970/04		

▼ Precipitation

	Precipitation												Year	Code
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Rainfall (mm)	178.4	120.8	112.0	96.6	66.4	51.7	48.2	62.3	83.5	169.5	191.8	190.0	1371.2	C
Snowfall (cm)	12.7	9.9	5.2	1.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	6.0	37.9	C
Precipitation (mm)	190.7	130.8	116.8	97.7	66.4	51.7	48.1	62.2	83.5	169.5	193.8	196.2	1407.5	C
	1	1	0	0	0	0	0	0	0	0	0	0	0	C

Precipitation

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year	Code
Average Snow Depth (cm)														
Median Snow Depth (cm)	0	0	0	0	0	0	0	0	0	0	0	0	0	C
Snow Depth at Month-end (cm)	1	0	0	0	0	0	0	0	0	0	0	1	0	C
Extreme Daily Rainfall (mm)	66.4	45.8	41.5	79.5	48.3	39.1	22.1	46.5	48.5	58.6	66.2	66.8		
Date (yyyy/dd)	2001/09	1983/09	1983/08	1952/15	1950/16	1973/11	1957/30	1991/29	1961/04	1978/31	1984/01	1991/20		
Extreme Daily Snowfall (cm)	38.0	27.4	19.6	8.6	1.5	0.0	0.0	0.0	0.0	2.0	22.9	23.4		
Date (yyyy/dd)	1996/27	1972/25	1951/05	1971/19	1962/01	1949/01	1949/01	1948/01	1945/01	1984/30	1964/27	1955/19		
Extreme Daily Precipitation (mm)	81	66	30	3	0	0	0	0	0	1	28	43		
Date (yyyy/dd)	2001/09	1983/09	1946/27	1952/15	1950/16	1973/11	1957/30	1991/29	1961/04	1978/31	1984/01	1991/20		
Date (yyyy/dd)	1969/13	1969/06	1972/01	1968/11	1955/01	1955/01	1955/01	1955/01	1955/01	1984/29	1964/28	1971/23		

- ▶ Days with Maximum Temperature
- ▶ Days with Minimum Temperature
- ▼ Days with Rainfall

Days with Rainfall

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year	Code
>= 0.2 mm	21.8	17.8	20.9	19.8	17.7	15.8	14.9	14.9	17.3	22.8	23.3	22.7	229.7	C
>= 5 mm	10.4	7.4	7.9	6.5	4.4	3.2	3.4	4.3	5.6	10.9	11.2	11.7	86.8	C
>= 10 mm	6	4.2	3.7	2.8	1.6	1.1	1	1.6	2.4	5.8	6.8	7.1	44.2	C
>= 25 mm	1.4	1	0.24	0.32	0.16	0.04	0	0.08	0.28	1	1.2	1.6	7.3	C

- ▶ Days With Snowfall
- ▶ Days with Precipitation
- ▶ Days with Snow Depth
- ▼ Wind

Wind

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year	Code
	22.4	20.7	20.3	20.3	19.4	17.4	16.2	16.3	16.8	19.5	21.2	21.1	19.3	C

Wind

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year	Code
Speed (km/h)														
Most Frequent Direction	SE	SE	SE	SE	SE	SE	W	W	W	SE	SE	SE	SE	C
Maximum Hourly Speed (km/h)	129	105	100	113	97	77	74	74	93	137	121	121		
Date (yyyy/dd)	1955/03	1974/20	1981/24	1954/08	1954/30	1965/10	1993/21	1991/29	1962/27	1954/20	1954/12	1954/08		
Direction of Maximum Hourly Speed	SE	SE	SE	SE	SE	SE	SE	E	SE	SE	E	SE		
Date (yyyy/dd)	1955/03	1974/20	1981/24	1954/08	1954/30	1965/10	1993/21	1991/29	1962/27	1954/20	1954/12	1954/08		
Maximum Gust Speed (km/h)	161	164	121	140	122	97	93	100	113	148	161	152		
Date (yyyy/dd)	1955/03	1974/20	1970/12	1960/16	1987/29	1956/21	1982/05	1991/29	1958/24	1977/24	1959/01	1981/04		
Direction of Maximum Gust	SE	SE	SE	SE	E	SE	SE	E	SE	E	SW	SE		
Date (yyyy/dd)	1955/03	1974/20	1970/12	1960/16	1987/29	1956/21	1982/05	1991/29	1958/24	1977/24	1959/01	1981/04		

- ▶ Degree Days
- ▶ Bright Sunshine
- ▶ Humidex
- ▶ Wind Chill
- ▶ Humidity
- ▶ Pressure
- ▶ Radiation
- ▶ Frost-Free

Legend

- A = WMO "3 and 5 rule" (i.e. no more than 3 consecutive and no more than 5 total missing for **either** temperature **or** precipitation)
- B = At least 25 years
- C = At least 20 years
- D = At least 15 years

Date modified: 2015-09-22



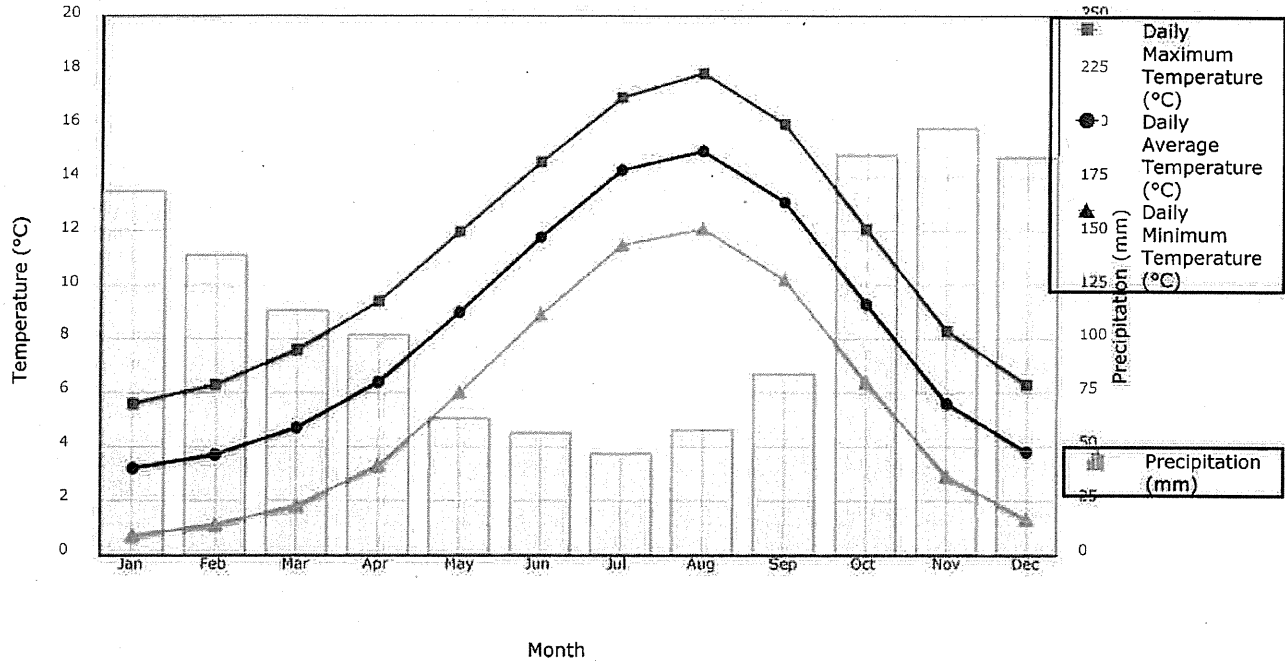
Climate

Home > Data > Climate Normals & Averages

Canadian Climate Normals 1971-2000 Station Data

Temperature and Precipitation Charts Normals Data Station / Element Metadata Calculation Information

Temperature and Precipitation Chart for 1971 to 2000 Canadian Climate Normals SANDSPIT A





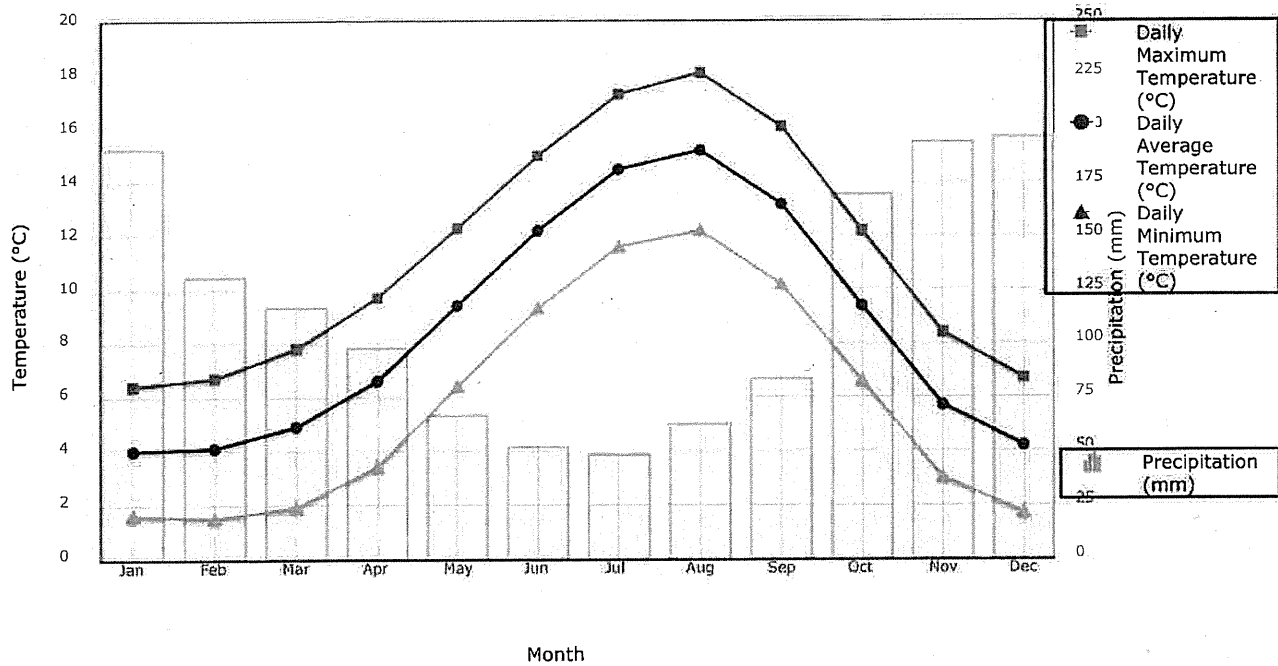
Climate

Home > Data > Climate Normals & Averages

Canadian Climate Normals 1981-2010 Station Data

Temperature and Precipitation Charts Normals Data Station / Element Metadata Calculation Information

Temperature and Precipitation Chart for 1981 to 2010 Canadian Climate Normals
SANDSPIT A



APPENDIX D
PINCHIN WEST LTD.
HAZARDOUS MATERIALS TEST RESULTS

The Following report may include information on materials found in the facility that are outside of the Contract Area. Any removal of the hazardous materials that are mentioned in the report is limited to the Contract Area only unless noted elsewhere.



August 8, 2016

Public Works and Government Services Canada
c/o Read Jones Christoffersen Ltd.
300-1285 West Broadway
Vancouver, BC V6H 3X8

E-mail: ktopping@rjc.ca

Attention: Mr. Kurtis Topping
Design Engineer

Re: Hazardous Materials Test Results
Sandspit Airport, Sandspit, BC
PWL File: 12166C-01

Pinchin West Ltd. (PWL) was retained by Public Works and Government Services Canada to collect bulk samples of suspect hazardous building materials within the Sandspit Airport located in Sandspit, BC. Sample collection was performed by Gordon Watkins, *Senior Technologist* on July 28, 2016

The purpose of this sample collection was to facilitate the renovations to building. Sample collection was limited to suspect asbestos-containing materials and lead-based paint found in the renovation area.

The findings are to be used in conjunction with the existing PWL report: "Pre-Renovation Hazardous Building Materials Survey Report, Combined Services Building, Sandspit Airport, Sandspit BC", File 12166C, dated September 21, 2011.

No other hazardous materials (i.e. lead products, mercury, PCBs, halocarbons and mould) were included in the sample collection.

METHODOLOGY AND CRITERIA

Asbestos

An inspection for the presence of friable and non-friable asbestos-containing materials (ACM) was conducted. A separate set of samples is collected of each type of homogenous material suspected to contain asbestos. A homogeneous sampling area is defined by the U.S. Environmental Protection Agency (EPA) as containing material that is uniform in texture and appearance, was installed at one time and is unlikely to consist of more than one type or formulation of material.

The surveyor used information obtained on site by visual examination, available information on the phases of the construction and any information on renovations provided by the client, to determine the extent of each homogeneous area and the number of samples required.



An asbestos-containing material is defined as materials containing 0.5% asbestos by weight, or any amount of asbestos for vermiculite insulation.

Samples of materials were analyzed using polarised light microscopy (PLM) methods in accordance with EPA Test Method 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials, July 1993.

Lead Paint

Samples of paint finishes are collected where removal of the paint is possible by scraping the painted finish to include base and covering applications.

Analysis is performed in accordance with EPA Method No. 3050B/Method No. 7420; flame atomic absorption at an accredited laboratory.

For this report, all paints containing lead at a concentration 0.009% or greater are discussed.

RESULTS AND CONCLUSIONS

Asbestos

Table 1 – Asbestos Testing Results

Sample No.	Locations	Description	Result
S0014A-B	Garage Mezzanine (Loc. 1)	Acoustic Ceiling Tile, Pressed wood	None Detected.
S015	Garage Mezzanine (Loc. 1)	Duct Mastic, brown	None Detected.
S016	Roof (Loc. 8)	Duct Mastic, grey	None Detected.
S017	Roof (Loc. 8)	Duct Tar, black	None Detected.
S018	Roof (Loc. 8)	Mastic, black on access hatch	None Detected.



Lead Paint

Sample results that exceed the criteria of 0.009% are highlighted in Table 2. For analytical results, refer to the Laboratory Test Report attached to this letter as Appendix I.

Table 2 – Lead Paint Testing Results

Sample	Location	Description of Material and Substrate	Result (%)
LB10	Roof (Loc. 8)	Blue paint on metal flashing	<0.007
LB11	Garage Office (Loc. 3)	White paint on drywall wall	0.091

This testing identified the presence of lead in paints that requires evaluation and assessment if disturbed.

Under most conditions, non-aggressive removal or disturbance of lead coated materials (e.g. only non-powered hand tools, hand demolition, building demolition with heavy machinery and removal of minor amounts of paint) would require standard dust control, clean-up and worker protection. However, if these surfaces are disturbed by aggressive methods (e.g. grinding, torch cutting/burning, abrasive blasting, power tools) there may be a potential for elevated worker exposure to lead and contamination of work areas and more elaborate engineering controls (ventilation, containment and dust suppression), will be required.

RECOMMENDATIONS

The following recommendations are presented:

The disturbance of lead paint should be assessed on a case by case basis to take into consideration the method and extent of disturbance. If deemed necessary by the assessment, safe work procedures must be followed.

Lead-painted items may be a hazardous waste. Test lead-painted materials for leachable lead prior to disposal.



LIMITATIONS

The work performed by PWL was conducted in accordance with generally accepted engineering or scientific practices current in this geographical area at the time the work was performed. No warranty is either expressed or implied by furnishing written reports or findings. The Client acknowledges that subsurface and concealed conditions may vary from those encountered or inspected. PWL can only comment on the environmental conditions observed on the date(s) the assessment is performed. The work is limited to those areas of concern identified by the Client or outlined in our proposal. Other areas of concern may exist but were not investigated within the scope of this assignment.

PWL makes no other representations whatsoever, including those concerning the legal significance of its findings, or as to other legal matters touched on in this report, including, but not limited to, ownership of any property, or the application of any law to the facts set forth herein. With respect to regulatory compliance issues, regulatory statutes are subject to interpretation and these interpretations may change over time. PWL accepts no responsibility for consequential financial effects on transactions or property values, or requirements for follow-up actions and costs.

The liability of PWL or its staff will be limited to the lesser of the fees paid or actual damages incurred by the Client. PWL will not be responsible for any consequential or indirect damages. PWL is only liable for damages resulting from negligence of PWL. All claims by the Client shall be deemed relinquished if not made within two years after last date of services provided. Information provided by PWL is intended for Client use only. PWL will not provide results or information to any party unless disclosure by PWL is required by law. Any use by a third party of reports or documents authored by PWL or any reliance by a third party on or decisions made by a third party based on the findings described in said documents, is the sole responsibility of such third parties. PWL accepts no responsibility for damages suffered by any third party.



Hazardous Materials Test Results

Sandspit Airport, Sandspit BC
Public Works and Government Services Canada

August 8, 2016

12166C-01

FINAL

If you have any questions regarding this report, please contact Hien Nguyen, Project Manager for PWL at 604-238-2902.

Yours truly,

Pinchin West Ltd.

Prepared by:

Nadia Slakov, B.EnvD, Dipl.T

Project Coordinator

604-238-2964

nslakov@pinchinwest.com

Reviewed by:

Bryan Zecchel, AScT

Senior Project Manager

604-238-2901

bzecchel@pinchinwest.com

Encl.: Laboratory Reports

Cc: Glade Schoenfeld gschoenfeld@rjc.ca

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APPENDIX I
Laboratory Report



Bulk Asbestos Analysis

By Polarized Light Microscopy
EPA Method: 600/R-93/116 and 600/M4-82-020



NVLAP Lab Code: 200664-0

Customer: Pinchin West Ltd.
Suite 200, 13775 Commerce Parkway
Richmond, BC V6V 2V4

Attn: Gordon Watkins
Hien Nguyen
Laura Erwin

Lab Order ID: 1614936
Analysis ID: 1614936_PLM
Date Received: 8/1/2016
Date Reported: 8/1/2016

Project: 12166C-01 Sandspit Airport

Sample ID	Description	Asbestos	Fibrous Components	Non-Fibrous Components	Attributes
Lab Sample ID	Lab Notes				Treatment
S014A	Acoustic Ceiling Tile, Pressed Wood - Garage Mezzanine, Location 1	None Detected	70% Cellulose	30% Other	Tan, White Fibrous Heterogeneous
1614936PLM_1					Teased, Crushed
S014B	Acoustic Ceiling Tile, Pressed Wood - Garage Mezzanine, Location 1	None Detected	70% Cellulose	30% Other	Tan, White Fibrous Heterogeneous
1614936PLM_2					Teased, Crushed
S015	Duct Mastic, Brown - Garage Mezzanine, Location 1	None Detected	10% Wollastonite	90% Other	Brown Non Fibrous Heterogeneous
1614936PLM_3					Ashed
S016	Duct Mastic, Grey - Roof, Location 8	None Detected		100% Other	Gray Non Fibrous Homogeneous
1614936PLM_4					Ashed
S017	Duct Tar, Black - Roof, Location 8	None Detected	5% Cellulose	95% Other	Black Non Fibrous Heterogeneous
1614936PLM_5					Dissolved
S018	Mastic, Black on Access Hatch - Roof, Location 8	None Detected		100% Other	Black Non Fibrous Homogeneous
1614936PLM_6					Ashed

Disclaimer: Due to the nature of the EPA 600 method, asbestos may not be detected in samples containing low levels of asbestos. We strongly recommend that analysis of floor tiles, vermiculite, and/or heterogeneous soil samples be conducted by TEM for confirmation of "None Detected" by PLM. This report relates only to the samples tested and may not be reproduced, except in full, without the written approval of SAI. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. government. Analytical uncertainty available upon request. Scientific Analytical Institute participates in the NVLAP Proficiency Testing program. Unless otherwise noted blank sample correction was not performed. Estimated MDL is 0.1%.

Bobby Wheatley (6)

Analyst

Approved Signatory



Analysis for Lead Concentration in Paint Chips

by Flame Atomic Absorption Spectroscopy
EPA SW-846 3050B/6010C/7420



Customer: Pinchin West Ltd.
Suite 200, 13775 Commerce Parkway
Richmond, BC V6V 2V4

Attn: Gordon Watkins
Hien Nguyen

Lab Order ID: 1614916
Analysis ID: 1614916_PBP
Date Received: 8/1/2016
Date Reported: 8/1/2016
Date Amended: 8/3/2016

Project: 12166C-01 Sandspit Airport

Sample ID	Description	Mass	Concentration	Concentration
<i>Lab Sample ID</i>	<i>Lab Notes</i>	<i>(g)</i>	<i>(ppm)</i>	<i>(% by weight)</i>
LB10	Blue on metal flashing - roof, location 8	0.0568	< 70.	< 0.007%
1614916PBP_1				
LB11	White on drywall - garage office, location 3	0.0913	920	0.091%
1614916PBP_2				

Unless otherwise noted blank sample correction was not performed on analytical results. Scientific Analytical Institute participates in the AIHA ELPAT program. ELPAT Laboratory ID: 173190. This report relates only to the samples tested and may not be reproduced, except in full, without the written approval of SAI. Analytical uncertainty available upon request. The quality control samples run with the samples in this report have passed all EPA required specifications unless otherwise noted. RL: (Report Limit for an undiluted 50ml sample is 4µg Total Pb).

Daniel Olson (2)

Analyst

Scientific Analytical Institute, Inc. 4604 Dundas Dr. Greensboro, NC 27407 (336) 292-3888

Laboratory Director

