PROJECT MANUAL

DIVISION 1 TO DIVISION 21

ST. ANDREW'S CHURCH ROOF REPLACEMENT & FIRE PROTECTION UPGRADES

Bennett Lake, BC
2018

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kobayashi+zedda

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END OF SECTION

Part 1 General

1.1 WORK COVERED BY CONTRACT DOCUMENTS

.1 Work of this Contract comprises the roof replacement and wildfire sprinkler upgrades to St. Andrew's Presbyterian Church, located in the Chilkoot Trail National Historic Site at Bennett Lake, BC; and further identified as St. Andrew's Church.

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

.1 Construction Fencing: All work areas are to be protected with secure fencing.

.2 Temporary Facilities: Contractor is to provide own site camp including office, accommodations, cooking facilities, site storage of materials, camp supplies, communications, power and water. Locate as directed by Departmental Representative.

.3 Photographic documentation of existing conditions of roof assemblies at each stage of work.

.4 Replacing typical roofing materials and associated accessories in kind. Colours of new roofing materials and associated accessories are to match the existing colours.

.5 Demolition of existing roofing, underlayment, flashing, fascia boards, and damaged sheathing boards and rafter tails as indicated. Allow for the replacement of a maximum of 0.525 m^3 (222.5 board feet) of deteriorated roof sheathing boards.

.1 A hazardous materials hazard assessment was completed in 2016, and indicates that there are no asbestos containing materials (ACM) in the tar paper roofing underlayment. The contractor shall refer the the following report for the testing of hazardous material on site:

.1 Laboratory Analysis by AGAT Laboratories, entitled "Courthouse – St. Andrew's Hazmat," January 2016.

.6 Protection and repair of existing decorative roofing elements on the bell tower.

.7 Installation of new plywood roof sheathing.

.8 Installation of new fire retardant treated cedar shingle roof assembly to match size and exposure of existing.

.9 Installation of new wood hip ridge caps and fascia boards to match existing.

.10 Installation of copper flashings where indicated, including: ridge and intermediate moss control flashings, roof cricket and step flashings, coping flashing, and roof penetration flashings.

.11 Installation and commissioning of new dry wildfire sprinkler system as indicated.

.12 Management and disposal of all demolition and construction waste.

1.2 SCHEDULE

.1 The Work of this contract to be completed by July 31, 2018.

.2 Schedule of Work: The Work of this contract can commence as soon as weather permits.

.3 Hours of Work: Refer to Section 01 14 00 – Work Restrictions.

.4 Provide detailed project schedule (Gantt Bar Chart) within 5 working days of Award of Contract date showing activity sequencing, interdependencies and duration estimates. Include listed activities as follows:

.1 Shop drawings.

.2 Samples.

.3 Approvals.

.4 Mobilization.

.5 Construction.

.6 Installation.

.7 Site works.

.8 Testing.

.9 Acceptance.

.10 De-mobilization.

.5 Do not change approved schedule without notifying and receiving approval from Departmental Representative.

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

.7 Schedule Work in consultation with Departmental Representative to minimize impact on public use of site during operating hours.

1.3 WORK SEQUENCE

.1 Construct work in stages to accommodate reviews of the substructure by the Departmental Representative.

.2 Required stages:

.1 Phase 1: Demolition of existing roofing to reveal existing roof sheathing.

.2 Phase 2: Replacement of damaged sheathing boards.

.3 Phase 3: Installation of new roofing and wildfire fire protection.

1.4 SCHEDULE OF VALUES

.1 Within 5 days after award of Contract, submit a breakdown of the Contract lump sum prices in detail as determined by the Departmental Representative and aggregating Contract price.

1.5 TAXES

.1 Pay all taxes levied by law (including Federal, Provincial and Municipal).

1.6 CONTRACTOR USE OF PREMISES

.1 Use of Site:

.1 The Chilkoot Trail is a National Historic Site, and Bennett Lake, BC is an operational site accessible to the public. All activities and security controls must remain operational at all times unless otherwise indicated. Coordinate with the Departmental Representative for all activities that impact on-going operations.

.2 Work is to be executed with least possible interference or disturbance to the normal use of the St. Andrew's Church site. Refer to 01 14 00 – Work Restrictions. Work restrictions and security provisions will be enforced.

.3 Assume responsibility for assigned premises for laydown and storage areas as established at the project start-up meeting and for performance of this work.

.2 Co-ordinate use of premises under direction of Departmental Representative.

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

.4 Maintain temporary construction fencing and weather protection throughout duration of work.

.5 Execute work with least possible interference or disturbance to normal use. Make arrangements with Departmental Representative to facilitate work as stated.

.6 Maintain existing services and provide for personnel and visitor access to all areas other than those designated for use by the Contractor.

.7 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.

.8 Remove or alter existing work to prevent injury or damage to portions of existing work which remain.

.9 Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as directed by Departmental Representative.

.10 At completion of operations condition of existing work: equal to or better than that which existed before new work started.

1.7 TRANSPORTATION

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

.2 The Work is located in a remote area inaccessible by roads. The Contractor is to arrange transportation of materials and equipment into the site. Available options include, but are not limited to rail, helicopter, float plane.

.3 Helicopter Transportation:

.1 Brief Departmental Representative 7 days prior to operations.

.2 Staging areas shall be identified prior to commencing operations, and dunnage to be installed.

.3 Heli-slinging ground operations will be lead by the Contractor with oversight provided by staff assigned by the Departmental Representative.

.4 The pilot-in-command must meet the following experience requirements and the Contractor must provide the Departmental Representative with documentary proof of this experience if requested:

.1 1,000 hours on rotary wing aircraft;

.2 500 hours on type to be used;

.3 250 hours similar areas as Contract (examples: mountain environments; historic buildings; populated area's);

.4 50 hours long-line including experience in proximity to buildings; and

.5 Documented annual heli-sling training.

.5 Pilots used in helicopter slinging operations must have experience slinging materials at the Chilkoot Trail National Historic Site.

.6 Staging for helicopter shall be from Log Cabin, BC.

.7 All materials must be packaged to facilitate safe and efficient loading and slinging.

.8 Contractor to supply sufficient dunnage to ensure safe and efficient loading and slinging.

.9 Ensure landing sites are clear of debris and other materials which may become an airborne hazard during landing and takeoff activities.

.10 Follow protocols for the safe entering, exiting, and transport of materials using a helicopter.

.4 Boat Transportation:

.1 A boat dock is not available in Bennett, BC for Contractor use.

.2 Contractors should be aware of potential adverse weather conditions on Bennett Lake.

.3 Due to the above, boat transportation of materials is not recommended.

.5 Unload and secure any wildlife attractants as soon as possible.

.6 Limit transportation of materials in and out of site between 08:00 and 10:00 hours, and between 18:00 and 20:00 hours. Coordinate with White Pass and Yukon Route Railway to avoid transporting materials when a passenger train is stopped at the train station, and 20 minutes before and after train arrival and departure times.

1.8 MINIMUM STANDARDS

.1 Work to conform to the minimum applicable standards of the Canadian General Standards Board, the Canadian Standards Association, the National Building Code of Canada 2015 (NBC) and applicable Provincial and Municipal codes. In the case of conflict or discrepancy, the most stringent requirement applies.

.2 Work must be carried out in conformance to WorkSafe BC safety standards and requirements.

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

.4 The primary approach to conservation is one of minimal intervention, and all conservation treatments are to follow the approach of preservation except for the specific items identified as being replaced. For these items, the Contractor is to follow the conservation strategy of rehabilitation as described in the Standards and Guidelines for the Conservation of Historic Places in Canada, 2010.

1.9 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. Drawings have been prepared in colour for clarity purposes and are intended to be printed in colour. Contractor is responsible for any misinterpretations caused as a result of printing in black and white.

1.10 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.

1.11 DOCUMENTS REQUIRED

.1 Maintain at job site, one copy of each document as follows:

- .1 Contract Drawings.
- .2 Specifications.
- .3 Addenda.
- .4 Reviewed Shop Drawings.
- .5 List of Outstanding Shop Drawings.
- .6 Change Orders.
- .7 Other Modifications to Contract.
- .8 Field Test Reports.
- .9 Copy of Approved Work Schedule.
- .10 Health and Safety Plan and Other Safety Related Documents.
- .11 Other documents as specified.

1.12 REGULATORY REQUIREMENTS

.1 Obtain and pay for – Certificates, Licenses and other permit enforced at the location concerned 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.

1.13 EXAMINATION

.1 Examine Site and be familiar and conversant with existing conditions likely to affect Work, including Contaminated Waste.

.2 Provide photographs of surrounding properties, objects and structures liable to be damaged or be the subject of subsequent claims.

1.14 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.

1.15 ACCEPTANCE OF SUBSTRATES

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

1.16 QUALITY OF WORK

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

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

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

1.17 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.

.3 Work coordination:

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

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

.3 Ensure disputes between subcontractors are resolved.

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

.5 Maintain efficient and continuous supervision. Full-time site superintendent required throughout project.

1.18 APPROVALS OF PRODUCT DATA AND SAMPLES

.1 In accordance with Section 01 33 00 – Submittal Procedures, submit the requested product data samples indicated in each of the technical Sections to the Departmental Representative.

.2 Allow sufficient time for the following:

.3 Review of product data.

.4 Approval of Products.

.5 Review of re-submission.

.6 Ordering of accepted material and/or products.

1.19 TESTING AND INSPECTIONS

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

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

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

.1 Mill tests and certificates of compliance.

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

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

.4 Contractor shall Notify Departmental Representative in advance of planned testing.

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

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

.7 The Departmental Representative may require, and pay for, additional inspection and testing services.

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

1.20 AS-BUILT DOCUMENTS

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

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

.3 Provide as-built documents to Departmental Representative within 60 calendar days of substantial completion.

1.21 CLEANING

.1 Conduct daily cleaning and disposal operations. Comply with local ordinances and anti-pollution laws.

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

1.22 CONTROL

.1 Existing Structure:

.1 The existing structure forms part of a National Historic Site. The Contractor and sub trade personnel shall pay utmost attention to the preservation of all existing items on this site at all times during remediation work. Prior to the commencement of this project, the Contractor shall submit to the Departmental Representative a list of all proposed protection measures for approval. This list must identify procedures for the protection of adjacent building materials and elements to prevent accidental damage to the site for the duration of the project.

.2 Maintain and relocate protection until work is complete.

1.23 RELICS AND ANTIQUITIES

.1 Relics and antiquities and items of historical or scientific interest will remain property of the Department. Protect such articles and request directives from Departmental Representative.

.2 Give immediate notice to Departmental Representative if evidence of archeological finds are encountered during excavation/construction, and await Departmental Representative's written instructions before proceeding with Work in this area.

1.24 ENVIRONMENTAL PROTECTION & HAZARDOUS MATERIAL

.1 Contractor is responsible for environmental protection during all construction activities at all locations work is performed.

.2 Environmental degradation arising from construction activities shall be prevented, abated, controlled and minimized by complying with all applicable federal, provincial and local laws and regulations concerning environmental pollution control and abatement.

.3 Do not dispose of waste or volatile materials into water courses, storm or sanitary sewers. Construction methods shall be employed to ensure no fuels, oils, wood preservatives or other contaminants enter the site. As general Mitigation Measures for this project, it must be enforced and closely supervised and monitored as follows:

.1 All contractors and work crews must be briefed upon the importance of adhering to prescribed best practices or mitigation measures. Project meeting prior to commencement of the work shall indicate the above requirements have been fully explained to the contractor and staff.

.2 A copy of the mitigation measures shall be posted in a conspicuous location on site or readily accessible for reference.

.3 Conduct work in a manner which clearly separates visitors from the active construction area on site to minimize potential accidents for public safety.

.4 Contractor and sub trade personnel must develop and maintain spill response and reporting procedures including containment methods. In the event of a spill, contact the Provincial Emergency Program at 1-800-663-3456 and the Departmental Representative.

.5 The Contractor is to have personnel on site that are trained and ready to use spill containment kits. Ensure proper disposal procedures in accordance with all applicable provincial and municipal regulations. Fires and burning of rubbish on site is not permitted.

.6 Hazardous material shall be stored in suitable containers and separated by type.

.7 The Contractor must have all spill containment kits ready for immediate deployment, containing sufficient quantities of absorbent materials on site in close proximity to working machinery and equipment such as fuel portable generator, air compressors, hoist and tools. Spill containment kit to be sized to contain 110% of the largest possible spill at all time.

.8 Ensure all equipment used on site is properly tuned, clean and free from contaminants, in good operating order, free of leaks, and fitted with standard emission control devices and spark arrestors prior to arrival on site.

.9 Cleaning of tools and equipment must be completed more than 30 meters from shorelines to prevent the release of wash water that may contain deleterious substances.

.10 Fuel-fired equipment shall be stored, maintained and refuelled on a flat surface at least 100 meters away from shorelines. Refueling to occur within bermed containment area.

.11 Petrochemical products, paints and chemicals shall be stored at least 100 meters away from shorelines, and shall be secured outside of working hours in a locked and enclosed area approved by the Departmental Representative.

.4 Ensure proper disposal procedures in accordance with all applicable provincial regulations.

.5 Hazardous or contaminated waste or material uncovered during construction shall be investigated, source identified, removed, and disposed of as directed by the Departmental Representative. Submit proof of disposal to Departmental Representative.

.6 Pressure treated wood shall be handled and installed in accordance with the Parks Canada Guide for the Use, Handling and Disposal of Pressure Treated Wood.

.7 Minimize the number of saw cuts made to wood on site. All required cuts made on site shall occur at least 30 meters away from shorelines, and over tarps to catch debris. Cuttings, sawdust, and other wood waste material shall not enter the marine environment. Provide sawdust control such as shop vacuum connection on saws.

1.25 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 sets of Contract documents for use by the Contractor at no additional cost.

1.26 FAMILIARIZATION WITH SITE

.1 The site can be viewed using Google Street View at the following website: https://goo.gl/maps/GHHvjaRbkfp

1.27 SUBMISSION OF TENDER

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

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 DESCRIPTION

.1 St. Andrew's church is an important cultural resource related to the designation of the Chilkoot Trail National Historic Park. It is the sole surviving structure from the commemoration period, and is therefore irreplaceable. It is the responsibility of the Contractor to protect the building from irreversible damage during completion of the Work.

.2 The restrictions in this section and the Parks Canada Best Practices Guide are required to be implemented by the Contractor.

1.2 REFERENCES

.1 Appendix 2: Parks Canada Best Practices Guide and Basic Impact Analysis.

1.3 CO-ORDINATION WITH THE DEPARTMENTAL REPRESENTATIVE

.1 Co-operate with the Departmental Representative to coordinate the work restrictions.

.2 Immediately modify work procedures as necessary to ensure compliance with the requirements of this section.

.3 Departmental Representative has the authority to close down the site due to non-compliance with the requirements of this section.

1.4 ACCESS AND EGRESS

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

1.5 USE OF SITE AND FACILITIES

.1 A maximum of eight workers are allowed on site at any time.

.2 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Departmental Representative to facilitate work as stated.

.3 Existing pathways to be used to access the Work unless otherwise approved by Departmental Representative

.4 Use existing disturbed areas whenever possible.

.5 Departmental Representative will assign sanitary facilities for use by Contractor's personnel. Keep facilities clean.

.6 Temporary facilities shall be located 10 m away from existing buildings.

.7 Work must remain within the construction limits.

.8 Avoid wildlife while on site.

.9 Alcohol and non-prescription drugs shall not be permitted on site.

.10 Wildlife Protection & Safety:

.1 Avoid wildlife while on site.

.2 Workers to carry bear spray at all times.

.3 Keep camp clean, and dispose of all waste in a timely manner.

.4 Food preparation and consumption to occur at the hiker shelter, Contractor's wildlife proof cook shack, or other area designated by the Departmental Representative.

.5 Store all food and attractants in bear lockers, knack box, or hard sided building.

.6 Use grey water pit to dispose of water. Sieve water to remove food.

.7 Food waste to be transported out of site by train as required.

.8 Food and attractants shall not be stored in personal tents.

.9 Provide electric bear fence if more space is required for food storage and preparation.

.10 Provide evening safety check of all secure food storage including electric fence.

.11 Report all bear sightings to Departmental Representative.

.12 Minimize the preparation and use of fatty or smelly food.

.13 Minimize the amount of food kept on site, and resupply by train as necessary.

.14 Store fuel containment berms within bear proof container or electric fence.

1.6 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

.1 Execute work with least possible interference or disturbance to normal use of premises. Arrange with Departmental Representative to facilitate execution of work.

1.7 EXISTING SERVICES

.1 Construct barriers in accordance with Section 01 50 00 - Temporary Facilities and Controls.

1.8 SPECIAL REQUIREMENTS

.1 Carry out noise generating Work from 08:00 to 20:00 hours.

.2 Install rubber matting as directed by Departmental Representative to protect sensitive areas around the construction site. Matting to be provided by the Departmental Representative.

1.9 CONSTRUCTION EQUIPMENT AND MATERIALS

.1 Internal combustion engine-powered air equipment shall be placed so the exhausts discharge away from combustible materials.

.2 Service areas and fuel for construction equipment shall not be located inside the building.

.3 Combustible and flammable construction components stored inside the building shall be limited to the minimum required to complete a day's project.

.4 Storage of highly combustible materials (e.g., foam, plastic, rubber products, and so forth) shall not be permitted inside the building.

.5 Tarpaulins or plastic sheeting, if used as part of a barrier, shall be of a fire retardant to NFPA 701.

.6 Equipment operators shall be trained and experienced.

1.10 EMERGENCY AND FIRE PROTECTION

.1 As much as possible any hot work (cutting, grinding, welding and soldering) is to be completed off site, and no hot work is allowed on or within 11 m of the building.

.2 Safety clearances are required before any cutting, welding, core drilling, open flame work or dust work is done. A request in writing to the Owner must be made and approved a minimum of 72 hours before this work is anticipated.

.3 All combustibles within 11 m of any hot work operation shall be relocated or be covered with non-combustible or fire retardant-coated tarpaulins or otherwise shielded with metal or non-combustible guards or curtains.

.4 All heat generating operations (cutting, grinding, welding, soldering) are to be supervised by a worker trained in the use of fire extinguishers for the duration of the work. Work is to cease at least three hours prior to the end of the work day and shall be followed by a 1-hour fire watch of the hot work site immediately thereafter with frequent monitoring during the remaining hours of the work day.

.5 At the end of each day the person responsible for fire protection on the site shall inspect areas where welding, cutting, or other hot work operations have been conducted for hot metal or smoldering combustible materials.

.6 Hot work shall not be permitted in the building unless approved by the Departmental Representative.

.7 Provide and maintain at all times, ready access to firefighting equipment.

.8 Provide temporary portable fire extinguishers throughout the Work and at every Work area.

.9 Prior to execution of any work which may possibly start a fire, provide proper and suitable precautions and fire extinguishers. Provide fire-watch during and for minimum 1 hour after all hot work operations.

1.11 BUILDING SMOKING ENVIRONMENT

.1 Comply with smoking restrictions. Smoking is not permitted.

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 ADMINISTRATIVE

.1 Schedule and administer project meetings throughout the progress of the work at the call of Departmental Representative.

.2 Prepare agenda for meetings.

.3 Distribute written notice of each meeting four days in advance of meeting date to Departmental Representative.

.4 Provide physical space and conference call services, and make arrangements for meetings.

.5 Preside at meetings.

.6 Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.

.7 Reproduce and distribute copies of minutes within three days after meetings and transmit to meeting participants, affected parties not in attendance, and Departmental Representative.

.8 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

1.2 PRECONSTRUCTION MEETING

.1 Within 10 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.

.2 Departmental Representative, Contractor, major Subcontractors, field inspectors and supervisors 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 Schedule of Work: in accordance with 01 11 55 – General Instructions.

.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, utilities, fences in accordance with Section 01 50 00 – Temporary Facilities and Controls.

.5 Requirements for mitigation measures, site specific considerations, and contingency plans.

.6 Hazards associated with work in isolated locations, and working with aircraft.

.7 Work practices within a cultural landscape.

.8 Site orientation: staging, work and camp areas, access paths, cultural resources, site safety, first aid, communication, and camp guidelines.

.9 Delivery schedule of specified equipment.

.10 Site security in accordance with Section 01 50 00 - Temporary Facilities and Controls.

.11 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.

.12 Commissioning.

.13 Record drawings in accordance with Section 01 78 00 – Closeout Submittals.

.14 Maintenance manuals in accordance with Section 01 78 00 - Closeout Submittals.

.15 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 - Closeout Submittals.

.16 Monthly progress claims, administrative procedures, photographs, hold backs.

.17 Appointment of inspection and testing agencies or firms.

.18 Insurances, transcript of policies.

1.3 PROGRESS MEETINGS

.1 During course of Work and 2 weeks prior to project completion, schedule progress meetings every 2 weeks. Additional meetings will be scheduled to resolve extraordinary issues as required.

.2 During execution of the work on site, the meetings will be scheduled to occur on site. Allow for conference call services using an on-site satellite phone to allow subcontractors and Departmental Representatives not in attendance to call in.

.3 Contractor, major Subcontractors involved in Work and Departmental Representative are to be in attendance.

.4 Notify parties minimum 5 days prior to meetings.

.5 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within 3 days after meeting.

.6 Agenda to include the following:

.1 Review, approval of minutes of previous meeting.

.2 Review of Work progress since previous meeting.

.3 Field observations, problems, conflicts.

.4 Problems which impede construction schedule.

.5 Review of off-site fabrication delivery schedules.

.6 Corrective measures and procedures to regain projected schedule.

.7 Revision to construction schedule.

.8 Progress schedule, during succeeding work period.

.9 Review submittal schedules: expedite as required.

.10 Maintenance of quality standards.

.11 Review of Commissioning.

.12 Review proposed changes for affect on construction schedule and on completion date.

.13 Other business.

1.4 COORDINATION MEETINGS

.1 During the course of Work on site, schedule coordination (tailgate) meetings with the Departmental Representative weekly, at the start of every week.

.2 Agenda to include coordination of the week's scheduled with the Departmental Representative and to address any problems that have arisen since the previous progress 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 REFERENCES

.1 Approval of shop drawings and samples required by Departmental Representative as indicated.

1.2 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.

1.3 SHOP DRAWINGS AND PRODUCT DATA

.1 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.

.2 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.

.3 Allow 14 days for Departmental Representative's review of each submission.

.4 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.

.5 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.

.6 Accompany submissions with transmittal letter, in electronic format, 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.

.7 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.
  - .1 Submissions not stamped, signed, dated and identified to the specific project will be returned without being reviewed and will be considered rejected.
- .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.

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

.9 Submit electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.

.10 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.

.11 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.

.12 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.

.13 Submit electronic copies of manufacturers 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.

.14 Submit electronic copies of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative.

.15 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

.16 Submit electronic copies of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental Representative.

.17 Delete information not applicable to project.

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

.19 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.

.20 The review of shop drawings by Public Works and Government Services Canada (PWGSC) is for sole purpose of ascertaining conformance with general concept.

.1 This review shall not mean that PWGSC 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.

1.4 SAMPLES

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

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

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

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

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

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

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

1.5 MOCK-UPS

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

1.6 PROGRESS SCHEDULE

.1 Submit work schedule and cost breakdown in accordance with Section 01 11 55 – General Instructions.

1.7 PHOTOGRAPHIC DOCUMENTATION

.1 Submit electronic copy of colour digital photography in jpg format, standard resolution monthly with progress statement and as directed by Departmental Representative.

.2 Project identification: name and number of project and date of exposure indicated.

.3 Number of viewpoints: Maximum 20 locations.

.1 Viewpoints and their location as determined by Departmental Representative.

.4 Frequency of photographic documentation: as directed by Departmental Representative.

.1 At each stage of construction, and after the installation of each layer in an assembly.

.2 Before concealment of Work and as directed by Departmental Representative.

1.8 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 REFERENCES

.1 Government of Canada.

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

.2 National Building Code of Canada (NBC):

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

.3 The Canadian Electric Code (as amended)

.4 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 CSA Z1006-10 Management of Work in Confined Spaces.
- .5 CSA Z462- Workplace Electrical Safety Standard

.5 National Fire Code of Canada 2010 (as amended)

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

.6 American National Standards Institute (ANSI):

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

.7 Province of British Columbia:

- .1 Workers Compensation Act Part 3-Occupational Health and Safety.
- .2 Occupational Health and Safety Regulations

.8 Laboratory Analysis by AGAT Laboratories, entitled "Courthouse – St. Andrew's Hazmat," January 2016.

1.2 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures

.2 Section 01 50 00 – Temporary Facilities and Controls

1.3 WORKER'S 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 Parks Canada may terminate the Contract without liability to Parks Canada where the Contractor, in the opinion of Parks Canada, 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 ACTION AND INFORMATIONAL SUBMITTALS

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

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

.3 Submittals to include the following:

- .1 Site-specific Health and Safety Plan
- .2 Copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
- .3 Copies of incident and accident reports.
- .4 WHMIS MSDS - Material Safety Data Sheets and all other documentation required by Workplace Hazardous Materials Information System (WHMIS) requirements.
- .5 Emergency Procedures.

.4 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 5 days after receipt of plan. Revise plan as appropriate and resubmit to Departmental Representative.

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

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

- .1 Be construed to imply approval by the Departmental Representative.
- .2 Be interpreted as a warranty of being complete, accurate and legislatively compliant.
- .3 Relieve the Contractor of his legal obligations for the provision of health and safety on the project.

1.6 RESPONSIBILITY

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

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

.3 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.7 HEALTH AND SAFETY COORDINATOR

.1 The Health and Safety Coordinator:

.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 traffic.

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

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

.2 Secure site at night time as deemed necessary to protect site against entry.

1.9 PROJECT/SITE CONDITIONS

.1 Work at site will involve contact with:

.1 Multi-employer work site.

.2 Federal employees and general public.

.3 See Preconstruction Hazard Assessment Form in Appendix 1.

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 speciality 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 Departmental Representative's review: the review of Site Specific Health and Safety Plan by Parks Canada shall not relieve the Contractor of responsibility for errors or omissions in final Site Specific 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 and site staff.

.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 and site staff.

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

.1 Work at high angles.

.2 Work in confined spaces or where there is a risk of entrapment.

.3 Work with hazardous substances.

.4 Underground work.

.5 Work on, over, under and adjacent to water.

.6 Workplaces where there are persons who require physical assistance to be moved.

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

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 Advise Departmental Representative beforehand of the product(s) intended for use. Submit applicable MSDS and WHMIS documents as per Section 01 33 00 – Submittal Procedures.

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

.3 Provide adequate means of ventilation in accordance with Section 01 50 00 – Temporary Facilities and Controls.

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

.5 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 OVERLOADING

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

1.18 FALSEWORK

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

1.19 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.

1.20 CONFINED SPACES

.1 Carry out work in confined spaces in compliance with Provincial / Territorial Regulations

1.21 POWDER-ACTUATED DEVICES

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

1.22 FIRE SAFETY AND HOT WORK

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

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

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

1.23 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.

1.24 POSTED DOCUMENTS

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

.1 Site Specific Health and Safety Plan.

.2 Sequence of work.

.3 Emergency procedures.

.4 Site drawing showing project layout, locations of the first-aid station, evacuation route and marshalling station, and the emergency transportation provisions.

.5 Notice of Project.

.6 Floor plans or site plans.

.7 Notice as to where a copy of the Workers' Compensation Act and Regulations are available on the work site for review by employees and workers.

.8 Workplace Hazardous Materials Information System (WHMIS) documents.

.9 Material Safety Data Sheets (MSDS).

.10 List of names of Joint Health and Safety Committee members, or Health and Safety Representative, as applicable.

.2 Post all Material Safety Data Sheets (MSDS) on site, in a common area, visible to all workers and in locations accessible to tenants when work of this Contract includes construction activities adjacent to occupied areas.

.3 Postings should be protected from the weather, and visible from the street or the exterior of the principal construction site shelter provided for workers and equipment, or as approved by the Departmental Representative.

1.25 MEETINGS

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

1.26 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 INSPECTION

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

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

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

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

1.2 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.

1.3 REJECTED WORK

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

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

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

1.4 REPORTS

.1 Submit 2 copies of inspection and test reports to Departmental Representative.

.2 Provide copies to subcontractor of work being inspected or tested, or manufacturer or fabricator of material being inspected or tested.

1.5 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 If requested, Departmental Representative will assist in preparing schedule fixing dates for preparation.

.6 Remove mock-up at conclusion of Work or when acceptable to Departmental Representative.

.7 Specification section identifies whether mock-up may remain as part of Work or if it is to be removed and when.

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 ACTION AND INFORMATIONAL 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 Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of tents to be used, and avenues of ingress/egress to fenced area.

.3 Provide construction facilities in order to execute work expeditiously.

.4 Indicate use of supplemental or other staging area.

.5 Remove from site all such work after use.

1.3 WATER SUPPLY

.1 Water supply is not available on site. Provide continuous supply of potable water for construction use.

1.4 TEMPORARY POWER AND LIGHT

.1 Power is not available on site. Provide and pay for temporary power during construction for temporary lighting and operating of power tools.

.2 If fuel-fired generator is used, contractor is responsible for all fuel management and storage.

1.5 TEMPORARY COMMUNICATION FACILITIES

.1 Provide and pay for temporary satellite telephone hook up, and equipment necessary for own use and use of Departmental Representative.

.2 Provide and pay for satellite communications device to allow for messages to be sent to site from contractor's office.

1.6 TEMPORARY ACCOMMODATIONS, CAMP & SITE OFFICE

.1 Accommodations are not available with the campsite located on site. Provide own secure camp in location designated by Departmental Representative.

.2 Contractor to provide own lodging facilities. Acceptable lodging will be tents. Any other accommodations will require approval by the Departmental Representative.

.3 Between May 1 – June 15 and August 15 – October 15, the contractor is able to use the Parks Canada Hiker Shelter and Cooking Cabin located on site for food preparation.

.4 Contractor to provide own food and food preparation facilities. All food must be stored in bear proof containers at all time. Provide an electric fence around the perimeter of food and food preparation facilities.

.5 Contractor to use existing on-site outhouses and grey water pits to dispose of grey water and human waste.

.6 Contractor to provide own bathing/shower facility.

.7 Contractor to provide own water delivery system and treatment or boiling of lake water for camp needs.

.8 All soaps used for cleaning shall be biodegradable.

1.7 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.

1.8 GROUND PROTECTION

.1 Provide 9 mm plywood protection under all material and equipment storage areas, and all work areas.

1.9 SCAFFOLDING

.1 Scaffolding in accordance with CAN/CSA-S269.2 and Worksafe BC requirements.

.2 Provide and maintain scaffolding.

.3 Scaffolding to be erected independent of walls and roof. Remove promptly when no longer required.

1.10 SITE STORAGE/LOADING

.1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.

.2 Do not load or permit to load any part of Work with weight or force that will endanger Work.

.3 Storage space will be limited to the identified area of construction.

.4 Locate materials on site in manner to cause least interference with work activities.

.5 Store all material and equipment on dunnage.

.6 Secure all wildlife attractants within wildlife-proof containers, in a secure building, or a vehicle. Attractants include, but are not limited to, petroleum products, food, food waste containers, and garbage. Notify Departmental Representative immediately should wildlife gain access to attractants.

1.11 SANITARY FACILITIES

.1 Sanitary facilities are available on site for use by the contractor. Provide own camp supplies.

1.12 CONSTRUCTION SIGNAGE

.1 Signs and notices for safety and instruction are required in both official languages Graphic symbols to CAN/CSA-Z321.

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

1.13 CONSTRUCTION FENCING

.1 Erect temporary site enclosures using modular interlocking construction fencing. Fencing may also be used around temporary accommodations area. If fencing is not used, then the area shall be defined using stakes and/or biodegradable flagging tape.

.2 Fencing to be a minimum 1.8 m high.

.3 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

1.14 WEATHER ENCLOSURES

.1 Provide weather tight closures to openings in roofs.

1.15 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.

1.16 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 Consultant locations and installation schedule prior to installation.

.4 Be responsible for damage incurred due to lack of or improper protection.

1.17 CLEAN-UP

.1 Remove construction debris, waste materials, packaging material from work site daily.

.2 Store materials resulting from demolition activities that are salvageable.

.3 Stack stored new or salvaged material not in construction facilities.

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 Within text of each specifications section, reference may be made to reference standards.

.2 Conform to these reference standards, in whole or in part as specifically requested in specifications.

.3 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.

.4 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 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.

.3 Should disputes arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.

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

.5 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, and lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.

.5 Provide ground protection as per Section 01 50 00 – Temporary Facilities and Controls.

.6 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.

1.5 TRANSPORTATION

.1 Refer to Section 01 11 55 – General Instructions.

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 Refer to Section 01 73 00 - Execution Requirements.

.2 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.

.3 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 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.

.7 Fasteners to not penetrate the underside of the roof sheathing so that no fasteners are visible from the interior.

1.11 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 in all 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.

1.12 PROTECTION OF EXISTING BUILDING AND WORK IN PROGRESS

.1 Protect existing building components and finishes from damage. Repair damaged components and finishes according to Departmental Representative's specification, to better condition.

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

1.13 PRODUCT SPECIFICATIONS

.1 Products are specified by performance specifications: select any product meeting or exceeding the specifications.

.2 Upon request of Departmental Representative obtain from manufacturer an independent laboratory report showing that the product meets or exceeds the specified requirements at no cost to 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 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Submit written request in advance of cutting or alteration which affects:

- .1 Structural integrity of elements of project.
- .2 Integrity of weather-exposed or moisture-resistant elements.
- .3 Efficiency, maintenance, or safety of operational elements.
- .4 Visual qualities of sight-exposed elements.
- .5 Work of Owner or separate contractor.

.3 Include in request:

- .1 Identification of project.
- .2 Location and description of affected Work.
- .3 Statement on necessity for cutting or alteration.
- .4 Description of proposed Work, and products to be used.
- .5 Alternatives to cutting and patching.
- .6 Effect on Work of Owner or separate contractor.
- .7 Written permission of affected separate contractor.
- .8 Date and time work will be executed.

1.2 MATERIALS

.1 Required for original installation.

.2 Change in Materials: Submit request for substitution in accordance with Section 01 33 00 - Submittal Procedures.

1.3 PREPARATION

.1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.

.2 After uncovering, inspect conditions affecting performance of Work.

.3 Beginning of cutting or patching means acceptance of existing conditions.

.4 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.

.5 Provide protection from elements for areas which are to be exposed by uncovering work; maintain excavations free of water.

1.4 EXECUTION

.1 Execute cutting, fitting, and patching to complete Work.

.2 Fit several parts together, to integrate with other Work.

.3 Uncover Work to install ill-timed Work.

.4 Remove and replace defective and non-conforming Work.

.5 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.

.6 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.

.7 Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.

.8 Restore work with new products in accordance with requirements of Contract Documents.

.9 Fit Work tight to pipes and other penetrations through surfaces.

.10 Refinish surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition 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 PROJECT CLEANLINESS

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by Owner 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 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.4 Provide on-site containers for collection of waste materials and debris.

.5 Provide and use marked separate bins for recycling. Refer to Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.6 Dispose of waste materials and debris off site.

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

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

.9 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces.

1.2 FINAL CLEANING

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

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

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

.4 Remove waste products and debris other than that caused by Owner or other Contractors.

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

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

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

.8 Remove dirt and other disfiguration from exterior surfaces.

.9 Clean equipment and fixtures to sanitary condition.

.10 Clean roofs.

1.3 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition 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 WASTE MANAGEMENT GOALS

.1 Prior to start of Work conduct meeting with Departmental Representative to review and discuss PWGSC's waste management Plan and Goals.

.2 Protect environment and prevent environmental pollution damage.

1.2 REFERENCES

.1 Definitions:

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

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

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

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

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

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

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

.2 Reference Standards:

.1 Canadian Construction Association (CCA)

.1 CCA 81-2001: A Best Practices Guide to Solid Waste Reduction.

.2 Parks Canada

.1 Guide for the Use, Handling and Disposal of Pressure Treated Wood, 2009

.3 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 STORAGE, HANDLING AND PROTECTION

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

.2 All solid waste to be stored and handled according to applicable federal and provincial regulations.

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

.4 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility. All material to be removed from site.

.5 Cover materials during transportation.

.6 Protect structural components not removed and salvaged materials from movement or damage.

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

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

.9 Separate and store materials produced during project in designated areas.

.10 Securely store waste materials.

.11 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 required.

.2 Remove co-mingled materials to off site processing facility for separation.

1.4 DISPOSAL OF WASTES

.1 Do not bury or burn rubbish or waste materials.

.2 Do not dispose of waste, volatile material, mineral spirits, oil, or paint thinner into waterways, storm, or sanitary sewers.

.3 Dispose of treated wood in accordance with Parks Canada Guide for the Use, Handling and Disposal of Pressure Treated Wood, 2009.

.4 All waste materials from Work shall be removed from the site on upon completion and considered for reuse or resale prior to disposal.

.5 All cuttings, sawdust, and other wood waste material shall be collected and disposed of at an approved disposal facility.

.6 Collect all sawdust using dust collection devices such as shop vacuum attachments or bags.

.7 Remove materials on-site as Work progresses.

.8 Food waste shall be removed daily and disposed of as directed by the Departmental Representative.

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

3.2 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

.1 Leave Work area clean at end of each day.

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

END OF SECTION

Part 1 General

1.1 ADMINISTRATIVE REQUIREMENTS

.1 Acceptance of Work Procedures:

.1 Contractor's Inspection: Contractor: conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.

.1 Notify Departmental Representative in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.

.2 Request Departmental Representative review.

.2 Departmental Representative review:

.1 Departmental Representative and Contractor to inspect Work and identify defects and deficiencies.

.2 Contractor to correct Work as directed.

.3 Completion Tasks: submit written certificates in English that tasks have been performed as follows:

.1 Work: completed and inspected for compliance with Contract Documents.

.2 Defects: corrected and deficiencies completed.

.3 Equipment and systems: tested, adjusted, balanced and fully operational.

.4 Certificates required by Fire Commissioner: submitted.

.5 Operation of systems: demonstrated to Owner's personnel.

.6 Commissioning of mechanical systems: completed in accordance with 01 91 13 - General Commissioning (Cx) Requirements and copies of final Commissioning Report submitted to Departmental Representative.

.7 Work: complete and ready for final inspection.

.4 Final Inspection:

.1 When completion tasks are done, request final inspection of Work by Departmental Representative, and Contractor.

.2 When Work incomplete according to Departmental Representative, complete outstanding items and request re-inspection.

.5 Declaration of Substantial Performance: when Departmental Representative considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.

.6 Commencement of Lien and Warranty Periods: date of Owner's acceptance of submitted declaration of Substantial Performance to be

date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.

.7 Final Payment:

.1 When Departmental Representative considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.

.2 When Work deemed incomplete by Departmental Representative, complete outstanding items and request re-inspection.

.8 Payment of Holdback: after issuance of Certificate of Substantial Performance of Work, submit application for payment of holdback amount in accordance with contractual agreement.

1.2 FINAL CLEANING

.1 Clean in accordance with Section 01 74 11 - Cleaning.

.1 Remove surplus materials, excess materials, rubbish, tools and equipment.

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

.1 Pre-warranty Meeting:

.1 Convene meeting one week prior to contract completion with contractor's representative and Departmental Representative, in accordance with Section 01 31 19 - Project Meetings to:

.1 Verify Project requirements.

.2 Review warranty requirements.

.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.

1.2 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 Departmental Representative, two final copies and one electronic copy 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.

1.3 FORMAT

.1 Organize data as instructional manual.

.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 National Master Specification 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.

1.4 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.

1.5 AS -BUILT DOCUMENTS AND SAMPLES

.1 Maintain, in addition to requirements in General Conditions, at site for Departmental Representative one record copy of:

.1 Contract Drawings.

.2 Specifications.

.3 Addenda.

.4 Change Orders and other modifications to Contract.

.5 Reviewed shop drawings, product data, and samples.

.6 Field test records.

.7 Inspection certificates.

.8 Manufacturer's certificates.

.2 Store record documents and samples in field office apart from documents used for construction.

.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.

1.6 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

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

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

.3 Record information concurrently with construction progress.

.1 Do not conceal Work until required information is recorded.

.4 Contract Drawings and shop drawings: mark each item to record actual construction, including:

.1 Field changes of dimension and detail.

.2 Changes made by change orders.

.3 Details not on original Contract Drawings.

.4 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, field test records, required by individual specifications sections.

.7 Provide digital photos, if requested, for site records.

1.7 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 Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.

.2 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences.

.1 Include regulation, control, stopping, shut-down, and emergency instructions.

.2 Include summer, winter, and any special operating instructions.

.3 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

.4 Include manufacturer's printed operation and maintenance instructions.

.5 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

.6 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

.7 Include test and balancing reports as specified in 01 91 13 - General Commissioning (Cx) Requirements.

.8 Additional requirements: as specified in individual specification sections.

1.8 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 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.

1.9 MAINTENANCE MATERIALS

.1 Extra Stock 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 location as directed; place and store.

.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.

1.10 WARRANTIES AND BONDS

.1 Develop warranty management plan to contain information relevant to Warranties.

.2 Submit warranty management plan, 30 days before planned pre-warranty conference, to Departmental Representative approval.

.3 Warranty management plan to include required actions and documents to assure that Departmental Representative receives warranties to which it is entitled.

.4 Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.

.5 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 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.

.6 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.

.7 Conduct joint warranty meeting in June 2019.

.8 Include information contained in warranty management plan as follows:

.1 Roles and responsibilities of personnel associated with warranty process, including points of contact and telephone numbers within the organizations of Contractors, subcontractors, manufacturers or suppliers involved.

.2 Listing and status of delivery of Certificates of Warranty for extended warranty items, to include roofs and sprinkler systems.

.3 Provide list for each warranted equipment, item, feature of construction or system indicating:

.1 Name of item.

.2 Model and serial numbers.

.3 Location where installed.

.4 Name and phone numbers of manufacturers or suppliers.

.5 Names, addresses and telephone numbers of sources of spare parts.

.6 Warranties and terms of warranty: include one-year overall warranty of construction. Indicate items that have extended warranties and show separate warranty expiration dates.

.7 Cross-reference to warranty certificates as applicable.

.8 Starting point and duration of warranty period.

.9 Summary of maintenance procedures required to continue warranty in force.

.10 Cross-Reference to specific pertinent Operation and Maintenance manuals.

.11 Organization, names and phone numbers of persons to call for warranty service.

.12 Typical response time and repair time expected for various warranted equipment.

.4 Contractor's plans for attendance at 9-month post-construction warranty meeting.

.5 Procedure and status of tagging of equipment covered by extended warranties.

.6 Post copies of instructions near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

.9 Respond in timely manner to oral or written notification of required construction warranty repair work.

.10 Written verification to follow oral instructions.

.1 Failure to respond will be cause for the Departmental Representative to proceed with action against Contractor.

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 SUMMARY

.1 Section Includes:

.1 General requirements relating to commissioning of project's components and systems, specifying general requirements to PV of components, equipment, sub-systems, systems, and integrated systems.

.2 Related Requirements

.1 Section 21 13 00 – Wildfire Protection System.

.3 Acronyms:

.1 Cx - Commissioning.

.2 CxA – Commissioning Authority assigned by the Departmental Representative

.3 CCA – Contractor's Commissioning Agent

.4 EIVF – Equipment & Installation Verification Forms.

.5 O&M - Operation and Maintenance.

.6 OPRs – Owner's Project Requirements

.7 PI - Product Information.

.8 PV - Performance Verification.

.9 PVF – Performance Verification Forms

.10 TAB – Testing, Adjusting and Balancing.

1.2 REFERENCES

.1 National Fire Protection Association (NFPA)

.1 NFPA-13-02, Installation of Sprinkler Systems Handbook.

.2 Canadian Standards Association (CSA)

.1 Z320-11, Building Commissioning Standard

.3 Underwriters' Laboratories of Canada (ULC)

1.3 GENERAL

.1 Cx is a planned program of tests, procedures and checks carried out systematically on systems and integrated systems of the finished Project. Cx is performed after systems and integrated systems are completely installed, functional and Contractor's Performance Verification responsibilities have been completed and approved. Objectives:

.1 Verify installed equipment, systems and integrated systems operate in accordance with contract documents and design criteria and intent.

.2 Ensuring appropriate documentation is provided for ongoing operation and maintenance of the facility

.3 Effectively train O&M staff.

.4 Providing an effective means of communicating operational difficulties back to the design and construction teams, and

.2 Contractor assists in Cx process, operating equipment and systems, troubleshooting and making adjustments as required.

.1 Systems to be operated at full capacity under various modes to determine if they function correctly and consistently at peak efficiency. Systems to be interactively with each other as intended in accordance with Contract Documents and design criteria.

.2 During these checks, adjustments to be made to enhance performance to meet environmental or user requirements.

.3 Design Criteria: as per client's requirements or determined by designer. To meet Project functional and operational requirements.

1.4 COMMISSIONING OVERVIEW

.1 Cx Plan

.1 The commissioning plan will be distributed to the project team early in the project and will directly reflect the information provided in this section.

.2 May be updated during construction, if necessary, to accommodate client program modifications or approved design and construction changes.

.2 Cx to be a line item of Contractor's cost breakdown.

.3 Cx activities supplement field quality and testing procedures described in relevant technical sections.

.4 Cx is conducted in concert with activities performed during stage of project delivery. Cx identifies issues in Planning and Design stages which are addressed during Construction and Cx stages to ensure the built systems are constructed and proven to operate satisfactorily under weather, environmental and occupancy conditions to meet functional and operational requirements. Cx activities includes transfer of critical knowledge to facility operational personnel.

.5 Departmental Representative will issue Interim Acceptance Certificate when:

.1 Completed Cx documentation has been received, reviewed for suitability and approved by Departmental Representative.

.2 Equipment, components and systems have been commissioned.

.3 O&M training has been completed.

.6 Cx responsibilities

.1 Commissioning Team shall include the following:

.1 Departmental Representative

.2 Commissioning Authority (CxA)

.3 Contractor's Commissioning Agent (CCA)

.4 Design Team

.5 Construction Team (includes specialty testing agencies, equipment suppliers, and sub- trades as necessary).

.2 The Departmental Representative's role includes:

.1 Arranging for staff and/or third party maintenance provider to attend formal training sessions.

.2 Participate in a formal agreed procedure for handling user issues during the warranty period, and

.3 Advising the contractor of any additional required involvement in the commissioning process such as staff witness start-up and testing activities.

.3 The CxA's role is quality control and does not in any way relieve the contractor of any commissioning duties. Typical activities provided by the CxA include includes:

.1 Participate in a formal agreed procedure for handling user issues during the warranty period,

.2 Reviewing the contractor's Cx schedule and tracking Commissioning progress

.3 Reviewing shop drawings for equipment substitutions that might impact on the OPRs or commissionability

.4 Chair commissioning meetings and distribute meeting minutes

.5 Reviewing construction meeting minutes for items impacting on the Cx process,

.6 Reviewing submitted commissioning forms for completeness and acceptability

.7 Checking RFIs, SIs, and CCNs for assessment of their impact on the OPRs or commissionability,

.8 Selective witnessing of testing,

.9 Reviewing Inspection Reports for any specific issues that might affect installation & performance verification activities

.10 Reviewing completed commissioning forms

.11 Reviewing the contractor's training schedule

.4 The Construction Team's responsibility is the provision of all necessary labour, materials, tools, and equipment for implementing all required Cx activities including:

.1 Create and update throughout the project the commissioning plan

.2 Preparation of "Commissioning Forms" (PVF)

.3 Integration of Cx activities into the construction schedule and ensuring activities are carried out in a timely manner.

.4 Provide a separate Commissioning Schedule if requested by the CxA.

.5 Raising commissioning concerns to the CxA and Departmental Representative.

.6 Carrying a commissioning agenda item at site meetings until such time that Commissioning activities necessitate separate meetings

.7 Attending Cx meetings

.8 Complete system by system testing and quality control and then document all required information on the installation and performance commissioning forms provided by the CxA.

.9 All checking, testing, adjusting, and balancing

.10 Preparation of training materials and the training of facility O&M staff

.11 Preparation of O&M materials as outlined in this specification section and in accordance with specification sections, for inclusion in the O&M Manuals.

.12 Preparation of as-built drawings

.13 Re-testing and/or undertaking remedial works as deemed necessary by the CxA and/or to address occupant issues

.14 Fine tuning of system set points and operation prior to handover and during the warranty period,

1.5 EXTENT OF CX

.1 The Cx 'process' as detailed in these specifications shall apply to all building systems for which some form of Cx is required, and includes the following:

.1 Mechanical:

.1 Fire Protection System

1.6 NON-CONFORMANCE TO PERFORMANCE VERIFICATION REQUIREMENTS

.1 Should equipment, system components, and associated controls be incorrectly installed or malfunction during Cx, correct deficiencies, re-verify equipment and components within the unfunctional system, including related systems as deemed required by CxA, to ensure effective performance.

.2 Costs for corrective work, additional tests, inspections, to determine acceptability and proper performance of such items to be borne by Contractor. Above costs to be in form of progress payment reductions or hold-back assessments.

1.7 PRE-CX REVIEW

.1 Before Construction:

.1 Review contract documents, confirm by writing to Departmental Representative.

.1 Adequacy of provisions for Cx.

.2 Aspects of design and installation pertinent to success of Cx.

.2 During Construction:

.1 Co-ordinate provision, location and installation of provisions for Cx.

.3 Before start of Cx:

.1 Have completed Cx Plan up-to-date.

.2 Ensure installation of related components, equipment, sub-systems, systems is complete.

.3 Fully understand Cx requirements and procedures.

.4 Have Cx documentation shelf-ready.

.5 Understand completely design criteria and intent and special features.

.6 Submit complete start-up documentation to Departmental Representative.

.7 Have Cx schedules up-to-date.

.8 Ensure systems have been cleaned thoroughly.

.9 Complete TAB procedures on systems, submit TAB reports to Departmental Representative for review and approval.

.10 Ensure "As-Built" system schematics are available.

.4 Inform CxA in writing of discrepancies and deficiencies on finished works.

1.8 CONFLICTS

.1 Report conflicts between requirements of this section and other sections to CxA before start-up and obtain clarification.

.2 Failure to report conflict and obtain clarification will result in application of most stringent requirement.

1.9 ACTION AND INFORMATIONAL SUBMITTALS

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

.1 Submit no later than 4 weeks after award of Contract:

.1 Name of Contractor's Cx agent.

.2 Draft Cx documentation.

.3 Preliminary Cx schedule.

.2 Submit proposed Cx procedures to Departmental Representative where not specified and obtain written approval at least 4 weeks prior to start of Cx.

.3 Provide additional documentation relating to Cx process required by CxA.

1.10 COMMISSIONING DOCUMENTATION

.1 Refer to Appendix 3 for Performance Verification (PV) Forms.

.2 CxA to review and approve Cx documentation.

.3 Provide completed and approved Cx documentation to CxA.

1.11 COMMISSIONING MEETINGS

.1 Convene Cx meetings following regular project meetings.

.2 Purpose: to resolve issues, monitor progress, identify deficiencies, relating to Cx.

.3 Continue Cx meetings on regular basis until commissioning deliverables have been addressed.

1.12 STARTING AND TESTING

.1 Contractor assumes liabilities and costs for inspections. Including disassembly and re-assembly after approval, starting, testing and adjusting, including supply of testing equipment.

1.13 WITNESSING OF STARTING AND TESTING

.1 Provide 14 days notice prior to commencement.

.2 CxA to witness of start-up and testing.

.3 Contractor's Cx Agent to be present at tests performed and documented by sub-trades, suppliers and equipment manufacturers.

1.14 PROCEDURES

.1 Verify that equipment and systems are complete, clean, and operating in normal and safe manner prior to conducting start-up, testing and Cx.

.2 Conduct start-up and testing in following distinct phases:

.1 Included in delivery and installation:

.1 Verification of conformity to specification, approved shop drawings.

.2 Visual inspection of quality of installation.

.2 Start-up: follow accepted start-up procedures.

.3 Operational testing: document equipment performance.

.4 System PV: include repetition of tests after correcting deficiencies.

.5 Post-substantial performance verification: to include fine-tuning.

.3 Correct deficiencies and obtain approval from CxA after distinct phases have been completed and before commencing next phase.

.4 Document require tests on approved PV forms.

.5 Failure to follow accepted start-up procedures will result in re-evaluation of equipment by an independent testing agency selected by CxA. If results reveal that equipment start-up was not in accordance with requirements, and resulted in damage to equipment, implement following:

.1 Minor equipment/systems: implement corrective measures approved by CxA.

.2 Major equipment/systems: if evaluation report concludes that damage is minor, implement corrective measures approved by CxAe.

.3 If evaluation report concludes that major damage has occurred, CxA shall reject equipment.

.1 Rejected equipment to be remove from site and replace with new.

.2 Subject new equipment/systems to specified start-up procedures.

1.15 START-UP DOCUMENTATION

.1 Assemble start-up documentation and submit to CxA for approval before commencement of commissioning.

.2 Start-up documentation to include:

.1 Factory and on-site test certificates for specified equipment.

.2 Pre-start-up inspection reports.

.3 Signed installation/start-up check lists.

.4 Start-up reports,

.5 Step-by-step description of complete start-up procedures, to permit CxA to repeat start-up at any time.

1.16 OPERATION AND MAINTENANCE OF EQUIPMENT AND SYSTEMS

.1 After start-up, operate and maintain equipment and systems as directed by equipment/system manufacturer.

.2 With assistance of manufacturer develop written maintenance program and submit to CxA for approval before implementation.

.3 Operate and maintain systems for length of time required for commissioning to be completed.

.4 After completion of commissioning, operate and maintain systems until issuance of certificate of interim acceptance.

1.17 TEST RESULTS

.1 If start-up, testing and/or PV produce unacceptable results, repair, replace or repeat specified starting and/or PV procedures until acceptable results are achieved.

.2 Provide manpower and materials, assume costs for re-commissioning.

1.18 START OF COMMISSIONING

.1 Notify CxA at least 14 days prior to start of Cx.

.2 Start Cx after elements of building affecting start-up and performance verification of systems have been completed.

1.19 INSTRUMENTS / EQUIPMENT

.1 Submit to CxA for review and approval:

.1 Complete list of instruments proposed to be used.

.2 Listed data including, serial number, current calibration certificate, calibration date, calibration expiry date and calibration accuracy.

.2 Provide the following equipment as required:

.1 2-way radios.

.2 Ladders.

.3 Equipment as required to complete work.

1.20 COMMISSIONING PERFORMANCE VERIFICATION

.1 Carry out Cx:

.1 Under actual operating conditions, over entire operating range, in all modes.

.2 On independent systems and interacting systems.

.2 Cx procedures to be repeatable and reported results are to be verifiable.

.3 Follow equipment manufacturer's operating instructions.

1.21 WITNESSING COMMISSIONING

.1 CxA to witness activities and verify results.

1.22 AUTHORITIES HAVING JURISDICTION

.1 Where specified start-up, testing or commissioning procedures duplicate verification requirements of authority having jurisdiction, arrange for authority to witness procedures so as to avoid duplication of tests and to facilitate expedient acceptance of facility.

.2 Obtain certificates of approval, acceptance and compliance with rules and regulation of authority having jurisdiction.

.3 Provide copies to CxA within 5 days of test and with Cx report.

1.23 EXTENT OF VERIFICATION

.1 Elsewhere:

.1 Provide manpower and instrumentation to verify up to 30 % of reported results, unless specified otherwise in other sections.

.2 Number and location to be at discretion of CxA.

.3 Conduct tests repeated during verification under same conditions as original tests, using same test equipment, instrumentation.

.4 Review and repeat commissioning of systems if inconsistencies found in more than 20% of reported results.

.5 Perform additional commissioning until results are acceptable to CxA.

1.24 REPEAT VERIFICATIONS

.1 Assume costs incurred by CxA for third and subsequent verifications where:

.1 Verification of reported results fail to receive CxA's approval.

.2 Repetition of second verification again fails to receive approval.

.3 CxA deems Contractor's request for second verification was premature.

1.25 SUNDRY CHECKS AND ADJUSTMENTS

.1 Make adjustments and changes which become apparent as Cx proceeds.

.2 Perform static and operational checks as applicable and as required.

1.26 DEFICIENCIES, FAULTS, DEFECTS

.1 Correct deficiencies found during start-up and Cx to satisfaction of Departmental Representative.

.2 Report problems, faults or defects affecting Cx to Departmental Representative in writing. Stop Cx until problems are rectified. Proceed with written approval from Departmental Representative.

1.27 COMPLETION OF COMMISSIONING

.1 Upon completion of Cx leave systems in normal operating mode.

.2 Except for warranty and seasonal verification activities specified in Cx specifications, complete Cx prior to issuance of Interim Certificate of Completion.

.3 Cx to be considered complete when contract Cx deliverables have been submitted and accepted by Departmental Representative.

1.28 ACTIVITIES UPON COMPLETION OF COMMISSIONING

.1 When changes are made to baseline components or system settings established during Cx process, provide updated Cx form for affected item.

1.29 TRAINING

.1 Demonstrate operation, maintenance, and re-commissioning of all equipment and systems as required by these specifications.

.2 Co-ordinate with CxA to provide training for the Departmental Representative's personnel and / or designated service providers. Provide a schedule for training not less than one month prior to proposed start date. Training to be undertaken during normal working hours.

.3 Demonstration and training to include field demonstration at each significantly different system or piece of equipment.

.4 Demonstration and training to be completed no later then one (1) week before substantial completion.

.5 Record date and time of training, attendees, and instructors.

.6 The O&M Manual shall be used as the basis of instruction; review contents of manual in detail to explain all aspects of O&M.

.7 Provide participants with training evaluation forms (included in the Cx Plan) allowing space for participants to suggest need for additional or revised O&M Manual material, review comments and make changes as appropriate. Return completed evaluation sheets to the Departmental Representative.

.8 Each training session should cover as a minimum:

.1 Description of the equipment & system

.2 Demonstration of the equipment & system

.3 Normal & Emergency Operation Procedures

.4 Maintenance provided by the installing contractor during the warranty period

.5 Maintenance provided by the manufacturer during the warranty period

.6 Tools & materials required for equipment servicing

.7 Spare parts provided as part of this contract and source of and typical delivery time for other parts

.8 Health & safety issues associated with maintenance activities including required use of hazardous materials or personal protection devices

1.30 PERFORMANCE VERIFICATION TOLERANCES

.1 Application tolerances:

.1 Specified range of acceptable deviations of measured values from specified values or specified design criteria. Except for special areas, to be within +/- 10% of specified values.

.2 Instrument accuracy tolerances:

.1 To be of higher order of magnitude than equipment or system being tested.

.3 Measurement tolerances during verification:

.1 Unless otherwise specified actual values to be within +/- 2 % of recorded values.

1.31 OWNER'S PERFORMANCE TESTING

.1 Performance testing of equipment or system by CxA will not relieve Contractor from compliance with specified start-up and testing procedures.

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 Laboratory Analysis by AGAT Laboratories, entitled "Courthouse – St. Andrews Hazmat," January 2016.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

1.3 SITE CONDITIONS

.1 Review designated substance report and take precautions to protect environment.

.2 If material resembling spray or trowel-applied asbestos or other designated substance listed as hazardous be encountered, stop work, take preventative measures, and notify Departmental Representative immediately.

.1 Proceed only after receipt of written instructions have been received from Departmental Representative.

.3 Notify Departmental Representative before disrupting building access.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 EXAMINATION

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

3.2 PREPARATION:

.1 Protection of In-Place Conditions:

.1 Prevent movement, settlement, or damage to adjacent structures, landscaping features and parts of building and finishes to remain in place.

.2 Keep noise, dust, and inconvenience to occupants to minimum.

.3 Provide railings, supports and other protection as required.

.4 Do Work in accordance with Section 01 35 29 - Health and Safety Requirements.

.2 Demolition/Removal:

.1 Remove items as indicated.

.2 Remove parts of existing building to permit new construction.

.3 Items for re-installation to be stored in a dry, protected area as directed by Departmental Representative.

3.3 REINSTALLATION

.1 Reinstall elements that have been removed for remediation work once complete and reviewed by Departmental Representative.

.2 Install in original position and conserve any damaged elements to the satisfaction of Departmental Representative.

.3 Upon completion of installation, notify Departmental Representative for review of completed work.

3.4 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

.1 Leave Work area clean at end of each day.

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

.3 Refer to demolition drawings and specifications for items to be salvaged for reuse.

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

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

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 02 41 99 – Demolition for Minor Works

1.2 REFERENCES

.1 Definitions:

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

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

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

.2 Reference Standards:

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

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

.2 Department of Justice Canada (Jus)

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

.2 Transportation of Dangerous Goods Regulations (T-19.01-SOR/2001-286).

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

.1 Material Safety Data Sheets (MSDS).

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

.1 National Fire Code of Canada-2005.

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 hazardous materials and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit two copies of WHMIS MSDS in accordance with Section 01 35 33 - Health and Safety Requirements to Departmental Representative for

each hazardous material required prior to bringing hazardous material on site.

.3 Submit hazardous materials management plan to Departmental Representative that identifies hazardous materials, usage, location, personal protective equipment requirements, and disposal arrangements.

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

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

.1 When exporting hazardous waste to another country, ensure compliance with Export and Import of Hazardous Waste and Hazardous Recyclable Materials Regulations.

.4 Storage and Handling Requirements:

.1 Co-ordinate storage of hazardous materials with Departmental Representative and abide by internal requirements for labelling and storage of materials and wastes.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

.4 Segregate incompatible materials and wastes.

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

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

.7 Maintain clear egress from storage area.

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

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

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

.11 When hazardous waste is generated on site:

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

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

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

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

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

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

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

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

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

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

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

Part 2 Products

2.1 MATERIALS

.1 Description:

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

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

Part 3 Execution

3.1 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

.1 Leave Work area clean at end of each day.

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

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

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

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

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

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

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

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

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

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

.1 Hazardous wastes recycled in manner constituting disposal.

.2 Hazardous waste burned for energy recovery.

.3 Lead-acid battery recycling.

.4 Hazardous wastes with economically recoverable precious metals.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 06 10 00 – Rough Carpentry.

1.2 SECTION INCLUDES

.1 Splicing of new rafter tails.

1.3 ALTERNATES

.1 Obtain Departmental Representative's approval before changing, sources of supply, wood species, or wood grade.

1.4 REFERENCES

.1 ASTM International

.1 ASTM A325M-09, Standard Specification for Structural Bolts, Steel, Heat Treated 830 Mpa Minimal Tensile Strength Metric.

.2 Canadian Institute of Steel Construction (CISC)/Canadian Paint Manufacturers' Association (CPMP)

.1 CISC/CPMA 1-73a-1975, A Quick Drying One-coat Paint for Use on Structural Steel.

.3 CSA International

.1 CSA O141-05(R2009), Softwood Lumber

1.5 SUBMITTAL

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

.2 Samples:

.1 Submit duplicate samples of rafter tail splint: sample size to match existing and 600 mm long.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.

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

.3 Storage and Handling Requirements:

.1 Storage area designated by Departmental Representative.

.2 Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.3 Store and protect wood from nicks, scratches, and blemishes.

.4 Replace defective or damaged materials with new.

.4 Stack wood above ground or soil with spacer slats between layers to ensure adequate ventilation for air drying.

.5 Cover wood supply with breathable membrane.

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

Part 2 Products

2.1 MATERIALS

.1 Dimension lumber:

.1 Splints: Use sub-alpine fir to match existing.

.2 Actual size: thickness 50 mm, width 135 mm to match existing, rough sawn from the log.

.3 Material must not be harvested on site.

.4 Moisture content: maximum 19% to CSA O141

.2 Timber connections:

.1 Nails: to CSA B111

.3 Finishes:

.1 Galvanizing: to ASTM A123/A123M.

Part 3 Execution

3.1 PREPARATION

.1 Protection of in-place conditions:

.1 Protect existing materials and finishes adjacent to repair area from damage during the Work.

.2 Surface Preparation:

.1 Install adequate scaffolding, ladders and platforms for completion of work in accordance with Contract Drawings.

.2 Install adequate shoring and bracing. Ensure support in vicinity of repair.

.1 Review with Departmental Representative before start of Work.

3.2 CONSTRUCTION

.1 Cut back damaged or decayed wood as indicated.

.2 Remove decayed wood with extreme care. Cause neither disruption nor damage to adjacent surfaces and structure.

.3 Joints:

.1 Lay out and cut joints to match existing.

.2 Trial fit joints before fastening in place. Adjust as necessary to ensure close accurate fit with adjacent surfaces.

.4 Metal Connectors:

.1 Nail splints to existing truss chord with 89mm long nails at 200 mm on centre, staggered.

.2 Attach new rafter tails splints to sheathing with nails providing a minimum penetration of 38mm into new splints.

3.3 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

.1 Leave Work area clean at end of each day.

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

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

3.4 PROTECTION

.1 Cover completed work not enclosed or sheltered with waterproof covering. Anchor securely in place.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Repair and replacement of exterior architectural woodwork including facia, rabbeted hip cap, and finials.

1.2 REFERENCES

.1 CSA International

.1 CSA B111-74(R2003), Wire Nails, Spikes and Staples.

.2 CSA O141-05(R2009), Softwood Lumber.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Samples:

.1 Submit duplicate samples of fascia and rabbet hip cap: sample size to match existing and 600 mm long.

1.4 QUALITY ASSURANCE

.1 Mock-ups:

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

.1 Construct 1200 mm long mock-up of fascia and hip cap where directed by Departmental Representative.

.2 Allow 48 hours for inspection of mock-up before proceeding with work.

.3 When accepted, mock-up will demonstrate minimum standard of quality required for this work.

.1 Approved mock-up may not remain as part of finished work. Remove mock-up and dispose of materials when no longer required and when directed by Departmental Representative.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

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

.1 Protect millwork against dampness and damage during and after delivery.

.2 Store millwork in ventilated areas, protected from extreme changes of temperature or humidity.

.3 Storage and Handling Requirements:

.1 Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect exterior architectural woodwork from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

.1 Softwood lumber: spruce to match existing, moisture content 19 % or less in accordance with following standards: CSA O141.

.1 Fascia: Pine or sub-alpine fir logs to match existing.

.1 Size: match logs to be replaced in shape and surface appearance. Diameter to be approximately 120 mm.

.2 Preparation: logs to be milled 1 side to match existing, and delivered with bark left intact.

.2 Hip Cap: Pine or sub-alpine fir logs to match existing.

.1 Size: to match existing in shape and surface appearance. Diameter is approximately 100 mm.

.2 Preparation: logs to be milled with rabbet to fit over roof hip and delivered with bark intact.

.3 Material must not be harvested on site.

.2 Nails and staples: to CSA B111 galvanized to ASTM A123/A123M for exterior work.

.3 Wood screws: stainless steel, type and size to suit application.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for wood products installation in accordance with manufacturer's instructions.

.1 Visually inspect substrate.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 INSTALLATION

.1 Scribe and cut as required, fit to abutting walls, and surfaces, fit properly into recesses and to accommodate piping, columns, fixtures, outlets, or other projecting, intersecting or penetrating objects.

.2 Form joints to conceal shrinkage.

3.3 CONSTRUCTION

.1 Fastening:

.1 Position items of finished carpentry work accurately, level, plumb, true and fasten or anchor securely.

.2 Design and select fasteners to suit size and nature of components being joined and to match existing fastening method.

.3 Set all finishing nails.

.2 Fascia Boards:

.1 Joints between boards to match existing.

.2 Fit backs of fascia board snugly to rafter tails to eliminate cracks at junction.

.3 Hip Cap:

.1 Install hip caps using nails.

3.4 REPAIR OF EXISTING FINIAL

.1 Repair existing finial by resetting nails as directed by Departmental Representative.

3.5 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 – Cleaning.

.1 Leave Work area clean at end of each day.

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

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition 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 finish carpentry installation.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Work includes labour, materials, equipment and services necessary for:

.1 Treatment of cedar shingles and ridge boards.

1.2 REFERENCES

.1 American Wood-Preservers' Association (AWPA)

.1 AWPA M2-01, Standard for Inspection of Treated Wood Products.

.2 AWPA M4-06, Standard for the Care of Preservative-Treated Wood Products.

.2 Canadian Standards Association (CSA International)

.1 CSA O80 Series-97(R2002) - O80S2-05, Wood Preservation.

.2 CSA O80.20-1.1-M97(R2002), This Standard applies to the fire-retardant treatment of lumber by pressure processes.

.3 CSA O80.201-M89, This Standard covers hydrocarbon solvents for preparing solutions of preservatives.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Quality assurance submittals:

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

.2 For products treated with preservative and fire-retardant by pressure impregnation submit following information certified by authorized signing officer of treatment plant:

.1 Information listed in AWPA M2 and revisions specified in CSA O80 Series, Supplementary Requirement to AWPA M2 applicable to specified treatment.

.2 Moisture content after drying following treatment with water-borne preservative and fire-retardant.

.3 Acceptable types of paint, stain, and clear finishes that may be used over treated materials to be finished after treatment.

1.4 QUALITY ASSURANCE

.1 Each piece of lumber and plywood for preserved wood foundations to be identified by CSA O322 certified stamp.

.2 Regulatory Requirements:

.1 Each board or bundle of fire-retardant treated material to bear ULC label indicating Flame Spread Classification (FSC), and smoke developed.

1.5 DELIVERY, STORAGE, AND HANDLING

.1 Waste Management and Disposal:

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

Part 2 Products

2.1 MATERIALS

.1 Fire-Retardant: to CAN/ULC-S107, to provide:

.1 Flame Spread Classification: UL Class B.

.2 Smoke developed of not more than: 15.

Part 3 Execution

3.1 APPLICATION: FIRE-RETARDANT

.1 Treat cedar shingles and ridge boards by pressure impregnation with fire-retardant chemicals in accordance with CSA O80.20.

.2 Following treatment, kiln-dry material to maximum moisture content of 19%.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Plywood roof sheathing and miscellaneous concealed wood blocking and framing.

.2 Roof Ladder.

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 A653/A653M-11, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 CSA International

.1 CSA B111-1974 (R2003), Wire Nails, Spikes and Staples.

.2 CSA O121-08, Douglas Fir Plywood.

.3 CSA O141-05(R2009), Softwood Lumber.

.4 CSA O325-07, Construction Sheathing.

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

.1 Material Safety Data Sheets (MSDS).

.4 National Lumber Grades Authority (NLGA)

.1 Standard Grading Rules for Canadian Lumber 2010.

1.3 QUALITY ASSURANCE

.1 Plywood identification: by grade mark in accordance with applicable CSA standards.

.2 Plywood, OSB and wood based composite panel construction sheathing identification: by grademark in accordance with applicable CSA standards.

1.4 DELIVERY, STORAGE, AND HANDLING

.1 Waste Management and Disposal:

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

Part 2 Products

2.1 LUMBER MATERIAL

.1 Lumber: unless specified otherwise, softwood, S4S, moisture content 19% or less in accordance with following standards:

.1 CSA O141.

.2 NLGA Standard Grading Rules for Canadian Lumber.

.2 Furring, blocking, nailing strips, grounds, rough bucks, cants, curbs, fascia backing and sleepers:

.1 S2S is acceptable for concealed locations.

.2 Board sizes: "standard" or better grade.

.3 Dimension sizes: "standard" light framing or better grade.

2.2 PANEL MATERIALS

.1 Douglas fir plywood: to CSA O121, standard construction.

2.3 ACCESSORIES

.1 Fasteners: to CAN/CSA-G164, for exterior work.

.2 Nails: to CSA B111.

.1 Select fastener length to ensure fastener is not visible from below.

2.4 FINISHES

.1 Galvanizing: to ASTM A123/A123M, use galvanized fasteners for exterior work.

.2 Wood Treatment Stain Finish: for roof ladder, apply a wood stain finish with the following properties:

.1 Non-toxic, based on EC50 and EC20 testing.

.2 Powder concentrate mixed with water

.3 Application: dipping

Part 3 Execution

3.1 INSTALLATION

.1 Comply with requirements of NBC, supplemented by the following paragraphs.

.2 Install furring and blocking as required to space-out work as required.

.3 Install wood cants, fascia backing, nailers, curbs and other wood supports as required and secure using galvanized fasteners.

3.2 FINISHES

.1 Apply wood treatment stain in accordance with manufacturer's instructions.

3.3 ERECTION

.1 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 06 40 13 – Exterior Architectural Woodwork.

.2 Section 07 62 00 – Sheet Metal Flashing and Trim.

.3 Section 21 13 00 – Wildfire Protection System.

1.2 REFERENCES

.1 Definitions:

.1 Shingle: tapered slice of wood sawn from block with taper in direction of grain or axial direction.

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

.1 ASTM B370-12, Standard Specification for Copper Sheet and Strip for Building Construction.

.2 ASTM E96/E 96M - Test Methods for Water Vapor Transmission of Materials.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-4.2 No 26.3-95, Textile Test Methods: Textile Fabrics - Determination of Resistance to Water Penetration - Hydrostatic Pressure Test.

.3 CSA International

.1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.

.2 CSA O118.1-08, Western Red Cedar Shakes and Shingles.

.4 Cedar Shake and Shingle Bureau (CSSB)

.1 CSSB-97, Cedar Shake and Shingle Grading Rules.

.2 CSSB New Roof Construction Manual for Roof Application Details, Metric Version 2015.

.5 Roofing Contractors Association of British Columbia.

.1 RGC Roofing Practices Manual, Current Edition.

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 shingles and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.1 Indicate details of flashing installation.

.4 Samples:

.1 Submit duplicate full size shingles, of finish and profile specified.

1.4 QUALITY ASSURANCE

.1 Mock-ups:

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

.1 Construct 1200 mm x 1200 mm mock-up where directed by Departmental Representative.

.2 Allow 48 hours for inspection of mock-up before proceeding with work.

.3 When accepted, mock-up will demonstrate minimum standard of quality required for this work.

.1 Approved mock-up may not remain as part of finished work. Remove mock-up and dispose of materials when no longer required and when directed by Departmental Representative.

.2 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.

.3 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.

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

.3 Storage and Handling Requirements:

.1 Exercise care to avoid damage during unloading and storing.

.2 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.3 Store and protect shingles from nicks, scratches, and blemishes.

.4 Replace defective or damaged materials with new.

.5 Remove only in quantities required for same day use.

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

1.6 UNUSED MATERIALS

.1 Unused shingles remain property of Owner.

.2 Return unused shingles to Owner. Retain packaging or rewrap shingles to form complete bundles.

.3 Label packages to identify product, quantity and manufacturer/supplier.

.4 Deliver and store in location designated by Departmental Representative.

1.7 EXTENDED WARRANTY

.1 For work done within this Section, 12-month warranty period will be extended to 24 months.

Part 2 Products

2.1 MATERIALS

.1 Sawn Shingles: to CSA O118.1.

.1 Species: Western Red Cedar.

.2 Grade: Certigrade No. 1 Blue Label, grading audited by a Standards Council of Canada accredited agency.

.3 Fire Retardant Treatment to CAN/ULC-S107, Class B, and kiln dried to < 19% moisture content.

.4 Profile: 1.6 mm at point. 5 butts to equal 51 mm (5/51mm)

.5 Widths: 75 mm minimum - 350 mm maximum.

.6 Lengths: 406 mm "Fivex"

.7 Exposure:120 mm minimum to 125 mm maximum

.8 Grain: 100% edge grain.

.9 Wood: 100% heartwood.

.10 Defects: 100% clear.

.2 Ridge Boards:

.1 Gables and dormers: to be Western Red Cedar, Premium Grade, 25mm thick, +/-120 mm wide to match existing, lengths to match existing, with sawn finish to match shingles.

.1 Fire Retardant Treatment to match shingles.

.2 Contractor to confirm widths and lengths of existing ridge boards.

.2 Hips: Refer to Section 06 03 20 – Exterior Finish Carpentry.

.3 Vapour Permeable Underlayment membrane: spun-bonded polypropylene with embedded breathable film, with the following properties:

.1 Width: Minimum 1.2m

.2 Water Penetration Resistance: > 600cm to CAN/CGSB-4.2

.3 Water Vapor Transmission: > 50 perms to ASTM E96, Method B.

.4 Flame Spread: Maximum 25 to NFPA Class A and ASTM E84-09

.5 UV Exposure: Maximum exposure of minimum 4 weeks.

.6 Auxiliary materials:

.1 Tape: As recommended by Manufacturer for overlaps, penetrations, and repairs.

.2 Adhesive: As recommended by manufacturer.

.3 Fasteners: Galvanized or stainless steel, as recommended by manufacturer.

.4 Flashing: Refer to Section 07 62 00 – Sheet Metal Flashing.

.5 Mechanical Penetration Sleeve: Non-fading sealing rubber collar with galvanized steel base suited for roof pitch. Minimum base dimension of 275 mm x 350 mm.

.6 Nails: 2.1mm (3d) Stainless steel, type 316 to CSA B111, and CSA O118.1, Appendix E. Nails must have sufficient length to penetrate completely through the new plywood sheathing and existing sheathing boards a minimum of 20 mm, but must not be visible from the underside.

.7 Plywood and replacement wood sheathing boards: Refer to Section 06 10 00 – Rough Carpentry.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable 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 MANUFACTURER'S INSTRUCTIONS

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

3.3 REMOVAL OF EXISTING ROOFING

.1 Remove existing roofing, flashings and underlayment, and expose sheathing of roof.

.2 Withdraw existing shingle and flashing nails, set those which break off. Leave surfaces free from dirt and loose material.

.3 Departmental Representative to inspect roof sheathing. Take up, cut out, remove burn out portion of sheathing boards affected by fungal or insect attack as directed on site by Consultant.

.4 Replace cut out portions of sheathing boards or lath with boards of equal sectional dimensions, and specified grade. Seat each end of board on rafter, with 25 mm bearing, and secure to rafter.

.5 Solid roof sheathing: lay boards with tight joints.

3.4 APPLICATION

.1 Do wood shingle work in accordance with CSA O118.1, Appendix C and RGC system sheet specification STR-CS. Where the requirements of this specification are more stringent than the RGC specifications, the more stringent requirement will be applied.

.2 Install shingles over dry substrate.

.3 Space shingle joints 6 mm.

.4 Stagger joints minimum of 40 mm in succeeding courses. Ensure that in any 3 courses no two joints are in alignment.

.5 Use two nails per shingle. Space nails 20 mm from edge and 40 mm above butt line of following course.

.6 Drive nails flush but do not crush shingles.

.7 Fasteners must not penetrate through underside of existing sheathing boards, and must not be visible from below.

3.5 SHINGLE ROOFING

.1 Vapour Permeable Underlayment:

.1 Penetrations:

.1 Install manufactured penetration sleeves sized for the penetration and install as recommended by the manufacturer.

.2 Unroll underlayment membrane next to penetration and fold membrane back on itself. Mark and cut out penetration size out of membrane. Ensure cut out section is slightly smaller than diameter of penetration. Slide membrane over penetration.

.3 Wrap manufacturer recommended tape around penetration. Ensure that 50 mm extends onto the membrane, as well as on to the penetrating subject.

.2 Membrane Installation

.1 Comply with manufacturer's installation instructions.

.2 Install shingles with 120-125 mm weather exposure and having triple thickness of shingle at any given point.

.3 Triple shingles at eaves, projecting butts 40 mm from fascia board. Project shingles 25 mm minimum at gable ends.

.4 Lay shingles with grain perpendicular to eaves.

.5 Saw shingles parallel to valley centre line. Do not break joints into valley.

.6 Apply strip of vapour permeable underlayment membrane minimum 200 mm wide over hips and ridges under flashing. Install ridge caps with butt joints to match existing.

.7 Saddles and crickets shall extend a minimum of 255 mm under shingles.

.8 Install bottom step flashing (soaker base flashing) interleafed between shingles at vertical junctions. Step flashing shall extend a minimum 125 mm up vertical surfaces, 100 mm between courses of roofing and have a 75 mm head lap. Step flashing shall extend a minimum 75 mm beyond the down slope corners and be folded, but not cut.

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 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/Demolition Waste Management and Disposal.

.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 wood shingles and shakes installation.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Flashing and counter-flashings.

.2 Cricket and coping flashings.

.3 Collar flashings.

.4 Moss control strips.

.5 Sheet metal underlayment membrane.

1.2 RELATED REQUIREMENTS

.1 Section 07 03 32 – Historic – Wood Shingle Roofing.

1.3 REFERENCES

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

.1 ASTM B32-04, Standard Specification for Solder Metal.

.2 ASTM B370-03, Standard Specification for Copper Sheet and Strip for Building Construction.

.2 Copper Development Association (CDA)

.1 Copper in Architecture Handbook.

.2 Design Handbook – Architectural Applications.

.3 Canadian Roofing Contractors Association (CRCA)

.1 Roofing Specifications Manual 1997.

.4 Canadian Standards Association (CSA International)

.1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.

.5 Roofing Contractor Association of British Columbia.

.1 RGC Roofing Practices Manual, Current Edition.

1.4 PERFORMANCE REQUIREMENTS

.1 Installation Requirements: Fabricator is responsible for installing system, including anchorage to substrate and necessary modifications to meet specified and drawn requirements and maintain visual design concepts in accordance with Contract Documents and following installation methods as stipulated in the "Copper in Architecture" handbook published by the Copper Development Association Inc. (CDA).

.1 Drawings are diagrammatic and are intended to establish basic dimension of units, sight lines, and profiles of units.

.2 Make modifications only to meet field conditions and to ensure fitting of system components.

.3 Obtain Departmental Representative's approval of modifications.

.4 Provide concealed fastening wherever possible.

.5 Attachment considerations: Account for site peculiarities and expansion and contraction movements so there is no possibility of loosening, weakening and fracturing connection between units and building structure or between components themselves.

.6 Obtain Departmental Representative's approval for connections to building elements at locations other than indicated in Drawings.

.7 Accommodate building structure deflections in system connections to structure.

.2 Performance Requirements:

.1 System shall accommodate movement of components without buckling, failure of joint seals, undue stress on fasteners, or other detrimental effects when subjected to seasonal temperature changes and live loads.

.2 Design system capable of withstanding building code requirements for negative wind pressure.

1.5 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 Shop Drawings:

.1 Shop drawings: submit drawings of sheet metal flashing profiles, methods of joining, and anchorage details at 1:5 scale.

.4 Samples:

.1 Submit duplicate 150 x 150 mm samples of each type of sheet metal material.

.2 Submit duplicate 300 mm long mock-ups of each flashing assembly detailed for the project including: Crickets, step flashing (including kick-out diverter), and coping.

1.6 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/Demolition Waste Management and Disposal.

Part 2 Products

2.1 SHEET METAL MATERIALS

.1 Copper sheet: to ASTM B370 temper designation H00 cold-rolled except where temper 060 is required for forming;

.1 Mass: 4.88 kg/m^2 (16 oz/ft^2) minimum.

.2 Thickness: 0.55 mm minimum.

.2 Collar Flashing Sheet Metal: zinc coated sheet steel, 0.55 mm, commercial quality to ASTM A653/A653M, with Z275 designation zinc coating.

2.2 ACCESSORIES

.1 Bituminous Isolation coating: SSPC-Paint 12, Cold-Applied Asphalt Mastic (Extra Thick Film), nominally free of sulfur, compounded for 15-mil dry film thickness per coat.

.2 Plastic cement: to CAN/CGSB 37.5.

.3 Underlay for metal flashing: high temperature grade water barrier underlayment: Cold applied, self-adhering membrane composed of a high density, cross laminated polyethylene film coated on one side with a layer of butyl rubber or high temperature asphalt adhesive. Provide primer when recommended by water barrier manufacturer.

.1 Minimum Thickness: 0.762 mm (30 mil)

.2 Tensile Strength: 1723 kPa (250 psi) to ASTM D 412 (Die C Modified).

.3 Membrane Elongation: ASTM D 412 (Die C Modified); 250%

.4 Permeance (Max): 2.86 ng/s•m2•Pa (0.05 US Perms) to ASTM E96.

.4 Cleats: of same material, and temper as sheet metal, minimum 50 mm wide. Thickness same as sheet metal being secured.

.5 Fasteners: of same material as sheet metal, to CSA B111, stainless steel 316 flat head roofing nails of length and thickness suitable for metal flashing application.

.6 Solder: to ASTM B32, alloy composition $Sn_{50}Pb_{50}$ or lead-free alternative of similar or greater strength solder.

.7 Flux: Muriatic acid neutralized with zinc or approved brand of soldering flux suitable for materials to be soldered.

2.3 FABRICATION

.1 Fabricate metal flashings and other sheet metal work in accordance with applicable CRCA 'FL' series details and SMACNA Architectural Sheet Metal Manual.

.2 Fabricate copper flashings and other sheet copper work in accordance with the Canadian Copper and Brass Development Association Copper in Architecture Handbook.

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

.4 Shop-fabricate work to greatest extent possible. Comply with details shown and with applicable requirements of the Copper in Architecture handbook and other recognized industry practices. Fabricate for waterproof and weather-resistant performance, with expansion provisions for running work, sufficient to permanently prevent leakage, damage, or deterioration of the work. Form work to fit substrates. Comply with material manufacturer instructions and recommendations for forming material. Form exposed copper work without excessive oil-canning, buckling, and tool marks, true to line and levels indicated, with exposed edges folded back to form hems.

.1 Fabricate to allow for adjustments in field for proper anchoring and joining.

.2 Form sections true to shape, accurate in size, square, free from distortion and defects.

.3 Cleats: Fabricate cleats of same material as sheet, interlockable with sheet in accordance with CDA recommendations.

.4 Fabricate corners from one piece with minimum 450-mm long legs; solder for rigidity if required; seal non-soldered weather joints with sealant.

.5 Form pieces in 2400 mm maximum lengths.

.1 Make allowance for expansion at joints.

.6 Hem exposed edges on underside 12 mm.

.1 Mitre and seal corners with sealant.

.5 Seams: Fabricate non-moving seams with flat-lock seams where possible. Tin edges and cleats to be seamed, form seams, and solder. Where soldered flat-lock seams are not possible, use soldered riveted lap seams joints for additional strength.

.6 Expansion Provisions: Where lapped or bayonet-type expansion provisions in work cannot be used, or would not be sufficiently water/weatherproof, form expansion joints of intermeshing hooked flanges, not less than 25 mm deep, filled with mastic sealant (concealed within joints).

.7 Sealant Joints: Where movable, non-expansion type joints are indicated or required for proper performance of work, form metal to provide for proper installation of elastomeric sealant, in compliance with CDA standards.

.8 Separations: Provide for separation of metal from noncompatible metal or corrosive substrates by coating concealed surfaces at locations of contact, with bituminous coating or other permanent separation as recommended by manufacturer/fabricator.

.1 Apply isolation coating to copper surfaces to be in contact with western red cedar.

.9 Solder

.1 Solder and seal metal joints except those indicated or required to be expansive type joints.

.2 Tin edges of copper sheets and cleats at soldered joints.

.3 After soldering, carefully remove flux and other residue from surfaces. Neutralize acid flux by washing with baking soda solution, and then flushing clear water rinse. Wipe and wash solder joints clean.

.4 No soldering to occur in place on building due to risk of fire. For all joints that need to be made in place, use a combination of sealants and seams to provide a watertight finish.

.10 Seams:

.1 Provide following seam types unless noted or detailed otherwise.

.1 Flat: Drive cleat.

.2 Corner: Double lock corner.

.3 Standing: Double lock standing lap seam.

.11 Copper Thickness: Comply with CDA recommendations for copper size and shape.

.12 Flashing and Counter Flashing:

.1 Fabricate as indicated on Drawings and in accordance with the CDA "Copper in Architecture" handbook.

.2 Hem exposed flashings on underside 13-mm; miter and seam corners.

.3 Fabricate vertical faces with bottom edge formed outward 6-mm and hemmed to form drip.

.4 Fabricate flashings to allow toe to extend minimum 50-mm over wall surfaces.

.13 Coping: As indicated on Drawings and in accordance with the CDA "Copper in Architecture" handbook.

.14 Crickets:

.1 Fabricate cricket flashing according to details and specified requirements.

.2 Fabricate as one piece.

.15 Moss Control Strips: 150 mm wide strips and angle ridge flashing under ridge boards.

2.4 FINISHES

.1 Natural weathering mill finished copper. No applied finish.

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 EXAMINATION

.1 General: Examine conditions and proceed with work when substrates are ready.

.2 Confirm that substrate system is even, smooth, sound, clean, dry, and free from defects.

3.3 INSTALLATION

.1 Install sheet metal work in accordance with the Copper in Architecture handbook. Anchor units of work securely in place by methods indicated, providing for thermal expansion of units; conceal fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weatherproof.

.1 Install units plumb, level, square, and free from warp or twist while maintaining dimensional tolerances and alignment with surrounding construction.

.2 Apply asphalt mastic on copper surfaces of units in contact with dissimilar metals.

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

.4 Miter, lap seam and close corner joints with solder prior to installation on roof. Seal seams and joints watertight.

.5 Install expansion joints at frequency recommended by CDA. Do not fasten moving seams such that movement is restricted.

.6 Coordinate with installation of roofing system and roof accessories.

.2 Water Barrier Membrane Underlayment:

.1 Clean substrate of dirt, dust, and materials which may impair adhesion.

.2 Apply primer, when required, in accordance with manufacturer's requirements.

.3 Apply to surface under coping and crickets.

.4 Install without fishmouths and wrinkles.

.5 Press tape into firm contact with substrate.

.6 Lap tape ends minimum of 50 mm.

.3 Underlayment: Where installation is to be directly on wood substrates, install red rosin paper slip sheet over layer of asphalt saturated felt.

.4 Bed flanges of work in a thick coat of bituminous roofing cement where required for waterproof performance.

.5 Install reglets to receive counterflashing in manner and by methods indicated.

.6 Counterflashing and Reglets:

.1 Fabricate counterflashings and reglets as 2 piece assemblies to permit installation of counterflashing after base flashings are in place.

.2 Fabricate reglets of same metal and thickness as counterflashings.

.3 Overlap roof base flashing 100 mm minimum.

.4 Install bottom edge tight against base flashing.

.5 Lap seam vertical joints 75 mm minimum and apply sealant.

.7 Install counterflashing in reglets, either by snap-in seal arrangement, lock seal in accordance with the "Copper in Architecture" handbook published by the Copper Development Association (CDA), or by soldering in place for anchorage and filling reglet with mastic or elastomeric sealant, as indicated and depending on degree of sealant exposure.

.8 Coping, and Fascia/Gravel Stops:

.1 Space seams: 2400 mm on centre maximum.

.2 Lock exterior edges over continuous cleats to secure to substrate.

.3 Slope towards exterior, 13 mm minimum, unless indicated otherwise.

.4 Lock interior edges to substrate with cleats spaced at 300 mm centers.

.5 Provide drainage system at seams to prevent water infiltration.

.9 Cricket Flashing:

.1 Extend metal flashing a minimum of 300-mm onto roof deck on each side of cricket.

.10 Moss Control Strips:

.1 Install copper strips between layers of wood shingles leaving a minimum 50mm of copper exposed for length of roof.

.2 Install maximum every 3.6m along slope, evenly dividing the roof.

.3 Install ridge flashing under ridge boards at peak and hip leaving 50mm of copper exposed on either side of roof.

.11 Use concealed fastenings except where approved before installation.

.12 Lock end joints and caulk with sealant.

.13 Caulk flashing at reglet with sealant.

3.4 CLEANING

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

.2 Remove protective film (if any) from exposed surfaces of copper promptly upon installation. Strip with care to avoid damage to finishes.

.3 Clean exposed copper surfaces, removing substances that might cause abnormal discoloration of metal.

.4 Upon completion of each area of soldering, carefully remove flux and other residue from surfaces. Neutralize acid flux by washing with baking soda solution, and then flushing with clear water rinse. Use special care to neutralize and clean crevices

.5 Clean exposed metal surfaces of substances that would interfere with normal oxidation and weathering.

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

.7 Leave work areas clean, free from grease, finger marks and stains.

3.5 PROTECTION

.1 Advise Contractor of required procedures for protection of flashings and sheet metal work during construction to ensure that work will be without damage or deterioration other than natural weathering at time of Substantial Completion.

END OF SECTION

PART 1 GENERAL

1.1 References

.1 ANSI/NFPA 13, Installation of Sprinkler Systems.

.2 FM, Factory Mutual Research Corporation for Property Conservation.

1.2 Scope of Work

.1 The sprinkler system shall conform to NFPA 13. Piping shall be seismically restrained and braced in accordance with the referenced standard.

.2 The Contractor shall engage a seismic engineer registered in British Columbia to review the installation and provide direction on bracing, connections and pipe support to the requirements of NFPA 13 and NBC. Seismic Engineer shall become engineer of record for this work and submit a letter of assurance to the AHJ. Review of existing structure is not included in the work outlined above.

1.3 Shop Drawings and Product Data

.1 Submit shop drawings and product data in accordance with Section 01 33 00 Submittal Procedures

.2 Standard of Acceptance means that item named and specified by manufacturer and/or catalogue number forms part of specification and sets standard regarding performance, quality of material and workmanship and when used in conjunction with a referenced standard, shall be deemed to supplement the standard.

.3 Equipment and material shall be installed and tested in accordance with the detailed recommendations of the manufacturer. Where there is a discrepancy between the drawings and/or the specifications and the manufacturer's written installation instructions, the most stringent shall be followed.

.4 All materials shall be CSA certified or FM approved for fire protection use.

.5 No substitutions shall be permitted without prior written approval of Owner's Representative.

.6 Proposals for substitution may only be submitted up to 7 working days prior to tender closing. Proposals after award of contract must include statements of respective costs of items originally specified and the proposed substitution.

.7 Proposals after award of contract will be considered by Owner's Representative if:
- .1 materials selected by tenderer from those specified are not available;
- .2 delivery date of materials selected from those specified would unduly

delay completion of contract; or

.3 alternative material to those specified, which are brought to the attention of and considered by Owner's Representative as equivalent to the material specified and will result in a credit to the Contract amount.

.8 Should proposed substitution be accepted, either in part or in whole, assume full responsibility and costs when substitution affects other work on project. Pay for design or drawing changes required as result of substitution.

.9 Amounts of all credits arising from approval of substitutions will be determined by Owner's Representative and Contract Price will be reduced accordingly.

.10 Submit for:
- .1 Pipes and fittings.
- .2 Sprinkler Heads
- .3 Camlock Connection
- .4 Seismic Bracing means and methods per the Seismic Engineer.

.11 Engineered shop drawings are not required unless the planned installation varies from that indicated on the drawings. If so, the engineered shop drawings are to include all information required by the appropriate sections of the referenced standard, and be sealed by a Mechanical Engineer registered in the Yukon Territory.

1.4 Related Sections

.1 01 91 13 Commissioning

PART 2 PRODUCTS

2.1 Pipe, Fittings and Valves

.1 Piping;
- .1 Schedule 10, to ANSI/NFPA 13, ASTM A-135, ASTM A-53, ASTM A-123, and ASTM A-795, Galvanized, Corrosion Resistance Ratio 1.00 minimum, ULC listed and FM approved.
  - .1 Standard of Acceptance: Allied M-Coat.

.2 Fittings and joints to ANSI/NFPA 13, ANSI/AWWA C606, 170 psi, FM approved.
- .1 Rigid roll grooved couplings:
  - .1 Standard of Acceptance: Victaulic 005 Firelock.
- .2 Flexible, roll grooved.
  - .1 Standard of Acceptance: Victaulic Style 77.
- .3 Gaskets:
  - .1 Dry System: FlushSeal style, EPDM, for use in dry sprinkler systems.
    - .1 Standard of Acceptance: Victaulic Grade E Type A.

.3 Pipe hangers:
.1 ULC listed and FM approved for fire protection services.

2.2 Sprinkler Heads

.1 General: to ANSI/NFPA 13, FM approved and ULC listed for fire services.

.2 SP-1: Open spray nozzle, 65° deflector, die cast brass, optional corrosion resistant finish, 15mm NPT threads, K factor 5.6.
.1 Standard of Acceptance: Victaulic Model V1268 with VC-250 coating.

.3 SP-2: Open spray nozzle, 180° deflector, die cast brass, optional corrosion resistant finish, 15mm NPT threads, K factor 5.6.
.1 Standard of Acceptance: Victaulic Model V1268 with VC-250 coating.

2.3 Camlock Connection

.1 To ANSI/NFPA 13, ULC listed, 2" camlock female connection, location as indicated. Contractor to confirm size, orientation (male/female) and location with client prior to installation.

PART 3 EXECUTION

3.1 Sprinkler Piping

.1 Install, inspect and test to acceptance in accordance with ANSI/NFPA 13, NFPA 25, and manufacturer's written installation instructions.
.1 Ensure rods for last hanger are in contact with pipe for all heads.
.2 Ensure proper grooving depths using Manufacturer's measuring tape (Victaulic Pie Tape PT-100) and Field Installation Manual (Victaulic I-100).
.3 For cold spaces, lubricate gaskets.
.4 Ensure correct slope on piping.

.2 Brace piping in accordance with NFPA 13 and seismic shop drawings.

.3 Use roll grooved fittings where possible in order to maximize system flexibility. Use static and flexible fittings to meet NFPA 13 seismic requirements.

.4 Arrange sprinkler piping such that it is completely drainable. Install auxiliary drains in all trapped sections of piping and where indicated on the drawings.

.5 Pipe all drains to ground level and provide drain valve and hose connection.

.6 **The contractor is required to perform a pre-installation meeting with the**

client prior to installation to review the approach. The contractor must adequately detail all hangers and brace location along with connection points to the existing structure. The connections shall be limited to the minimum required and shall be as discrete as possible.

.7 Hanger and bracing shop drawings shall be submitted to the client for review.

3.2 Sprinkler Heads

.1 Maintain sprinkler clearance from obstructions such as lights, beams, columns, and partitions. Relocate as required at discretion of Engineer.

.2 Provide guards for heads where shown on the drawings and where required to protect heads from physical damage.

3.3 Testing

.1 Testing to be witnessed by an authorized agent. This may be the general contractor, engineer or client representative.
- .1 Hydraulically test sprinkler systems at 1380 kPa for two hours, inclusive of fire department connection.
- .2 Rework and retest if there is any drop in gauge pressure or visual leakage.
- .3 Provide "Contractor's Material and Test Certificate" forms as per NFPA 13.

3.4 Training and Closeout

.1 Provide training session as required. The contractor is required to be available for a trip to site to train staff.

.2 Provide copies of all acceptance materials, test certificates, and equipment installation, operation and maintenance information to the engineer for review.

END OF SECTION

Parks Canada Basic Impact Analysis

1. PROJECT TITLE & LOCATION

St. Andrew's Presbyterian Church roof and fire suppression system (sprinkler) replacement
Bennett, British Columbia

2. PROPONENT INFORMATION

Parks Canada, Yukon Field Unit

3. PROPOSED PROJECT DATES

The project will take place between May 1, 2018 and October 31, 2018.

4. INTERNAL PROJECT FILE NAME

St. Andrew's Church at Bennett

5. PROJECT DESCRIPTION

The reroofing project assessed in this BIA includes three components that are further described in this section:

1. Replacement of the St. Andrew's Church roof (by a contractor);
2. Replacement of the entire fire suppression system associated with the church (by a contractor);
3. The installation of temporary interpretive signage (by Parks Canada).

BACKGROUND

Constructed in 1899, St. Andrew's Church (hereafter, the church) at Bennett, B.C., is a cultural resource of national historic significance at Chilkoot Trail National Historic Site. It is in its original location overlooking Bennett Lake and the White Pass and Yukon railway station. It is also a Recognized Federal Heritage Building because of its historical associations, and its architectural and environmental value. St. Andrew's Church is the last surviving building in Bennett from the gold rush era.

In October 2016, a condition assessment of the church was prepared for Parks Canada by Public Works and Government Services Canada (PWGSC). Information from this report highlights the following issues with the roof, fire suppression system, and the landscaping rock perimeter:

1. Replacement of the St. Andrew's Church roof

Among other items, the cedar shingle roofing on the main church was found to have reached its end of life based on the amount of organic growth, the deterioration of the wood fibres from repeated wetting and drying, the extensive cupping and distortion of the majority of the shingles, and the many missing or broken and split shingles. Rain water shedding directly off the roof has been hitting the large perimeter rocks and splashing up the walls causing staining, premature exfoliation of the bark finish, and possibly decay. Where the water runoff hits a discontinuous flashing in a vertical wall plane or where there is no flashing, water has been running into the building envelope, saturating wood members, and causing decay.

The following points describe the overall roofing observations.

- Distortion in the roof form due to excessive and differential movements in the structural system. Overall condition: Fair;

- Cedar shingles on the main church building display extensive organic growth, are mostly cupped and distorted, many are missing, broken, or split. Condition: Poor;
- Ridge cap boards are seriously deteriorated. Condition: Poor;
- Building paper beneath shingles is not visible but may have reached the end of its life. Condition: unknown but requires replacement in reroofing project;
- Roof sheathing is not visible from on top of the roof but there are indications of water staining on the underside as seen from inside the church. This will require further investigation when the shingles and building paper are removed to determine if boards are deteriorated and require replacement in kind. Condition: unknown at present;
- Rafter tails forming the east and west roof overhangs are sagging in locations as they may be undersized to cantilever as they do and adequately resist snow and wind loading. Condition: Fair to Poor;
- Fascia boards in various locations have been subject to excessive wetting due to rain water runoff working its way back to the fascia surfaces as the shingle ends do not create an effective drip edge. Condition: Fair to Poor;
- The cricket detail with copper flashing between church roof slope and west wall of bell tower is notionally effective in shedding water from between slope and vertical planes, however, it has been damaged. Furthermore the flashing is not continuous from cricket to extent of roof overhang along junction between roof slope and north and south walls of bell tower. This has resulted in extensive damage to the split log siding boards at the roof level and all the way down the walls in the path of the runoff. Condition: Poor;
- Lack of drip edge flashing at eaves leads to premature water damage to bottom edge of shingles, roof sheathing, and rafter tails. Condition: non-existent.

Roofing on bell tower:

- Minimal distortion in the roof form due to minimal movements in the structural system. Overall condition: Good;
- Cedar shingles on the bell tower display significant organic growth on the north elevation and north facing roof slopes on dormers on east and west elevations. Condition: Poor;
- Gothic arched louvres in the gable dormers. Condition: Fair;
- Finial and the peak cap members require some conservation treatment. Condition: Fair to Poor;
- Pinnacles at four corners of spire base are weathered but intact. Condition: Fair;
- Coping flashing and substrate at base of spire requires additional investigation and replacement of substrate if deteriorated and flashing re-nailed to substrate as required. Condition: Fair
- Hip cap poles are seriously deteriorated. Condition: Poor;
- Louvres in the four gable dormers. Condition: Fair

PWGSC recommended that reroofing (replacing the cedar shingles and related flashing and rain water runoff control work) be completed within a one to five year timeframe. Completing this work sooner rather than later will reduce the negative impacts of excessive moisture in and on the building envelope.

The scope of reroofing includes (Northern Climate Engineering Ltd. And NumberTEN architectural group, 2016):

- Removal and replacement of the connection of the bell tower to the sanctuary roof (cricket and flashings) with a new framed in cricket with the appropriate self-adhesive membrane,

copper/prefinished metal flashing and counter flashing all matching existing, installed behind the neighbouring bell tower roof shingles and bell tower wall cladding.

- Removal of the gable roofs over the sanctuary, bell tower, belfry gabled vents down to and exposing the rafters and structure (allowing for a visual inspection of the rafters and or rafter tails by a structural engineer to ascertain repairs).
- Installation of new rafter tails and or purlins between the rafters at the gable roofs over the sanctuary only for rafters than need to be replaced.
- Sheathing of the exposed portion of the soffit with new linear boards spanning from rafter tail to rafter tail of the same thickness and style as existing, respecting its heritage construction.
- Installation of new cedar shingled roofs "Certigrade" COFI label of same type, size and overlap of existing, using, new stainless steel fasteners, installed over a new self-adhesive sanded membrane.
- Installation of new copper drip flashings over the eave/fascia throughout.
- Replacement of the rebated timber pole caps with matching poles of the same caliber for the hips of the bell tower and the 4-pyramidal spires.
- Removal/modification/repair of the drainage attitude counter flashing at the bell tower pyramidal roof to the bell tower wall intersection to ensure it drains and sheds water effectively.

2. Replacement of the entire fire suppression system associated with the church

The PWGSC report also noted that the "fire suppression system consists of a pump at the shoreline of Bennett Lake and fire hoses extended to the church and running up the roof level. Garden hoses and sprinklers extend out onto the gable roof ridge and sprinkler heads project through the north and east louvres in the bell tower. Additionally, sprinklers are situated around the church in the trees. This fire suppression system relies on early warning and the ability to get the pump started."

This system will be replaced at the same time that the roof is being rebuilt. The system is being upgraded to new parts to code; no rerouting or other new construction is being conducted. The intake system at the lake will remain essentially the same configuration; it will be upgraded.

3. Installation of temporary interpretive signage

Parks Canada will install temporary interpretive signs adjacent to the construction site in an effort to augment visitor experience due to the disturbance of construction.

<u>WORK COMPONENTS</u>

- A scaffold will be constructed around the church to enable work on the roof and sprinkler system.
- A work camp for 4-8 construction workers be set up at Bennett, within the existing campground.
- A fenced/marked storage location for construction material will be set-up near the church and the church itself will be fenced-in.
- Minor vegetation/tree removal may be required to ensure adequate space for safe helicopter slinging operations.
- Substantial construction material and camp supplies will be hauled by truck from Whitehorse to Log Cabin where they will be transported by helicopter directly to the specified material staging area adjacent to the St. Andrew's Church in Bennett.
- Workers will arrive in Bennett by train and will travel between the train station and their camp/work site on foot; smaller supplies may be carried or transported by wheelbarrow/cart.

- Work will be accomplished with a combination of hand and power tools and a generator will be used.

6. VALUED COMPONENTS LIKELY TO BE AFFECTED

Soil and Landforms: The site is located on a hill overlooking Bennett Lake; the church is approximately 100 meters from the shore and the camp location is 30-40 meters from the shore. The soil is thin and sandy and bedrock outcroppings are common.

Flora: The site is characterized by subalpine boreal forest; subalpine fir, lodgepole pine, willow and alder are predominant. There are no know species at risk in the area.

Fauna: The most common fauna potentially encountered at the site include moose, wolves, black and grizzly bears, porcupine, wolverine, ruffed grouse and white-throated sparrows. SARA-listed Species at Risk (SAR) potentially located at Bennett during the summer months include: Olive-sided Flycatchers, Common Nighthawk, Peregrine Falcon, Western Toad, Little Brown Myotis and Northern Myotis, and Northern Mountain Caribou (Carcross herd). However, the project is not expected to impact these SAR as, if present, the mammals will be transiting through the site and are expected to largely avoid Bennett due to the increase in visitors during the summer months. Birds, bats and Western Toad are not known to be nesting/present in the specific project location.

Cultural Resources: Character-defining elements of the church are as follows:

- The heritage character of St. Andrew's Church resides in its simple yet pleasing proportions, its design and details inspired from the High Victorian Gothic, its use of indigenous materials, its weatherproofing construction techniques, and its environmental qualities.
- The church consists of a simple rectangular wood frame structure with a gable roof, and an adjoining asymmetrically placed tower. The arrangement of openings on the elevations contribute to the balanced composition of the building. The fine proportions of the church and the pattern of opening should be respected.
- The church exhibits in a vernacular and rustic manner the characteristics of High Victorian Gothic, an architectural style which emphasizes verticality, complexity of outline, varied colours and textures. At St. Andrew's Church, verticality is expressed by the steeply pitched roof, the dominant tower, the pointed arch openings and the use of vertical siding for the lower section of the building and lower portion of the gable ends. Complexity is seen in the tower, with its peaked dormers, breaking but reinforcing the thrust of the steep roof, its corner pinnacles and its decorative finial. Varied texture and colour is created by the use of short lengths of slab wood set in several courses and placed in varying patterns - vertically, horizontally and diagonally. The tower has six distinct courses of wooden siding, including one in a lattice design, and basket-weave design. The overall effect is one of a rich textured surface whose shades and shadows intensify the intricate patterns.
- All of the surviving materials should be carefully preserved. A regular maintenance program should be established to protect the original fabric of this important heritage structure. Any repairs done on the building should use indigenous materials, and be done in the spirit of the original design to maintain the rustic frontier aesthetics.
- The functional design of St. Andrew's was simple and the local materials were eminently suitable. The exterior sheathing of split slabs (bark retained) provides an excellent waterproof covering, and

when set diagonally, gives extra strength to the walls. All doors and windows were packed with oakum to reduce drafts. Four inches of dead air space was created between the inner and outer walls with building paper applied to the interior side of the outside wall. All of these construction techniques, which are a response to weatherproofing, should be maintained.

- Nothing remains of the interior finish. The fine leaded windows, set in frames that were faced with rough slabs, are no longer extant St. Andrew's Church always stood as a prominent structure in its surrounding environment, originally as the centre of a booming town, now as a landmark in a national historic park. The predominance of the church on its surrounding should not be compromised.

The replacement of the roof and of the fire-suppression system touch on many character-defining elements. The planned visitor experience elements also need to be evaluated to assess any impacts to the interior of the building. While nothing remains of the building's interior finish, any changes to the inner walls or floor plan should be evaluated.

There are visible and shallow buried archaeological resources around the church. These include stone retaining walls and raised earthen platforms that delineate the foundations of the former kitchen and woodshed. Scaffolding, signage and other visitor experience additions could impact these archaeological resources.

Visitor Experience: The Chilkoot Trail National Historic Site is one of the Yukon Field Unit's biggest attractions and is visited year round for hiking, skiing, and sightseeing, though visitor numbers in the summer are much higher than in the winter. Bennett is the northern terminus of the Chilkoot Trail and is also commonly accessed in the summer by visitors travelling on the White Pass and Yukon Scenic Railroad; though not accessible on the inside, the church is one of the primary attractions at Bennett with visitors taking photos and walking around the exterior of the building.

7. EFFECTS ANALYSIS

The effects on all valued components will occur during the construction phase of the project.

Soil and Landforms: Soil may be contaminated from waste (e.g., fuel spills when refueling generators, garbage).

Flora: Storage of construction material/equipment may result in compression of natural vegetation. Minor vegetation/tree removal may be required to ensure adequate space for safe helicopter slinging operations.

Fauna: Operation of generators and construction/flying noise may result in temporary habitat displacement/ preferred habitat avoidance, including disturbance to nesting birds and/or their nests. However, the majority of the work will take place on or near existing disturbed areas that do not represent quality nesting habitat; the area of natural vegetated habitat to be disturbed is small and no vegetation clearing is required; and there is a pre-existing high level of human activity on the site (e.g., resulting in noise disturbance).

Cultural Resources: A Cultural Resource Impact Analysis (CRIA) has been undertaken to assess the architectural and archaeological impacts of this project. As part of this process, an Archaeological Overview Assessment (AOA) has been prepared to determine how to mitigate any impacts on the archaeological resources around the church (see Appendix A). All impacts need to be mitigated in accordance with the *Treasury Board Policy on Management of Real Property* (2006), the *Parks Canada Cultural Resource Management Policy* (2013), and *The Standards & Guidelines for the Conservation of Historic Places in Canada* (2010).

Visitor Experience: Visitor experience quality may be adversely affected due to noise and presence of construction equipment/material; decreased aesthetic appeal and impacted viewscape; and restricted access to the church. The project will temporarily decrease the quality of the overall visitor experience but this is limited to the construction period and will result in an improved visitor experience over the long term.

8. MITIGATION MEASURES

General

Work Site Conditions/Staging/Laydown

1. An onsite orientation/start up meeting will be held with onsite project personnel to review the mitigation measures and any site-specific considerations with the Departmental Representative before work begins.
2. Existing pathways will be used to access the construction site unless otherwise approved by the Departmental Representative.
3. Clearly mark staging area, work site and restricted areas with stakes, biodegradable flagging tape, fencing, temporary gates or other means; remove same when project is completed.
4. The maximum on-site contract personnel is eight workers.

Equipment Operation

5. Equipment must be properly tuned, clean and free of contaminants, in good operating order, free of leaks (e.g., fuel, oil or grease), and fitted with standard air emission control devices and spark arrestors prior to arrival on site.
6. During construction, any required cleaning of tools and equipment must be done off-site to prevent the release of wash water that may contain deleterious substances.
7. Equipment operators must be competent and certified where required.
8. Equipment (e.g., chainsaws, and generators) must be stored, maintained and refuelled on a flat surface at least 100 meters from the shoreline.
9. All lumber must be cut in an area designated by the Departmental Representative
10. All saw dust/lumber ends must be collected on a tarp and contained in a barrel/gravel bag/suitable container for off-site disposal.

Delivery of Contractor Supplied Items

11. A Departmental Representative will oversee heli-slinging operations on the ground at the staging area and work site for any Contractor Supplied Items to be transported to the site by helicopter.
12. The Contractor will maintain responsibility for conducting all phases of helicopter slinging operations, including but not limited to the safe packaging, handling receiving and managing of materials/loads.

13. The Contractor will retain the services of a pilot with experience heli-slinging at Chilkoot Trail NHS for all helicopter slinging operations.
14. Any and all Contractor Supplies Items to be transported by helicopter to and from the site must be packaged to facilitate safe and efficient loading and slinging.
15. The Contractor must supply adequate dunnage to ensure safe and efficient loading and slinging as well as to ensure minimal disturbance occurs to ground at on site storage area
16. The Contractor is responsible for protection from the elements and security of all Contractor Supplied Items until project completion
17. The Departmental Representative will designate areas for staging, storage and work.

Helicopter safety and best practices

18. Safety briefing prior to operations will be mandatory and provided by the pilot
19. All helicopter operations must avoid train times
20. Unload and secure any wildlife attractants as soon as possible (i.e. food, fuels, etc)
21. Ensure helicopter landing sites are clear of debris and other materials which may become an airborne hazard during all landing and takeoff activities.

Camp Site

22. Tents for the construction workers will be placed within the existing campground; provision of these tents is the responsibility of the Contractor.
23. The Contractor must have at least one satellite phone for project/emergency communications
24. The Contractor will be responsible for their own bathing/shower facility. Bathing/shower facilities must be situated more than 30 m away from water sources in an area designated by the Departmental Representative.
25. Biodegradable and unscented soap must be used for bathing/showering.
26. The existing grey water pit in the campground must be used to drain water from cooking and dish washing. Water must be sieved and any food pieces must be disposed in solid waste garbage.
27. Camp must be kept clean; food and wildlife attractants must be stored in a hard sided building (check with Departmental Representative prior to use), existing bear boxes and/or contractor supplied bear proof containers.
28. Existing outhouses will be utilized. Waste (barrels) will be removed by Parks Canada as required.
29. The Contractor will secure food and wildlife attractants when not in use
30. The Contractor must erect and maintain an electric fence of adequate size and voltage to form a perimeter around all food materials and wildlife attractants such as petroleum products.
31. Alcohol and non-prescription drugs are not permitted on site
32. The Contractor will observe quiet hours between 8 PM and 8 AM PST. During these periods only low volume work will be conducted

Bear Safety

42. All bear sightings/incidents (conflict/food reward) must be to be reported to the Departmental Representative.
43. Minimize the use of fatty and smelly foods.
44. Minimize the amount of food kept on site; resupply by train or other means as necessary.

Waste

33. All solid waste will be securely stored and handled according to applicable federal/provincial regulations.

34. All construction waste materials (e.g., construction material, refuse material, waste petroleum, and demolition waste including asphalt) shall be removed from the site upon project completion and considered, prior to disposal, for reuse, resale or recycling and then disposed of at an approved facility; cover waste loads during transportation.
35. Existing cedar roof shingles must be separated from the construction waste and provided to the Departmental Representative.
36. Burning of waste is not permitted at the National Historic Site.
37. The Contractor will retain adequate personnel to manage the appropriate disposal of waste at all stages and locations.
38. The Contractor is responsible for all costs associated with project waste disposal

Hazardous Materials

39. Prevent the release of hazardous substances into the environment, including but not limited to, paints, chemicals and petroleum products and their derivatives.
40. All on-site personnel must be briefed on reporting requirements for hazardous materials spills; spills must be reported immediately to the Departmental Representative.
41. The construction sites must be equipped with containers suitable for the secure, temporary storage of hazardous wastes, separated by type.
42. A spill contingency response kit including sorbent material and berms to contain 110% of the largest possible spill (i.e., fuel or other toxic liquids) related to the work must be available on site at all times. On-site personnel must be aware of its location and trained in its use. Any contaminants must be recovered at source and disposed of according to applicable laws, policies and regulations.
43. All spills must be contained and cleaned-up as soon as possible. In the event of a major spill, all other work must stop until the spill has been adequately contained and cleaned up.
44. Petrochemical products, paints and chemicals must be stored 100 meters from the shoreline.
45. Any hazardous waste or contaminated material uncovered during construction must be investigated, source identified, removed and disposed of outside the protected heritage place at an approved facility. Disposal documentation must be provided to the Departmental Representative.

Natural Resources

General

46. Waste materials (e.g., organic materials, soil stockpiles, construction waste, plastic wrap and garbage) must not enter the aquatic environment. Securely store in place at all times.
47. Treated wood must be handled, installed, and disposed of according to the Parks Canada Guide for the Use, Handling and Disposal of Pressure Treated Wood 2009.
48. Minimise the number of saw cuts made to treated wood in the field. If unavoidable, cut treated wood more than 30m from the shoreline and over tarps to catch debris. Cuttings, sawdust and other treated wood waste material must not enter the aquatic environment.

Soil and Landforms

49. All construction material/equipment will be stored on dunnage (i.e.: wooden boards, lumber, or raised platforms) to avoid crushing vegetation and historic material.

Flora/Fauna

50. Never approach or harass wildlife (e.g., feeding, baiting, luring).

51. Stay within the construction limit, including staging areas.
52. Use existing disturbed areas whenever possible.
53. Limit construction activities, including the flying in and out of materials/equipment, to the time between dawn and dusk to avoid the illumination of adjacent habitat, disturbing songbirds when they are most active, and to provide opportunities for foraging.
54. No vegetation/tree removal will be conducted without explicit permission and/or authorization from the Departmental Representative.

Cultural Resources (see additional *Site Protection and Avoidance Measures* in attached Archaeological Overview Assessment, page 18 of this document)

55. Careful coordination of some aspects of the sprinkler system installation is essential to minimize the potential negative impact.
56. Penetrations through the building envelope for the new sprinkler system must try to reuse existing holes or keep the number of new holes to a minimum.
57. Where sprinkler system components must be secured to the building or sway braces are to be installed, this should be completed in a fashion that creates as little damage as possible to the building fabric.
58. Where materials are sound and are still performing as needed, every effort should be made to keep the replacement of the rafter tales to a minimum.
59. Protection measures need to be reviewed by the Departmental Representative to ensure that the scaffolding and weathertight enclosure are appropriately engineered and will not inadvertently damage the building.
60. Roof Replacement will require material stockpiling, scaffold placement and general site use by contractor. All these factors have the potential to impact shallow cultural resources of site 1785T as well as the historically recorded kitchen and wood shed. Without care and attention and physical protection to these resources, some impact to cultural resources may be anticipated. Therefore erection of scaffolding should involve above ground anchors and leveling devices. No subsurface excavation is to be allowed. No movement of boulders is allowed. Laydown and material storage should be restricted to areas designated by the Departmental Representative only.
61. Replacement of the fire suppression system, if placed in the same location of existing system, should not impact on archaeological resources or features. A caution remains that care and attention should be made when adjusting and anchoring the intake system at the lake shoreline to avoid the recorded historic features such as the boat slips.
62. Installation of signage should incorporate existing infrastructure such as fences or existing posts and walkways. No new posts or holders that impact the surface should be contemplated.
63. The preferred staging area is located south of the church on the hill side. This location avoids known intact deposits of site 1785T. One historic feature to the south and east should be adequately buffered. The wood shed and kitchen area have both on surface boulders and shallow buried archaeological features located adjacent to the south wall of the church. This area must be covered with protective rubber matting to be provided by the Contractor. Laydown and material storage should be restricted to designated areas only.
64. Apply Accidental Finds Protocol: If significant features (i.e., previously unknown structural remains and/or high artifact concentrations) or human remains are encountered, work should cease in the

immediate area, the work area in relation to the findings photo documented and geo-referenced, and the Parks Canada project manager informed. The project manager should then contact Parks Canada's Terrestrial Archaeology section for advice and assessment of significance that will in turn determine what will be required to mitigate the chance find.

65. Any changes to the proposed plans must be submitted to Terrestrial Archaeology for review.

Visitor Experience

66. The trail to the church will remain open throughout the project and, prior to project Parks Canada will install interpretation panels In order to minimize the impacts to the visitor experience at the site.
67. The Contractor will schedule helicopter flights to avoid train presence at Bennett and outside peak visitor hours i.e. early morning or late afternoon.
68. Construction should be completed in as short a time period as is practicable.
69. Maintain the site in as tidy a condition as possible for the duration of work.
70. Safety risks to visitors during construction must be minimized:
    - The work site (church and staging/storage areas) must be closed and clearly delineated with fencing, barriers, temporary gates, caution tape, stakes, or combination thereof. These must be removed upon completion of the project.
    - Appropriate bilingual signage must be posted at common visitor access points and strategic locations.
    - Maintain a safe working distance between work activities and visitors, especially when transporting machinery and materials between the staging area and the site; consider the use of lookouts to manage direct visitors in this area.
    - Secure and clearly mark unattended safety hazards (e.g., debris piles) with fencing, warning signs, caution tape or combinations thereof.
    - Ensure any materials long lined into the site are secured and the equipment used is in good working order to prevent the accidental release of materials.
    - Ensure that access to areas where helicopters are slinging materials to and from are signed to prevent unauthorized access during activities and there is a person is on site to direct visitors away from work areas.

9. OTHER Considerations

Check all that apply

☐ Public/stakeholder engagement

☒ Aboriginal engagement or consultation. Engagement has occurred with Edna Helm (Carcross Tagish FN), whose cabin is adjacent to the site

☒ Site Inspection/Surveillance: It is recommended that the Project Manager assigned to this project visit the site at least twice a week during construction activities to ensure that the mitigation measures detailed in this BIA are adequately carried out and to provide additional mitigation for unforeseen impacts. He or she will be kept informed of project scheduling and will be notified of changes to the schedule at all times.

☐ Follow-up monitoring, required to evaluate effectiveness of mitigation measures and/or assess restoration success

☐ Follow-up monitoring, required by legislation or policy (indicate basis of requirement e.g. required by the *Species at Risk Act)*

☐ SARA Notification

10. SIGNIFICANCE OF RESIDUAL ADVERSE EFFECTS

Natural Resources: Given the magnitude of effects and application of mitigation measures, the project is unlikely to result in significant residual adverse effects to natural resources.

Cultural Resources: Given the magnitude of effects and application of mitigation measures, the project is unlikely to result in significant residual adverse effects to cultural resources.

Visitor Experience: Given the magnitude of effects, the installation of temporary interpretation signage, and reversibility after construction, the project is unlikely to result in significant residual adverse effects to visitor experience.

11. EXPERTS CONSULTED

Department/Agency/Institution: Parks Canada	*Date of Request*: 2017-01-25 and ongoing
Expert's Name & Contact Information: Lisa Forbes Parks Canada 30, rue Victoria Gatineau (Québec) lisa.forbes@pc.gc.ca Tel: 819-420-9233	*Title*: Cultural Resource Management Policy Officer
Expertise Requested: Provide an assessment regarding project impacts on cultural resources.	
Response: Built Heritage and Archaeological advice and mitigation measures have been provided.	
Department/Agency/Institution: Parks Canada	*Date of Request*: 2017-01-25 and ongoing
Expert's Name & Contact Information: Shelley Bruce Parks Canada 300 - 300 West Georgia St, Vancouver, BC shelley.bruce@pc.gc.ca Tel: 604.666.0078	*Title*: Built Heritage Advisor, Indigenous Affairs and Cultural Heritage Directorate
Expertise Requested: Provide an assessment regarding project impacts on cultural resources.	
Response: Built Heritage and Archaeological advice and mitigation measures have been provided.	
Department/Agency/Institution: Parks Canada	*Date of Request*: 2017-01-25 and ongoing

Expert's Name & Contact Information:	*Title*: Federal Infrastructure Investments Project Archaeologist
Brian Smith Parks Canada 145 McDermot Ave. Winnipeg, Manitoba BrianJ.Smith@pc.gc.ca Tel: 204.984.8276	
Expertise Requested: Provide an assessment regarding project impacts on archaeological resources.	
Response: Archaeological advice and mitigation measures have been provided.	

12. DECISION

Taking into account implementation of mitigation measures outlined in the analysis, the project is:

- ☒ Not likely to cause significant adverse environmental effects.
- ☐ Likely to cause significant adverse environmental effects.

FOR SARA REQUIREMENTS:

- ☒ There are no residual adverse effects to species at risk and therefore the SARA-Compliant Authorization Decision Tool was not required

OR, the SARA-Compliant Authorization Decision Tool (Appendix 2) was used and determined:

- ☐ There is no contravention of SARA prohibitions
- ☐ Project activities contravene a SARA prohibition and CAN be authorized under SARA
- ☐ Project activities contravene a SARA prohibition and CANNOT be authorized

13. RECOMMENDATION AND APPROVAL

(Add additional blocks as required)

Prepared by: Jacquie Bastick Impact Assessment Specialist, Natural Resource Conservation Branch, Parks Canada	Date: January 19, 2018
Recommended by: Chris Hunter Site Manager, Chilkoot Trail National Historic Site	Date: January 19, 2018
Approval signature: Diane Wilson Field Unit Superintendent, Yukon Field Unit	Date: jan 25/18.

14. ATTACHMENTS

Archaeological Overview Assessment – FII Project: Bennett, St. Andrew's Church Rehabilitation (#851) Chilkoot Trail National Historic Site of Canada (CTNHS), British Columbia. Prepared by Parks Canada, December 2017.

Documents Reviewed

Specifications for St. Andrews Church Roof Replacement and Fire Protection Upgrades, Bennett Lake, BC. Issued for 99% Review – February 2017. Public Services and Procurement Canada. Project No. R.075650.001

Drawings for St. Andrews Church Roof Replacement and Fire Protection Upgrades. Issued for 99% Review – March 6, 2017. Kobayashi + Zedda. Project No. R.075650.001 (7 sheets)

Fire Prevention Systems Report. Northern Climate Engineering, November 17, 2016

St. Andrew's Presbyterian Church Condition Assessment. Heritage Conservation Western & Heritage Conservation Directorate, Public Works and Government Services Canada, October 2016

St. Andrews Presbyterian Church RS1 Requirements, Analysis of Project Requirements. NumberTEN architectural group and Northern Climate Engineering Ltd., December 2016

REFERENCES

Chilkoot Trail Commemorative Integrity Statement

St. Andrew's Presbyterian Church Bennett Lake, British Columbia, Heritage Character Statement

St. Andrew's Presbyterian Church, Chilkoot Trail National Historic Park, Bennett Lake, British Columbia. Federal Heritage Buildings Review Office, Building Report 88-176

Standards and Guidelines for the Conservation of Historic Places in Canada (2010)

15. NATIONAL IMPACT ASSESSMENT TRACKING SYSTEM

☒ Project registered in tracking system

☐ Not yet registered *(CEAA 2012 requires PCA submit a report to Parliament annually. EIAs must be entered in the tracking system* ***by the end of April*** *to enable reporting.*

*****Ensure that all required mitigation measures and conditions (e.g. follow-up monitoring requirements) are included in project permits and authorizations***

APPENDIX A: **Archaeological Overview Assessment**

Archaeological Overview Assessment
FII Project: Bennett, St. Andrew's Church Rehabilitation (#851)
Chilkoot Trail National Historic Site of Canada (CTNHS), British Columbia

Brian Smith (FII)
Terrestrial Archaeology, IACHD
December 1, 2017

Introduction

The Yukon Unit (YFU) is planning to undertake rehabilitation of the roof and fire suppression system (sprinkler) of the St. Andrew's Presbyterian Church at Bennett, British Columbia within Chilkoot Trail National Historic Site (CTNHS) on Bennett Lake (Figure 1); the current roof having reached its end of life due to natural deterioration. Construction is scheduled between May 1 and July 31, 2018. Project activities are as follows:

1. Replacement of the St. Andrew's Church roof (by a contractor);
2. Replacement of the entire fire suppression system associated with the church (by a contractor);
3. The installation of temporary interpretive signage (by Parks Canada).

Work components include:

- A scaffold will be constructed around the church to enable work on the roof and sprinkler system.
- A work camp for 4-8 construction workers be set up at Bennett, within the existing campground.
- A fenced/marked storage location for construction material will be set-up near the church and the church itself will be fenced-in.
- Construction material and camp supplies will be hauled by truck from Whitehorse to Carcross, Fraser, or Log Cabin where they will be transported by train to Bennett. In Bennett, they will be moved from the train station to the work site by helicopter.
- Workers will arrive in Bennett by train and will travel between the train station and their camp/work site on foot; smaller supplies may be carried or transported by wheelbarrow/cart.
- Work will be accomplished with a combination of hand and power tools and a generator will be used.

This Archaeological Overview Assessment will evaluate the archaeological potential of the project area and the potential for the proposed work to impact cultural resources. It will determine if an Archaeological Impact Assessment, or like mitigation measures and any specific archaeological requirements are necessary prior to, or in conjunction with, the Bennett St. Andrew's Church Roof Replacement in order to protect CTNHS's cultural resources.

Bennett Church Roof Replacement Project in Chilkoot Trail NHS: Brief Contextual and Archaeological Overview

Chilkoot Trail National Historic Site of Canada (CTNHS), located in the northwest corner of British Columbia commemorates the mass movement of people into the Yukon during the Klondike gold rush. The trail through the Chilkoot Pass, follows an ancient First Nations trade route from tide water at Dyea, Alaska to

the headwaters of the Yukon River at Bennett Lake, British Columbia. Following the establishment of the rail service to Bennett in 1899, and Whitehorse in 1900, the Chilkoot trail fell into disuse as a travel route into the Yukon. Carcross Tagish and Tlingit First Nations people continued to use the area for traditional purposes. Parks Canada began managing the site in 1974. Since that time, thousands of hikers have visited the Chilkoot Trail, to hike the trail and visit the historic gold rush towns. Bennett City was largely abandoned at the turn of the last century, however the legacy of the Klondike gold rush remains in the form of landscape, by St. Andrew's Church, built in 1899; the Bennett Train Station, located adjacent to CTNHS; tent platforms; building foundations; abandoned equipment; can and bottle dumps and other historic materials. Once a bustling metropolis, extending from the north shore of Lindeman Lake, many of the buildings once found at Bennett City have been scavenged or salvaged, although extensive archaeological evidence remains. Contemporary features include, the residence and outbuildings of the Helm family, an interpretive platform, interpretive signage, board walks, stairs, benches and campground with tent pads, picnic tables, signage, visitor shelters and outhouses.

Previous Archaeological Work and Archaeological Potential

In 1986 Greer wrote that, based on regional archaeological site data, there was every reason to believe the Chilkoot Trail NHS had been occupied, if not at least intermittently used, for many millennia prior to the Klondike Gold Rush of the late 1890's. Regional culture history dating back to 9800 BP relates to both Coastal and Interior cultural sequences. Historic ethnographic data indicates the Chilkoot Trail connected both coastal and interior peoples as a trade, travel and resource gathering route; a lifeways pattern and land use that has a lengthy pre-contact history. In the Lindeman - Bennett area three pre-contact sites have been recorded (1785T; 1786T; 1787T) with a program of systematic testing and excavation undertaken in 1995. Each of the sites has suffered from both natural and gold rush era and recent human factors. Although each site contained lithic debitage and tools, these, were non diagnostic as to chronological age, and attempts at radiocarbon dating were inconclusive due to soil conditions and forest fire related factors. These sites do indicate that both intact pre-contact as well as gold rush era archaeological resources can be expected along the Chilkoot Trail (Thomson and Hems 1996).
With reference to the Gold Rush Era archaeological resources, a 1983 summary noted that:
From its beginning at the summit to its end at Bennett, the Canadian portion of the Chilkoot Trail is distinguished by an intensive artifact scatter. For the most part, this scatter is distributed in a linear fashion along the entire length of the Trail. In addition, there are several isolated areas or nodes where the intensity of the scatter increases substantially. These generally correspond to favoured stop-over points where goods were temporarily cached for further transport down the trail or represent semi-permanent encampment sites where the stampeders in their wait for spring breakup. (RD & A Report, on file Parks Canada Agency)

Over the course of the following decades, various archaeological investigations including the Chilkoot Trail Cultural Resource Inventory and Assessment conducted by Parks Canada from 1988-1993 have documented many of the Trail's cultural resources, but this inventory is not exhaustive, is continually being updated and the potential threat to unrecorded sites and features from modern use and NHS development remains high. Periodic monitoring and archeological review of resources at selected locations along the Chilkoot Trail is conducted by site staff. In recent years, archaeological investigations have focused on mitigating the potential impact of new and upgraded infrastructure (Thomson, pers. comm. 2016).

Site 1785T The Bennett Church Site

This pre-contact site, located immediately adjacent to St. Andrew's Church at the northern terminus of the Chilkoot Trail at Bennett Lake (Figure 2) was first recorded in 1988 and re-examined during a field survey in 1995. Artifacts were recovered both on the surface and buried at a shallow 2 cm below surface from a number of excavated test units. The following summarizes the results of the archaeological investigations:

- Portions of Site 1785T are still intact, but are vulnerable to disturbance as cultural material is only 1 – 2 cm below the surface and located along pathways in close proximity to the historic church.
- Site 1785T has already been impacted by foot traffic around the church, and the site area is located on the main access to the campground and train station.

Historic Period Church related / Gold Rush era Structures

There are visible archaeological resources around the church. These include stone retaining walls and raised earthen platforms that delineate the foundations of the former kitchen and woodshed at the rear of the church. Those previously recorded in close proximity to the church are depicted in Figure 3. Between the church and the Bennett Lake shoreline are a number of surface structural features as well as a number of historic period features including boat slips that become exposed as lake water levels recede throughout the summer. These features are mapped in Figure 4.

Assessment of Potential Impact to Archaeological Resources: Bennett St. Andrew's Church Rehabilitation Project, Chilkoot Trail NHS

Roof Replacement St. Andrew's Presbyterian Church

Public Works and Government Services Canada (PWGSC) recommended that reroofing (replacing the cedar shingles and related flashing and rain water runoff control work) be completed sooner rather than later to reduce the negative impacts of excessive moisture in and on the building envelope.

Fire Suppression System Replacement

Fire suppression system for the church consists of a pump at the shoreline of Bennett Lake and fire hoses extended to the church and running up the roof level. Garden hoses and sprinklers extend out onto the gable roof ridge and sprinkler heads project through the north and east louvres in the bell tower. Additionally, sprinklers are situated around the church in the trees.

This system will be replaced at the same time that the roof is being rebuilt. The system is being upgraded to new parts to code; no rerouting or other new construction is being conducted. The intake system at the lake will remain essentially the same configuration; it will be upgraded. The intake at the lake must be extended outward as lake levels drop considerably over the course of the spring to fall months.

Temporary Interpretive Signage Installation

In order to minimize disturbance to the visitor experience during construction when visitor access to the church site is not possible, Parks Canada will install temporary interpretive signs, with pre-construction and historical photographs of the church on/near the fence. Details regarding temporary sign placement are not yet finalized.

Assessment of Project Works: Mitigation of Possible Impacts to Archaeological Resources

Project Work and Impact	Assessment / Concerns
Roof Replacement **Moderate Archaeological Resource Concerns** -the designated area includes the foundations of the kitchen / woodshed and areas around the church where precontact cultural resources are known to be present. Rubber matting must be laid down to protect the kitchen/woodshed foundations from foot traffic. Rubber matting is also required in work areas on the west side of the church, to prevent erosion / exposure of shallow cultural resources.	Roof Replacement will require material stockpiling, scaffold placement and general site use by contractor. All these factors have the potential to impact shallow cultural resources of precontact site 1785T as well as the historically recorded kitchen and wood shed. Without care and attention and physical protection to these resources, some impact to cultural resources may be anticipated. Therefore erection of scaffolding should involve above ground anchors and leveling devices. No subsurface excavation is to be allowed. No movement of cobbles is allowed – these may be associated with gold rush era features. Laydown and material storage should be restricted to designated areas only. A restricted use area has been identified on the south side of the church (Figs. 5, 6). Although foot traffic through this area is permissible, the ground surface must be protected with rubber matting and it cannot be used as a work area.
Fire Suppression System Replacement **Low - Archaeological Resource Concerns**	Replacement of the fire suppression system, if placed in the same location of existing system, should not impact on archaeological resources or features. A caution remains that care and attention should be made when adjusting and anchoring the intake system at the lake shoreline to avoid the recorded historic features such as the boat slips (Figure 4).
Temporary Interpretive Signage Installation **Low - Nil Archaeological Resource Concerns**	Installation of signage should incorporate existing infrastructure such as fences or existing posts and walkways. No new posts or holders that impact the surface should be contemplated.
Staging and Work Areas **Moderate Archaeological Concerns if contract area remains as proposed** **Low Archaeological Resource Concerns, with modifications to the proposed contract area**	The preferred staging area is located south of the church on the hill side. This location avoids known intact deposits of site 1785T. One historic feature to the south and east should be adequately buffered (Figure 5). The wood shed and kitchen area have both on surface boulders and shallow buried archaeological features located adjacent to the south wall of the church. This area needs to be covered with protective rubber matting (Figures 5, 6). Laydown and material storage should be restricted to designated areas only.

It has been determined from this Archaeological Overview Assessment that the above aspects of the Bennett St. Andrew's Church rehabilitation project works as described if properly managed, will have a low to moderate, very low or nil potential to negatively impact on archaeological / cultural resources. **Therefore no Archaeological fieldwork mitigation measures prior to work commencing will be required.** However, the following requirements will still apply.

Site Protection and Avoidance Measures

The proposed contract area includes areas of high archaeological potential, where known cultural resources are present. Without modifications, the project would be expected to have moderate impact to these resources. The impacts can be acceptably mitigated by:

1. Restricting use of the area abutting the south side of the church, where the foundations of a former kitchen and woodshed are present (Figs. 5, 6). These foundations are visibly marked by scattered large stone cobbles on the surface. Shallowly buried artifacts are expected to be present. Foot traffic through this area is permissible, but the ground surface must be protected by rubber matting. No work tables, cutting wood, etc. are permitted in this area. Cobbles must not be moved.

2. The contract area must be modified slightly on its east side to provide a greater buffer for a historic tent platform (Fig. 5).

3. Rubber mats must also be used in the work area on the west side of the church (Fig. 5). This will prevent erosion/exposure of shallowly buried artifacts associated with precontact use of the area around the church."

Change of Scope
Any changes to the proposed plans must be submitted to Terrestrial Archaeology for review.

Accidental Finds Protocol

There could be a chance, however low, that features or artifact concentrations are encountered during construction activities. If significant features (i.e., previously unknown structural remains and/or high artifact concentrations) or human remains are encountered, work should cease in the immediate area, the work area in relation to the findings photo documented and geo-referenced, and the Parks Canada project manager informed. The project manager should then contact Parks Canada's Terrestrial Archaeology section for advice and assessment of significance that will in turn determine what will be required to mitigate the chance find.

References

Greer, Shelia

1986 Pre-Gold Rush Culture History of the Chilkoot Trail National Historic Park. Parks Canada Agency Microfiche Report No. 413, on file with Parks Canada Agency, Winnipeg MB

Parks Canada

2010 Chilkoot Trail National Historic Site of Canada Management Plan.

2017 Basic Impact Analysis (BIA) St. Andrew's Church Roof Replacement.

2016 Site files, Parks Canada Agency, on file Winnipeg MB.

Thomson, Sharon

2015 Archaeological Review of the Proposed Iconic Experience Development in Bennett and Lindeman, Chilkoot Trail National Historic Site of Canada. Permit no. CHT-2014-16460. Terrestrial Archaeology Parks Canada Agency report on file, Winnipeg MB.

2016 Personal communication.

Thomson, Sharon and David Hems

1996 Chilkoot Trail Threatened Sites Archaeological Project: Pre-contact Sites at Bennett British Columbia. Permit no. 95-0006. Cultural Resource Services report on file with Parks Canada Agency, Winnipeg MB.

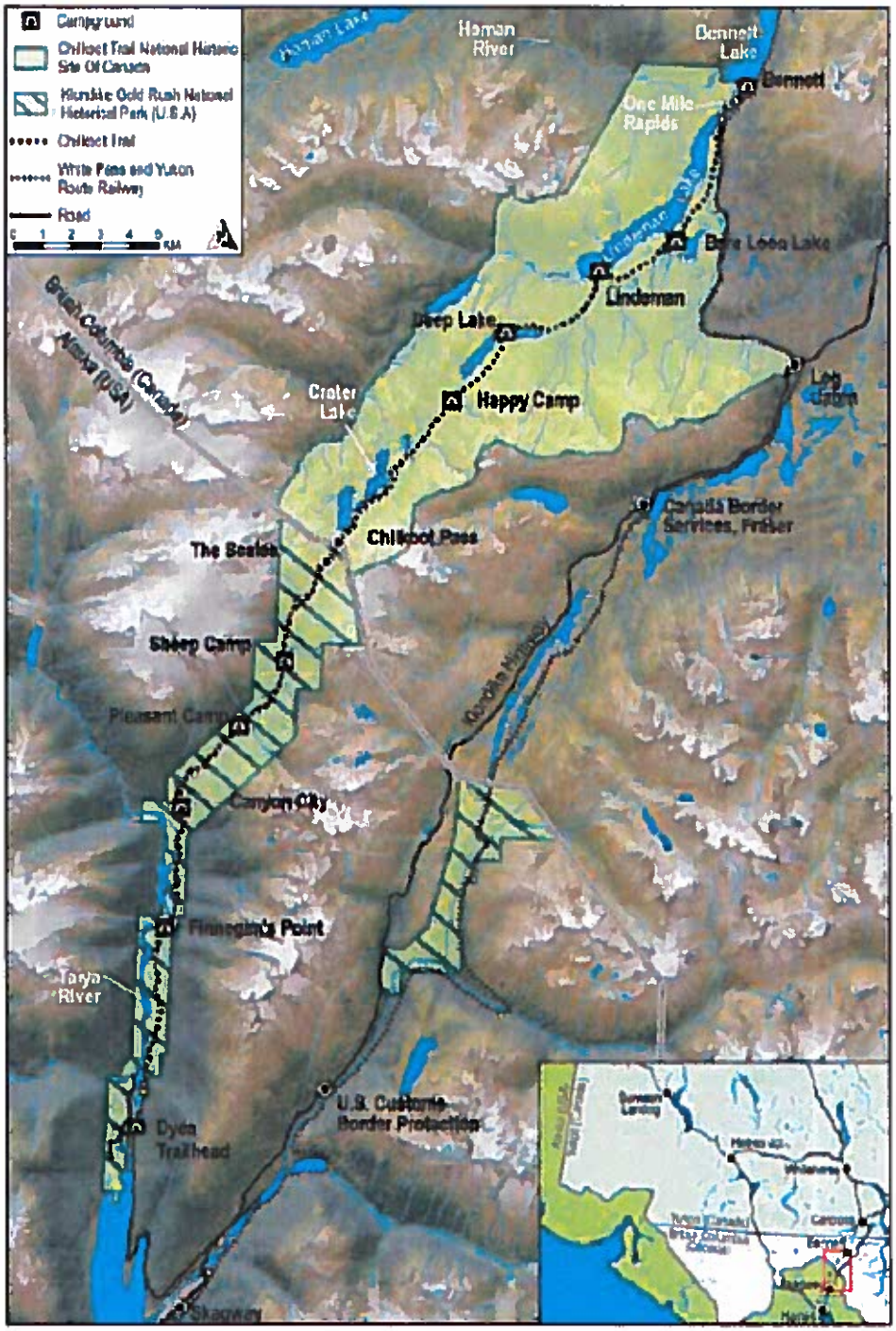

Figure 1: Location of Bennett B.C. at the southern end of Bennett Lake, within the Chilkoot Trail NHS.

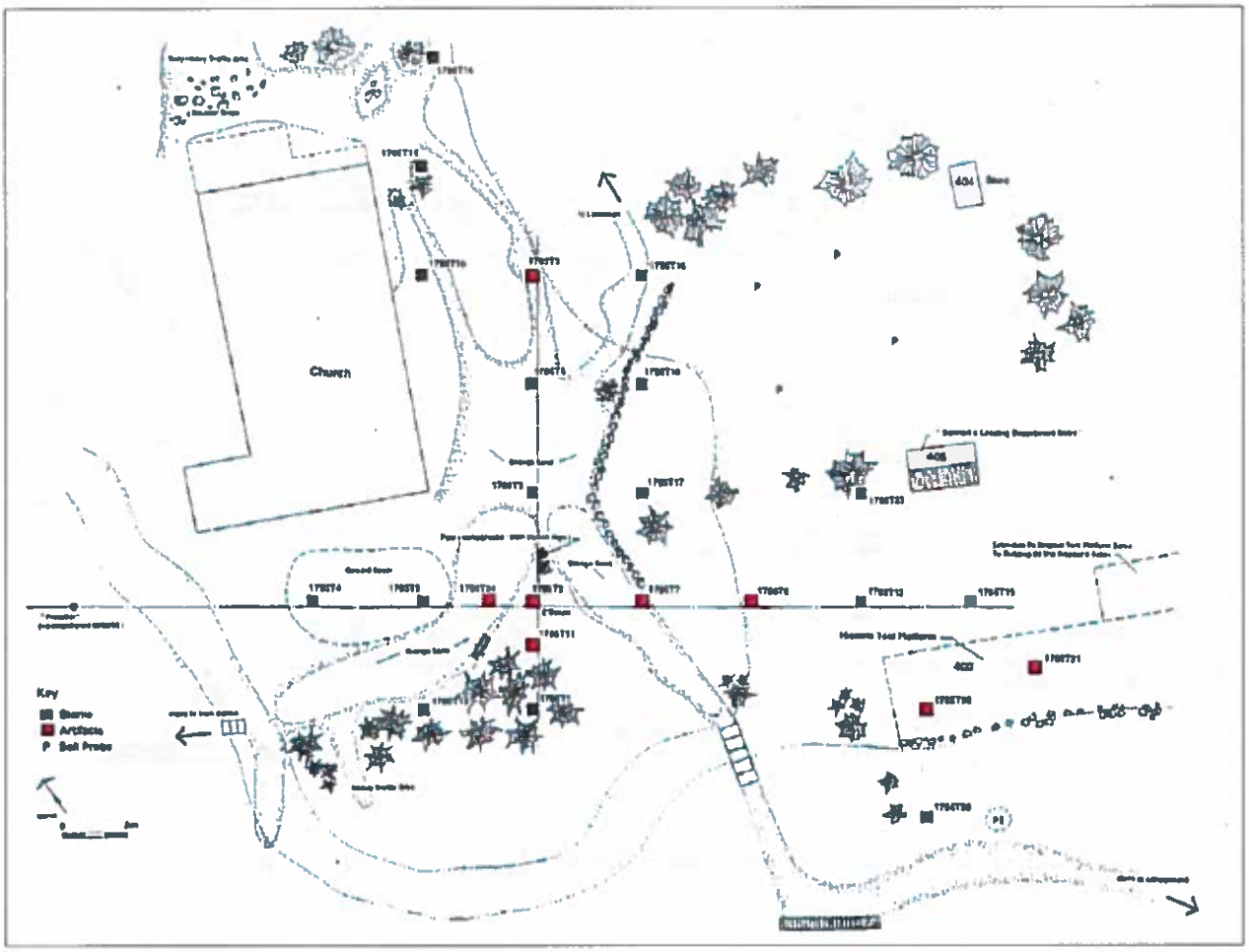

Figure 2: Map of site 1785T in relation to the St. Andrew's Church at Bennett. Boxes shaded red show where precontact artifacts were recovered in archaeological test pits. Results indicate shallowly buried artifacts may be present throughout the work area.

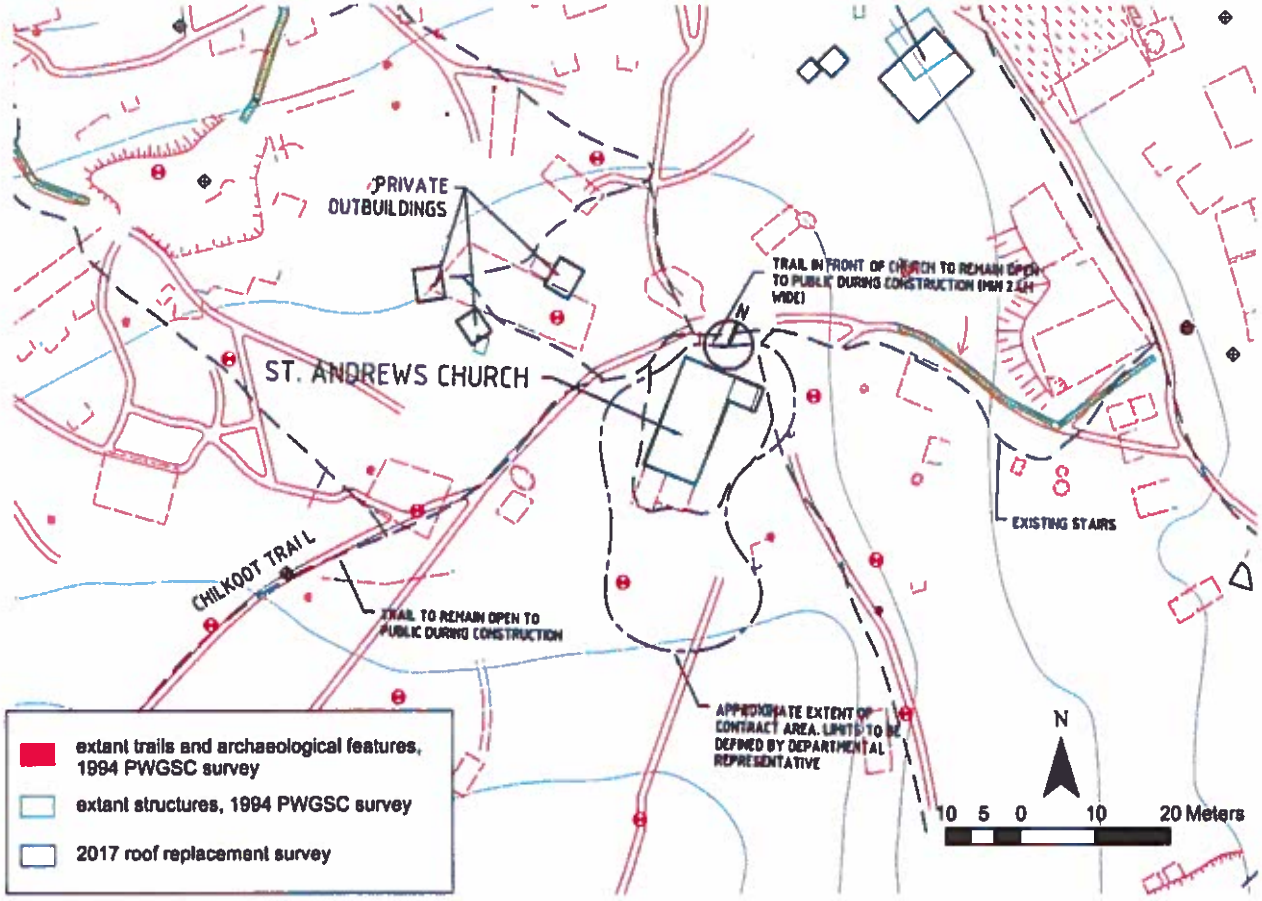

Figure 3: Extant archaeological features recorded in the vicinity of St. Andrew's Church.

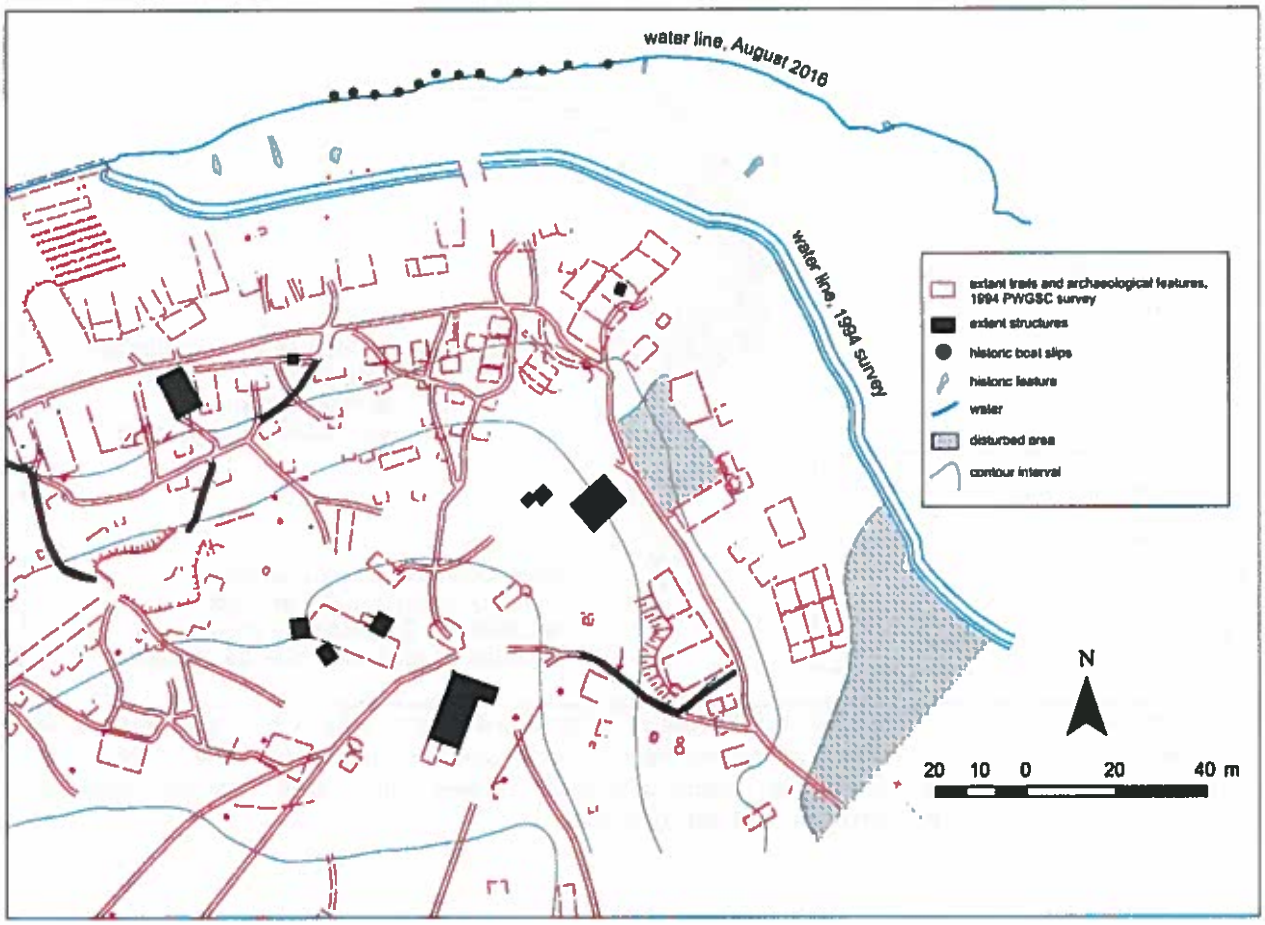

Figure 4: Extant archaeological features recorded in the vicinity of St. Andrew's Church and Lake Bennett shoreline. Note difference in lake levels in 1994 and 2016.

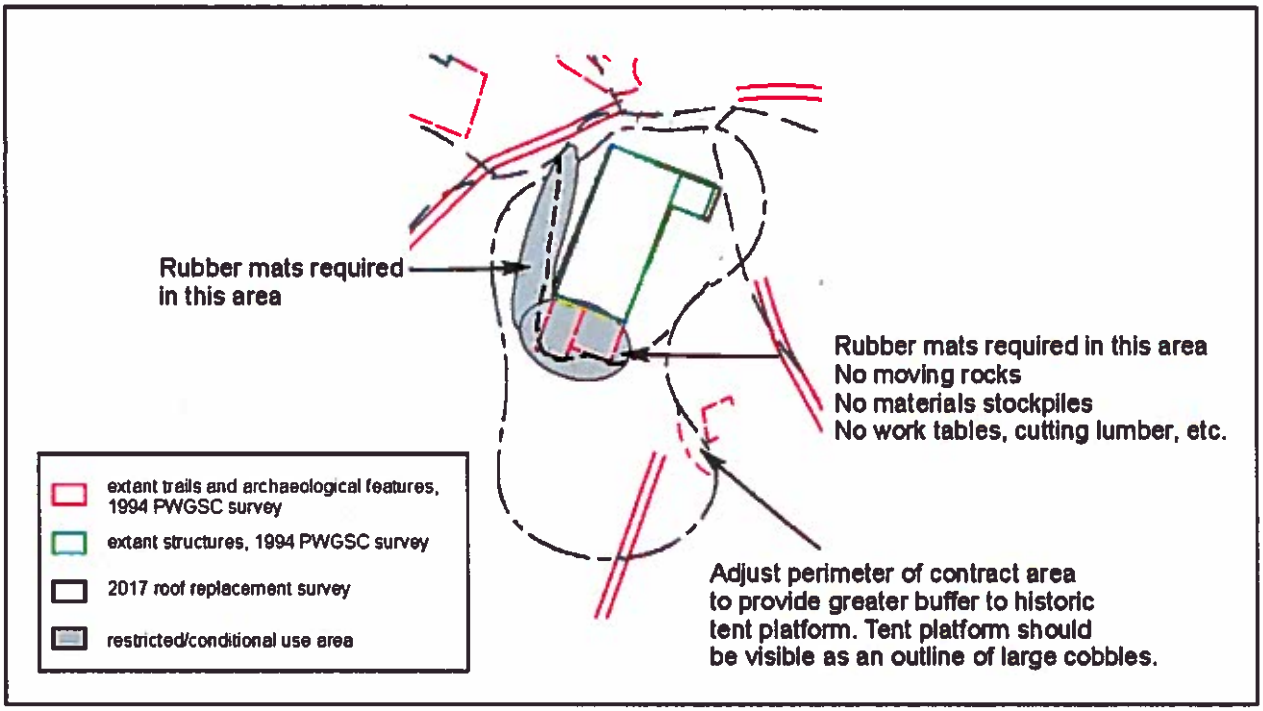

Figure 5: Immediate area surrounding Church, note former kitchen and woodshed area (to be avoided for laydown and protected from foot traffic by rubber matting –see Figure 6) on the south-southwest end of the church. A greater buffer is required for the archaeological feature to the south and east of the church. Preferred laydown or material storage area to be on hillside to the south side of church.

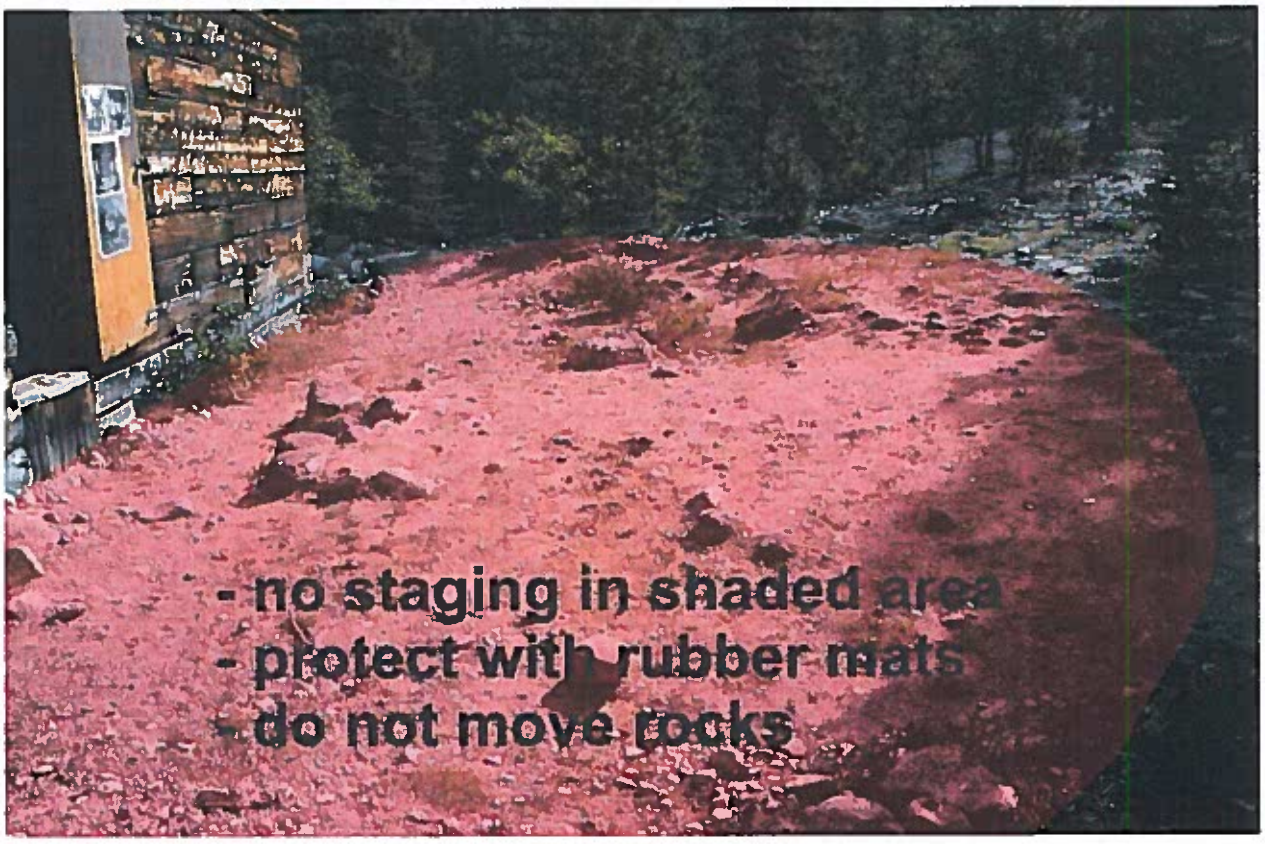

Figure 6: Kitchen and wood shed area at south end of church illustrating area to be protected during project.

AGAT Laboratories

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FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: MISC AGAT CLIENT ON
#205-300 MAIN
WHITEHORSE, YK Y1A2B5
(867) 667-3902

ATTENTION TO: Hugh Copland

PROJECT: Courthouse - St. Andrews Hazmat

AGAT WORK ORDER: 15T056228

ASBESTOS REVIEWED BY: Whenhong Zou, Lab Analyst

SOIL ANALYSIS REVIEWED BY: Elizabeth Polakowska, MSc (Animal Sci), PhD (Agri Sci), Inorganic Lab Supervisor

DATE REPORTED: Jan 08, 2016

PAGES (INCLUDING COVER): 6

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

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Certificate of Analysis

AGAT WORK ORDER: 15T056228

PROJECT: Courthouse - St. Andrews Hazmat

CLIENT NAME: MISC AGAT CLIENT ON

ATTENTION TO: Hugh Copland

SAMPLING SITE:

SAMPLED BY:

Bulk Asbestos

DATE RECEIVED: 2015-12-23

DATE REPORTED: 2016-01-08

				SAMPLE DESCRIPTION:	CTNHS 15-1
				SAMPLE TYPE:	Other
				DATE SAMPLED:	12/10/2015
Parameter	Unit	G / S	RDL	7312150	
Asbestos (Bulk)	%		0.5	ND	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

7312150 Condition of sample was satisfactory at time of arrival in laboratory.

"ND" - Not Detected

Certified By: Wenhong Zou

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Certificate of Analysis

AGAT WORK ORDER: 15T056228

PROJECT: Courthouse - St. Andrews Hazmat

CLIENT NAME: MISC AGAT CLIENT ON

ATTENTION TO: Hugh Copland

SAMPLING SITE:

SAMPLED BY:

O. Reg. 558 Lead

DATE RECEIVED: 2015-12-23

DATE REPORTED: 2016-01-08

				SAMPLE DESCRIPTION:	TCP-03	TCP-04
				SAMPLE TYPE:	Paint	Paint
				DATE SAMPLED:	12/10/2015	12/10/2015
Parameter	Unit	G / S	RDL		7312143	7312149
Lead Leachate	mg/L	5	0.010		0.517	0.186

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O. Reg. 558 - Schedule IV Leachate Quality Criteria

Certified By: Elizabeth Rolakowska

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Quality Assurance

CLIENT NAME: MISC AGAT CLIENT ON

AGAT WORK ORDER: 15T056228

PROJECT: Courthouse - St. Andrews Hazmat

ATTENTION TO: Hugh Copland

SAMPLING SITE:

SAMPLED BY:

Soil Analysis

RPT Date: Jan 08, 2016			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 558 Lead															
Lead Leachate	7311753		<0.010	<0.010	NA	< 0.010	102%	90%	110%	90%	80%	120%	88%	70%	130%

Comments: NA signifies Not Applicable.
Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Certified By: Elizabeth Pololowska

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Method Summary

CLIENT NAME: MISC AGAT CLIENT ON

AGAT WORK ORDER: 15T056228

PROJECT: Courthouse - St. Andrews Hazmat

ATTENTION TO: Hugh Copland

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Asbestos (Bulk)	INORG 93-6010	EPA 600/R-93/116 & NIOSH 9002	PLM
Soil Analysis			
Lead Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS

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Laboratory Use Only
Arrival Temperature: 1ST056228
AGAT Job Number:
Notes:

Report Information
Company: Parks Canada - Yukon Field Unit
Contact: Hugh Copland
Address: #205-300 Main St.
Whitehorse, Yukon Y1A 2B5
Phone: 867.667.3902 Fax:
AGAT Quote #:
Client Project #: Courthouse - St. Andrews Hazmat

Report Information
1. Name: Hugh Copland
Email: hugh.copland@pc.gc.ca
2. Name:
Email:

Report Format
☐ Single Sample per page
☑ Multiple Samples per page
☑ Excel Format Included

Turnaround Time Required (TAT)
Regular TAT ☑ 5 to 7 working days
Rush TAT ☐ Day 2 - 100% ☐ Day 3 - 50% ☐ Day 4 - 25%
Date Required:
PLEASE CONTACT LABORATORY IF RUSH REQUIRED SAMPLE SUBMISSION CUT OFF FOR EFFECTIVE DATE BY 3 PM

Invoice To Same as above Yes ☑ / No ☐
Company:
Contact:
Address:
Phone: Fax:
PO/AFE#:

Requirements *(Please Check)*
☐ BC CSR Soil: ☐ AL ☐ IL ☐ PL ☐ CL ☐ RL
☐ BC CSR - Water: ☐ DW ☐ AW ☐ IW ☐ LW
Schedule 11 *(Please Specify)*
CCME *(Please Specify)*
Other *(Please Specify)*

LABORATORY USE (LAB ID #)	SAMPLE IDENTIFICATION	SAMPLE MATRIX	DATE/TIME SAMPLED	COMMENTS - SITE SAMPLE INFO. SAMPLE CONTAINMENT	Analyis for TCLP Lead	Analysis for presence of asbestos fibre	NUMBER OF CONTAINERS	PRESERVED (Y/N)	HAZARDOUS (Y/N)	Hold for: ☐ 60 DAYS
	TCP-03	paint	Dec. 10 1500h	paint chips for TCLP Pb	☑		1			
	TCP-04	paint	Dec.10 1500h	paint chips for TCLP Pb	☑		1			
	CTNHS 15-1	paper	Oct. 15 0900h	tar paper for asbestos content		☑	1			

Samples Relinquished By (Print Name and Sign):	Date/Time	Samples Received By (Print Name and Sign):	Date/Time
H.Copland	16 Dec 15	Simon	29/12/15 12:15
Samples Relinquished By (Print Name and Sign):	Date/Time	Samples Received By (Print Name and Sign):	Date/Time
Samples Relinquished By (Print Name and Sign):	Date/Time	Samples Received By (Print Name and Sign):	Date/Time

Page _____ of _____
N°: