



# ELIJAH SMITH ELEMENTARY SCHOOL

ROOF REPAIRS

Whitehorse, Yukon

## PROJECT MANUAL

Divisions 00-09

Issued for Tender

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**Part 1            General****1.1                WORK COVERED BY CONTRACT DOCUMENTS**

- .1        Work of this Contract comprises repairs to the asphalt shingle roof and interiors at Elijah Smith Elementary School located at 1399 Hamilton Boulevard in Whitehorse, Yukon as described in the attached drawings and specifications.
  
- .2        Work includes, but is not limited to the following:
  - .1        All architectural work shown on drawings and described in specifications.
  - .2        Demolition of existing shingle roof assemblies and interior finishes as indicated.
  - .3        Installation of asphalt shingle roof assemblies. Pricing for both roof assembly options to be provided.
  - .4        Repair of all interior finishes as indicated.
  - .5        Contractor to be responsible for relocating and re-instating any furniture or movable equipment to allow for interior repairs.
  - .6        O&M manuals and as-built drawings.
  - .7        Co-ordination of sub-contractors.
  - .8        Liaison with Owner and Consultant.
  - .9        Securing and paying for all fees and permits as required by the Authorities Having Jurisdiction as required to complete the Work.
  - .10      Mobilization and demobilization costs.
  - .11      Hoarding costs.
  - .12      Dumpster, construction fencing, and coordination of all rental costs (including all heavy and light equipment).
  - .13      Temporary Facilities as required to perform the Work.
  - .14      Coordination and management of all staging areas.
  - .15      Site cleanliness, including progressive and final cleaning.

**1.2                CONTRACT METHOD**

- .1        Construct Work under stipulated price contract.

**1.3                WORK BY OTHERS**

- .1        The work on this contract includes coordination and cooperation with other contractors and building personnel working in the building. If any part of work under this Contract depends for its proper execution or result upon work of another Contractor, report promptly to Consultant, in writing, any defects which may interfere with proper execution of Work.

**1.4 COMPLETION DATE**

- .1 The Contractor must achieve Substantial Performance by **August 15, 2026**.

**1.5 WORK SEQUENCE**

- .1 Construct Work in stages to accommodate reviews of the substructure by the Consultant and the Owner's continued use of premises during construction. Coordinate areas to be closed off with the Owner.
- .2 Co-ordinate Progress Schedule and co-ordinate with Owner Occupancy during construction.
- .3 Construct Work in stages to ensure all building envelope areas remain watertight. No part of the envelope is to be removed which cannot be replaced and can be made watertight under climatic conditions existing at the time.
- .4 Maintain fire access/control.

**1.6 OWNER OCCUPANCY**

- .1 Owner will occupy the building during entire construction period.
- .2 Co-operate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage.

**1.7 HOURS OF WORK**

- .1 School Summer Break is as follows: June 13, 2026 to August 19, 2026
- .2 Work during School Session Breaks, weekends or statutory holidays shall be done between 8:00 and 17:30 Yukon Time. Earlier or later working hours are available upon approval from the Owner.
- .3 Outside of Statutory Holidays, unless otherwise approved by the Owner, work on weekdays shall be done after school hours of operation; 15:30 to 08:00 Yukon Time. Work on weekdays during school hours of operation; 08:00 to 15:30 Yukon Time; may be permitted in coordination with the Owner to minimize disturbance and mitigate disruption to school operations.
- .4 All noise generating or strong-smelling work to be completed must be coordinated with the Owner.
- .5 The Contractor shall not permit his personnel to work alone on this project when the following activities are undertaken:
  - .1 Work assessment determined that the potential health & safety risk is high;
  - .2 Work requiring entry into or work within a Confined Space;
  - .3 Work requiring use of fall arrest equipment;

- .4 Work on scaffolding;
- .5 Work requiring supplied air respirators or similar equipment;
- .6 Work involving cranes or hoisting;
- .7 Work or work situations identified by the Departmental Representative.

## 1.8 REQUESTS FOR INFORMATION

- .1 Submit RFI on a standardized "Request for Information" form. The Consultant shall not respond to an RFI except as submitted on a form.
- .2 Where RFI form does not provide sufficient space for complete information to be provided thereon, attach additional sheets as required.
- .3 Submit with RFI form necessary supporting documentation.
- .4 Submit RFIs sufficiently in advance of affected parts of the Work so as not to cause delay in the performance of the Work. Costs resulting from failure to do this will not be paid by the Owner.
- .5 Number RFIs consecutively in one sequence in order submitted.
- .6 Submit one distinct RFI per RFI form.
- .7 Maintain log of RFIs sent to and responses received from the Consultant, complete with corresponding dates.
- .8 Consultant shall review RFIs from the Contractor submitted in accordance with this section, with the following understandings:
  - .1 Consultant's response shall not be considered as a Change Order or Change Directive, nor does it authorize changes in the Contract Price or Contract Time or changes in the Work.
  - .2 Only the Consultant shall respond to RFIs. Responses to RFIs received from entities other than the Departmental Representative shall not be considered.
- .9 Allow 5 Working Days for review and initial response to each RFI by the Consultant.

## 1.9 PROJECT MEETINGS

- .1 Schedule and administer project meetings throughout the progress of the work at the call of Consultant or Owner. Regular meetings will be scheduled bi-weekly.
- .2 Prepare agenda for meetings.
- .3 Distribute written notice of each meeting four working days in advance of meeting date to Consultant and Owner.
- .4 Contractor to provide conference (or video) call services for meetings to allow all parties to call-in to the meeting.
- .5 Provide conference speakerphone at the meeting location.
- .6 Meetings during the duration of the Work on site.

- .7 Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.
- .8 Reproduce and distribute copies of minutes within three working days after meetings and transmit to meeting participants, affected parties not in attendance, and Departmental Representative.
- .9 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

### 1.10 WORK SCHEDULE

- .1 On award of contract submit a critical path method (CPM) gantt chart construction schedule for the work, indicating anticipated progress stages within time of completion.
- .2 Minimum stages include:
  - .1 Mobilization,
  - .2 Shop drawings, Product data MSDS sheets and samples submittal,
  - .3 Order and delivery of major components and equipment,
  - .4 Major approvals stages,
  - .5 Interim and final inspection times,
  - .6 Commissioning timeframes,
  - .7 Final deficiency corrections,
  - .8 Training,
  - .9 Demobilization,
  - .10 Close-out manuals submission.
- .3 Clearly show sequence and interdependence of construction activities and indicate:
  - .1 Start and completion of all items of Work, their major components, and interim milestone completion dates.
  - .2 Activities for procurement, delivery, installation and completion of each major piece of equipment, materials and other supplies, including:
    - .1 Time for submittals, resubmittals and review.
    - .2 Time for fabrication and delivery of manufactured products for Work.
    - .3 Interdependence of procurement and construction activities.
  - .3 Include sufficient detail to assure adequate planning and execution of Work. Activities generally range in duration from 3 to 15 work days each.
- .4 Provide level of detail for project activities such that sequence and interdependency of Contract tasks are demonstrated and allow co-ordination and control of project activities. Show continuous flow from left to right.
- .5 Ensure activities with no float are calculated and clearly indicated on logical CPM construction network system as being, whenever possible, continuous series of activities

throughout length of Project to form "Critical Path". Increased number of critical activities is seen as indication of increased risk.

- .6 Insert Change Orders in appropriate and logical location of Detail Schedule. After analysis, clearly state and report to Consultant for review effects created by insertion of new Change Order.
- .7 When schedule has been reviewed and approved by the Consultant take necessary measures to complete work within scheduled times. Do not change schedule without written approvals from the Consultant.
- .8 Project schedule reporting:
  - .1 Update Project Schedule on bi-weekly basis reflecting activity changes and completions, as well as activities in progress.
  - .2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.
  - .3 Ensure project schedule efficiencies through monitoring of project in detail to ensure integrity of Critical Path, by comparing actual completions of individual activities with their scheduled completions, and review progress of activities that has started but are not yet completed.
  - .4 Monitor sufficiently often so that causes of delays can immediately be identified and mitigated.

#### 1.11 SUBMITTALS

- .1 Submit to Consultant 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 Do not proceed with work affected by a submittal, including ordering of Products, until relevant submittal has been reviewed by Consultant.

#### 1.12 HEALTH & SAFETY REQUIREMENTS

- .1 Submit a site-specific Health and Safety Plan, within 7 days after Notice to Proceed and prior to commencement of Work. The Health and Safety Plan must include:
  - .1 Site-specific safety hazard assessment.
  - .2 Safety and health risk or hazard analysis for site risks and operation.
- .2 Submit copies of reports or directions issued by Territorial health and safety inspectors.

- .3 Submit to Consultant Material Safety Data Sheets for all products to be used on site (MSDS). MSDS submittals must be provided a minimum of 14 days before products are to be used on site
- .4 File Notice of Project with Territorial authorities prior to beginning of Work.
- .5 Perform site specific safety hazard assessment related to project.
- .6 Pre-construction meetings: The Contractor shall attend a Pre-Construction Meeting.
- .7 Be responsible for the Health and Safety of persons on site, safety of property on site and for the protection of persons adjacent to the site and environment to the extent that they may be affected by the conduct of Work.
- .8 Contractor shall comply with and enforce compliance by their employees with the safety requirements of the Contract Documents, applicable federal, provincial, local statutes, regulations, ordinances, and site-specific Health and Safety Plan. (i.e. Occupational Health and Safety Acts and Regulations for Construction Projects, Canada Labour Code Part II)
- .9 The Contractor shall advise the Owner of any accident, injury, near-miss incident, fire, explosion or chemical spill occurring at the Work site and any visit to the site by a governmental enforcement official.
- .10 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Territory having jurisdiction, and in consultation with Owner.
- .11 Immediately address health and safety non compliance issues identified by authority having jurisdiction, Consultant or by Owner.
- .12 Provide Owner with written report of action taken to correct non compliance of health and safety issues identified.
- .13 Owner may stop Work if non compliance of health and safety regulations is not corrected.
- .14 The Contractor's disregard and/or lack of compliance to health and safety measures, procedures and policies shall lead to disciplinary action by the Owner.
- .15 The Owner and/or designated Health and Safety personnel may stop work for health and safety considerations.
- .16 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

### 1.13 CONTRACT DOCUMENTS

- .1 The Contract Documents have been arranged into various divisions, sections, drawings, and schedules in a complementary manner for the purpose of presenting the Work in a logical and organized form and to enable ease of reference and interpretation, and are not intended to be an arrangement of precise and independent Subcontractors, or jurisdiction of responsibility for the various parts of the Work. The Contractor shall be

solely responsible for coordinating the execution of the Work of this Contract in accordance with the requirements of the Contract Documents.

- .2 As a result, the Consultant shall not be required to decide on questions arising with regard to agreements or contracts between the Contractor and Subcontractors or Suppliers, nor to the extent of the parts of the Work assigned thereto.
- .3 Further, no extra will be allowed as a result of the failure to coordinate and allocate the Work such that the Work is Provided in accordance with the Contract Documents.
- .4 Drawings are, in general, diagrammatic and are intended to indicate the scope and general arrangement of the work.

#### 1.14 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.

#### 1.15 DOCUMENTS REQUIRED

- .1 Maintain at job site, one copy of each document as follows:
  - .1 Contract Drawings.
  - .2 Contract Specifications.
  - .3 Addenda.
  - .4 Reviewed Shop Drawings and samples.
  - .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 Manufacturers' installation and application instructions
  - .12 One set of record drawings and specifications for "as-built" purposes
  - .13 Current construction standards of workmanship listed in technical Sections
  - .14 Other documents as specified.

**1.16 CHANGE ORDERS**

- .1 The Consultant will issue a Proposed Change Order (PCO) to the Contractor.
  - .1 Contractor shall submit a Contractor Proposal within 10 working days, stipulating:
    - .1 A lump sum increase, decrease, or no change in the Contract Price, and
    - .2 An increase, decrease, or no change in the Contract Time, on account of the proposed change in the Work.
  - .2 If, at any time, the Consultant submits a large enough number PCOs or if a PCO is complex enough that the Contractor cannot prepare the Contractor Proposal(s) within the specified time, then the Contractor will confer with the Consultant within 1 working day of receipt of such PCOs, and the Contractor and Consultant will jointly prepare an estimate of time necessary for preparing the Contractor Proposal(s), and an order of priority for the PCOs. The Contractor shall accommodate such necessary time at no increase in the Contract Time and at no additional cost to the Owner.
  - .3 Include in Contractor Proposal a detailed breakdown of lump sum increase or decrease, indicating Contractor's, and where applicable Subcontractors' and Sub subcontractors':
    - .1 Itemized direct costs applicable to the proposed change in the Work, and
    - .2 Applicable amounts for overhead and profit, in accordance with percentages specified in Contract added to the cumulative costs of all increase and decreases to the cost of work.

*Do not include costs that would otherwise be incurred in the normal performance of the Work.*

*Overhead and profit is to be added to the cumulative price of any additions or deletions within the PCO.*
  - .4 Include in detailed breakdown of Contractor Proposal a further breakdown of the total labour cost component indicating, for each applicable trade and trade classification, the labour rate(s) and the number of hours from which the total labour cost is derived.
  - .5 Upon the Consultant's approval and acceptance of the Contractor Proposal, a "Change Order" will be issued to Contractor.

**1.17 PAYMENT PROCEDURES**

- .1 Submit to Consultant, at least 14 days before the first application for payment, a Schedule of Values for parts of Work, aggregating total amount of Contract Price, to facilitate evaluation of applications for payment. After approval, it will be used as the basis for progress payments.
- .2 Include updated project schedule with each application for payment. Consultant will not review application unless an updated schedule is provided.

- .3 Prior to submitting application for substantial performance of the Work, Prepare and submit to Consultant comprehensive list of items to be completed or corrected and apply for a review by Departmental Representative to establish Substantial Performance of Work. Failure to include items on list does not alter responsibility to complete Contract.

#### 1.18 TRANSPORTATION

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

#### 1.19 POWDER ACTUATED DEVICES

- .1 Do not employ powder-actuated guns using explosives, unless expressly permitted by the Owner.

#### 1.20 REGULATORY REQUIREMENTS

- .1 The following codes and Standards are in place for work under this contract. The latest edition applicable at the time to be utilized.
  - .1 Standards and Guidelines for the Conservation of Historic Places in Canada 2nd Edition.
  - .2 National Building Code of Canada (NBC) 2020
  - .3 National Fire Code of Canada (NFC) 2020
  - .4 Canadian Electric Code.
  - .5 National Plumbing Code of Canada (NPC) 2020.
  - .6 Canada Labour Code Part II and Federal Occupational Health and Safety Policies
  - .7 Construction Standards and/or any other Code or bylaw of local application.
- .2 Comply with applicable local bylaws, rules and regulations enforced at the location concerned.
- .3 Meet or exceed requirements of Contract documents, specified standards, codes and referenced documents.
- .4 In any case of conflict or discrepancy, the most stringent requirements shall apply

#### 1.21 FEES

- .1 Obtain and pay for Building Permit as required by the Yukon Government, Certificates, Licenses and other permits required by regulatory municipal, territorial 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 to the requirements of the authority having jurisdiction.

#### 1.22 HAZARDOUS MATERIALS

- .1 Comply with the requirements of the Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials: and regarding labeling and the provision of Material Safety Data Sheets (MSDS) acceptable to Human Resources Development Canada, Labour Program.

#### 1.23 WORKMANSHIP

- .1 Workmanship shall be the best quality, executed by workers experienced and skilled in the respective duties for which they are employed. Immediately notify the Consultant, if required, if work is such as to make it impractical to produce required results.

.2 Do not employ any person unfit or unskilled in their required duties. The Consultant reserves the right to require the dismissal from the site, workers deemed incompetent, careless, insubordinate or otherwise objectionable.

- .3 The Work as covered by the Contract Documents documents is intended to comply exactly with the latest rules and regulations of the inspection authorities, and these rules are to be considered an integral part of the Contract Documents. In case of conflict, any ruling by the Inspection Authority shall be final. All changes and alterations to the Contractor's work required by an authorized inspector or any authority having jurisdiction shall be carried out at the expense of the Contractor.

- .4 Decisions as to the quality or fitness of workmanship in cases of dispute rest solely with the Consultant, whose decision is final.

#### 1.24 INSPECTION

- .1 Allow Consultant 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 Consultant 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 Consultant 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, Owner shall pay cost of examination and replacement.

**1.25 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 Consultant 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 Consultant, 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 Consultant.

**1.26 UTILITIES**

- .1 Water supply is available on site and will be provided for construction usage at no cost. Facility Supervisor reserves the right to limit volume of water utilized.
- .2 Existing electrical services to a maximum of 230 volts 30 amps required for the work may be used by the Contractor without charge. Ensure capacity is adequate prior to connecting and imposing additional loads. Connect and disconnect at own expense and responsibility.
- .3 Permanent heating system of building, will be operational throughout the Work and will be operated by the Owner.

**1.27 EQUIPMENT**

- .1 Provide and maintain equipment such as temporary stairs, ladders, ramps, scaffolds, swing stages, runways, chutes and the like, as required for execution of work
- .2 Provide and maintain conveying equipment such as cranes, hoists, derricks and the like, as required for execution of work.
- .3 Assume complete responsibility for construction strength, placing, anchoring and operation of derricks, cranes, hoists and other mechanical contrivances used for work; and ensure that loads carried thereon can be safely supported and be free from accidents to all persons.
- .4 Comply with all governing safety regulations in force at the time of construction.
- .5 Remove immediately such equipment when not required for work.
- .6 Provide and maintain, on site, suitable fire extinguishers in sufficient quantities, as required by the Safety Code.

- .7 Temporary Ventilation:
- .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
  - .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
  - .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
  - .4 Ventilate storage spaces containing hazardous or volatile materials.
  - .5 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.
  - .6 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
    - .1 Conform with applicable codes and standards.
    - .2 Enforce safe practices.
    - .3 Prevent abuse of services.
    - .4 Prevent damage to finishes.
- .8 Scaffolding
- .1 Scaffolding in accordance with CAN/CSA-S269.2.
  - .2 Provide and maintain scaffolding as required to complete the Work.

### 1.28 HOISTING

- .1 All crane operations are restricted to the following:
  - .1 All craning of materials and equipment must be done outside normal building operating hours, ensure interior areas below are kept unoccupied.
- .2 Provide, operate and maintain hoists or cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for their use of hoists.
- .3 Hoists or cranes to be operated by qualified operator.

### 1.29 LOADING

- .1 Take precautions to prevent the overloading of any part of the structure during the progress of the work. Make good, at no expense to Owner, any damage resulting from such overloading.

### 1.30 CONSTRUCTION PARKING

- .1 Parking will be permitted on site.
- .2 Provide and maintain adequate access to project site.

**1.31 HOARDING**

- .1 Erect temporary site enclosures using 2.1 m high construction fencing.
- .2 Erect and maintain pedestrian walkways at all building entrances, including roof and side covers, complete with signs and electrical lighting as required by law.
- .3 Erect fencing a minimum of 3m away from the edge of roof around entire perimeter of building where Work is underway to protect areas below from any falling materials from the roof. Extra caution should be given for playground areas at all times as these may also be used by the Public outside of school hours.

**1.32 WEATHER ENCLOSURES**

- .1 Provide weather tight closures to unfinished door and window openings, tops of shafts and other openings in floors and roofs.
- .2 Close off floor areas where walls are not finished; seal off other openings; enclose building interior work for temporary heat.
- .3 Design enclosures to withstand wind pressure and snow loading when used during the months of October to April.

**1.33 SIGNAGE**

- .1 No advertising and/or posting of company signs shall be permitted.
- .2 Provide common-use signs as related to traffic control, information, instruction, health and safety, use of equipment, public safety devices, in both official languages or by the use of commonly understood graphic symbols to the Departmental Representative's approval.

**1.34 CONTRACTOR PROJECT SUPERINTENDENT**

- .1 The Contractor shall, upon award of contract, designate a Project Superintendent. The Contractor shall provide the name, cellular phone number to the Consultant and Owner at the preconstruction meeting.
- .2 The Project Superintendent shall have full responsibility for the project and shall be authorized to accept and act upon any notice or direction provided by the Consultant. Project Superintendent shall be available on site at all times that work is being performed under this contract.
- .3 Supervise and direct all persons engaged in the work, including all tradesmen and suppliers. Become familiar with the requirements of each trade. Coordinate delivery and work operations. Examine the work of all trades during work operations to ensure compliance with the contract requirements. Expedite all work to maintain the contract schedule.

- .4 Cooperate with all other contractors working on site in parallel or related projects.
- .5 Attend coordination and project meetings at the direction of the Consultant and Owner.

### 1.35 CONTRACTOR AND SUB-CONTRACTORS

- .1 The Contractor agrees to employ those sub-contractors proposed by him in writing as listed in the Contractor's tender submission.
- .2 Do not change or substitute approved contractor for sub-contractors without prior authorization from the Departmental Representative.
- .3 Contractor and sub-contractor personnel shall be qualified as per definitions under the Trades Qualification and Apprenticeship Acts and as required by regulatory agencies in the Yukon Territory.

### 1.36 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 Owner 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.

### 1.37 PRODUCT HANDLING AND STORAGE

- .1 Deliver materials in original and unopened containers or wrappings with Manufacturers' seals and labels intact and legible.

- .2 Deliver materials in sufficient quantity to allow continuity of the work. Do not encumber site with unnecessary materials.
- .3 All unused materials at the end of any working day shall be properly protected from damage.
- .4 All materials, equipment, etc. to be handled and stored as not to interfere with the operation of the building.
- .5 All material and equipment to be new unless specified otherwise.
- .6 Contractors who use controlled products must ensure that their workers are properly trained in the safe use and handling of such products in compliance with the Workplace Hazardous Materials Information System (WHMIS).
- .7 Comply with all requirements with respect to Controlled products labeling and Material Safety Data Sheets (MSDS) according to the requirements of WHMIS and the Hazardous Products Act.

#### 1.38 PRODUCT AVAILABILITY

- .1 Upon award of contract immediately review product delivery requirements and advise the Consultant of any foreseeable delays.
- .2 In the event of failure to notify the Consultant at commencement of the work, the Consultant reserves the right to require the supply of substitute products of equivalent quality at no increase in contract price to ensure adherence to project schedule.

#### 1.39 MATERIALS STANDARDS

- .1 Materials shall be new and work shall conform to the minimum applicable standards of the Canadian General Standards Board, the Canadian Standards Association, the National Building Code of Canada and all applicable Provincial and Municipal codes. In the case of conflict or discrepancy the most stringent requirements shall apply.
- .2 Products (materials, equipment and articles) incorporated in work shall be new, not damaged or defective and of best quality compatible with specifications for purpose intended. If requested by the design authorities, furnish evidence as type, source, and quality of product.
- .3 Defective products will be rejected, regardless of previous inspections. Inspection does not relieve responsibility but is a precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.
- .4 Should any dispute arise as to the quality of fitness of products, the decision shall rest with the Consultant based upon requirements of Contract Documents. The Departmental Representative's decision shall be final.

- .5 Ensure that materials, equipment, services and labour are brought to site in sufficient quantity and in accordance with requirements of the work schedule.
- .6 Use materials/products containing highest percentage of recycled and recovered materials practicable – consistent with maintaining cost effective satisfactory levels of completion. Adhere to waste reduction requirements for reuse or recycling of waste materials, thus diverting materials from landfill

#### 1.40 PROTECTION

- .1 Protect finished work against damage until take-over.
- .2 Protect the work and all surrounding equipment, landscape, structures, floors, ceilings, walls, etc., from damage.
- .3 Make good, at no cost to the Owner, any damage caused.
- .4 Protect any services, which are uncovered during work.
- .5 Protect all areas adjacent to the construction areas from dust and debris produced during construction. Use hoarding, solid walls, drop cloths, sealed dust screens and tarps and clean up and vacuum up all debris daily.

#### 1.41 MATERIALS OTHER THAN SPECIFIED

- .1 Secure in writing, permission from the Consultant to use any materials other than those specified.
- .2 The listed suppliers/manufacturers are acceptable for their ability to meet the general design intent, quality and performance characteristics of the specified product. The listed equipment/materials does not endorse the acceptability of all products available from the listed manufacturers/suppliers.
- .3 It remains the responsibility of the Contractor to ensure the products supplied are equal to the specified products in every aspect, operate as intended, and meet the performance specifications and physical dimensions of the specified product.
- .4 The Contractor shall be fully responsible for any additional materials, to accommodate the use of equipment from the acceptable manufacturer and suppliers list.

#### 1.42 PROPOSED SUBSTITUTIONS

- .1 Where equivalent products have been submitted without specifics, it is the Contractor's responsibility to provide detailed specifications highlighting differences to the specified unit prior to requesting for acceptance as equal. Requests without inclusion of sufficient details will automatically be rejected. Provide differences and clear quantifiable characteristics why, how and where the unit meets performance and other

requirements. Requests for substitution must be made to the Departmental Representative.

- .2 Products specified serves to set minimum standard. Substituted equipment shall meet performance requirements and physical limitations, including fitting within space constraints.

#### 1.43 WARRANTY

- .1 Provide written one (1) year guarantee for all materials and labour provided as part of this Contract. Effective start date shall be date of final completion.
- .2 Provide extended warranties as requested in specification.
- .3 The Contractor, at own expense, shall correct any defects in the work due to faulty products and/or workmanship appearing within the extended guarantee/warranty periods set out in the individual sections from date of final completion.

#### 1.44 CLEANING

- .1 Remove waste materials and debris from the site at the end of each day. Leave the work area unencumbered upon completion of each work shift. Store materials and equipment.
- .2 Ensure site is clean, orderly and neat at all times during the work shift. Provide additional cleaning as requested by the Consultant and Owner.
- .3 At the end of the project, remove dirt, dust and other disfigurements from all surfaces affected by the project including, but not limited to ceilings, walls, floors, fixtures and lights. Clean by dusting, damp wiping, washing, waxing and polishing to the satisfaction of the Consultant and Owner.
- .4 Upon completion, remove scaffolding, temporary protections and surplus materials. Make good any defects noted at this stage.
- .5 Clean areas affected under contract, to a condition at least equal to that previously existing and to satisfaction of the Consultant and Owner.
- .6 Use only cleaning materials recommended by manufacturer of surface to be cleaned.

#### 1.45 WASTE MANAGEMENT

- .1 Comply with the Environmental Protection Act for waste management programs on construction and demolition projects.
- .2 Waste Management: separate waste materials for reuse and recycling.

- .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.
- .2 Source separate materials to be reused/recycled into specified sort areas.

**1.46 RECORD DRAWINGS**

- .1 As work progresses, maintain accurate records to show deviations from the contract drawings. Just prior to completion of work, supply to the Departmental Representative one set of white prints with all deviations neatly inked in with red pen.

**1.47 FAMILIARIZATION WITH BUILDING**

- .1 Prior to submitting a tender, visit site and thoroughly investigate locations, connections, and details affected by the Work included in the specifications and drawings.
- .2 No extras will be permitted for work resulting from conditions which would have been evident upon a thorough examination of the site.
- .3 Notify the Owner and Consultant in writing, prior to the tender closing date, any discrepancy. Failing this, allow for the most expensive course of action.

**1.48 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.

**END OF SECTION**

**Part 1            General**

**1.1                CO-ORDINATION WITH THE CONSULTANT AND OWNER**

- .1    Co-operate with the Consultant to coordinate the work restrictions.
- .2    Immediately modify work procedures as necessary to ensure compliance with the requirements of this section.
- .3    Consultant and Owner has the authority to close down the site due to non-compliance with the requirements of this section.
- .4    Questions and concerns are to be resolved prior to work proceeding.
- .5    A contact phone number for the Contractor is to be provided to the Owner's representative to contact when the Contractor is not on site. An alternate person shall be designated the site lead.

**1.2                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.
- .2    Do not close or obstruct streets, sidewalks, lanes or other public rights of way without obtaining required permits from the authorities having jurisdiction.
- .3    Maintain adequate traffic control procedures during operations, including delivery and offloading of materials, on or adjacent to streets, sidewalks, lanes, public rights of way and parking areas available to the public.
- .4    During progress of the Work maintain adequate means of egress from the Project and around the facility in the event of fire or other emergency. Do not store materials in a manner that will impair means of egress.

**1.3                CONTRACTOR USE OF PREMISES**

- .1    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 the Owner.
- .3    Co-operate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage.
- .4    Do not unreasonably encumber site, with material or equipment.
- .5    Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Owner Representative and Owner to facilitate work as stated.
- .6    Maintain existing services to building and provide for personnel and vehicle access.

- .7 Maintain a solid or chain link, or construction security fence c/w suitable locks around storage areas at all times.
- .8 Where security is reduced by work provide temporary means to maintain security.
- .9 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.
- .10 Remove or alter existing work to prevent injury or damage to portions of existing work which remain.
- .11 Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as directed by Consultant.
- .12 At completion of operations condition of existing work: equal to or better than that which existed before new work started.
- .13 Closures: protect work temporarily until permanent enclosures are completed.

#### 1.4 WORKING LIMITS

- .1 Confine all operations within the area of new construction and to those areas as indicated on drawings located within the property limits.
- .2 Restrict working hours to hours stipulated in Municipal Bylaws and by the Owner.
- .3 The Owner has the right to stop noisy Contractor activities that interfere with school operations.

#### 1.5 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

- .1 Execute work with least possible interference or disturbance to building operations, occupants, public and normal use of premises. Arrange with Owner to facilitate execution of work.
- .2 Cutting and Patching
  - .1 Cut existing surfaces as required to accommodate new work. Openings shall be neatly cut and dimensioned to fit electrical conduits, mechanical pipes and/or ductwork passing through the surfaces.
  - .2 Patch and make good cut on both sides of surfaces, damaged or disturbed to match or better existing conditions to the satisfaction of the Consultant.
  - .3 The Contractor shall patch and make good existing openings when Contractor utilizes the existing openings for his work.
- .3 Demolition
  - .1 Except if expressly stated otherwise, materials indicated for removal, become the Contractor's property and shall be promptly taken from the site.

#### 1.6 EXISTING SERVICES

- .1 Notify Consultant, Owner and utility companies of intended interruption of services and obtain required permission.

- .2 Where Work involves breaking into or connecting to existing services, give Consultant and Owner 72 hours of notice for necessary interruption of mechanical or electrical service throughout course of work. Keep duration of interruptions minimum.
- .3 Provide for personnel, pedestrian and vehicular traffic.
- .4 Construct barriers in accordance with Section 01 50 00 - Temporary Facilities and Controls.

### 1.7 SPECIAL REQUIREMENTS

- .1 Ensure Contractor's personnel employed on site become familiar with and obey regulations, procedures, other requirements including safety, fire, traffic and security.
- .2 Keep within limits of work and avenues of ingress and egress.

### 1.8 REGULATORY REQUIREMENTS

- .1 The Contractor shall comply with the specified standards and regulations to ensure safe operations. The latest editions are applicable.
  - .1 National Building Code Part 8 – Safety Measures at Construction & Demolition Sites
  - .2 National Fire Code Part 4 – Flammable and Combustible Liquids
  - .3 National Fire Code Part 5 – Hazardous Process and Operations

### 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 HOT WORK REQUIREMENTS

- .1 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.

- .2 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.
- .3 Hot work shall not be permitted inside the building unless approved by the Owner.
- .4 Provide and maintain at all times, ready access to firefighting equipment.
- .5 Provide temporary portable fire extinguishers throughout the Work and at every Work area.

**1.11 SECURITY**

- .1 Where security of the existing building has been reduced by Work of Contract, provide temporary means to maintain security.

**1.12 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**

PREVIEW

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**Part 1 General****1.1 REFERENCE STANDARDS**

- .1 American National Standards Institute (ANSI)
  - .1 ANSI A10.8 2011, Safety Requirements for Scaffolding
- .2 National Research Council Canada (NRC)
  - .1 National Building Code of Canada 2020 (NBC).
- .3 Department of Justice Canada (Jus)
  - .1 Canadian Environmental Assessment Act (CEAA), 2012
  - .2 Canadian Environmental Protection Act (CEPA), 2012
    - .1 SOR/2003-2, On-Road Vehicle and Engine Emission Regulations
    - .2 SOR/2006-268, Regulations Amending the On-Road Vehicle and Engine Emission Regulations
    - .3 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34
    - .4 Motor Vehicle Safety Act (MVSA), 1995
    - .5 Hazardous Materials Information Review Act, 1985
- .4 National Fire Protection Association (NFPA)
  - .1 NFPA 241 13, Standard for Safeguarding Construction, Alteration, and Demolition Operations

**1.2 DEFINITIONS**

- .1 Demolish: Detach items from existing construction and legally dispose of them off site, unless indicated to be removed and salvaged or removed and reinstalled.
- .2 Remove and Salvage: Detach items from existing construction and deliver them to Representative ready for reuse.
- .3 Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.
- .4 Existing to Remain: Existing items of construction that are not removed and that are not otherwise indicated as being removed, removed and salvaged, or removed and reinstalled.
- .5 Hazardous Substances: Dangerous substances, dangerous goods, hazardous commodities and hazardous products may include asbestos, mercury and lead, PCB's, poisons, corrosive agents, flammable substances, radioactive substances, or other material that can endanger human health or wellbeing or environment if handled improperly as defined by the Federal Hazardous Products Act (RSC 1985) including latest amendments.

**1.3 ADMINISTRATIVE REQUIREMENTS**

- .1 Coordination: Coordinate selective demolition work so that work of this Section adheres to aesthetic criteria established by the Drawings and specified dimensions with all elements in planes as drawn, maintaining their relationships with all other building elements.
- .2 Coordination: Coordinate with Representative for the material ownership as follows:
  - .1 Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Representative's property, demolished materials shall become Contractor's property and shall be removed from Project site.
  - .2 Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to Representative that may be encountered during selective demolition remain Representative's property:
    - .1 Carefully remove and salvage each item or object in a manner to prevent damage and deliver promptly to Representative.
    - .2 Coordinate with Representative's historical adviser, who will establish special procedures for removal and salvage.
- .3 Pre-Demolition Meeting: Conduct a pre-demolition meeting at Project site in accordance with requirements listed in Section 01 11 55 – General Instructions to confirm extent of salvaged and demolished materials.

**1.4 ACTION AND INFORMATION SUBMITTALS**

- .1 Action Submittals: Provide the following submittals before starting any work of this Section:
  - .1 Schedule of Selective Demolition Activities: Coordinate with Section 01 11 55 – General Instructions, and indicate the following:
    - .1 Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity.
    - .2 Coordinate with Representative's building manager ongoing site operations, and limit the number of interruptions during regular business hours.
    - .3 Interruption of utility services.
    - .4 Coordination for shutoff, capping, and continuation of utility services.
    - .5 Locations of temporary partitions and means of egress, including for others affected by selective demolition operations.
    - .6 Coordination with Representative's continuing occupancy of portions of existing building.

**1.5 QUALITY ASSURANCE**

- .1 Regulatory Requirements: Comply with governing environmental notification requirements and regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction and in accordance with the following:
  - .1 Provincial/Territorial Workers' Compensation Boards/Commissions.
  - .2 Provincial/Territorial Occupational Health and Safety Standards and Programs.
- .2 Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project:
  - .1 Conform to territorial Workers' Compensation Board Regulations.
  - .2 Conform to the local municipal bylaws and regulations governing this type of work.

**1.6 SITE CONDITIONS**

- .1 Representative will occupy portions of building immediately adjacent to selective demolition area:
  - .1 Conduct selective demolition so that Representative's operations will not be disrupted.
  - .2 Provide not less than 72 hours notice to Representative of activities that will affect Representative's operations.
- .2 Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities and as follows:
  - .1 Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from authorities having jurisdiction.
- .3 Representative assumes no responsibility for condition of areas to be selectively demolished:
  - .1 Conditions existing at time of Pre Bid Site Review will be maintained by Representative as far as practical.
- .4 Hazardous Materials: Hazardous materials are present in building to be selectively demolished. A report on the presence of hazardous materials is attached as an information document in the Appendix for review and use:
  - .1 Examine report to become aware of locations where hazardous materials are present.
  - .2 Coordinate with Section 02 81 01 – Hazardous Materials.
  - .3 Do not disturb hazardous materials or items suspected of containing hazardous materials.
- .5 Storage or sale of removed items or materials on site will not be permitted.

- .6 Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
- .7 Maintain fire protection facilities in service during selective demolition operations.

**Part 2 Products****2.1 MATERIALS**

- .1 Temporary Support Structures: Design temporary support structures required for demolition work and underpinning and other foundation supports necessary for the project using a qualified professional engineer registered or licensed in province of the Work.
- .2 Repair Materials: Use repair materials identical to existing materials:
  - .1 If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
  - .2 Use materials whose installed performance equal or surpasses that of existing materials.
  - .3 Comply with material and installation requirements specified in individual technical specification Sections.

**Part 3 Execution****3.1 EXAMINATION**

- .1 Verify that utilities have been disconnected and capped.
- .2 Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.
- .3 Notify the Consultant and Historic Sites Unit where existing mechanical, electrical, or structural elements conflict with intended function or design:
  - .1 Investigate and measure the nature and extent of conflict and submit a written report to Representative.
  - .2 Representative will issue additional instructions or revise drawings as required to correct conflict.

**3.2 UTILITY SERVICES**

- .1 Coordinate existing services indicated to remain and protect them against damage during selective demolition operations.
- .2 Locate, identify, disconnect, and seal or cap off indicated utilities serving areas to be selectively demolished.

- .1 Arrange to shut off affected utilities with utility companies.
- .2 If utility services are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary utilities that bypass area of selective demolition and that maintain continuity of service to other parts of building.
- .3 Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.
- .4 Cut off pipe or conduit to a minimum of 25 mm below slab, and remove concrete mound.
- .3 Coordinate with Mechanical and Electrical Divisions for shutting off, disconnecting, removing, and sealing or capping utilities.
- .4 Do not start selective demolition work until utility disconnecting and sealing have been completed and verified in writing.

### 3.3

#### PREPARATION

- .1 Conduct selective demolition and debris removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities:
  - .1 Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Representative and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
  - .2 Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction.
  - .3 Protect existing site improvements, appurtenances, and landscaping to remain.
  - .4 Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.
- .2 Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain in accordance with Section 01 50 00 – Temporary Facilities and Controls, and as follows:
  - .1 Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
  - .2 Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
  - .3 Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
  - .4 Cover and protect furniture, furnishings, and equipment that have not been removed.

- .3 Provide temporary enclosures for protection of existing building and construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities in accordance with Section 01 50 00 - Temporary Facilities and Controls.
  - .1 Where heating or cooling is needed and permanent enclosure is not complete, provide insulated temporary enclosures.
  - .2 Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
- .4 Erect and maintain dustproof partitions and temporary enclosures to limit dust and dirt migration and to separate areas from fumes and noise in accordance with Section 01 50 00 – Temporary Facilities and Controls.

### 3.4 POLLUTION CONTROLS

- .1 Remove and transport debris to prevent spillage on adjacent surfaces and areas.
- .2 Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- .3 Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

### 3.5 SELECTIVE DEMOLITION

- .1 Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
  - .1 Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
  - .2 Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
  - .3 Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
  - .4 Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame cutting operations. Maintain fire watch and portable fire suppression devices during flame cutting operations.
  - .5 Maintain adequate ventilation when using cutting torches.
  - .6 Remove decayed, vermin infested, or otherwise dangerous or unsuitable materials and promptly dispose of off site.

- .7 Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
- .8 Dispose of demolished items and materials promptly.
- .9 Return elements of construction and surfaces that are to remain to condition existing before selective demolition operations began.
- .2 Comply with Owner's requirements for using and protecting stairs, walkways, building entries, and other building facilities during selective demolition operations.
- .3 Removed and Salvaged Items:
  - .1 Clean salvaged items
  - .2 Pack or crate items after cleaning
  - .3 Identify contents of containers
  - .4 Store items in a secure area until delivery to Representative
  - .5 Transport items to Representative's storage area on site designated by Representative.
  - .6 Protect items from damage during transport and storage
- .4 Removed and Reinstalled Items:
  - .1 Clean and repair items to functional condition adequate for intended re use. Paint equipment to match new equipment
  - .2 Pack or crate items after cleaning and repairing
  - .3 Identify contents of containers
  - .4 Protect items from damage during transport and storage
  - .5 Reinstall items in locations indicated
  - .6 Comply with installation requirements for new materials and equipment
  - .7 Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated
- .5 Existing Items to Remain:
  - .1 Protect construction indicated to remain against damage and soiling during selective demolition
  - .2 Items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete

### 3.6 CLOSEOUT ACTIVITIES

- .1 Patching and Repairs: Promptly repair damage to adjacent construction caused by selective demolition operations and as follows:
  - .1 Patch to produce surfaces suitable for new materials where repairs to existing surfaces are required,

- .2 Demolition Waste Disposal: Arrange for legal disposal and remove demolished materials to accredited provincial landfill site or alternative disposal site (recycling centre) and as follows:
  - .1 Promptly dispose of demolished materials.
  - .2 Do not allow demolished materials to accumulate onsite.
  - .3 Do not burn demolished materials.

**END OF SECTION**

**PREVIEW**

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**Part 1 General****1.1 RELATED SECTIONS**

- .1 Section 07 31 13 – Asphalt Shingles

**1.2 REFERENCE STANDARDS**

- .1 CSA Group (CSA)
  - .1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
  - .2 CAN/CSA-G164-M92, Hot Dip Galvanizing of Irregularly Shaped Articles.
  - .3 CSA O112 Series-M1977, CSA Standards for Wood Adhesives.
  - .4 CSA O121-08, Douglas Fir Plywood.
  - .5 CSA O141-05(R2009), Softwood Lumber.
  - .6 CAN/CSA-O325.0-07, Construction Sheathing.
- .2 National Research Council Canada (NRC)
  - .1 National Building Code of Canada 2020 (NBC).
- .3 National Lumber Grades Authority (NLGA)
  - .1 Standard Grading Rules for Canadian Lumber 2010.

**1.3 QUALITY ASSURANCE**

- .1 Lumber identification by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
- .2 Plywood and wood based composite panel construction sheathing identification: by grademark in accordance with applicable CSA and ANSI standards.

**1.4 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 11 55 – General Instructions.
- .2 Store wood products in dry condition raised off the ground on dunnage.

**Part 2 Products****2.1 FRAMING AND STRUCTURAL MATERIALS**

- .1 Lumber: unless specified otherwise, softwood, S4S, moisture content 19% or less in accordance with following standards:
  - .1 CAN/CSA-O141.
  - .2 NLGA Standard Grading Rules for Canadian Lumber.

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

.1 SPF species, No 2 or better grade

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

## 2.2 PANEL MATERIALS

.1 Plywood and wood based composite panels: to CAN/CSA-O325.0.

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

## 2.3 ACCESSORIES

.1 Fasteners: galvanized to CAN/CSA-G164, for exterior work. Min #10 screws with flat head for fastening strapping through continuous insulation.

.2 Nails, spikes and staples: to CSA B111.

.3 Bolts: 12.5 mm diameter unless indicated otherwise, complete with nuts and washers.

.4 Concealed connectors: As indicated on drawings.

.5 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, recommended for purpose by manufacturer.

## Part 3 Execution

### 3.1 EXAMINATION

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

### 3.2 PREPARATION

.1 Treat surfaces of material with wood preservative, before installation.

.2 Apply preservative by dipping, or by brush to completely saturate and maintain wet film on surface for minimum 3-minute soak on lumber and 1-minute soak on plywood.

.3 Re-treat surfaces exposed by cutting, trimming or boring with liberal brush application of preservative before installation.

.4 Treat material as follows:

.1 Wood cants, fascia backing, curbs, nailers, sleepers on roof deck.

.2 Wood furring.

### 3.3 INSTALLATION

.1 Comply with requirements of National Building Code of Canada (NBC), supplemented by the following paragraphs.

- .2 Install members true to line, levels and elevations, square and plumb.
- .3 Install roof sheathing and wall sheathing as indicated and in accordance with requirements of NBC and drawings.
- .4 Install furring and blocking as required to space-out and support casework, cabinets, wall and ceiling finishes, facings, fascia, soffit, siding and other work as required.
- .5 Install furring for siding with fasteners selected to provide a minimum of 50mm penetration into the existing solid wood framing.
- .6 Align and plumb faces of furring and blocking to tolerance of 1:600.
- .7 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work.
- .8 Install wood cants, fascia backing, nailers, curbs and other wood supports as required and secure using galvanized fasteners.
- .9 Install wood backing, dressed, tapered and recessed slightly below top surface of roof insulation for roof hopper.
- .10 Install sleepers as indicated.

### 3.4 ERECTION

- .1 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
- .2 Countersink bolts where necessary to provide clearance for other work.

### 3.5 CLEANING

- .1 Progress and Final Cleaning: clean in accordance with Section 01 11 55 – General Instructions.
  - .1 Leave Work area clean at end of each day.

### 3.6 SCHEDULES

- .1 Roof Sheathing
  - .1 Plywood, DFP sheathing, T&G edge, minimum 16 mm thick.
- .2 Wall Sheathing
  - .1 Plywood, DFP sheathing, 13 mm thick.

**END OF SECTION**

**Part 1 General****1.1 RELATED REQUIREMENTS**

- .1 Section 02 41 19 – Selective Demolition
- .2 Section 07 31 13 – Asphalt Shingles.

**1.2 PERFORMANCE**

- .1 Contractor must maintain a minimum of a two (2) man crew on-site for the roof installations. Contractor must remain on-site from start to completion without shutdown, (except statutory holidays, weekends, and inclement weather).

**1.3 QUALITY OF WORK**

- .1 All work shall be completed to the Roofing Contractors Association of British Columbia – RGC Guarantee Standards and Roofing Practices Manual (RPM), or better.

**1.4 DEMOLITION**

- .1 It is intended that all existing siding, strapping and roofing be removed with the exceptions as noted in specification or drawings. All demolished material to be carefully contained and removed by approved means from roof surfaces in order of procedure listed generally. Chutes or roof hoists are to be used from areas above the ground floor.
- .2 It is intended that all existing roofing be removed with the exceptions as noted in specification or drawings. All demolished material to be carefully contained and removed by approved means from roof surfaces in order of procedure listed generally. Chutes or roof hoists are to be used.
- .3 Demolished material to be deposited in dust tight containers and removed from site as soon as possible. Container locations are to be pre-approved areas only. Keep general areas clean of loose debris and sweep clean at frequent intervals.

**1.5 PROCEDURE**

- .1 All parts of the building are to remain watertight. No openings are to be made or roofing is to be removed which cannot be protected or replaced and be made watertight under climatic conditions existing at the time.

**1.6 ACCESS TO ROOF**

- .1 Access to building roofs is to be confirmed by the Owners' Departmental Representative.

**1.7 SEQUENCE OF WORK**

- .1 The contractor shall ensure that the work is carried out in such a way as to inconvenience as little as possible the proper functioning of the premises.

- .2 Contractor to stage roofing demolition and installation to ensure roof remains watertight.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

END OF SECTION

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**Part 1 General****1.1 RELATED REQUIREMENTS**

- .1 Section 06 08 99 – Rough Carpentry for Minor Works.
- .2 Section 07 01 20 – General Envelope Requirements.

**1.2 REFERENCE STANDARDS**

- .1 Canadian Urethane Foam Contractors Association Inc. (CUFCA)
- .2 Underwriters Laboratories of Canada (ULC)
  - .1 CAN/ULC-S101-07, Standard Methods of Fire Tests of Building Construction and Materials.
  - .2 CAN/ULC-S102-10, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
  - .3 CAN/ULC-S705.1-01, Standard for Thermal Insulation - Spray Applied Rigid Polyurethane Foam, Medium Density, Material Specification. Includes Amendment 1.2.
  - .4 CAN/ULC-S705.2-05, Standard for Thermal Insulation - Spray Applied Rigid Polyurethane Foam, Medium Density, Application.
  - .5 CAN/ULC-S770-15, Standard Test Method for Determination of Long-Term Thermal Resistance of Closed-Cell Insulating Foams.

**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 polyurethane foam sprayed insulation and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Test Reports:
  - .1 Submit certified test reports for insulation from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties.
  - .2 Submit test reports in accordance with CAN/ULC-S101 for fire endurance and CAN/ULC-S102 for surface burning characteristics.
- .4 Manufacturer's Instructions:
  - .1 Submit manufacturer's installation instructions and special handling criteria, installation sequence, and cleaning procedures.

**1.4 QUALITY ASSURANCE**

- .1 Applicators to conform to CUFCA Quality Assurance Program.
- .2 Qualifications:
  - .1 Installer: person specializing in sprayed insulation installations approved by manufacturer.
  - .2 Manufacturer: company with experience in producing of material used for work required for this project, with sufficient production capacity to produce and deliver required units without causing delay in work.
- .3 Health and Safety Requirements: worker protection:
  - .1 Protect workers as recommended by CAN/ULC-S705.2 and manufacturer's recommendations:
  - .2 Workers must wear protective clothing when applying foam insulation.
  - .3 Workers must not eat, drink or smoke while applying foam insulation.

**1.5 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

**1.6 SITE CONDITIONS**

- .1 Ventilate area in accordance with Section 01 50 00 - Temporary Facilities and Controls.
- .2 Ventilate area to receive insulation by introducing fresh air and exhausting air continuously during and 24 hours after application to maintain non-toxic, unpolluted, safe working conditions.
- .3 Provide temporary enclosures to prevent spray and noxious vapours from contaminating air beyond application area.
- .4 Protect adjacent surfaces and equipment from damage by overspray, fall-out, and dusting of insulation materials.
- .5 Apply insulation only when surfaces and ambient temperatures are within manufacturers' prescribed limits.

**Part 2 Products****2.1 MATERIALS**

- .1 Insulation: spray polyurethane with hydrofluoroolefins (HFOs) in blowing agent to CAN/ULC-S705.1.
  - .1 Long Term Thermal Resistance: RSI 1.86 per 50 mm to CAN/ULC S770-09.
  - .2 Standard of Acceptance: Polarfoam Soya HFO by Demilec.
- .2 Primers: in accordance with manufacturer's recommendations for surface conditions.

**Part 3 Execution**

**3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for sprayed insulation application accordance with manufacturer's written instructions.

**3.2 APPLICATION**

- .1 Apply insulation to clean surfaces in accordance with CAN/ULC-S705.2 and manufacturer's printed instructions.
- .2 Use primer where recommended by manufacturer.
- .3 Apply sprayed foam insulation to achieve thickness as indicated.
- .4 Individual passes must not exceed manufacturer recommendations.
- .5 Apply thermal barrier in thickness required by manufacturer.

**3.3 CLEANING**

- .1 Progress and Final Cleaning: clean in accordance with Section 01 11 55 – General Instructions.
  - .1 Leave Work area clean at end of each day.

**END OF SECTION**

**Part 1 General****1.1 RELATED REQUIREMENTS**

- .1 Section 07 01 20 – General Building Envelope Requirements.
- .2 Section 07 62 00 – Sheet Metal Flashing and Trim.
- .3 Section 07 92 00 – Joint Sealants.

**1.2 REFERENCE STANDARDS**

- .1 ASTM International
  - .1 ASTM D6757/D6757M-18, Standard Specification for Underlayment Felt Containing Inorganic Fibers Used in Steep-Slope Roofing.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-37.4-M89, Fibrated, Cutback Asphalt, Lap Cement for Asphalt Roofing.
  - .2 CAN/CGSB-37.5-M89, Cutback Asphalt Plastic Cement.
- .3 Canadian Roofing Contractors' Association (CRCA)
  - .1 CRCA Roofing Specification Manual - 2011.
- .4 CSA Group (CSA)
  - .1 CSA A123.5-05 (R2015), Asphalt Shingles Made from Glass Felt and Surfaced with Mineral Granules.
  - .2 CSA A123.22-08, Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
  - .3 CAN3-A123.51-M85 (R2011), Asphalt Shingle Application on Roof Slopes 1:3 and Steeper.
  - .4 CAN3-A123.52-M85 (R2011), Asphalt Shingle Application on Roof Slopes 1:6 to Less Than 1:3.
  - .5 CSA B111-1974 (R2003), Wire Nails, Spikes and Staples.
- .5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .6 National Research Council Canada (NRC) - Canadian Construction Materials Centre (CCMC)
  - .1 CCMC Registry of Product Evaluations.
- .7 Roofing Contractor's Association of British Columbia (RCABC)
  - .1 RCABC Roofstar Roofing Practices Manual – 2020.

**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 asphalt shingles and accessories and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit proof of manufacturer's CCMC listing and listing number.
  - .3 Manufacturer's Instructions: provide to indicate special handling criteria, installation sequence, and cleaning procedures.
  - .4 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 29 - Health and Safety Requirements.
- .3 Samples:
  - .1 Submit duplicate samples of full-size specified shingles.

**1.4 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance 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.

**1.5 EXTRA STOCK MATERIALS**

- .1 Submit maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
- .2 All unused shingles remain property of the Owner.

**Part 2 Products****2.1 MATERIALS**

- .1 Eave and Valley Protection: Self-adhering styrene butadiene styrene (SBS) to CSA A123.22. Fiberglass reinforced mat saturated with a blend of SBS and asphalt.
  - .1 Thickness: Minimum 40 mils.
  - .2 Tensile Strength: Minimum 25 lbf/in to ASTM D2523
  - .3 Elongation at break: Minimum 10% to ASTM D2523
  - .4 Low Temperature Flexibility: -29°C to ASTM D1970
  - .5 Operating temperature: -45°C to 90°C
  - .6 Moisture Vapour Permeance: Max 0.1 Perms to ASTM E96, Method A.
  - .7 Nail Sealability: to ASTM D1970
  - .8 Acceptable Products:

- .1 Storm Guard by GAF
  - .2 Eaveguard by Henry
  - .3 Weathertex by BP.
  - .4 Armourgard by IKO.
- .2 High Temperature Roofing Underlayment: Self-adhering styrene butadiene styrene (SBS) to CSA A123.22 meant for high temperature installation under metal roofing and flashings. Fiberglass reinforced mat saturated with a blend of SBS and asphalt.
- .3 Underlayment: Synthetic (inorganic felt) vapour permeable (breathable) underlayment to ASTM D6757.
- .1 Width: Minimum 1.2m
  - .2 Water Penetration Resistance: > 600cm to CAN/CGSB-4.2
  - .3 Water Vapor Transmission: > 15 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.
  - .7 Acceptable Products:
    - .1 Deck Armor by GAF.
    - .2 Hydra by FT Synthetics
    - .3 Stormtite by IKO.
- .4 Asphalt shingles: styrene butadiene styrene (SBS) modified asphalt to CSA A123.05M (R2015).
- .1 Type: Architectural
  - .2 Appearance: Wood shake.
  - .3 Sealing: double self-sealing.
  - .4 Grade: #1.
  - .5 Warranty: Minimum 40 years
  - .6 Fire Resistance: Class A to CAN/ULC S107.
  - .7 Weight: 12 kg/sq.m.
  - .8 Exposure: 149 mm.
  - .9 Colours: Twilight Grey
  - .10 Ridge shingles: As recommended by manufacturer. Colour to match colour of selected roof shingle.
  - .11 Specified Product: Mystique by BP

- .5 Asphaltic Cement:
  - .1 Plastic cement: multi-purpose plastic cement conforming to ASTM D4586.
  - .2 Lap cement: Asbestos free lap cement for asphalt roofing conforming to CSA A123.51-M85.
- .6 Nails: to CSA B111, of galvanized steel, minimum 9mm head, sufficient length to penetrate 19 mm into deck.

### Part 3 Execution

#### 3.1 WEATHER CONDITIONS

- .1 Proceed with work only when existing and forecasted weather conditions will permit work to be performed in accordance with roofing shingle manufacturer's recommendations.

#### 3.2 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for asphalt shingles installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Consultant.
  - .2 Inform Consultant 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 Consultant.

#### 3.3 REMOVAL OF EXISTING ROOFING

- .1 Remove existing roofing, flashings and underlay, and expose sheathing or shingle lath of roof.
- .2 Withdraw existing shingle and flashing nails, set those which break off. Leave surfaces free from dirt and loose material.
- .3 Consultant to inspect roof sheathing.
- .4 Remove portion of sheathing affected by fungal or insect attack as directed by Consultant.
- .5 Replace cut out portions of sheathing or lath with sheathing of equal sectional dimensions, and specified grade. Seat each end on rafter, with 25 mm bearing, and secure to rafter.

#### 3.4 APPLICATION

- .1 Do asphalt shingle work to CRCA Specification except where specified otherwise.
- .2 Eave Protection:

- .1 Apply eave protection from the edge of the roof to a line not less than 300 mm (12 in) inside the inner face of the exterior wall, and at all valleys.
- .2 Ensure material is laid flat and smooth with no buckles or unadhered areas.
- .3 Underlayment:
  - .1 Install one ply over the entire roof area not already covered by eave protection. Apply underlayment over properly prepared, clean and dry decks.
  - .2 Lay the underlayment parallel to the eaves, starting at the eaves or eave protection, lapping each course a minimum 50 mm (2 in) over the underlying course.
  - .3 Secure the underlayment with the minimum number of nails to hold it securely in place before shingles are applied.
  - .4 If two or more pieces are required to continue a course, overlap ends a minimum 100 mm (4 in). End laps should be staggered from those in a preceding course by a minimum 150 mm (6 in).
- .4 Drip Edge Flashing: Refer to Section 07 62 00 – Sheet Metal Flashing and Trim.
  - .1 Install the drip edge along eaves and rake edge.
  - .2 At eaves install drip edge prior to installation of eave protection and underlayment.
  - .3 Nail drip edge onto deck at 400 mm (16 in) maximum intervals.
- .5 Install bottom step flashing (soaker base flashing) interleaved between shingles at vertical junctions.
- .6 Install asphalt shingles on roof slopes 1:3 and steeper in accordance with CAN3-A123.51 supplemented as follows:
  - .1 General
    - .1 The surface of the substrate shall be inspected prior to the installation of the roofing shingles.
    - .2 The substrate shall be clean, dry, free from debris and smooth with no surface roughness or contamination.
    - .3 Broken, delaminated, wet or damaged eave protection or underlayment shall be replaced prior to shingling.
    - .4 Mark a horizontal chalk line parallel to the eave and measured to the appropriate distance on the roof.
    - .5 On long runs snap a vertical chalk line in the centre of the run and apply shingles to the left and right of the line.
    - .6 Check horizontal lines periodically as the shingle application approaches the ridge so as to ensure the upper course will be parallel to it.
    - .7 Fastener length shall be sufficient to penetrate 20 mm (13/16 in) into the roof deck. Where the deck is less than 20 mm (13/16 in), the fastener should be long enough to penetrate the full thickness of the deck or through the deck.

- .8 Apply asphalt plastic cement in accordance with the manufacturers recommendations if temperature is too low to activate the integrated shingle sealant band.
- .2 Application of Asphalt Shingles (Slopes 1:3 and Steeper)
  - .1 The starter strip may be either a shingle with the tab portion removed or mineral surfaced roll roofing at least 175 mm (7 in) wide.
  - .2 The first course of shingles starts with a full shingle and succeeding courses start with portions removed according to the style of shingle being installed and the pattern desired. Offset method to match existing shingles.
  - .3 Use four nails per shingle in accordance with manufacturer's recommendations for placement and spacing. In areas of high wind exposure, additional fasteners may be required. For special shingle types follow manufacturer's instructions.
  - .4 The correct exposure for square tab strip shingles is approximately 143 mm (6 in). Install variable butt line shingles according to manufacturer's instructions to obtain correct exposure. Do not use an alignment system where shingle joints are closer than 100 mm (4 in) to one another.
  - .5 Apply asphalt plastic cement on the back of shingles in accordance with the manufacturer's installation instructions.
- .7 Valleys
  - .1 General
    - .1 Valley flashing must be in place before shingle application is begun.
    - .2 To install underlayment in a valley, first centre a 914 mm (36 in) wide strip of self-adhesive membrane in the valley and secure with enough nails to hold in place.
    - .3 Trim horizontal courses of underlayment to overlap valley strip by a minimum 150 mm (6 in) where applicable.
  - .2 Open Valley
    - .1 Flashing material for open valleys shall be corrosion resistant metal (recommended) or mineral surface roll roofing. Metal valley flashing should not be less than 600 mm (24 in) wide.
    - .2 First install a half width of self-adhesive membrane centred in the valley and nailed in place with sufficient nails to hold in place. If two pieces are required, overlap 300 mm (12 in) in the flow direction and embed in plastic cement.
    - .3 After this strip has been secured, centre the metal strip without puncturing the metal. This can be achieved by nailing so that nail shanks are adjacent to the metal edge with the nail heads overlapping and securing the flashing in place.
    - .4 If more than one piece of metal flashing is required, overlap in the flow direction by 300 mm (12 in) and embed in plastic cement.

- .5 Snap two chalk lines, one on each side of the valley. The lower ends should diverge from each other at the rate of 10 mm/m ( 1 /9 in/ft).
  - .6 As shingles are applied toward the valley, trim the last shingle in each course to fit on the chalk line. Do not use a shingle less than 300 mm (12 in) to finish a course running into a valley.
  - .7 Clip 25 mm (1 in) from the upper corner from each shingle at a 45-degree angle to direct water into the valley and prevent water ingress between courses.
  - .8 Cement the shingle to the valley flashing with a 75 mm (3 in) width of plastic cement. There should be no exposed nails along the valley flashing.
- .8 Hips and Ridges
- .1 Hips and ridges may be capped using either strip shingles cut in thirds or shingles manufactured for this purpose.
  - .2 Start hips at eaves. Start ridges at the end away from the prevailing wind direction.
  - .3 Bend each shingle so that it will extend an equal distance from each side of the hip or ridge.
  - .4 Apply each shingle so as to overlap the previous one and leave an exposure of 125 mm (5 in) or as recommended by individual manufacturers.
  - .5 Do not leave any exposed nails.
- .9 Flashings
- .1 Flashing at Other Locations
    - .1 Protect with flashing all areas where the roofing is perforated with vents, vent pipes or other projections.
    - .2 The flanges of these flashing shall extend a minimum of 150 mm (6 in) onto the roof surface and have sufficient nails to hold them securely.

### 3.5 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Stage work progress so that traffic is minimized over completed roofing.
- .3 Repair damage to adjacent materials caused by asphalt shingles installation.

**END OF SECTION**

**Part 1 General****1.1 RELATED REQUIREMENTS**

- .1 Section 07 01 20 – General Envelope Requirements.
- .2 Section 07 92 00 - Joint Sealants.

**1.2 REFERENCES**

- .1 American Society for Testing and Materials International (ASTM)
  - .1 ASTM A653/A653M-07, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - .2 ASTM A792/A792M-06a, Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
  - .3 ASTM D523-89(1999), Standard Test Method for Specular Gloss.
- .2 Canadian Roofing Contractors Association (CRCA)
  - .1 Roofing Specifications Manual 1997.
- .3 Canadian Standards Association (CSA International)
  - .1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
- .4 SMACNA
  - .1 SMACNA Architectural Sheet Metal Manual, Current Edition

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's printed product literature for sheet metal flashing systems materials, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.

**1.4 QUALITY ASSURANCE**

- .1 Mock-Up
  - .1 Build mock-ups for each type of flashing and counter flashing complete with all fasteners as per drawings and specifications and obtain Departmental Representative's approval prior to fabrication of any further metal flashings.

**Part 2 Products****2.1 SHEET METAL MATERIALS**

- .1 Aluminum-zinc alloy coated steel sheet: to ASTM A792/A792M, commercial quality, grade 33 with AZ180 coating, regular spangle surface, chemically treated for unpainted finish, not chemically treated for paint finish, 24-gauge base metal thickness unless indicated otherwise.
  - .1 Where no thickness specified, provide base sheet metal in thickness recommended in SMACNA Architectural Sheet Metal Manual for type of item being fabricated, but not less than the thickness required by the authority having jurisdiction.

**2.2 PREFINISHED STEEL SHEET**

- .1 Prefinished steel with factory applied two-coat polyvinylidene fluoride resin on specified steel sheet substrate conforming to ASTM A755 (PVDF).
  - .1 Colour selected by Consultant from manufacturer's standard range to match existing tower coping flashing.
  - .2 Specular gloss: 25 units +/- in accordance with ASTM D523.
  - .3 Coating thickness: not less than 22 micrometres.
  - .4 Resistance to accelerated weathering for chalk rating of 8, colour fade 5 units or less and erosion rate less than 20 % to ASTM D822 as follows:
    - .1 Outdoor exposure period 2,500 hours.
    - .2 Humidity resistance exposure period 2,000 hours.
  - .5 Standard of Acceptance: Cascadia Metals Ltd.

**2.3 ACCESSORIES**

- .1 Isolation coating: alkali resistant bituminous paint.
- .2 Plastic cement: to CAN/CGSB 37.5.
- .3 Sealants: Refer to Section 07 92 00 – Joint Sealants.
- .4 Clips and cleats: of same material, and temper as sheet metal, minimum 50 mm wide. 24 gauge minimum.
- .5 Fasteners: of same material as sheet metal, to CSA B111, ring thread flat head roofing nails of length and thickness suitable for metal flashing application. Provide a minimum 25 mm penetration into substrate.
- .6 Washers: of same material as sheet metal, 1 mm thick with rubber packings.
- .7 Touch-up paint: as recommended by prefinished material manufacturer.
- .8 High Temperature Underlayment Membrane: Self-adhering high temperature membrane complete with compatible primer and sealant.

- .1 Acceptable products: Soprema Lastobond Shield HT, Bakor Blueskin PE 200HT, Protecto Wrap Jiffyseal 140/60 or acceptable substitution.

## 2.4 FABRICATION

- .1 Fabricate metal flashings and other sheet metal work in accordance with applicable SMACNA, RCABC and CRCA S-lock and standing seam details and as indicated.
- .2 Form pieces in 2400 mm maximum lengths.
  - .1 Make allowance for expansion at joints.
- .3 Hem exposed edges on underside 19 mm.
  - .1 Mitre and seal corners with sealant.
- .4 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.
- .5 Apply isolation coating to metal surfaces to be embedded in concrete or mortar.

## 2.5 METAL FLASHINGS

- .1 Form flashings, copings, fascias, and trims to profiles indicated of prefinished 24 gauge prefinished steel sheet metal.

## 2.6 EAVE & FASCIA FLASHING

- .1 Form eave and fascia flashing, to profiles indicated of prefinished 22 gauge prefinished steel sheet metal.

## Part 3 Execution

### 3.1 MANUFACTURER'S INSTRUCTIONS

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

### 3.2 INSTALLATION

- .1 Install sheet metal work in accordance with RCABC and CRCA standards.
- .2 Use concealed fastenings except where approved before installation.
- .3 Provide underlay under sheet metal.
  - .1 Secure in place and lap joints 100 mm.
  - .2 Provide self-adhesive membrane to tie into adjacent assemblies.
- .4 Counterflash bituminous flashings at intersections of roof with vertical surfaces and curbs. Flash joints using S-lock seams forming tight fit over hook strips.
- .5 Install continuous starter strips where indicated or required to present a true, non-waving, leading edge. Anchor to back-up to provide rigid, secure installation.

- .6 Corner joints where adjacent lengths of metal flashing meet shall be made using folded joints. Apply a continuous bead of sealant as an additional protection
- .7 Lock end joints and caulk with sealant.
- .8 Make all roof and sill areas watertight. Flash openings and other items projecting through roofing. Bend up flashing as required, fold and clip neatly and secure in straight lines free from wrinkles and undulations.
- .9 Install base metal flashing on all vertical surfaces, walls, curbs etc where hot asphalt is used to adhere flashing membranes.
- .10 Ensure wide girth flashings are adequately sloped to the inside of roof areas and do not pond water. Back-sloped flashings will be rejected by the Consultant. Fastenings to be concealed and watertight. Carefully place, form and trim breaks. Bond and neutralize soldering.
- .11 Turn back edges of all exposed flashing to form 6 mm stiffeners.
- .12 Keep all metal flashings a minimum of 100 mm above all roof surfaces.
- .13 Install flashing in maximum 2 400 mm lengths, to profiles indicated.
- .14 Construct internal and external mitres with properly shaped capping pieces.
- .15 Form all flashing on a bending brake. Execute all hand trimming, shaping and soldering with appropriate tools. Install with hold down clips.
- .16 Allow for expansion and contraction to finished work without deformation.
- .17 Neutralize all acid flux before painting.
- .18 Slope all horizontal wall flashings 2% to exterior.

### 3.3

#### CLEANING

- .1 Proceed in accordance with Section 01 11 55 – General Instructions.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.
- .3 Leave work areas clean, free from grease, finger marks and stains.

END OF SECTION

**Part 1 General**

**1.1 SUMMARY**

- .1 This Section specifies caulking and sealants not specified in other Sections.
- .2 Refer to other Sections for other caulking and sealants.
- .3 Supply all labour, materials and equipment necessary to complete all caulking and sealing of exterior and interior joints where shown on the drawings and as specified herein.

**1.2 RELATED SECTIONS**

- .1 Section 07 01 20 – General Envelope Requirements.
- .2 Division 7.

**1.3 REFERENCES**

- .1 ASTM International
  - .1 ASTM C919-08, Standard Practice for Use of Sealants in Acoustical Applications.
- .2 Canadian General Standards Board (CGSB)
  - .1 CGSB 19-GP-5M-1984, Sealing Compound, One Component, Acrylic Base, Solvent Curing (Issue of 1976 reaffirmed, incorporating Amendment No. 1).
  - .2 CAN/CGSB-19.13-M87, Sealing Compound, One-component, Elastomeric, Chemical Curing.
  - .3 CGSB 19-GP-14M-1984, Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing (Reaffirmation of April 1976).
  - .4 CAN/CGSB-19.13-M87, Sealing Compound, One Component, Elastomeric, Chemical Curing.
  - .5 CAN/CGSB-19.17-M90, One-Component Acrylic Emulsion Base Sealing Compound.
  - .6 CAN/CGSB-19.24-M90, Multi-component, Chemical Curing Sealing Compound.
- .3 General Services Administration (GSA) - Federal Specifications (FS)
  - .1 FS-SS-S-200-E(2)1993, Sealants, Joint, Two-Component, Jet-Blast-Resistant, Cold Applied, for Portland Cement Concrete Pavement.
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).

**1.4 ACTION AND INFORMATIONAL SUBMITTALS**

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

- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for joint sealants and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Manufacturer's product to describe:
    - .1 Caulking compound.
    - .2 Primers.
    - .3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.
  - .3 Manufacturer's Instructions:
    - .1 Submit instructions to include installation instructions for each product used.

### 1.5 CLOSEOUT SUBMITTALS

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

### 1.6 SITE CONDITIONS

- .1 Ambient Conditions:
  - .1 Proceed with installation of joint sealants only when:
    - .1 Ambient and substrate temperature conditions are within limits permitted by joint sealant manufacturer or are above 4.4 degrees C.
    - .2 Joint substrates are dry.
    - .3 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.
- .2 Joint-Width Conditions:
  - .1 Proceed with installation of joint sealants only where joint widths are more than those allowed by joint sealant manufacturer for applications indicated.
- .3 Joint-Substrate Conditions:
  - .1 Proceed with installation of joint sealants only after contaminants capable of interfering with adhesion are removed from joint substrates.

### 1.7 QUALIFICATIONS OF APPLICATOR

- .1 Caulking installation to be performed by workmen thoroughly skilled and specially trained in the techniques of caulking and who are completely familiar with the published recommendations of the manufacturer of the caulking material to be used.

- .2 Indication of lack of skill on the part of caulking applicators will be sufficient grounds for the Consultant to reject installed caulking and to require its immediate removal and complete re-caulking at no extra cost to the contract price.

## 1.8 QUALITY ASSURANCE

- .1 Provide a written guarantee, signed and issued in the name of the Owner, stating that caulking work of this Section is guaranteed against leakage, cracking, crumbling, melting, shrinkage, running, loss of adhesion, staining adjacent surfaces, or other failure, for a period of three years from the date of Certificate of Substantial Performance.

## 1.9 ENVIRONMENTAL REQUIREMENTS

- .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 Health Canada.
- .2 Ventilate area of work as directed Consultant by use of approved portable supply and exhaust fans.

## 1.10 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.

## Part 2 Products

### 2.1 SEALANT MATERIALS

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

### 2.2 SEALANT MATERIALS

- .1 Type 1: Medium modulus, moisture curing, one-part silicone sealant. Meeting the specified requirements of specification CAN/CGSB-19.13-M87, Classification MCG-2-25-A-L.
  - .1 Locations: Use in metal-to-metal joints in sheet metal.
  - .2 Acceptable material, Dow 791 or 795; Spectrem 2 by Tremco Ltd.
- .2

- .3 Type 2: One-component, polyurethane sealant to CAN/CGSB-19.13-M87, Type 2, Shore A Hardness 20-35.
  - .1 Locations: Use at all locations, except where another type is specified.
  - .2 Acceptable Product: Dymonic 100 by Tremco Ltd., Sikaflex 1A, Vulkem 116.
- .4 Type 3: One component, paintable acrylic latex sealant. Meeting the specified requirements of specification CGSB-19-GP-17M.
  - .1 Locations: Interior non-moving joints that may be painted.
  - .2 Acceptable Product: Tremflex 834 by Tremco Ltd.
- .5 Type 4: Ultra low modulus, one component, moisture curing silicone room temperature vulcanized sealant.
  - .1 Acceptable Product: Spectrem 1 by Tremco Ltd.
- .6 Colours of sealant to be selected by the Consultant from the range of manufacturer's standard colours.
- .7 Joint Cleaner
  - .1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant in accordance with sealant manufacturer's written recommendations.
- .8 Preformed compressible and non-compressible back-up materials:
  - .1 Polyethylene, urethane, neoprene or vinyl foam:
    - .1 Extruded closed cell foam backer rod.
    - .2 Size: oversize 30 to 50 %.
    - .3 Vertical Surfaces: Open cell polyethylene foam.
    - .4 Horizontal Surfaces: Closed cell polyethylene foam.
- .9 Primer: in accordance with sealant manufacturer's written recommendations.
- .10 Bond breaker, where joint configuration does not allow for proper depth/width ratio place a pressure sensitive plastic tape at the back of the joint that will not bond to the sealant.
  - .1 Standard of Acceptance: 3M #226 or #481 or Valley Industries #40.

### Part 3 Execution

#### 3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for joint sealants installation in accordance with manufacturer's written instructions.

**3.2 FORMED OPENINGS**

- .1 Provide properly formed and prepared expansion joint openings constructed to the exact dimensions and elevations shown on manufacturer's standard system drawings or as shown on the contract drawings.

**3.3 SURFACE PREPARATION**

- .1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants. Maintain depth of sealant at middle of joint width as follows:

Joint Width	Sealant Depth	Joint Depth
6 mm	6 mm	10 mm
20 mm	10 mm	15 mm
32 mm	13 mm maximum	20 mm

Minimum adhesion surface to be 1.5 times depth.

- .2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair Work.
- .3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.
- .4 Ensure joint surfaces are dry and frost free.
- .5 Prepare surfaces in accordance with manufacturer's directions.

**3.4 PRIMING**

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

**3.5 BACKUP MATERIAL**

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

**3.6 MIXING**

- .1 Mix materials in strict accordance with sealant manufacturer's instructions.

**3.7 APPLICATION**

- .1 Sealant:

- .1 Apply sealant in accordance with manufacturer's written instructions.
  - .2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.
  - .3 Apply sealant in continuous beads.
  - .4 Apply sealant using gun with proper size nozzle.
  - .5 Use sufficient pressure to fill voids and joints solid.
  - .6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.
  - .7 Tool exposed surfaces before skinning begins to give slightly concave shape.
  - .8 Remove excess compound promptly as work progresses and upon completion.
- .2 Locations:
- .1 Caulk all joints where indicated on the drawings and at all locations where required to provide a complete weathertight building.
  - .2 Install sealants in all locations shown on drawings.
  - .3 Seal the junctions of differing exterior wall materials.
  - .4 Provide a minimum of two continuous beads of sealant under all prefinished metal wall flashings.
- .3 Curing:
- .1 Cure sealants in accordance with sealant manufacturer's instructions.
  - .2 Do not cover up sealants until proper curing has taken place.

### 3.8 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 11 55 – General Instructions
  - .1 Leave Work area clean at end of each day.
  - .2 Clean adjacent surfaces immediately.
  - .3 Remove excess and droppings, using recommended cleaners as work progresses.
  - .4 Remove masking tape after initial set of sealant.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 11 55 – General Instructions.

### 3.9 PROTECTION

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

**END OF SECTION**

**Part 1 General****1.1 RELATED REQUIREMENTS**

- .1 Section 09 91 00 - Painting

**1.2 REFERENCE STANDARDS**

- .1 ASTM International (ASTM)
  - .1 ASTM C1396/C1396M-09a, Standard Specification for Gypsum Wallboard.
  - .2 ASTM C475/C475M-02(2007), Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
  - .3 ASTM C840-08, Standard Specification for Application and Finishing of Gypsum Board.
  - .4 ASTM C1002-07, Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
  - .5 ASTM C1047-10, Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.

**1.3 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.

**Part 2 Products****2.1 MATERIALS**

- .1 Gypsum Board:
  - .1 Standard board: to ASTM C1396/C1396M Type X, 16mm thick, 1200 mm wide x maximum practical length, ends square cut, edges tapered.
  - .2 Steel screws: to ASTM C1002.
  - .3 Casing beads, corner beads, control joints and edge trim: to ASTM C1047, Zinc, 0.5 mm base thickness, perforated flanges, one-piece length per location.

**Part 3 Execution****3.1 EXAMINATION**

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's written instructions prior to partition installation.

**3.2 ERECTION OF GYPSUM BOARD AND ACCESSORIES**

- .1 Do application and finishing of gypsum board in accordance with ASTM C840 except where specified otherwise.
- .2 Install wall furring for gypsum board wall finishes in accordance with ASTM C840, except where specified otherwise.
- .3 Install gypsum boards in direction that will minimize number of end-butt joints. Stagger end joints 250 mm minimum.

**3.3 APPLICATION**

- .1 Apply gypsum board after bucks, anchors, blocking, sound attenuation, electrical and mechanical work are approved.
- .2 Apply single layer gypsum board to metal furring or framing using screw fasteners. Maximum spacing of screws 300 mm on centre.

**3.4 INSTALLATION**

- .1 Erect accessories straight, plumb or level, rigid and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners accurately, free from rough edges. Secure using contact adhesive for full length.
- .2 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated. Seal joints with sealant.
- .3 Install insulating strips continuously at edges of gypsum board and casing beads abutting metal window and exterior door frames, to provide thermal break.
- .4 Finish face panel joints and internal angles with joint system consisting of joint compound, joint tape and taping compound installed according to manufacturer's directions and feathered out onto panel faces.
- .5 Finish corner beads, control joints and trim as required with two coats of joint compound and one coat of taping compound, feathered out onto panel faces.
- .6 Fill screw head depressions with joint and taping compounds to bring flush with adjacent surface of gypsum board so as to be invisible after surface finish is completed.
- .7 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for surface finish.

**3.5 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 11 55 – General Instructions.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 11 55 – General Instructions.

**3.6 PROTECTION**

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

**END OF SECTION**

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**Part 1 General****1.1 RELATED REQUIREMENTS**

- .1 Section 09 21 16 – Gypsum Board Assemblies: Gypsum board to be painted.

**1.2 REFERENCE STANDARDS**

- .1 Environmental Protection Agency (EPA)
  - .1 Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, EPA Method 24 - Surface Coatings.
  - .2 SW-846, Test Method for Evaluating Solid Waste, Physical/Chemical Methods.
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .3 Master Painters Institute (MPI)
  - .1 Architectural Painting Specification Manual - current edition.
- .4 National Research Council Canada (NRC)
  - .1 National Fire Code of Canada 2015 (NFC).
- .5 Society for Protective Coatings (SSPC)
  - .1 Systems and Specifications, SSPC Painting Manual 2011.

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide in accordance with Section 01 33 00- Submittal Procedures.
- .2 Product Data:
  - .1 Provide manufacturer's instructions, printed product literature and data sheets for paint and paint products and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Confirm products to be used are in MPI's approved product list.
  - .3 Upon completion, provide records of products used. List products in relation to finish system and include the following:
    - .1 Product name, type and use.
    - .2 Manufacturer's product number.
    - .3 Colour number[s] .
    - .4 MPI Environmentally Friendly classification system rating.
    - .5 Manufacturer's Material Safety Data Sheets (MSDS).
    - .6 MPI #
- .3 Certificates: Provide certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties. MPI Gateway #.

- .4 Manufacturer's Instructions:
  - .1 Provide manufacturer's installation instructions.

#### 1.4 CLOSEOUT SUBMITTALS

- .1 Provide in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: Provide operation and maintenance data for painting materials for incorporation into manual.
- .3 Include:
  - .1 Product name, type and use.
  - .2 Manufacturer's product number.
  - .3 Colour number[s].
  - .4 MPI Environmentally Friendly classification system rating.

#### 1.5 MAINTENANCE MATERIAL SUBMITTALS

- .1 Extra Stock Materials:
  - .1 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
  - .2 Submit 1 one four litre can of each type and colour of finish coating. Identify colour and paint type in relation to established colour schedule and finish system.

#### 1.6 QUALITY ASSURANCE

- .1 Qualifications:
  - .1 Contractor: to have a minimum of 5 years proven satisfactory experience. When requested, provide list of last 3 comparable jobs including, job name and location, specifying authority, and project manager.
  - .2 Qualified journeypersons as defined by local jurisdiction to be engaged in painting work
  - .3 Apprentices: may be employed provided they work under direct supervision of qualified journeyperson in accordance with trade regulations.
  - .4 Conform to latest MPI requirements for exterior painting work including preparation and priming.
  - .5 Materials: in accordance with MPI Painting Specification Manual "Approved Product" listing and from a single manufacturer for each system used.
  - .6 Retain purchase orders, invoices and documents to prove conformance with noted MPI requirements when requested by Consultant.
  - .7 Standard of Acceptance:
    - .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.

- .2 Soffits: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.
- .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

### 1.7 DELIVERY, STORAGE AND HANDLING

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

### 1.8 SITE CONDITIONS

- .1 Ambient Conditions:
  - .1 Heating, Ventilation and Lighting:
    - .1 Ventilate enclosed spaces in accordance with Section 01 11 55 – General Instructions.
    - .2 Do not perform painting work unless adequate and continuous ventilation and sufficient heating facilities are in place to maintain ambient air and substrate temperatures above 10 degrees C for 24 hours before, during and after paint application until paint has cured sufficiently.  
Where required, provide continuous ventilation for seven days after completion of application of paint.
    - .4 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.
    - .5 Perform no painting work unless a minimum lighting level of 323 Lux is provided on surfaces to be painted. Adequate lighting facilities to be provided by General Contractor.
  - .2 Temperature, Humidity and Substrate Moisture Content Levels:
    - .1 Unless specifically pre-approved by specifying body, Paint Inspection Agency and, applied product manufacturer, perform no painting work when:
      - .1 Ambient air and substrate temperatures are below 10 degrees C.
      - .2 Substrate temperature is over 32 degrees C unless paint is specifically formulated for application at high temperatures.
      - .3 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's prescribed limits.
      - .4 Relative humidity is above 85 % or when dew point is less than 3 degrees C variance between air/surface temperature.
      - .5 Rain or snow are forecast to occur before paint has thoroughly cured or when it is foggy, misty, raining or snowing at site.

- .2 Perform no painting work when maximum moisture content of substrate exceeds:
  - .1 12 % for plaster and gypsum board.
- .3 Conduct moisture tests using a properly calibrated electronic Moisture Meter, except test concrete floors for moisture using a simple "cover patch test".
- .4 Test concrete, masonry and plaster surfaces for alkalinity as required.
- .3 Application Requirements:
  - .1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.
  - .2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits noted herein.
  - .3 Apply paint when previous coat of paint is dry or adequately cured.
  - .4 Additional interior application requirements:
    - .1 Apply paint finishes when temperature at location of installation can be satisfactorily maintained within manufacturer's recommendations.

**Part 2****Products****2.1****PERFORMANCE REQUIREMENTS**

- .1 Environmental Performance Requirements:
  - .1 Provide paint products meeting MPI "Environmentally Friendly" E2 ratings based on VOC (EPA Method 24) content levels.

**2.2****MATERIALS**

- .1 Only paint materials listed in latest edition of MPI Approved Products List (APL) are acceptable for use on this project.
- .2 Paint materials for paint systems: to be products of single manufacturer.
- .3 Conform to latest MPI requirements for painting work including preparation and priming.
- .4 Only qualified products with E2 "Environmentally Friendly" rating[s] are acceptable for use on this project.
- .5 Use only MPI listed materials.
- .6 Water-borne paints and stains, recycled water-borne surface coatings and water borne varnishes must meet a minimum "Environmentally Friendly" E2 rating.

**2.3****COLOURS**

- .1 Match existing colours.

- .2 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats if requested by Consultant.
- .3 For deep and ultra deep colours 4 coats may be required.

**2.4 MIXING AND TINTING**

- .1 Perform colour tinting operations prior to delivery of paint to site. On-site tinting of painting materials is allowed only with Consultant's written permission.
- .2 Mix paste, powder or catalyzed paint mixes in accordance with manufacturer's written instructions.
- .3 Add thinner to paint manufacturer's recommendations. Do not use kerosene or organic solvents to thin water-based paints.
- .4 Thin paint for spraying according in accordance with paint manufacturer's instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to Consultant.
- .5 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity.

**2.5 GLOSS/SHEEN RATINGS**

- .1 Paint gloss: defined as sheen rating of applied paint, in accordance with following values:

Gloss Level Category/	Units @ 60 Degrees/	Units @ 85 Degrees/
G1 - matte finish	0 to 5	max. 10
G2 - velvet finish	0 to 10	10 to 35
G3 - eggshell finish	10 to 25	10 to 35
G4 - satin finish	20 to 35	min. 35
G5 - semi-gloss finish	35 to 70	
G6 - gloss finish	70 to 85	
G7 - high gloss finish	85	

- .2 Gloss level ratings of painted surfaces as specified.

**2.6 INTERIOR PAINTING SYSTEMS**

- .1 Plaster and gypsum board: gypsum wallboard, drywall, "sheet rock type material", and textured finishes:
  - .1 INT 9.2M - Institutional low odour VOC (over primer sealer, low odour low VOC) finish. G3 gloss level, except as specified below:
    - .1 G1: Gypsum board ceilings.

**Part 3 Execution****3.1 MANUFACTURER'S INSTRUCTIONS**

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

**3.2 GENERAL**

- .1 Perform preparation and operations for interior painting in accordance with MPI Architectural Painting Specifications Manual except where specified otherwise.
- .2 Apply paint materials in accordance with paint manufacturer's written application instructions.

**3.3 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable to be painted in accordance with manufacturer's written instructions.
- .2 Conduct moisture testing of surfaces to be painted using properly calibrated electronic moisture meter, except test concrete floors for moisture using simple "cover patch test". Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.

**3.4 PREPARATION**

- .1 Perform preparation and operations for exterior painting in accordance with MPI Maintenance Repainting Manual except where specified otherwise.
- .2 Apply paint materials in accordance with paint manufacturer's written application instructions.
- .3 Clean and prepare exterior surfaces to be repainted in accordance with MPI Architectural Painting Specification Manual requirements. Refer to the MPI Manual in regard to specific requirements and as follows:
  - .1 Remove dust, dirt, and surface debris by vacuuming, wiping with dry, clean cloths or compressed air.
  - .2 Wash surfaces with a biodegradable detergent and bleach where applicable and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.
  - .3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
  - .4 Allow surfaces to drain completely and allow to dry thoroughly. Allow sufficient drying time and test surfaces using electronic moisture meter before commencing work.
  - .5 Use water-based cleaners in place of organic solvents where surfaces will be repainted using water-based paints.

- .6 Use trigger operated spray nozzles for water hoses.
- .7 Many water-based paints cannot be removed with water once dried. Minimize use of mineral spirits or such organic solvents to clean up water-based paints.
- .4 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before priming and between applications of remaining coats. Touch-up, spot prime, and apply primer, paint, or pre-treatment as soon as possible after cleaning and before deterioration occurs.
- .5 Where possible, prime non-exposed surfaces of new wood surfaces before installation. Use same primers as specified for exposed surfaces.
  - .1 Apply sealer to MPI #36 over knots, pitch, sap and resinous areas.
  - .2 Apply wood filler to nail holes and cracks.
  - .3 Tint filler to match stains for stained woodwork.
- .6 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to 1000 mm.
- .7 Carried out during shop priming: clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with MPI requirements. Remove traces of blast products from surfaces, pockets and corners to be painted by blowing with clean dry compressed air.
- .8 Touch up of shop primers with primer as specified.
- .9 Do not apply paint until prepared surfaces have been accepted by Consultant.

### 3.5

#### APPLICATION

- .1 Method of application to be as approved Consultant. Conform to manufacturer's application instructions unless specified otherwise.
- .2 Brush and Roller Application:
  - .1 Apply paint in a uniform layer using brush and/or roller of types suitable for application.
  - .2 Work paint into cracks, crevices and corners.
  - .3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
  - .4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces to be free of roller tracking and heavy stipple.
  - .5 Remove runs, sags and brush marks from finished work and repaint.
- .3 Spray Application:
  - .1 Provide and maintain equipment that is suitable for intended purpose, capable of properly atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.

- .2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
  - .3 Apply paint in a uniform layer, with overlapping at edges of spray pattern.
  - .4 Brush out immediately runs and sags.
  - .5 Use brushes to work paint into cracks, crevices and places which are not adequately painted by spray.
  - .6 Wood, stucco, concrete, cement masonry units CMU's and brick; if sprayed, must be back rolled.
- .4 Use dipping, sheepskins or daubers when no other method is practical in places of difficult access and when specifically authorized by Consultant.
  - .5 Apply coats of paint as continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
  - .6 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.
  - .7 Sand and dust between coats to remove visible defects.
  - .8 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as tops of interior cupboards and cabinets and projecting ledges.
  - .9 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.
  - .10 Wood, drywall, plaster, stucco, concrete, concrete masonry units and brick; if sprayed, must be back rolled.

### 3.6 MECHANICAL/ELECTRICAL EQUIPMENT

- .1 Unless otherwise specified, paint exposed conduits, piping, hangers, duct work and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as noted otherwise.
- .2 Do not paint over nameplates.
- .3 Keep sprinkler heads free of paint.
- .2 Paint new fire protection piping to match existing.

### 3.7 FIELD QUALITY CONTROL

- .1 Standard of Acceptance:
  - .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
  - .2 Ceilings: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.
  - .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

- .2 Advise Consultant when surfaces and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.
- .3 Retain purchase orders, invoices and other documents to prove conformance with noted MPI requirements when requested by Consultant.

**3.8 CLEANING**

- .1 Progress and Final Cleaning: clean in accordance with Section 01 74 00 – Cleaning:

**END OF SECTION**

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