PROJECT MANUAL

DIVISION 1 TO DIVISION 9

KNPHQ BUILDING SIDING AND ROOFING REPLACEMENT

Haines Junction, YT
2018

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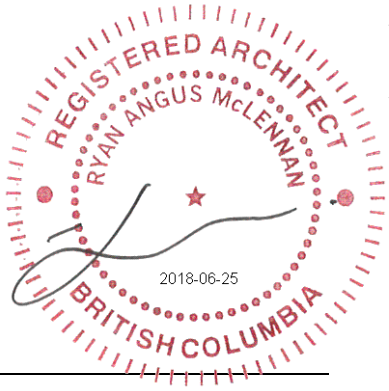
KZA Project No. 1741

Parks Canada Parcs Canada

APPENDICES

LIST OF DRAWINGS

END OF SECTION



Part 1 General

1.1 SECTION INCLUDES:

.1 Information regarding minimum expectations and requirements of the envelope commissioning process.

1.2 RELATED SECTIONS

.1 Division 7.

1.3 REFERENCES

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

.1 ASTM E779-03, Standard Practice for Determining Air Leakage Rate By Fan Pressurization.

.2 ASTM E1186-03, Standard Practice for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems.

.3 ASTM E1827-11, Standard Test Methods for Determining Airtightness of Buildings Using an Orifice Blower Door.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB 149.10-M86, Determination of the Airtightness of Building Envelopes by the Fan Depressurization Method.

1.4 DEFINITIONS

.1 As Operated: the measurement of total air leakage of a building under normal operating conditions. Energuide requires that intentional openings, such as dryer vents, combustion air inlets and fireplace chimneys to be left as-is and included in the results.

.2 Building Science Principles: best building envelope practices and recommended construction procedures, methods and materials that enhance air tightness, moisture resistance and water vapour control of building envelopes as researched and tested by National Research Council of Canada; Canada Mortgage and Housing Corporation; or other recognized building envelope research organizations.

.3 Blower Door: A machine used to measure the airtightness of a building.

.4 Blower Door Testing: analysis of the building envelope by conducting an air depressurization test to provide specific information concerning the airtightness of the building. Equipment operated by qualified energy auditor technician having specific knowledge of building science principles as they relate to building enclosures and materials, and as follows:

.1 Quantitative Inspection: inspection procedure using measurements of airtightness, assigning specific numeric values to observed deficient patterns, and presenting that information in Quantitative Blower Door Testing Report.

.2 Identify presence of leaks using a smoke pencil. Makes note and rates their importance in the report.

.5 Blower Door Testing Report: organized document stating inspection purpose, climatic data during inspection, general findings not limited to appropriately analyzed testing data with corresponding visual photographs to express observed deficient conditions, statements interpreting observed deficient conditions.

.1 Quantitative Blower Door Testing Report: developed by means of quantitative blower door testing where measurement of airtightness is used to determine relative fault severity. Recommendations identify corrective measures required to fix deficient conditions.

.6 Total Air Leakage (TAL): TAL is the air leakage rate through the building envelope during the air tightness test done using the Fan Depressurization Method and measured in L/s.

.7 Normalized Leakage Rate (NLR_{75}): Leakage rate normalized to envelope area at an indoor to outdoor pressure differential of 75 Pa. It is calculated by dividing the TAL by the total building envelope area. It has units of L/s-m

.8 Enclosure Assembly: The series of assembles including, but not limited to, exterior walls, demising walls, fire separations, ceiling assemblies, floor assemblies, windows, and doors.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Provide electronic copy of Blower Door Testing Report Consultant.

.3 Submit Blower Door Testing Report containing specific test results listed in this section, organized in accordance with CAN/CGSB 149.10-M86 and as follows:

.1 Scoping statement and problem identification.

.2 Names and qualifications of personnel performing inspections, interpreting data and preparing Blower Door Testing Report.

.3 Ambient conditions under which inspections were performed including, but not limited to, as follows:

.1 Time of day that scans were performed.

.2 Wind conditions during inspection.

.3 Pressure differential readings for duration of inspection and prior to inspection.

.4 Temperature ranges at which blower door testing data was collected.

.4 Types of equipment used and methods of confirmation including, but not limited to, as follows:

.1 Blower door testing equipment including frame, gauges, fans, cloth door, and air current testers.

.2 Blower door testing software used.

.3 Values and equipment used to calibrate airtightness readings.

.5 Diagnoses and identification including photographs and commentary indicating severity and types of air leakage detected:

.1 Record anomalies related to air leakage, onto analogue and/or digital storage mediums or files.

.2 Convert relevant information to photo quality images for inclusion in written Blower Door Testing Report.

.6 Interpretation of observed conditions and deficiencies including probable causes of each anomaly detected.

.7 Recommendations for solutions and related additional inspections that may be required to verify that repairs have been completed.

.8 Attachments and appendices including, but not limited to, drawings, visual images, thermographic images, and calculations used to determine air leakage.

.4 Submit calibration report dated within one year prior to inspection demonstrating that blower door testing equipment is accurately calibrated and measuring pressure differentials in accordance with equipment manufacturer's specifications.

.5 Submit information obtained during testing and for preparing Blower Door Testing Report for use of Consultant; submit original data used to prepare Blower Door Testing Report as separate package.

1.6 OBJECTIVES

.1 Construct air barrier such that overall NLR_{75} is less than 1.0 l/s-m^2 when the building is tested as per standard CAN/CGSB-149.10-M OR ASTM E- 779-03.

.2 Demonstrate and document that building envelope meets the above requirement.

1.7 DESCIPTION OF WORK

.1 Construct all envelope assembly details as indicated.

.1 Ensure the air barrier materials in each suite enclosure assembly are continuous.

.2 Seal all penetrations through air barrier material(s) to limit air leakage through the assembly. Penetrations include, but are not limited to, communications, plumbing, electrical and HVAC.

.3 Connect the air barrier material(s) in all intersecting envelope component assemblies to limit air leakage.

.2 Carry out baseline, progress, and final air tightness testing.

1.8 QUALITY ASSURANCE

.1 Technician Qualifications: provide personnel having minimum 3 years of related experience and having following minimum levels of training:

.2 Testing Agency Qualification: at least five years of experience.

.3 Test Witness: The Contractor shall provide two weeks of notice to Departmental Representative to witness the mock up suite and entire building test.

Part 2 Products

2.1 EQUIPMENT

.1 Blower door testing equipment:

- .1 Fan:
  - .1 Variable speed control (solid-state control)
  - .2 Must operate on 110 to 125 vac/60 Hz supply
  - .3 Minimum flow at maximum fan speed to be at least 2501 L/s (5300 CFM) at 50 Pa pressure difference
  - .4 Must be able to both pressurize and depressurize the size of building being tested.
  - .5 Calibration curves and test verification certificate must be included with each fan
- .2 Blower Door Frame:
  - .1 Width: adjustable from 81.3 cm to 99 cm to fit a wide variety of doors or a suitably close range.
  - .2 Height: adjustable from 129.5 cm to 221 cm or a suitably close range
  - .3 Door frame edge seal: flexible gasket or inflatable edge seal
  - .4 Door frame material: wood, aluminum or metal
  - .5 Door frame cover: nylon bag or moulded plastic or fibreglass
- .3 Pressure and fan flow gauges:
  - .1 Analogue gauges (Dwyer Magnahelic) for measuring the building pressure and flow (one for low flow and second for high flow) or digital pressure gauge for simultaneous or switchable display of pressure and airflow readings
  - .2 Pressure gauge unit: Pa
  - .3 Pressure range: 0 to 60 Pa (suggested for building pressure)
  - .4 Measurement resolution: 1 Pa for analogue gauges; 0.1 Pa for digital micro-mamometers
  - .5 Wind damping should be built into pressure gauge or available as add-on
  - .6 Calibration of pressure measurement as per CGSB Standard No. 149.10-M86
  - .7 Flow measurement unit: L/s.
  - .8 Flow measurement resolution: 1/100 times the flow reading
  - .9 Flow range: capable of measuring a minimum airflow of 30 L/s within its operating range
  - .10 Calibration of flow measurement as per CGSB Standard No. 149.10-M86
- .4 Software and Calculation Procedures

.1 Calculation software based on current calibration data for blower door selected to determine airtightness results. Data analysis procedure and reporting must meet requirements set in CGSB Standard No. 149.10-M86

.2 Calibration characteristics and technical manuals

.2 Related Equipment: provide related equipment for performing blower door testing including, but not limited to, as follows:

.1 Ambient Air Thermometer.

.2 Anemometer.

.3 Air Flow Meter.

.4 Smoke Candles or generators.

.5 Visible Still Image (35 mm) or Digital Cameras having minimum 4 mega pixel image resolution.

.6 Other equipment or supplies necessary to complete building envelope inspection in accordance with CAN/CGSB 149-GP-2M.

Part 3 Execution

3.1 AIRTIGHTNESS TESTING

.1 The Testing Agency is responsible for carrying out blower door tests for the whole building.

.2 Blower door tests must be carried out in accordance with Standard CAN/CSGB- 149.10-M86, Determination of the Airtightness of Building Envelopes by the Fan Depressurization Method or Standard ASTM E 779-03, Standard Test Method for Determining Air Leakage Rate by Fan Pressurization.

.3 Upon completion, provide the Departmental Representative Contractor with records of all blower tests carried out on the whole building and conducted in accordance with the testing and sampling methodology noted above.

.4 Upon completion of the Final Airtightness test the Testing Agency will issue a report summarizing the air tightness results and related findings. If required, the report will include corrective or remedial actions. The Contractor is responsible for carrying out any corrective or remedial work listed in the report. Upon completion of the said work, the Contractor must notify the Testing Agency so that the building can be re-tested.

3.2 CLEANING

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

.2 Remove the blower door and return the building to pre-test conditions after the completion of each test. Seal and restore surfaces where openings were required for test equipment and return HVAC systems to normal operational modes.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 This Section includes the following:

- .1 Demolition and removal of selected portions of exterior building components.
- .2 Demolition of mechanical and electrical equipment.
- .3 Demolition and removal of selected site elements.
- .4 Repair procedures for selective demolition operations.

.2 This section does not include the following:

- .1 Removal of hazardous materials or asbestos abatement.
- .2 Demolition of interior building components and finishes.

1.2 RELATED REQUIREMENTS

.1 Section 02 81 01- Hazardous Materials: Conditions applying to the abatement or removal of hazardous materials associated with selective building demolition

1.3 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 2015 (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

1.4 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.

1.5 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 31 19– Project Meetings to confirm extent of salvaged and demolished materials.

1.6 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 Use of elevator and stairs.

.6 Locations of temporary partitions and means of egress, including for others affected by selective demolition operations.

.7 Coordination with Representative's continuing occupancy of portions of existing building.

1.7 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.

1.8 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 Representative 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 Departmental Representative'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

.6 Bats:

.1 The existing building siding has become a habitat for bats between April and October, which is part of the impetus of this project. Demolition activities should not create opportunities for new bat habitats. Sequence demolition work in such a way to not create openings greater than 6mm, and close off all openings at the end of each day.

.2 If a current bat habitat is identified during demolition, stop work in that area and notify Departmental Representative.

.3 All guano, or dead bats found during demolition should be removed by workers using appropriate protective gear, including: protective suits, NIOSH filter respirator, goggles, and gloves to Workers Compensation Safety Regulations.

.1 Wet all bat guano prior to removal with a 10% bleach solution.

.2 Place all bat waste into doubled-up contractor grade 3 mil garbage bags placed within 200L drum or other secure container.

.4 Clean material intended to remain and are contaminated by bat guano or urine under the allowance carried in Section 01 21 00 – Allowances, as follows:

.1 Contractor to follow all Workers Compensation safety regulations for cleaning.

.2 Workers are to wear a protection coveralls, HEPA filter respirator, goggles, and gloves when working with contaminated material.

.3 Apply 10% bleach solution to any guano or urine stained materials, and scrub lightly to remove stain.

.4 Allow affected materials to dry completely before installing any new materials.

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

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 02 41 19 – Selective Demolition

.2 Section 02 82 00 – Asbestos Abatement

1.2 REFERENCE STANDARDS

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

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

.2 Department of Justice Canada (Jus)

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

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

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

.1 Material Safety Data Sheets (MSDS).

.4 National Research Council Canada (NRC)

.1 National Fire Code of Canada 2015 (NFC).

1.3 DEFINITIONS

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

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

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

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

.2 Submit two copies of WHMIS MSDS in accordance with Section 01 35 29 - Health and Safety Requirements to Departmental Representative for each hazardous material required prior to bringing hazardous material on site.

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

.4 Hazardous waste classification: identify waste codes applicable to each hazardous waste material based on applicable federal and provincial acts, regulations, and guidelines. Waste profiles, analyses, and classification submitted to contract offices for review and approval.

1.5 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.

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

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

.4 Storage and Handling Requirements:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

.4 Segregate incompatible materials and wastes.

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

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

.7 Maintain clear egress from storage area.

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

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

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

.11 When hazardous waste is generated on site:

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

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

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

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

.5 Label container[s] with legible, visible safety marks as prescribed by federal and provincial regulations.

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

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

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

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

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

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

Part 2 Products

2.1 MATERIALS

.1 Description:

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

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

.3 Spill Response Materials: provide spill response materials which can be used for absorbing/shoveling and containing hazardous materials.

.4 Provide personal protective equipment.

Part 3 Execution

3.1 CLEANING

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

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

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

.3 Waste Management: separate waste materials in accordance with Section 01 74 19- Waste Management and Disposal.

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

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

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

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

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

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

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

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

.1 Hazardous wastes recycled in manner constituting disposal.

.2 Hazardous waste burned for energy recovery.

.3 Lead-acid battery recycling.

.4 Hazardous wastes with economically recoverable precious metals.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Comply with requirements of this Section when performing following work:

.1 Removing non-friable asbestos-containing materials, other than ceiling tiles, if the material is installed or removed without being broken, cut, drilled, abraded, ground, sanded or vibrated at locations indicated on drawings.

.2 Break, cut, grind, sand, drill, scrape, vibrate or abrade non-friable asbestos containing materials using non-powered hand-held tools, and the material is wetted to control the spread of dust or fibres.

1.2 RELATED REQUIREMENTS

.1 Section 02 41 19 – Selective Demolition

.2 Section 02 81 01 – Hazardous Materials

1.3 REFERENCE STANDARDS

.1 Department of Justice Canada (Jus)

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

.2 Transport Canada (TC)

.1 Transportation of Dangerous Goods Act, 1992 (TDGA).

1.4 DEFINITIONS

.1 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.

.2 Amended Water: water with nonionic surfactant wetting agent added to reduce water tension to allow thorough wetting of fibres.

.3 Asbestos-Containing Materials (ACMs): materials that contain 0.5 per cent or more asbestos by dry weight and are identified under Existing Conditions including fallen materials and settled dust.

.4 Asbestos Work Area: area where work takes place which will, or may, disturb ACMs.

.5 Authorized Visitors: Engineer[s], Consultant[s] or designated representative[s] , and representative[s] of regulatory agencies.

.6 Competent worker: in relation to specific work, means a worker who:

.1 Is qualified because of knowledge, training and experience to perform the work.

.2 Is familiar with the [provincial] [federal] laws and with the provisions of the regulations that apply to the work.

.3 Has knowledge of all potential or actual danger to health or safety in the work.

.7 Friable material: means material that:

.1 When dry, can be crumbled, pulverized or powdered by hand pressure, or

.2 is crumbled, pulverized or powdered.

.8 Non-Friable Material: material that when dry cannot be crumbled, pulverized or powdered by hand pressure.

.9 Occupied Area: any area of the building or work site that is outside Asbestos Work Area.

.10 Polyethylene: polyethylene sheeting or rip-proof polyethylene sheeting with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide protection and isolation.

.11 Sprayer: garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must have appropriate capacity for work.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Submit proof satisfactory to Departmental Representative that suitable arrangements have been made to dispose of asbestos-containing waste in accordance with requirements of authority having jurisdiction.

.3 Submit Provincial/Territorial and/or local requirements for Notice of Project Form.

.4 Submit proof of Contractor's Asbestos Liability Insurance.

.5 Submit to Departmental Representative necessary permits for transportation and disposal of asbestos-containing waste and proof that asbestos-containing waste has been received and properly disposed.

.6 Submit proof that all asbestos workers and/or supervisor have received appropriate training and education by a competent person in the hazards of asbestos exposure, good personal hygiene and work practices while working in Asbestos Work Areas, and the use, cleaning and disposal of respirators and protective clothing.

.7 Submit proof satisfactory to Departmental Representative that employees have respirator fitting and testing. Workers must be fit tested (irritant smoke test) with respirator that is personally issued.

1.6 QUALITY ASSURANCE

.1 Regulatory Requirements: comply with Federal, Provincial/Territorial, and local requirements pertaining to asbestos, provided that in case of conflict among these requirements or with these specifications, more stringent requirement applies. Comply with regulations in effect at time Work is performed.

.2 Health and Safety:

.1 Perform construction occupational health and safety in accordance with Section 01 35 29 - Health and Safety Requirements.

.2 Safety Requirements: worker protection.

.1 Protective equipment and clothing to be worn by workers while in Asbestos Work Area include:

.1 Air purifying half-mask respirator with N-100, R-100 or P-100 particulate filter, personally issued to worker and marked as to efficiency and purpose, suitable for protection against asbestos and acceptable to Provincial Authority having jurisdiction. The respirator to be fitted so that there is an effective seal between the respirator and the worker's face, unless the respirator is equipped with a hood or helmet. The respirator to be cleaned, disinfected and inspected after use on each shift, or more often if necessary, when issued for the exclusive use of one worker, or after each use when used by more than one worker. The respirator to have damaged or deteriorated parts replaced prior to being used by a worker; and, when not in use, to be stored in a convenient, clean and sanitary location. The employer to establish written procedures regarding the selection, use and care of respirators, and a copy of the procedures to be provided to and reviewed with each worker who is required to wear a respirator. A worker not to be assigned to an operation requiring the use of a respirator unless he or she is physically able to perform the operation while using the respirator.

.2 Disposable-type protective clothing that does not readily retain or permit penetration of asbestos fibres. Protective clothing to be provided by the employer and worn by every worker who enters the work area, and the protective clothing shall consist of a head covering and full body covering that fits snugly at the ankles, wrists and neck, in order to prevent asbestos fibres from reaching the garments and skin under the protective clothing to include suitable footwear, and to be repaired or replaced if torn.

.2 Eating, drinking, chewing, and smoking are not permitted in Asbestos Work Area.

.3 Before leaving Asbestos Work Area, the worker can decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing, or, if the protective clothing will not be reused, place it in a container for dust and waste. The container to be dust tight, suitable for asbestos waste, impervious to asbestos, identified as asbestos waste, cleaned with a damp cloth or a vacuum equipped with a HEPA filter immediately before removal from the work area, and removed from the work area frequently and at regular intervals.

.4 Facilities for washing hands and face shall be provided within or close to the Asbestos Work Area.

.5 Ensure workers wash hands and face when leaving Asbestos Work Area. Facilities for washing are located [as indicated on drawings] .

.6 Ensure that no person required to enter an Asbestos Work Area has facial hair that affects seal between respirator and face.

1.7 WASTE MANAGEMENT AND DISPOSAL

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

.2 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.

.3 Disposal of asbestos waste generated by removal activities must comply with Federal, Provincial, Territorial and Municipal regulations. Dispose of asbestos waste in sealed double thickness 6 mils bags or leak proof drums. Label containers with appropriate warning labels.

.4 Provide manifests describing and listing waste created. Transport containers by approved means to licensed landfill for burial.

1.8 EXISTING CONDITIONS

.1 Reports and information pertaining to ACMs to be handled, removed, or otherwise disturbed and disposed of during this project are bound into this specification in the Appendix.

.2 Notify Departmental Representative of friable material discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material pending instructions from Departmental Representative.

1.9 PERSONNEL TRAINING

.1 Before beginning Work, provide Departmental Representative satisfactory proof that every worker has had instruction and training in hazards of asbestos exposure, in personal hygiene and work practices, and in use, cleaning, and disposal of respirators and protective clothing.

.2 Instruction and training related to respirators includes, following minimum requirements:

.1 Fitting of equipment.

.2 Inspection and maintenance of equipment.

.3 Disinfecting of equipment.

.4 Limitations of equipment.

.3 Instruction and training must be provided by a competent, qualified person.

Part 2 Products

2.1 MATERIALS

.1 Drop Sheets:

.1 Polyethylene: 0.15 mm thick.

.2 FR polyethylene: 0.15 mm thick woven fibre reinforced fabric bonded both sides with polyethylene.

.2 Wetting Agent: 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with water in a concentration to provide thorough wetting of asbestos-containing material.

.3 Waste Containers: contain waste in two separate containers.

.1 Inner container: 0.15 mm thick sealable polyethylene waste bag.

.2 Outer container: sealable metal or fibre type where there are sharp objects included in waste material; otherwise outer container may be sealable metal or fibre type or second 0.15 mm thick sealable polyethylene bag.

.3 Labelling requirements: affix pre-printed cautionary asbestos warning in both official languages that is visible when ready for removal to disposal site.

.4 Slow - drying sealer: non-staining, clear, water - dispersible type that remains tacky on surface for at least 8 hours and designed for purpose of trapping residual asbestos fibres.

.5 Tape: fibreglass - reinforced duct tape suitable for sealing polyethylene under both dry conditions and wet conditions using amended water.

Part 3 Execution

3.1 PROCEDURES

.1 Do construction occupational health and safety in accordance with Section 01 35 29 - Health and Safety Requirements.

.2 Before beginning Work, isolate Asbestos Work Area using, minimum, preprinted cautionary asbestos warning signs in both official languages that are visible at access routes to Asbestos Work Area.

.1 Remove visible dust from surfaces in the work area where dust is likely to be disturbed during course of work.

.2 Use HEPA vacuum or damp cloths where damp cleaning does not create a hazard and is otherwise appropriate.

.3 Do not use compressed air to clean up or remove dust from any surface.

.3 Prevent spread of dust from Asbestos Work Area using measures appropriate to work to be done.

.1 Use FR polyethylene drop sheets over flooring such as carpeting that absorbs dust and over flooring in Asbestos Work Area where dust and contamination cannot otherwise be safely contained. Drop sheets are not to be reused.

.4 Wet materials containing asbestos to be cut, ground, abraded, scraped, drilled, or otherwise disturbed unless wetting creates hazard or causes damage.

.1 Use garden reservoir type low - velocity fine - mist sprayer.

.2 Perform Work to reduce dust creation to lowest levels practicable.

.3 Work will be subject to visual inspection and air monitoring.

.4 Contamination of surrounding areas indicated by visual inspection or air monitoring will require complete enclosure and clean-up of affected areas.

.5 Frequently and at regular intervals during Work and immediately on completion of work:

.1 Dust and waste to be cleaned up and removed using a vacuum equipped with a HEPA filter, or by damp mopping or wet sweeping, and placed in a waste container, and

.2 Drop sheets to be wetted and placed in a waste container as soon as practicable.

.6 Cleanup:

.1 Place dust and asbestos containing waste in sealed dust-tight waste bags. Treat drop sheets and disposable protective clothing as asbestos waste; wet and fold these items to contain dust, and then place in plastic bags.

.2 Clean exterior of each waste-filled bag using damp cloths or HEPA vacuum and place in second clean waste bag immediately prior to removal from Asbestos Work Area.

.3 Seal waste bags and remove from site. Dispose of in accordance with requirements of Provincial/Territorial and Federal Authority having jurisdiction. Supervise dumping and ensure that dump operator is fully aware of hazardous nature of material to be dumped and that the appropriate guidelines and regulations for asbestos disposal are followed.

.4 Perform final thorough clean-up of Work areas and adjacent areas affected by Work using HEPA vacuum.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

.1 ASTM International

.1 ASTM A 53/A 53M-12, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.

.2 ASTM A307-14, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

.2 CSA Group

.1 CSA G40.20-13 /G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.2 CAN/CSA G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.

.3 CSA S16-14, Design of Steel Structures.

.4 CSA W48-14, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).

.5 CSA W59-13, Welded Steel Construction (Metal Arc Welding) Metric.

1.2 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 cable railings and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.1 Submit drawings stamped and signed by professional engineer registered or licensed in Yukon, Canada.

.2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

1.3 QUALITY ASSURANCE

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

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

1.4 DELIVERY, STORAGE AND HANDLING

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

Part 2 Products

2.1 MATERIALS

.1 Steel sections and plates: to CSA G40.20/G40.21, Grade 300W.

.2 Steel pipe: to ASTM A53/A53M standard weight, galvanized finish.

.3 Welding materials: to CSA W59.

.4 Welding electrodes: to CSA W48 Series.

.5 Bolts and anchor bolts: to ASTM A307.

.6 Stainless steel components: 316L.

.7 Grout: non-shrink, non-metallic, flowable, 15 MPa at 24 hours.

2.2 FABRICATION

.1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.

.2 Use self-tapping shake-proof crews on items requiring assembly by screws or as indicated.

.3 Where possible, fit and shop assemble work, ready for erection.

.4 Exposed welds continuous for length of each joint. File or grind exposed welds smooth and flush.

2.3 FINISHES

.1 Galvanizing: hot dipped galvanizing with zinc coating 600 g/$m^2$to CAN/CSA-G164.

2.4 ISOLATION COATING

.1 Isolate aluminum from following components, by means of bituminous paint:

.1 Dissimilar metals except stainless steel, zinc, or white bronze of small area.

.2 Concrete, mortar and masonry.

.3 Wood.

2.5 GUARDRAILS AND HANDRAILS

.1 Steel pipe: 32mm

.2 Stainless steel aircraft cable: 4mm diameter, polished finish, 1x19 left hand lay, maximum 75mm spacing.

.3 Maximum post spacing: 1200 mm, match existing.

.4 Galvanize exterior pipe railings after fabrication.

.5 Cable Railing Accessories: through post fastening, stainless steel

.1 Tensioning and compression fittings.

.2 Nut covers: architectural finish

Part 3 Execution

3.1 EXAMINATION

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

3.2 ERECTION - GENERAL

.1 Do welding work in accordance with CSA W59 unless specified otherwise.

.2 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.

.3 Provide suitable means of anchorage acceptable to Departmental Representative such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.

.4 Exposed fastening devices to match finish and be compatible with material through which they pass.

.5 Supply components for work by other trades in accordance with shop drawings and schedule.

.6 Make field connections with bolts to CSA S16.

.7 Deliver items over for casting into concrete and building into masonry together with setting templates to appropriate location and construction personnel.

.8 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.

.1 Primer: maximum VOC limit 250 g/L to GS-11.

3.3 GUARDRAILS AND HANDRAILS

.1 Install pipe railings as indicated.

3.4 CLEANING

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

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

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

3.5 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by metal fabrications installation.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 06 17 53 – Shop-Fabricated Wood Trusses

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 2015 (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 61 00 - Common Product Requirements.

.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.

.3 Wood Preservative:

.1 Surface-applied wood preservative: coloured, copper naphthenate.

2.3 ACCESSORIES

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

.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 Align and plumb faces of furring and blocking to tolerance of 1:600.

.6 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work.

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

.8 Install wood backing, dressed, tapered and recessed slightly below top surface of roof insulation for roof hopper.

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

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

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

3.6 SCHEDULES

.1 Wall Sheathing

.1 Plywood, DFP sheathing, T&G edge, 16 mm thick

.2 Roof Sheathing

.1 Plywood, DFP sheathing, 10 mm thick to match existing

.3 Foundation Protection Board

.1 Plywood, PWF, 13 mm thick.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

.1 ASTM International

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

.2 CSA Group (CSA)

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

.2 CAN/CSA O80 Series-08, Wood Preservation.

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

.1 Material Safety Data Sheets (MSDS).

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for wood decking and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit two copies of WHMIS MSDS in accordance with Section 01 35 29 - Health and Safety Requirements.

.3 Samples:

.1 Submit 2 300 x 300 mm samples of each type.

.4 Certifications: submit certificates signed by manufacturer certifying materials comply with specified performance characteristics and physical properties.

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 Furfurylated Modified Wood Decking: Wood modified with a bio-based liquid, requiring no treatment on end cuts **OR** Thermally Modified Wood Siding: Wood modified by subjecting to high heat and steam in a controlled environment, requiring no treatment on end cuts.

.1 Boardwalk Decking: 38mm x 140mm.

.2 Species: Pinus Radiata or Southern Yellow Pine, or American Ash, Clear face, defect free

.3 Face appearance: Smooth, with comb profile at stair nosings.

.4 Technical Data:

.1	Moisture:	4-8%
.2	Min. Density:	500 Kg/m^3
.3	Min. Hardness:	5.5 Brinell
.4	Max. Swelling:	4%
.5	Decay Resistance:	1 (To EN 350)
.6	Use Class:	3 (To EN 335)

.5 Acceptable Products

.1 Kebony Clear SYP Boardwalk Smooth

.2 Novawood

.3 Thermory

.2 Wood decking and siding to be from the same manufacturer.

.3 Decking lengths: 1.8 to 6 m or longer with a minimum of 90% planks exceeding 3 m. Square end trimmed.

.4 Screws: Stainless Steel with trimhead for edge deck fastening, reverse rake tip, 316 Stainless, 60mm.

.5 Fastening system: edge deck with no visible fasteners.

.1 Standard of Acceptance: Camo Marksman Pro and Edge Deck Fasteners.

Part 3 Execution

3.1 EXAMINATION

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

3.2 INSTALLATION

.1 Install in accordance with manufacturer’s directions.

.2 Pre-drill for all non-self-drilling screws.

.3 Stagger end joints in adjacent planks minimum of one sleeper.

3.3 CLEANING

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

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

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

.3 Waste Management: separate waste materials for in accordance with Section 01 74 19- Waste Management and Disposal.

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

3.4 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by wood decking installation.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 06 10 00 – Rough Carpentry

1.2 REFERENCES

.1 Canadian Standards Association (CSA International)

.2 CAN/CSA-O86-01, Engineering Design in Wood.

.3 CAN/CSA-O141-91(R1999), Softwood Lumber.

.4 CSA S307-M1980(R2001), Load Test Procedure for Wood Roof Trusses for Houses and Small Buildings.

.5 CSA S347-99(R2004), Method of Test for Evaluation of Truss Plates Used in Lumber Joints.

.6 CSA W47.1-03, Certification of Companies for Fusion Welding of Steel.

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

.1 Material Safety Data Sheets (MSDS).

.3 National Lumber Grades Authority (NLGA)

.1 NLGA-03, Standard Grading Rules for Canadian Lumber.

.4 National Research Council (NRC)/Institute for Research in Construction (IRC) - Canadian Construction Materials Centre (CCMC)

.1 CCMC-2002, Registry of Product Evaluations.

.5 Truss Plate Institute of Canada (TPIC)

.1 TPIC - 1996 (R2001), Truss Design Procedures and Specifications for Light Metal Plate Connected Wood Trusses (Limit States Design).

1.3 DESIGN REQUIREMENTS

.1 Design light metal plate connected wood trusses in accordance with TPIC truss design procedures for wood truss chords and webs in accordance with engineering properties in CAN/CSA-O86.

.2 Design light metal plate connected wood trusses in accordance with TPIC truss design procedures for truss joint designs to test engineering properties in accordance with CSA S347 and listed in CCMC Registry of Product Evaluations.

.3 Design trusses, bracing bridging in accordance with CAN/CSA-O86.1 for loads indicated for building locality as ascertained by NBC, Climatic Information for Building Design in Canada and minimum uniform and minimum concentrated loadings stipulated in NBC commentary

1.4 QUALITY ASSURANCE

.1 Qualifications:

.1 Fabricator for trusses to show evidence of quality control program such as provided by regional wood truss associations, or equivalent.

.2 Pre-Installation Meeting:

.1 Convene pre-installation meeting one week prior to beginning work of this Section and on-site installations in accordance with Section 01 32 17 - Construction Progress Schedule

.1 Verify project requirements.

.2 Review installation and substrate conditions.

.3 Co-ordination with other building subtrades.

.4 Review manufacturer's installation instructions and warranty requirements.

1.5 SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's printed product literature, specifications and datasheet in accordance with Section 01 33 00 - Submittal Procedures.

.3 Shop Drawings

.4 Each shop erection drawing submission showing connection details to be signed and stamped by professional engineer registered or licensed in the Yukon Territory of Canada

.5 Indicate TPIC Truss Design Procedure and CSA O86 Engineering Design in Wood and specific CCMC Product Registry number of the truss plates

.6 Indicate species, sizes, and stress grades of lumber used as truss members. Show pitch, span, camber, configuration and spacing of trusses. Indicate connector types, thicknesses, sizes, locations and design value. Show bearing details. Indicate design load for members.

.7 Submit stress diagram or print-out of computer design indicating design load for truss members.

.8 Indicate arrangement of webs or other members to accommodate ducts and other specialties.

.9 Show location of lateral bracing for compression members.

.10 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

.11 Instructions: submit manufacturer's installation instructions.

1.6 DELIVERY, STORAGE AND HANDLING

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

.2 Storage and Protection:

.1 Store trusses on job site in accordance with manufacturer's instructions. Provide bearing supports and bracings. Prevent bending, warping and overturning of trusses.

Part 2 Products

2.1 MATERIALS

.1 Materials and products in accordance with Section 01 47 15 - Sustainable Requirements: Construction

.2 Lumber: SPF species, Machines Stress Rated or grade to suit truss design, softwood, S4S, with maximum moisture content of 16% at time of fabrication and to following standards:

.1 CAN/CSA-O141.

.2 NLGA (National Lumber Grading Association), Standard Grading Rules for Canadian Lumber.

.3 Fastenings: to CAN/CSA-O86.

2.2 FABRICATION

.1 Fabricate wood trusses in accordance with reviewed approved shop drawings.

.2 Connect members using metal gusset plates

2.3 SOURCE QUALITY CONTROL

.1 Identify lumber by grade stamp of an agency certified by Canadian Lumber Standards Administration Board.

.2 Certify by agency accredited by Standards Council of Canada that preservative and fire retardant treated wood in accordance with CSA O80 Series.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 ERECTION

.1 Erect wood trusses as indicated in accordance with reviewed approved shop drawings.

.2 Handling, installation, erection, bracing and lifting in accordance with manufacturers instructions.

.3 Make adequate provisions for handling and erection stresses.

.4 Exercise care to prevent out-of-plane bending of trusses.

.5 Install temporary horizontal and cross bracing to hold trusses plumb and in safe condition until permanent bracing and sheathing are installed.

.6 Install permanent bracing in accordance with approved reviewed shop drawings, prior to application of loads to trusses.

.7 Do not cut or remove any truss material without approval of the truss design engineer

3.3 FIELD QUALITY CONTROL

.1 Manufacturer's Field Services:

.1 Have manufacturer of products supplied under this Section review work involved in handling, installation/application, protection and cleaning of its products, and submit written reports, in acceptable format, to verify compliance of work with Contract.

.2 Manufacturer's field services: provide manufacturer's field services, consisting of product use recommendations and periodic site visits for inspection of product installation, in accordance with manufacturer's instructions.

.3 Schedule site visits to review work at stages listed:

.1 After delivery and storage of products, and when preparatory work on which work of this Section depends is complete, but before installation begins.

.2 During progress of work at 90% complete.

.2 Upon completion of work, after cleaning is carried out.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 02 41 19 – Selective Demolition

.2 Division 07

.3 Division 08

1.2 DEMOLITION

.1 It is intended that all existing siding and strapping 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 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.

1.3 PROCEDURE

.1 All parts of building envelope are to remain watertight. No openings are to be made which cannot be protected and made watertight under climatic conditions existing at the time.

1.4 MOCK-UP

.1 Construct mock-ups in accordance with Section 07 46 16 – Aluminum Siding and Section 07 46 19 – Steel Siding.

1.5 ACCESS TO WORK

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

1.6 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 wall and roof demolition and installation to ensure building remains watertight.

1.7 AIRTIGHTNESS TESTING

.1 Contractor to complete airtightness testing as specified in Section 01 91 19 – Facility Shell Commissioning at the following stages of construction:

.1 Prior to construction: to establish a baseline.

.2 Upon completion of the installation of the air barrier and windows and doors, to identify any air leaks, and allow for correction.

.3 At substantial completion of construction.

1.8 BAT EXCLUSION

.1 The existing building siding has become a habitat for bats between April and October, which is part of the impetus of this project. Construction activities should not create opportunities for new bat habitats. Sequence construction work in such a way to not create openings greater than 6mm, and close off all openings at the end of each day.

.2 Provide preventative measures and close-up working area at the end of each day to exclude the entry of bats.

.3 If a bat habitat is identified during construction, stop work in that area and notify Departmental Representative.

.4 Seal entire building envelope at both air barrier and siding layers to prevent bat entry and exit points into the building and construction assemblies.

.5 All openings ≥4 mm to be sealed using joint sealant. Refer to Section 07 92 00 – Joint Sealants.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 06 10 00 – Rough Carpentry: Wood Strapping and Fasteners.

.2 Section 07 05 00 – Common Work Results for Thermal and Moisture Protection.

.3 Section 07 27 00 – Air Barriers.

1.2 REFERENCES

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

.1 ASTM C518-17, Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.

.2 ASTM C1104-13a, Standard Test Method for Determining the Water Vapor Sorption of Unfaced Mineral Fiber Insulation.

.3 ASTM D2842-12, Standard Test Method for Water Absorption of Rigid Cellular Plastics.

.2 Underwriters Laboratories of Canada (ULC)

.1 CAN/ULC-S102-10, Standard Test Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

.2 CAN/ULC-S114-05, Standard Method of Test for Determination of Non-Combustibility in Building Materials.

.3 CAN/ULC-S701-05, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Coverings.

.4 CAN/ULC-S702-97, Standard for Thermal Insulation, Mineral Fibre, for Buildings.

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

.1 Material Safety Data Sheets (MSDS).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures.

.2 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions.

1.4 DELIVERY, STORAGE AND HANDLING

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

Part 2 Products

2.1 INSULATION

.1 Concrete Faced Extruded Polystyrene (XPS) Insulation: to CAN/ULC-S701.

.1 Type 4

.2 Thermal Resistance: RSI 0.87/25mm to ASTM C518.

.3 Water Absorption: <0.7% to ASTM D2842.

.4 Insulation Thickness: 51 mm

.5 Size: 610 mm x 1220 mm.

.6 Concrete: Latex modified concrete mix, 8 mm thick, with control joint score at mid-length.

.7 Edge Treatment: Tongue and groove along longitudinal foam edges, butt joints on lateral edges.

.8 Internal and External Corners: Mitred wall panel corners.

.9 Surface Finish: Textured Broom finish; Grey colour

.2 Rock wool rigid board: to CAN/ULC-S702 and non-combustible to CAN/ULC S114.

.1 Type: 1.

.2 Density: 128 kg/m^3.

.3 Thermal Resistance: RSI 0.70/25.4 mm to ASTM C518.

.4 Moisture Absorption: Maximum 0.05% to ASTM C1104.

.5 Flame Spread Index: 0 to CAN/ULC S102

.6 Smoke Developed Index: 0 to CAN/ULC S102

.7 Surfaces: unsurfaced.

.8 Thickness: 51 mm.

.9 Size: 1220 mm x 2440 mm.

2.2 ACCESSORIES

.1 Insulation clips: impale type, perforated 50 x 50 mm cold rolled carbon steel 0.8 mm thick, adhesive back, spindle of 2.5 mm diameter annealed steel, length to suit insulation, 25 mm diameter washers of self-locking type.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 WORKMANSHIP

.1 Install insulation after building substrate materials are dry.

.2 Install insulation to maintain continuity of thermal protection to building elements and spaces.

.3 Fit insulation tight around electrical boxes, plumbing and heating pipes and ducts, around exterior doors and windows and other protrusions.

.4 Keep insulation minimum 75 mm from heat emitting devices such as recessed light fixtures, and minimum 50 mm from sidewalls of CAN4-S604 type A chimneys and CAN/CGA-B149.1 and CAN/CGA-B149.2 type B and L.

.5 Cut and trim insulation neatly to fit spaces. Butt joints tightly, offset vertical joints. Use only insulation boards free from chipped or broken edges. Use largest possible dimensions to reduce number of joints.

.6 Offset both vertical and horizontal joints in multiple layer applications.

.7 Do not enclose insulation until it has been inspected and approved by Departmental Representative.

3.3 EXAMINATION

.1 Examine substrates and immediately inform Departmental Representative in writing of defects.

.2 Prior to commencement of work ensure:

.1 Substrates are firm, straight, smooth, dry, free of snow, ice or frost, and clean of dust and debris.

3.4 PERIMETER FOUNDATION INSULATION

.1 Exterior application: extend boards as indicated. Install on exterior face of perimeter foundation wall using manufacturer’s fasteners.

.2 Mitre all external corners.

.3 Provide isolation joint between perimeter foundation insulation and adjacent concrete or asphalt surfaces.

3.5 RIGID INSULATION INSTALLATION

.1 Install mineral fibre insulation boards with:

.1 Insulation clips and disk, 2 per 600 x 1200 mm board minimum, fit boards tight, cut off fastener spindle 3 mm beyond disk or secure using strapping, or

.2 Wood strapping.

3.6 CLEANING

.1 Clean installed work as specified in Section 01 74 11 - Cleaning.

3.7 SCHEDULE:

.1 Concrete Faced Extruded Polystyrene (XPS) Insulation:

.1 At foundation perimeter as indicated.

.2 Rock wool insulation board:

.1 In wall type W2; and

.2 For protection of foamed plastics.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

.1 ASTM International

.1 ASTM C553-13, Standard Specification for Mineral Fibre Blanket Thermal Insulation for Commercial and Industrial Applications.

.2 ASTM C665-12, Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.

.3 ASTM C1320-10, Standard Practice for Installation of Mineral Fiber Batt and Blanket Thermal Insulation for Light Frame Construction.

.2 Underwriters Laboratories of Canada (ULC)

.1 CAN/ULC-S702-2012, Standard for Mineral Fibre Insulation for Buildings.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit printed product literature and data sheets for blanket insulation and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Certificates:

.1 Submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.4 Test Reports:

.1 Submit certified test reports showing compliance with specified performance characteristics and physical properties.

1.3 DELIVERY, STORAGE AND HANDLING

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

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

.3 Storage and Handling Requirements:

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

.2 Replace defective or damaged materials with new.

Part 2 Products

2.1 INSULATION

.1 Semi-Rigid Batt Rock Wool: to CAN/ULC-S702.

.1 Type: 1 .

.2 Density: >32 kg/m^3

.3 Thickness: as indicated.

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 blanket insulation application in accordance with manufacturer's written instructions.

3.2 INSULATION INSTALLATION

.1 Install insulation to maintain continuity of thermal protection to building elements and spaces and to ASTM C1320.

.2 Fit insulation closely around electrical boxes, pipes, ducts, frames and other objects in or passing through insulation.

.3 Do not compress insulation to fit into spaces.

.4 Keep insulation minimum 75 mm from heat emitting devices such as recessed light fixtures, and minimum 50 mm from sidewalls of CAN/ULC-S604 Type A chimneys and CSA B149.1 and CSA B149.2 Type B vents.

.5 Do not enclose insulation until it has been inspected and approved by Departmental Representative.

3.3 CLEANING

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

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

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

END OF SECTION

Part 1 General

1.1 SYSTEM DESCRIPTION

.1 Supply labor, materials and equipment for a fully adhered water-resistive vapor permeable air barrier membrane system.

.2 Complete Work as shown on the Drawings and specified herein to bridge gaps and seal the water-resistive vapor permeable air barrier membrane against air leakage and water intrusion, including:

.1 Connections of the walls to the roof membrane

.2 Connections of the walls to the foundations

.3 Openings and penetrations of window and door frames, store front, curtain wall

.4 Piping, conduit, duct and similar penetrations

.5 Screws, bolts and similar penetrations

.6 All other air leakage pathways in the building envelope

.3 Install primary water-resistive vapor permeable air barrier, flashing, and ventilation strip accessories.

1.2 RELATED REQUIREMENTS

.1 Section 07 05 00 – Common Work Results for Thermal and Moisture Protection

.2 Section 07 46 16 – Aluminum Siding

.3 Section 07 46 19 – Steel Siding

.4 Section 07 52 00 – Modified Bituminous Membrane Roofing

.5 Section 07 61 00 – Sheet Metal Roofing

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

.7 Section 07 92 00 – Joint Sealants

.8 Section 08 11 00 – Metal Doors and Frames

.9 Section 08 44 13 – Glazed Aluminum Curtain Walls

.10 Fiberglass Windows

1.3 REFERENCES

.1 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-19.13M-M87, Sealing Compound, One Component, Elastomeric Chemical Curing.

.2 CAN/CGSB-19.24M-M90, Multi-Component, Chemical Curing Sealing Compound.

.3 CGSB 19-GP-14M-84, Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing.

.2 Sealant and Waterproofer's Institute - Sealant and Caulking Guide Specification.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 02 81 01 - Hazardous Materials.

.3 Quality Assurance Submittals: submit following in accordance with Section 01 45 00 - Quality Control.

.1 Existing Substrate Condition: report deviations, as described in PART 3 - EXAMINATION in writing to Departmental Representative.

.2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

.3 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, and cleaning procedures.

.4 Manufacturer's Field Reports: submit manufacturer's written reports within 3 days of review, verifying compliance of Work, as described in PART 3 - FIELD QUALITY CONTROL.

1.5 QUALITY ASSURANCE

.1 Single Source: Self-adhered water-resistive vapor permeable air barrier membrane components and accessories must be obtained as a single-source membrane system to ensure total system compatibility and integrity.

.2 Manufacturer Qualifications:

.1 Manufacturer of specified products listed in this Section to have experience in the manufacture and supply of highly vapor permeable water resistive air barrier products successfully installed in similar project applications.

.2 Manufacturer of specified products listed in this Section to have experienced in-house technical and field observation personal qualified to provide expert technical support.

.3 Installer Qualifications:

.1 Applicator:

.1 Completed installation must be approved by the material manufacturer.

.4 Mock-Up:

.5 Refer to Section 07 46 16 – Aluminum Siding and Section 07 46 19 – Steel Siding.

.6 Site Meetings: as part of Manufacturer's Services described in PART 3 - FIELD QUALITY CONTROL, schedule site visits, to review Work, at stages listed.

.1 Once during progress of Work at 25% complete.

1.6 DELIVERY, STORAGE AND HANDLING

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

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

.3 Avoid spillage: immediately notify Departmental Representative if spillage occurs and start clean up procedures.

.4 Clean spills and leave area as it was prior to spill.

1.7 WASTE MANAGEMENT AND DISPOSAL

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

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

.3 Ensure emptied containers are sealed and stored safely for disposal away from children.

1.8 AMBIENT CONDITIONS

.1 Install solvent curing sealants and vapour release adhesive materials in open spaces with ventilation.

.2 Maintain temperature and humidity recommended by materials manufactures before, during and after installation.

1.9 SEQUENCING

.1 Sequence work in accordance with Section 01 11 55 – General Instructions.

.2 Sequence work to permit installation of materials in conjunction with related materials and seals.

.1 Air barrier vapor permeable membrane to include self-adhered air barrier, transition membranes and sealants at penetrations.

.2 Drainage plane to include drainage cavity, water resistive barrier and flashings to the exterior.

1.10 WARRANTY

.1 Provide three-year warranty under provisions of Section 01 78 00 - Closeout Submittals.

.2 Warranty: include coverage of installed sheet materials which:

.1 Fail to achieve air tight and watertight seal.

.2 Exhibit loss of adhesion or cohesion.

.3 Do not cure.

Part 2 Products

2.1 MATERIALS

.1 Self-adhesive spun-bonded polypropylene water-resistive vapour permeable air barrier membrane:

.1 UV Resistance: Minimum 180 days exposure prior to coverage.

.2 Breaking Strength and Elongation: Minimum 350N MD, and 350N XD.

.3 Water Vapour Permeance: Minimum 10 perms to ASTM E96, Method B.

.4 Air Leakage: ≤0.0001 L/s m2 @ 75 Pa to ASTM E2178

.5 Air Leakage (Assembly): ≤0.01 L/s m2 @ 75 Pa to ASTM E2357

.6 Water Resistance: No leakage under 550mm hydrostatic head for 5 hours to AATCC 127.

.7 Surface Burning Characteristics: Class A, Flame-spread <5, smoke developed <15 to ASTM E84.

.2 Self-adhesive spun-bonded polypropylene water-resistive vapour-permeable roof underlayment membrane:

.1 Tensile Strength: Minimum 350N MD, and 350N XD.

.2 Water Vapour Permeance: Minimum 10 perms to ASTM E96, Method B.

.3 Air Leakage: ≤0.0001 L/s m2 @ 75 Pa to ASTM E2178

.4 Water Resistance (Ponding): Min. 600mm for 48 hours, no leakage.

.5 Liquid Water Transmission: to ASTM D4869

.3 Self-adhesive air/vapour barrier and waterproofing membrane:

.1 Surface: Trilaminate woven polyethylene

.2 Thickness: 1mm (40 mils)

.3 Tensile Strength: Minimum 9kN MD and 9kN XD to ASTM D5147

.4 Ultimate Elongation: 40% MD and 25% XS to ASTM D5147

.5 Puncture Resistance: Minimum 500N to ASTM D5147

.6 Cold Temperature Flexibility: -35 °C to ASTM D5147

.7 Tear Resistance: Minimum 500N to ASTM E154

.8 Lap Adhesion: Minimum 2kN/m to ASTM D1876

.9 Air Leakage: < 0.0001 L/s m2 @ 75 Pa to ASTM E2178

.10 Nail Sealability: Pass to ASTM D1970

.11 Primer: As recommended by manufacturer

.12 Edge Sealant: As recommended by manufacturer.

2.2 WINDOW FLASHING SYSTEM

.1 As recommended by air barrier manufacturer.

2.3 SEALANTS

.1 Penetration Sealant: Provide sealant for penetrations as recommended by manufacturer.

2.4 ACCESSORIES

.1 Through Wall Flashings: 0.05mm Stainless Steel Sheet with 0.2mm butyl adhesive backing

.2 Transition Flashings: flexible 2mm extruded silicone

.1 Dynamic movement: +200% / -50% to ASTM C1523

.2 Elongation: 400% to ASTM D412

.3 Tensile Strength: 2 MPa to ASTM D412

.4 Tear Strength: 3 N/mm to ASTM D624.

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 Work in accordance with National Air Barrier Association - Professional Contractor Quality Assurance Program and requirements for installation.

3.3 EXAMINATION

.1 Verify that surfaces and conditions are ready to accept work of this section.

.2 Ensure surfaces are clean, dry, sound, smooth, continuous and comply with air barrier manufacturer's requirements.

.3 Report unsatisfactory conditions to Departmental Representative in writing.

.4 Do not start work until deficiencies have been corrected.

.1 Beginning of Work implies acceptance of conditions.

3.4 PREPARATION

.1 Remove loose or foreign matter, which might impair adhesion of materials.

.2 Ensure substrates are clean of oil or excess dust; and concrete surfaces free of large voids, spalled areas or sharp protrusions.

.3 Ensure substrates are free of surface moisture prior to application of self-adhesive membrane.

.4 Ensure metal closures are free of sharp edges and burrs.

.5 Prime substrate surfaces to receive adhesive in accordance with manufacturer's instructions.

3.5 INSTALLATION

.1 Install materials in accordance with manufacturer's instructions.

.2 Tie-in to structural beams, columns, floor slabs and intermittent floors, parapet curbs, foundation walls, roofing systems and at the interface of dissimilar materials with self-adhering air barrier transition and flashing membrane.

.3 Align and position fully self-adhered air barrier transition and flashing membrane, remove protective film and press firmly into place. Provide minimum 75 mm lap on to substrates.

.4 Ensure minimum 75 mm overlap at side and end laps of membrane and 150 mm at inside and outside corners, if joints occur at corner locations.

.5 Roll membrane and lap seams with roller to ensure positive contact and adhesion, immediately.

.6 Vertical Applications:

.1 For vertical applications, align sheets with an ‘inside’ or ‘outside’ corner to avoid wrinkles and misalignment of subsequent applications.

.2 Measure and pre-cut into manageable sized fully self-adhered sheets to suit the application conditions.

.3 Allow for excess material at bottom of wall to accommodate tie-ins and connections to adjacent surfaces.

.4 Roll up pre-cut material lengths with release paper facing OUTWARD.

.5 Starting at a corner of the roll, peel back approx. 150 mm of release film from across the width of the pre-cut material roll.

.6 Using hand pressure, lightly apply the exposed adhesive surface to the substrate.

.7 Allow the rolled-up material to drop down the wall, with the remainder of the release film still attached (facing the wall), and extend down to lowest point of wall, checking for proper alignment, repositioning as necessary.

.8 Allow for excess material at bottom of wall to accommodate tie-ins and connections to adjacent surfaces.

.9 Align and position fully self-adhered membrane, remove release film and press firmly into place. Provide minimum 75 mm overlap at side and end laps of membrane.

.10 Continue to remove release film and apply pressure to ensure positive contact onto wall substrate.

.11 Install subsequent sheets of fully self-adhered vapor permeable air barrier sheets in overlapping weatherboard format. Ensure sheets lay smooth and flat to surfaces. Roll membrane and lap seams with two handed roller to ensure contact and adhesion.

.7 Horizontal Applications:

.1 For horizontal applications, align sheets and begin installation of water-resistive weather barrier at bottom or lowest point of wall.

.2 To avoid wrinkles and misalignment of subsequent applications, it is recommended to pre-mark or "Snap" a level line to work from.

.3 Measure and pre-cut into manageable sized sheets to suit the application conditions.

.4 Allow for excess material at bottom of wall to accommodate tie-ins and connections to adjacent surfaces.

.5 Align and position fully self-adhered membrane, remove release film and press firmly into place. Provide minimum 75 mm overlap at all side and end laps of membrane. Roll membrane and lapped seams with a two-handed roller to ensure contact and adhesion.

.6 Continue to remove release film and apply pressure to ensure positive contact onto wall substrate.

.7 Install subsequent sheets of fully self-adhered vapor permeable air barrier sheets in overlapping weatherboard format. Ensure sheets lay smooth and flat to surfaces. Roll membrane and lapped seams with a two-handed roller to ensure contact and adhesion.

.8 Mechanical Equipment Penetrations:

.1 Mechanical pipe, electrical conduit and/or duct work must be secured solid into position prior to installation of fully self-adhered vapor permeable air barrier membrane.

.2 Electrical services penetrating the wall assembly and fully self-adhered vapor permeable air barrier membrane must be placed in appropriate conduit and secured solid into position.

.3 Install manufactured flanged penetration sleeves as recommended by sleeve manufacturer.

.4 For straight sided penetrations, cut and fit fully self-adhered vapor permeable air barrier to accommodate sleeve, install liquid applied breathable waterproof flashing to seal the air barrier membrane to ductwork or preformed flange sleeve.

.5 For pipe penetrations, refer to manufacturer’s standard details.

.9 Windows, Doors, and Other Wall Openings:

.1 As recommended by manufacturer.

3.6 FIELD QUALITY CONTROL

.1 Manufacturer's Field Services:

.1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - SUBMITTALS.

.2 Provide manufacturer's field services consisting of product use recommendations and site visit for inspection of product installation in accordance with manufacturer's instructions.

.3 Schedule site visits, to review Work, as directed in PART 1 - QUALITY ASSURANCE.

3.7 CLEANING

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

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

3.8 PROTECTION OF WORK

.1 Protect finished work in accordance with Section 01 61 00 - Common Product Requirements.

.2 Do not permit adjacent work to damage work of this section.

.3 Ensure finished work is protected from climatic conditions.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Supply and installation of profiled prefinished aluminum cladding and soffit forming a part of an exterior wall rainscreen system, flashings and trims using prefinished sheet materials and concealed fasteners.

1.2 RELATED REQUIREMENTS

.1 Section 06 10 00 – Rough Carpentry: Wood strapping.

.2 Section 07 05 00 – Common Work Results for Thermal and Moisture Protection: Common requirements for all Division 7 work.

.3 Section 07 27 00 – Air Barriers: Air and weather barrier membrane.

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

.5 Section 07 92 00 – Joint Sealants

1.3 REFERENCES

.1 American Architectural Manufacturers Association (AAMA)

.1 AAMA 2604-13, Voluntary Specification Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.

.2 AAMA 2605-11 - Voluntary Specification, Performance requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.

.3 AAMA 2604 - Voluntary Specification, Performance requirements and Test Procedures for High Performing Organic Coatings on Aluminum Extrusions and Panels.

.4 AAMA 2603 - Voluntary Specification, Performance requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.

.2 American Association Inc. (AAI)

.1 DAF 45 03, Designation System for Aluminum Finishes.

.3 American Society for Testing and Materials International, (ASTM)

.1 ASTM D 958 - Practice for Determining Temperatures of Standard ASTM Molds for Test Specimens of Plastics.

.2 ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C

.3 ASTM F1667-15, Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.

.4 ASTM E2768-11 – Standard Test Method for Extended Duration Surface Burning Characteristics for Building Materials (30 min Tunnel Test). Results: Zero Flame Spread, Smoke Developed Index of 5. Meets criteria for Class A fire rating.

.4 Canadian General Standards Board (CGSB)

.1 CAN/CGSB 93.2 M91, Prefinished Aluminum Siding, Soffits and Fascia, for Residential Use.

.5 .2 CGSB 93.5 92, Installation of Metal Residential Siding, Soffits and Fascia.

.6 Underwriter Laboratories of Canada (ULC)

.1 CAN/ULC S102-10, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

.2 CAN/ULC S114 – Standard method of test for determination of non-combustibility in building materials.

.3 CAN/ULC S157-05, Strength Design in Aluminum.

1.4 PERFORMANCE REQUIREMENTS

.1 Maximum deflection not to exceed L/180 under system's own weight plus wind load (positive and negative) loads acting normal to the plane in accordance with the National Building Code Climatic Data, wind load 1:50 years.

.2 Design sheet cladding to span continuously over at least four structural supports (three spans) and design fastening to structural supports to sustain factored loads in accordance with authority having jurisdiction.

.3 Calculate live load deflections in accordance with authority having jurisdiction and as modified by the requirements of this Section.

.4 Provide for movement of components without causing buckling, failure of joint seals, undue stress on fasteners when subject to seasonal temperature range from 40°C to +50°C, and wind loads.

.5 Include expansion joints to accommodate movement in wall system and between wall system and building structure, where these movements are caused by deflection of building structure, and accommodate these movements, without permanent distortion, damage to infills, racking of joints, breakage of seals, or water penetration.

.6 Provide for positive drainage to the exterior of all water entering or condensation occurring within the system.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data: Manufacturer's data sheets on each product to be used, including:

.1 Preparation instructions and recommendations.

.2 Storage and handling requirements and recommendations.

.3 Installation methods.

.3 Shop Drawings: Indicate dimensions, layout, joints, expansion joints, construction details, methods of anchorage, and interface with adjacent materials.

.4 Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

.5 Verification Samples: For each finish product specified, two samples, minimum size 1 mm by 89 mm, representing actual product, color, and gloss.

.6 Manufacturer's Certificates: Certify products meet or exceed specified requirements.

.7 Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic cleaning and maintenance of components.

1.6 QUALITY ASSURANCE

.1 Mock-Up:

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

.2 Construct typical exterior details, 0.6m long by 0.6m deep by 0.6m high, incorporating wood framing, sheathing, rigid insulation, air barrier, strapping, siding, and base of wall/head flashing; illustrating materials interface and seals at the following locations:

.1 Building Exterior Corner Miter at Base of Wall: Details 2/A702 and 1/A704.

.2 Window Sill/Jamb with Sloping Wood Sill at Exterior Wall: Details 2/A702 and 6/A704.

.3 Construct separately from building to allow it to be reviewed throughout the process.

.4 Mock-up may not remain as part of finished work.

.5 Construct mock-up a minimum of 2 weeks prior to commencing the work of this section.

.2 Warranty: Provide manufacturer 15-year warranty including coverage for products that are damaged by cracking, peeling and gloss/color retention.

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.

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

.3 Storage and Handling Requirements:

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

.2 Store and protect siding from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

1.8 MAINTENANCE

.1 Extra Materials:

.1 Provide maintenance materials in accordance with Section 01 78 00 – Closeout Submittals.

.2 Provide siding amounting to 2% gross exterior wall area.

.3 Deliver to Owner, upon completion of the work of this section.

Part 2 Products

2.1 MATERIALS

.1 Extruded Aluminum Siding and Soffits: Wood Grain Aluminum Siding and Soffits with Alluminate bonded film finish to be extruded aluminum with integrated venting system.

.1 Profile: 100 mm x 7315 mm V-Groove Siding & Soffit.

.2 Aluminum Thickness: Minimum 1.5 mm

.3 Finish: Wood grain fluorocarbon coating per AAMA 2605.

.4 Acceptable Products:

.1 Longboard Siding and Soffit by Mayne Coatings Corp.

.2 V-Line Siding and Soffit by AL13.

.2 Accessories:

.1 Prefinished aluminum: Provide with starter strips, cap flashings, drip flashings, internal corner flashings, copings and closures for head, jamb, sill and corners, of same material, thickness and finish as exterior cladding, brake formed to shape.

.1 Provide flat cap/base trims at siding expansion joints as indicated and on siding runs no more than 7.3 lineal metres.

.3 Finishes:

.1 Electrostatically applied Fluromax Architectural Powder Coatings approved to AAMA 2605 Superior Performance Standard.

.1 Gloss Level: Standard Gloss is 30 percent, plus or minus 5 percent.

.2 Architectural Wood Grains: Colour to be selected from manufacturer standard colours.

.4 Exterior wall sheathing paper: Refer to Section 07 27 00 – Air Barriers.

.5 Insect Screen: Black aluminum insect screen.

.6 Fasteners: As recommended by manufacturer.

.7 Sealants: Refer to Section 07 92 00 – Joint Sealants.

Part 3 Execution

3.1 EXAMINATION

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

.2 Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not fabricate products under environmental conditions outside manufacturer's absolute limits.

3.2 PREPARATION

.1 Clean surfaces thoroughly prior to installation.

.2 Repair substrate flaws or defects before applying siding or soffits.

.3 Fur surfaces to even plane and free from obstructions.

.4 Prepare surfaces using methods recommended by manufacturer for achieving best result for substrate under project conditions.

3.3 MANUFACTURER'S INSTRUCTIONS

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

3.4 INSTALLATION

.1 Install siding to manufacturers' written instructions.

.2 Install air barrier as per Section 07 27 00 – Air Barriers.

.3 Install sill flashings, edgings and flashings over openings as per Section 07 62 00 – Sheet Metal Flashing and Trim.

.4 Install wood strapping as per Section 06 10 00 – Rough Carpentry

.5 Install insect screen.

.6 Fasten siding to structural supports; aligned, level, and plumb.

.7 Locate joints over supports.

.8 Install continuous starter strips, inside and outside corners, edgings, soffit, drip, cap, sill and window/door opening flashings as indicated.

.9 Install outside corners, fillers and closure strips with carefully formed and profiled work.

.10 Install expansion control joints where indicated.

.11 Attach components in manner not restricting thermal movement.

.12 Use concealed fasteners unless otherwise approved by Consultant.

.13 Install siding, and accessories in accordance with best practice, with all joint members plumb and true.

.14 Maintain joints in exterior cladding, true to line, tight fitting, hairline joints.

.15 Caulk junctions with adjoining work with sealant. Do work in accordance with Section 07 92 00 Joint Sealing.

.16 Apply isolation coating to areas of contact between dissimilar metals.

.17 Touch-Up Painting: Inspect completed wall system and apply matching touch-up paint as needed to correct minor paint flaws.

3.5 FIELD QUALITY CONTROL

.1 After installation of cladding, check entire surface for obvious flaws or defects.

.2 Replace and repair any problem areas, paying close attention to the substrate for causes of the problem.

3.6 CLEANING

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

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

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

3.7 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by wood siding installation.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 06 10 00 – Rough Carpentry: Wood strapping.

.2 Section 07 05 00 – Common Work Results for Thermal and Moisture Protection: Common requirements for all Division 7 work.

.3 Section 07 27 00 – Air Barriers: Air and weather barrier membrane.

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

.5 Section 07 92 00 – Joint Sealants

1.2 REFERENCE STANDARDS

.1 American Society of Mechanical Engineers (ASME)

.1 ASME B18.6.3-2013, Machine Screws, Tapping Screws, and Metallic Drive Screws (Inch Series).

.2 ASTM International

.1 ASTM A653/A653M-15e1, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 ASTM D2369-10–2015e1, Test Method for Volatile Content of Coatings.

.3 ASTM D2832-92(2016), Standard Guide for Determining Volatile and Nonvolatile Content of Paint and Related Coatings.

.4 ASTM D5116-10, Standard Guide For Small-Scale Environmental Chamber Determinations of Organic Emissions From Indoor Materials/Products.

.3 CSA Group

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

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

.2 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 29 - Health and Safety Requirements.

.3 Shop Drawings:

.1 Indicate dimensions, profiles, attachment methods, schedule of wall elevations, trim and closure pieces, and related work.

.4 Samples:

.1 Submit duplicate metal siding samples.

1.4 CLOSEOUT SUBMITTALS

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

.2 Operation and Maintenance Data: submit operation and maintenance data for installed products for incorporation into manual.

.3 Warranty Documentation: submit warranty documents specified.

1.5 QUALITY ASSURANCE

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

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

.3 Mock-Up:

.1 Provide site mock-up for work of this Section indicating methods and materials, and procedures proposed to achieve final results in accordance with Section 01 45 00– Quality Control, and to comply with following requirements, using materials indicated for completed work:

.1 Build mock-up at garage transom windows – east elevation - and include mock-up of full height of wall and the width of one siding panel at the building corner.

.2 Obtain Departmental Representative's acceptance of mock-ups before starting construction; mock-up used throughout construction period as standard of acceptance for subsequent work.

.3 Mock-up may form part of permanent structure when accepted by Departmental Representative; repair or replace unacceptable mock-ups at no additional cost to Owner.

1.6 DELIVERY, STORAGE AND HANDLING

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

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

.3 Storage and Handling Requirements:

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

.2 Store and protect steel siding from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

1.7 SITE CONDITIONS

.1 Execute work of this Section within environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer.

1.8 WARRANTY

.1 Manufacturer's warranty: Submit, for Departmental Representative's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty in addition to and not limit other rights Owner may have under Contract Documents.

Part 2 Products

2.1 MATERIALS

.1 Steel siding: Fabricated from commercial grade to ASTM A652M with Z275 zinc coating:

.1 Profile: vertical, 22mm (7/8") corrugated

.2 Pattern: smooth surface.

.3 Finish coating: factory precoated with modified silicone paint finish, 2 coat system dry paint film thickness of 0.025 mm.

.4 Colour: colour selected by Departmental Representative from manufacturer's standard colours.

.5 Thickness: 0.76 mm (22 gauge) base metal thickness.

.2 Fasteners: gasketted screws to ASME B18.6.3, galvanized steel, colour matched to siding purpose made.

.3 Sealants: in accordance with Section 07 92 00- Joint Sealants.

.4 Exterior wall sheathing paper: in accordance with Section 07 27 00 – Air Barriers.

2.2 ACCESSORIES

.1 Exposed trim: inside corners, outside corners, cap strip, drip cap, undersill trim, starter strip and window/door trim of same material, gloss, colour as cladding, with fastener holes pre-punched.

.2 Flashings: In accordance with Section 07 62 00 – Sheet Metal Flashing and Trim.

.3 Closures and Backer Rods: Closed-cell foam closures and backer rods to suit profiles selected.

.4 Insect Screen: Black fiberglass screen.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrate previously installed under other Sections or Contracts acceptable in accordance with manufacturer's written instructions.

3.2 PREPARATION

.1 Clean surfaces thoroughly prior to installation.

.2 Repair substrate flaws or defects before applying siding or soffits.

.3 Fur surfaces to even plane and free from obstructions.

.4 Prepare surfaces using methods recommended by manufacturer for achieving best result for substrate under project conditions.

3.3 MANUFACTURER'S INSTRUCTIONS

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

3.4 INSTALLATION

.1 Install steel siding in accordance with manufacturer's written instructions.

.2 Install exterior wall sheathing paper in accordance with Section 07 27 00 – Air Barriers.

.3 Install continuous starter strips, inside and outside corners, edgings, soffit, drip, cap, sill and window/door opening flashings as indicated.

.4 Install outside corners, fillers and closure strips with carefully formed and profiled work.

.5 Install soffit and fascia cladding as indicated.

.6 Maintain joints in exterior cladding, true to line, tight fitting, hairline joints.

.7 Attach components in manner not restricting thermal movement.

.8 Caulk junctions with adjoining work with sealant. Do work in accordance with Section 07 92 00- Joint Sealants.

3.5 CLEANING

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

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

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

3.6 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by preformed metal siding installation.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

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

1.2 REFERENCES

.1 Canadian General Standards Board (CGSB)

.1 CGSB 37-GP-56M-80b(A1985), Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing.

.2 Canadian Roofing Contractors Association (CRCA)

.1 CRCA Roofing Specifications Manual-1997.

.3 Factory Mutual (FM Global)

.1 FM Approvals - Roofing Products.

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

.1 Material Safety Data Sheets (MSDS).

.5 Underwriters Laboratories' of Canada (ULC)

.1 CAN/ULC-S701-05, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Convene pre-installation meeting one week prior to beginning waterproofing Work, with roofing contractor's representative and Departmental Representative in accordance with Construction Progress Schedule to:

.1 Verify project requirements.

.2 Review installation and substrate conditions.

.3 Co-ordination with other building subtrades.

.4 Review manufacturer's installation instructions and warranty requirements.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Provide two copies of most recent technical roofing components data sheets describing materials' physical properties and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Provide two copies of WHMIS MSDS in accordance with Section 01 35 29 - Health and Safety Requirements, and indicate VOC content for:

.1 Primers.

.2 Asphalt.

.3 Sealers.

.3 Provide shop drawings:

.1 Indicate flashing details.

.4 Manufacturer's Certificate: certify that products meet or exceed specified requirements.

.5 Test and Evaluation Reports: submit laboratory test reports certifying compliance of membrane with specification requirements.

.6 Manufacturer's Installation Instructions: indicate special precautions required for seaming the membrane.

1.5 QUALITY ASSURANCE

.1 Installer qualifications: company or person specializing in application of modified bituminous roofing systems approved by manufacturer.

1.6 FIRE PROTECTION

.1 Fire Extinguishers:

.1 Maintain one stored pressure rechargeable type with hose and shut-off nozzle,

.2 ULC labelled for A, B and C class protection.

.3 One extinguisher required on roof per torch applicator, within 6 m of torch applicator.

.2 Maintain fire watch for 1 hour after each day's roofing operations cease.

1.7 DELIVERY, STORAGE, AND HANDLING

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

.2 Storage and Handling Requirements:

.1 Safety: comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of asphalt, sealing compounds, primers and caulking materials.

.2 Provide and maintain dry, off-ground weatherproof storage.

.3 Store rolls of felt and membrane in upright position. Store membrane rolls with salvage edge up.

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

.5 Place plywood runways over completed Work to enable movement of material and other traffic.

.6 Store sealants at +5 degrees C minimum.

.7 Store insulation protected from daylight, weather and deleterious materials.

1.8 SITE CONDITIONS

.1 Ambient Conditions

.1 Do not install roofing when temperature remains below -18 degrees C for torch application.

.2 Minimum temperature for solvent-based adhesive is -5 degrees C.

.2 Install roofing on dry deck, free of snow and ice, use only dry materials and apply only during weather that will not introduce moisture into roofing system.

1.9 WARRANTY

.1 For Work of this Section 07 52 00 - Modified Bituminous Membrane Roofing, 12 months warranty period is extended to 60 months.

Part 2 Products

2.1 PERFORMANCE CRITERIA

.1 Compatibility between components of roofing system is essential. Provide written declaration to Departmental Representative stating that materials and components, as assembled in system, meet this requirement.

.2 Roofing System: to CSA A123.21 for wind uplift resistance.

2.2 OVERLAY BOARD & DECK COVERING

.1 Overlay Board: 6 mm thick asphalt based recovery board with non-woven glass facers, as recommended by the membrane manufacturer.

.1 Install over insulation and wood roof sheathing to provide torch safe surface.

2.3 MEMBRANE

.1 Base sheet membrane (deck only): to CGSB 37-GPP-56M.

.1 Styrene-Butadiene-Styrene (SBS) elastomeric polymer prefabricated sheet, polyester reinforcement, having nominal weight of 180 g/m^2

.2 Type 1.

.3 Class C - plain surfaced.

.4 Grade 1 - standard service.

.5 Top and bottom surfaces:

.1 polyethylene /polyethylene.

.6 Base sheet membrane properties: to CGSB 37-GP-56M.

.1 Strain energy (longitudinal/transversal): 9.0/7.0 kN/m.

.2 Breaking strength (longitudinal/transversal): 17.0/12.5 N/5 cm.

.3 Ultimate elongation (longitudinal/transversal): 60/65 %.

.4 Tear resistance: 60 N.

.5 Cold bending at -30 degrees C: no cracking.

.6 Softening point:[3] 110 degrees C.

.7 Static puncture resistance: 400.

.8 Dimensional Stability: -0.3 / 0.3 %.

.2 Cap sheet membrane (roof + deck): to CGSB 37-GP-56M.

.1 Styrene-Butadiene-Styrene(SBS) elastomeric polymer, prefabricated sheet, polyester reinforcement, having minimum nominal weight of 180 g/m^2.

.2 Type 1 and 2, fully adhered.

.3 Class A-granule surfaced where exposed and C-plain surfaced where covered.

.1 Colour for granular surface: gray (roof), black (deck)

.4 Grade 1-standard service.

.5 Bottom surface polyethylene.

.6 Cap sheet membrane properties: to CGSB 37-GP-56M.

.1 Strain energy (longitudinal/transversal): 11.0/11.4 kN/m.

.2 Breaking strength (longitudinal/transversal): 25.0/16.0 kN/m.

.3 Ultimate elongation (longitudinal/transversal): 60/65 %.

.4 Tear resistance: 80 N.

.5 Cold bending at -30 degrees C: No cracking.

.6 Softening point: ≥ 110 degrees C.

.7 Static puncture resistance: 400.

.8 Dimensional Stability: -0.2 / 0.2 %.

2.4 EXTRUDED POLYSTYRENE COMPOSITE INSULATION (CONCRETE TOPPING)

.1 Polystyrene: to CAN/ULC-S701, Type 4, thickness 102 mm to match existing.

.2 Concrete topping: latex modified concrete, 10 mm thick, smooth, colour grey.

.3 Size 600 x 1200 mm, tongue and groove edges.

.4 Fasteners: Standard type to suit application; hot dip galvanized or stainless steel.

.5 Edge Securement: Metal counter-flashing

.6 Corner Strapping: Minimum 22-gauge galvanized metal, 37mm wide, 2400mm long with 12mm hem both sides. Re-use existing where in good condition.

.7 Fasteners: Min. 25mm self-tapping concrete screws.

2.5 SEALERS

.1 Plastic cement: asphalt.

.2 Sealing compound: rubber asphalt type.

2.6 CARPENTRY

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

Part 3 Execution

3.1 QUALITY OF WORK

.1 Do examination, preparation and roofing Work in accordance with Roofing Manufacturer's Specification Manual and CRCA Roofing Specification Manual, particularly for fire safety precautions.

.2 Do priming in accordance with manufacturers written recommendations.

.3 Assembly, component and material connections will be made in consideration of appropriate design loads.

3.2 EXAMINATION OF ROOF DECKS

.1 Verification of Conditions:

.1 Inspect with Departmental Representative existing membrane conditions including parapets, construction joints, roof drains, plumbing vents and ventilation outlets to determine readiness to proceed.

.2 Evaluation and Assessment:

.1 Prior to beginning of work ensure:

.1 Existing membrane is firm, straight, smooth, dry, free of snow, ice or frost, and swept clean of dust and debris. Do not use calcium or salt for ice or snow removal.

.2 Curbs have been built.

.3 Roof drains have been installed at proper elevations relative to finished roof surface.

.4 Plywood and lumber nailer plates have been installed to deck, walls and parapets as indicated.

.3 Do not install roofing materials during rain or snowfall.

3.3 PROTECTION OF IN-PLACE CONDITIONS

.1 Cover walls, walks and adjacent work where materials hoisted or used.

.2 Use warning signs and barriers. Maintain in good order until completion of Work.

.3 Clean off drips and smears of bituminous material immediately.

.4 Dispose of rain water off roof and away from face of building until roof drains or hoppers installed and connected.

.5 Protect roof from traffic and damage. Comply with precautions deemed necessary by Departmental Representative.

.6 At end of each day's work or when stoppage occurs due to inclement weather, provide protection for completed Work and materials out of storage.

3.4 DECK COVERING

.1 Mechanically fasten to wood deck asphalt based recovery board with non-woven glass facers with screws to wood deck as recommended by manufacturer.

3.5 (EXPOSED) CONVENTIONAL MEMBRANE ROOFING (CMR) APPLICATION

.1 Overlay Board: adhesive application:

.1 Adhere overlay board to insulation with vulcanized adhesive at the rate of one litre per m^2.

.2 Place boards in parallel rows with end joints staggered. Cap joints approximately 25 mm.

.3 Cut ends to suit and apply adhesive in continuous ribbons at 300 mm on centre.

.2 Base sheet application:

.1 Starting at low point of roof, perpendicular to slope, unroll base sheet, align and reroll from both ends.

.2 Unroll and torch base sheet onto substrate taking care not to burn membrane or its reinforcement or substrate.

.3 Lap sheets 75 mm minimum for side and 150 mm minimum for end laps.

.4 Application to be free of blisters, wrinkles and fishmouths.

.3 Cap sheet application:

.1 Starting at low point on roof, perpendicular to slope, unroll cap sheet, align and reroll from both ends.

.2 Unroll and torch cap sheet onto base sheet taking care not to burn membrane or its reinforcement.

.3 Lap sheets 75 mm minimum for side laps and 150 mm minimum for end laps. Offset joints in cap sheet 300 mm minimum from those in base sheet.

.4 Application to be free of blisters, fishmouths and wrinkles.

.5 Do membrane application in accordance with manufacturer's recommendations.

.4 Flashings:

.1 Complete installation of flashing base sheet stripping prior to installing membrane cap sheet.

.2 Torch base sheet onto substrate in 1 metre wide strips.

.3 Lap flashing base sheet to membrane base sheet minimum 150 mm and seal by mopping or torch welding.

.4 Lap flashing cap sheet to membrane cap sheet 250 mm minimum and torch weld.

.5 Provide 75 mm minimum side lap and seal.

.6 Properly secure flashings to their support, without sags, blisters, fishmouths or wrinkles.

.7 Do work in accordance with Section 07 60 00- Flashing and Sheet Metal and manufacturer's recommendations.

.5 Roof penetrations:

.1 Seal existing roof penetrations to membrane in accordance with manufacturer's recommendations and details.

3.6 PROTECTED MEMBRANE ROOFING (PMR) APPLICATION

.1 Cap sheet application:

.1 Starting at low point on roof, perpendicular to slope, unroll cap sheet, align and reroll from both ends.

.2 Unroll and embed cap sheet in uniform coating of asphalt applied at rate of 1.2 kg/m^2, EVT at point of contact.

.3 Unroll and torch cap sheet onto base sheet taking care not to burn membrane or its reinforcement.

.4 Lap sheets 75 mm minimum for side laps and 150 mm minimum for end laps. Offset joints in cap sheet 300 mm from those in base sheet.

.5 Application to be free of blisters, fishmouths and wrinkles.

.6 Do membrane application in accordance with manufacturer's recommendations.

.2 Flashings:

.1 Complete installation of flashing base sheet stripping prior to installing membrane cap sheet.

.2 Torch sheet onto substrate in 1 metre wide strips.

.3 Lap flashing base sheet to membrane base sheet minimum 100 mm and seal by mopping or torch welding.

.4 Lap flashing cap sheet to membrane cap sheet 150 mm and torch weld.

.5 Provide 75 mm side lap and seal.

.6 Properly secure flashings to their support, without sags, blisters, fishmouths or wrinkles.

.7 Do Work in accordance with Section 07 60 00 - Flashing and Sheet Metal.

.3 Roof penetration:

.1 Install roof drain pans, vent stack covers and other roof penetration flashings and seal to membrane in accordance with the manufacturer's recommendations and details.

3.7 EXTRUDED POLYSTYRENE COMPOSITE INSULATION (CONCRETE TOPPING)

.1 Install roof panel assembly to manufacturer’s written instructions. Install panels tight, with butt joint lines and control joint lines, staggered from adjacent panel.

.2 Install panels with staggered joints in alignment.

.3 Maintain neat panel appearance.

3.8 FIELD QUALITY CONTROL

.1 Inspections:

.1 Inspection of roofing application will be carried out by testing laboratory designated by Departmental Representative.

.2 Costs of inspections will be paid by Departmental Representative.

3.9 CLEANING

.1 Remove bituminous markings from finished surfaces.

.2 In areas where finished surfaces are soiled caused by work of this section, consult manufacturer of surfaces for cleaning advice and complying with their [documented] instructions.

.3 Repair or replace defaced or disfigured finishes caused by work of this section.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 06 10 00 – Rough Carpentry: Plywood sheathing

.2 Section 07 62 00 – Sheet Metal Flashing and Trim: All roof flashings.

.3 Section 07 72 53 – Snow Guards.

1.2 REFERENCE STANDARDS

.1 ASTM International

.1 ASTM A653/A653M-10, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 ASTM A792/A792M-10, Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot Dip Process.

.3 ASTM D523-89(2008), Standard Test Method for Specular Gloss.

.4 ASTM D822-01(R2006), Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-37.5-M89, Cutback Asphalt Plastic Cement.

.2 CAN/CGSB-37.29-M89, Rubber-Asphalt Sealing Compound.

.3 Canadian Sheet Steel Building Institute (CSSBI)

.1 CSSBI 10M-08, Standard for Steel Roof Deck

.2 CSSBI 20M-08, Standard for Sheet Steel Cladding for Architectural, Industrial, and Commercial Building Applications.

.4 Canadian Standards Association

.1 CSA S136-16, North American Specification for the Design of Cold-Formed Steel Structural Members.

.5 Department of Justice Canada (Jus)

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

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

.1 Material Safety Data Sheets (MSDS).

.7 National Building Code of Canada 2015 (NBC).

.1 CCMC- Registry of Product Evaluations.

.8 Transport Canada (TC)

.1 Transportation of Dangerous Goods Act (TDGA), 1992.

1.3 DESIGN REQUIREMENTS

.1 Design roof system to resist:

.1 Snow loads and snow build-up and rain load, expected in this geographical region NBCC climatic data, 50 year probability: 2.2 kPa (S_s) and 0.1 kPa (S_r)

.2 Wind loads, positive and negative, expected in this geographical region NBCC climatic data, 50 year probability: 0.34 kPa

.3 Dead load of roof system.

.2 Deflection of the roof system is not to exceed 1/240thof the span for the specified live loading.

.3 Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, overstressing of components, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime sky heat loss.

.1 Temperature Change (Range): 20 deg C, ambient; 40 deg C, material surfaces

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 sheet metal roofing and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Proof of manufacturer's CCMC listing and listing number.

.3 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 29- Health and Safety Requirements.

.3 Samples:

.1 Submit duplicate 300 x 300 mm samples of each sheet metal material.

1.5 QUALITY ASSURANCE

.1 Provide a manufacturer’s written warranty: Furnish panel manufacturer’s written warranty covering failure of factory-applied exterior finish within the warranty period. Warranty period for finish: 40 years after the date of Substantial Completion.

1.6 DELIVERY, STORAGE AND HANDLING

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

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

.3 Storage and Handling Requirements:

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

.2 Store and protect sheet metal roofing from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

Part 2 Products

2.1 SHEET METAL MATERIALS

.1 Zinc coated steel sheet: to ASTM A653/A653M, commercial quality, with Z275 coating, extra smooth surface, prefinished as specified in 2.2.

2.2 PREFINISHED STEEL SHEET

.1 Prefinished steel with factory applied silicone modified polyester.

.1 Colour: Selected by Departmental Representative from manufacturer's standard range

.2 Specular gloss: 30 units +/-5 to ASTM D523.

.3 Coating thickness: 25 micrometres minimum.

.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 1000 hours minimum.

.2 Humidity resistance exposure period 1000 hours minimum.

2.3 ROOF SYSTEM COMPONENTS

.1 Clip System:

.1 Thermally responsive clips to be fabricated from a minimum of 0.91 mm steel, with minimum Z275 galvanized coating designed to accommodate expansion and contraction of the roof sheet.

.2 Roof Fasteners: As specified by manufacturer, to resist wind uplift and sliding snow forces.

.2 Prefinished Roof Sheet, exposed to exterior

.1 Profile: I-style ribs at 400 mm spacing with nap cap.

.2 Panel: Z275 galvanized (zinc coated) sheet steel conforming to ASTM A653M structural quality Grade 230 having a nominal core thickness 0.76mm.

.3 Acceptable Product: Tradition 100 Roofing by VicWest

.3 Snap Cap

.1 Provide 25 mm high snap caps for full length of the roof panel and retained by panel clips, fabricated from Z275 galvanized (zinc coated) sheet steel conforming to ASTM A653M structural quality Grade 230 having a minimum nominal core thickness 0.61mm. Finish and colour to match roof sheet.

2.4 ACCESSORIES

.1 Isolation coating: alkali resistant bituminous paint.

.2 Plastic cement: to CAN/CGSB-37.5.

.3 Underlayment: Synthetic or self-adhered high-temperature underlayment intended for metal roofs with the following minimum performance specifications:

.1 Tensile Strength: ≥ 20kN/m to ASTM E96-00.

.2 Water Transmission: Pass to ASTM D4869.

.3 Water Absorption: ≤ 0.1% to ASTM D1970.

.4 UV Exposure: ≥ 6 months to ASTM G90

.5 Acceptable Products:

.1 Henry Blueskin: Roof High Temp Roof Underlayment

.2 Soprema: Lastobond Shield HT

.3 Vicwest: Self-Adhered HT Underlayment

.4 Sealant: Section 07 92 00- Joint Sealants.

.5 Rubber-asphalt sealing compound: to CAN/CGSB-37.29.

.6 Closures: Foam and metal closures to suit profiles selected, to manufacturer's recommendations.

.7 Cleats: of same material, and temper as sheet metal: 50 mm minimum wide.

.1 Thickness: same as sheet metal being secured.

.8 Fasteners: concealed

.9 Washers: of same material as sheet metal, 1 mm thick with rubber packings.

.10 Touch-up paint: as recommended by sheet metal roofing manufacturer.

2.5 FABRICATION

.1 Fabricate roof components to comply with dimensions, profiles, gauges and details as shown on the shop drawings, including fascia and soffit panels and all companion flashing.

.2 Fabricate all components of the system in the factory, ready for field installation.

.3 Panel Lengths: Fabricate panels in one continuous length.

.4 Hem exposed edges on underside 12 mm, mitre and seal.

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

.6 Apply minimum 0.2 mm dry film thickness coat of plastic cement to both faces of dissimilar metals in contact.

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 sheet metal roofing installation in accordance with manufacturer's written instructions.

3.2 INSTALLATION

.1 Roof Materials:

.1 Underlayment: Install underlayment fully adhered to solid substrate according to manufacturer's recommendations. Ensure all joints are properly lapped and sealed. Tie in with barriers on adjacent surfaces to ensure airtight construction. Provide a continuous seal around all openings in the insulated metal roof system.

.2 Clip: Attach Tradition clips using fasteners as recommended by the manufacturer, to suit the substrate.

.2 Roof Panel Installation:

.1 Install exterior prefinished roof panels on panel support clips, using manufacturer's proper construction procedure. Ensure metal roofing sheet side-lap is positively retained by clips, and proper sheet coverage is maintained.

.2 Install the snap-cap at all side laps as shown on the approved shop drawings. Mitre snap-cap as required to resist water entry.

.3 Where indicated on approved shop drawings, secure the end-lap of metal roofing sheets in accordance with the manufacturers specifications and details to provide a weather-tight seal. Exposed fasteners to match colour of the roof sheet.

.4 Provide notched and formed closures, sealed against weather penetration, at changes in pitch, and at ridges and eaves, where required.

.5 Install all companion flashing as shown on the shop drawings. Use concealed fasteners when possible. Exposed fasteners to match colour of roof sheet.

3.3 CLEANING

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

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

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

3.4 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by sheet metal roofing installation.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 07 46 16 – Aluminum Siding.

.2 Section 07 46 19 – Steel Siding.

.3 Section 07 46 23 – Wood Siding.

.4 Section 07 52 00 – Modified Bituminous Membrane Roofing

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

.1 Material Safety Data Sheets (MSDS).

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.

.2 Submit two copies WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 35 33 - Health and Safety Requirements.

.3 Samples:

.1 Submit duplicate 50 x 50 mm samples of each type of sheet metal material, finishes and colours.

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.

1.5 DELIVERY, STORAGE AND HANDLING

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

Part 2 Products

2.1 BASE SHEET METAL MATERIALS

.1 Provide sheet metal in base metal thickness specified. 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 Zinc coated steel sheet: Z275 designation zinc coating.

2.2 PREFINISHED STEEL SHEET

.1 Prefinished steel with factory applied polyvinylidene fluoride resin on specified steel sheet substrate conforming to ASTM A755.

.1 Finished one side with wash coat on back.

.2 Colours to be selected by Departmental Representative from manufacturer's standard range.

.3 Specular gloss: 25 units +/- in accordance with ASTM D523.

.4 Coating thickness: not less than 22 micrometres.

2.3 ACCESSORIES

.1 Isolation coating: alkali resistant bituminous paint.

.2 Plastic cement: to CAN/CGSB 37.5.

.3 High Temperature Underlayment Membrane: Self-adhering high temperature membrane complete with compatible primer and sealant.

.4 Sealants: Refer to Section 07 90 00 – Joint Protection.

.5 Cleats: of same material, and temper as sheet metal, minimum 50 mm wide. Thickness same as sheet metal being secured. Gauge shall be sufficient to retain the flashings in place.

.6 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.

.7 Washers: of same material as sheet metal, 1 mm thick with rubber packings.

.8 Touch-up paint: as recommended by prefinished material manufacturer.

.9 Splash pads: precast concrete, 305 mm x 610 mm x 64 mm.

2.4 FABRICATION

.1 Metal flashing shall be as detailed, supplemented by recommendations of Canadian Roofing Contractors' Association Specifications and SMACNA architectural details.

.2 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.

.3 Form pieces in 2400 mm maximum lengths.

.1 Make allowance for expansion at joints.

.4 All free edges of metal flashing shall be strengthened by a fold at least 6mm wide, set out slightly and presenting a straight line and a neat finish.

.5 End joints where adjacent lengths of metal flashing meet shall be made using an S-joint. This shall be executed by inserting the end of one coping length in a 25-mm deep S-joint formed in the end of the adjacent length in a full bed of caulking compound. Concealed portion of the S-joint shall extend 25 mm outwards and be nailed to the substrate. Face nailing of the joints will not be permitted.

.6 The metal shall be formed on a bending brake. Shaping, trimming and hand-seaming shall be done on the bench as far as is practicable with the proper sheet-metal working tools. The angle of the bends and the folds for interlocking the metal shall be made with full regard to expansion and contraction to avoid buckling or fullness in the metal after it is in service and to avoid damaging the surface of the metal.

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

2.5 METAL FLASHINGS

.1 Form flashings, copings and fascias to profiles indicated of 0.45 mm (26 gauge) thick prefinished steel sheet metal.

2.6 CAP FLASHINGS

.1 Form metal cap flashing of 0.45 mm thick (26 gauge) prefinished steel sheet metal as detailed.

2.7 EAVES TROUGHS AND DOWNPIPES

.1 Form eaves troughs and downpipes from 22 gauge prefinished steel sheet metal.

.2 Sizes and profiles as indicated.

.3 Provide goosenecks, outlets, strainer baskets and necessary fastenings.

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 Provide underlay under sheet metal.

.1 Secure in place and lap joints 100 mm.

.2 Provide self-adhesive membrane to tie into adjacent assemblies.

.2 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.

.3 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

.4 Lock end joints and caulk with sealant.

.5 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.

.6 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.

.7 Construct internal and external mitres with properly shaped capping pieces.

.8 Slope all horizontal wall flashings 2% to exterior.

.9 Counter Flashings:

.1 Install counter flashings as soon as possible after membrane flashings are in place.

.2 Counter flashings shall have a folded, bottom-edge, stiffening break, where indicated, and shall extend up the vertical face of the wall or curb to height shown, then be turned into reglets or interlocked with cap flashings.

.10 Cap Flashings:

.1 Tops of walls, parapets, counter flashings and the like shall be cap flashed as detailed, after membrane and metal counter flashings are in place.

3.3 SCUPPERS

.1 Install scuppers as indicated.

3.4 EAVES TROUGHS AND DOWNPIPES

.1 Install eaves troughs and secure to building at 750 mm on centre with eaves trough screws through spacer ferrules.

.1 Slope eaves troughs to downpipes as indicated.

.2 Seal joints watertight.

.2 Install downpipes and provide goosenecks back to wall.

.1 Secure downpipes to wall with straps at 1800 mm on centre; minimum two straps per downpipe.

.3 Install splash pads as indicated.

3.5 CLEANING

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

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

.3 Leave work areas clean, free from grease, finger marks and stains.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Snow retention system for metal roofs.

1.2 RELATED REQUIREMENTS

.1 Section 07 61 00 – Sheet Metal Roofing

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

1.3 REFERENCES

.1 Aluminum Association (AA) - Aluminum Standards and Data, 2003 Edition.

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

.2 B85-03 - Standard Specification for Aluminum-Alloy Die Castings.

.1 B221-04a - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

1.4 SYSTEM DESCRIPTION

.1 Attachment system to attach to metal roof as follows:

.1 With only minor dimpling of panel seams.

.2 Without penetrations through roof seams or panels.

.3 Without use of sealers or adhesives.

.4 Without voiding roof warranty

.2 Components

.1 Non-penetrating aluminum brackets, and aluminum rods with coupling system.

.2 Aluminum “ice flags” centered in the middle of the panel to prevent sliding ice. Use over pedestrian areas.

.3 Design Requirements

.1 Bracket spacing and loading is based on specific project design.

.2 Based on snow load, climatic conditions, length of roof panel and width of panel; multiple rows of snow guards may be needed.

.3 Loading: Design snow guard system to resist minimum in-service vector load determined based on vertical snow load.

.4 Factor of safety: Utilize a factor of safety ≥ 2 to determine allowable loads from ultimate tested clamp tensile load values.

1.5 SUBMITTALS

.1 Product data: Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 11 55 - General Instructions.

.2 Shop Drawings:

.1 Submit shop drawings in accordance with Section 01 11 55 - General Instructions.

.2 Show locations of snow guards on roof and attachment spacing.

.3 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions.

.4 Closeout Submittals:

.1 Provide maintenance data for hardware complete with pertinent details, spare parts lists and warnings against harmful maintenance materials and practices for incorporation into manual specified in 01 78 00 Closeout Submittals.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Inspect material upon delivery and order replacements for any missing or defective items. Keep material dry, covered and off the ground until installed.

Part 2 Products

2.1 CLAMPS & STRAPS

.1 Manufactured from 6061-T6 aluminum extrusions conforming to ASTM B221 or aluminum castings conforming to ASTM B85 and to AA Aluminum Standards.

.2 Set screws: 300 series stainless steel, 18-8 allow, 10mm diameter with round nose point.

2.2 CROSS-MEMBERS

.1 Manufactured from extruded 25 mm diameter aluminum rod with aluminum coupler at end joints to ensure alignment and structural continuity.

.2 Acceptable Product:

.1 DualGard (CCD) by S-5 Metal Roof Innovations Ltd.

2.3 ICE AND SNOW CLIPS

.1 Aluminum, with rubber foot, minimum 75mm wide.

2.4 FINISH

.1 Powder coated finish to match metal roof colour.

Part 3 Execution

3.1 EXAMINATION

.1 Prior to beginning installation, verify that:

.1 Roof panel installation is complete.

.2 Panel attachment is sufficient to withstand loads applied by snow guard system.

.3 Installation will not impede roof drainage.

.2 Prior to beginning installation, verify that:

.1 Roof attachment is sufficient to withstand loads applied by snow guard system.

.2 Installation will not impede roof drainage.

3.2 PREPARATION

.1 Clean areas to receive attachments; remove loose and foreign matter that could interfere with installation or performance.

3.3 INSTALLATION

.1 Install system in accordance with manufacturer's instructions and approved Shop Drawings

.2 Snow Retention Systems

.1 Place clamps at maximum 800 mm on center or as required by in-service loads.

.2 Place clamps in straight, aligned rows.

.3 Place both set screws on same side of clamp.

.4 Tighten set screws to manufacturer's recommended torque. Randomly test set screw torque using calibrated torque wrench.

.5 Install cross members through holes in clamps and posts.

.6 Install coupler at cross member end joints.

.7 Tighten set screws against cross members at all “E” clamp and post locations.

.8 Do not cantilever cross members more than 4 inches beyond last clamp at ends.

.9 Install one snow clip per panel between panel seams.

3.4 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 RELATED REQUIREMENTS

.1 Section 07 05 00 – Common Work Results for Thermal and Moisture Protection

.2 Section 07 27 00 – Air Barriers.

.3 Section 07 46 16 – Aluminum Siding

.4 Section 07 46 19 – Steel Siding

.5 Section 07 52 00 – Modified Bituminous Membrane Roofing

.6 Section 07 61 00 – Sheet Metal Roofing.

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

.8 Division 08 – Openings.

1.2 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-19.17-M90, One-Component Acrylic Emulsion Base Sealing Compound.

.5 CAN/CGSB-19.24-M90, Multi-component, Chemical Curing Sealing Compound.

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

.1 Material Safety Data Sheets (MSDS).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for joint sealants and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Manufacturer's product to describe:

.1 Caulking compound.

.2 Primers.

.3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.

.3 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 33 - Health and Safety Requirements.

.3 Samples:

.1 Submit 2 samples of each type of material and colour.

.2 Cured samples of exposed sealants for each colour where required to match adjacent material.

.4 Manufacturer's Instructions:

.1 Submit instructions to include installation instructions for each product used.

1.4 CLOSEOUT SUBMITTALS

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

.2 Operation and Maintenance Data: submit operation and maintenance data for incorporation into manual.

1.5 DELIVERY, STORAGE AND HANDLING

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

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

.3 Storage and Handling Requirements:

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

.2 Replace defective or damaged materials with new.

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 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 Departmental Representative will arrange for ventilation system to be operated on maximum outdoor air and exhaust during installation of caulking and sealants indoors.

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 MATERIAL DESIGNATIONS

.1 Type 1: High performance, ultra-low modulus, one component, moisture curing silicone sealant.

.1 Locations: Perimeter of exterior openings.

.2 Acceptable Products:

.1 Dow Corning 790

.2 Sika Sikasil WS-290

.3 Tremco Spectrem 1.

.2 Type 2: High performance, medium modulus, one component, moisture curing silicone sealant, to CAN/CGSB-19.13.

.1 Locations: Glass to glass, glass to metal, and metal to metal in curtainwall joints and sheet metal roofing.

.2 Acceptable Products:

.1 Dow Corning 791

.2 Dow Corning 795

.3 Sika Sikasil WS-295

.4 Tremco Spectrem 2.

.3 Type 3: One component, paintable acrylic latex sealant to CGSB-19-GP-17M.

.1 Locations: Interior non-moving joints that may be painted.

.2 Acceptable Products:

.1 DAP Alex Plus

.2 Tremco Tremflex 834

.4 Colours of sealant to be selected by the Consultant from the range of manufacturer's standard colours.

.5 Acoustical sealant: to ASTM C919.

.6 Butyl: to CGSB 19-GP-14M.

.7 Preformed compressible and non-compressible back-up materials:

.1 Polyethylene, urethane, neoprene or vinyl foam:

.1 Extruded closed cell foam backer rod.

.2 Size: oversize 30 to 50 %.

.2 Neoprene or butyl rubber:

.1 Round solid rod, Shore A hardness 70.

.3 High density foam:

.1 Extruded closed cell polyvinyl chloride (PVC), extruded polyethylene, closed cell, Shore A hardness 20, tensile strength 140 to 200 kPa, extruded polyolefin foam, 32 kg/m^3 density, or neoprene foam backer, size as recommended by manufacturer.

.4 Bond breaker tape:

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

2.3 JOINT CLEANER

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

.2 Primer: in accordance with sealant manufacturer's written recommendations.

Part 3 Execution

3.1 EXTENT OF WORK

.1 Install sealants in all locations indicated.

.2 Install sealant at the perimeter of all exterior openings where doors, windows, grilles and other items abut or penetrate the exterior wall materials.

.3 At all door saddles, spread a bead of sealant compound over entire seat of saddles at least 3 mm (0.12 in.) thick before installing saddle.

.4 Seal the junctions of differing exterior wall materials.

.5 Provide a minimum of two continuous beads of sealant under all prefinished galvanized steel wall flashings.

.6 Install sealant on the interior of all exterior door and window frames.

3.2 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.

3.3 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 the middle of the joint as follows:

Joint Width	Sealant Depth
6 mm	6 mm
20 mm	10 mm
32 mm	13mm max
Minimum adhesion surface shall 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 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 74 11 - Cleaning.

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

.2 Clean adjacent surfaces immediately.

.3 Remove excess and droppings, using recommended cleaners as work progresses.

.4 Remove masking tape after initial set of sealant.

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

3.9 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

Door #	Room	Door					Frame				Fire Rating	Hard. Group	Key Sched	Comments
		Type	Size Width/ Height	Cons t.	Face Mat /Fin	Cut out	Type	Mat	Fin	Sill				
D024-1	024 - Vestibule	Exist.	2-914x2134	IHM	P	-	Exist.	AL	-	TBA	-	4		LHR/RHR. Install new door hardware on existing door.
D024-2	024 - Vestibule	Exist.	2-914x2134	HM	P	-	Exist.	WS	P	AL	-	3		LHR/RHR. Install new door hardware on existing door.
D100-1	100 - Vestibule	Exist.	1067x2134	TBA	AA	G	Exist.	TBA	AA	TBA	-	1		RHR. Remove existing deadbolt and install new hardware – patch door as required. Key to match existing.
D112-1	112 - Vestibule	D1	914x2134*	TBA	AA	-	1	WS	AA	TBA	-	5		RHR. Height of door to be confirmed. Key to match existing.
D118	118 – Janitor	Exist.	914x2134	HM	P	-	1	WS	P	AL	3/4 HR	2		LH
D119	119 – Roof Access	Exist.	914x2134	HM	P	G	1	WS	P	AL	3/4 HR	2		LHR
D201	201 – Mechanical Penthouse	D2	914x2134	IHM	P	G	2	TWS	P	TBA	-	6		LHR. Key to match existing.
DG101-1	G100 - Garage	Exist.	914x2134	SC	P	-	Exist.	WD	P	AL	-	-		Repaint existing door and frame
DG101-2	G100 - Garage	Exist.	2400x2400	SC	P	-	Exist.	WS	P	-	-	-		Repaint existing door and frame
DG101-3	G100 - Garage	Exist.	2400x2400	SC	P	-	Exist.	WS	P	-	-	-		Repaint existing door and frame
DG101-4	G100 - Garage	Exist.	2400x2400	SC	P	-	Exist.	WS	P	-	-	-		Repaint existing door and frame
DG101-5	G100 - Garage	Exist.	2400x2400	SC	P	-	Exist.	WS	P	-	-	-		Repaint existing door and frame

Material/Finish

AA	Anodized Aluminum
M	Metal
WD	AWMAC Architectural Grade Wood Door
P	Paint

Door Construction

AL	Aluminum
TBA	Thermally Broken Aluminum
HM	Hollow Metal
IHM	Insulated Hollow Metal
SC	Solid Core WD
MDM	Maximum Duty Metal

Frame Material

TBA	Thermally Broken Aluminum
TWS	Thermally Broken Welded Steel
WS	Welded Steel
MDM	Maximum Duty Metal
AL	Aluminum

Cutouts / Transom/Side light

G	Glazing
L	Louvres

Notes:

1. All door frame types to have welded corners.
2. For door and frame types, refer to **A703.**
3. All solid doors to be 44mm thick unless noted otherwise.
4. All exterior doors to be insulated and thermally broken

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 06 10 00 – Rough Carpentry.

.2 Section 07 27 00 – Air Barriers.

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

.4 Section 07 92 00 – Joint Sealants.

.5 Section 08 71 00 – Hardware.

.6 Section 09 91 00 – Painting.

1.2 REFERENCES

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

.1 ASTM A653/A653M-06a, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 ASTM B29-03, Standard Specification for Refined Lead.

.3 ASTM B749-03, Standard Specification for Lead and Lead Alloy Strip, Sheet and Plate Products.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.

.2 CGSB 41-GP-19Ma-84, Rigid Vinyl Extrusions for Windows and Doors.

.3 Canadian Standards Association (CSA International)

.1 CSA-G40.20-04/G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.2 CSA W59-03, Welded Steel Construction (Metal Arc Welding).

.4 Canadian Steel Door Manufacturers' Association (CSDMA)

.1 CSDMA, Recommended Specifications for Commercial Steel Doors and Frames, 2000.

.2 CSDMA, Selection and Usage Guide for Commercial Steel Doors, 1990.

.5 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S701-01, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

.2 CAN/ULC-S702-97, Standard for Thermal Insulation, Mineral Fibre, for Buildings.

.3 CAN/ULC-S704-03, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.

1.3 SYSTEM DESCRIPTION

.1 Design Requirements:

.1 Design exterior frame assembly to accommodate to expansion and contraction when subjected to minimum and maximum surface temperature of -35 degrees C to 35 degrees C.

.2 Maximum deflection for exterior steel entrance screens under wind load of 1.2 kPa not to exceed 1/175th of span.

.3 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104 for ratings specified or indicated.

.4 Provide fire labelled frames for openings requiring fire protection ratings. Test products in conformance with CAN4-S104, ASTM E152 and listed by nationally recognized agency having factory inspection services.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Provide shop drawings: in accordance with Section 01 33 00 - Submittal Procedures.

.1 Indicate each type of door, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, glazed, louvred, arrangement of hardware, fire rating and finishes.

.2 Indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors and exposed fastenings, reinforcing, fire rating, and finishes.

.3 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.

.4 Submit test and engineering data, and installation instructions.

1.5 DELIVERY, STORAGE AND HANDLING

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

Part 2 Products

2.1 MATERIALS

.1 Hot dipped galvanized steel sheet: to ASTM A653M, ZF75, minimum base steel thickness in accordance with CSDMA Table 1 - Thickness for Component Parts.

.2 Reinforcement channel: to CSA G40.20/G40.21, Type 44W, coating designation to ASTM A653M, ZF75.

2.2 DOOR CORE MATERIALS

.1 Stiffened: face sheets laminated, insulated core (exterior doors).

.1 Polyurethane: to CAN/ULC-S704 rigid, modified poly/isocyanurate, closed cell board. Density 32 kg/m³.

.2 Maximum Operable U-Factor: 0.29 to ASTM C1363.

.3 Maximum Calculated U-Factor: 0.09 to ASTM C518.

.4 Standard of Acceptance: SW FlemingTrio-E

2.3 ADHESIVES

.1 Polystyrene and polyurethane cores: heat resistant, epoxy resin based, low viscosity, contact cement.

.1 Polyurethane: to CAN/ULC-S704 rigid, modified poly/isocyanurate, closed cell board. Density 32 kg/m^3.

.2 Lock-seam doors: fire resistant, resin reinforced polychloroprene, high viscosity, sealant/adhesive.

2.4 PRIMER

.1 Touch-up prime CAN/CGSB-1.181.

2.5 PAINT

.1 Field paint steel doors and frames in accordance with Section 09 91 00 - Painting. Protect weatherstrips from paint. Provide final finish free of scratches or other blemishes.

2.6 ACCESSORIES

.1 Door silencers: single stud rubber/neoprene type.

.2 Exterior top and bottom caps: rigid polyvinylchloride extrusion conforming to CGSB 41-GP-19Ma.

.3 Fabricate glazing stops as formed channel, minimum 16 mm height, accurately fitted, butted at corners and fastened to frame sections with counter-sunk oval head sheet metal screws.

.4 Door bottom seal: Refer to Section 08 71 00 – Door Hardware.

.5 Metallic paste filler: to manufacturer's standard.

.6 Fire labels: metal riveted.

.7 Sealant: Refer to Section 07 92 00 – Joint Sealants.

.8 Astragals welded to doors where scheduled in Section 08 71 00 and on all exterior doors, minimum thickness 4.69 mm. Install astragals full length of door, do not cut to accommodate latch hardware.

2.7 FRAMES FABRICATION GENERAL

.1 Fabricate frames in accordance with CSDMA specifications.

.2 Fabricate frames to profiles and maximum face sizes as indicated.

.3 Exterior frames: 1.6 mm thermally broken type construction.

.4 Blank, reinforce, drill and tap frames for mortised, templated hardware using templates provided by finish hardware supplier. Reinforce frames for surface mounted hardware.

.5 Protect mortised cutouts with steel guard boxes.

.6 Prepare frame for door silencers, 3 for single door, 2 at head for double door.

.7 Manufacturer's nameplates on frames and screens are not permitted.

.8 Conceal fastenings except where exposed fastenings are indicated.

.9 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.

.10 Insulate exterior frame components with polyurethane insulation.

2.8 FRAME ANCHORAGE

.1 Provide appropriate anchorage to floor and wall construction.

.2 Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb.

.3 Provide 2 anchors for rebate opening heights up to 1520 mm and 1 additional anchor for each additional 760 mm of height or fraction thereof.

.4 Locate anchors for frames in existing openings not more than 150 mm from top and bottom of each jambs and intermediate at 660 mm on centre maximum.

2.9 FRAMES: WELDED TYPE

.1 Welding in accordance with CSA W59.

.2 Accurately mitre or mechanically joint frame product and securely weld on inside of profile.

.3 Cope accurately and securely weld butt joints of mullions, transom bars, centre rails and sills.

.4 Grind welded joints and corners to a flat plane, fill with metallic paste and sand to uniform smooth finish.

.5 Securely attach floor anchors to inside of each jamb profile.

.6 Weld in 2 temporary jamb spreaders per frame to maintain proper alignment during shipment.

.7 Securely attach lead to inside of frame profile from return to jamb soffit (inclusive) on door side of frame only.

2.10 DOOR FABRICATION GENERAL

.1 Doors: swing type, flush, with provision for glass and/or louvre openings as indicated.

.2 Exterior doors: hollow steel construction. Interior doors: honeycomb construction.

.3 Fabricate doors with longitudinal edges locked seam. Seams: visible.

.4 Blank, reinforce, drill doors and tap for mortised, templated hardware.

.5 Factory prepare holes 12.7 mm diameter and larger except mounting and through-bolt holes, on site, at time of hardware installation.

.6 Reinforce doors where required, for surface mounted hardware. Provide flush PVC top caps to exterior doors. Provide inverted, recessed, spot welded channels to top and bottom of interior doors.

.7 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.

.8 Provide fire labelled doors for those openings requiring fire protection ratings, as scheduled. Test such products in conformance with CAN4-S104 and list by nationally recognized agency having factory inspection service and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.

.9 Manufacturer's nameplates on doors are not permitted.

2.11 HOLLOW STEEL CONSTRUCTION

.1 Form face sheets for exterior doors from 1.6 mm sheet steel.

.2 Reinforce doors with vertical stiffeners, securely laminated to face sheets at 150 mm on centre maximum.

.3 Fill voids between stiffeners of exterior doors with polyurethane core.

2.12 THERMALLY BROKEN DOORS AND FRAMES

.1 Fabricate thermally broken doors by using insulated core and separating exterior parts from interior parts with continuous interlocking thermal break.

.2 Thermal break: rigid polyvinylchloride extrusion conforming to CGSB 41-GP-19Ma.

.3 Fabricate thermally broken frames separating exterior parts form interior parts with continuous interlocking thermal break.

.4 Apply insulation.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 INSTALLATION GENERAL

.1 Install labelled steel fire rated doors and frames to NFPA 80 except where specified otherwise.

.2 Install doors and frames to CSDMA Installation Guide.

3.3 FRAME INSTALLATION

.1 Set frames plumb, square, level and at correct elevation.

.2 Secure anchorages and connections to adjacent construction.

.3 Brace frames rigidly in position while building-in. Install temporary horizontal wood spreader at third points of door opening to maintain frame width. Provide vertical support at centre of head for openings over 1200 mm wide. Remove temporary spreaders after frames are built-in.

.4 Make allowances for deflection of structure to ensure structural loads are not transmitted to frames.

.5 Caulk perimeter of frames between frame and adjacent material.

.6 Maintain continuity of air barrier.

3.4 DOOR INSTALLATION

.1 Install doors and hardware in accordance with hardware templates and manufacturer's instructions and Section 08 71 00 - Door Hardware.

.2 Provide even margins between doors and jambs and doors and finished floor and thresholds as follows.

.1 Hinge side: 1.0 mm.

.2 Latchside and head: 1.5 mm.

.3 Finished floor, and thresholds: 13 mm.

.3 Adjust operable parts for correct function.

.4 Install louvres.

3.5 FINISH REPAIRS

.1 Touch up with primer finishes damaged during installation.

.2 Fill exposed frame anchors and surfaces with imperfections with metallic paste filler and sand to a uniform smooth finish.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Section Includes:

.1 Aluminum curtain wall.

.2 Aluminum entrance doors.

.3 Air barrier transitions and connections between air barriers of adjacent wall systems.

1.2 RELATED REQUIREMENTS

.1 Section 07 05 00 – Common Work Results for Thermal and Moisture Protection

.2 Section 07 27 00 – Air Barriers

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

.4 Section 07 92 00 – Joint Sealants.

.5 Section 08 80 00 – Glazing.

1.3 REFERENCE STANDARDS

.1 Aluminum Association (AA)

.1 AA DAF 45-03(R2009), Designation System for Aluminum Finishes.

.2 American Architectural Manufacturers Association (AAMA)

.1 AAMA CW-10-04, Care and Handling of Architectural Aluminum From Shop to Site.

.2 AAMA CW-11-85, Design Wind Loads and Boundary Layer Wind Tunnel Testing.

.3 AAMA T1R-A1-04, Sound Control for Fenestration Products.

.4 AAMA 501-05, Methods of Test for Exterior Walls.

.5 AAMA 611-98, Voluntary Specifications for Anodized Finishes Architectural Aluminum.

.6 AAMA 612-02, Voluntary Specifications, Performance Requirements, and Test Procedures for Combined Coatings of Anode Oxide and Transparent Organic Coatings on Architectural Aluminum.

.7 AAMA 2603-02, Voluntary Specification Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.

.8 AAMA 2604-05, Voluntary Specification Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.

.3 ASTM International

.1 ASTM A36/A36M-08, Specification for Carbon Structural Steel.

.2 ASTM A123/A123M-09, Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

.3 ASTM A167-99(2009), Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

.4 ASTM A653/A653M-09a, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.5 ASTM B209-07, Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

.6 ASTM B221-08, Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

.7 ASTM E283-04, Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

.8 ASTM E330-02, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls, by Uniform Static Air Pressure Difference.

.9 ASTM E331-00(2009), Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform Static Air Pressure Difference.

.10 ASTM E413-04, Classification for Rating Sound Insulation.

.11 ASTM E1105-00(2008), Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference.

.4 Canadian General Standards Board (CGSB)

.1 CAN/CGSB 1.108-M89, Bituminous Solvent Type Paint.

.2 CAN/CGSB-12.20-M89, Structural Design of Glass for Buildings.

.5 CSA Group (CSA)

.1 CSA G40.20/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.2 CSA S136-07, North American Specification for the Design of Cold Formed Steel Structural Members.

.3 CAN/CSA-S157/S157.1-05, Strength Design in Aluminum/Commentary on CAN/CSA-S157, Strength Design in Aluminum.

.4 CSA W59.2-M1991(R2008), Welded Aluminum Construction.

.6 National Research Council Canada (NRC)

.1 National Building Code of Canada 2015 (NBC).

.7 Society for Protective Coatings (SSPC)

.1 SSPC - Paint 20-02(R2004), Zinc Rich Coating, Type I - Inorganic and Type II - Organic.

.2 SSPC - Paint 25 - 97(R2004) BCS, Zinc Oxide, Alkyd, Linseed Oil and Primer for Use Over Hand Cleaned Steel Type 1 and Type 2.

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Co-ordination: co-ordinate work of this Section with installation of flashing placement, and air barrier placement.

.2 Pre-Installation Meetings:

.1 Convene pre-installation meeting 1 week prior to beginning work of this Section, with Contractor's Representative and Departmental Representative in accordance with Section 01 11 55 – General Instructions to:

.1 Verify project requirements.

.2 Review installation and substrate conditions.

.3 Co-ordination with other building subtrades.

.4 Review manufacturer's written installation instructions and warranty requirements.

1.5 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 curtain wall components, anchorage and fasteners, glass and infill, and internal drainage details and include product characteristics, performance criteria, physical size, finish and limitations and water flow diagrams.

.3 Shop Drawings:

.1 Indicate system dimensions, framed opening requirements and tolerances, adjacent construction, anchor details anticipated deflection under load, affected related Work, weep drainage network, expansion and contraction joint location and details, and field welding required.

.4 Delegated Design Submittals:

.1 Include framing member structural and physical characteristics, calculations, dimensional limitations, special installation requirements.

.5 Test Reports:

.1 Submit substantiating engineering data, test results of previous tests by independent laboratory which purport to meet performance criteria, and supportive data.

1.6 CLOSEOUT SUBMITTALS

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

.2 Operation and Maintenance Data: submit operation and maintenance data for [glazed aluminum curtain wall] for incorporation into manual.

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.

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

.3 Storage and Handling Requirements:

.1 Handle work of this Section in accordance with AAMA CW-10.

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

.3 Store and protect aluminum glazed curtain wall components from nicks, scratches, and blemishes.

.4 Protect prefinished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

.5 Replace defective or damaged materials with new.

1.8 AMBIENT CONDITIONS

.1 Install sealants when ambient and surface temperature is above 5 degrees C minimum.

.2 Maintain this minimum temperature during and for 48 hours minimum after installation of sealants.

1.9 WARRANTY

.1 Contractor hereby warrants that glazed aluminum curtain wall will function as specified in accordance with CCDC 24, but for 60 months.

Part 2 Products

2.1 SYSTEMS

.1 Description:

.1 Vertical glazed aluminum curtain wall system includes thermally broken tubular aluminum sections with self-supporting framing, shop fabricated, factory prefinished, vision glass; related flashings, anchorage and attachment devices.

.2 Assembled system to permit re-glazing of individual glass (and infill panel) units from exterior without requiring removal of structural mullion sections.

.2 Performance Requirements:

.1 Unless specified otherwise, glazing systems shall be designed to the following standards and references:

.1 IGMA 'North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use'.

.2 GANA 'Glazing Manual'.

.3 GANA 'Sealant Manual'.

.4 American Architectural Manufacturers Association (AAMA).

.2 Removal and replacement of broken lites of glass shall be possible without cutting metal or moving the main frame in relation to the anchors.

.3 Setting blocks and their supports (when used) shall incorporate a restraining method to prevent them from being pumped through the exterior weather seal. If approved by the sealant manufacturer and the insulating glass manufacturer setting blocks may not be required providing the structural silicone design shear load is not exceeded as specified herein.

.4 Design and size components to withstand dead and live loads caused by pressure and suction of wind, acting normal to plane of system as calculated in accordance with National Building Code of Canada (NBC) to a design pressure required by the NBC as measured to ASTM E330.

.5 Design and size components to withstand seismic loads and sway displacement as calculated in accordance with applicable codes.

.6 Limit mullion deflection to L/240 with full recovery of glazing materials.

.7 Size glass units and glass dimensions to limits established in CAN/CGSB-12.20.

.8 Glazing that extends to a dimension of less than 1070 mm (42") above the adjacent finished floor level which is greater than 600 mm (24") above the ground on the exterior or interior of the building, shall have the glass, mullions and connections be designed as a guard to the following:

.1 The building code requirements for guards.

.2 The building code requirements for glazing subject to human impact.

.9 Ensure system is designed to accommodate the following without damage to components or deterioration of seals:

.1 Movement within system.

.2 Movement between system and perimeter framing components.

.3 Dynamic loading and release of loads.

.4 Deflection of structural support framing.

.10 Limit air infiltration through assembly to 0.0003 $m^3/s/m^2$ of wall area, measured at a reference differential pressure across assembly of 75 Pa as measured in accordance with AAMA 501.

.11 Vapour seal with interior atmospheric pressure of 25 mm sp, 22 degrees C, 40% RH: no failure.

.12 Water leakage: none, when measured to AAMA 501.

.13 Ensure system allows for expansion and contraction within system components when temperature range is 95 degrees C over 12 hour period without causing detrimental affect to system components.

.14 Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to exterior by weep drainage network.

.15 Maintain continuous air barrier and vapour retarder throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound.

.1 Position thermal insulation on exterior surface of air barrier and vapour retarder.

.16 Ensure no vibration harmonics, wind whistles, noises caused by thermal movement transmitted to other building elements, loosening, weakening, or fracturing of attachments or components of system occur.

.17 Reinforce curtain wall system to accommodate window washing guide rails.

.1 Supply sufficiently rigid anchors to resist loads caused by equipment platform, without damage to wall system.

2.2 MATERIALS

.1 Extruded aluminum: to ASTM B221.

.2 Sheet aluminum: to ASTM B209.

.3 Sheet steel: to CSA S136; galvanized

.4 Anchors: 3-way adjustable hot-dip galvanized cast iron.

.5 Fasteners: finish to match curtain wall.

.6 Bituminous paint: CAN/CGSB 1.108, without thinner.

.7 Insulating glass units: In accordance with Section 08 80 00 – Glazing.

.8 Thermal Break: Glass fibre reinforced polyamide porthole extrusion.

.9 Sealant: Refer to Section 07 92 00 – Joint Sealants.

2.3 COMPONENTS

.1 Mullion profile:

.1 Thermally broken with interior tubular section insulated from exterior pressure plate.

.2 Matching stops and pressure plate of sufficient size and strength to ensure adequate bite on glass.

.3 Drainage holes, deflector plates and internal flashings to accommodate internal weep drainage system.

.4 Internal mullion baffles to eliminate "stack effect" air movement within internal spaces.

.2 Flashings: 3 mm thick aluminum to match curtain wall mullion sections where exposed, concealed fastening method

.3 Aluminum Doors: medium stile, thermally broken, double glazed.

.1 Install as integral part of entrances

.2 Reinforce mechanically-joined corners of doors to produce sturdy door unit.

.3 Glazing stops: interlocking snap-in type for dry glazing. Exterior stops: tamperproof type.

.4 Gasketing: To CCD-45 Silicone compatible rubber or extruded silicone gaskets.

.5 Spacers and Setting Blocks as recommended by manufacturer.

.6 Vapour retarder: connect to existing polyethylene vapour barrier.

.7 Air barrier: specified in Section 07 27 00- Air Barriers.

.8 Sealant: Refer to Section 07 92 00 – Joint Sealants.

.9 Sealant Bond Breaker: Open cell foam backer rod sized to suit project requirements.

.10 Liquid Foam Insulation: Single component, moisture cure, low expansion rate spray-in-place polyurethane liquid foam insulation to ULC-S710.1 and in accordance with manufacturer's written recommendations.

.11 Miscellaneous Components: Covers, copings, special flashings, filler pieces, termination pieces, cap closures, expansion joint covers, and metal bellows to match curtain wall system as indicated.

2.4 FABRICATION

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

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

.3 Prepare components to receive anchor devices. Install anchors.

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

.5 Prepare system components to receive hardware specified in Section 08 71 00 – Door Hardware.

.6 Reinforce framing members for external imposed loads.

.7 Visible manufacturer's identification labels not permitted.

.8 Finishes:

.1 Finish coatings: conform to AAMA 611

.2 Exterior exposed aluminum surfaces: to A42 anodized to 215-R1, pre-treatment, anodized to match existing curtain wall colour.

.3 Touch-up primer for galvanized steel surfaces: SSPC 20 Paint zinc rich.

.4 Concealed steel items: galvanized in accordance with 600 ASTM A123 gm/m^2.

.5 Apply 1 coat[s] of bituminous paint to concealed aluminum and steel surfaces in contact with cementitious or dissimilar materials.

2.5 SOURCE QUALITY CONTROL

.1 Perform work in accordance with AAMA GSM-1.

.2 Manufacturer qualifications: company specializing in manufacturing the products specified in this section with minimum 3 years experience.

.3 Installer qualifications: company specializing in performing the work of this section

.4 Perform welding Work in accordance with CSA W59.2.

Part 3 Execution

3.1 EXAMINATION

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

3.2 INSTALLATION

.1 Install curtain wall system in accordance with manufacturer's instructions.

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

.3 Use alignment attachments and shims to permanently fasten system to building structure. Clean weld surfaces; apply protective primer to field welds and adjacent surfaces.

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

.5 Use thermal isolation where components penetrate or disrupt building insulation.

.6 Install sill flashings.

.7 Co-ordinate attachment and seal of perimeter air barrier and vapour retarder materials.

.8 Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

.9 Install glass in accordance with Section 08 80 00 - Glazing, to glazing method required to achieve performance criteria. Place sealant on the up-slope side of the pressure plate cover caps; finish the surface with a slope to encourage drainage over the cap.

.10 Install perimeter sealant to method required to achieve performance criteria.

.11 Install doors and hardware in accordance with hardware templates and manufacturer's instructions.

.12 Adjust door components to ensure smooth operation.

3.3 SITE TOLERANCES

.1 Maximum variation from plumb: 1.5 mm/m non-cumulative or 12 mm/30 m, whichever is less.

.2 Maximum misalignment of two adjoining members abutting in plane: 0.8 mm.

.3 Maximum sealant space between curtain wall and adjacent construction: 13 mm.

3.4 ADJUSTING

.1 Adjust operating sash for smooth operation.

3.5 CLEANING

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

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

.2 Remove protective material from prefinished aluminum surfaces.

.3 Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

.4 Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

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

3.6 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by glazed aluminum curtain wall installation.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 07 05 00 – Commons Work Results for Thermal and Moisture Protection

.2 Section 07 27 00 – Air Barriers

.3 Section 07 60 00 – Flashing and Sheet Metal

.4 Section 07 90 00 – Joint Protection

1.2 REFERENCE STANDARDS

.1 CSA Group (CSA)

.1 AAMA/WDMA/CSA 101/I.S.2/A440-11(R2016), NAFS - North American Fenestration Standard for Windows, Doors, and Skylights.

.2 CSA A440S1-09, Canadian Supplement to AAMA/WDMA/CSA 101/1.S.2/A440, NAFS - North American Fenestration Standard for Windows, Doors, and Skylights.

.3 CAN/CSA-A440.2-14 /A440.3 14, Fenestration energy performance/User guide to CSA A440.2, Fenestration energy performance.

.4 CAN/CSA-A440.4-07(R2016), Window, Door, and Skylight Installation

.5 CAN/CSA-Z91-02(R2013), Health and Safety Code for Suspended Equipment Operations.

.2 Screen Manufacturers Association (SMA)

.1 SMA 1201R-2012 Specification for Insect Screens for Windows, Sliding Doors and Swinging Doors.

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Pre-Installation Meetings:

.1 Convene pre-installation meeting 1 week prior to beginning work of this Section, with Departmental Representative and Contractor's Representative in accordance with Section 01 11 55 – General Instructions to:

.1 Verify project requirements.

.2 Review installation and substrate conditions.

.3 Co-ordination with other construction subtrades.

.4 Review manufacturer's written installation instructions and warranty requirements.

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

.2 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 33 - Health and Safety Requirements.

.3 Shop Drawings:

.1 Indicate materials and details in full size scale for head, jamb and sill, profiles of components, elevations of unit, anchorage details, description of related components and exposed finishes, fasteners, and caulking. Indicate location of manufacturer's nameplates.

.2 Indicate locations, dimensions, openings and requirements of related work.

.4 Test and Evaluation Reports:

.1 Submit test reports from approved independent testing laboratories, certifying compliance with specifications.

.2 All test reports that reference the NAFS must include, on the first page, a summary of the results including, at minimum:

.1 The product manufacturer.

.2 The type of product.

.3 The model number/series number.

.4 The primary product designation.

.5 The secondary product designation.

.1 Positive design pressure.

.2 Negative design pressure.

.3 Water penetration resistance test pressure.

.4 Canadian air infiltration and exfiltration levels.

.6 The test completion date.

.3 The report will also contain the following information:

.1 Test dates.

.2 Report preparation dates.

.3 Test information retention period.

.4 Location of testing facilities.

.5 Full description of test samples, including:

.1 Enamelled finish, weathering characteristics.

.2 Condensation resistance.

.3 Forced entry resistance.

.4 Mullion deflection - combination and composite windows.

.6 Complete description of amendments, as applicable.

.7 Conclusion.

.8 Drawings signed by the testing laboratory, if provided.

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 windows for incorporation into manual.

1.6 QUALITY ASSURANCE

.1 Certifications: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.2 Mock-Up:

.1 Provide site mock-up for work of this Section indicating methods and materials, and procedures proposed to achieve final results in accordance with Section 01 45 00– Quality Control, and to comply with following requirements, using materials indicated for completed work:

.1 Build mock-ups in location and of size as directed by Departmental Representative.

.2 Obtain Departmental Representative 's acceptance of mock-ups before starting construction; mock-up used throughout construction period as standard of acceptance for subsequent work.

.3 Mock-up may form part of permanent structure when accepted by Departmental Representative; repair or replace unacceptable mock-ups at no additional cost to Owner.

1.7 DELIVERY, STORAGE AND HANDLING

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

1.8 WARRANTY

.1 Manufacturer's warranty: Submit, for Departmental Representative acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty in addition to and not limit other rights Owner may have under Contract Documents.

Part 2 Products

2.1 MATERIALS

.1 Materials: to AAMA/WDMA/CSA 101/I.S.2/A440 supplemented as follows:

.2 Windows by same manufacturer.

.3 Main frame: Fibreglass.

.4 Glass: Refer to Section 08 80 00 - Glazing

.5 Complete with anchoring devices.

.6 Sealants: Refer to Section 07 90 00 – Joint Protection.

2.2 WINDOW TYPE AND CLASSIFICATION

.1 Product type:

.1 FW- Fixed window.

.2 Classification rating: to AAMA/WDMA/CSA 101/I.S.2/A440.

.1 Primary designation:

.1 Performance classes: LC.

.2 Performance categories: 25.

.2 Secondary designation:

.1 Water penetration resistance test pressure: >500 Pa

.2 Canadian air infiltration and exfiltration levels: Fixed, A3.

.3 Design wind pressure: >4000 Pa.

.3 Surface condensation control: compliant with standard CAN/CSA-A440.2/A440.3.

.4 Ancillary properties (Energy rating) based on Glazing Specified in Section 08 80 00 - Glazing.

.1 Overall coefficient of heat transfer (Usi-factor) ≤0.80

.2 Solar heat gain coefficient (SHGC) <0.35

.3 Visible transmittance (VT) >50%

2.3 FABRICATION

.1 Fabricate in accordance with AAMA/WDMA/CSA 101/I.S.2/A440 supplemented as follows:

.2 Fabricate units square and true with maximum tolerance of plus or minus 1.5 mm for units with a diagonal measurement of 1800 mm or less, and plus or minus 3 mm for units with a diagonal measurement over 1800 mm.

.3 Face dimensions detailed maximum permissible sizes.

.4 Brace frames to maintain squareness and rigidity during shipment and installation.

.5 Finish steel clips and reinforcement with zinc coating to ASTM A123/A123M.

2.4 ENAMEL COATING

.1 Enamel coating: in accordance with AAMA/WDMA/CSA 101/I.S.2/A440, including appendices, supplemented as follows:

.1 Standard colour to match existing fiberglass windows.

2.5 GLAZING

.1 Glaze windows in accordance with AAMA/WDMA/CSA 101/I.S.2/A440.

2.6 AIR BARRIER AND VAPOUR RETARDER

.1 Equip window frames with site installed air barrier material for sealing to building air barrier as follows:

.1 Material: identical to, or compatible with, building air barrier and vapour retarder materials to provide required air tightness and vapour diffusion control throughout exterior envelope assembly.

.2 Material width: adequate to provide required air tightness and vapour diffusion control to building air barrier from interior.

Part 3 Execution

3.1 EXAMINATION

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

3.2 INSTALLATION

.1 Window installation:

.1 Install in accordance with AAMA/WDMA/CSA 101/I.S.2/A440.

.2 Arrange components to prevent abrupt variation in colour.

.2 Caulking:

.1 Seal joints between windows and window sills with sealant. Bed sill expansion joint cover plates and drip deflectors in bedding compound. Caulk between sill upstand and window-frame. Caulk butt joints in continuous sills.

.2 Apply sealant in accordance with Section 07 90 00- Joint Protection. Conceal sealant within window units except where exposed use is permitted by Departmental Representative.

3.3 CLEANING

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

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

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

3.4 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by window installation.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 08 11 00 – Metal Doors and Frames.

.2 Section 08 44 13 – Glazed Aluminum Curtain Walls.

1.2 REFERENCES

.1 American National Standards Institute (ANSI) / Builders Hardware Manufacturers Association (BHMA)

.1 ANSI/BHMA A156.1-2000, American National Standard for Butts and Hinges.

.2 ANSI/BHMA A156.2-2003, Bored and Preassembled Locks and Latches.

.3 ANSI/BHMA A156.3-2001, Exit Devices.

.4 ANSI/BHMA A156.4-2000, Door Controls - Closers.

.5 ANSI/BHMA A156.5-2001, Auxiliary Locks and Associated Products.

.6 ANSI/BHMA A156.6-2005, Architectural Door Trim.

.7 ANSI/BHMA A156.8-2005, Door Controls - Overhead Stops and Holders.

.8 ANSI/BHMA A156.12-2005, Interconnected Locks and Latches.

.9 ANSI/BHMA A156.13-2002, Mortise Locks and Latches Series 1000.

.10 ANSI/BHMA A156.16-2002, Auxiliary Hardware.

.11 ANSI/BHMA A156.18-2006, Materials and Finishes.

.2 Canadian Steel Door and Frame Manufacturers' Association (CSDMA)

.1 CSDMA Recommended Dimensional Standards for Commercial Steel Doors and Frames - 2009.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Submit electronic copy of the Hardware Schedule to the Consultant for review.

.3 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for door hardware and include product characteristics, performance criteria, physical size, finish and limitations.

.4 Hardware List:

.1 Submit contract hardware list.

.2 Indicate specified hardware, including make, model, material, function, size, finish and other pertinent information.

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

.6 Manufacturer's Instructions: submit manufacturer's installation instructions.

1.4 CLOSEOUT SUBMITTALS

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

.2 Operation and Maintenance Data: submit operation and maintenance data for door hardware for incorporation into manual.

.3 Submit manufacturer's parts lists and instructions for closers, locksets, exit devices and electronics upon completion of work.

1.5 MAINTENANCE MATERIALS SUBMITTALS

.1 Extra Stock Materials:

.1 Supply maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.

.2 Tools:

.1 Supply two (2) sets of wrenches for door closers, locksets and fire exit hardware.

1.6 QUALITY ASSURANCE

.1 Regulatory Requirements:

.1 Hardware for doors in fire separations and exit doors certified by a Canadian Certification Organization accredited by Standards Council of Canada.

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

.3 Make a detailed review of the Schedule of Finish Hardware and make whatever allowance in tender price appropriate to accommodate changes which may be necessary.

.4 Supplier must be an established contract builders' hardware firm. Persons responsible for the complete finish hardware contract for this project, including: scheduling, detailing, ordering and coordinating hardware, shall be experienced Architectural Hardware Consultants (AHC) and members in good standing with the Door and Hardware Institute (DHI). This representative shall provide the architect with a written report confirming that all hardware items, including electronics, are installed in accordance with the manufacturers' installation instructions and are adjusted and operating properly.

.5 All finish hardware to conform to CAN/CGSB 69-GP Series-M90/ANSI/BHMA-A156 Series.

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.

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

.3 Package finishing hardware separately for each opening. Identification shall correspond with hardware list symbols. Label all packages legibly, indicating manufacturer's number, type, size and hardware list reference number. Wrap hardware and include screws, bolts and fastenings necessary for proper installation in the package.

.4 Deliver all items of hardware to the job site in manufacturer's original packages. Clearly mark each item with the proper opening number.

.5 Storage and Handling Requirements:

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

.2 Store and protect door hardware from nicks, scratches, and blemishes.

.3 Protect prefinished surfaces with wrapping.

.4 Replace defective or damaged materials with new.

1.8 PRE-APPROVED ALTERNATES

.1 Bid only those products specified; or for the purpose of tendering, products listed as equivalents or other pre-approved alternative.

.2 Substituted non-approved items will be replaced with specified items and all related costs will be borne by the supplier. This project will be inspected upon completion to ensure compliance.

.3 Submit requests for approval of alternative material or product in writing to the Consultant no later than ten (10) days prior to bid closing. Submissions shall be made in duplicate. Provide samples of the products and finishes proposed if and when requested by the Consultant.

1.9 WARRANTY

.1 All finish hardware shall be guaranteed by the hardware manufacturer, with written certification, for a period of one (1) year from the date of "substantial completion" against any defects in the design, materials and workmanship, except closers and exit devices. Closers shall have a five (5) year guarantee and exit devices shall have a three (3) year guarantee. Any defects will be made good by the manufacturer at no additional cost to the owner.

Part 2 Products

2.1 DESIGN PRINCIPALS AND STANDARDS

.1 Hardware for fire doors shall meet Underwriters requirements. Submit written certification of conformance to ULC requirements for each type of hardware prior to delivery.

.2 All doors shall be accessible to residents in wheelchairs, including public and common areas.

.3 All doors to be handicap accessible and shall have lever handles consistent with the specified grade of locks for that application.

2.2 MATERIALS

.1 Use one manufacturer's products only for similar items.

.2 Hardware shall be best grade, entirely free from imperfections in manufacture and finish and shall be supplied in accordance with the hardware list specified herein.

.3 The following list of manufacturers and products are considered approved for this project and no variations from the listed or pre-approved items will be permitted.

.4 Installed items to be equal in all respects to approved samples.

.5 Supply all templates as required. Frame manufacturer will allow for maximum swing of doors when templating for closers. On pairs of doors RHR leaf is to be active unless otherwise noted.

.6 Package hardware with all necessary screws and fittings, clearly labelled with door number as per Door Schedule, as to intended location. Include all necessary installation instructions.

.7 Any doors not listed shall have hardware as listed for similar locations.

2.3 MANUFACTURERS – STANDARD OF ACCEPTANCE

.1 Hinges: McKinney.

.1 Note: All hinges to be 3 knuckle with 2 concealed bearings, material and finish as specified.

.2 Locksets, Latchsets and Privacy sets: Sargent 7900 Series; 7 Line Series

.3 Deadbolt/Deadlatch: Adams Rite 2190 Series; 4900 Series

.4 Exit Devices: Sargent 80 Series x 32D.

.5 Closers: Sargent 351 Series; Sargent 1431 Series.

.1 All closers must be ULC listed and certified under ANSI standards A156.4 Grade 1. Use one manufacturer for all closer units throughout the work.

.6 Electric Strikes: Hes or Adams Rite

.7 Door Stops & Pulls: Gallery.

.8 Kick Plates: Gallery.

.9 Thresholds, Seals and Door Bottoms: KN Crowder; Pemko.

.1 ULC fire/sound/smoke labels where required.

.2 Thresholds for all doors shall allow for passage of a wheelchair.

.10 Overhead Stops: Rixson.

2.4 FASTENINGS

.1 Use only fasteners provided by manufacturer. Failure to comply may void warranties and applicable licensed labels.

.2 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.

.3 Exposed fastening devices to match finish of hardware.

.4 Where pull is scheduled on one side of door and push plate on other side, supply fastening devices, and install so pull can be secured through door from reverse side. Install push plate to cover fasteners.

.5 Use fasteners compatible with material through which they pass.

2.5 KEYING

.1 Project to be master keyed to existing system.

.2 Provide each cylinder with two keys, not stamped "Do Not Duplicate".

.3 Provide 6 each master keys.

.4 Supply construction cores and provide 6 each construction keys

.5 Deliver master keys directly to owner

.6 Keying schedule to be submitted by hardware supplier for owner's approval.

.7 Hand over permanent cores and keys to Owner.

2.6 FINISH

.1 All hardware finishes shall match throughout the project, generally satin chrome, stainless steel or as noted in the finish hardware schedule.

Part 3 Execution

3.1 COOPERATION

.1 Confer with the various sections of work and refer to the detail drawings before ordering hardware to be sure that it will conform to and fit actual conditions on the job.

.2 Before furnishing hardware, check drawings for hardware requirements, verify door swings, check shop drawings, frame and door lists, and advise in writing if revisions are required. Ensure early delivery of hardware required for this project.

.3 Supply complete information and templates required by the metal door and fame manufacturers to provide reinforcing for the application of hardware.

.4 Submit the names of hardware manufacturers used in the preparation of the Tender. If the manufacturer's names are not stated, it shall be understood to mean that the hardware will be purchased from the manufacturers specified.

.5 Submit cuts, illustrations or samples of the following items proposed for this project immediately following award of Contract and before ordering hardware:

.1 Hinges

.2 Locksets

.3 Latchsets & Strikes

.4 Exit Devices

.5 Closers

.6 Specialty Items

3.2 INSTALLATION

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

.2 Supply metal door and frame manufacturers with complete instructions and templates for preparation of their work to receive hardware.

.3 Supply manufacturers' instructions for proper installation of each hardware component.

.4 Install hardware to standard hardware location dimensions in accordance with CSDFMA Canadian Metric Guide for Steel Doors and Frames (Modular Construction).

.5 Where door stop contacts door pulls, mount stop to strike bottom of pull.

.6 Install key control cabinet.

.7 Use only manufacturer's supplied fasteners.

.1 Use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.

.8 Remove construction cores when directed by Consultant.

.1 Install permanent cores and ensure locks operate correctly.

3.3 ADJUSTING

.1 Adjust door hardware, operators, closures and controls for optimum, smooth operating condition, safety and for weather tight closure.

.2 Lubricate hardware, operating equipment and other moving parts.

.3 Adjust door hardware to ensure tight fit at contact points with frames.

3.4 CLEANING

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

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

.2 Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacturer's instructions.

.3 Remove protective material from hardware items where present.

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

3.5 DEMONSTRATION

.1 Maintenance Staff Briefing:

.1 Brief maintenance staff regarding:

.1 Proper care, cleaning, and general maintenance of projects complete hardware.

.2 Description, use, handling, and storage of keys.

.3 Use, application and storage of wrenches for door closers, locksets, and fire exit hardware.

.2 Demonstrate operation, operating components, adjustment features, and lubrication requirements.

3.6 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by door hardware installation.

3.7 SCHEDULE

.1 Hardware group No. 1 (Existing Main Entry Door)**:**

1	Ea.	Interconnected Deadbolt/Deadlatch	2190-311-1-MW	32D

REMOVE EXISTING DEADBOLT AND EXTERIOR PULL AND MODIFY EXISTING DOOR TO SUIT NEW HARDWARE. PATCH DOOR AS REQUIRED TO MATCH EXISTING FINISH.

.2 **Hardware group No. 2** (Existing Interior Doors)

1	Ea.	Door Bottom Sweep	315CN
1	Ea.	Threshold	151A

.1 **Hardware group No. 3** (Existing Interior Doors)

2	Ea.	Door Bottom Sweep	315CN
1	Ea.	Threshold	151A

.2 **Hardware group No. 4** (Existing Exterior Door)

2	Ea.	Automatic Door Bottom	CT-52	

.3 **Hardware group No. 5** (New Staff Entry Door)

1	Ea.	Deadlatch	4900-3	313
1	Ea.	Mortise Cylinder	Match Existing	
1	Ea.	Deadlatch handle	4569	130
1	Ea.	Electric Strike	7100-0-3-1-0	313
1	Ea.	Power Supply	PS-1	
1	Ea.	Power Harness	To Suit	
1	Ea.	Continuous Hinge	MCK-12HD	CL
1	Ea.	Door Closer / stop	351-O-Top Jamb	EN
1	Ea.	Door Pull	1180-2	32D
1	Ea.	Door Sweep	By Door Supplier	
1	Ea.	Auto Bottom	CT-52	
1	Ea.	Threshold	1-CT-44-1 X 1/CT-42 X 1 FROST INSERT	

PROVIDE ALL ELECTRICAL BOXES, LINE VOLTAGE WIRING, CONDUIT AND CONNECTIONS. PROVIDE ROUGH-IN FOR FUTURE CARD READER, INCLUDING: JUNCTION BOX FOR CARD READER; MIN. 32MM CONDUIT TO ELECTRIC STRIKE, CARD READER, AND FUTURE DOOR CONTACT; 300X300 MM JUNCTION BOX FOR SECURITY CONNECTION TO DOOR CONTACT; INSTALLATION OF POWER SUPPLY CONNECTED WITH MIN. 32MM CONDUIT HOME RUN TO LOCAL PANEL WITH AVAILABLE POWER.

.4 **Hardware group No. 6** (Mechanical Penthouse)

3	Ea.	Butt Hinges	TA 314 4 ½ X 4 (NRP)	32D
1	Ea.	Passage Lockset	7G15LL	26D
1	Ea.	Deadbolt	485	26D
1	Ea.	Door Closer	3511-O	EN
1	Ea.	Kickplates	80A (250 mm high x width)	32D
1	Ea.	Door Seal	W-20N	
1	Ea.	Door Sweep	W-13S	
1	Ea.	Threshold	CT-406	

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 08 44 13 – Glazed Aluminum Curtain Wall

.2 Section 08 50 00 – Windows.

1.2 REFERENCE STANDARDS

.1 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-12.1-M90, Tempered or Laminated Safety Glass.

.2 CAN/CGSB-12.3-M91, Flat, Clear Float Glass.

.3 CAN/CGSB-12.8-97, Insulating Glass Units.

.4 CAN/CGSB-12.8-97 (Amendment), Insulating Glass Units.

.5 CAN/CGSB-12.10-M76, Glass, Light and Heat Reflecting.

.2 Environmental Choice Program (ECP)

.1 CCD-045-95(R2005), Sealants and Caulking Compounds.

.3 Glass Association of North American (GANA)

.1 GANA Glazing Manual - 2008.

.2 GANA Laminated Glazing Reference Manual - 2009.

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 glass, sealants, and glazing accessories and include product characteristics, performance criteria, physical size, finish and limitations.

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

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

1.4 CLOSEOUT SUBMITTALS

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

.2 Operation and Maintenance Data: submit operation and maintenance data for glazing for incorporation into manual.

1.5 QUALITY ASSURANCE

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

1.6 DELIVERY, STORAGE AND HANDLING

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

1.7 AMBIENT CONDITIONS

.1 Ambient Requirements:

.1 Install glazing when ambient temperature is 10 degrees C minimum. Maintain ventilated environment for 24 hours after application.

.2 Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

Part 2 Products

2.1 MATERIALS

.1 Design Criteria:

.1 Ensure continuity of building enclosure vapour and air barrier using glass and glazing materials as follow:

.1 Utilize inner light of multiple light sealed units for continuity of air and vapour seal.

.2 Size glass to withstand wind loads, dead loads and positive and negative live loads to ASTM E330 acting normal to plane of glass to design pressure required by the National Building Code

.3 Limit glass deflection to 1/200 with full recovery of glazing materials.

.2 Flat Glass:

.1 Float glass: to CAN/CGSB-12.3, glazing.

.2 Safety glass: to CAN/CGSB-12.1, transparent

.1 Type 2-tempered.

.2 Class B-float.

.3 Category 1.

.3 Low emissivity (LOW E) glass, Type 1

.1 Metallic coating: soft, sputtered.

.2 Light transmittance: 70%

.3 Shading co-efficient: 0.37

.4 U-Value: 1.42 with argon fill

.4 Low emissivity (LOW E) glass, Type 2

.1 Metallic coating: soft, sputtered.

.2 Light transmittance: 79%

.3 Shading co-efficient: 0.68

.4 U-Value: 1.48 with argon fill

.3 Insulating Glass Units:

.1 Insulating glass units: to CAN/CGSB-12.8, triple unit, double low “e”

.1 Glass: to CAN/CGSB-12.1 and CAN/CGSB-12.3.

.2 Glass thickness: 6 mm each light.

.3 Inter-cavity space thickness: 12 mm with low conductivity spacers between inner and middle lights and between middle and outer lights.

.4 Glass coating: surface number 2 low "E" Type 1

.5 Glass coating: surface number 5, low "E” Type 2

.6 Inert gas fill: 90% argon.

.4 Plastic Film: Frosted crystal translucent film providing the appearance of sandblasted glass.

.5 Sealant: in accordance with Section 07 90 00 - Joint Protection.

Part 3 Execution

3.1 EXAMINATION

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

3.2 INSTALLATION

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

3.3 INSTALLATION: PLASTIC FILM

.1 Install plastic film with adhesive, applied in accordance with film manufacturer's instructions.

.2 Place without air bubbles, creases or visible distortion.

.3 Fit tight to glass perimeter with razor cut edge.

3.4 CLEANING

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

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

.1 Remove traces of primer, caulking.

.2 Remove glazing materials from finish surfaces.

.3 Remove labels.

.4 Clean glass using approved non-abrasive cleaner in accordance with manufacturer's instructions.

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

3.5 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 After installation, mark each light with an "X" by using removable plastic tape or paste.

.1 Do not mark heat absorbing or reflective glass units.

.3 Repair damage to adjacent materials caused by glazing 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 regular, 13mm 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 74 00- Cleaning.

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

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00- Cleaning.

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

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 05 50 00 – Metal Fabrications.

.2 Section 08 11 00 – Metal Doors and Frames.

1.2 REFERENCE STANDARDS

.1 Green Seal Environmental Standards (GS)

.1 GS-11-2008, 2nd Edition, Paints and Coatings.

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

.1 Material Safety Data Sheets (MSDS).

.3 The Master Painters Institute (MPI)

.1 Architectural Painting Specification Manual - current edition.

.2 Maintenance Repainting Manual 2004, Master Painters Institute (MPI), including Identifiers, Evaluation, Systems, Preparation and Approved Product List.

.4 National Research Council Canada (NRC)

.1 National Building Code of Canada 2015 (NBC).

.5 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards

.1 SCAQMD Rule 1113-A2007, Architectural Coatings.

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 paint and coating products and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 29 - Health and Safety Requirements.

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

1.4 DELIVERY, STORAGE AND HANDLING

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

.2 Fire Safety Requirements:

.1 Supply 9 kg Type ABC fire extinguisher adjacent to storage area.

.2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.

.3 Handle, store, use and dispose of flammable and combustible materials in accordance with National Fire Code of Canada (NFC) requirements.

1.5 SITE CONDITIONS

.1 Heating, Ventilation and Lighting:

.1 Ventilate enclosed spaces in accordance with Section 01 50 00- Temporary Facilities and Controls.

.2 Co-ordinate use of existing ventilation system with Departmental Representative and ensure its operation during and after application of paint as required.

.3 Provide minimum lighting level of 323 Lux on surfaces to be painted.

.2 Temperature, Humidity and Substrate Moisture Content Levels:

.1 Apply paint finishes when ambient air and substrate temperatures at location of installation can be satisfactorily maintained during application and drying process, within MPI and paint manufacturer's prescribed limits.

.2 Apply paint to adequately prepared surfaces, when moisture content is below paint manufacturer's prescribed limits.

.3 Additional 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 in occupied facilities during silent hours only. Schedule operations to approval of Departmental Representative such that painted surfaces will have dried and cured sufficiently before occupants are affected.

Part 2 Products

2.1 MATERIALS

.1 Supply paint materials for paint systems from single manufacturer.

.2 Conform to latest MPI requirements for painting work including preparation and priming.

.3 Materials in accordance with MPI - Architectural Painting Specification Manual "Approved Product" listing.

.1 Use MPI listed materials having E3 rating where indoor air quality requirements exist.

.4 Colours:

.1 Base colour schedule on selection of 5 colours by Departmental Representative.

.5 Mixing and tinting:

.1 Perform colour tinting operations prior to delivery of paint to site, in accordance with manufacturer's written recommendations.

.2 Use and add thinner in accordance with paint manufacturer's recommendations.

.1 Do not use kerosene or similar organic solvents to thin water-based paints.

.3 Thin paint for spraying in accordance with paint manufacturer's written recommendations.

.4 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.

.6 Gloss/sheen ratings:

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

Gloss Level-Category	Gloss @ 60 degrees	Sheen @ 85 degrees
Gloss Level 1 - Matte Finish	Max. 5	Max. 10
Gloss Level 2 - Velvet	Max.10	10 to 35
Gloss Level 3 - Eggshell	10 to 25	10 to 35
Gloss Level 4 - Satin	20 to 35	min. 35
Gloss Level 5 - Semi-Gloss	35 to 70	
Gloss Level 6 - Gloss	70 to 85	
Gloss Level 7 - High Gloss	More than 85	

.2 Gloss level ratings of painted surfaces as indicated.

.7 Exterior painting:

.1 Structural Steel and Metal Fabrications: columns, beams, joists and miscellaneous metal.

.1 EXT 5.1D - Alkyd G5 finish, Premium Grade.

.2 Structural Steel and Metal Fabrications: existing overhead door frames:

.1 REX 5.1B - High Performance Acrylic, G5 finish, Premium Grade.

.3 Galvanized Metal: high contact/high traffic areas (doors, frames, railings and handrails, etc.).

.1 EXT 5.3K – W.B Light Industrial Coating (over w.b. primer) G5 finish, Premium Grade.

.4 Existing Dressed Lumber: doors, door and window frames, casings, battens, and smooth fascias.

.1 REX 6.3A - High Performance Acrylic, G5 finish, Premium Grade.

.8 Interior painting:

.1 Plaster and gypsum board: gypsum wallboard, drywall, "sheet rock" type material, etc.

.1 INT 9.2M - Institutional low odour/low VOC G4 finish.

Part 3 Execution

3.1 GENERAL

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

.2 Perform preparation and operations for interior painting in accordance with MPI - Architectural Painting Specifications Manual except where specified otherwise.

3.2 EXAMINATION

.1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Departmental Representative damages, defects, unsatisfactory or unfavourable conditions before proceeding with work.

.2 Conduct moisture testing of surfaces to be painted using properly calibrated electronic moisture meter. Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.

.3 Exterior surfaces requiring repainting: inspected by painting contractor who will notify Departmental Representative in writing of defects or problems, prior to commencing repainting work, or after surface preparation if unseen substrate damage is discovered.

.4 Where an assessed degree of surface degradation of DSD-1 to DSD-3 before preparation of surfaces for repainting is revealed to be DSD-4 after preparation, repair or replacement of such unforeseen defects discovered are to be corrected, as mutually agreed, before repainting is started.

3.3 PREPARATION

.1 Protection of in-place conditions:

.1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore surfaces as directed by Departmental Representative.

.2 Protect items that are permanently attached such as Fire Labels on doors and frames.

.3 Protect factory finished products and equipment.

.2 Surface Preparation:

.1 Remove electrical cover plates, light fixtures, surface hardware on doors, bath accessories and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations. Identify and store items in secure location and re-installed after painting is completed.

.2 Move and cover furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.

.3 Place "WET PAINT" signs in occupied areas as painting operations progress. Signs to approval of Departmental Representative.

.4 Clean and prepare surfaces in accordance with MPI - Architectural Painting Specification Manual and MPI – Maintenance Repainting Manual specific requirements and coating manufacturer's recommendations.

.5 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.

.6 Where possible, prime non-exposed surfaces of new wood surfaces before installation. Use same primers as specified for exposed surfaces.

.1 Apply vinyl 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.

.7 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.

.8 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.

.9 Touch up of shop primers with primer as specified.

3.4 EXISTING CONDITIONS

.1 Prior to commencing work, examine site conditions and existing exterior substrates to be repainted and report in writing to Departmental Representative damages, defects, unsatisfactory or unfavourable conditions of surfaces that will adversely affect this work.

.2 Conduct moisture testing of surfaces to be painted using a properly calibrated electronic moisture meter, and report findings to Departmental Representative. Maximum moisture content not to exceed specified limits.

.3 No repainting work to commence until such adverse conditions and defects have been corrected and surfaces and conditions are acceptable to Painting Subcontractor and Inspection Agency.

.4 Degree of surface deterioration (DSD) to be assessed using MPI Identifiers and Assessment criteria indicated in the MPI Maintenance Repainting Manual. MPI DSD ratings and descriptions are as follows:

Condition	Description

DSD-0	Sound Surface (includes visual (aesthetic) defects that do not affect film's protective properties).
DSD-1	Slightly Deteriorated Surface (indicating fading; gloss reduction, slight surface contamination, minor pin holes and scratches).
DSD-2	Moderately Deteriorated Surface (small areas of peeling, flaking, slight cracking, and staining).
DSD-3	Severely Deteriorated Surface (heavy peeling, flaking, cracking, checking, scratches, scuffs, abrasion, small holes and gouges).
DSD-4	Substrate Damage (repair or replacement of surface required).

3.5 APPLICATION

.1 Paint only after prepared surfaces have been accepted by Departmental Representative.

.2 Use method of application approved by Departmental Representative.

.1 Conform to manufacturer's application recommendations.

.3 Apply coats of paint in continuous film of uniform thickness.

.1 Repaint thin spots or bare areas before next coat of paint is applied.

.4 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.

.5 Sand and dust between coats to remove visible defects.

.6 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.

.7 Finish inside of cupboards and cabinets as specified for outside surfaces.

.8 Finish closets and alcoves as specified for adjoining rooms.

.9 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

3.6 CLEANING

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

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

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.

.3 Place paint and primer defined as hazardous or toxic waste, including tubes and containers, in containers or areas designated for hazardous waste.

END OF SECTION