



# Government of Canada | Gouvernement du Canada

DEPARTMENT OF NATIONAL DEFENCE

## REAL PROPERTY OPERATIONS UNIT (ONTARIO) DETACHMENT (BORDEN)

### SPECIFICATION

# Borden Replace Windows and Exterior Doors On Building A-150 – BN300257

PROJECT MANAGER (OPI):

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JOB #: L-B147-6834/09/301-307  
File #: BN300257



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**Part 1 General**

**1.1 WORK COVERED BY CONTRACT DOCUMENTS**

- .1 Work of this Contract comprises the removal and disposal off-site of all exterior doors and windows, and the replacement with new windows and doors, located at Building A-150 at CFB Borden. The existing window exterior caulking has an estimated quantity of 46 meters of 2% Chrysotile Asbestos and 2 meters of 10% Chrysotile Asbestos, which is to be removed and disposed of under this contract. The DSS report located in Annex A for building A-150 is to be reviewed by all bidding contractors. The drywall joint compound around all windows & doors should be white in colour and is not asbestos containing. If the contractor encounters any drywall compound other than white in colour during the course of their work, the contractor is to stop work immediately, and notify the DCC representative.

**1.2**

**.1 CONTRACT METHOD**

Construct Work as per enclosed drawings and specifications provided.

**1.3 SUBMITTALS**

- .1 Submit Project Construction Progress Schedule - Critical Path Method (CPM) Construction Progress Schedule - Bar (GANNT) Chart.
- .2 Sustainable Design Submittals:
  - .1 Construction Waste Management:
    - .1 Submit project Waste Management Plan, Waste Reduction Work plan highlighting recycling and salvage requirements.
    - .2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating 75 % of construction wastes recycled or salvaged.
  - .3 Submit site-specific Work Plan and Health and Safety Plan in accordance with Section 01 70 03 Safety Requirements.

**1.4 WORK BY OTHERS**

- .1 Co-operate with other Contractors in carrying out their respective works and carry out instructions from DCC Representative.
- .2 Co-ordinate work with other contractors. If any part of work under this Contract depends for its proper execution or result upon work of another contractor, report promptly to DCC Representative, in writing, any defects which may interfere with proper execution of Work.
- .3 Verify work of Project executed during Work of this Contract.
- .4 Verify work of Project which will be executed after completion of Work covered under this Contract.

## **1.5 WORK SEQUENCE**

- .1 Construct Work in stages one floor at a time, starting on the third floor, then second floor, and finish on ground floor, to accommodate Owner's continued use of premises during construction.
- .2 Co-ordinate Progress Schedule and co-ordinate with Owner Occupancy & DCC Representative during construction.
- .3 Contractor to maintain fire access/control, during all stages of work floor by floor.
- .4 Contractor to protect workers and building occupants with public safety measures, yielding separation.

## **1.6 CONTRACTOR USE OF PREMISES**

- .1 Restricted use of building, one floor at a time until Substantial Performance.
  - .1 Hours of work to be between 7am to 5 pm
- .2 Limit use of premises for Work, to allow:
  - .1 Owner occupancy.
  - .2 Work by other contractors.
  - .3 Public usage.
- .3 Co-ordinate use of premises under direction of DCC Representative.
- .4 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.
- .5 Refer to Section 01 56 00 - Temporary Barriers and Enclosures, for temporary facilities access, access roads and parking areas, traffic regulations, and utilities.
- .6 Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as directed by DCC Representative. If work within a room is going to cause excess dust or dirt, the contractor shall protect existing furniture and contents with tarps or drop cloths, and ensure the room is properly cleaned and returned to original state by contractor before departure to next room.
- .7 Ensure that operations conditions of existing work at completion are still the same, equal to or better than that which existed before new work started.

## **1.7 OWNER OCCUPANCY**

- .1 Owner will occupy premises during entire construction period for execution of normal operations.
- .2 Co-operate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage.

## **1.8 ALTERATIONS, ADDITIONS OR BUILDING**

- .1 Execute work with least possible interference or disturbance to building occupants, and normal use of premises. Arrange with DCC Representative to facilitate execution of work.
- .2 Use only existing stairs in building for moving workers and material between floors.

**1.9 DOCUMENTS REQUIRED**

- .1 Maintain at job site, one copy of each document as follows:
  - .1 Contract Drawings.
  - .2 Specifications.
  - .3 Addenda.
  - .4 Reviewed Shop Drawings.
  - .5 List of Outstanding Shop Drawings.
  - .6 Change Orders.
  - .7 Other Modifications to Contract.
  - .8 Field Test Reports.
  - .9 Copy of Approved Work Schedule.
  - .10 Health and Safety Plan and Other Safety Related Documents.

**END OF SECTION**

**Part 1            General**

**1.1            ACCESS AND EGRESS**

- .1 For "access to" and "egress from" work areas, use building existing stairs to access all interior work areas. For all exterior work areas contractor is to provide their own lift equipment to suitably reach all work areas safely, in accordance with relevant municipal, provincial and other regulations.

**1.2            USE OF SITE AND FACILITIES**

- .1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with DCC Representative to facilitate work as stated.
- .2 Maintain existing services to building and provide for personnel and vehicle access.
- .3 Where security is reduced by work provide temporary means to maintain security.  
x
- .4 Contractor to provide their own portable sanitary facilities, for use by Contractor's personnel. Contractor to consult with the DCC Representative, as to the location of the portable sanitary facilities. Contractor is to keep facilities clean.
- .5 Use only stairs existing in building for moving workers and material.

**1.3            ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING**

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

**1.4            EXISTING SERVICES**

- .1 Notify, DCC Representative, and utility companies of any intended interruption of services and obtain required permission. 48 hours of notice of any electrical or mechanical interruption is required.

**1.5            BUILDING SMOKING ENVIRONMENT**

Comply with smoking restrictions, smoking is not permitted on the work site.

**END OF SECTION**



**Part 1            General**

**1.1                REFERENCE STANDARDS**

- .1 National Research Council of Canada (NRC):
  - .1 National Building Code of Canada (NBC), 2015
  - .2 National Fire Code of Canada (NFC), 2015
- .2 National Fire Protection Association (NFPA):
  - .1 NFPA 51B-19, Standard for Fire Prevention during Welding, Cutting, and Other Hot Work

**1.2                CONSTRUCTION FIRE SAFETY**

- .1 Contractor is responsible for construction fire safety in accordance with NFC.

**1.3                FIRE DEPARTMENT BRIEFING**

- .1 DCC Representative will coordinate arrangements for a Pre-Commencement Meeting after Contract is awarded. Base Fire Hall Representative or designated representative will brief Contractors regarding Fire Safety before beginning Work on site.
- .2 DCC Representative will give Contractor a copy of all Fire Orders.

**1.4                ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit fire safety plan.

**1.5                REPORTING FIRES**

- .1 Be aware at all times of nearest fire alarm pull station location, nearest telephone, and emergency phone number.
- .2 Report fire incidents to Base Fire Hall Representative immediately in the following sequence:
  - .1 Activate nearest fire alarm pull station.
  - .2 Telephone the Base Fire Department
- .3 Person activating fire alarm pull station to remain at main site entrance and direct Fire Department personnel to location of fire.
- .4 When reporting a fire by telephone, give location of fire, building name or number, and be prepared to give basic directions (e.g., northeast corner of base compound, visual reference points).
- .5 Promptly inform DCC Representative and Base Fire Hall Representative of fire incidents at Work site, regardless of size.



## **1.6            FIRE SAFETY PLAN**

- .1    Prepare a fire safety plan in cooperation with the local fire department and other applicable regulatory authorities for the Work site before beginning Work on site.
- .2    Submit fire safety plan to DCC representative who will submit to local fire department for their review. Implement recommendations from local fire department into fire safety plan.
- .3    Limit scope of fire safety plan to Work site area only. Existing fire safety plans covering other existing buildings are not the responsibility of this construction contract.
- .4    Prepare fire safety plan in conformance with NFC. Include:
  - .1    Emergency procedures in case of fire, including:
    - .1    Sounding fire alarm
    - .2    Notifying fire department
    - .3    Instructing occupants on procedures to follow when fire alarm sounds.
    - .4    Evacuating occupants, including special provisions for persons requiring assistance
    - .5    Confining, controlling, and extinguishing the fire
  - .2    Appointment and organization of designated supervisory staff to carry out fire safety duties.
  - .3    Training of supervisory staff and other occupants in their responsibilities for fire safety
  - .4    Documents, including diagrams, showing type, location and operation of building fire emergency systems.
  - .5    Holding of fire drills
  - .6    Control of fire hazards in the building
  - .7    Inspection and maintenance of building facilities provided for the safety of occupants.
- .5    Post fire safety plan at each entrance to Work site or near each Work site's health and safety board.
- .6    Review fire safety plan a maximum of every 12 months to ensure it considers changes in the use and other characteristics of the building. Revise fire safety plan when it can be improved.

## **1.7            FIRE WARNING SYSTEM**

- .1    Provide a fire warning system for entire Work site, capable of notifying construction personnel of a fire emergency in construction area.
- .2    Provide a fire warning system with sufficient coverage so that alarms are capable of being heard throughout building and everywhere on site.

## **1.8            FIRE PROTECTION SYSTEM IMPAIRMENT**

- .1    Maintain existing fire protection systems in an operational state at all times during construction.
- .2    Use of fire hydrants, standpipes, or hose systems for purposes other than firefighting, unless authorized by Base Fire Hall Representative, is prohibited.

- .3 Existing fire protection and alarm systems will not be obstructed, shut off, disabled, or left inactive at end of each Working Day or shift without written authorization from Base Fire Hall Representative.
- .4 Submit written notification to DCC Representative and Base Fire Hall Representative 48 hours in advance of planned interruption of services. Submit written notification for operation including shutting down active fire protection system, including water supply, fire suppression, fire detection, and life safety systems.
- .5 Where an existing fire protection system that provides fire alarm monitoring becomes impaired in an existing building, provide a fire watch as directed by Base Fire Hall Representative.
- .6 Where systems are affected or impaired during the Work, conduct work on fire protection system in accordance with NFC, FMD 4006, and Base Fire Orders.

## **1.9            TEMPORARY PORTABLE FIRE EXTINGUISHERS**

- .1 Provide portable extinguishers, or as otherwise directed by Base Fire Hall Representative.
- .2 Provide supplemental portable extinguishers to the following areas or as otherwise directed by Base Fire Hall Representative:
  - .1 Adjacent to hot works
  - .2 Areas where combustibles materials are stored.
  - .3 Adjacent to areas where flammable liquids or gases are stored or handled.
  - .4 Near or on internal combustion engines
  - .5 Adjacent to temporary oil fired or gas fired equipment.
  - .6 Adjacent to bitumen heating equipment
  - .7 Adjacent to each roof installation or repair work area
- .3 Provide portable extinguishers classified and rated as 10-A: 80B: C, minimum 20 pounds unless otherwise directed by Base Fire Hall Representative.
- .4 Provide dry chemical type extinguishers unless otherwise required by hazard being protected.
- .5 Provide enough portable extinguishers based on a maximum travel distance between fire extinguishers of 22.9 m.
- .6 Inspect and maintain extinguishers in accordance with NFC.

## **1.10          ACCESS FOR FIRE FIGHTING**

- .1 Provide and maintain access for firefighting operations in accordance with NFC.
- .2 Submit written notification to Base Fire Hall Representative a minimum of five Working Days before operation of activities that may cause problems that might impede fire department equipment access and personnel response including:
  - .1 Violation of minimum horizontal and overhead clearances
  - .2 Other operations as directed by Base Fire Hall Representative,
  - .3 Erecting of barricades and digging of trenches.

- .3     Maintain a minimum 6.0-m clear horizontal width for access routes, or as otherwise directed by Base Fire Hall Representative.
- .4     Maintain a minimum 5.0-m vertical clearance for access routes, or as otherwise directed by Base Fire Hall Representative.

### **1.11           SMOKING RESTRICTIONS**

- .1     Smoking is prohibited in buildings, including buildings under construction.
- .2     Obey posted signs and restrict smoking to only existing designated smoking areas. Obey posted smoking restrictions near existing buildings.
- .3     Provide a temporary approved non-combustible receptacle at each designated smoking area in accordance with the Fire Safety Plan.

### **1.12           WASTE MANAGEMENT**

- .1     Manage waste in accordance with Section 01 74 19 - Waste Management and Disposal, and as follows:
  - .1     Minimize waste materials.
  - .2     Do not burn waste materials.
  - .3     Remove waste from Work site at end of each Working Day or shift, or more frequently when directed by Base Fire Hall Representative.
  - .4     Storage:
    - .1     Store oily waste in approved receptacles to ensure maximum cleanliness and safety.
    - .2     Deposit greasy or oily rags and materials subject to spontaneous combustion in approved receptacles. Remove at end of each Working Day.
  - .5     Provide temporary waste bins no closer than 3.0 m to buildings.

### **1.13           FLAMMABLE AND COMBUSTIBLE LIQUIDS**

- .1     Handle, store, and use flammable and combustible liquids in accordance with NFC or as otherwise directed by the Senior Firefighter.
- .2     Store flammable and combustible liquids such as gasoline, kerosene, and naphtha in quantities not exceeding 45 litres. Store in approved safety cans bearing Underwriters' Laboratory of Canada or Factory Mutual approved certification mark. Obtain written authorization from Base Fire Hall Representative for storage of quantities of flammable and combustible liquids exceeding 45 litres.
- .3     Transfer of flammable or combustible liquids within buildings or on jetties is prohibited.
- .4     Transfer of flammable or combustible liquids in vicinity of open flames or any type of heat-producing device is prohibited.
- .5     Use of flammable liquids having a flash point below 38 degrees C such as naphtha or gasoline as solvents or cleaning agents is prohibited.

- .6 Storing flammable and combustible waste liquids on site is prohibited. Remove daily or more frequently as directed by Base Fire Hall Representative.

#### 1.14 HOT WORKS

- .1 Implement a Hot Works program in accordance with NFC, FMD 4004, and NFPA 51B. Apply Hot Works program to processes involving welding, cutting, roofing, and other hot works when directed by Base Fire Hall Representative.
- .2 Obtain a Hot Works permit 48 hours in advance from Base Fire Hall Representative for hot works in work area. Frequency of renewal for hot works permits is at discretion of the Base Fire Hall Representative.
- .3 When Work is carried out in dangerous or hazardous areas involving use of heat, provide fire watchers equipped with sufficient fire extinguishers. Determination of dangerous or hazardous areas along with level of protection necessary for Fire Watch is at discretion of the Base Fire Hall Representative.
- .4 Provide fire watch service for Work as directed by Base Fire Hall Representative and as defined in Fire Department Briefing. Provide fire watchers trained in use of fire extinguishing equipment.
- .5 Carry out hot works processes in areas free of combustible and flammable content.
- .6 Where hot works must be carried out in areas where combustibles are present:
  - .1 Protect flammable and combustible materials within 15.0 m of hot works in accordance with NFC.
  - .2 Provide a fire watch during hot works and for a minimum of 60 minutes after work is complete, unless otherwise directed by Base Fire Hall Representative.
  - .3 Conduct a final inspection of area not less than 4 hours after completion of hot works, unless otherwise directed by Base Fire Hall Representative.
- .7 Where there is a possibility of sparks leaking onto combustible materials in areas adjacent to areas where the hot works is carried out:
  - .1 Cover or close openings in walls, floors, or ceilings to prevent passage of sparks to such adjacent areas.
  - .2 Provide a fire watch during hot works, and a minimum 60 minutes after hot works is complete.
  - .3 Conduct a final fire watch inspection not less than 4 hours after hot works is complete, unless otherwise directed by Base Fire Hall Representative.
- .8 Protection of flammable or combustible materials:
  - .1 Remove flammable and combustible materials including combustible or flammable dust or residue from area where hot works is carried out.
  - .2 When removal is not possible, protect materials with a non-combustible covering.
- .9 Provide a temporary fire extinguisher within 3.0 m of hot works, minimum size of 20 lbs Type ABC extinguisher, unless otherwise directed by Base Fire Hall Representative.

### **1.15            HAZARDOUS SUBSTANCES**

- .1      Perform Work involving the use of toxic or hazardous materials, chemicals, or explosives, or otherwise creating hazard to life, safety or health, in accordance NFC.
- .2      Provide temporary mechanical ventilation where flammable liquids, such as lacquers or urethanes are used. Eliminate sources of ignition. Provide written notification to the Base Fire Hall Representative a minimum five days before starting Work and immediately at completion of Work.

### **1.16            PARTIAL OCCUPANCY PROCEDURES**

- .1      Implement partial occupancy procedures as required by NBC Division B Part 8 and FMD 4005. Partial occupancy is defined as a Work site adjacent to an area occupied by Departmental or Canadian Forces personnel. This includes:
  - .1      Phased new construction.
  - .2      Early or partial occupancy of new construction
  - .3      New construction being added onto an existing building.
  - .4      Renovation or recapitalization of an existing building
  - .5      Phased renovation or recapitalization of an existing building
- .2      Where partial occupancy occurs, implement requirements as indicated in Plans (drawings) and Specifications. This may include temporary construction of a rated fire separation between occupied and construction areas as required by NFC.
- .3      If Work occurs in an occupied building, perform fire watch at least every hour, throughout entire site during period of demolition.
- .4      If Work occurs in an occupied building and where building does not have a Fire Alarm system or similar automatic monitoring or protection equipment, perform inspections every hour for entire period of construction.

### **1.17            QUESTIONS OR CLARIFICATION**

- .1      Direct questions and requests for clarification on Fire Safety to DCC Representative.
- .2      DCC Representative will obtain clarifications from Base Fire Hall Representative. Do not contact Base Fire Hall Representative directly for notification, authorization, or any requests unless situation constitutes an immediate emergency.

### **1.18            FIRE INSPECTION**

- .1      Coordinate site inspections by Base Fire Hall Representative through DCC Representative.
- .2      Allow Base Fire Hall Representative unrestricted access to work site.
- .3      Cooperate with Base Fire Hall Representative during routine fire safety inspection of Work site.
- .4      Immediately remedy unsafe fire situations observed by Base Fire Hall Representative.

**END OF SECTION**

## **Part 1           General**

### **1.1               DEFINITIONS**

- .1     **Quality Control (QC):** QC refers to the actual monitoring of specific project results to determine if they comply with relevant quality standards. There are a number of deliverables associated with the QC sub-system, most of these are generally already used on typical construction projects. The deliverables include, shop drawing reviews, on-site inspections and tests and related reports, site meeting minutes etc.
- .2     **Quality Assurance (QA):** QA refers to the documented intent outlining the activities that are implemented in the QCP to provide confidence that the project will satisfy the relevant quality standards and specifications.
- .3     **Quality Control Plan:** The Quality Control Plan (QCP) consists of the organizational structure and the inherent responsibilities, procedures, processes and resources needed to implement quality control management of the building process. In addition, and for the purpose of this project, "Commissioning" will be considered an integral element of the quality management system.
  - .1     The Contractor shall establish and maintain a documented QCP to ensure that the specified quality standards for the project are achieved, in compliance with the terms and conditions of the contract.
  - .2     Under the terms of the Contract, the Contractor is responsible for the delivery of a facility that meets the standards of quality demanded by the specification as it applies to the materials, workmanship, and completed results. The purpose of the QCP is to assist in the fulfillment of this obligation and to provide to the DCC Representative a means to confirm the specified level of quality will be achieved.

### **1.2               INSPECTION**

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

**1.3 INDEPENDENT INSPECTION AGENCIES**

- .1 The contractor to furnish and pay for independent inspection/testing agency, equipment, facilities, and labour to provide Quality Control (QC) testing in accordance with the contractor's quality control plan.
- .2 DCC Representative will appoint and pay for independent inspection/testing agency, equipment, facilities, and labour to provide Quality Assurance (QA) testing and designated substance testing.
- .3 Provide equipment required for executing inspection and testing by appointed agencies.
- .4 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
- .5 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by DCC Representative at no cost to DCC Representative. Pay costs for retesting and reinspection.

**1.4**

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

**1.5**

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

**1.6**

- .1 **REJECTED WORK**  
Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by DCC Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.
- .2 Make good other Contractor's work damaged by such removals or replacements promptly.
- .3 If in opinion of DCC Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner may deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which shall be determined by DCC Representative.



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**1.7 REPORTS**

- .1 Submit electronic pdf format inspection and test reports to DCC Representative.
- .2 Provide copies to Subcontractor of work being inspected or tested or manufacturer or fabricator of material being inspected or tested.

**1.8 CONTRACTOR RESPONSIBILITIES**

- .1 Contractor is responsible for the execution of the Construction Quality Plan. Contractor is to pay all costs for the execution of the Construction Quality Plan. Contractor shall designate an experienced site representative for carrying out the Construction Quality Plan.

**1.9 TESTS AND MIX DESIGNS**

- .1 Furnish test results and mix designs as requested.
- .2 The cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work shall be appraised by DCC Representative and may be authorized as recoverable.

**1.10 MILL TESTS**

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

**1.11 EQUIPMENT AND SYSTEMS**

- .1 Submit adjustment and balancing reports for mechanical, electrical and building equipment systems.
- .2 Refer to Section 01 78 00 - Closeout Submittals for definitive requirements.

**END OF SECTION**

**Part 1            General**

**1.1                SECTION INCLUDES**

- .1        Barriers.
- .2        Environmental Controls.
- .3        Traffic Controls.
- .4        Fire Routes.

**1.2                INSTALLATION AND REMOVAL**

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

**1.3                HOARDING**

- .1        Erect temporary site enclosure using Standard Leasable fence panels 2m x 3m (6'x10').
  - .1        Either Chain link or Welded Wire Panels are acceptable.
  - .2        Provide one lockable truck gate.
  - .3        Maintain fence in good repair.
- .2        Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

**1.4                GUARD RAILS AND BARRICADES**

- .1        Provide secure, rigid guard rails and barricades around deep excavations, open shafts, open stair wells, open edges of floors and roofs.
- .2        Provide as required by governing authorities.

**1.5                WEATHER ENCLOSURES**

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

**1.6 DUST TIGHT SCREENS**

- .1 Provide dust tight screens or partitions to localize dust generating activities, and for protection of workers, finished areas of Work and public.
- .2 Maintain and relocate protection until such work is complete.

**1.7 ACCESS TO SITE**

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

**1.8 PUBLIC TRAFFIC FLOW**

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

**1.9 FIRE ROUTES**

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

**1.10 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY**

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

**1.11 PROTECTION OF BUILDING FINISHES**

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

**END OF SECTION**

**Part 1      General**

Use for buildings intended for partial or full occupancy/operations during construction.

**1.1      SUBMITTALS**

- .1      Submit to DCC Representative copies of the following documents, including updates issued:
  - .1      Site-specific Health and Safety Plan prior to commencement of work on the work site.
  - .2      Fire Safety Plan.
  - .3      Reports or directions issued by authorities having jurisdiction, immediately upon issuance from that authority.
  - .4      Accident or Incident Reports, within 24 hrs. of occurrence.
- .2      Submit other data, information and documentation upon request by the DCC Representative as stipulated elsewhere in this section.

**1.2      COMPLIANCE REQUIREMENTS**

- .1      Comply with the latest edition of the Ontario Occupational Health and Safety Act, and the Regulations made pursuant to the Act.
- .2      As a minimum, comply with the Canada Labour Code Part II Part 125(1)(l) and 125(1)(w), and the Canada Occupational Safety and Health Regulations made under Part II of the Canada Labour Code.
- .3      A copy of the Canada Labour Code Part II may be obtained by contacting:
  - .1      A condensed version can be viewed on-line at <http://laws.justice.gc.ca/en/index.html>
- .4      Where the Base Health and Safety Program may stipulate more stringent requirements than identified in the Canada Labour Code Part II and the Canada Occupational Safety and Health Regulations made under Part II of the Canada Labour Code, the DCC Representative shall provide the Contractor with the applicable excerpts from the Base Health and Safety Program.
- .5      Observe and enforce construction safety measures required by:
  - .2      National Building Code of Canada (latest edition).
  - .3      Workplace Safety and Insurance Board of Ontario (WSIB).
- .6      In event of conflict between any provisions of above authorities the most stringent provision shall apply. Should a dispute arise in determining the most stringent requirement, the DCC Representative shall advise on the course of action to be followed. In the case of direct conflict between the federal and provincial/territorial regulatory Health and Safety instruments noted above in paragraphs 1.2.1 and 1.2.2, the Canada Labour Code shall be the default regulatory instrument.

- .7 Provide and maintain Workplace Safety and Insurance Board of Ontario (WSIB) coverage for all employees for the duration of the contract. Prior to commencement of the work, at the time of Interim Completion and prior to final payment, provide to the DCC Representative a certificate of Clearance from the Workplace Safety and Insurance Board of Ontario (WSIB) indicating that the Contractor's account is in good standing.

### 1.3 RESPONSIBILITY

- .1 In accordance with the Canada Labour Code Part II, the obligations and responsibilities for safety reside with the Department of National Defence. The DCC Representative on behalf of the Department of National Defence will monitor safety on the Work Site in accordance with the Canada Labour Code Part II and the Canada Occupational Safety and Health Regulations made under Part II of the Canada Labour Code.
- .2 Carry out work placing emphasis on health and safety of the public, building employees, site personnel and protection of the environment.
- .3 The Contractor is responsible to enforce compliance by its employees and sub-contractors accessing the Work Site with safety requirements of Contract Documents, and all applicable federal, provincial, local statutes, regulations, and ordinances.
- .4 The Contractor is responsible to manage safety of the work site to ensure that any persons, including but not limited to, building employees and the general public circulating adjacent to the work operations are protected against harm due to the extent that they may be affected by conduct of the work.
- .5 Contractors are required under the Canada Labour Code Part II to conduct site specific occupational health and safety meetings. For the purpose of this contract, the Contractor is responsible to establish and conduct site specific occupational health and safety meetings on a **weekly basis**.
- .6 The Contractor is responsible to record and post minutes of all site specific occupational health and safety meetings in plain view on the work site. Make copies available to DCC Representative upon request.
- .7 The Contractor is responsible to designate a competent person or persons to be present on site at all times during the work as the site health and safety representative. The designated person(s) shall be required to conduct regularly scheduled safety inspections of the work site as follows:
- .1 Informal inspections on a minimum bi-weekly basis noting deficiencies and remedial actions taken in a logbook or diary. Make the log book and/or diary available for the DCC Representative's viewing as requested.
- .2 Formal inspections on a minimum weekly basis and is to provide a written report to the DCC Representative for each formal inspection, document deficiencies, remedial action needed and assign responsibility for rectification to the appropriate party.
- .8 The Contractor is responsible to ensure Contractor employees and sub-contractors accessing the work site are in possession of and wear appropriate personnel protective equipment (PPE).

- .9 Should an unforeseen or peculiar safety related hazard or condition become evident during performance of work, the Contractor is responsible to immediately take measures to rectify the situation and prevent damage or harm and to advise the DCC Representative verbally and in writing of the hazard or condition.
- .10 Daily or weekly field level hazard assessment shall be completed by the Contractor and communicated to all employees and occupant representative with the intent to identify known and potential hazards associated with current and future work tasks. The Contractor shall establish and implement control measures for known and potential hazards that have been identified

## 1.4

### SITE CONTROL AND ACCESS

- .1 The Contractor shall be responsible after consultation with the DCC Representative to control all work site access points and work site activities.
- .2 Delineation and isolation of the work site from adjacent and surrounding areas is not possible as the facility and infrastructure must remain fully operational and partially occupied and utilized by the Department of National Defence throughout the duration of the work of this contract. Refer to section 01 11 00 Summary of Work for further details on control of work site, working with occupants in the building and Fire Safety Plan submission requirements.
- .3 The Department of National Defence as represented by Defence Construction Canada will be performing a safety monitoring function as required by the Canada Labour Code to verify that the Contractor is fulfilling all of the required responsibilities and duties as identified above. This monitoring function will be performed throughout the duration of the contract.
- .4 Erect signage at access points and at other strategic locations around the work site clearly identifying the work site area(s) as being “off-limits” to non-authorized persons. Signage must be professionally made with well understood graphic symbols and is not to be used as advertising but for the specific use as related to site safety and key contact information.

## 1.5

### FILING OF NOTICE

- .1 File Notice of Project and any other required Notices with the Provincial/Territorial Authorities prior to commencement of the work. Provide the DCC Representative with a copy of the filed Notice(s) prior to commencement of the work.

## 1.6

### PERMITS

- .1 Obtain permits, licenses and compliance certificates at appropriate times and frequencies as required by the authorities having jurisdiction.
- .2 Post all permits, licenses and compliance certificates on work site and provide copies to the DCC Representative.
- .3 Acquire a Hot Work Permit from Base Fire Hall Representative prior to commencing any cutting, welding, hot roofing, or similar work.
- .4 Acquire a Fire Alarm Impairment Permit from DND prior to commencing any work which will affect the Fire alarm system.

## 1.7 PROJECT/SITE CONDITIONS

- .1 The following are the known hazardous substances and/or hazardous conditions at the work site which shall be considered as health or environmental hazards and shall be properly managed should they be encountered as part of the work:
  - .1 Asbestos, Lead paint, may be found during demolition, e.g., Asbestos in the old window caulking, and lead paint on the interior walls are known hazardous substances and/or hazardous conditions that exist at the work site. The drywall joint compound around all windows and doors should be white in colour and is not asbestos containing. If the contractor encounters any drywall compound other than white in colour during their work, the contractor is to stop work immediately and notify the DCC representative.
  - .2 Designated Substance Survey (DSS) Report identifying the known hazardous substances is attached in Annex A.
  - .3 Contractors are required to be aware of the known hazardous substances and/or hazardous conditions and are to include in their tender price all work associated in working with, in and around the hazards.
- .2 Obtain from the DCC Representative, a copy of the MSDS data sheets of the existing hazardous materials stored on site or being used by facility personnel in the course of their operations.
- .3 The above lists shall not be construed as being complete and inclusive of all safety and health hazards encountered as a result of Contractor's operations during the course of work. Include above items into the hazard assessment program specified herein.

## 1.8 MEETINGS

- .1 Prior to commencement of work attend a pre-commencement meeting conducted by the DCC Representative. Ensure minimum attendance by the Contractor's site superintendent. The DCC Representative will arrange to have the Contractor's site superintendent and designated site health and safety representative briefed on the specific content of the Base Health and Safety Program where it requires more stringent requirements than stipulated in the Canada Labour Code Part II and the Canada Occupational Safety and Health Regulations made under Part II of the Canada Labour Code. DCC Representative will advise of time, date and location of the meeting and will be responsible for recording and distributing the minutes.
- .2 The Contractor is responsible to conduct safety meetings as required by paragraph 1.3 above.

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## 1.9 HEALTH AND SAFETY PROGRAM

- .1 The Canada Labour Code Part II and the Canada Occupational Safety and Health Regulations made under Part II of the Canada Labour Code provides the Contractor with the overall program of health and safety for operations on the Base. For the purpose of this contract, the Contractor shall perform a hazard assessment of the work site in order to acknowledge, assess and address the hazardous substances and/or hazardous conditions known and identified in paragraph 1.7, and to develop a written site-specific Health and Safety Plan as related to these known hazards. The Contractor shall be required to write the site-specific Health and Safety Plan for review by the DCC Representative, on behalf of the Department of National Defence. The site-specific Health and Safety Plan shall include provisions for an on-going hazard assessments performed during the progress of work identifying and documenting new or potential health risks and safety hazards not previously known and identified.
- .2 The format of the site-specific Health and Safety Plan shall at a minimum for the purpose of this contract contain the following three (3) parts:
  - .1 Part 1: Detailed description of the project and a list of individual health risks and safety hazards identified by the contractor's detailed site specific hazard assessment(s).
    - .1 List of critical construction activities to be communicated with the DCC Representative which could affect facility, infrastructure, and occupant operations, or pose a risk to the health and safety of the occupants, Contractor employees and to the general public.
  - .2 Part 2: List of specific measures to control or mitigate each hazard and risk identified in part one of the Plan. Describe the Engineering controls, personnel protective equipment, safe work practices and any other applicable means to be implemented and followed when performing work related to each identified hazard or risk. Part 2 of the Plan must also include:
    - .1 In the management of safety responsibility, provide the name of the competent employee(s) assigned as site safety representative(s) who is (are) to be always present on-site during work.
    - .2 A written statement, where applicable, that the Contractor has been made aware of known hazards and hazardous substances referred to under paragraph 1.7, and that the Contractor will inform all Contractor employees, sub-contractor employees and any persons affected or potentially affected by the work of this contract of the known hazards.
    - .3 A written statement confirming that Contractor employees, sub-contractors and other authorized persons accessing the work site are trained and have been fully instructed in:
      - .1 Safe operation of tools and equipment.
      - .2 Proper wearing and use of personnel protective equipment (PPE) as applicable to the purpose and activities to be conducted on site.
      - .3 Safe work practices and procedures to be followed during the performance of their given work tasks or function on the work site.
      - .4 Work site conditions and minimum site safety rules provided through safety orientation sessions.



- .4 A copy of the Contractor's health and safety policy and disciplinary policy that will be followed to enforce compliance by Contractor employees and sub-contractors with safety requirements of contract documents, applicable regulations and the Contractor's site-specific Health and Safety Plan.
- .3 Part 3: Emergency Measures and Communications Procedures as follows:
  - .1 Emergency Measures: On-site operating procedures, evacuation measures and emergency response to be implemented in the occurrence of an accident or incident. Procedures to be specific and relevant to identified hazards. Measures to complement and be integrated with the Facility Emergency Response Plan(s) in place at site.
  - .2 Confirmation of the location of nearest fire alarm activation box and telephone.
  - .3 A map depicting the location of the nearest emergency medical facility.
  - .4 The location of emergency equipment and supplies including but not limited to first aid kits, emergency eye wash stations, spill kits/equipment and fire extinguishers. Including confirmation that equipment and supplies have been verified/certified for use.
  - .5 The names of all persons assigned responsibility by the Contractor as a first aid attendant at the project.
  - .6 An inventory listing the common name of all controlled products (WHMIS Products) that the Contractor knows or intends to bring to the project site. List to be updated as necessary as project proceeds.
  - .7 A copy of the Contractor's accident/incident investigation policy and incident and accident report form(s) to be used by the Contractor to document any incident or accident that might occur during the course of project work
  - .8 Communication procedures:
    - .1 List of names and telephone numbers of designated official(s), to be contacted should an incident or emergency situation occur, including the following:
      - .1 Contractor and all sub-contractors.
      - .2 Federal and Provincial departments and local emergency resources organizations, as applicable to the hazards identified and type of accident or incident which might occur, in accordance with applicable laws and regulations.
    - .2 Procedures implemented at site to communicate and share information between Contractor employees, sub-contractors, and the Contractor on work site activities, and in particular those which might endanger employees and facility occupants and infrastructure users.
    - .3 The procedure to be followed by contract personnel to initiate emergency response by fire, police and medical personnel.
    - .4 Post a copy, including all updates, of the Health and Safety Plan in a common visible location at work site.

- .3 Provide one copy of the site-specific Health and Safety Plan to the DCC Representative prior to commencement of work on the work site. The copy provided to the DCC Representative is for the purpose of review against both Canada Labour Code Part II and the Canada Occupational Safety and Health Regulations made under Part II of the Canada Labour Code and the contract requirements related to the known hazardous substances and/or hazardous conditions.
- .4 Provide and maintain one copy of the site-specific Health and Safety Plan at the work site, in a location that is easily accessible by all Contractor employees, sub-contractor employees and any persons affected or potentially affected by the work of this contract.

#### **1.10 MINIMUM SITE SAFETY RULES**

- .1 Notwithstanding the requirement to abide by federal and provincial health and safety regulations, the following safety rules shall be considered minimum requirements at the work site and obeyed by all persons accessing the work site:
  - .1 Wear PPE appropriate to the function and task while on the work site.
  - .2 Immediately report unsafe activities, conditions, near miss accidents, injuries and damages.
  - .3 Maintain the work site in a tidy condition.
  - .4 Obey warning signs and safety tags.

#### **1.11 ACCIDENT REPORTING**

- .1 Investigate and report incidents and accidents as required by Canada Labour Code Part II and Ontario Occupational Safety and Health Act, and the Regulations made pursuant to the Act.
- .2 For the purpose of this contract immediately investigate and provide a report to the DCC Representative on incidents and accidents that involve:
  - .1 A resulting injury that may or may not require medical aid but involves lost time at work by the injured person(s).
  - .2 Exposure to toxic chemicals or substances.
  - .3 Property damage.
  - .4 Interruption to adjacent and/or integral infrastructure operations with potential loss implications.

#### **1.12 RECORDS ON SITE**

- .1 Maintain on site a copy of the safety documentation as specified in this section and any other safety related reports and documents issued to or received from the authorities having jurisdiction.
- .2 Upon request, make copies available to the DCC Representative.

**END OF SECTION**

**Part 1            General**

**1.1                PROJECT CLEANLINESS**

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

**1.2                FINAL CLEANING**

- .1        When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2        Remove waste products and debris other than that caused by others and leave Work clean and suitable for occupancy.
- .3        Prior to final review remove surplus products, tools, construction machinery and equipment.

- .4 Contractor to remove waste products and debris by Contractors and sub-contractors. Leave area clean and suitable for occupancy.
- .5 Remove waste materials from site at regularly scheduled times or dispose of as directed by DCC Representative. Do not burn waste materials on site, unless approved by DCC Representative.
- .6 Decide with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

**END OF SECTION**

## **Part 1 General**

### **1.1 SUMMARY**

- .1 This Section includes requirements for management of construction waste and disposal, which forms the Contractor's commitment to reduce and divert waste materials from landfill and includes the following:
  - .1 Preparation of a Draft Construction Waste Management Plan that will be used to track the success of the Construction Waste Management Plan against actual waste diversion from landfill.
  - .2 Preparation of a Construction Waste Management Plan that provides guidance on a logical progression of tasks and procedures to be followed in a pollution prevention program to reduce or eliminate the generation of waste, the loss of natural resources, and process emissions through source reduction, reuse, recycling, and reclamation.
  - .3 Preparation of monthly progress reports indicating cumulative totals representing progress towards achieving diversion and reduction goals of waste materials away from landfill and identifying any special programs, landfill options or alternatives to landfill used during construction.
  - .4 Preparation of a Construction Waste Management Report containing detailed information indicating total waste produced by the Project, types of waste material and quantity of each material, and total waste diverted and diversion rates indicated as a percentage of the total waste produced.
- .2 Owner has established that this Project shall generate the least amount of waste possible and that processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors be employed by the Contractor.

### **1.2 DEFINITIONS**

- .1 Clean Waste: Untreated and unpainted; not contaminated with oils, solvents, sealants or similar materials.
- .2 Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction operations.
- .3 Hazardous: Exhibiting the characteristics of hazardous substances including properties such as ignitability, corrosiveness, toxicity, or reactivity.
- .4 Non-hazardous: Exhibiting none of the characteristics of hazardous substances, including properties such as ignitability, corrosiveness, toxicity, or reactivity.
- .5 Non-toxic: Not poisonous to humans either immediately or after a long period of exposure.
- .6 Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.
- .7 Recycle: To remove a waste material from the Project site to another site for remanufacture into a new product for reuse by others.

- .8 Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form; recycling does not include burning, incinerating, or thermally destroying waste.
- .9 Return: To give back reusable items or unused products to vendors for credit.
- .10 Reuse: To reuse a construction waste material in some manner on the Project site.
- .11 Salvage: To remove a waste material from the Project site to another site for resale or reuse by others.
- .12 Sediment: Soil and other debris that has been eroded and transported by storm or well production run off water.
- .13 Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.
- .14 Toxic: Poisonous to humans either immediately or after a long period of exposure.
- .15 Trash: Any product or material unable to be reused, returned, recycled, or salvaged.
- .16 Volatile Organic Compounds (VOC's): Chemical compounds common in and emitted by many building products over time through outgassing:
  - .1 Solvents in paints and other coatings;
  - .2 Wood preservatives; strippers and household cleaners;
  - .3 Adhesives in particleboard, fiberboard, and some plywood; and foam insulation.
  - .4 When released, VOC's can contribute to the formation of smog and can cause respiratory tract problems, headaches, eye irritations, nausea, damage to the liver, kidneys, and central nervous system, and possibly cancer.
- .17 Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.
- .18 Construction Waste Management Plan: A project related plan for the collection, transportation, and disposal of the waste generated at the construction site; the purpose of the plan is to ultimately reduce the amount of material being landfilled.

### **1.3 REFERENCE STANDARDS**

- .1 ASTM International (ASTM)
  - .1 ASTM E 1609 01, Standard Guide for Development and Implementation of a Pollution Prevention Program
- .2 Recycling Certification Institute (RCI)
  - .1 RCI Certification Construction and Demolition Materials Recycling

### **1.4 ADMINISTRATIVE REQUIREMENTS**

- .1 Coordination: Coordinate waste management requirements with all Divisions of the Work for the Project, and ensure that requirements of the Construction Waste Management Plan are followed.

- .2 Preconstruction Meeting: Contractor to arrange a pre-construction meeting before starting any Work of the Contract attended by the Owner (DND), Contractor, affected Subcontractor's and DDC Representative to discuss the Contractor's Construction Waste Management Plan and to develop mutual understanding of the requirements for a consistent policy towards waste reduction and recycling.

## **1.5 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Action Submittals: Provide the following submittals before starting any work of this Section:
  - .1 Draft Construction Waste Management Plan (Draft CWM Plan): Submit to DCC Representative a preliminary analysis of anticipated site generated waste by listing a minimum of five (5) construction or demolition waste streams that have potential to generate the most volume of material indicating methods that will be used to divert construction waste from landfill and source reduction strategies; DCC Representative will provide commentary before development of Contractor's Construction Waste Management Plan.
  - .2 Construction Waste Management Plan (CWM Plan): Submit a CWM Plan for this Project to the DCC Representative before any waste removal from site:
    - .1 Material Streams: Analysis of the proposed jobsite waste being generated, including material types and quantities forming a part of identified material streams in the Draft CWM Plan; materials removed from site destined for alternative daily cover at landfill sites and land clearing debris cannot be considered as contributing to waste diversion and will be included as a component of the total waste generated for the site.
    - .2 Recycling Haulers and Markets: Investigate local haulers and markets for recyclable materials, and incorporate into CWM Plan.
    - .3 Alternative Waste Disposal: Prepare a listing of each material proposed to be salvaged, reused, recycled or composted during the course of the Project, and the proposed local market for each material.
    - .4 Landfill Materials: Identify materials that cannot be recycled, reused or composted and provide explanation or justification; energy will be considered as a viable alternative diversion strategy for these materials where facilities exist and are operated in accordance with LEED Construction and Demolition Waste Management requirements.
    - .5 Landfill Options: The name of the landfill where trash will be disposed of; landfill materials will form a part of the total waste generated by the Project.
    - .6 Materials Handling Procedures: A description of the means by which any recycled waste materials will be protected from contamination, and a description of the means to be employed in recycling the above materials consistent with requirements for acceptance by designated facilities.
    - .7 Transportation: A description of the means of transportation of the recyclable materials, whether materials will be site separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler and removed from the site, and destination of materials.

## **1.6 PROJECT CLOSEOUT SUBMITTALS**

- .1 Submit closeout Submittals as follows:

- .1 Construction Waste Management Report (CWM Report): Submit a CWM Report for this Project. Include the following information:
  - .1 Accounting: Submit information indicating total waste produced by the Project.
  - .2 Composition: Submit information indicating types of waste material and quantity of each material.
  - .3 Diversion Rate: Submit information indicating total waste diverted from landfill as a percentage of the total waste produced by the Project.
  - .4 Submit copies of transportation documents or shipping manifests indicating weights of materials, and other evidence of disposal indicating final location of waste diverted from landfill and waste sent to landfill.
  - .5 Multiple Waste Hauling: Compile all information into a single CWM Report where multiple waste hauling and diversion strategies were used for the project.
  - .6 Photographs: Submit photographs of waste diversion facilities documenting location and signage describing usage of waste separation containers.

## **1.7 QUALITY ASSURANCE**

- .1 Resources for Development of Construction Waste Management Report (CWM Report): The following sources may be useful in developing the Draft Construction Waste Management Plan:
  - .1 Recycling Haulers and Markets: Investigate local haulers and markets for recyclable materials, and incorporate into CWM Plan.
  - .2 Waste-to-Energy Systems: Investigate local waste-to-energy incentives where systems for diverting materials from landfill for reuse or recycling are not available.
- .2 Certifications: Provide proof of the following during the course of the Work:
  - .1 Compliance Certification: Provide proof that recycling center is third party verified and is listed as a Certified Facility through the registration and certification requirements of the Recycling Certification Institute.

## **1.8 DELIVERY, STORAGE, AND HANDLING**

- .1 Storage Requirements: Implement a recycling/reuse program that includes separate collection of waste materials as appropriate to the Project waste and the available recycling and reuse programs in the Project area.
- .2 Handling Requirements: Clean materials that are contaminated before placing in collection containers and ensure that waste destined for landfill does not get mixed in with recycled materials:
  - .1 Deliver materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to recycling process.
  - .2 Arrange for collection by or delivery to the appropriate recycling or reuse facility.
- .3 Hazardous Waste and Hazardous Materials: Handle in accordance with applicable regulations.



**Part 2 Execution**

**2.1 (CWM PLAN) IMPLEMENTATION**

- .1 Manager: Contractor is responsible for designating an on-site party or parties responsible for instructing workers and overseeing and documenting results of the CWM Plan for the Project.
- .2 Distribution: Distribute copies of the CWM Plan to the job site foreman, all Subcontractors, the Owner, the DCC Representative and other site personnel as required to maintain CWM Plan.
- .3 Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, composting and return methods being used for the Project to Subcontractor's at appropriate stages of the Project.
- .4 Separation Facilities: Lay out and label a specific area to facilitate separation of materials for potential recycling, salvage, reuse, composting and return:
  - .1 Recycling and waste bin areas are to be kept neat and clean and clearly marked in order to avoid contamination of materials.
  - .2 Hazardous wastes shall be separated, stored, and disposed of in accordance with local regulations.
- .5 Progressive Documentation: Submit a monthly summary of waste generated by the Project to ensure that waste diversion goals are on track with Project requirements:
  - .1 Submittal of waste summary can coincide with application for progress payment, or similar milestone event as agreed upon between the Owner, and DCC Representative.
  - .2 Monthly waste summary shall contain the following information:
    - .1 The amount in tonnes or m<sup>3</sup> and location of material landfilled,
    - .2 The amount in tonnes or m<sup>3</sup> and location of materials diverted from landfill, and
    - .3 Indication of progress based on total waste generated by the Project with materials diverted from landfill as a percentage.

**2.2 SUBCONTRACTOR'S RESPONSIBILITY**

- .1 Subcontractors shall cooperate fully with the Contractor to implement the CWM Plan.
- .2 Failure to cooperate may result in the Owner not achieving their environmental goals, and may result in penalties being assessed by the Contractor to the responsible Subcontractor's.

**END OF SECTION**

**Part 1            General**

**1.1                SUMMARY**

- .1    This Section includes the following:
  - .1    Demolition and removal of selected portions of interior doors, exterior windows, door and associated trims.
  - .2    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 exterior building components or structural elements.

**1.2                REFERENCES**

- .1    CSA International
  - .1    CSA S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures.

**1.3                ACTION AND INFORMATIONAL SUBMITTALS**

- .1    Submit demolition drawings:
  - .1    Construction Waste Management:
    - .1    Submit project Waste Reduction Workplan highlighting recycling and salvage requirements.
    - .2    Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 50% of construction wastes were recycled or salvaged.

**1.4                SITE CONDITIONS**

- .1    Review "Designated Substance Report" and take precautions to protect environment.
- .2    If material resembling spray or trowel-applied asbestos or other designated substance is encountered, stop work, take preventative measures, and notify DCC Representative immediately.
  - .1    Proceed only after receipt of written instructions have been received from DCC Representative.
- .3    Notify DCC Representative before disrupting building access or services.

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**Part 2 Products**

**2.1 DESCRIPTION**

- .1 This section of the Work includes, but is not necessarily limited to, the following:
  - .1 Demolition, removal completely from site, and disposal of all identified components, materials, equipment and debris
  - .2 Selective demolition to allow new walls, bulkheads, ceilings and other materials to meet existing construction as indicated
  - .3 All material from demolition shall be removed from site immediately with no salvage, selling, sorting or burning permitted on site
  - .4 Retain items indicated on drawings for re use in new construction

**2.2 DEBRIS**

- .1 Make all arrangements for transport and disposal of all demolished materials from the site.

**Part 3 Execution**

**3.1 EXAMINATION**

- .1 Inspect building with DCC Representative and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain.
- .2 Locate and protect utilities. Preserve active utilities traversing site in operating condition.
- .3 Notify and obtain approval of utility companies before starting demolition.
- .4 Disconnect, cap, plug or divert, as required, existing public utilities within the property where they interfere with the execution of the work, in conformity with the requirements of the authorities having jurisdiction. Mark the location of these and previously capped or plugged services on the site and indicate location (horizontal and vertical) on the record drawings. Support, shore up and maintain pipes and conduits encountered.
  - .1 Immediately notify DCC Representative Consultant and utility company concerned in case of damage to any utility or service, designated to remain in place.
  - .2 Immediately notify the DCC Representative should uncharted utility or service be encountered, and await instruction in writing regarding remedial action.

**3.2 PREPARATION**

- .1 Remove items as indicated.
- .2 Protect adjacent surface for removal of existing windows and trim as required.
- .3 Remove parts of existing building to permit new construction.

- .4 Trim edges of partially demolished building elements to tolerances as defined by DCC Representative to suit future use.

### **3.3 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 Refer to demolition drawings and specifications for items to be salvaged for reuse.

**END OF SECTION**

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**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1        Section 02 82 00.01 – Asbestos Abatement – Minimum Precautions
- .2        Section 07 92 00 - Joint Sealants
- .3        Section 09 91 13 - Exterior Painting
- .4        Section 09 91 23.01 - Interior Re-Painting
- .5        Section 09 91 23 - Interior Painting

**1.2                REFERENCES**

- .1        Canadian Environmental Protection Act, 1999.
  - .1        Export and Import of Hazardous Waste Regulations (SOR/2005-149).
- .2        Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1        WHMIS Safety Data Sheets (SDS).
- .3        National Fire Code of Canada (latest version)
- .4        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).

**1.3                DEFINITIONS**

- .1        Dangerous Goods: product, substance, or organism that is specifically listed or meets hazard criteria established in Transportation of Dangerous Goods Regulations.
- .2        Hazardous Material: product, substance, or organism that is used for its original purpose; and that is either dangerous goods or a material that may cause adverse impact to environment or adversely affect health of persons, animals, or plant life when released into the environment.
- .3        Hazardous Waste: any hazardous material that is no longer used for its original purpose and that is intended for recycling, treatment or disposal.
- .4        Workplace Hazardous Materials Information System (WHMIS): Canada-wide system designed to give employers and workers information about hazardous materials used in workplace. Under WHMIS, information on hazardous materials is provided on container labels, material safety data sheets (MSDS), and worker education programs. WHMIS is put into effect by combination of federal and provincial laws.

**1.4                SUBMITTALS**

- .1 Product Data:
  - .1
  - .1 Submit to the DCC Representative current Material Safety Data Sheet (MSDS) for each hazardous material required prior to bringing hazardous material on site.
  - .2 Submit hazardous materials management plan to DCC Representative that identifies hazardous materials, their use, their location, personal protective equipment requirements, and disposal arrangements.

## **1.5 DELIVERY, STORAGE, AND HANDLING**

- .1 Co-ordinate storage of hazardous materials with the DCC 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 current National Fire Code of Canada requirements.
- .4 Keep no more than 45 litres of flammable and combustible liquids such as gasoline, kerosene and naphtha for ready use.
  - .1 Store flammable and combustible liquids in approved safety cans bearing the Underwriters' Laboratory of Canada or Factory Mutual seal of approval.
  - .2 Storage of quantities of flammable and combustible liquids exceeding 45 litres for work purposes requires the written approval of the DCC Representative.
- .5 Transfer of flammable and combustible liquids is prohibited within buildings.
- .6 Do not transfer flammable and combustible liquids in vicinity of open flames or heat-producing devices.
- .7 Do not use flammable liquids having flash point below 38 degrees C, such as naphtha or gasoline as solvents or cleaning agents.
- .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 not mixed.

- .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 Ensure personnel have been trained in accordance with Workplace Hazardous Materials Information System (WHMIS) requirements.
- .12 Report spills or accidents immediately to DCC Representative. Submit a written spill report to DCC Representative within 24 hours of incident.

## **1.6 TRANSPORTATION**

- .1 Transport hazardous materials and wastes in accordance with federal Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial regulations.
- .2 If exporting hazardous waste to another country, ensure compliance with federal Export and Import of Hazardous Waste Regulations.
- .3 If hazardous waste is generated on site:
  - .1 Co-ordinate transportation and disposal with DCC Representative.
  - .2 Ensure compliance 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 Prior to shipping material obtain written notice from intended hazardous waste treatment or disposal facility that it will accept material and that it is licensed to accept this material.
  - .5 Label container[s] with legible, visible safety marks as prescribed by federal and provincial regulations.
  - .6 Ensure that trained personnel handle, offer for transport, or transport dangerous goods.
  - .7 Provide photocopy of shipping documents and waste manifests to DCC Representative.
  - .8 Track receipt of completed manifest from consignee after shipping dangerous goods. Provide a photocopy of completed manifest to DCC Representative.
  - .9 Report discharge, emission, or escape of hazardous materials immediately to DCC Representative and appropriate provincial authority. Take reasonable measures to control release.

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**Part 2            Products**

**2.1                MATERIALS**

- .1            Only bring on site quantity of hazardous materials required to perform work.
- .2            Maintain MSDS in proximity to where materials are being used. Communicate this location to personnel who may have contact with hazardous materials.

**Part 3            Execution**

**3.1                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**



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**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.
  - .3 Removing less than one square metre of drywall in which joint-filling compounds that are asbestos containing materials have been used.

**1.2                RELATED REQUIREMENTS**

- .1 Section 01 70 03 - Safety Requirements
- .2 Section 01 74 19 - Waste Management and Disposal.
- .3 Section 02 41 99 Demolition for Minor Works.
- .4 Section 02 81 01 Hazardous Materials

**1.3                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: Engineers, Consultants or designated representatives, and representatives 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 and 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.

#### **1.4 REFERENCE STANDARDS**

- .1 Department of Justice Canada (Jus)
  - .1 Canadian Environmental Protection Act, 1999 (CEPA).
  - .2 SOR/2018-196 Prohibition of Asbestos and Products Containing Asbestos Regulations.
- .2 Transport Canada (TC)
  - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).

#### **1.5 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit proof satisfactory to DCC Representative that suitable arrangements have been made to dispose of asbestos-containing waste in accordance with requirements of authority having jurisdiction.
- .2 Submit Provincial/Territorial and/or local requirements for Notice of Project Form.
- .3 Submit to DCC Representative necessary permits for transportation and disposal of asbestos-containing waste and proof that asbestos-containing waste has been received and properly disposed.
- .4 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.
- .5 Submit proof satisfactory to DCC 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 70 03 - 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 by contractor.

- .5 Ensure workers wash hands and face when leaving Asbestos Work Area. Facilities for washing are to be supplied by contractor.
- .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 Separate waste materials for recycling in accordance with Section 01 74 19 - Waste Management and Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Place materials defined as hazardous or toxic in designated containers.
- .4 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.
- .5 Fold up metal banding, flatten and place in designated area for recycling.
- .6 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.
- .7 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 available for inspection at Annex 'A' bound into this specification at back.
- .2 Notify DCC 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 DCC Representative.

## **1.9 PERSONNEL TRAINING**

- .1 Before beginning Work, provide DCC 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.

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**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 70 03 - 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    CSA Group (CSA)
  - .1    CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
  - .2    CSA O121-08, Douglas Fir Plywood.
  - .3    CSA O141-05(R2009), Softwood Lumber.
  - .4    CSA O151-09, Canadian Softwood Plywood.
  - .5    CAN/CSA-O325.0-07, Construction Sheathing.
  - .6    CAN/CSA-Z809-08, Sustainable Forest Management.
- .2    National Research Council Canada (NRC)
  - .1    National Building Code of Canada 2015 (NBC).
- .3    Forest Stewardship Council (FSC)
  - .1    FSC-STD-01-001-2004, FSC Principle and Criteria for Forest Stewardship.
- .4    Green Seal Environmental Standards (GS)
  - .1    GS-11-11, Paints and Coatings.
- .5    National Lumber Grades Authority (NLGA)
  - .1    Standard Grading Rules for Canadian Lumber 2010.
- .6    South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
  - .1    SCAQMD Rule 1113-A2011, Architectural Coatings.
- .7    Sustainable Forestry Initiative (SFI)
  - .1    SFI-2010-2014 Standard.

**1.2                ACTION AND INFORMATIONAL SUBMITTALS**

- .1    Product Data:
  - .1    Submit manufacturer's instructions, printed product literature and data sheets for rough carpentry work and include product characteristics, performance criteria, physical size, finish and limitations.

**1.3                QUALITY ASSURANCE**

- .1    Lumber identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.

- .2 Plywood identification: by grade mark in accordance with applicable CSA standards.
- .3 Plywood, OSB and wood based composite panel construction sheathing identification: by grade mark in accordance with applicable CSA standards.
- .4 Sustainable Standards Certification:
  - .1 Certified Wood: submit listing of wood products and materials used in accordance with CAN/CSA-Z809 or FSC or SFI.

#### **1.4 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with 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 wood from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.

### **Part 2 Products**

#### **2.1 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.
  - .3 CAN/CSA-Z809 or FSC or SFI certified.
- .2 Furring, blocking, nailing strips, grounds, rough bucks, cants, curbs, fascia backing and sleepers:
  - .1 S2S
  - .2 Board sizes: "Standard" or better grade.
  - .3 Dimension sizes: "Standard" light framing or better grade.
  - .4 Post and timbers sizes: "Standard" or better grade.
- .3 Panel Materials:
  - .1 Douglas fir plywood (DFP): to CSA O121, standard construction.
    - .1 Urea-formaldehyde free.
  - .2 Canadian softwood plywood (CSP): to CSA O151, standard construction.
    - .1 Urea-formaldehyde free.



- .3 Plywood, OSB and wood based composite panels: to CAN/CSA-O325.
  - .1 Urea-formaldehyde free.
- .4 Wood Preservative:
  - .1 Surface-applied wood preservative: clear or 5% pentachlorophenol solution, water repellent preservative.
  - .2 Pentachlorophenol use is restricted to building components that are in ground contact and subject to decay or insect attack only. Where used, pentachlorophenol-treated wood must be covered with two coats of an appropriate sealer.
  - .3 Structures built with wood treated with pentachlorophenol and inorganic arsenicals must not be used for storing food nor should the wood come in contact with drinking water.
- .5 Primers Coatings: in accordance with manufacturer's recommendations for surface conditions:

## **2.2 ACCESSORIES**

- .1 Fasteners: to CAN/CSA-G164, for exterior work or interior highly humid areas, pressure-preservative fire-retardant treated lumber.
- .2 Nails, spikes and staples: to CSA B111.
- .3 Bolts: 12.5 mm diameter unless indicated otherwise, complete with nuts and washers.
- .4 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, explosive actuated fastening devices, 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.
  - .1 Visually inspect substrate in presence of DCC Representative.
  - .2 Inform DCC Representative of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from DCC Representative.

### **3.2 PREPARATION**

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

- .2 Apply preservative by dipping, or by brush to completely saturate and maintain wet film on surface for minimum 3-minute soak on lumber and 1-minute soak on plywood.
- .3 Re-treat surfaces exposed by cutting, trimming or boring with liberal brush application of preservative before installation.

### **3.3 INSTALLATION**

- .1 Comply with requirements of National Building Code of Canada (NBC), supplemented by the following paragraphs.
- .2 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.
- .3 Align and plumb faces of furring and blocking to tolerance of 1:600.
- .4 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work.
- .5 Install wood cants, fascia backing, nailers, curbs and other wood supports as required and secure using galvanized steel fasteners.
- .6 Install wood backing, dressed, tapered and recessed slightly below top surface of roof insulation for roof hopper.
- .7 Install sleepers as indicated.
- .8 Use caution when working with particle board. Use dust collectors and high-quality respirator masks.
- .9 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.

**END OF SECTION**

**Part 1            General**

**1.1               RELATED SECTIONS**

- .1    Section 08 11 00 - Metal Doors and Frames.
- .2    Section 06 08 99 - Rough Carpentry
- .3    Section 09 91 23 - Interior Painting

**1.2               REFERENCES**

- .1    American National Standards Institute (ANSI)
  - .1    ANSI/HPVA HP-1-2004, Standard for Hardwood and Decorative Plywood.
- .2    Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Architectural Woodwork Institute (AWI)
  - .1    Architectural Woodwork Quality Standards, 2nd edition, 2014.
- .3    Canadian Standards Association (CSA International)
  - .1    CSA B111-74(R2003), Wire Nails, Spikes and Staples.
  - .2    CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
- .4    National Hardwood Lumber Association (NHLA)
  - .1    Rules for the Measurement and Inspection of Hardwood and Cypress 1998.
- .5    National Lumber Grades Authority (NLGA)
  - .1    Standard Grading Rules for Canadian Lumber 2005.
- .6    Underwriters Laboratories of Canada (ULC)
  - .1    CAN/ULC-S104-10, Standard Method for Fire Tests of Door Assemblies.
  - .2    CAN/ULC-S105-09, Standard Specification for Fire Door Frames.

**1.3               SUBMITTALS**

- .1    Shop Drawings Submittals:
  - .1    Indicate details of construction, profiles, jointing, fastening and other related details.
  - .2    Indicate materials, thicknesses, finishes and hardware.

**1.4               QUALITY ASSURANCE**

- .1    Lumber by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.

## **1.5 DELIVERY, STORAGE, AND HANDLING**

- .1 Deliver, handle, store and protect materials in accordance with Common Product Requirements.
  - .1 Protect materials against dampness during and after delivery.
  - .2 Store materials in ventilated areas, protected from extreme changes of temperature or humidity.
- .2 Waste Management and Disposal:
  - .1 Separate waste materials for reuse and recycling in accordance with standard Environmental Procedures.

## **Part 2 Products**

### **2.1 LUMBER MATERIAL**

- .1 Softwood and Hardwood lumber: moisture content 3 % or less in accordance with following standards:
  - .1 National Hardwood Lumber Association (NHLA).
  - .2 AWMAC premium grade, moisture content as specified.
  - .3 Grade mark softwood and hardwood lumber by the appropriate association under authority of the National Lumber Grades Authority. Wood shall be select lumber, and clear where required to meet specified use and finish. Wood that is not exposed shall be of highest grade that satisfies fabrication, utility, and structural needs.
  - .4 Hardwood Maple, Clear Select.
  - .5 Softwood: Where no species is indicated, provide No. 1 White Pine.
- .2 Millwork and Casework Components:
  - .1 Window Sills:
    - .1 Hardwood, no sharp edges primed and painted
    - .2 Minimum Thickness – 19mm.

### **2.2 ACCESSORIES**

- .1 Nails and staples: to CSA B111; galvanized to CAN/CSA-G164 for exterior work, interior humid areas and for treated lumber; plain finish elsewhere.
- .2 Wood screws: plain steel, type and size to suit application.
- .3 Splines: wood.
- .4 Adhesive: recommended by manufacturer.
  - .1 Adhesives: maximum VOC limit 30 g/L.

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**Part 3 Execution**

**3.1 INSTALLATION**

- .1 Do finish carpentry to Quality Standards of the Architectural Woodwork Manufacturers Association of Canada (AWMAC), except where specified otherwise.
- .2 Scribe and cut as required, fit to abutting walls, and surfaces, fit properly into recesses and to accommodate piping, columns, fixtures, outlets, or other projecting, intersecting or penetrating objects.
- .3 Form joints to conceal shrinkage.

**3.2 CONSTRUCTION**

- .1 Fastening:
  - .1 Position items of finished carpentry work accurately, level, plumb, true and fasten or anchor securely.
  - .2 Design and select fasteners to suit size and nature of components being joined. Use proprietary devices as recommended by manufacturer.
  - .3 Set finishing nails to receive filler. Where screws are used to secure members, countersink screw in round smooth cut hole and plug with wood plug to match material being secured.
  - .4 Replace items of finish carpentry with damage to wood surfaces including hammer and other bruises.

**3.3 SCHEDULES**

- .1 Window Sills and trim:
  - .1 Sills as described, trim solid hardwood.

**END OF SECTION**

**Part 1            General**

**1.1                REFERENCE STANDARDS**

- .1 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-51.33-M89, Vapour Barrier Sheet, Excluding Polyethylene, for Use in Building Construction.
  - .2 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet, for Use in Building Construction.

**1.2                ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for vapour retarders and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit 2 copies of WHMIS SDS in accordance with Section 01 70 03- Safety Requirements and standard Environmental Procedures.
- .2 Certificates:
  - .1 Submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

**1.3                QUALITY ASSURANCE**

- .1 Mock-Ups:
  - .1 Submit mock-ups in accordance with Section 01 45 00 - Quality Control.
  - .2 Construct mock-up of sheet vapour barrier installation including one lap joint, one inside corner and at one electrical box. Mock-up may be part of finished work.
  - .3 Mock-up will be used to judge quality of work, substrate preparation, and material application.
  - .4 Locate where directed where indicated.
  - .5 Allow 24 hours for inspection of mock-up by DCC Representative before proceeding with vapour barrier work.
  - .6 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may not remain as part of finished work. Remove mock-up and dispose of materials when no longer required and when directed by DCC Representative.

**1.4                DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Common Product Requirements and within 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 off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect specified materials from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.

## **Part 2 Products**

### **2.1 SHEET VAPOUR BARRIER**

- .1 Polyethylene film: to CAN/CGSB-51.34, 0.10 0.15 mm thick.

### **2.2 ACCESSORIES**

- .1 Joint sealing tape: air resistant pressure sensitive adhesive tape, type recommended by vapour barrier manufacturer, 50 mm wide for lap joints and perimeter seals, 25 mm wide elsewhere.
- .2 Sealant: compatible with vapour retarder materials, recommended by vapour retarder manufacturer. To Section 07 92 00 - Joint Sealants.
- .3 Staples: minimum 6 mm leg.

## **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 vapour retarder installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of DCC Representative.
  - .2 Inform DCC Representative of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from DCC Representative.

### **3.2 INSTALLATION**

- .1 Ensure services are installed and inspected prior to installation of retarder.
- .2 Install sheet vapour retarder on warm side of exterior wall assemblies prior to installation of gypsum board to form continuous retarder.
- .3 Use sheets of largest practical size to minimize joints.
- .4 Inspect for continuity. Repair punctures and tears with sealing tape before work is concealed.

### **3.3 EXTERIOR SURFACE OPENINGS**

- .1 Cut sheet vapour retarder to form openings and ensure material is lapped and sealed to frame.

### **3.4 PERIMETER SEALS**

- .1 Seal perimeter of sheet vapour barrier as follows:
  - .1 Apply continuous bead of sealant to substrate at perimeter of sheets.
  - .2 Lap sheet over sealant and press into sealant bead.
  - .3 Install staples through lapped sheets at sealant bead into wood substrate.
  - .4 Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.

### **3.5 LAP JOINT SEALS**

- .1 Seal lap joints of sheet vapour barrier as follows:
  - .1 Attach first sheet to substrate.
  - .2 Apply continuous bead of sealant over solid backing at joint.
  - .3 Lap adjoining sheet minimum 150 mm and press into sealant bead.
  - .4 Install staples through lapped sheets at sealant bead into wood substrate.
  - .5 Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.

### **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.
  - .1 Remove insulation material spilled during installation and leave work area ready for application of wall board.

**END OF SECTION**



**Part 1            General**

**1.1                REFERENCE STANDARDS**

- .1    ASTM International
  - .1    ASTM C 919-08, 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    General Services Administration (GSA) - Federal Specifications (FS)
  - .1    FS-SS-S-200-E(2)1993, Sealants, Joint, Two-Component, Jet-Blast-Resistant, Cold Applied, for Portland Cement Concrete Pavement.
- .4    Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1    Safety Data Sheets (SDS).
- .5    South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
  - .1    SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.

**1.2                ACTION AND INFORMATIONAL SUBMITTALS**

- .1    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 SDS in accordance with Section 01 70 03 - Safety Requirements and standard Environmental Procedures.
- .2    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.

.3 Manufacturer's Instructions:

.1 Submit instructions to include installation instructions for each product used.

### **1.3 CLOSEOUT SUBMITTALS**

.1 Operation and Maintenance Data: submit operation and maintenance data for incorporation into manual.

### **1.4 DELIVERY, STORAGE AND HANDLING**

.1 Deliver, store and handle materials in accordance with Common Product Requirements and within 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 off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect joint sealants from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

### **1.5 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.

### **1.6 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 Safety Data Sheets (SDS) acceptable to Health Canada.

- .2 DCC Representative will arrange for ventilation system to be operated on maximum outdoor air and exhaust during installation of caulking and sealants. Ventilate area of work as directed by DCC Representative by use of approved portable supply and exhaust fans.

## **Part 2 Products**

### **2.1 SEALANT MATERIALS**

- .1 General:
  - .1 All materials used for the work of this Section, including but not limited to, primers and sealants are to have low VOC content limits.
  - .2 Use materials as received from manufacturers, without additives or adulterations. Use one manufacturer's Product for each kind of Product specified.
- .2 Sealant Type A: ASTM C920, Type S, Grade NS, Class 25; One-part, non-sag type, silicone sealant, in standard colours selected.
  - .1 'DC CWS' by Dow Corning Inc. or equivalent by another approved supplier.
  - .2 'Sikasil 305CN' by Sika. or equivalent by another approved supplier.
  - .3 'Tremsil 400' by Tremco Ltd. or equivalent by other approved supplier.
- .3 Sealant Type B: ASTM C920, Type S, Grade NS; One-part mildew-resistant silicone, in standard colours selected.
  - .1 '786 Mildew Resistant Silicone Sealant' by Dow Corning Inc. or equivalent by another approved supplier.
  - .2 'Sikasil GP Mildew Resistant' by Sika or equivalent by another approved supplier.
  - .3 'Tremsil 200 Silicone Sealant' by Tremco Ltd. or equivalent by another approved supplier.
- .4 Sealant Type C: ASTM C834; Pure acrylic siliconized sealant; in standard white colour (paintable).
  - .1 '950A Siliconized Acrylic Latex Caulk' by Sherwin Williams or equivalent by another approved supplier
  - .2 'Tremflex 834 Siliconized Sealant' by Tremco Ltd. or equivalent by another approved supplier
  - .3 'Dap' Alex Ultra Advance Acrylic Latex Caulk with Silicone or equivalent by another approved supplier.

### **2.2 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.

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**Part 3 Execution**

**3.1 EXAMINATION**

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

**3.2 SURFACE PREPARATION**

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

**3.3 PRIMING**

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

**3.4 BACKUP MATERIAL**

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

**3.5 MIXING**

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

**3.6 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.

### **3.7 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
  - .1 Leave Work area clean at end of each day.
  - .2 Clean adjacent surfaces immediately.
  - .3 Remove excess and droppings

### **3.8 SCHEDULE**

- .1 Use mould and mildew-resistant silicone sealant Type 'B' for non-moving joints in washrooms.
- .2 Seal perimeters of hollow metal door frames on both sides and the exterior of all windows with sealant Type 'A'.
- .3 Use sealant Type 'C' to seal window and door frame trim around the inside perimeter, so that an airtight seal is obtained, as indicated on Drawings.

**END OF SECTION**

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**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1      Section 07 92 00 Joint Sealants
- .2      Section 09 91 13 Exterior Painting
- .3      Section 09 91 23 Interior Painting

**1.2                REFERENCES**

- .1      American Society for Testing and Materials International (ASTM)
  - .1      ASTM A 653/A 653M-06a, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2      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).
- .3      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.
- .4      Underwriters' Laboratories of Canada (ULC)
  - .1      CAN/ULC-S704-03, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.
  - .2      CAN/ULC-S104-15, Standard Method for Fire Tests of Door Assemblies
  - .3      CAN/ULC-S105-16, Standard Specification for Fire Door Frames Meeting the Performance Required by CAN/ULC-S104

**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., for all exterior doors.
  - .2      Maximum deflection for exterior steel entrance screens under wind load of 1.2 kPa not to exceed 1/175th of span.

**1.4                ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide product data:
- .2 Provide shop drawings:
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada.
  - .2 Indicate each type of door, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, glazed, arrangement of hardware and fire rating and finishes.
  - .3 Indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors and exposed fastenings and reinforcing fire rating finishes.
  - .4 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.
- .3 Provide samples.
- .4 Submit one 300 x 300 mm corner sample of each type of frame.

## **1.5 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with common product requirements. Ensure all new materials are kept protected, dry, and out of the elements of weather until installation.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Hot dipped galvanized steel sheet: to ASTM A 653M, 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 A 653M, ZF75.

### **2.2 DOOR CORE MATERIALS**

- .1 Stiffened: face sheets honeycomb insulated core.
  - .1 Fibreglass: to CAN/ULC-S702, semi-rigid for exterior doors, density 24 kg/m<sup>3</sup>.

### **2.3 ADHESIVES**

- .1 Polystyrene and polyurethane cores: heat resistant, epoxy resin based, low viscosity, contact cement.
- .2 Lock-seam doors: fire resistant, resin reinforced polychloroprene, high viscosity, sealant/adhesive.

## **2.4 PRIMER**

- .1 Touch-up prime CAN/CGSB-1.181.
  - .1 Maximum VOC limit 50 g/L to GC-03.

## **2.5 PAINT**

- .1 Field paint steel doors and frames in accordance with Sections 09 91 23 - Interior Painting, 09 91 13 - Exterior Painting. Protect weatherstrips from paint. Provide final finish free of scratches or other blemishes.

## **2.6 ACCESSORIES**

- .1 Fire Labels: Metal riveted
- .2 Door silencers: single stud rubber/neoprene type.
- .3 Exterior and interior top caps: rigid polyvinylchloride extrusion conforming to CGSB 41-GP-19Ma steel.
- .4 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.
- .5 Metallic paste filler: to manufacturer's standard.
- .6 Sealant: Refer to Section 07 92 00.
- .7 Double glazed sealed unit, 6 mm.
- .8 Make provisions for glazing as indicated and provide necessary glazing stops.
  - .1 Provide removable stainless steel glazing beads for use with glazing tapes and compounds and secured with countersunk stainless steel screws.
  - .2 Design exterior glazing stops to be tamperproof.

## **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, and electronic hardware using templates provided by finish hardware supplier. Reinforce frames for surface mounted hardware.
- .5 Prepare frame for door silencers, 3 for single door, 2 at head for double door.
- .6 Manufacturer's nameplates on frames and screens are not permitted.



- .7 Conceal fastenings except where exposed fastenings are indicated.
- .8 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.
- .9 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.

## **2.10 DOOR FABRICATION GENERAL**

- .1 Doors: swing type, flush, with provision for glass openings as indicated.
- .2 Exterior doors: hollow steel insulated construction.
- .3 Fabricate doors with longitudinal edges locked seamed, adhesive assisted. Seams: visible.
- .4 Blank, reinforce, drill doors and tap for mortised, templated hardware and electronic 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 CAN/ULC-S104 & NFPA 252 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 polystyrene 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 from 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 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 and vapour retarder with a cap of flexible membrane flashing.

### **3.4 DOOR**

- .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 Latch side and head: 1.5 mm.
  - .3 Finished floor, top of carpet and thresholds: 13 mm.
- .3 Adjust operable parts for correct function.

### **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.

### **3.6 GLAZING**

- .1 Install glazing for doors and frames in accordance with Section 08 80 50 - Glazing.

**END OF SECTION**

**Part 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 Not Used.

**1.2 REFERENCES**

- .1 Aluminum Association (AA)
  - .1 AA DAF 45-03, Designation System for Aluminum Finishes.
- .2 CSA International
  - .1 CSA-A440-00/A440.1-00(R2005), A440-00, Windows/Special Publication A440.1-00, User Selection Guide to CSA Standard A440-00, Windows. CAN/CSA-A440.2-09, Fenestration Energy Performance.
  - .2 CAN/CSA-Z91-02(R2013), Health and Safety Code for Suspended Equipment Operations.
  - .3 CAN/CSA-Z809-08, Sustainable Forest Management.
- .3 Forest Stewardship Council (FSC)
  - .1 FSC-STD-01-001-2014, FSC Principle and Criteria for Forest Stewardship.
- .4 Green Seal Environmental Standards (GS)

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 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 Shop Drawings:
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada.
  - .2 Indicate materials and details in full size scale for head, jamb and sill, profiles of components, interior and exterior trim, elevations of unit, anchorage details, description of related components and exposed finishes, fasteners, and caulking. Indicate location of manufacturer's nameplates.
- .3 Samples:
  - .1 Submit for review and acceptance of each unit.
  - .2 Samples will be returned for inclusion into work.
  - .3 Submit one representative model of each type window.
  - .4 Include frame, sash, sill, glazing and weatherproofing method, insect screens, surface finish and hardware. Show location of manufacturer's nameplates.
  - .5 Include 150 mm long samples of head, jamb, sill, to indicate profile.

- .4 Test and Evaluation Reports:
  - .1 Submit test reports from approved independent testing laboratories, certifying compliance with specifications, for:
    - .1 Windows classifications.
    - .2 anodized finish, weathering characteristics.
    - .3 Air tightness.
    - .4 Water tightness.
    - .5 Wind load resistance.
    - .6 Condensation resistance.
    - .7 Forced entry resistance.

#### **1.4 CLOSEOUT SUBMITTALS**

- .1 Submit Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for windows for incorporation into manual.

#### **1.5 QUALITY ASSURANCE**

- .1 Certifications: 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 Common Product Requirements and within 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 off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect windows from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.
- .4 Develop Construction Waste Management Plan related to Work of this Section
- .5 Packaging Waste Management: Contractor is to remove from site all pallets, crates, padding, and packaging materials, and recycle where possible, or send for Disposal.

### **Part 2 Products**

#### **2.1 MATERIALS**

- .1 Materials: to CSA-A440/A440.1 supplemented as follows:
- .2 All windows by same manufacturer.
- .3 Sash: aluminum thermally broken for exterior.
- .4 Main frame: aluminum thermally broken for exterior.

- .5 Glass: Insulating Glass Units (for exterior windows): in accordance with Section 08 80 50 - Glazing.
  - .1 Insulating glass units: to CAN/CGSB-12.8, double unit, 7 mm overall thickness.
    - .1 Glass: to CAN/CGSB-12.3.
    - .2 Glass thickness: 7 mm inner light and 7 mm outer light.
    - .3 Inter-cavity space thickness: 7 mm with low conductivity spacers.
    - .4 Glass coating: surface number 2, low "E".
    - .5 Inert gas fill: argon.
- .6 Interior and Exterior aluminum facings: extruded aluminum of type and size as detailed to suit job conditions; minimum 3 mm thick, complete with joint covers, jamb drip deflectors, chairs, anchors.
- .7 Isolation coating: alkali resistant bituminous paint.
- .8 Sealants:
  - .1 VOC limit 250 g/L maximum to SCAQMD Rule 1168.

## 2.2 WINDOW TYPE AND CLASSIFICATION

- .1 Type:
  - .1 Fixed: with insulating glass.
- .2 Classification rating: to CSA-A440/A440.1.
  - .1 Air tightness: A1.
  - .2 Water tightness: B1.
  - .3 Wind load resistance: C1.
  - .4 Condensation resistance: Temperature Index, I 59.
  - .5 Forced Entry: F1.
  - .6 Glazing: G1.

## 2.3 FABRICATION

- .1 Fabricate in accordance with CSA-A440/A440.1 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 are maximum permissible sizes.
- .4 Brace frames to maintain squareness and rigidity during shipment and installation.
- .5 Finish steel clips and reinforcement with shop coat primer to CAN/CGSB-1.40 380 g/m<sup>2</sup> zinc coating to ASTM A 123/A 123M.

## 2.4 ALUMINUM FINISHES

- .1 Finish exposed surfaces of aluminum components in accordance with Aluminum Association Designation System for Aluminum Finishes.
- .2 Integral colour anodic finish: white to match new vinyl windows.

## **2.5 GLAZING**

- .1 Glaze windows in accordance with CSA-A440/A440.1.
  - .1 Insulating glass units: to CAN/CGSB-12.8.

## **2.6 AIR BARRIER AND VAPOUR RETARDER**

- .1 Equip window frames with site installed air barrier and vapour retarder material for sealing to building air barrier and vapour retarder 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 and vapour retarder from interior.

## **Part 3 Execution**

### **3.1 EXAMINATION**

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

### **3.2 INSTALLATION**

- .1 Window installation:
  - .1 Install in accordance with CSA-A440/A440.1.
  - .2 Arrange components to prevent abrupt variation in colour.
- .2 Sill installation:
  - .1 Install metal sills with uniform wash to exterior, level in length, straight in alignment with plumb upstands and faces. Use one piece lengths at each location.
  - .2 Cut sills to fit window opening.
  - .3 Secure sills in place with anchoring devices located at ends joints of continuous sills and evenly spaced 600 mm on center in between.
  - .4 Fasten expansion joint cover plates and drip deflectors with self-tapping stainless steel screws.
  - .5 Maintain 6 to 9 mm space between butt ends of continuous sills. For sills over 1200 mm in length, maintain 3 to 6 mm space at each end.
- .3 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 92 00 - Joint Sealants. Conceal sealant within window units except where exposed use is permitted by DCC Representative.

### **3.3 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.

### **3.4 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 SECTIONS**

- .1     07 92 00 - Joint Sealants
- .2     08 80 50 - Glazing

**1.2                REFERENCE STANDARDS**

- .1     ASTM International
  - .1     ASTM A 123/A 123M-13, Standard Specification for Zinc (Hot-Dipped Galvanized) Coatings on Iron and Steel Products.
  - .2     ASTM E2190-10 Standard Specification for Insulating Glass Unit Performance and Evaluation
- .2     Canadian General Standards Board (CGSB)
  - .1     CAN/CGSB-12.20-M89, Structural Design of Glass for Buildings.
  - .2     CAN/CGSB 12.8-17 Insulating Glass Units Standard
- .3     CSA Group
  - .1     AAMA/WDMA/CSA 101/I.S.2/A440-11, NAFS - North American Fenestration Standard/Specification for Windows, Doors and Skylights.
  - .2     CSA A440S1-09, Canadian Supplement to AAMA/WDMA/CSA 101/I.S.2/A440, NAFS - North American Fenestration Standard for Windows, Doors and Skylights.
  - .3     CSA A440.2/A440.3-14, Fenestration Energy Performance/User Guide to CSA A440.2, Fenestration Energy Performance.
  - .4     CAN/CSA-A440.4-07 (R2012), Window, Door, and Skylight Installation.
- .4     National Research Council Canada (NRC)
  - .1     National Building Code of Canada 2015 (NBC).
- .5     Energy Star
  - .1     Energy Star Canada Specification Version 5.0 – January 1, 2020

**1.3                ACTION AND INFORMATIONAL SUBMITTALS**

- .1     Product Data:
  - .1     Submit manufacturer's instructions, printed product literature and data sheets for exterior windows and include product characteristics, performance criteria, physical size, finish and limitations.

- .2 Shop drawings:
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Ontario, Canada.
  - .2 Include:
    - .1 Plans, elevations, sections, and details.
    - .2 Glazing types.
    - .3 Finishes.
    - .4 Reinforcement, anchorage, assembly fixings.
    - .5 Anchorage inserts, system installation tolerances.
    - .6 Detailing, locations, and allowances for movement, expansion, contraction.
    - .7 Description of related components.
    - .8 Path of cavity drainage and air pressure equalization.
    - .9 Location of isolation coating.
    - .10 Sealants type, backing, joint space.
    - .11 Location of manufacturer's nameplates.
  - .3 Provide full size details of materials and details for head, jamb and sill, profiles of components, interior and exterior trim junction between combination units, anchorage details.
- .3 Samples:
  - .1 Submit one representative model of each type window.
  - .2 Submit 300 x 300 mm sample of each glazing type.
- .4 Certificates:
  - .1 Submit certification from window manufacturer that window system conforms to design requirements specified herein.
- .5 Test reports:
  - .1 Submit test reports from approved independent testing laboratories, certifying compliance with specifications, for:
    - .1 Air tightness.
    - .2 Water tightness.
    - .3 Wind load resistance.
    - .4 Sash strength and stiffness Operable Casement
    - .5 Sash pull-off RFP and vinyl windows.
    - .6 Forced entry resistance.
    - .7 Mullion deflection - combination and composite windows.
    - .8 Finish, weathering characteristics.

#### **1.4 CLOSEOUT SUBMITTALS**

- .1 Submit Closeout Submittals.

- .2 Operation and Maintenance Data: submit operation and maintenance data for exterior windows for incorporation into manual.

## **1.5 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store, and handle windows in accordance with CSA A440.4, Appendix A.
- .2 Deliver, store and handle materials in accordance with Common Product Requirements and within manufacturer's written instructions.
- .3 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .4 Storage and Handling Requirements:
  - .1 Store materials off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect specified materials from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.

## **1.6 WARRANTY**

- .1 Manufacturer's warranty: Submit manufacturer's standard materials and fabrication warranty documentation.

## **Part 2 Products**

### **2.1 SYSTEM DESCRIPTION**

- .1 Provide vinyl window assemblies consisting of but not limited to the following:
  - .1 Fixed: glazed.
  - .2 Casement: opening right or left where indicated in the contract drawings.
  - .3 Glazing: double triple glazing Low-E coating storms.
  - .4 Screens: on ventilating portion of windows as indicated.
  - .5 Hardware: thumb rotary operators with locking handles. Install a tamper proof opening restrictor that allows no more than 100mm of opening in operable casement window to meet NBC safety requirements
  - .6 Finish: anodized. Finish to last a minimum of 5 years without loss of colour, gloss, or deterioration in appearance.
  - .7 Color: White.

### **2.2 DESIGN REQUIREMENTS**

- .1 Design, fabricate and install window assembly in accordance with AAMA/WDMA/CSA 101/I.S.2/A440 and CSA A440S1.

- .2 All new Vinyl Windows to be manufactured by the same manufacturer and be an Energy Star Canada Participant with the Energy Rating (ER) of:
  1. Fixed (Picture) Vinyl Windows: 43 (unitless) or higher.
  2. Casement Vinyl Windows: 40 (unitless) or higher.
- .3 Design window assembly in accordance with following Climatic Design Data for Borden CFB, contained in the National Building Code (NBC).
  - .1 Design Temperature Value (NBC): January 2-1/2% value.
  - .2 Wind (Hourly Wind Pressures): 1 in 30-year occurrence.
  - .3 Earthquake: seismic data as listed.
- .4 Design window system to accommodate following without detrimental effect.
  - .1 Cyclic 40 degrees C daily, thermal swing of components.
  - .2 Cyclic, dynamic loading and release of loads such as wind loads.
  - .3 Relative humidity of: 80%.
  - .4 13 mm vertical deflection in the supporting structure and movement of supporting structure due to live, dead load, and creep or deflection, seismic load, sway displacement and similar items.
- .5 Design window assembly in accordance with following minimum AAMA/WDMA/CSA 101/I.S.2/A440 and CSA A440S1 classification ratings: Borden, Ontario, Canada
- .6 Select glass thickness to CAN/CGSB-12.20. Perform stress analysis. Design units to accommodate live, dead, lateral, wind, seismic, handling, transportation, and erection loads.
- .7 Select glazing to accommodate requirement needed to meet specified Energy Star, Energy Rating (ER).
- .8 Design and detail-controlled drainage path to discharge water, which enters into, or forms within windows assembly, to exterior. Prevent accumulation or storage of water within window assembly.
- .9 Design and detail air/vapour retarder and rain screen products and assemblies into continuous and integrated window envelope. Optimize windows design to align envelope layers, to minimize thermal bridges, and to provide required air and vapour diffusion control throughout exterior envelope assembly.
- .10 Design anchorage inserts for installation as part of other Sections of the Work. Design anchorage assemblies to accommodate construction and installation tolerances.

## 2.3 FABRICATION

- .1 Fabricate sections free from defects impairing appearance, strength and durability.

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**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 exterior windows installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of DCC Representative.
  - .2 Inform DCC Representative of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from DCC Representative.

**3.2 INSTALLATION**

- .1 Install in accordance with CAN/CSA-A440.4, reviewed shop drawings, and manufacturer's installation instruction.
- .2 Install windows securely, in correct location, level, square, plumb, at proper elevations, free of warp or twist.
- .3 Fill voids between window framing and adjacent construction with batt foam insulation to provide air seal around window frame.

**3.3 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.
- .3 Remove stickers from glazing upon completion of installation
- .4 Clean both sides of newly installed window.

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1        Section 06 20 00 Finish Carpentry
- .2        Section 08 11 00 Metal Doors and Frames

**1.2                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.

**1.3                STORAGE AND HANDLING**

- .1        Store and handle materials in accordance with Common Product Requirements and within manufacturer's written instructions.
- .2        Storage and Handling Requirements:
  - .1        Store materials off ground indoors in dry location and 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 strippable coating.
  - .4        Replace defective or damaged materials with new.

**Part 2            Products**

**2.1                HARDWARE ITEMS**

- .1        All hardware to be supplied to contractor by DND along with installation instructions. Please see hardware schedule on Drawings for list.

**2.2                FASTENINGS**

- .1        All fastening to be supplied to contractor by DND.

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**Part 3 Execution**

**3.1 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 DCC Representative.
  - .1 Install permanent cores and ensure locks operate correctly.

**3.2 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.

**3.3 CLEANING**

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

**3.4 PROTECTION**

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

- .2 Repair damage to adjacent materials caused by door hardware installation.

**3.5 SCHEDULE**

- .1 Refer to Drawings.

**END OF SECTION**



**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1            Section 07 92 00 Joint Sealants

**1.2                REFERENCES**

- .1            American National Standards Institute (ANSI):
  - .1            ANSI Z97.1-2015, Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test
  - .2            ASTM International
    - .1            ASTM C 542-05, Standard Specification for Lock-Strip Gaskets.
    - .2            ASTM E 330-02, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference
  - .3            Canadian General Standards Board (CGSB)
    - .1            CAN/CGSB-12.1-2017, Tempered or Laminated Safety Glass.
    - .2            CAN/CGSB-12.8-2017, Insulating Glass Units.
  - .4            Glass Association of North American (GANA)
    - .1            GANA Glazing Manual - 2008.
    - .2            GANA Laminated Glazing Reference Manual - 2019.
  - .5            UL Canada (UL):
    - .1            UL 2761-2011, Sealants and Caulking Compounds
  - .6            ULC Standards (ULC):
    - .1            CAN/ULC S102-10, Test for Surface Burning Characteristics of Building Materials and Assemblies
    - .2            CAN/ULC S104-10, Standard Method of Fire Tests for Door Assemblies
    - .3            CAN/ULC S106-15, Standard Method of Fire Tests of Windows and Glass Block Assemblies
  - .7            United States Consumer Product Safety Commission (CPSC):
    - .1            CPSC 16 CFR 1201 - Safety Standard for Architectural Glazing

**1.3                ADMINISTRATIVE REQUIREMENTS**

- .1            Pre-Installation Meetings:
  - .1            Contractor to convene pre-installation meeting 1 week prior to beginning work of this Section and on-site installation, with Contractor's Representative and DCC Representative to:

- .1 Verify project requirements.
  - .2 Review installation and substrate conditions.
  - .3 Coordination with other building subtrades.
  - .4 Review manufacturer's written installation instructions and warranty requirements.
- .2 Arrange for site visit with DCC Representative prior to start of Work to examine existing site conditions adjacent to demolition Work.
  - .3 Ensure key personnel attend.
  - .4 DCC Representative will submit verbal notification of change to meeting schedule established upon contract award 24 hours prior to scheduled meeting.

#### **1.4 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Contractor to submit:
- .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 Shop Drawings:
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada.
- .4 Samples:
  - .1 Submit for review and acceptance of each unit.
  - .2 Samples will be returned for inclusion into work.
  - .3 Submit duplicate mm size samples of 300 x 300 mm and sealant material.
- .5 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .6 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
  - .1 Submit testing and analysis of glass under provisions of Section 01 45 00 - Quality Control.
  - .2 Submit shop inspection and testing for glass.

#### **1.5 CLOSEOUT SUBMITTALS**

- .1 Submit Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for glazing for incorporation into manual.

## **1.6 QUALITY ASSURANCE**

- .1 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .2 Mock-ups:
  - .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
  - .2 Construct mock-up to include glass glazing, and perimeter air barrier and vapour retarder seal.
  - .3 Mock-up will be used:
    - .1 To judge quality of work, substrate preparation, operation of equipment and material application.
    - .2 For testing to determine compliance with performance requirements. Perform tests as follows:
      - .1 Water and air test on 2 windows.
  - .4 Locate where directed.
  - .5 Allow 24 hours for inspection of mock-up before proceeding with work.
  - .6 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may not remain as part of finished work.

## **1.7 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with 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 off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect glazing and frames from nicks, scratches, and blemishes.
  - .3 Protect prefinished aluminum surfaces with wrapping, strippable coating.
  - .4 Replace defective or damaged materials with new.

## **1.8 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.

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**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.
    - .3 Limit glass deflection to flexural limit of glass with full recovery of glazing materials.
  - .2 Flat Glass (for interior windows and doors):
    - .1 Flat glass: to CAN/CGSB-12.3, glazing quality, 7 mm thick.
    - .2 Sheet glass: to CAN/CGSB-12.2, AA-special selected, 5 mm thick.
    - .3 Safety glass: to CAN/CGSB-12.1, transparent, 5 mm thick.
      - .1 Type 2-tempered.
      - .2 Class B-float.
      - .3 Category 11.
      - .4 Edge treatment.
  - .3 Wire mesh style: square glass: to ANSI Z97.1 and CPSC 16 CFR 1201 Cat. 1 and II, with surface applied safety film.
    - .1 Thickness: 6mm.
  - .4 Insulating Glass Units:
    - .1 Insulating glass units: to CAN/CGSB-12.8, double unit, 25 mm overall thickness.
      - .1 Glass: to CAN/CGSB-12.3.
      - .2 Glass thickness: 6 mm each light
      - .3 Inter-cavity space thickness: 12 mm with low conductivity spacers.
      - .4 Glass coating: surface number 2 low "E"
      - .5 Inert gas fill: argon.
  - .5 Sealant: in accordance with Section 07 92 00 - Joint Sealants.

**2.2                ACCESSORIES**

- .1 Setting blocks: neoprene Shore A durometer hardness to ASTM D 2240, length of 25 mm for each square meter of glazing.
- .2 Spacer shims: neoprene Shore A durometer hardness to ASTM D 2240, 75 mm long x one half height of glazing stop x thickness to suit application. Self-adhesive on one face.

- .3 Glazing tape:
  - .1 Preformed butyl compound with integral resilient tube spacing device, 10-15 Shore A durometer hardness to ASTM D 2240; coiled on release paper; black colour.
- .4 Glazing clips: manufacturer's standard type.
- .5 Lock-strip gaskets: to ASTM C 542.

### **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.
  - .1 Verify that openings for glazing are correctly sized and within tolerance.
  - .2 Verify that surfaces of glazing channels or recesses are clean, free of obstructions, and ready to receive glazing.
  - .3 Visually inspect substrate in presence of DCC Representative.
  - .4 Inform DCC Representative of unacceptable conditions immediately upon discovery.
  - .5 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from DCC Representative.

#### **3.2 PREPARATION**

- .1 Clean contact surfaces with solvent and wipe dry.
- .2 Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- .3 Prime surfaces scheduled to receive sealant.

#### **3.3 INSTALLATION: EXTERIOR - WET/DRY METHOD (PREFORMED TAPE AND SEALANT)**

- .1 Perform work in accordance with GANA Glazing Manual for glazing installation methods.
- .2 Cut glazing tape to length and set against permanent stops, 6 mm below sight line. Seal corners by butting tape and dabbing with sealant.
- .3 Apply heel bead of sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete continuity of air and vapour seal.
- .4 Place setting blocks at 1/4 points, with edge block maximum 150 mm from corners.

- .5 Rest glazing on setting blocks and push against tape and heel head of sealant with sufficient pressure to attain full contact at perimeter of light or glass unit.
- .6 Install removable stops with spacer strips inserted between glazing and applied stops 6 mm below sight line. Place glazing tape on glazing light or unit with tape flush with sight line.
- .7 Fill gap between glazing and stop with sealant to depth equal to bite of frame on glazing, maximum 9 mm below sight line.
- .8 Apply cap head of sealant along void between stop and glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

### **3.4 INSTALLATION: INTERIOR – DRY METHOD (TAPE AND TAPE)**

- .1 Perform work in accordance with GANA Glazing Manual for glazing installation methods.
- .2 Cut glazing tape to length and set against permanent stops, projecting 1.6 mm above sight line.
- .3 Place setting blocks at 1/4 points, with edge block maximum 150 mm from corners.
- .4 Rest glazing on setting blocks and push against tape for full contact at perimeter of light or unit.
- .5 Place glazing tape on free perimeter of glazing in same manner described.
- .6 Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.
- .7 Knife trim protruding tape.

### **3.5 INSTALLATION: MIRRORS**

- .1 Set mirrors with adhesive, applied in accordance with adhesive manufacturer's instructions.
- .2 Set mirrors with clips. Anchor rigidly to wall construction.
- .3 Set in frame.
- .4 Place plumb and level.

### **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.
    - .1 Remove traces of primer, caulking.

- .2 Remove glazing materials from finish surfaces.
- .3 Remove labels.
- .4 Clean glass and mirrors 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 00 - Cleaning.
- .2 Waste Management: Remove recycling containers and bins from site and dispose of materials at appropriate facility.

### **3.7 PROTECTION**

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

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1        Section 07 92 00 Joint Sealants
- .2        Section 08 11 00 Metal Doors and Frames

**1.2                REFERENCES**

- .1        Environmental Protection Agency (EPA)
  - .1        Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 (for Surface 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 - February 2004.
  - .2        Standard GPS-1-05, MPI Green Performance Standard for Painting and Coatings.
- .4        Society for Protective Coatings (SSPC)
  - .1        Systems and Specifications, SSPC Painting Manual 2005.

**1.3                QUALITY ASSURANCE**

- .1        Qualifications:
  - .1        Contractor: to have a minimum of five years proven satisfactory experience. When requested, provide list of last three comparable jobs including, job name and location, specifying authority, and project manager.
  - .2        Qualified journeypersons as defined by local jurisdiction to be engaged in painting work
  - .3        Apprentices: may be employed provided they work under direct supervision of qualified journeyperson in accordance with trade regulations.
  - .4        Conform to latest MPI requirements for exterior painting work including preparation and priming.
  - .5        Materials: in accordance with MPI Painting Specification Manual "Approved Product" listing and from a single manufacturer for each system used.
  - .6        Paint materials such as linseed oil, shellac and turpentine to be highest quality product from an approved manufacturer listed in MPI Painting Specification Manual and to be compatible with other coating materials as required.
  - .7        Retain purchase orders, invoices and documents to prove conformance with noted MPI requirements when requested by DCC Representative.



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

#### **1.4 PERFORMANCE REQUIREMENTS**

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

#### **1.5 SCHEDULING**

- .1 Submit work schedule for various stages of painting to DCC Representative for approval. Submit schedule minimum of 48 hours in advance of proposed operations.
- .2 Obtain written authorization from DCC Representative for changes in work schedule.
- .3 Schedule painting operations to prevent disruption of occupants in and about building.

#### **1.6 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 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.
- .2 Upon completion, submit records of products used. List products in relation to finish system and include the following:
  - .1 Product name, type and use.
  - .2 Manufacturer's product number.
  - .3 Colour numbers.
  - .4 MPI Environmentally Friendly classification system rating.
  - .5 Manufacturer's Material Safety Data Sheets (MSDS).

- .3 Provide samples:
  - .1 Submit duplicate 200 x 300 mm sample panels of each paint, clear coating with specified paint or coating in colours, gloss/sheen and textures required to MPI Painting Specification Manual standards submitted on the following substrate materials:
    - .1 3 mm plate steel for finishes over metal surfaces.
  - .2 When approved, samples shall become acceptable standard of quality for appropriate on-site surface with one of each sample retained on-site.
  - .3 Submit full range of available colours where colour availability is restricted.

## 1.7 QUALITY CONTROL

- .1 Provide mock-up in accordance with Section 01 45 00 - Quality Control.
- .2 When requested by DCC Representative or Paint Inspection Agency, prepare and paint designated surface, area, room or item to requirements specified herein, with specified paint or coating showing selected colours, number of coats, gloss/sheen, textures and workmanship to MPI Painting Specification Manual standards for review and approval. When approved, surface, area, room and/or items shall become acceptable standard of finish quality and workmanship for similar on-site work.

## 1.8 MAINTENANCE

- .1 Extra Materials:
  - .1 Submit maintenance materials submittals.
- .2 Submit one, four litre can of each type and colour of finish coating. Identify colour and paint type in relation to established colour schedule and finish system.

## 1.9 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Common Product Requirements, supplemented as follows:
  - .1 Deliver and store materials in original containers, sealed, with labels intact.
  - .2 Labels: to indicate:
    - .1 Manufacturer's name and address.
    - .2 Type of paint or coating.
    - .3 Compliance with applicable standard.
    - .4 Colour number in accordance with established colour schedule.
  - .3 Remove damaged, opened and rejected materials from site.
  - .4 Provide and maintain dry, temperature controlled, secure storage.
  - .5 Observe manufacturer's recommendations for storage and handling.
  - .6 Store materials and supplies away from heat generating devices.
  - .7 Store materials and equipment in well-ventilated area with temperature range 7 degrees C to 30 degrees C.

- .8 Store temperature sensitive products above minimum temperature as recommended by manufacturer.
- .9 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of DCC Representative. After completion of operations, return areas to clean condition to approval of DCC Representative.
- .10 Remove paint materials from storage only in quantities required for same day use.
- .11 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.
- .12 Fire Safety Requirements:
  - .1 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.
  - .2 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.

## **1.10 AMBIENT CONDITIONS**

- .1 Heating, Ventilation and Lighting:
  - .1 Do not perform painting work unless adequate and continuous sufficient heating facilities are in place to maintain ambient air and substrate temperatures above 10 degrees C for 24 hours before, during and after paint application until paint has cured sufficiently.
  - .2 Perform no painting work unless a minimum lighting level of 323 Lux is provided on surfaces to be painted. Adequate lighting facilities to be provided by General Contractor.
- .2 Temperature, Humidity and Substrate Moisture Content Levels:
  - .1 Unless specifically pre-approved by specifying body, Paint Inspection Agency and, applied product manufacturer, perform no painting work when:
    - .1 Ambient air and substrate temperatures are below 10 degrees C.
    - .2 Substrate temperature is over 32 degrees C unless paint is specifically formulated for application at high temperatures.
    - .3 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's prescribed limits.
    - .4 Relative humidity is above 85% or when dew point is less than 3 degrees C variance between air/surface temperature.
    - .5 Rain or snow is forecast to occur before paint has thoroughly cured or when it is foggy, misty, raining or snowing at site.
  - .2 Conduct moisture tests using a properly calibrated electronic Moisture Meter, except test concrete floors for moisture using a simple "cover patch test".
  - .3 Test concrete, masonry and plaster surfaces for alkalinity as required.
- .3 Surface and Environmental Conditions:

- .1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.
- .2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits noted herein.
- .3 Apply paint when previous coat of paint is dry or adequately cured.
- .4 Apply paint finishes when conditions forecast for entire period of application fall within manufacturer's recommendations.
- .5 Do not apply paint when:
  - .1 Temperature is expected to drop below 10 degrees C before paint has thoroughly cured.
  - .2 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's limits.
  - .3 Surface to be painted is wet, damp or frosted.
- .6 Provide and maintain cover when paint must be applied in damp or cold weather. Heat substrates and surrounding air to comply with temperature and humidity conditions specified by manufacturer. Protect until paint is dry or until weather conditions are suitable.
- .7 Schedule painting operations such that surfaces exposed to direct, intense sunlight are scheduled for completion during early morning.
- .8 Remove paint from areas which have been exposed to freezing, excess humidity, rain, snow or condensation. Prepare surface again and repaint.
- .9 Paint occupied facilities in accordance with approved schedule only. Schedule operations to approval of DCC Representative such that painted surfaces will have dried and cured sufficiently before occupants are affected.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Paint materials listed in latest edition of MPI Approved Products List (APL) are acceptable for use on this project.
- .2 Paint materials for paint systems: to be products of single manufacturer.
- .3 Only qualified products with E2 "Environmentally Friendly" ratings are acceptable for use on this project.

- .4 Water-borne surface coatings must be manufactured and transported in a manner that steps of processes, including disposal of waste products arising therefrom, will meet requirements of applicable governmental acts, by-laws and regulations including, for facilities located in Canada, Fisheries Act and Canadian Environmental Protection Act (CEPA).
- .5 Water-borne surface coatings must not be formulated or manufactured with aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium or their compounds.
- .6 Water-borne surface coatings and recycled water-borne surface coatings must have flash point of 61.0 degrees C or greater.
- .7 Both water-borne surface coatings and recycled water-borne surface coatings must be made by a process that does not release:
  - .1 Matter in undiluted production plant effluent generating a 'Biochemical Oxygen Demand' (BOD) in excess of 15 mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.
  - .2 Total Suspended Solids (TSS) in undiluted production plant effluent in excess of 15 mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.
- .8 Water-borne paints and stains, recycled water-borne surface coatings and water borne varnishes must meet a minimum "Environmentally Friendly" E2 rating.
- .9 The following must be performed on each batch of consolidated post-consumer material before surface coating is reformulated and canned. These tests must be performed at a laboratory or facility which has been accredited by the Standards Council of Canada.
  - .1 Lead, cadmium and chromium are to be determined using ICP-AES (Inductively Coupled Plasma - Atomic Emission Spectroscopy) technique no. 6010 as defined in EPA SW-846.
  - .2 Mercury is to be determined by Cold Vapour Atomic Absorption Spectroscopy using Technique no. 7471 as defined in EPA SW-846.
  - .3 Organochlorines and PCBs are to be determined by Gas Chromatography using Technique no. 8081 as defined in EPA SW-846.

## 2.2 COLOURS

- .1 Colours per finish schedule noted in the contract documents. One colour to be applied to bollards and one colour to exterior metal frames.
- .2 Selection of colours will be from manufacturer's full range of colours.
- .3 Where specific products are available in restricted range of colours, selection will be based on limited range.
- .4 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

## 2.3 MIXING AND TINTING

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

## 2.4 GLOSS/SHEEN RATINGS

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

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

- .2 Gloss level ratings of painted surfaces as specified and as noted on Finish Schedule.

## 2.5 EXTERIOR PAINTING SYSTEMS

- .1 Galvanized Metal: (not chromate passivated) Doors & Frames
  - .1 EXT 5.3C - Epoxy finish G4.

## 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 EXAMINATION**

- .1 Where 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 Perform preparation and operations for exterior painting in accordance with MPI Maintenance Repainting Manual except where specified otherwise.
- .2 Apply paint materials in accordance with paint manufacturer's written application instructions.
- .3 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before priming and between applications of remaining coats. Touch-up, spot prime, and apply primer, paint, or pre-treatment as soon as possible after cleaning and before deterioration occurs.
- .4 Do not apply paint until prepared surfaces have been accepted by DCC Representative.
- .5 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.

### **3.4 EXISTING CONDITIONS**

- .1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to DCC Representative damages, defects, unsatisfactory or unfavourable conditions before proceeding with work.
- .2 Conduct moisture testing of surfaces to be painted using a properly calibrated electronic moisture meter, except test concrete floors for moisture using a simple "cover patch test" and report findings to DCC Representative. Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.

### **3.5 PROTECTION**

- .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 such surfaces as directed by DCC Representative.
- .2 Protect items that are permanently attached such as Fire Labels on doors and frames.
- .3 Protect factory finished products and equipment.
- .4 Protect building occupants in and about building.

- .5 Remove light fixtures, surface hardware on doors, and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations. Store items and re-install after painting is completed.
- .6 Move and cover exterior furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.
- .7 As painting operations progress, place "WET PAINT" signs in pedestrian and vehicle traffic areas to approval of DCC Representative.

### 3.6 APPLICATION

- .1 Method of application to be as approved by DCC Representative. Apply paint by brush and roller. Conform to manufacturer's application instructions unless specified otherwise.
- .2 Brush and Roller Application:
  - .1 Apply paint in a uniform layer using brush and/or roller of types suitable for application.
  - .2 Work paint into cracks, crevices and corners.
  - .3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
  - .4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces shall be free of roller tracking and heavy stipple unless approved by DCC Representative.
  - .5 Remove runs, sags and brush marks from finished work and repaint.
- .3 Apply coats of paint as continuous film of uniform thickness. 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 projecting ledges.
- .7 Finish top, bottom, edges and cut-outs of doors after fitting as specified for door surfaces.

### 3.7 MECHANICAL/ELECTRICAL EQUIPMENT

- .1 Unless otherwise specified, paint exterior exposed conduits, piping, hangers, duct work and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as noted otherwise.
- .2 Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.
- .3 Do not paint over nameplates.



- .4 Paint fire protection piping red.
- .5 Paint steel electrical light standards. Do not paint outdoor transformers and substation equipment.

### **3.8 FIELD QUALITY CONTROL**

- .1 Inspection:
  - .1 Field inspection of exterior painting operations to be carried out by independent inspection firm or DND Representative, as designated by DCC Representative.
  - .2 Advise DCC Representative when each surface and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.
  - .3 Cooperate with inspection firm and provide access to areas of work.
- .2 Manufacturer's Field Services:
  - .1 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

### **3.9 CLEANING**

- .1 Proceed in accordance with Section 01 74 00 - Cleaning.
  - .1 Remove paint where spilled, splashed, splattered or sprayed as work progresses using means and materials that are not detrimental to affected surfaces.

### **3.10 RESTORATION**

- .1 Clean and re-install hardware items removed before undertaken painting operations.
- .2 Remove protective coverings and warning signs as soon as practical after operations cease.
- .3 Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.
- .4 Protect freshly completed surfaces from paint droppings and dust to approval of DCC Representative. Avoid scuffing newly applied paint.
- .5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by DCC Representative.

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1        Section 06 20 00 Finish Carpentry
- .2        Section 07 92 00 Joint Sealants

**1.2                REFERENCES**

- .1        Environmental Protection Agency (EPA)
  - .1        EPA Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 - 1995, (for Surface Coatings).
- .2        Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1        Material Safety Data Sheets (MSDS).
- .3        Master Painters Institute (MPI)
  - .1        MPI Architectural Painting Specifications Manual, 2004.
- .4        National Fire Code of Canada - 1995
- .5        Society for Protective Coatings (SSPC)
  - .1        SSPC Painting Manual, Volume Two, 8th Edition, Systems and Specifications Manual.

**1.3                QUALITY ASSURANCE**

- .1        Qualifications:
  - .1        Contractor: DCC may request information on last three comparable jobs including, job name and location, specifying authority, and project manager.
  - .2        Journeymen: qualified journeymen who have "Tradesman Qualification Certificate of Proficiency" engaged in painting work.
  - .3        Apprentices: working under direct supervision of qualified trades person in accordance with trade regulations.

**1.4                ACTION AND INFORMATIONAL SUBMITTALS**

- .1        Product Data:
  - .1        Submit product data and instructions for each paint and coating product to be used.
  - .2        Submit product data for the use and application of paint thinner.

- .3 Submit two copies of Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS). Indicate VOCs during application and curing.
- .2 Samples:
  - .1 Submit full range colour sample chips to indicate where colour availability is restricted.
  - .2 Submit duplicate 200 x 300 mm sample panels of each paint, clear coating with specified paint or coating in colours, gloss/sheen and textures required to MPI Architectural Painting Specification Manual standards submitted on following substrate materials:
    - .1 3 mm plate steel for finishes over metal surfaces.
    - .2 13 mm maple plywood for finishes over wood surfaces.
    - .3 50 mm concrete block for finishes over concrete or concrete masonry surfaces.
    - .4 13 mm gypsum board for finishes over gypsum board and other smooth surfaces.
  - .3 Retain reviewed samples on-site to demonstrate acceptable standard of quality for appropriate on-site surface.
  - .4 Test reports: submit certified test reports for paint from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties.
    - .1 Lead, cadmium and chromium: presence of and amounts.
    - .2 Mercury: presence of and amounts.
    - .3 Organochlorines and PCBs: presence of and amounts.
  - .5 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
  - .6 Manufacturer's Instructions:
    - .1 Submit manufacturer's installation and application instructions.
  - .7 Closeout Submittals: submit maintenance data for incorporation into manual include following:
    - .1 Product name, type and use.
    - .2 Manufacturer's product number.
    - .3 Colour numbers.
    - .4 MPI Environmentally Friendly classification system rating.

## 1.5 MAINTENANCE

- .1 Extra Materials:
  - .1 Deliver extra materials from same production run as products installed. Package products with protective covering and identify as extra material.

- .2 Quantity: provide one - four litre can of each type and colour of finish coating. Identify colour and paint type in relation to established colour schedule and finish system.
- .3 Delivery, storage and protection: comply with DCC Representative requirements for delivery and storage of extra materials.

## **1.6 DELIVERY, STORAGE AND HANDLING**

- .1 Packing, Shipping, Handling and Unloading:
  - .1 Pack, ship, handle and unload materials in accordance with Common Product Requirements, and manufacturer's written instructions.
- .2 Acceptance at Site:
  - .1 Identify products and materials with labels indicating:
    - .1 Manufacturer's name and address.
    - .2 Type of paint or coating.
    - .3 Compliance with applicable standard.
    - .4 Colour number in accordance with established colour schedule.
- .3 Remove damaged, opened and rejected materials from site.
- .4 Storage and Protection:
  - .1 Provide and maintain dry, temperature controlled, secure storage.
  - .2 Store materials and supplies away from heat generating devices.
  - .3 Store materials and equipment in well-ventilated area with temperature range 7 degrees C to 30 degrees C.
- .5 Store temperature sensitive products above minimum temperature as recommended by manufacturer.
- .6 Keep areas used for storage, cleaning and preparation clean and orderly. After completion of operations, return areas to clean condition.
- .7 Remove paint materials from storage only in quantities required for same day use.
- .8 Fire Safety Requirements:
  - .1 Provide one 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 requirements.

## 1.7 SITE CONDITIONS

- .1 Heating, Ventilation and Lighting:
  - .1 Provide heating facilities to maintain ambient air and substrate temperatures above 10 degrees C for 24 hours before, during and after paint application until paint has cured sufficiently.
  - .2 Provide continuous ventilation for seven days after completion of application of paint.
  - .3 Coordinate use of existing ventilation system with DCC Representative and ensure its operation during and after application of paint as required.
  - .4 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.
  - .5 Provide minimum lighting level of 323 Lux on surfaces to be painted.
- .2 Temperature, Humidity and Substrate Moisture Content Levels:
  - .1 Unless pre-approved written approval by DCC Representative and product manufacturer, perform no painting when:
    - .1 Ambient air and substrate temperatures are below 10 degrees C.
    - .2 Substrate temperature is above 32 degrees C unless paint is specifically formulated for application at high temperatures.
    - .3 Substrate and ambient air temperatures are not expected to fall within MPI or paint manufacturer's prescribed limits.
    - .4 The relative humidity is under 85% or when the dew point is more than 3 degrees C variance between the air/surface temperature. Paint should not be applied if the dew point is less than 3 degrees C below the ambient or surface temperature. Use sling psychrometer to establish the relative humidity before beginning paint work.
  - .2 Perform painting work when maximum moisture content of the substrate is below:
    - .1 Allow new concrete and masonry to cure minimum of 28 days.
    - .2 15% for wood.
    - .3 12% for plaster and gypsum board.
  - .3 Test for moisture using calibrated electronic Moisture Meter. Test concrete floors for moisture using "cover patch test".
  - .4 Test concrete, masonry and plaster surfaces for alkalinity as required.
- .3 Surface and Environmental Conditions:
  - .1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.
  - .2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits.
  - .3 Apply paint when previous coat of paint is dry or adequately cured.

- .4 Additional interior application requirements:
  - .1 Apply paint finishes when temperature at location of installation can be satisfactorily maintained within manufacturer's recommendations.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Paint materials listed in the MPI Approved Products List (APL) are acceptable for use on this project.
- .2 Provide paint materials for paint systems from single manufacturer.
- .3 Only qualified products with E2 "Environmentally Friendly" rating are acceptable for use on this project.
- .4 Conform to latest MPI requirements for interior painting work including preparation and priming.
- .5 Materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners, solvents, etc.) in accordance with MPI Architectural Painting Specification Manual "Approved Product" listing.
- .6 Provide paint products meeting MPI "Environmentally Friendly" E2 ratings based on VOC (EPA Method 24) content levels.
- .7 Use MPI listed materials having minimum E2 rating where indoor air quality (odour) requirements exist.
- .8 Formulate and manufacture water-borne surface coatings with no aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium or their compounds.
- .9 Flash point: 61.0 degrees C or greater for water-borne surface coatings and recycled water-borne surface coatings.
- .10 Ensure manufacture and process of both water-borne surface coatings and recycled water-borne surface coatings does not release:
  - .1 Matter in undiluted production plant effluent generating 'Biochemical Oxygen Demand' (BOD) in excess of 15 mg/L to natural watercourse or sewage treatment facility lacking secondary treatment.
  - .2 Total Suspended Solids (TSS) in undiluted production plant effluent in excess of 15 mg/L to natural watercourse or a sewage treatment facility lacking secondary treatment.
- .11 Water-borne paints and stains, recycled water-borne surface coatings and water borne varnishes to meet minimum "Environmentally Friendly" E2 rating.

## 2.2 COLOURS

- .1 DCC Representative will provide Colour Schedule after Contract award.
- .2 Colour Schedule will be based upon selection of three base colours and one accent colour. No more than four colours will be selected for entire project and no more than three colours will be selected in each area.
- .3 Selection of colours from manufacturers full range of colours.
- .4 Where specific products are available in restricted range of colours, selection based on limited range.
- .5 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

## 2.3 MIXING AND TINTING

- .1 Perform colour tinting operations prior to delivery of paint to site. Obtain written approval from DCC Representative] for tinting of painting materials.
- .2 Mix paste, powder or catalyzed paint mixes in accordance with manufacturer's written instructions.
- .3 Use and add thinner in accordance with paint manufacturer's recommendations. Do not use kerosene or similar organic solvents to thin water-based paints.
- .4 Thin paint for spraying in accordance with paint manufacturer's instructions.
- .5 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity.

## 2.4 GLOSS/SHEEN RATINGS

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

<u>Gloss @ 60 Degrees</u>	<u>Sheen @ 85 Degrees</u>	
Gloss Level 1 – Matte Finish (flat)	Max. 5	Max. 10
Gloss Level 2 – Velvet Like Finish	Max.10	10 to 35
Gloss Level 3 – Eggshell Finish	10 to 25	10 to 35
Gloss Level 4 – Satin Like Finish	20 to 35	min. 35
Gloss Level 5 – Traditional Semi-Gloss Finish	35 to 70	
Gloss Level 6 – Traditional Gloss	70 to 85	
Gloss Level 7 – High Gloss Finish	More than 85	

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

## **2.5 INTERIOR PAINTING SYSTEMS**

- .1 Galvanized metal: doors & frames
  - .1 INT 5.3M - High performance architectural latex G4 finish (Doors/Frames).
- .2 Dressed Lumber: Window frames
  - .1 INT 6.3A - High performance architectural latex G5 finish.

## **2.6 SOURCE QUALITY CONTROL**

- .1 Perform following tests on each batch of consolidated post-consumer material before surface coating is reformulated and canned. Testing by laboratory or facility which has been accredited by Standards Council of Canada.
  - .1 Lead, cadmium and chromium are to be determined using ICP-AES (Inductively Coupled Plasma - Atomic Emission Spectroscopy) technique no. 6010 as defined in EPA SW-846.
  - .2 Mercury is to be determined by Cold Vapour Atomic Absorption Spectroscopy using Technique no. 7471 as defined in EPA SW-846.
  - .3 Organochlorines and PCBs are to be determined by Gas Chromatography using Technique no. 8081 as defined in EPA SW-846.

## **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 data sheet.

### **3.2 GENERAL**

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

### **3.3 EXAMINATION**

- .1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to DCC 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, except test concrete floors for moisture using simple "cover patch test". Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.



- .3 Maximum moisture content as follows:
  - .1 Stucco, plaster and gypsum board: 12%.
  - .2 Concrete: 12%.
  - .3 Clay and Concrete Block/Brick: 12%.
  - .4 Wood: 15%.

### 3.4 PREPARATION

- .1 Protection:
  - .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 DCC Representative.
  - .2 Protect items that are permanently attached such as Fire Labels on doors and frames.
  - .3 Protect factory finished products and equipment.
  - .4 Protect building occupants in and about the building.
- .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 for approval of DCC Representative.
- .3 Clean and prepare surfaces in accordance with MPI Architectural Painting Specification Manual requirements. Refer to MPI Manual in regard to specific requirements and as follows:
  - .1 Remove dust, dirt, and other surface debris by vacuuming, wiping with dry, clean cloths.
  - .2 Wash surfaces with a biodegradable detergent and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.
  - .3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
  - .4 Allow surfaces to drain completely and allow to dry thoroughly.
  - .5 Prepare surfaces for water-based painting, water-based cleaners should be used in place of organic solvents.
  - .6 Use trigger operated spray nozzles for water hoses.
  - .7 Many water-based paints cannot be removed with water once dried. Minimize use of mineral spirits or organic solvents to clean up water-based paints.
- .4 Clean following surfaces with high pressure water washing: concrete floor.

- .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 pre-treatment 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. Remove traces of blast products from surfaces, pockets and corners to be painted by brushing with clean brushes or vacuum cleaning.
- .9 Touch up of shop primers with primer as specified.
- .10 Do not apply paint until prepared surfaces have been accepted by DCC Representative.

### 3.5

#### APPLICATION

- .1 Method of application to be as approved by DCC Representative. Apply paint by brush and roller. Conform to manufacturer's application instructions unless specified otherwise.
- .2 Brush and Roller Application:
  - .1 Apply paint in uniform layer using brush and/or roller type suitable for application.
  - .2 Work paint into cracks, crevices and corners.
  - .3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
  - .4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces free of roller tracking and heavy stipple.
  - .5 Remove runs, sags and brush marks from finished work and repaint.
- .3 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access.
- .4 Apply coats of paint continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
- .5 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.

- .6 Sand and dust between coats to remove visible defects.
- .7 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.

### **3.6 MECHANICAL/ELECTRICAL EQUIPMENT**

- .1 Paint finished area exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment with colour and finish to match adjacent surfaces.
- .2 Other unfinished areas: leave exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish and touch up scratches and marks.
- .3 Touch-up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.
- .4 Do not paint over nameplates.
- .5 Keep sprinkler heads free of paint.
- .6 Paint inside of ductwork where visible behind grilles, registers and diffusers with primer and one coat of matt black paint.
- .7 Paint fire protection piping red.
- .8 Paint disconnect switches for fire alarm system and exit light systems in red enamel.
- .9 Paint natural gas piping yellow.
- .10 Paint both sides and edges of backboards for telephone and electrical equipment before installation. Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.
- .11 Do not paint interior transformers and substation equipment.

### **3.7 SITE TOLERANCES**

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

### **3.8 FIELD QUALITY CONTROL**

- .1 Standard of Acceptance:

- .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
- .2 Ceilings: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.
- .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.
- .2 Field inspection of painting operations to be carried out by independent inspection firm, or DND Representative, as designated by DCC Representative.
- .3 Advise DCC Representative when surfaces and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.
- .4 Cooperate with inspection firm and provide access to areas of work.
- .5 Retain purchase orders, invoices and other documents to prove conformance with noted MPI requirements when requested by DCC Representative.

### **3.9 RESTORATION**

- .1 Clean and re-install hardware items removed before undertaken painting operations.
- .2 Remove protective coverings and warning signs as soon as practical after operations cease.
- .3 Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.
- .4 Protect freshly completed surfaces from paint droppings and dust to approval of DCC Representative. Avoid scuffing newly applied paint.
- .5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by DCC Representative.

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1        Section 06 20 00 Finish Carpentry
- .2        Section 07 92 00 Joint Sealants

**1.2                REFERENCES**

- .1        The Master Painters Institute (MPI)
  - .1        Maintenance Repainting Manual 2004, Master Painters Institute (MPI), including Identifiers, Evaluation, Systems, Preparation and Approved Product List.
- .2        Environmental Protection Agency (EPA)
  - .1        Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 (for Surface Coatings).
- .3        Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1        Material Safety Data Sheets (MSDS).
- .4        South Coast Air Quality Management District (SCAQMD), California State
  - .1        SCAQMD Rule 1113-04, Architectural Coatings.

**1.3                QUALITY ASSURANCE**

- .1        Qualifications:
  - .1        Contractor: DCC may request information on last three comparable jobs including, job name and location, specifying authority, and project manager. Qualified journey persons as defined by local jurisdiction to be engaged in repainting work.
  - .2        Apprentices: may be employed provided they work under the direct supervision of qualified journey person in accordance with applicable trade regulations.
  - .3        Apprentices: may be employed provided they work under the direct supervision of qualified journey person in accordance with applicable trade regulations.
- .2        Conform to latest MPI requirements for interior repainting work including cleaning, preparation and priming.
- .3        Materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners and solvents) shall be in accordance with the latest edition of the MPI Approved Product List and shall be from a single manufacturer for each system used.
- .4        Paint materials such as linseed oil, shellac, reducers and turpentine shall be the highest quality product of an approved manufacturer listed in MPI Maintenance Repainting Manual and shall be compatible with other coating materials as required.

- .5 Retain purchase orders, invoices and other documents to prove conformance with noted MPI requirements when requested by DCC Representative.
- .6 Standard of Acceptance: when viewed using final lighting source surfaces shall indicate the following:
  - .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
  - .2 Ceilings: no defects visible from floor at 45 degrees to surface.
  - .3 Final coat to exhibit uniformity of colour and sheen across full surface area.
- .7 Mock-ups: construct mock-ups in accordance with Section 01 45 00 - Quality Control.
  - .1 Provide a mock-up in accordance with requirements of Section 01 45 00 - Quality Control to DCC Representative and Paint Inspection Agency.
  - .2 Prepare and repaint mock-up designated interior room, surface or item to requirements specified herein, with specified paint or coating showing selected colours, gloss/sheen, textures and workmanship to MPI Maintenance Repainting Manual standards for review and approval.
  - .3 When approved, repainted room, surface and/or item shall become acceptable standard of finish quality and workmanship for similar on-site interior repainting work.

#### **1.4 PERFORMANCE REQUIREMENTS**

- .1 Environmental Performance Requirements:
  - .1 Provide paint products meeting MPI "Environmentally Friendly" E2 ratings based on VOC (EPA Method 24) content levels.
  - .2 Where indoor air quality (odour) is a problem, use only MPI listed materials having a minimum E3 rating.

#### **1.5 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide product data and manufacturer's installation/application instructions for each paint and coating product to be used.
- .2 Submittal Procedures.
  - .1 Submit full range colour sample chips for review and selection. Indicate where colour availability is restricted.
  - .2 Submit WHMIS MSDS - Material Safety Data Sheets for paint and coating materials in accordance with Section 02 81 01 - Hazardous Materials.

#### **1.6 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Common Product Requirements, supplemented as follows.
  - .1 Deliver and store materials in original containers, sealed, with labels intact.
  - .2 Labels to indicate:

- .1 Manufacturer's name and address.
- .2 Type of paint or coating.
- .3 Compliance with applicable standard.
- .4 Colour number in accordance with established colour schedule.
- .3 Remove damaged, opened and rejected materials from site.
- .4 Store and handle in accordance with manufacturer's recommendations.
- .5 Store materials and equipment in secure, dry, well-ventilated area with temperature range between 7 degrees C to 30 degrees C. Store materials and supplies away from heat generating devices and sensitive products above minimum temperature as recommended by manufacturer.
- .6 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of DCC Representative. After completion of operations, return areas to clean condition to approval of DCC Representative.
- .7 Remove paint materials from storage in quantities required for same day use.
- .8 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.
- .9 Fire Safety Requirements:
  - .1 Provide one 9 kg Type ABC dry chemical 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 daily.
  - .3 Handle, store, use and dispose of flammable and combustible materials in accordance with National Fire Code of Canada.

## 1.7 SITE CONDITIONS

- .1 Heating, Ventilation and Lighting:
  - .1 Do not perform repainting work unless adequate and continuous ventilation and sufficient heating facilities are in place to maintain ambient air and substrate temperatures above 10 degrees C for 24 hours before, during and after paint application and until paint has cured sufficiently.
  - .2 Ventilate enclosed spaces. Where required, provide continuous ventilation for seven days after completion of application of paint.
  - .3 Co-ordinate use of existing ventilation system with DCC Representative and ensure its operation during and after application of paint as required.
  - .4 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements. Use of gas-fired appliances is not permitted.
  - .5 Do not perform painting work unless minimum lighting level of 323 Lux is provided on surfaces to be painted.
- .2 Temperature, Humidity and Substrate Moisture Content Levels:

- .1 Unless specifically pre-approved by specifying body, Paint Inspection Agency and, applied product manufacturer, do not perform repainting work when:
  - .1 Ambient air and substrate temperatures are below 10 degrees C.
  - .2 Substrate temperature is over 32 degrees C unless paint is specifically formulated for application at high temperatures.
  - .3 Relative humidity within area to be repainted is above 85%.
- .2 Conduct moisture tests using properly calibrated electronic Moisture Meter, except use simple "cover patch test" on concrete floors to be repainted.
- .3 Do not perform repainting work when maximum moisture content of substrate exceeds:
  - .1 12% for concrete and masonry (clay and concrete brick/block).
  - .2 15% for wood.
  - .3 12% for plaster and gypsum board.
- .4 Test painted concrete, masonry and plaster surfaces for alkalinity as required.
- .3 Surface and Environmental Conditions:
  - .1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when ventilation conditions are such that airborne particles will not affect quality of finished surface.
  - .2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits noted herein.
  - .3 Apply paint when previous coat of paint is dry or adequately cured, unless otherwise pre-approved by specific coating manufacturer.
  - .4 Apply paint in occupied facilities during silent hours only Schedule operations to approval of the DCC Representative such that painted surfaces will have dried and cured sufficiently before occupants are affected.

## **1.8 MAINTENANCE**

- .1 Submit maintenance materials:
- .2 Submit one - one litre can of each type and colour of finish coating. Identify type and colour in relation to established colour schedule and finish system.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Paint materials listed in the MPI Approved Products List (APL) are acceptable for use on this project.
- .2 Provide paint materials for paint systems from single manufacturer.
- .3 Only qualified products with E2 "Environmentally Friendly" rating are acceptable for use on this project.



- .4 Conform to latest MPI requirements for interior painting work including preparation and priming.
- .5 Materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners, solvents, etc.) in accordance with MPI Architectural Painting Specification Manual "Approved Product" listing.
- .6 Provide paint products meeting MPI "Environmentally Friendly" E2 ratings based on VOC (EPA Method 24) content levels.
- .7 Use MPI listed materials having minimum E2 rating where indoor air quality (odour) requirements exist.
- .8 Formulate and manufacture water-borne surface coatings with no aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium or their compounds.
- .9 Flash point: 61.0 degrees C or greater for water-borne surface coatings and recycled water-borne surface coatings.
- .10 Ensure manufacture and process of both water-borne surface coatings and recycled water-borne surface coatings does not release:
  - .1 Matter in undiluted production plant effluent generating 'Biochemical Oxygen Demand' (BOD) in excess of 15 mg/L to natural watercourse or sewage treatment facility lacking secondary treatment.
  - .2 Total Suspended Solids (TSS) in undiluted production plant effluent in excess of 15 mg/L to natural watercourse or a sewage treatment facility lacking secondary treatment.
- .11 Water-borne paints and stains, recycled water-borne surface coatings and water borne varnishes to meet minimum "Environmentally Friendly" E2 rating.

## 2.2 COLOURS

- .1 DCC Representative will provide Colour Schedule after Contract award.
- .2 Colour schedule will be based upon selection of five base colours and three accent colours. No more than eight colours will be selected for entire project and no more than three colours will be selected in each area.
- .3 Selection of colours will be from manufacturer's full range of colours.
- .4 Where specific products are available in restricted range of colours, selection will be based on limited range.
- .5 First coat in two coat Premium repaint system to be tinted slightly lighter colour than top coat to show visible difference between coats.

### 2.3 MIXING AND TINTING

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

### 2.4 GLOSS/SHEEN RATINGS

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

<u>Gloss Level Category</u>	<u>Units @ 60 Degrees</u>	<u>Units @ 85 Degrees</u>
G1 - matte finish	0 to 5	maximum 10
G2 - velvet finish	0 to 10	10 to 35
G3 – eggshell finish	10 to 25	10 to 35
G4 - satin finish	20 to 35	minimum 35
G5 – semi-gloss finish	35 to 70	
G6 - gloss finish	70 to 85	
G7 - high gloss finish	> 85	

- .2 Gloss level ratings of repainted surfaces shall be as specified herein.

### 2.5 INTERIOR PAINTING SYSTEMS

- .1 Paint areas as indicated on drawings.
- .2 Galvanized metal: doors and frames:
  - .1 INT 5.3J - High performance architectural latex G4 finish (Doors/Frames).
- .3 Dressed Lumber: Window frames
  - .1 RIN 6.3A - High performance architectural latex G5 finish.
- .4 Plaster and gypsum board: gypsum wallboard, drywall, "sheet rock type material", and textured finishes:
  - .1 RIN 9.2B - High performance architectural latex G3 finish.

## **2.6 SOURCE QUALITY CONTROL**

- .1 Perform following tests on each batch of consolidated post-consumer material before surface coating is reformulated and canned. Testing by laboratory or facility which has been accredited by Standards Council of Canada.
  - .1 Lead, cadmium and chromium are to be determined using ICP-AES (Inductively Coupled Plasma - Atomic Emission Spectroscopy) technique no. 6010 as defined in EPA SW-846.
  - .2 Mercury is to be determined by Cold Vapour Atomic Absorption Spectroscopy using Technique no. 7471 as defined in EPA SW-846.
  - .3 Organochlorines and PCBs are to be determined by Gas Chromatography using Technique no. 8081 as defined in EPA SW-846.

## **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 PREPARATION**

- .1 Perform preparation and operations for interior painting in accordance with MPI Maintenance Repainting Manual requirements except where otherwise specified.
- .2 Apply paint materials in accordance with paint manufacturer's written application instructions.
- .3 Clean and prepare interior surfaces to be repainted in accordance with MPI Maintenance Repainting Manual requirements. Refer to MPI Manual in regard to specific requirements and as follows:
  - .1 Remove dust, dirt, and surface debris by vacuuming, wiping with dry, clean cloths.
  - .2 Wash surfaces with a biodegradable detergent and clean warm water using stiff bristle brush to remove dirt, oil and surface contaminants.
  - .3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
  - .4 Allow surfaces to drain completely and to dry thoroughly. Allow sufficient drying time and test surfaces using an electronic moisture meter before commencing work.
  - .5 Use water-based cleaners in place of organic solvents where surfaces will be repainted using water based paints.
  - .6 Many water-based paints cannot be removed with water once dried. Minimize use of kerosene or such organic solvents to clean up water-based paints.

- .4 Clean metal surfaces to be repainted by removing rust, dirt, oil, grease and foreign substances in accordance with MPI requirements. Remove such contaminants from surfaces, pockets and corners to be repainted by brushing with clean brushes, blowing with clean dry compressed air, or brushing/vacuum cleaning as required.
- .5 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before priming and between applications of remaining coats. Touch-up, spot prime, and apply primer, paint, or pre-treatment as soon as possible after cleaning and before deterioration occurs.
- .6 Do not apply paint until prepared surfaces have been accepted by DCC Representative.
- .7 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from distance up to 1000 mm.

### 3.3 EXISTING CONDITIONS

- .1 Prior to commencing work, examine site conditions and existing interior substrates to be repainted. Report in writing to DCC Representative, damages, defects, or unsatisfactory or unfavourable conditions or surfaces that will adversely affect this work.
- .2 Conduct moisture testing of surfaces to be painted using properly calibrated electronic moisture meter, except test concrete floors for moisture using simple "cover patch test" and report findings to DCC Representative. Maximum moisture content not to exceed specified limits.
- .3 Do not 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 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, 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).

### 3.4 PROTECTION

- .1 Protect existing surfaces and adjacent fixtures and furnishings from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore such surfaces as directed by DCC Representative.

- .2 Protect items that are permanently attached such as Fire Labels on doors and frames.
- .3 Protect factory finished products and equipment.
- .4 Protect general public and building occupants in and about building.
- .5 Remove electrical cover plates, light fixtures, surface hardware on doors, bath accessories and surface mounted equipment, fittings and fastenings prior to undertaking re-painting operations. Store items and re-install after painting is completed.
- .6 Move and cover furniture and portable equipment as necessary to carry out repainting operations. Replace as painting operations progress.
- .7 As repainting operations progress, place "WET PAINT" signs in occupied areas to approval of DCC Representative.

### **3.5 APPLICATION**

- .1 Apply paint by method that is best suited for substrate being repainted using brush or roller Conform to manufacturer's application instructions unless specified otherwise. Methods of application as pre-approved by DCC Representative before commencing work.
- .2 Brush and Roller Application:
  - .1 Apply paint in uniform layer using brush and/or roller of types suitable for application.
  - .2 Work paint into cracks, crevices and corners.
  - .3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
  - .4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces free of roller tracking and heavy stipple unless approved by DCC Representative.
  - .5 Remove runs, sags and brush marks from finished work and repaint.
- .3 Spray Application:
  - .1 Provide and maintain equipment that is suitable for intended purpose, capable of properly atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
  - .2 Keep paint ingredients properly mixed in containers during paint application by intermittent agitation frequently as necessary.
  - .3 Apply paint in uniform layer, with overlapping at edges of spray pattern.
  - .4 Back roll spray applications and brush out runs and sags immediately.
  - .5 Use brushes to work paint into cracks, crevices and places which are not adequately painted by spray.
- .4 Use dipping, sheepskins or daubers when no other method is practical in places of difficult access and when specifically authorized by DCC Representative.

- .5 Apply paint coats in continuous manner and allow surfaces to dry and properly cure between coats for minimum time period as recommended by manufacturer. Minimum dry film thickness of coats not less than that recommended by manufacturer. Repaint thin spots or bare areas before next coat of paint is applied.
- .6 Sand and dust between coats to remove visible defects.
- .7 Repaint 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.
- .8 Repaint top, bottom, and vertical edges of doors to be repainted.
- .9 Repaint inside of cupboards and cabinets as specified for outside surfaces.
- .10 Repaint closets and alcoves to match existing, unless otherwise scheduled or noted.

### **3.6 MECHANICAL/ELECTRICAL EQUIPMENT**

- .1 Unless otherwise noted, repainting to include exposed to view / previously painted mechanical and electrical equipment and components (panels, conduits, piping, hangers, and ductwork.).
- .2 Touch up scratches and marks and repaint such mechanical and electrical equipment and components with colour, and sheen finish to match existing unless otherwise noted or scheduled.
- .3 Do not paint over name plates or instruction labels.
- .4 Leave unfinished exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish.
- .5 Keep sprinkler heads free of paint.
- .6 Do not paint interior transformers and substation equipment.
- .7 Standard of Acceptance: when viewed using natural prevailing sunlight at peak period of day (mid-day) on surface viewed, surfaces to indicate following:
  - .1 Walls: no defects visible from distance of 1000 mm at 90 degrees to surface.
  - .2 Soffits: no defects visible from grade at 45 degrees 1000 to surface.
  - .3 Final coat to exhibit uniformity of colour and sheen across full surface area.

### **3.7 FIELD QUALITY CONTROL**

- .1 Advise DCC Representative and Paint Inspection Agency when each surface and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.
- .2 Cooperate with Paint Inspection Agency and provide access to areas of work.

### **3.8 CLEANING**

- .1 Proceed in accordance with Section 01 74 00 - Cleaning, supplemented as follows.
  - .1 Remove paint where spilled, splashed, splattered or sprayed as work progresses using means and materials that are not detrimental to affected surfaces.
  - .2 Keep work area free from unnecessary accumulation of tools, equipment, surplus materials and debris.
  - .3 Remove combustible rubbish materials and empty paint cans each day and safely dispose of same in accordance with requirements of authorities having jurisdiction.
  - .4 Clean equipment and dispose of wash water used for water borne materials, solvents used for oil based materials as well as other cleaning and protective materials (e.g. rags, drop cloths, and masking papers), paints, thinners, paint removers/strippers in accordance with safety requirements of authorities having jurisdiction and as noted herein.
  - .5 Clean painting equipment in leak-proof containers that will permit particulate matter to settle out and be collected. Sediment remaining from cleaning operations to be recycled or disposed of in manner acceptable to authorities having jurisdiction.
  - .6 Recycle paint and coatings in excess of repainting requirements as specified.

### **3.9 RESTORATION**

- .1 Clean and re-install hardware items removed before undertaken painting operations.
- .2 Remove protective coverings and warning signs as soon as practical after operations cease.
- .3 Remove paint splashings on affected exposed surfaces. Remove smears and spatter immediately as operations progress, using compatible solvent.
- .4 Protect freshly completed surfaces from paint droppings and dust to approval of DCC Representative. Avoid scuffing newly applied paint.
- .5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by DCC Representative.

**END OF SECTION**

**Part 1            General**

**1.1                ACTION AND INFORMATIONAL SUBMITTALS**

- .1        Submit shop drawings: Indicate dimensions in relation to window jambs, operator details, head anchorage details, hardware and accessories details.
- .2        Submit one (1) representative working sample of each type roller shade.
- .3        Submit duplicate samples of manufacturer's full range of colours for selection by DCC Representative.
- .4        Provide maintenance data for hardware complete with pertinent details, spare parts lists and warnings against harmful maintenance materials and practices for incorporation into manual.

**1.2                GUARANTEE**

- .1        Provide a written guarantee of work of this Section against defects in material and quality of work for a period of two (2) years from the date of publication of the Certificate of Substantial Performance.

**Part 2            Products**

**2.1                MATERIALS**

- .1        Acceptable Manufacturers:
  - .1        Hunter Douglas
  - .2        SunProject Toro Inc.
  - .3        Altex
- .2        Type:
  - .1        Description: PVC-Free, Privacy Weave; Slim Design; complete with fascia and shade holder
  - .2        Operation: Chain; Light Lift.
  - .3        Fascia: Silver Clear Anodized
  - .4        Fabric: As selected by DCC Representative from Manufacturer's full fabric range.
  - .5        Installation: Wall
  - .6        Dimensions: As required to suit window openings.



## **2.2 LOCATION AND WARRANTY**

- .1 Refer to New Construction Floor Plans on DWG. L-B147-6834/9-301 for Roller Window Shades location, and size new Roller Window Shades to installed window sizes as measured by contractor.
- .2 Warranty: Manufacturer shall provide warranty that all components are free of manufacturing defects for two (2) years from date of installation. This warranty is void if the product has been improperly installed, wired or subjected to improper care.

## **2.3 FABRICATION**

- .1 Shadebands: Construction of shadeband includes the fabric, the hembar and hempocket, and the attachment of the shadeband to the roller tube.
- .2 Manually operated hardware and shade brackets: Provide shade hardware system that allows multi-banded manually operated shades to be capable of a smooth operation when the axis is offset a maximum of  $6\phi$  on each side of the plane perpendicular to the radial lines of the curve ( $12\phi$  total offset).
- .3 Shade roller and shadecloth attachment: Provide an extruded aluminum shade roller tube without the use of adhesives, adhesive tape, staples or rivets. A mounting method that does not readily allow the shade band to be removed from the shade tube while installed is not acceptable.
- .4 Accessories: Continuous removable extruded fascia that attaches to shade mounting brackets without the use of adhesives, magnetic strips or exposed fasteners.

## **Part 3 Execution**

### **3.1 INSTALLATION**

- .1 Install units to comply with manufacturer's written instructions for type of mounting and operation required.
- .2 Provide units plumb, true, and securely anchored in place with recommended hardware and accessories to provide for smooth operation without binding.
- .3 Adjust shade and shadecloth to hang flat without buckling or distortion.
- .4 Clean all exposed surfaces. Remove and replace work which cannot be satisfactorily cleaned.

**END OF SECTION**