LAB CONVERSION

PROJECT NO. PTS 4753

OTTAWA, ONTARIO

SPECIFICATIONS

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SPECIFICATIONS

DRAWINGS

ELECTRICAL

E1	ELECTRICAL LEGENDS, SPECIFICATIONS AND DRAWING LIST
E2	ELECTRICAL NEW AND DEMOLITION WORK

END OF SECTION

Part 1 General

1.1 MINIMUM STANDARDS

.1 Materials shall be new and work shall conform to the minimum applicable standards of the Canadian General Standards Board, the Canadian Standards Association, the National Building Code of Canada 2015 (NBC) and all applicable Provincial and Municipal codes. In the case of conflict or discrepancy the most stringent requirement shall apply.

1.2 TAXES

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

1.3 FEES, PERMITS AND CERTIFICATES

.1 Pay all fees and obtain all permits. Provide authorities with plans and information for acceptance certificates. Provide inspection certificates as evidence that work conforms to requirements of Authority having jurisdiction.

1.4 FIRE SAFETY REQUIREMENTS

.1 Comply with both the National Building Code of Canada 2010 and the National Fire Code of Canada 2010 for safety of persons in buildings in the event of a fire and the protection of buildings from the effects of fire, as follows;

.1 The National Building Code (NBC): for fire safety and fire protection features that are required to be incorporated in a building during construction.

.2 The National Fire Code (NFC):

.1 The on-going maintenance and use of the fire safety and fire protection features incorporated in buildings.

.2 The conduct of activities that might cause fire hazards in and around buildings.

.3 Limitations on hazardous contents in and around buildings.

.4 The establishment of fire safety plans.

.5 Fire safety at construction and demolition sites.

.2 Welding and cutting:

.1 Before welding, soldering, grinding and/or cutting work, obtain a permit as directed by the Departmental Representative. Store flammable liquids in approved CSA containers.

.2 At least one week prior to commencing cutting, welding or soldering procedure, provide to Departmental Representative:

.1 Notice of intent, indicating devices affected, time and duration of isolation or bypass.

.2 Completed welding permit as defined in NFC.

.3 Return welding permit to Departmental Representative immediately upon completion of procedures for which permit was issued.

.3 "Fire Watchers" as described in NFC shall be assigned when welding or cutting operations are carried out in areas where combustible materials within 15m may be ignited by conduction or radiation.

.3 Where work requires interruption or cause activation of fire alarms or fire suppression, extinguishing or protection systems:

.1 Provide "Watchman Service" as described in NFC; In general, watchman service is defined as an individual conversant with "Fire Emergency Procedures", performing fire picket duty within an unprotected and unoccupied (no workers) area once per hour.

.2 Retain services of manufacturer for fire protection systems on daily basis or as approved by Departmental Representative, to isolate and protect all devices relating to:

.1 modification of fire alarms, fire suppression, extinguishing or protection systems; and/or

.2 cutting, welding, soldering or other construction activities that might activate fire protection systems.

.3 Immediately upon completion of work, restore fire protection systems to normal operation and verify that all devices are fully operational.

.4 Inform fire alarm system monitoring agency and local Fire Department immediately prior to isolation and immediately upon restoration of normal operation.

1.5 FIELD QUALITY CONTROL

.1 Carry out Work using qualified licensed workers or apprentices in accordance with Provincial Act respecting manpower vocational training and qualification.

.2 Permit employees registered in Provincial apprenticeship program to perform specific tasks only if under direct supervision of qualified licenced workers.

.3 Determine permitted activities and tasks by apprentices, based on level of training attended and demonstration of ability to perform specific duties.

1.6 HAZARDOUS MATERIALS

.4 Hazardous Materials: product, substance, or organism that may cause adverse impact to environment or adversely affect health of persons, animals, or plant life when released into the environment.

.2 Comply with the requirements of the Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and the provision of Material Safety Data Sheets (MSDS).

.3 For work in occupied buildings give the Departmental Representative 48 hours notice for work involving designated substances (Ontario Bill 208), hazardous substances (Canada Labour Code Part II Section 10), and before painting, caulking or using adhesives and other materials that cause off gassing.

1.7 TEMPORARY UTILITIES

.1 Existing services required for work, may be used by the Contractor without charge. Ensure capacity is adequate prior to imposing additional loads. Connect and disconnect at own expense and responsibility and remove all such work after use.

.5 Maximum power supply of 115 V, 15 A is available. Connect to existing power supply in accordance with Canadian Electrical Code and provide meters and switching.

.3 Notify the Departmental Representative and utility companies of intended interruption of services, obtain requisite permission.

1.8 REMOVED MATERIALS

.1 Unless otherwise specified, materials for removal become the Contractor's property and shall be taken from site.

1.9 PROTECTION

.1 Protect finished work against damage until take-over.

.2 Protect adjacent work against the spread of dust and dirt beyond the work areas.

.3 Protect operatives and other users of site from all hazards.

1.10 CUT, PATCH and MAKE GOOD

.1 Cut surfaces as required to accommodate work.

.2 Remove all items so shown or specified.

.3 Patch and make good surfaces cut, damaged or disturbed, to Departmental Representative’s approval. Match existing material, colour, finish and texture.

1.11 SLEEVES, HANGERS AND INSERTS

.1 Co-ordinate setting and packing of sleeves and supply and installation of hangers and inserts. Obtain Departmental Representative’s approval before cutting into structure.

1.12 EXAMINATION

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

1.13 SIGNS

.1 Provide common-use signs related to traffic control, information, instruction, use of equipment, public safety devices, etcetera, in both official languages or by the use of commonly-understood graphic symbols to the Departmental Representative’s approval.

.2 No advertising will be permitted on this project.

1.14 ACCESS AND EGRESS

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

1.15 SCAFFOLDS AND WORK PLATFORMS

.1 Design, install, and inspect scaffolds and work platforms required for work in accordance with relevant municipal, provincial and other regulations.

.2 Provide design drawings, signed and sealed by qualified Professional Engineer licensed in the province of Ontario, where prescribed.

.3 Additions or modifications to scaffolding must be approved by Professional Engineer in writing.

1.16 SITE STORAGE

.1 Storage will be allowed within the area of Work only; no other storage will be available.

.2 Do not unreasonably encumber site with materials or equipment.

1.17 OPERATIONS AND MAINTENANCE MANUALS

.1 Submit to Departmental Representative six (4) copies of approved Operations Data and Maintenance Manual, compiled as follows:

.1 Bind data in vinyl hard cover 3 "D" ring type loose leaf binders for 212 x 275¦mm size paper. Binders must not exceed 75¦mm thick or be more than 2/3 full.

.2 Enclose title sheet labelled "Operation Data and Maintenance Manual," project name, date and list of contents. Project name must appear on binder face and spine.

.3 Organize contents into applicable sections of work to parallel project specifications breakdown. Mark each section by labelled tabs protected with celluloid covers fastened to hard paper dividing sheets.

.2 Include following information plus data specified.

.1 Maintenance instruction for finished surface and materials.

.2 Copy of hardware and paint schedules.

.3 Description: Operation of the equipment and systems defining start-up, shut-down and emergency procedures, and any fixed or adjustable set points that affect the efficiency of the operation. Include nameplate information such as make, size, capacity and serial number.

.4 Maintenance: Use clear drawings, diagrams or manufacturers' literature which specifically apply and detail the following:

.1 lubrication products and schedules.

.2 trouble shooting procedures.

.3 adjustment techniques.

.4 operational checks.

.5 Suppliers names, addresses and telephone numbers and components supplied by them must be included in this section. Components must be identified by a description and manufacturers part number.

.5 Guarantees showing:

.1 Name and address of project.

.2 Guarantee commencement date (date of Substantial Performance).

.3 Duration of guarantee.

.4 Clear indication of what is being guaranteed and what remedial action will be taken under guarantee.

.5 Signature and seal of Guarantor.

.6 Additional material used in project listed under various Sections showing name of manufacturer and source of supply.

.3 Spare parts: List all recommended spares to be maintained on site to ensure optimum efficiency. List all special tools appropriate to unique application. All parts/tools detailed must be identified as to manufacturer, manufacturer part number and supplier (including address).

.4 Include one complete set of final reviewed shop drawings (bound separately) indicating corrections and changes made during fabrication and installation.

1.18 RECORDS

.1 As work progresses, maintain accurate records to show deviations from contract drawings. Just prior to Departmental Representative's inspection for issuance of final certificate of completion, supply to the Departmental Representative one (1) complete set of white prints of all drawings including changes due to Site Instructions and Change Orders, with all other deviations neatly inked in. The Departmental Representative will provide two sets of clean white prints for this purpose.

1.19 GUARANTEES AND WARRANTIES

.1 Before completion of work collect all manufacturer's guarantees and warranties and deposit with Departmental Representative.

.2 Work of this contract shall not compromise any warranties in effect for the existing building.

1.20 CLEAN UP

.1 Clean up work area as work progresses. At the end of each work period, and more often if ordered by the Departmental Representative, remove debris from site, neatly stack material for use, and clean up generally.

.2 Upon completion remove scaffolding, temporary protection and surplus materials. Make good defects noted at this stage.

.3 Wash and polish glass, mirrors, ceramic tile, aluminum, chrome, stainless steel, baked or porcelain enamel, plastic laminate and other plastic surfaces, floors, hardware and washroom fixtures. Clean manufactured articles in accordance with manufacturer's directions. Clean all wall and ceiling surfaces, including existing building surfaces.

.4 Clean areas under contract to a condition at least equal to that previously existing and to approval of Departmental Representative.

1.21 BUILDING SMOKING ENVIRONMENT

.1 Smoking is not permitted on the site. Obey smoking restrictions on building property.

1.22 DUST CONTROL

.1 Provide dust tight control on the construction site to localize dust generating activities, and for protection of workers, finished areas of work and public.

1.23 TESTING LABORATORY SERVICES

.1 Departmental Representative will appoint and pay for costs of inspection and testing services, unless indicated otherwise.

.2 Provide safe working areas and assist with testing procedures, including provisions for materials or services and co-ordination, as required by testing agency and as authorized by Departmental Representative.

.3 Where tests indicate non-compliance with specifications, contractor to pay for initial test and all subsequent testing of work to verify acceptability of corrected work.

1.24 SCHEDULING

.1 Within 5 days after award of contract submit bar chart construction schedule for work, indicating anticipated progress stages within time of completion. When schedule has been reviewed by the Departmental Representative, make any corrections required and resubmit. Take necessary measures to complete work within scheduled time. Do not change schedule without notifying Departmental Representative.

.2 Ensure Project Schedule includes as minimum milestone and activity types the following (not necessarily in this order):

.1 Award
.2 Shop Drawings, Samples, broken down by category and connected as predecessors in the schedule to related site work
.3 Permits
.4 Site Mobilization
.5 Framing

.6 Plumbing
.7 Electrical
.8 HVAC
.9 Drywall
.10 Millwork
.11 Fire Systems
.12 Lighting
.13 Testing and Commissioning
.14 Final Review/Substantial Performance
.15 Deficiencies/Completion

.3 Unless advised otherwise and approved, the work performed at the site by the Contractor shall be carried out during normal working hours (06:00 – 16:00) during the week and shall be carried out with the least possible interference or disturbance to other site activities or operations. Perform noisy work, work requiring Hot Work Permits, and otherwise disruptive work (at the discretion of the Departmental Representative) after hours and on weekends. Schedule after-hours work at least 48 hours in advance with the Departmental Representative. Hot Work Permits also require minimum 48 hours notice.

.4 Update project schedule on monthly basis reflecting activity changes and completions, as well as activities in progress.

1.25 COST BREAKDOWN

.1 Before submitting first progress claim submit breakdown of Contract Amount in detail as directed by Departmental Representative and aggregating the Contract Amount. After approval by Departmental Representative cost breakdown will be used as the basis of progress payments.

1.26 PRECEDENCE

.3 For Federal Government projects, Division 01 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

REFER TO APPENDIX A

Part 1 General

1.1 ADMINISTRATIVE

.1 Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.2 Do not proceed with Work affected by submittal until review is complete.

.3 Present shop drawings, product data, samples and mock-ups in SI Metric units.

.4 Where items or information is not produced in SI Metric units converted values are acceptable.

.5 Review submittals prior to submission to Departmental Representative. This review will be confirmed by the Contractor’s stamp and represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.

.6 Notify Departmental Representative in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.7 Verify field measurements and affected adjacent Work are co-ordinated.

.8 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.

.9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.

.10 Keep one reviewed copy of each submission on site.

1.2 SHOP DRAWINGS AND PRODUCT DATA

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

.2 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario.

.3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.4 Allow 5 days for Departmental Representative's review of each submission.

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

.6 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.

.7 Accompany submissions with transmittal letter, containing:

- .1 Date.
- .2 Project title and number.
- .3 Contractor's name and address.
- .4 Identification and quantity of each shop drawing, product data and sample.
- .5 Other pertinent data.

.8 Submissions include:

- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and address of:
  - .1 Subcontractor.
  - .2 Supplier.
  - .3 Manufacturer.
- .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
- .5 Details of appropriate portions of Work as applicable:
  - .1 Fabrication.
  - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
  - .3 Setting or erection details, including anchors and/or other means of connection, as well as written verification that base building structure can support the connection at that point.
  - .4 Capacities.
  - .5 Performance characteristics.
  - .6 Standards.
  - .7 Operating weight.
  - .8 Wiring diagrams.
  - .9 Single line and schematic diagrams.
  - .10 Relationship to adjacent work.

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

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

files shall be scaled so that a 1:1 print produces properly scaled drawings. Provide paper copies as requested, up to 6 copies as requested.

.11 Submit PDF electronic copies of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product. Provide paper copies as requested, up to 6 copies as requested.

.12 Submit PDF electronic copies of test reports for requirements requested in specification Sections and as requested by Departmental Representative. Provide paper copies as requested, up to 6 copies as requested.

.1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.

.2 Testing must have been within 3 years of date of contract award for project.

.13 Submit PDF electronic copies of certificates for requirements requested in specification Sections and as requested by Departmental Representative. Provide paper copies as requested, up to 6 copies as requested.

.1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.

.2 Certificates must be dated after award of project contract complete with project name.

.14 Submit PDF electronic copies of manufacturers instructions for requirements requested in specification Sections and as requested by Departmental Representative. Provide paper copies as requested, up to 6 copies as requested.

.1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.

.15 Submit PDF electronic copies of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative. Provide paper copies as requested, up to 6 copies as requested.

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

.17 Submit PDF electronic copies of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental Representative. Provide paper copies as requested, up to 6 copies as requested.

.18 Delete information not applicable to project.

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

.20 If upon review by Departmental Representative no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

.21 The review of shop drawings by the Departmental Representative is for sole purpose of ascertaining conformance with general concept.

.1 This review shall not mean that the Departmental Representative approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.

.2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

1.3 SAMPLES

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

.2 Deliver samples prepaid to address(s) provided by Departmental Representative.

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

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

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

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

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

1.4 PHOTOGRAPHIC DOCUMENTATION

.1 Submit electronic copy of colour digital photography in jpg format, fine resolution weekly and as directed by Departmental Representative

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

.3 Number of viewpoints: minimum 4 locations.

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

.4 Frequency of photographic documentation: weekly and as directed by Departmental Representative, but to include completion of framing, services prior to concealment, and substantial completion.

1.5 CERTIFICATES AND TRANSCRIPTS

.1 Immediately after award of Contract, submit WSIB status.

.2 Submit transcription of insurance immediately after award of Contract.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 – GENERAL

1.1 REFERENCES

.1 Occupational Health and Safety Act R.S.O. 1990, c. 0.1, and Regulations for Construction Projects O. Reg. 213/91, current edition.

.2 CAN/CSA, Z462-15 (Workplace Electrical Safety Standard)

.3 CAN/CSA-Z460-05 (R2010) - Control of Hazardous Energy.

1.2 SUBMITTALS

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

.2 Submit site-specific Health and Safety Plan: Within seven (7) working days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:

.1 Results of site specific safety hazard assessment.

.2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.

.3 Written safe work procedures to address the known hazards.

.3 Submit three (3) copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative, weekly.

.4 Submit copies of reports or directions issued by Federal and Provincial health and safety inspectors.

.5 Submit copies of incident and accident reports within 24 hours after the event.

.6 Submit WHMIS MSDS - Material Safety Data Sheets to Departmental Representative.

.7 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within seven (7) working days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within seven (7) working days after receipt of comments from Departmental Representative.

.8 Departmental Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.

.9 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

1.3 FILING OF NOTICE

.1 File Notice of Project with Provincial authorities prior to beginning of Work.

1.4 SAFETY ASSESSMENT

.1 Perform site specific safety hazard assessment related to project.

1.5 MEETINGS

.1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.

1.6 GENERAL REQUIREMENTS

.1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.

.2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.7 RESPONSIBILITY

.1 Be responsible and assume the role of "Constructor" as described in the Ontario Occupational Health & Safety Act and Regulations for Construction Projects for only their scope and areas of work as defined in this Project Specification.

.2 Assume responsibility for health and safety of all other contractors present on site under the prescriptions of the present section.

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

1.8 COMPLIANCE REQUIREMENTS

.1 Comply with the Ontario Occupational Health and Safety Act, R.S.O. 1990, c. 0.1.

.2 Comply with the Ontario Regulations for Construction Projects, O. Reg. 213/91.

.3 Comply with CAN/CSA, Z462-15 (Workplace Electrical Safety Standard)

.4 Comply with CAN/CSA-Z460-05 (R2010) - Control of Hazardous Energy.

1.9 UNFORSEEN HAZARDS

.1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction and advise Departmental Representative verbally and in writing.

1.10 HEALTH AND SAFETY CO-ORDINATOR

.1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:

.1 Have site-related working experience specific to activities associated with specified Work. Submit relevant experience to Departmental Representative.

.2 Have working knowledge of occupational safety and health regulations.

.3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.

.4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.

.5 Be on site during execution of Work.

1.11 POSTING OF DOCUMENTS

.1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with Departmental Representative.

1.12 CORRECTION OF NON-COMPLIANCE

.1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.

.2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.

.3 Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.

1.13 BLASTING

.1 Blasting or other use of explosives is not permitted.

1.14 POWDER ACTUATED DEVICES

.1 Use powder actuated devices only after receipt of written permission from Departmental Representative.

1.15 WORK STOPPAGE

.1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

END OF SECTION

Part 1 General

1.1 INSPECTION

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

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

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

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

1.2 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies will be engaged by Departmental Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Departmental Representative or Contractor subject to item 1.1.4 above.

.2 Provide equipment required for executing inspection and testing by appointed agencies.

.3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.

.4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no cost to Departmental Representative. Pay costs for retesting and reinspection.

1.3 ACCESS TO WORK

.1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.

.2 Co-operate to provide reasonable facilities for such access.

1.4 PROCEDURES

.1 Notify appropriate agency and Departmental Representative in advance of requirement for tests, in order that attendance arrangements can be made.

.2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.

.3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.5 REJECTED WORK

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

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

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

1.6 REPORTS

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

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

1.7 TESTS AND MIX DESIGNS

.1 Furnish test results and mix designs as requested.

.2 Cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work will be appraised by Departmental Representative and may be authorized as recoverable.

1.8 MOCK-UPS

.1 Prepare mock-ups for Work specifically requested in specifications. Include for Work of Sections required to provide mock-ups.

.2 Construct in locations acceptable to Departmental Representative or as specified in specific Section.

.3 Prepare mock-ups for Departmental Representative review with reasonable promptness and in orderly sequence, to not cause delays in Work.

.4 Failure to prepare mock-ups in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

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

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

.7 Mock-ups may remain as part of Work at the discretion of Departmental Representative.

1.9 MILL TESTS

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

1.10 EQUIPMENT AND SYSTEMS

.1 Submit adjustment and balancing reports for mechanical, electrical and building equipment systems.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Canadian Standards Association (CSA International)

.1 CAN/CSA-S269.2-16, Access Scaffolding for Construction Purposes.

.2 Public Works Government Services Canada (PWGSC) Standard Acquisition Clauses and Conditions (SACC)-ID: R0202D, Title: General Conditions 'C', latest version.

1.2 SUBMITTALS

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

1.3 SCAFFOLDING

.1 Scaffolding in accordance with CAN/CSA-S269.2.

.2 Provide and maintain scaffolding ramps, ladders, swing staging, platforms, temporary stairs.

1.4 SITE STORAGE/LOADING

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

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

1.5 CONSTRUCTION PARKING

.1 Parking will be permitted on site. Locations, regulations and limitations to be provided by Departmental Representative.

1.6 OFFICES

.1 Provide office space of sufficient size to accommodate site meetings and furnished with drawing laydown table.

.2 Maintain a complete and updated set of all contract documents and approved submittals, including, but no limited to, drawings, specifications, addenda, shop drawings, site instructions, change orders

.3 Provide marked and fully stocked first-aid case in a readily available location.

1.7 EQUIPMENT, TOOL AND MATERIALS STORAGE

.1 Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.

.2 Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities.

1.8 SANITARY FACILITIES

.1 Sanitary facilities: Sanitary facilities on the floor of the Work may be used. Others shall not be used. Keep facilities clean. Do not use sanitary facilities for cleaning of tools and equipment.

.2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.9 CONSTRUCTION SIGNAGE

.1 No advertising will be permitted on site.

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

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

1.10 CLEAN-UP

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

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

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

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

.1 Refer to Civil.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Conform to reference standards in whole or in part as specifically requested in specifications.

.2 If there is question as to whether products or systems are in conformance with applicable standards, Departmental Representative reserves right to have such products or systems tested to prove or disprove conformance.

.3 Cost for such testing will be born by Departmental Representative in event of conformance with Contract Documents or by Contractor in event of non-conformance.

1.2 QUALITY

.1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.

.2 Procurement policy is to acquire, in cost effective manner, items containing highest percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition. Make reasonable efforts to use recycled and recovered materials and in otherwise utilizing recycled and recovered materials in execution of work.

.3 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.

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

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

.6 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.3 STORAGE, HANDLING AND PROTECTION

.1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.

.2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.

.3 Store products subject to damage from weather in weatherproof enclosures.

.4 Store cementitious products clear of earth or concrete floors, and away from walls.

.5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.

.6 Store sheet materials, lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.

.7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.

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

.9 Touch-up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.4 TRANSPORTATION

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

.2 Transportation cost of products supplied by Departmental Representative will be paid for by Departmental Representative. Unload, handle and store such products.

1.5 MANUFACTURER'S INSTRUCTIONS

.1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.

.2 Notify Departmental Representative in writing, of conflicts between specifications and manufacturer's instructions, so that Departmental Representative will establish course of action.

.3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Departmental Representative to require removal and re-installation at no increase in Contract Price or Contract Time.

1.6 QUALITY OF WORK

.1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Departmental Representative if required Work is such as to make it impractical to produce required results.

.2 Do not employ anyone unskilled in their required duties. Departmental Representative reserves right to require dismissal from site, workers deemed incompetent or careless.

.3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Departmental Representative, whose decision is final.

1.7 CO-ORDINATION

.1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.

.2 Be responsible for coordination and placement of openings, sleeves and accessories.

1.8 CONCEALMENT

.1 In finished areas conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.

.2 Before installation inform Departmental Representative if there is interference. Install as directed by Departmental Representative.

1.9 REMEDIAL WORK

.1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Co-ordinate adjacent affected Work as required.

.2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.10 LOCATION OF FIXTURES

.1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate and subject to relocation prior to installation within a radius of up to 3000mm from the location shown to suit site conditions, interferences or other conditions determined by the Departmental Representative.

.2 Inform Departmental Representative of conflicting installation. Install as directed.

1.11 FASTENINGS

.1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.

.2 Prevent electrolytic action between dissimilar metals and materials.

.3 Use non-corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification Section.

.4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.

.5 Keep exposed fastenings to a minimum, space evenly and install neatly.

.6 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

1.12 FASTENINGS - EQUIPMENT

.1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.

.2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use No. 304 stainless steel for exterior areas.

.3 Bolts may not project more than one diameter beyond nuts.

.4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

1.13 PROTECTION OF WORK IN PROGRESS

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

1.14 EXISTING UTILITIES

.1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, and/or building occupants.

.2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Record location of capped service.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 SUBMITTALS

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

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

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

.3 Include in request:

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

1.2 MATERIALS

.1 Required for original installation.

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

1.3 PREPARATION

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

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

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

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

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

1.4 EXECUTION

.1 Execute cutting, fitting, and patching including excavation and fill, to complete Work.

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

.3 Uncover Work to install ill-timed Work.

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

.5 Remove samples of installed Work for testing as requested.

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

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

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

.9 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry work without prior approval.

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

.11 Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

.12 Seal all penetrations through exterior wall and roof liner panels.

.13 Seal penetrations in wall, ceiling, or floor fire separations in accordance with applicable ULC listed firestop assemblies to maintain the integrity and indicated rating of the fire separation. Provide submittals for proposed firestop assemblies, including details conforming to existing conditions, prior to installation for approval by Departmental Representative. Where ULC listed assemblies are not available to match existing conditions, provide engineering judgements at the discretion of the Departmental Representative.

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

.15 Conceal pipes, ducts and wiring in floor, wall and ceiling construction.

1.5 WASTE MANAGEMENT AND DISPOSAL

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

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 GENERAL

1.1 Waste Management Goals

.1 Prior to start of Work conduct meeting with Departmental Representative to review and discuss Waste Management Plan and Goals.

.2 Waste Management Goal 75 percent of total Project Waste to be diverted from landfill sites. Provide Departmental Representative documentation certifying that waste management, recycling, reuse of recyclable and reusable materials have been extensively practiced.

.3 Accomplish maximum control of solid construction waste.

.4 Preserve environment and prevent pollution and environment damage.

.5 Waste materials (i.e. materials that cannot be reused, refurbished or recycled) will be properly labelled, stored, transported and disposed in compliance with the requirements of all applicable rules and regulations of Federal, Provincial and Municipal authorities having jurisdiction and the requirements of the protocols designated in the Specifications.

.6 The Ontario regulations mandate waste audits, waste reduction work plans and source separation (recycling) programs.

.7 The Ontario 3Rs Regulations consist of four regulations, made under the Ontario *Environmental Protection Act* (EPA). Two of the regulations apply to federal facilities (O. Reg 102 and 103).

1.2 Definitions

.1 Class III: non-hazardous waste - construction renovation and demolition waste.

.2 Cost/Revenue Analysis Workplan (CRAW): based on information from WRW, and intended as financial tracking tool for determining economic status of waste management practices.

.3 Demolition Waste Audit (DWA): relates to actual waste generated from project.

.4 Inert Fill: inert waste - exclusively asphalt and concrete.

.5 Materials Source Separation Program (MSSP): consists of series of ongoing activities to separate reusable and recyclable waste material into material categories from other types of waste at point of generation.

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

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

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

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

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

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

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

.11 Separate Condition: refers to waste sorted into individual types.

.12 Source Separation: acts of keeping different types of waste materials separate beginning from first time they became waste.

.13 Waste Audit (WA): detailed inventory of materials in building. Involves quantifying by volume/weight amounts of materials and wastes generated during construction, demolition, deconstruction, or renovation project. Indicates quantities of reuse, recycling and landfill. Refer to Schedule A.

.14 Waste Management Co-ordinator (WMC): contractor representative responsible for supervising waste management activities as well as coordinating related, required submittal and reporting requirements.

.15 Waste Reduction Workplan (WRW): written report which addresses opportunities for reduction, reuse, or recycling of materials. Refer to Schedule B. WRW is based on information acquired from WA (Schedule A).

.16 Waste Management Summary Report (MWSR): a one page report summarizing the total reuse, recycling and landfill percentages of all materials removed from site accompanied by copies of all material tracking forms.

1.3 Documents

.1 Maintain at job site, one copy of following documents:

.1 Waste Audit.

.2 Waste Reduction Workplan.

.3 Material Source Separation Plan.

.4 Waste Management Summary Report

.5 Schedules A, B, C and D completed for project.

1.4 Submittals

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

.2 Prepare and submit following prior to project start-up:

.1 Submit 2 copies of completed Waste Audit (WA): Schedule A.

.2 Submit 2 copies of completed Waste Reduction Workplan (WRW): Schedule B.

.3 Submit 2 copies of Cost/Revenue Analysis Workplan (CRAW): Schedule C.

.4 Submit 2 copies of completed Waste Management Summary Report (WMSR): Schedule D.

.5 Submit 2 copies of Materials Source Separation Program (MSSP) description.

.3 Submit before final payment summary of waste materials salvaged for reuse, recycling or disposal by project using deconstruction/disassembly material audit form.

.1 Failure to submit could result in hold back of final payment.

.2 Submit 2 copies of completed Waste Management Summary Report (WMSR).

.1 Provide receipts, scale tickets, waybills, and show quantities and types of materials reused, recycled, co-mingled and separated off-site or disposed of.

.2 For each material reused, sold or recycled from project, include amount in tonnes or quantities by number, type and size of items and the destination.

.3 For each material land filled or incinerated from project, include amount in tonnes of material and identity of landfill, incinerator or transfer station.

1.5 Quality Assurance – Compliance Requirements

.1 Comply with the Environmental Protection Act

.2 Comply with (Ontario Regulation 101/94 - Recycling and Composting of Municipal Wastes

.3 Comply with Ontario Regulation 102/94) - Waste Audits and Waste Reduction Work Plans

.4 Comply with Ontario Regulation 103/94- Industrial, Commercial and Institutional (IC&I) Source Separation Programs

.5 Comply with Ontario Regulation 105/94 - General Waste Management Amendment

1.6 Waste Audit (WA)

.1 Conduct WA prior to project start-up.

.2 Prepare WA: Schedule A.

.3 Record, on WA - Schedule A, extent to which materials or products used consist of recycled or reused materials or products.

1.7 Waste Reduction Workplan (WRW)

.1 Prepare WRW (Schedule B) prior to project start-up.

.2 WRW should include but not limited to:

.1 Destination of materials listed.

.2 Deconstruction/disassembly techniques and sequencing.

.3 Schedule for deconstruction/disassembly.

.4 Location.

.5 Security.

.6 Protection.

.7 Clear labelling of storage areas.

.8 Details on materials handling and removal procedures.

.9 Quantities for materials to be salvaged for reuse or recycled and materials sent to landfill.

.3 Structure WRW to prioritize actions and follow 3R's hierarchy, with Reduction as first priority, followed by Reuse, then Recycle.

.4 Describe management of waste.

.5 Identify opportunities for reduction, reuse, and recycling of materials. Based on information acquired from WA.

.6 Post WRW or summary where workers at site are able to review content.

.7 Set realistic goals for waste reduction, recognize existing barriers and develop strategies to overcome these barriers.

.8 Monitor and report on waste reduction by documenting total volume and cost of actual waste removed from project.

1.8 Cost /Revenue Analysis Workplan (CRAW)

.1 Prepare CRAW: Schedule C.

1.9 Waste Management Summary Report (WMSR)

.1 Prepare WMSR after project completion.

.2 Prepare WMSR: Schedule D

.3 Provide details of quantities of materials salvaged for reuse, recycling or disposal. Reports must be accompanied by copies of weigh bills/receipts/manifests/invoices from authorized facilities validating the figures stated in the reports.

1.10 Materials Source Separation Program (MSSP)

.1 Prepare MSSP and have ready for use prior to project start-up.

.2 Implement MSSP for waste generated on project in compliance with approved methods and as reviewed by Departmental Representative.

.3 Provide on-site facilities for collection, handling, and storage of anticipated quantities of reusable and recyclable materials.

.4 Provide containers to deposit reusable and recyclable materials.

.5 Locate containers in locations, to facilitate deposit of materials without hindering daily operations.

.6 Locate separated materials in areas which minimize material damage.

.7 Collect, handle, store on-site, and transport off-site, salvaged materials in separate condition.

.1 Transport to approved and authorized recycling facility.

.8 Collect, handle, store on-site, and transport off-site, salvaged materials in combined condition.

.1 Ship materials to site operating under Certificate of Approval.

.2 Materials must be immediately separated into required categories for reuse or recycling.

1.11 Storage, Handling and Protection

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

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

.3 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.

.4 Protect structural components not removed for demolition from movement or damage.

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

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

.7 Separate and store materials produced during dismantling of structures in designated areas.

.8 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated facilities.

.1 On-site source separation is recommended.
.2 Remove co-mingled materials to off-site processing facility for separation.
.3 Provide waybills for separated materials.

1.12 Disposal of Wastes

.1 Do not bury rubbish or waste materials.

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

.3 Keep records of construction waste including:

.1 Number and size of bins.
.2 Waste type of each bin.
.3 Total tonnage generated.
.4 Tonnage reused or recycled.
.5 Reused or recycled waste destination.

.4 Remove materials from deconstruction as deconstruction/disassembly Work progresses.

.5 Prepare project summary to verify destination and quantities on a material-by-material basis as identified in pre-demolition material audit.

.6 The Contractor shall not undertake any off-site transportation of demolition materials, rubble or debris unless all required permits have been obtained. The contractor shall be responsible for obtaining the necessary permits.

.7 All workers, haulers and subcontractors must possess current, applicable Certificates of Approval and Licenses in accordance with all applicable Ontario regulations to remove, handle and dispose of non-hazardous wastes. Provide proof of compliance within 24 hours upon written request of Departmental Representative.

.8 The Contractor is required to protect all recoverable materials from but not limited to: weather, theft, vandalism, animals, etc.

1.13 Use of Site and Facilities

.1 Execute work with least possible interference or disturbance to normal use of premises.

.2 Maintain security measures established by existing facility.

1.14 Scheduling

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

1.15 Sequencing

.1 Coordinate Work with other activities at site to ensure timely and orderly progress of work.

.2 Organize the site and workers in a manner that promotes waste reduction and the salvage and separation of materials for reuse and recycling.

.3 As a minimum, and in accordance with Ontario Regulation 103/94, separate and divert the following materials from landfill or incineration. (*Italics indicate those items required to be separated under 3Rs regulations*). Diverted materials shall be transported to approved facilities.

.1 Construction and Demolition Wastes
.2 Wood (not including painted or treated or laminated wood)
.3 Brick, Portland Cement Concrete (not including lead painted, adhesives or otherwise contaminated)
.4 Steel
.5 Metals (Metal work, electrical wire, metal plumbing, metal roofing, etc.*)*

PART 2 PRODUCTS

2.1 Not Used

.4 Not Used.

PART 3 EXECUTION

3.1 Application

.1 Do Work in compliance with WRW.

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

3.2 Cleaning

.1 Remove tools and waste materials on completion of Work, and leave work area in clean and orderly condition.

.2 Clean-up work area as work progresses.

.3 Source separate materials to be reused/recycled into specified sort areas.

3.3 Waste Management Plan Implementation

.1 Manager: Contractor to designate an on-site party (or parties) responsible for instructing workers and overseeing and documenting results of the Waste Management Plan for the Project.

.2 Distribution: Contractor to distribute copies of the Waste Management Plan to the Job Site Foreman, each Subcontractor, and the Departmental Representative.

.3 Instruction: Contractor shall provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the Project.

.4 Separation facilities: Contractor shall lay out and label a specific area to facilitate separation of materials for potential recycling, salvage, reuse, and return. Recycling and waste bin areas are to be kept neat and clean and clearly marked in order to avoid contamination of materials.

.5 Hazardous wastes: Hazardous wastes shall be separated, stored, and disposed of according to local regulations.

.6 Application for Progress Payments: Contractor shall submit with each Application for Progress Payment a Summary of Waste Generated by the Project:

.1 Failure to submit this information shall render the Application for Payment incomplete and shall delay Progress Payment.

.2 The Summary shall be submitted on a form acceptable to the Departmental Representative and shall contain the following information:

.1 The amount in tonnes or cubic metres (tons or cubic yards) of material land filled from the Project,

.2 The identity of the landfill, the total amount of tipping fees paid at the landfill, and

.3 The total disposal cost. Include manifests, weight tickets, receipt, and invoices.

.3 For each material recycled, reused, or salvaged from the Project, the amount tonnes of cubic metres (tons or cubic yards), the date removed from the job site, the receiving party, the transportation cost, the amount of any money paid or received for the recycled or salvaged material, and the net total cost or savings of salvage or recycling each material.

.4 Attach manifests, weight tickets, receipts, and invoices.

3.4 Canadian Governmental Departments Chief Responsibility for the Environment

.1 Schedule E – Government Chief Responsibility for the Environment

.2 Ontario Ministry of Environment 135 St. Clair Avenue West, Toronto, ON M4V 1P5. Tel: 416 323-4321, 800- 565-4923. Fax: 416- 323-4682.

.3 Environment Canada, Toronto, ON. Tel: 416-734-4494.

3.5 Waste Audit (WA)

.1 Schedule A - Waste Audit (WA):

(1) Material Category	(2) Material Quantity Unit	(3) Estimated Waste %	(4) Total Quantity of Waste (unit)	(5) Generation Point	(6) % Recycled	(7) % Reused

(1) Material Category	(2) Material Quantity Unit	(3) Estimated Waste %	(4) Total Quantity of Waste (unit)	(5) Generation Point	(6) % Recycled	(7) % Reused
Wood and Plastics Material Description						
Off-cuts						
Warped Pallet Forms						
Plastic Packaging						
Cardboard Packaging						
Other						
Doors and Windows Material Description						
Painted Frames						
Glass						
Wood						
Metal						
Gypsum Board						
Flooring						
Other (Specify)						

3.6 Waste Reduction Workplan (WRW)

.1 Schedule B – Waste

(1) Material Category	(2) Person(s) Respon-sible	(3) Total Quantity of Waste (unit)	(4) Reused Amount (units) Projected	Actual	(5) Recycled Amount (unit) Projected	Actual	(6) Material(s) Destina-tion
Wood and Plastics Material Description							
Chutes							
Warped Pallet Forms							
Plastic Packag ing							
Card-board Packag ing							
Other							
Doors and Windows Material Description							
Painted Frames							
Glass							
Wood							
Metal							
Gypsum Board							
Other (Specify)							

3.7 Cost/Revenue Analysis Workplan (CRAW)

.1 Schedule C - Cost/Revenue Analysis Workplan (CRAW):

(1) Material Description	(2) Total Quantity (unit)	(3) Volume (cum)	(4) Weight (cum)	(5) Disposal Cost/Credit $(+/-)	(6) Category Sub-Total $(+/-)
Wood					
Wood Stud					
Plywood					
Baseboard - Wood					
Door Trim - Wood					
Cabinet					
Doors and Windows					
Panel Regular					
Slab Regular					
Wood Laminate					
Gypsum Board					
Flooring					
Glazing					
Metal					
		(7) Cost (-) / Revenue (+)			

3.8 Waste Management Summary Report (WMSR)

.1 Schedule D – Waste Management Summary Report (WMSR):

(1) Material Description	(2) Quantity	(3) Unit	(4) Total	(5) Volume (cum)	(6) Weight (cum)	(7) Remarks and Assumptions
Wood						
Wood Stud						
Plywood						
Baseboard-Wood						
Door Trim - Wood						
Cabinet						
Doors and Windows						
Panel Regular						
Slab Regular						
Wood Laminate						
Gypsum Board						
Flooring						
Glazing						
Metal						

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 07 92 00 - Joint Sealants

.2 Section 09 91 99 - Interior Painting for Minor Works

1.2 REFERENCE STANDARDS

.1 American National Standards Institute (ANSI)

- .1 ANSI/ASME 18.6.1 1981 (R2016) Wood Screws (Inch Series).
- .2 ANSI/BHMA A156.9-2015, Cabinet Hardware.
- .3 ANSI/BHMA A156.11-2014, Cabinet Locks.
- .4 ANSI/BHMA A156.16-2013, Auxiliary Hardware.
- .5 ANSI/BHMA A156.18-2016, Materials and Finishes.
- .6 ANSI A208.1-R2016, Particleboard.
- .7 ANSI A208.2-2016, Medium Density Fiberboard (MDF) for Interior Applications.
- .8 ANSI/HPVA HP-1-2016, Standard for Hardwood and Decorative Plywood.

.2 Architectural Woodwork Manufacturers Association of Canada (AWMAC)

- .1 North American Architectural Woodwork Standards (AWMAC AWS), 2017.

.3 ASTM International

- .1 ASTM A 153/A 153M-16a, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- .2 ASTM E 1333-14, Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates From Wood Products Using a Large Chamber.
- .3 ASTM F1667-17 Standard Specification for Driven Fasteners: Nails, Spikes and Staples.

.4 CSA International

- .1 CSA O112-M Series 1977 (R2006) Standards for Wood Adhesives.
- .2 CSA O121-08 (R2013), Douglas Fir Plywood.
- .3 CSA O141-05 (R2014), Softwood Lumber.
- .4 CSA O151-17, Canadian Softwood Plywood.
- .5 CSA O153-M1980 (R2017), Poplar Plywood.
- .6 CAN/CSA-Z809-08 (R2013), Sustainable Forest Management.

.5 Forest Stewardship Council (FSC)

- .1 FSC-STD-01-001-2015, FSC Principle and Criteria for Forest Stewardship.

.6 Green Seal Environmental Standards (GS)

- .1 GS-11-2015, Paints, Coatings, Stains and Sealers.

.2 GS-36-2013, Adhesives for Commercial Use.

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

.1 Material Safety Data Sheets (MSDS).

.8 National Electrical Manufacturers Association (NEMA)

.1 ANSI/NEMA LD-3-05, High-Pressure Decorative Laminates (HPDL).

.9 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards

.1 SCAQMD Rule 1113-A2016, Architectural Coatings.

.2 SCAQMD Rule 1168-A2017, Adhesives and Sealants Applications.

.10 Sustainable Forestry Initiative (SFI)

.1 SFI-2015-2019 Standard and Rules.

1.3 PRE-INSTALLATION MEETING

.1 Prior to enclosing framing, convene a meeting of contractor, casework fabricator, casework installer, framing subcontractor.

.1 Review locations of backing required for casework installation as shown on shop drawings and as necessary for installation.

.2 Review method of attachment for backing to wall system.

.3 Review coordination with other affected sections.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Prepare and submit material list in accordance with AWMAC AWS, cross-referenced to specifications.

.2 Include manufacturer's instructions, printed product literature, data sheets and catalogue pages for all materials and products to be incorporated into architectural wood casework and include product characteristics, performance criteria, dimensions and profiles, finish and limitations on use.

.3 Submit two copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements.

.3 Hardware List:

.1 Submit hardware list cross-referenced to specifications.

.2 Include manufacturer’s specification sheets indicating name, model, material, function, finish, BHMA designations and other pertinent information.

.4 Shop Drawings:

.1 Prepare and submit shop drawings in accordance with AWMAC AWS and as follows.

.2 Submit of shop drawings review in accordance with requirements of Division 01.

.3 Indicate details of construction, profiles, jointing, fastening and other related details.

.1 Scales: details 1:2 or 1:5 as appropriate.

.4 Indicate materials, thicknesses, finishes and hardware.

.5 Indicate locations of service outlets in casework, typical and special installation conditions, and connections, attachments, anchorage and location of exposed fastenings.

.6 Show location on casework elevations of backing required in supporting structure for attachment of casework.

.7 Indicate AWMAC AWS quality grade where different from predominant grade specified.

.8 Include color schedule of all casework items, including all countertop, exposed, and semi-exposed cabinet finishes, finish material manufacturer, pattern, and color.

.9 Submit drawings stamped and signed by professional engineer registered or licensed in the Province of Ontario, Canada.

.5 Samples:

.1 Prepare and submit samples in accordance with AWMAC AWS and as follows.

.2 Apply sample finishes to specified substrate or core material minimum 300 x 300 mm. For veneers with transparent finish submit duplicate samples to illustrate range and colour of grain expected.

.3 Shop applied coatings:

.1 For transparent finish, submit duplicate samples of each species and cut of wood to be used, finished as specified.

.2 For opaque finish, submit duplicate samples for each colour selection, finished as specified.

.4 Submit duplicate samples of laminated plastic for each specified colour selection.

.5 Submit duplicate samples of laminated plastic joints, edging, cutouts.

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

.7 Submit statement of experience and qualifications of architectural wood casework fabricator.

1.5 QUALITY ASSURANCE

.1 Perform Work of this Section by single architectural wood casework fabricator with minimum 5 years of current architectural casework production experience and having completed minimum one project in the past 5 years with value within 20% of the cost of the work of this Section.

1.6 DELIVERY, STORAGE AND HANDLING

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

.2 Deliver wood casework only when area of work is enclosed, plaster and concrete work is dry, and area is broom clean and site environmental conditions are acceptable for installation.

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

.4 Store millwork in ventilated areas, protected from extreme changes of temperature and humidity, and within range recommended by AWMAC AWS for location of project.

.5 Store materials indoors in dry location in clean, dry, well-ventilated area.

.6 Protect architectural woodwork and hardware from nicks, scratches, and blemishes.

.7 Replace defective or damaged materials with new.

.8 Waste Management: for packaging and materials, in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

Part 2 Products

2.1 SUSTAINABILITY CHARACTERISTICS

.1 Lumber, plywood and composite wood products to be CAN/CSA-Z809 or FSC or SFI certified.

.2 Composite wood products: formaldehyde emissions within the following limits when tested in accordance with ASTM E1333.

.1 Hardwood plywood with veneer core (HWPW-VC): 0.05 ppm.

.2 Hardwood plywood with composite core (HWPW-CC): 0.05 ppm.

.3 Particleboard (PB): 0.09 ppm.

.4 Medium density fibreboard (MDF): 0.11 ppm.

.5 Thin (less than 8 mm) medium density fibreboard (tMDF): 0.13 ppm.

.3 Recycled content:

.1 Fibreboard must contain less than 10 % roundwood by weight, using weighted average over three month period at manufacturing locations.

.4 Adhesives: VOC limit 30 g/L maximum to SCAQMD Rule 1168.

.5 Coatings

.1 Clear Wood Finishes: VOC limit 275 g/L maximum to SCAQMD Rule 1113.

.2 Paints: VOC limit 275 g/L maximum to SCAQMD Rule 1113.

2.2 QUALITY GRADE

.1 Provide all materials and perform all fabrication in accordance with AWMAC AWS Custom Grade.

.2 In case of conflict between Contract Documents and AWMAC AWS grade requirements, Contract Documents govern.

2.3 LUMBER

.1 Softwood and Hardwood Lumber: Sound lumber to specified AWMAC AWS quality grade requirements, kiln-dried to moisture content recommended by AWMAC AWS for location of the Work.

.2 Machine stress-rated lumber is acceptable for all purposes.

.3 Trim, molding, edge-banding, stiles and rails: maple species, in profiles indicated.

2.4 PANEL MATERIALS

.1 Interior mat-formed wood particleboard: to ANSI/NPA A208.1, industrial grade M-2 or M-3, medium density (640-800 kg/m³), thickness 15 mm (19mm for shelves) unless indicated otherwise.

.2 Hardwood plywood: to ANSI/HPVA HP-1.

.3 Hardboard: To CAN/CGSB-11.3.

2.5 DECORATIVE VENEER FACED PLYWOOD

.1 Decorative hardwood plywood: to specified AWMAC AWS requirements for grade specified for exposed exterior and exposed interior surfaces

- .1 Veneer species: maple.
- .2 Matching: book.
- .3 Thickness: 17 mm (19 mm for shelves)
- .4 Bond: Type II.
- .5 Sanding: regular sanding.
- .6 Grain direction: vertical; parallel to long axis for shelves

2.6 LAMINATED PLASTIC MATERIALS

.1 Laminated plastic for flatwork: to NEMA LD3.

- .1 High pressure decorative laminated (HPDL) plastic.
  - .1 Type: GP (general purpose).
  - .2 Horizontal Surfaces: HGS to suit application, 1.2 mm thick.
  - .3 Colour: integral colour throughout, white.
  - .4 Pattern: solid.
  - .5 Finish: satin.
- .2 Laminated plastic for backing sheet:
  - .1 Type: backer.
  - .2 Grade: BKL.
  - .3 Thickness: same thickness as face laminate.
  - .4 Colour: same colour as face laminate.
- .3 Thermofused Melamine: to NEMA LD3 Grade LPDL, white.
  - .1 High wear resistant thermofused melamine: equal or exceed 400 cycles (Minimum standard for HPL abrasion test).
- .4 Surface and edge finishing for semi-exposed shelves (behind cabinet doors):

.1 Matching melamine and polyester overlay edge strip with thermoplastic adhesive.

.5 Laminated plastic adhesive:

.1 Adhesive: Subject to manufacturer's recommendations.

2.7 CASEWORK FABRICATION - GENERAL

.1 Fabricate casework of specified core and surface finish materials to specified AWMAC AWS quality grade.

.1 Construction type: frameless.

.2 Door-cabinet interface: flush overlay.

.2 Set nails and countersink screws apply stained wood filler to indentations, sand smooth and leave ready to receive finish.

.3 Shop install cabinet hardware for doors, shelves and drawers. Recess shelf standards unless noted otherwise.

.4 Shelving to cabinetwork to be adjustable unless otherwise noted.

.5 Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes and other fixtures.

.6 Shop assemble work for delivery to site in size easily handled and to ensure passage through building openings.

.7 Obtain governing dimensions before fabricating items which are to accommodate or abut appliances, equipment and other materials.

2.8 WOOD VENEER SURFACING

.1 Apply wood veneer to specified core material in accordance with AWMAC AWS requirements for grade specified and as follows.

.2 Exposed exterior surfaces including cabinet faces behind doors and drawer faces:

.1 Species: maple.

.2 Veneer slicing: plain cut.

.3 Veneer leaf matching: book.

.4 Grain direction: as indicated.

.3 Edge finishing:

.1 6 mm thick square solid lumber moulding of same species as exposed surfaces, for edges of cabinet doors and veneer shelves.

2.9 WOOD CASEWORK FABRICATION

.1 Fabricate casework bodies of specified particleboard panel materials in accordance with AWMAC AWS requirements for grade specified and as follows.

.1 Exposed interior surfaces – interior faces and edges of cabinetry and shelves of cabinets without doors: Veneer of same species and cut and grade as exposed exterior surfaces.

.2 Semi-exposed surfaces: melamine.

.3 Toe kick: plastic laminate covered by resilient coved vinyl base

.2 Fabricate door and drawer surfaces of specified veneered plywood panel materials.

.3 Drawer construction:

.1 Sides: LPDL melamine surface.

.2 Bottoms: Tempered hardboard

.3 Joinery: Meeting requirements of AWMAC AWS for Grade specified.

2.10 SHOP APPLIED FINISH COATINGS

.1 Finish system for wood veneer: AWMAC AWS transparent system 12, premium grade.

.2 Apply finish system component materials in accordance with manufacturer's instructions.

2.11 CABINET HARDWARE

.1 Cabinet hardware: to AWMAC AWS quality grade specified and to ANSI/BHMA A156.9, designated by letter B and numeral identifiers as listed below.

.2 Finish:

.1 Exposed hardware: satin stainless steel.

.2 Semi-exposed hardware: Manufacturer's standard finish.

.3 Casework door hinges: concealed European style Grade II hinges minimum 120º opening.

.4 Pulls: surface mounted wire D- pull, type B02191, finished to 630, 140mm centres, 8mm dia.

.5 Shelf brackets and standards: type recessed vertical slotted shelf standard, with shelf brackets.

.6 Drawer slides:

.1 Slide type: side mounted.

.2 Extension and capacity: full extension meeting requirements of AWMAC AWS for type and size of drawer.

2.12 CABINET LOCKS

.1 Provide locks for all doors and drawers.

.2 Cabinet locks: to ANSI/BHMA A156.11, designated by letter E and numeral identifiers as listed below.

.1 Door or drawer locks: half mortised into back of door or drawer

.2 Elbow catches: at all double doors with locks.

.3 Locks required on all doors and drawers.

.3 Keying: All locks for each room keyed alike

.1 Provide 1 key per lock.

.2 Provide 5 master keys.

.3 Stamp keying code numbers on keys and cylinders.

.4 Finished to 630.

2.13 ACCESSORIES

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

.2 Nails and staples: to CSA B111 and ASTM F1667.

.3 Splines: wood or metal.

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

2.14 LAMINATED PLASTIC COUNTERTOPS

.1 Laminated plastic for flatwork: to NEMA LD3.

.1 Type: general purpose.

.2 Grade: HGS.

.3 Size: 1.2 mm thick.

.4 Colour: integral colour throughout, white.

.5 Pattern: solid.

.6 Finish: satin.

.2 Core material: 19 mm exterior grade hardwood plywood with a non-telegraphing grain.

.1 Countertops to receive plumbing fixtures: Veneer core plywood with type II adhesive.

.3 Back splashes: per drawings.

.4 Front edges: per drawings.

Part 3 Execution

3.1 EXAMINATION

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

.1 Visually inspect substrate in presence of Departmental Representative.

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

.3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 INSTALLATION

.1 Install architectural wood casework in accordance with AWMAC AWS grade for respective items.

.2 In case of conflict between Contract Documents and AWMAC AWS grade requirements, Contract Documents govern.

.3 Install prefinished millwork at locations shown on drawings.

.1 Position accurately, level, plumb straight.

.4 Fasten and anchor millwork securely.

.1 Supply and install heavy duty fixture attachments for wall mounted cabinets.

.5 Countersink mechanical fasteners at exposed and semi-exposed surfaces, excluding installation attachment screws and screws securing cabinets end to end.

.6 Use draw bolts in countertop joints.

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

.8 At junction of plastic laminate counter back splash and adjacent wall finish, apply small bead of sealant in accordance with Section 07 92 00 - Joint Sealants.

.9 Apply moisture barrier between wood framing members and masonry or cementitious construction.

.10 Fit hardware accurately and securely in accordance with manufacturer's written instructions.

.11 Make cutouts for inset equipment and fixtures using templates provided.

3.3 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 00 10 – General Instructions.

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

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 00 10 – General Instructions.

.1 Clean surfaces of millwork, inside cupboards, and drawers.

.2 Remove excess glue, pencil and ink marks from surfaces.

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

3.4 PROTECTION

.1 Protect millwork from damage until final inspection.

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

.3 Repair damage to adjacent materials caused by architectural woodwork installation.

.4 Leave work to be site finished ready for finishing by Section 09 91 99 – Painting for Minor Works.

END OF SECTION

Approved: 2011-12-31

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 07 84 00 - Fire Stopping

1.2 REFERENCE STANDARDS

.1 ASTM International

.1 ASTM C919-12(2017), Standard Practice for Use of Sealants in Acoustical Applications.

.2 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.

.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, Regulation XI. Source Specific Standards

.1 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

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

.2 Manufacturer's product to describe:

.1 Caulking compound.

.2 Primers.

.3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.

.3 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements.

.3 Samples:

.1 Submit 2 samples of each type of material and colour.

.2 Cured samples of exposed sealants for each colour where required to match adjacent material.

.4 Manufacturer's Instructions:

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

.5 Sustainable Design Submittals:

.1 Construction Waste Management:

.1 Submit project Waste Management Plan and Waste Reduction Workplan highlighting recycling and salvage requirements.

.2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 75 % of construction wastes were recycled or salvaged.

1.4 CLOSEOUT SUBMITTALS

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

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

1.5 DELIVERY, STORAGE AND HANDLING

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

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

.3 Storage and Handling Requirements:

.1 Store materials in dry location indoors off ground 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.

.4 Develop Waste Reduction Workplan and Construction Waste Management Plan related to Work of this Section and in accordance with Section 01 74 21 Construction/Demolition Waste Management and Disposal.

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

1.6 SITE CONDITIONS

.1 Ambient Conditions:

.1 Proceed with installation of joint sealants only when:

.1 Ambient and substrate temperature conditions are within limits permitted by joint sealant manufacturer or are above 4.4 degrees C.

.2 Joint substrates are dry.

.3 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

.2 Joint-Width Conditions:

.1 Proceed with installation of joint sealants only where joint widths are more than those allowed by joint sealant manufacturer for applications indicated.

.3 Joint-Substrate Conditions:

.1 Proceed with installation of joint sealants only after contaminants capable of interfering with adhesion are removed from joint substrates.

1.7 ENVIRONMENTAL REQUIREMENTS

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of Material Safety Data Sheets (MSDS) acceptable to Health Canada.

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

Part 2 Products

2.1 SEALANT MATERIALS

.1 Do not use caulking that emits strong odours, contains toxic chemicals or is not certified as mould resistant in air handling units.

.2 Where sealants are qualified with primers use only these primers.

2.2 SEALANT MATERIAL DESIGNATIONS

.1 Silicones one part: to CAN/CGSB-19.13.

.2 Acrylics one part: to CGSB 19-GP-5M.

.3 Acrylic latex one part: to CAN/CGSB-19.17.

.4 Acoustical sealant: to ASTM C919.

.5 Preformed compressible and non-compressible back-up materials:

.1 Polyethylene, urethane, neoprene or vinyl foam:

.1 Extruded open closed cell foam backer rod.

.2 Size: oversize 30 to 50 %.

.2 Neoprene or butyl rubber:

.1 Round solid rod, Shore A hardness 70.

.3 High density foam:

.1 Extruded closed cell polyvinyl chloride (PVC), extruded polyethylene, closed cell, Shore A hardness 20, tensile strength 140 to 200 kPa, extruded polyolefin foam, 32 kg/m^{3}density, or neoprene foam backer, size as recommended by manufacturer.

.4 Bond breaker tape:

.1 Polyethylene bond breaker tape which will not bond to sealant.

2.3 SEALANT SELECTION

.1 Perimeters of interior frames, as detailed and itemized: sealant type: Acrylic Latex, paintable, Type S, Grade NS, Class 25, Use NT, O

.2 Perimeter of plumbing fixtures (e.g. sinks): sealant type: Clear Silicone, Type S, Grade NS, Class 25, Use I, O

.3 Junction of millwork and other surfaces: Clear Silicone, Type S, Grade NS, Class 25, Use O

.4 Junction of gypsum partition and concrete slab and penetrations in fire rated partitions: fire rated sealant

2.4 JOINT CLEANER

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

.2 Primer: in accordance with sealant manufacturer's written recommendations.

Part 3 Execution

3.1 EXAMINATION

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

.1 Visually inspect substrate in presence of Departmental Representative.

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

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

3.2 SURFACE PREPARATION

.1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.

.2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair Work.

.3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

.4 Ensure 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 00 10 – General Instructions.

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

.2 Clean adjacent surfaces immediately.

.3 Remove excess and droppings, using recommended cleaners as work progresses.

.4 Remove masking tape after initial set of sealant.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 00 10 – General Instructions.

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

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

3.8 PROTECTION

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

.2 Repair damage to adjacent materials caused by joint sealants installation.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 07 92 00 – Joint Sealants

.2 Section 08 14 10 – Flush Wood Doors

.3 Section 08 71 00 – Door Hardware

.4 Section 08 80 50 – Glazing

.5 Section 09 91 99 – Painting for Minor Works

1.2 REFERENCE STANDARDS

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

.1 ASTM A653/A653M-17, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 ASTM B29-14, Standard Specification for Refined Lead.

.3 ASTM B749-14, Standard Specification for Lead and Lead Alloy Strip, Sheet and Plate Products.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-12.1-2017, Safety Glazing

.3 Canadian Standards Association (CSA International)

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

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

.4 Canadian Steel Door Manufacturers' Association (CSDMA)

.1 CSDMA, Recommended Specifications for Commercial Steel Door and Frame Products, 2006.

.2 CSDMA, Recommended Selection and Usage Guide for Commercial Steel Door and Frame Products, 2009.

.5 South Coast Air Quality Management District (SCAQMD), California State

.1 SCAQMD Rule 1113-2016, Architectural Coatings.

.2 SCAQMD Rule 1168-2017, Adhesives and Sealants Applications.

.6 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S701.1-2017, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

.2 CAN/ULC-S702-14, Standard for Thermal Insulation, Mineral Fibre, for Buildings.

.3 CAN/ULC-S704-14, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.

.4 CAN4-S104-10, Standard Method for Fire Tests of Door Assemblies.

.5 CAN4-S105-09, Standard Specification for Fire Door Frames Meeting the Performance Required by CAN4-S104.

1.3 SYSTEM DESCRIPTION

.1 Design Requirements:

.1 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104 for ratings specified or indicated.

.2 Provide fire labelled frames for openings requiring fire protection ratings. Test products in conformance with CAN4-S104, ASTM E152 and listed by nationally recognized agency having factory inspection services.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Provide product data: in accordance with Section 01 33 00 - Submittal Procedures.

.3 Provide shop drawings: in accordance with Section 01 33 00 - Submittal Procedures.

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

.2 Indicate each type of door, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, louvred or glazed, arrangement of hardware fire rating and finishes.

.3 Indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors and exposed fastenings reinforcing fire rating finishes.

.4 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.

.5 Submit test and engineering data, and installation instructions.

1.5 DELIVERY, STORAGE AND HANDLING

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

.2 Waste Management and Disposal:

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

Part 2 Products

2.1 MATERIALS

.1 Hot dipped galvanized steel sheet: to ASTM A653M, ZF75, minimum base steel thickness in accordance with CSDMA Table 1 - Thickness for Component Parts.

.2 Reinforcement: to CSA G40.20/G40.21, Type 44W, coating designation to ASTM A653M, ZF75.

2.2 DOOR CORE MATERIALS

.1 Honeycomb construction:

.1 Structural small cell, 24.5 mm maximum kraft paper 'honeycomb', weight: 36.3 kg per ream minimum, density: 16.5 kg/m^3minimum sanded to required thickness.

.2 Stiffened: face sheets welded uninsulated honeycomb core.

.3 Temperature rise rated (TRR): core composition to limit temperature rise on unexposed side of door to 250 degrees C at 60 minutes. Core to be tested as part of a complete door assembly, in accordance with CAN4-S104, ASTM E152, covering Standard Method of Tests of Door Assemblies and listed by nationally recognized testing agency having factory inspection service.

2.3 ADHESIVES

.1 Honeycomb cores and steel components: heat resistant, spray grade, resin reinforced neoprene/rubber (polychloroprene) based, low viscosity, contact cement.

.2 Polystyrene and polyurethane cores: heat resistant, epoxy resin based, low viscosity, contact cement.

.3 Lock-seam doors: fire resistant, resin reinforced polychloroprene, high viscosity, sealant/adhesive.

2.4 PRIMER

.1 Touch-up prime CAN/CGSB-1.181.

2.5 PAINT

.1 Field paint steel doors and frames in accordance with Sections 09 91 99 – Painting for Minor Works. Protect weatherstrips from paint. Provide final finish free of scratches or other blemishes.

2.6 ACCESSORIES

.1 Door silencers: single stud rubber/neoprene type.

.2 Exterior and interior top and bottom caps: steel channels.

.3 Fabricate glazing stops as formed channel, minimum 16 mm height, accurately fitted, butted at corners and fastened to frame sections with counter-sunk oval head sheet metal screws.

.4 Metallic paste filler: to manufacturer's standard.

.5 Fire labels: metal riveted.

.6 Sealant: refer to section 07 92 00 – Joint Sealants.

.7 Glazing: to CAN/CGSB – 12.1

.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 Interior frames: 1.6 mm welded type construction.

.4 Blank, reinforce, drill and tap frames for mortised, templated hardware specified in Section 08 71 00 – Door Hardware, and for electronic security hardware to be provided by Departmental Representative. Reinforce frames for surface mounted hardware.

.5 Use templates provided by finish hardware supplier, security hardware suppliers and Departmental Representative.

.6 Include Conduits for wiring connections to electronic hardware where required.

.7 Coordinate security hardware requirements with the Departmental Representative prior to fabrication.

.8 Protect mortised cutouts with steel guard boxes.

.9 Prepare frame for door silencers, 3 for single door, 2 at head for double door.

.10 Manufacturer's nameplates on frames and screens are not permitted.

.11 Conceal fastenings except where exposed fastenings are indicated.

.12 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.

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 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 and/or louvre openings as indicated.

.2 Fabricate doors with longitudinal edges locked seamed, adhesive assisted welded locked seam. Seams: grind welded joints to a flat plane, fill with metallic paste filler and sand to a uniform smooth finish.

.3 Blank, reinforce, drill doors and tap for mortised, templated hardware electronic hardware.

.4 Factory prepare holes 12.7 mm diameter and larger except mounting and through-bolt holes, on site, at time of hardware installation.

.5 Reinforce doors where required, for surface mounted hardware. Provide flush steel top caps to exterior doors. Provide inverted, recessed, spot welded channels to top and bottom of interior doors.

.6 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.

.7 Provide fire labelled doors for those openings requiring fire protection ratings, as scheduled. Test such products in conformance with CAN4-S104 and list by nationally recognized agency having factory inspection service and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.

.8 Manufacturer's nameplates on doors are not permitted.

.9 prepare doors for electronic security hardware to be provided by Departmental Representative. Reinforce doors for surface mounted hardware.

2.11 DOORS: HONEYCOMB CORE CONSTRUCTION

.1 Form face sheets for interior doors from 1.6 mm sheet steel with honeycomb rate core laminate under pressure to face sheets.

2.12 HOLLOW STEEL CONSTRUCTION

.1 Form face sheets for interior doors from 1.6 sheet steel.

.2 Reinforce doors with vertical stiffeners, securely welded to face sheets at 150 mm on centre maximum.

.3 Fill voids between stiffeners of interior doors with honeycomb core.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 INSTALLATION GENERAL

.1 Install labelled steel fire rated doors and frames to NFPA 80 except where specified otherwise.

.2 Install doors and frames to CSDMA Installation Guide.

3.3 FRAME INSTALLATION

.1 Set frames plumb, square, level and at correct elevation.

.2 Secure anchorages and connections to adjacent construction.

.3 Brace frames rigidly in position while building-in. Install temporary horizontal wood spreader at third points of door opening to maintain frame width. Provide vertical support at centre of head for openings over 1200 mm wide. Remove temporary spreaders after frames are built-in.

.4 Make allowances for deflection of structure to ensure structural loads are not transmitted to frames.

.5 Caulk perimeter of frames between frame and adjacent material.

3.4 DOOR INSTALLATION

.1 Install doors and hardware in accordance with hardware templates and manufacturer's instructions and Section 08 71 00 - Door Hardware.

.2 Provide even margins between doors and jambs and doors and finished floorand thresholds as follows.

.1 Hinge side: 1.0 mm.

.2 Latchside and head: 1.5 mm.

.3 Finished floor, noncombustible sill top of carpet and thresholds: 13 mm.

.3 Adjust operable parts for correct function.

.4 Install louvres.

3.5 FINISH REPAIRS

.1 Touch up with primer finishes damaged during installation.

.2 Fill exposed frame anchors and surfaces with imperfections with metallic paste filler and sand to a uniform smooth finish.

3.6 GLAZING

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

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 08 11 00 – Metal Doors and Frames

.2 Section 08 71 00 – Door Hardware

.3 Section 08 80 50 - Glazing

1.2 REFERENCE STANDARDS

.1 Architectural Woodwork Manufacturers Association of Canada (AWMAC).

.1 North American Architectural Woodwork Standards (AWMAC AWS), 2017.

.2 Canadian Standards Association (CSA International).

.1 CSA Certification Program for Windows and Doors 00.

.3 Environmental Choice Program (ECP).

.1 CCD-045-2011, Sealants and Caulking Compounds.

.2 CCD-046-2011, Adhesives.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Product Data:

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

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

.1 For caulking materials during application and curing.

.2 For door materials and adhesives.

.2 Shop Drawings:

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

.2 Indicate door types and cutouts for lights, sizes, core construction, transom panel construction and cutouts.

1.4 SAMPLES

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

.2 Submit one 300 x 300 mm corner sample of each type wood door.

.3 Show door construction, core, glazing detail and faces.

.4 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions.

1.5 QUALITY ASSURANCE

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

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

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Storage and Protection:

.1 Protect doors from dampness. Arrange for delivery after work causing abnormal humidity has been completed.

.2 Store doors in well ventilated room, off floor, in accordance with manufacturer's recommendations.

.3 Protect doors from scratches, handling marks and other damage. Wrap doors.

.4 Store doors away from direct sunlight.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Dispose of polystyrene, plastic, or corrugated cardboard packaging material in appropriate on-site bin for recycling in accordance with site waste management program.

.3 Unused or damaged glazing materials are not recyclable and must not be diverted to municipal recycling programs.

.4 Divert unused adhesive material from landfill to official hazardous material collections site approved by Departmental Representative.

.5 Do not dispose of unused paint materials into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.

Part 2 Products

2.1 WOOD FLUSH DOORS

.1 Construction: particle core, ultra heavy-duty, anti-warping construction:

.2 Stiles: 3 mm thick veneer, longitudinally laminated by hot pressing with type 1 structural glue, as per ASTM-D5456-93 (LVL FSC), including a 22 mm piece of hardwood, matched with faces, for a total width of 107 mm.

.3 Top and bottom rails: 3 mm thick veneer, longitudinally laminated by hot pressing with type 1 structural glue, as per ASTM-D5456-93 (LVL FSC), or laminated strand lumber (LSL) for a total width of 85 mm.

.4 Core: Solid particleboard. Density of 0.45-0.50 metric ton per cubic metre. Complies with CSA-0188 and ANSI A208-1 standards (LD-1/LD-2). Available NAUF/FSC (LD-2).

.5 Faces: Maple veneer (2 ply plywood). Available NAUF/FSC, vertical grain, plain cut, book match

.6 Lock Block: Integrated

.7 Adhesive: Type I PVA Cross-link (NAUF)

2.2 GLAZING

.1 Glass: In accordance with Section 08 80 50 - Glazing

2.3 FABRICATION

.1 Vertical edge strips to match face veneer.

.2 Prepare doors for glazing. Provide glazing stops hardwood maple species with mitred corners.

.3 Bevel vertical edges of single acting doors 3 mm in 50 mm on lock side and 1.5 mm in 50 mm on hinge side.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 INSTALLATION

.1 Unwrap and protect doors in accordance with CAN/CSA-O132.2 Series, Appendix A.

.2 Install doors and hardware in accordance with manufacturer's printed instructions and CAN/CSA-O132.2 Series, Appendix A.

.3 Adjust hardware for correct function.

.4 Install glazing in accordance with Section 08 80 50 - Glazing.

3.3 ADJUSTMENT

.1 Re-adjust doors and hardware just prior to completion of building to function freely and properly.

3.4 CLEANING

.1 Perform cleaning as soon as possible after installation to remove construction and accumulated environmental dirt.

.2 Remove traces of primer, caulking; clean doors and frames.

.3 Clean glass and glazing materials with approved non-abrasive cleaner.

.4 On completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 08 11 00 – Metal Doors and Frames

.2 Section 08 14 16 – Flush Wood Doors.

.3 Section 08 80 50 - Glazing

1.2 REFERENCE STANDARDS

.1 American National Standards Institute (ANSI)/Builders Hardware Manufacturers Association (BHMA)

.1 ANSI/BHMA A156.1-2006, American National Standard for Butts and Hinges.

.2 ANSI/BHMA A156.2-2017, Bored and Preassembled Locks and Latches.

.3 ANSI/BHMA A156.3-2014, Exit Devices.

.4 ANSI/BHMA A156.4-2014, Door Controls - Closers.

.5 ANSI/BHMA A156.5-2014, Auxiliary Locks and Associated Products.

.6 ANSI/BHMA A156.6-2010, Architectural Door Trim.

.7 ANSI/BHMA A156.8-2010, Door Controls - Overhead Stops and Holders.

.8 ANSI/BHMA A156.12-2013, Interconnected Locks and Latches.

.9 ANSI/BHMA A156.13-2017, Mortise Locks and Latches Series 1000.

.10 ANSI/BHMA A156.15-2016, Release Devices - Closer Holder, Electromagnetic and Electromechanical.

.11 ANSI/BHMA A156.16-2013, Auxiliary Hardware.

.12 ANSI/BHMA A156.17-2014, Self-closing Hinges and Pivots.

.13 ANSI/BHMA A156.18-2016, Materials and Finishes.

.14 ANSI/BHMA A156.19-2013, Power Assist and Low Energy Power - Operated Doors.

.2 Canadian Steel Door and Frame Manufacturers' Association (CSDMA)

.1 CSDMA Recommended Dimensional Standards for Commercial Steel Doors and Frames - 2009.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

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

.3 Samples:

.1 Submit for review and acceptance of each unit.

.2 Samples will be returned for inclusion into work.

.3 Identify each sample by label indicating applicable specification paragraph number, brand name and number, finish and hardware package number.

.4 After approval samples will be returned for incorporation in Work.

.4 Hardware List:

.1 Submit contract hardware list.

.2 Indicate specified hardware, including make, model, material, function, size, finish and other pertinent information.

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

.6 Manufacturer's Instructions: submit manufacturer's installation instructions.

.7 Sustainable Design Submittals:

.1 Construction Waste Management:

.1 Submit project Waste management Plan and Waste Reduction Workplan highlighting recycling and salvage requirements.

.2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 75% of construction wastes were recycled or salvaged.

.2 Recycled Content:

.1 Submit listing of recycled content products used, including details of required percentages or recycled content materials and products, showing their costs and percentages of post-industrial and post consumer content, and total cost of materials for project.

.3 Regional Materials: submit evidence that project incorporates required percentage 20% of regional materials and products, showing their cost, distance from project to furthest site of extraction of manufacturer, and total cost of materials for project.

1.4 CLOSEOUT SUBMITTALS

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

.2 Operation and Maintenance Data: submit operation and maintenance data for door hardware for incorporation into manual.

1.5 MAINTENANCE MATERIAL SUBMITTALS

.1 Extra Stock Materials:

.1 Supply maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.

.2 Tools:

.1 Supply 2 sets of wrenches for door closers and locksets

1.6 QUALITY ASSURANCE

.1 Regulatory Requirements:

.1 Hardware for doors in fire separations and exit doors certified by a Canadian Certification Organization accredited by Standards Council of Canada.

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

1.7 DELIVERY, STORAGE AND HANDLING

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

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

.3 Package items of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.

.4 Storage and Handling Requirements:

.1 Store materials indoors in dry location off ground 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 Use one manufacturer's products only for similar items.

2.2 DOOR HARDWARE

.1 Locks and latches:

.1 Mortise locks and latches: to ANSI/BHMA A156.13, series 1000 mortise lock, grade 1, designed for function and keyed as stated in Hardware Schedule.

.2 Lever handles

.3 Roses: round.

.4 Normal strikes: box type, lip projection not beyond jamb.

.5 Cylinders: key into keying system as noted.

.6 Finished as indicated in Hardware Schedule.

.2 Butts and hinges:

.1 Butts and hinges: to ANSI/BHMA A156.1, designated by letter A and numeral identifiers, followed by size and finish, listed in Hardware Schedule.

.3 Door Closers and Accessories:

.1 Door controls (closers): to ANSI/BHMA A156.4, designated by letter C and numeral identifiers listed in Hardware Schedule, size in accordance with ANSI/BHMA A156.4, table A1, finished to 630

.4 Architectural door trim: to ANSI/BHMA A156.6, designated by letter J and numeral identifiers as listed in Hardware Schedule. Finished as listed in Hardware Schedule.

.1 Door protection plates: 1.27 mm thick stainless steel finished to 630.

2.3 FASTENINGS

.1 Use only fasteners provided by manufacturer. Failure to comply may void warranties and applicable licensed labels.

.2 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.

.3 Exposed fastening devices to match finish of hardware.

.4 Where pull is scheduled on one side of door and push plate on other side, supply fastening devices, and install so pull can be secured through door from reverse side. Install push plate to cover fasteners.

.5 Use fasteners compatible with material through which they pass.

2.4 KEYING

.1 Doors, padlocks and cabinet locks to be great great grand master keyed keyed differently grand master keyed great grand master keyed as noted in Hardware Schedule keyed alike in groups master keyed keyed alike as directed. Prepare detailed keying schedule in conjunction with DCC Representative Departmental Representative Consultant.

.2 Supply keys in duplicate for every lock in this Contract.

.3 Supply 3 master keys for each master key or grand master key group.

.4 Stamp keying code numbers on keys and cylinders.

.5 Supply construction cores.

.6 Hand over permanent cores and keys to Departmental Representative.

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 Use only manufacturer's supplied fasteners.

.1 Use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.

.7 Remove construction cores locks when directed by Departmental 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 00 10 – General Instructions.

.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 00 10 – General Instructions.

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

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

3.4 DEMONSTRATION

.1 Maintenance Staff Briefing:

.1 Brief maintenance staff regarding:

.1 Proper care, cleaning, and general maintenance of projects complete hardware.

.2 Description, use, handling, and storage of keys.

.3 Use, application and storage of wrenches for door closers and fire exit hardware locksets.

.2 Demonstrate operation, operating components, adjustment features, and lubrication requirements.

3.5 PROTECTION

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

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

3.6 SCHEDULE

Group - 001 Door # D82 – Type D Security Door

QTY	DESCRIPTION	FINISH	MANUFACTURER
3	Hinges: A5111 - 114 x 114 x NRP	630	
1	Mortise lockset: F07	652	
1	Door Closer: Heavy Duty Parallel Arm Mounted XP4040 EDA– Set at 90 degrees	689	
2	Kick Plate: J102 – 200 mm x length to suit	630	
1	Door Stop: LO2141 – dome floor	626	
1	Door Contact:	630	Provided by Departmental Representative

Group – 002 Door # D82A – Type D Security Door

QTY	DESCRIPTION	FINISH	MANUFACTURER
3	Hinges: A5111 - 114 x 114 x NRP	630	
1	Mortise lockset: F15	652	
1	Door Closer: Heavy Duty Parallel Arm Mounted XP4040 EDA– Set at 90 degrees	689	
2	Kick Plate: J102 – 200 mm x length to suit	630	
1	Threshold: J3437 – Interlocking Length to suit	719	
1	Door Stop: LO2141 – dome floor	626	
1	Door Contact:	630	Provided by Departmental Representative

Group – 003# D82B

QTY	DESCRIPTION	FINISH	MANUFACTURER
3	Hinges: A5111 - 114 x 114 x NRP	630	
1	Mortise lockset: F01	652	
1	Door Closer: Heavy Duty Parallel Arm Mounted XP4040 EDA– Set at 90 degrees	689	
2	Kick Plate: J102 – 200 mm x length to suit	630	
1	Door Stop: LO2141 – dome floor	626	

Group – 003# D82C

QTY	DESCRIPTION	FINISH	MANUFACTURER
3	Hinges: A5111 - 114 x 114 x NRP	630	
1	Mortise lockset: F01	652	
1	Door Closer: Heavy Duty Parallel Arm Mounted XP4040 EDA– Set at 90 degrees	689	
2	Kick Plate: J102 – 200 mm x length to suit	630	
1	Door Stop: LO2141 – dome floor	626	

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 08 11 00 – Metal Doors and Frames.

.2 Section 08 14 16 – Flush Wood Doors

1.2 REFERENCE STANDARDS

.1 ASTM International

.1 ASTM C542- 05,(2017), Standard Specification for Lock-Strip Gaskets.

.2 ASTM D790-07, Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.

.3 ASTM D1003-13, Standard Test Method for Haze and Luminous Transmittance of Plastics.

.4 ASTM D1929-16, Standard Test Method for Determining Ignition Temperature of Plastics.

.5 ASTM D2240-15e1, Standard Test Method for Rubber Property - Durometer Hardness.

.6 ASTM E84-17a, Standard Test Method for Surface Burning Characteristics of Building Materials.

.7 ASTM F1233-08, (2013) Standard Test Method for Security Glazing Materials and Systems.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-12.1-2017, Tempered or Laminated Safety Glass.

.2 CAN/CGSB-12.2-M91, R2017 Flat, Clear Sheet Glass.

.3 CAN/CGSB-12.3-M91, R2017 Flat, Clear Float Glass.

.3 Glass Association of North American (GANA)

.1 GANA Glazing Manual - 2008.

.2 GANA Laminated Glazing Reference Manual - 2009.

.4 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards

.1 SCAQMD Rule 1168-A2017, Adhesives and Sealants Applications.

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Pre-Installation Meetings:

.1 Convene pre-installation meeting 1 week prior to beginning work of this Section, with Departmental Representative to:

.1 Verify project requirements.

.2 Review installation and substrate conditions.

.3 Co-ordination with other building subtrades.

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

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for 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 Ontario, Canada.

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

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

.1 Submit shop inspection for glass.

.6 Sustainable Design Submittals:

.1 Construction Waste Management:

.1 Submit project Waste Reduction Workplan and Waste Management Plan highlighting recycling and salvage requirements.

.2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 75% of construction wastes were recycled or salvaged.

.2 Recycled Content:

.1 Submit listing of recycled content products used, including details of required percentages or recycled content materials and products, showing their costs and percentages of post-consumer and post-industrial content, and total cost of materials for project.

.3 Low-Emitting Materials:

.1 Submit listing of adhesives and sealants used in building, showing compliance with VOC and chemical component limits or restrictions requirements.

1.5 CLOSEOUT SUBMITTALS

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

.2 Operation and Maintenance Data: submit operation and maintenance data for 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.

1.7 DELIVERY, STORAGE AND HANDLING

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

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

.3 Storage and Handling Requirements:

.1 Store materials indoors 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.

Part 2 Products

2.1 MATERIALS

.1 Design Criteria:

.1 Limit glass deflection to flexural limit of glass 1/200 with full recovery of glazing materials.

.2 Flat Glass:

.1 Safety glass: to CAN/CGSB-12.1, transparent, 6 mm thick minimum but thicker if required for opening

.1 Type 2-tempered.

.2 Class B-float.

.3 Category 11 1 (cat 1 is of glass < 9ftsq, cat 11 is >9ftsq.)

2.2 ACCESSORIES

.1 Setting blocks: Shore A durometer hardness to ASTM D2240, to suit glazing method, glass light weight and area.

.2 Spacer shims: silicone neoprene, 50-60 Shore A durometer hardness to ASTM D2240, 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 D2240; coiled on release paper; black colour.

.4 Lock-strip gaskets: to ASTM C542.

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 Departmental Representative.

.4 Inform Departmental 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 Departmental 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: INTERIOR - DRY METHOD (TAPE AND TAPE)

.1 Perform work in accordance with GANA Glazing Manual GANA Laminated Glazing Reference 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.

3.4 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 00 10 – General Instructions.

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

.1 Remove traces of primer, caulking.

.2 Remove glazing materials from finish surfaces.

.3 Remove labels.

.4 Clean glass using approved non-abrasive cleaner in accordance with manufacturer's instructions.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 00 10 – General Instructions.

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

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

3.5 PROTECTION

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

.2 After installation, mark each light with an "X" by using removable plastic tape or paste.

.1 Do not mark heat absorbing or reflective glass units.

.3 Repair damage to adjacent materials caused by glazing installation.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 08 11 00 – Metal Doors and Frames

.2 Section 09 91 99 – Painting for Minor Works.

1.2 REFERENCE STANDARDS

.1 ASTM International

.1 ASTM C1396/C1396M-17, Standard Specification for Gypsum Wallboard.

.2 ASTM C475/C475M-17, Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.

.3 ASTM C514-04 (2014), Standard Specification for Nails for the Application of Gypsum Board.

.4 ASTM C645-14e1, Standard Specification for Nonstructural Steel Framing Members.

.5 ASTM C754-17, Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.

.6 ASTM C840-17a, Standard Specification for Application and Finishing of Gypsum Board.

.7 ASTM C954-15, Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.122 in. (2.84 mm) in Thickness.

.8 ASTM C1002-16, Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.

.9 ASTM C1047-14a, Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.

.2 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards

.1 SCAQMD Rule 1168-2017, Adhesives and Sealants Applications.

.3 Underwriters' Laboratories of Canada (ULC)

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

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Shop Drawings:

.1 Submit drawings stamped and signed by a professional engineer licenced in the Province of Ontario, Canada.

.2 For partitions that terminate at the existing suspended ceilings show lateral support framing required to support partitions independent of existing suspended ceiling system, to which the partition assembly shall not be fastened. Indicate member design thickness exclusive of coatings, connections and bracing details, screw sizing and spacing, and anchors.

.3 Indicate locations, dimensions, openings and requirements of related work including required blocking and backup to support cabinets.

.3 Product Data:

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

.4 Test and Evaluation Reports: submit test reports in accordance with Section 01 45 00 - Quality Control, from approved independent testing laboratory, certifying partition system complies with sound transmission rating, fire-resistance rating as specified.

.5 Sustainable Design Submittals:

.1 Construction Waste Management:

.1 Submit project Waste Management Plan and Waste Reduction Workplan highlighting recycling and salvage requirements.

.2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 75 % of construction wastes were recycled or salvaged.

.2 Recycled Content:

.1 Submit listing of recycled content products used, including details of required percentages or recycled content materials and products, showing their costs and percentages of post-consumer and post-industrial content, and total cost of materials for project.

.3 Regional Materials: submit evidence that project incorporates required percentage 20 % of regional materials and products, showing their cost, distance from project to furthest site of extraction or manufacture, and total cost of materials for project.

.4 Low-Emitting Materials:

.1 Submit listing of sealants used in building, comply with VOC and chemical component limits or restriction requirements.

1.4 DELIVERY, STORAGE AND HANDLING

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

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

.3 Storage and Handling Requirements:

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

.2 Store materials inside, level, under cover. Protect from weather, damage from construction operations and other causes, in accordance with manufacturer's printed instructions.

.3 Handle materials to prevent damage to edges or surfaces. Protect metal accessories and trim from being bent or damaged.

.4 Store and protect partition materials from nicks, scratches, and blemishes.

.5 Replace defective or damaged materials with new.

.4 Develop Waste Reduction Workplan and Construction Waste Management Plan related to Work of this Section.

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

Part 2 Products

2.1 MATERIALS

.1 Performance/Design Criteria:

.1 Partition assembly to be non-combustible construction.

.2 Non-structural Metal Framing:

.1 Non-load bearing channel stud framing: to ASTM C645, 92 mm stud size, roll formed from hot dipped galvanized steel sheet, for screw attachment of gypsum board. Knock-out service holes at 460 mm centres. Thickness to be determined by engineered shop drawings.

.2 Floor and ceiling tracks: to ASTM C645, in widths to suit stud sizes, 32 mm flange height.

.3 Metal channel stiffener: 19 x 1.4 mm thick cold rolled steel, coated with rust inhibitive coating.

.4 Floor and ceiling tracks: to ASTM C645, in widths to suit stud sizes, and as follows:

.1 Slotted Defection Track for Fire Separations: Premanufactured slotted top runner with 63 mm down standing legs and having 6 mm wide x 38 mm high slots spaced as 25 mm on center along length of runner; tested and certified for use in fire rated wall construction. Allow minimum 25 mm deflection space.

.3 Gypsum Board:

.1 Recycled content: Post-consumer 20% and Post-Industrial 20% minimum.

.2 Standard board: to ASTM C1396/C1396M Type X, 15mm thick, 1200 mm wide x maximum practical length, ends square cut, edges tapered.

.3 Drywall furring channels: 0.5 mm core thickness galvanized steel channels for screw attachment of gypsum board.

.4 Steel tapping screws: to ASTM C1002.

.5 Casing beads, corner beads, control joints and edge trim: to ASTM C1047, metal, zinc-coated by hot-dip process, 0.5 mm base thickness, perforated flanges, one piece length per location.

2.2 ACCESSORIES

.1 Sealants: in accordance with Section to ASTM C475 07 92 00 - Joint Sealants.

.1 VOC limit 250 g/L maximum to SCAQMD Rule 1168.

.2 Insulating strip: rubberized, moisture resistant, 3 mm thick closed cell neoprene strip, 12 mm wide, with self sticking permanent adhesive on one face, lengths as required.

Part 3 Execution

3.1 EXAMINATION

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

.1 Visually inspect substrate in presence of Departmental Representative.

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

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

3.2 ERECTION OF FRAMING

.1 Install steel framing members to receive screw-attached gypsum board in accordance with ASTM C754 except where specified otherwise.

.2 Align partition tracks at floor and ceiling and secure at 600 mm on centre maximum.

.3 Place studs vertically at 400 mm on centre and maximum of 50 mm from abutting walls, and at each side of openings and corners. Position studs in tracks at floor and ceiling. Cross brace steel studs as required to provide rigid installation to manufacturer's instructions.

.4 Erect metal studding to tolerance of 1:1000.

.5 Co-ordinate simultaneous erection of studs with installation of service lines. When erecting studs ensure web openings are aligned.

.6 Include two studs extending from floor to ceiling at each side of openings wider than stud centres specified. Secure studs together, 50 mm apart using column clips or other approved means of fastening placed alongside frame anchor clips.

.7 Install heavy gauge single jamb studs at openings.

.8 Erect track at head of door/window openings and sills of sidelight/window openings to accommodate intermediate studs. Secure track to studs at each end, in accordance with manufacturer's instructions. Install intermediate studs above and below openings in same manner and spacing as wall studs.

.9 Include 40 mm stud or furring channel secured between studs for attachment of fixtures behind lavatory basins, toilet and bathroom accessories, and other fixtures including grab bars and towel rails, attached to steel stud partitions.

.10 Install steel studs or furring channel between studs for attaching electrical and other boxes.

.11 Extend partitions to ceiling height except where indicated.

.12 Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs. Use double track slip joint.

.13 Install continuous insulating strips to isolate studs from uninsulated surfaces.

.14 Install insulating strip under studs and tracks around perimeter of sound control partitions.

3.3 ERECTION OF GYPSUM BOARD AND ACCESSORIES

.1 Do application and finishing of gypsum board in accordance with ASTM C840 except where specified otherwise.

.2 Erect hangers and runner channels for suspended gypsum board ceilings in accordance with ASTM C840 except where specified otherwise.

.3 Support light fixtures by providing additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.

.4 Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers, grilles.

.5 Install 19 x 64 mm furring channels parallel to, and at exact locations of steel stud partition header track.

.6 Furr for gypsum board faced vertical bulkheads within and at termination of ceilings.

.7 Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.

.8 Install wall furring for gypsum board wall finishes in accordance with ASTM C840, except where specified otherwise.

.9 Install acoustical sealant insulation in sound rated partitions to correspond with tested assembly.

.10 Install gypsum boards in direction that will minimize number of end-butt joints. Stagger end joints 250 mm minimum.

3.4 APPLICATION

.1 Apply gypsum board after bucks, anchors, blocking, sound attenuation, electrical and mechanical work are approved.

.2 Apply single layer gypsum board to metal furring or framing using screw fasteners. Maximum spacing of screws 300 mm on centre.

3.5 INSTALLATION

.1 Erect accessories straight, plumb or level, rigid and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners accurately, free from rough edges. Secure using contact adhesive for full length at 150 mm on centre.

.2 Install casing beads around perimeter of suspended ceilings.

.3 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated. Seal joints with sealant.

.4 Install insulating strips continuously at edges of gypsum board and casing beads abutting metal window and exterior door frames, to provide thermal break.

.5 Install access doors to electrical and mechanical fixtures specified in respective sections.

.1 Rigidly secure frames to furring or framing systems.

.6 Finish face panel joints and internal angles with joint system consisting of joint compound, joint tape and taping compound installed according to manufacturer's directions and feathered out onto panel faces.

.7 Finish corner beads, control joints and trim as required with two coats of joint compound and one coat of taping compound, feathered out onto panel faces.

.8 Fill screw head depressions with joint and taping compounds to bring flush with adjacent surface of gypsum board so as to be invisible after surface finish is completed.

.9 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for surface finish.

3.6 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 00 10 – General Instructions.

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

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 00 10 – General Instructions.

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

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

3.7 PROTECTION

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

.2 Repair damage to adjacent materials caused by partition installation.

3.8 SCHEDULES

.1 Construct zero hour (non-rated) fire separation assemblies where indicated.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 09 21 99 - Partitions for Minor Works

1.2 REFERENCE STANDARDS

.1 ASTM International

.1 ASTM F1303-04 (2014), Standard Specification for Sheet Vinyl Floor Covering with Backing.

.2 South Coast Air Quality Management District (SCAQMD)

.1 SCAQMD Rule 1113-2016, Architectural Coatings.

.2 SCAQMD Rule 1168-2017, Adhesive and Sealant Applications.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

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

.3 Samples:

.1 Submit duplicate 300 x 300 mm sample pieces of sheet material and 300 mm long edge strips.

.4 Sustainable Design Submittals:

.1 Construction Waste Management:

.1 Submit project Waste Reduction Workplan and Waste Management Plan highlighting recycling and salvage requirements.

.2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 75% of construction wastes were recycled or salvaged.

.2 Recycled Content:

.1 Submit listing of recycled content products used, including details of required percentages or recycled content materials and products, showing their costs and percentages of post-consumer and post-industrial content, and total cost of materials for project.

.3 Regional Materials: submit evidence that project incorporates required percentage 20 % of regional materials and products, showing their cost, distance from project to furthest site of extraction or manufacture, and total cost of materials for project.

.4 Low-Emitting Materials:

.1 Submit listing of adhesives and sealants used in building, showing compliance with VOC and chemical component limits or restriction requirements.

1.4 MAINTENANCE MATERIAL SUBMITTALS

.1 Extra Materials:

.1 Provide extra materials of resilient sheet flooring and adhesives in accordance with Section 01 78 00 - Closeout Submittals.

.2 Provide 2 m^2 of each colour, pattern and type flooring material required for project for maintenance use.

.3 Extra materials one piece and from same production run as installed materials.

.4 Identify each roll of sheet flooring and each container of adhesive.

.5 Deliver to Departmental Representative, upon completion of the work of this section.

.6 Store where directed by Departmental Representative.

1.5 DELIVERY, STORAGE AND HANDLING

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

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

.3 Storage and Handling Requirements:

.1 Store materials indoors off ground 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.

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

1.6 SITE CONDITIONS

.1 Ambient Conditions:

.1 Maintain air temperature and structural base temperature at flooring installation area above 20 degrees for 48 hours before, during and 48 hours after installation.

Part 2 Products

2.1 MATERIALS

.1 Linoleum sheet flooring - Product to be Marmoleum:

.1 Pattern and colour to Departmental Representative’s selection from standard product range.

.2 Thickness: 2.5 mm.

.2 Linoleum base: Sheet flooring to be carried up wall to form integral base.

.1 Height: 100mm

.3 Primers and adhesives: of types recommended by resilient flooring manufacturer for specific material on applicable substrate, above, on or below grade.

.1 Cove base adhesives:

.1 Adhesive: maximum VOC limit 50 g/L to SCAQMD Rule 1168.

.4 Sub-floor filler and leveller: as recommended by flooring manufacturer for use with their product.

.5 Metal edge and transition strips:

.1 Brushed solid stainless steel with lip to extend under floor finish, shoulder flush with top of adjacent floor finish.

.2 Brushed solid stainless steel transition strips suitable for transitioning from new marmoleum to existing adjacent finishes

.6 External corner protectors: stainless steel, type recommended by flooring manufacturer.

.7 Edging to floor penetrations: stainless steel type recommended by flooring manufacturer.

.8 Sealer and wax: type recommended by resilient flooring material manufacturer for material type and location.

.1 Sealer: maximum VOC limit 100 g/L to SCAQMD Rule 1113.

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 resilient sheet flooring installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Departmental Representative.

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

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

3.2 SITE VERIFICATION OF CONDITIONS

.1 Ensure concrete floors are clean and dry by using test methods recommended by flooring manufacturer.

3.3 PREPARATION

.1 Follow manufacturer's recommendations in addition to instructions below. In the case of discrepancy notify Departmental Representative.

.2 Remove existing resilient and other flooring.

.3 Remove or treat old adhesives to prevent residual, old flooring adhesives from bleeding through to new flooring and/or interfering with the bonding of new adhesives.

.4 Clean floor and apply filler; trowel and float to leave smooth, flat hard surface. Prohibit traffic until filler cured and dry.

.5 Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with sub-floor filler.

.6 Prime concrete slab to resilient flooring manufacturer's printed instructions.

3.4 APPLICATION: FLOORING

.1 Follow manufacturer's recommendations in addition to instructions below. In the case of discrepancy notify Departmental Representative.

.2 Provide high ventilation rate, with maximum outside air, during installation, and for 48 to 72 hours after installation. If possible, vent directly to outside. Do not let contaminated air recirculate through district or whole building air distribution system. Maintain extra ventilation for at least 1 month following building occupation.

.3 Apply adhesive uniformly using recommended trowel. Do not spread more adhesive than can be covered by flooring before initial set takes place.

.4 Lay flooring with seams parallel to building lines to produce a minimum number of seams. Border widths minimum 1/3 width of full material.

.5 Run sheets in direction of traffic. heat weld and continuously seal Double cut sheet joints according to manufacturer's printed instructions.

.6 Heat weld seams of linoleum sheet flooring in accordance with manufacturer's printed instructions.

.7 As installation progresses, and after installation roll flooring with 45 kg minimum roller to ensure full adhesion.

.8 Cut flooring around fixed objects.

.9 Install feature strips and floor markings where indicated. Fit joints tightly.

.10 Install flooring in pan type floor access covers. Maintain floor pattern.

.11 Continue flooring over areas which will be under built-in furniture.

.12 Continue flooring through areas to receive movable type partitions without interrupting floor pattern.

.13 Terminate flooring at centreline of door in openings where adjacent floor finish or colour is dissimilar.

.14 Install metal edge strips at unprotected or exposed edges where flooring terminates.

3.5 APPLICATION: BASE

.1 Sheet flooring to be carried up wall to form integral base.

.2 Clean substrate and prime with one coat of adhesive.

.3 Apply adhesive to back of base.

.4 Install straight and level to variation of 1:1000.

.5 Scribe and fit to door frames and other obstructions. Use premoulded end pieces at flush door frames.

.6 Cope internal corners and for right angle external corners.

.7 Heat weld base in accordance with manufacturer's printed instructions.

3.6 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 00 10 – General Instructions.

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

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 00 10 – General Instructions.

.1 Clean flooring surfaces to flooring manufacturer's printed instructions.

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

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

3.7 PROTECTION

.1 Protect new floors from time of final set of adhesive until final inspection.

.2 Prohibit traffic on floor for 48 hours after installation.

.3 Use only water-based coating for linoleum.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 09 21 99 - Partitions for Minor Works

1.2 REFERENCE STANDARDS

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

.1 Material Safety Data Sheets (MSDS).

.2 The Master Painters Institute (MPI)

.1 Architectural Painting Specification Manual - current edition.

.2 Maintenance Repainting Manual - current edition.

.3 National Research Council Canada (NRC)

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

.4 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards

.1 SCAQMD Rule 1113-A2016, Architectural Coatings.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for paint and coating products and include product characteristics, performance criteria, physical size, finish and limitations. For each paint and coating product. Indicate each product's MPI product number and label and organize each product by the MPI painting/repainting system to which it belongs

.2 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements.

.3 Samples:

.1 Submit for review and acceptance of each unit.

.2 Samples will be returned for inclusion into work.

.3 Submit 200 x 300 duplicate mm sample panels of each paint with specified paint or coating in colours, gloss/sheen and textures required to MPI Painting Specification Manual standards.

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

.5 Sustainable Design Submittals:

.1 Construction Waste Management:

.1 Submit project Waste Management Plan and Waste Reduction Workplan highlighting recycling and salvage requirements.

.2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 75 % of construction wastes were recycled or salvaged.

.2 Regional Materials: submit evidence that project incorporates required percentage 20 % of regional materials and products, showing their cost, distance from project to furthest site of extraction or manufacture, and total cost of materials for project.

.3 Low-Emitting Materials:

.1 Submit listing of paints and coatings used in building, comply with VOC and chemical component limits or restriction requirements.

1.4 DELIVERY, STORAGE AND HANDLING

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

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

.3 Storage and Handling Requirements:

.1 Provide and maintain dry, temperature controlled, secure storage.

.2 Store painting materials and supplies away from heat generating devices.

.3 Store materials and equipment in well ventilated area within temperature as recommended by manufacturer.

.4 Fire Safety Requirements:

.1 Supply fire extinguisher adjacent to storage area, type as recommended by paint manufacturer.

.2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.

.3 Handle, store, use and dispose of flammable and combustible materials in accordance with National Fire Code of Canada (NFC) requirements.

.5 Develop Waste Reduction Workplan and Construction Waste Management Plan related to Work of this Section and in accordance with Section 01 75 21 – Construction/Demolition Waste Management and Disposal.

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

1.5 SITE CONDITIONS

.1 Heating, Ventilation and Lighting:

.1 Ventilate enclosed spaces in accordance with Section 01 51 00- Temporary Utilities.

.2 Co-ordinate use of existing ventilation system with Departmental Representative and ensure its operation during and after application of paint as required.

.3 Provide minimum lighting level of 323 Lux on surfaces to be painted.

.2 Temperature, Humidity and Substrate Moisture Content Levels:

.1 Apply paint finishes when ambient air and substrate temperatures at location of installation can be satisfactorily maintained during application and drying process, within MPI and paint manufacturer's prescribed limits.

.2 Test concrete, masonry and plaster surfaces for alkalinity as required.

.3 Apply paint to adequately prepared surfaces, when moisture content is below paint manufacturer's prescribed limits.

.3 Additional application requirements:

.1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.

Part 2 Products

2.1 MATERIALS

.1 Supply paint materials for paint systems from single manufacturer.

.2 Conform to latest MPI requirements for painting work including preparation and priming.

.3 Materials in accordance with MPI - Architectural Painting Specification Manual and MPI - Maintenance Repainting Manual "Approved Product" listing.

.1 Use MPI listed materials having E3 or E2 rating where indoor air quality requirements exist.

.4 Colours:

.1 Submit proposed Colour Schedule to Departmental Representative for review.

.2 Base colour schedule on selection of 1 base colours and 1 accent colours.

.5 Mixing and tinting:

.1 Perform colour tinting operations prior to delivery of paint to site, in accordance with manufacturer's written recommendations. Obtain written approval from Departmental Representative for tinting of painting materials.

.2 Use and add thinner in accordance with paint manufacturer's recommendations.

.1 Do not use kerosene or similar organic solvents to thin water-based paints.

.3 Thin paint for spraying in accordance with paint manufacturer's written recommendations.

.4 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity.

.6 Gloss/sheen ratings:

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

Gloss Level-Category	Gloss @ 60 degrees	Sheen @ 85 degrees

Gloss Level 1 - Matte Finish	Max. 5	Max. 10
Gloss Level 2 - Velvet	Max.10	10 to 35
Gloss Level 3 - Eggshell	10 to 25	10 to 35
Gloss Level 4 - Satin	20 to 35	min. 35
Gloss Level 5 - Semi-Gloss	35 to 70	
Gloss Level 6 - Gloss	70 to 85	
Gloss Level 7 - High Gloss	More than 85	

.2 Gloss level ratings of painted surfaces as noted on Finish Schedule as indicated.

.7 Interior painting:

.1 Galvanized Metal: high contact/high traffic areas (doors, frames, railings and handrails, etc.).

.1 INT 5.3M – High performance architectural latex G5 (over W.B. galvanized primer) finish.

.2 Dressed Lumber: doors, door and window frames, casings, mouldings, etc.:

.1 INT 6.3K - Polyurethane varnish satin finish.

.3 Wood paneling and casework: partitions, panels, shelving, millwork – for touch-ups or site cuts of shop-finished millwork:

.1 INT 6.4J - Polyurethane varnish satin finish.

.4 Plaster and gypsum board: gypsum wallboard, drywall, "sheet rock" type material, etc.

.1 INT 9.2B - High performance architectural latex (over latex primer/sealer) G3 finish.

.8 Interior re-painting:

.1 Galvanized Metal: (doors, frames, railings and handrails, etc.).

.1 RIN 5.3J - High Performance Architectural Latex, Premium Grade, G5 finish

.1 When painting over existing alkyd paint, modify system to use MPI 17as full primer coat - clean and de-gloss existing surface prior to application. Allow 24 hours minimum drying time after application of primer coat

.2 Dressed Lumber: (Including Doors).

.1 RIN 6.3K - Polyurethane varnish, satin finish

.3 Plaster and Gypsum Board: gypsum wallboard, drywall, "sheet rock" type material, etc.

.1 RIN 9.2B – High Performance Architectural Latex, Premium Grade, G3 finish.

Part 3 Execution

3.1 GENERAL

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

.2 Perform preparation and operations for interior painting in accordance with MPI - Maintenance Repainting Manual and MPI - Architectural Painting Specifications Manual except where specified otherwise.

3.2 EXAMINATION

.1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Departmental Representative damages, defects, unsatisfactory or unfavourable conditions before proceeding with work.

.2 Conduct moisture testing of surfaces to be painted using properly calibrated electronic moisture meter, 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.

3.3 CONDITION OF SURFACES

.1 Assess the degree of surface deterioration (DSD) prior to commencement of painting using the assessment criteria indicated in the MPI Maintenance Repainting Manual and repaint accordingly per MPI.

.2 No repainting work shall commence until all DSD-4 adverse conditions and defects have been corrected and surfaces and conditions are acceptable.

3.4 PREPARATION

.1 Protection of in-place conditions:

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

.2 Protect items that are permanently attached such as Fire Labels on doors and frames.

.3 Protect factory finished products and equipment.

.2 Surface Preparation:

.1 Remove electrical cover plates, light fixtures, surface hardware on doors, bath accessories and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations. Identify and store items in secure location and re-installed after painting is completed.

.2 Move and cover furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.

.3 Place "WET PAINT" signs in occupied areas as painting operations progress. Signs to approval of Departmental Representative.

.4 Clean and prepare surfaces in accordance with MPI - Maintenance Repainting Manual and MPI - Architectural Painting Specification Manual specific requirements and coating manufacturer's recommendations.

.5 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.

.6 Where possible, prime non-exposed surfaces of new wood surfaces before installation. Use same primers as specified for exposed surfaces.

.1 Apply vinyl sealer to MPI #36 over knots, pitch, sap and resinous areas.

.2 Apply wood filler to nail holes and cracks.

.3 Tint filler to match stains for stained woodwork.

.7 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to 1000 mm.

.8 Clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with MPI requirements.

.9 Touch up of shop primers with primer as specified.

.10 Test all existing paint surfaces to determine if latex or alkyd prior to application.

3.5 APPLICATION

.1 Paint only after prepared surfaces have been accepted by Departmental Representative.

.2 Use method of application approved by Departmental Representative.

.1 Conform to manufacturer's application recommendations.

.3 Apply coats of paint in continuous film of uniform thickness.

.1 Repaint thin spots or bare areas before next coat of paint is applied.

.4 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.

.5 Sand and dust between coats to remove visible defects.

.6 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as tops of interior cupboards and cabinets and projecting ledges.

.7 Finish inside of cupboards and cabinets as specified for outside surfaces.

.8 Finish closets and alcoves as specified for adjoining rooms.

.9 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

.10 Mechanical/Electrical Equipment:

.1 Paint conduits, piping, hangers, ductwork and other mechanical and electrical equipment exposed in finished areas, to match adjacent surfaces, except as indicated.

.2 Do not paint over nameplates.

.3 Keep sprinkler heads free of paint.

.4 Paint disconnect switches for fire alarm system and exit light systems in red enamel.

3.6 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 00 10 – General Instructions.

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

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 00 10 – General Instructions.

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

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

.4 Place primer, stains and paint defined as hazardous or toxic waste, including tubes and containers, in containers or areas designated for hazardous waste.

END OF SECTION

DESIGNATED SUBSTANCES SURVEY

Royal Canadian Mounted Police | Gendarmerie royale du Canada

PROJECT SPECIFIC DESIGNATED SUBSTANCE SURVEY

ROOM 82 RENOVATION PROJECT

NPS BUILDING – 1200 VANIER PARKWAY, OTTAWA, ONTARIO

GEC PROJECT No. 30402

REPORT TO:

MS. SHELLY LAIDLAW
FACILITY MANAGER

ON:

PROJECT SPECIFIC DESIGNATED SUBSTANCE SURVEY
ROOM 82 RENOVATION PROJECT
NPS BUILDING – 1200 VANIER PARKWAY, OTTAWA, ONTARIO

Greenough Environmental Consulting Inc.
29 Capital Drive
Ottawa, ON K2G 0E7
Tel: (613) 792-4125
Fax: (613) 792-1077

Completed: January 29th, 2018

EXECUTIVE SUMMARY

Greenough Environmental Consulting Inc. (GEC) was commissioned by the Royal Canadian Mounted Police (RCMP) under the direction of Ms. Shelly Laidlaw, to provide a designated substance report (DSR) for the upcoming renovation project within Room 82 within the NPS Building located at 1200 Vanier Parkway in Ottawa, Ontario.

The purpose of the investigation was to identify the quantity, location, and condition of designated substances located within the proposed project areas.

For the purpose of this survey, GEC made reference to the results obtained from previous reports associated with the NPS building.

Based on the visual inspections of the accessible areas conducted during the survey and analytical results, asbestos-containing materials (ACMs) and lead-containing paints have been identified within the project areas. Silica and mercury are assumed present in select building materials. Other designated substances may be present in low concentrations in building materials, paints and adhesives within the project areas but they do not represent a concern to occupational health at this time.

A summary of the designated substance survey results is presented in **Table 1**.

TABLE 1 – SUMMARY OF RESULTS & RECOMMENDATIONS
PROJECT SPECIFIC DESIGNATED SUBSTANCE SURVEY – NPS BUILDING
ROOM 82 RENOVATION PROJECT – JANUARY 2018

Component	Comments	Recommendations
Acrylonitrile	None identified.	No recommendations warranted at this time.
Arsenic	None identified.	No recommendations warranted at this time.
Asbestos	Based on the findings of this survey as well as previous and current analytical results, the following <u>non-friable</u> asbestos-containing material (ACM) has been identified within the project areas.	<u>Project Specific Recommendations:</u> o Prior to the planned renovations, all drywall joint compound that will be or has the potential to be disturbed, must be removed in accordance with the procedures outlined in Ontario Regulation 278/05 as well

TABLE 1 – SUMMARY OF RESULTS & RECOMMENDATIONS PROJECT SPECIFIC DESIGNATED SUBSTANCE SURVEY – NPS BUILDING ROOM 82 RENOVATION PROJECT – JANUARY 2018		
Component	**Comments**	**Recommendations**
	• Drywall Joint Compound	as the PSPC Policy regarding Asbestos Management. <u>General Recommendations:</u> o Suspect materials identified during renovation and/or demolition activities not discussed in this report herein should be treated as ACMs unless proven otherwise through material specific sampling and analysis in accordance with the requirements of Ontario Regulation 278/05. o RCMP should update their existing ACM inventory upon completion of the project. o That the roles and responsibility of "the owner" as stipulated in Section 8 of Ontario Regulation 278/05 be recognized and adhered to including, but not limited to, notification to occupiers and workers as well as training. o Ontario Regulation 490/09, as amended to O. Reg. 148/12 - Designated Substance - made under the Occupational Health and Safety Act states that airborne levels of asbestos fibres should not exceed 0.1 f/cc.
Benzene	None identified.	No recommendations warranted at this time.

TABLE 1 – SUMMARY OF RESULTS & RECOMMENDATIONS PROJECT SPECIFIC DESIGNATED SUBSTANCE SURVEY – NPS BUILDING ROOM 82 RENOVATION PROJECT – JANUARY 2018		
Component	**Comments**	**Recommendations**
Coke Oven Emissions	None identified.	No recommendations warranted at this time.
Ethylene Oxides	None identified.	No recommendations warranted at this time.
Isocyanates	None identified.	No recommendations warranted at this time.
Lead	Based on the laboratory analysis, lead concentrations were found to be at a very low level of 28 ug/g in the painted finishes present within the project areas. Paint surfaces were generally found to be in good condition with minor localized blistering or peeling observed. Based on the age of the building and historical applications, lead is assumed to be present in solder on joints of copper piping, caulking in bell fittings associated with cast iron drainage pipe joints and used on electrical wiring/systems (where observed within the renovation areas).	In the event that any work is conducted that has the potential to create airborne lead, every employer shall take all necessary measures and procedures by means of engineering controls, work practices and hygiene practices and facilities as outlined in the Ontario Ministry of Labour Guideline - Lead on Construction Projects dated April 2011. Every employer shall also ensure that the time-weighted average exposure of a worker to airborne lead, except tetraethyl lead, shall not exceed 0.05 milligrams lead per cubic metre of air, and in the case of exposure to tetraethyl lead 0.10 milligrams lead per cubic metre of air as per O.Reg 490/09, as amended to 148/12. The disposal of construction waste containing lead is controlled by Ontario Regulation 347/90 as amended to O. Reg. 302/14 – General Waste Management, under the Ontario Environmental Protection Act. Leachate tests for lead in construction waste must not exceed 5 mg/L in order to be disposed of at a local landfill

TABLE 1 – SUMMARY OF RESULTS & RECOMMENDATIONS PROJECT SPECIFIC DESIGNATED SUBSTANCE SURVEY – NPS BUILDING ROOM 82 RENOVATION PROJECT – JANUARY 2018		
Component	**Comments**	**Recommendations**
		without treatment.
Mercury	Mercury vapour is present in fluorescent light tubes identified throughout the survey areas. Additionally, mercury may also be present within thermostats, switches and thermometers (where present). Based on the age of the building and historical applications, mercury is also assumed to be present in painted surfaces; however, sampling of mercury in painted surfaces was not performed for the purpose of this survey.	Mercury or mercury vapour within fluorescent light tubes and other equipment poses no risk to occupants provided the mercury containers remain intact. Best management practice for disposal of mercury-containing light tubes is to participate in the manufacturer's recycling program or to release the material to an approved waste carrier for disposal and/or recycling. Exposure to mercury in industrial establishments is regulated under O. Reg. 490/09, amended to O. Reg. 148/12. The TWA should not exceed 0.025 mg/m^3 for all forms except alkyl compounds. Alkyl compounds of mercury should not exceed 0.01 mg/m^3. All waste material including switches, thermostats and thermometers, must be handled and disposed of according to O. Reg. 347, amended to O. Reg. 302/14. Leachate tests for mercury in construction waste must not exceed 0.1 mg/L in order to be disposed of at a local landfill without treatment.
Silica	Based on the age of the building and historical applications, silica is	Silica dust can be generated by drilling, coring, blasting, grinding, crushing and

TABLE 1 – SUMMARY OF RESULTS & RECOMMENDATIONS PROJECT SPECIFIC DESIGNATED SUBSTANCE SURVEY – NPS BUILDING ROOM 82 RENOVATION PROJECT – JANUARY 2018		
Component	**Comments**	**Recommendations**
	assumed to be present in gypsum (drywall), drywall joint compound, poured concrete, concrete block and cement mortar identified within the proposed renovation areas (where applicable). The potential for the generation of airborne silica dust exists when manipulating the noted building materials.	sandblasting silica-containing materials. Prior to any renovation or demolition, ensure that all necessary measures and procedures by means of engineering controls, work practices and hygiene practices and facilities are implemented as outlined in the Ontario Ministry of Labour Guideline - Silica on Construction Projects dated April 2011 Every employer shall also ensure that the TWAEV of a worker to silica is reduced to the lowest practical level and in any event shall not exceed 0.05 milligrams per cubic metre of air by volume for cristobalite and tridymite, and 0.10 milligrams silica per cubic metre of air by volume for quartz and tripoli.
Vinyl Chloride	Likely present in stable form in pipes, paints and finishes.	No recommendations warranted at this time.

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TABLES

APPENDICES

1.0 INTRODUCTION

Greenough Environmental Consulting Inc. (GEC) was commissioned by the Royal Canadian Mounted Police (RCMP) under the direction of Ms. Shelly Laidlaw, to provide a designated substance report (DSR) for the upcoming Room 82 renovation project within the NPS Building located at 1200 Vanier Parkway in Ottawa, Ontario.

The purpose of the investigation was to identify the quantity, location, and condition of designated substances located within the proposed renovation areas.

For the purpose of this survey, GEC made reference to the results obtained from previous reports associated with the NPS building.

All DSR work meets the requirements of Section 30 of the Ontario Occupational Health and Safety Act and WHMIS Regulation (formerly Bill 208).

2.0 SCOPE AND METHODOLOGY

The scope of work followed during the assessment was in accordance with the scope of work agreed upon by GEC and RCMP.

All work was conducted in accordance with provincial regulations (O. Reg 490/09 and 278/05). The survey included the following designated substances:

- Acrylonitrile
- Arsenic
- Asbestos
- Benzene
- Coke oven Emissions
- Ethylene Oxide
- Isocyanates
- Lead
- Mercury
- Silica
- Vinyl Chloride

Materials suspected to contain designated substances, were visually identified based on the surveyor's knowledge as well as historical application of building components. Where permitted, visual identification of materials suspected to contain asbestos was supported by the collection and analysis of representative samples as directed by the Client. Asbestos bulk sampling was performed by GEC in order to meet the current minimum sampling requirements of Ontario Regulation 278/05 - Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations (O. Reg. 278/05), as amended.

In Ontario, a material is defined as an ACM if the material has a minimum asbestos content of 0.5% by dry weight. ACMs are divided into two categories: friable and non-friable materials. A friable ACM is a material that can be crumbled, powdered, pulverized or reduced to dust by hand or moderate pressure. Friable materials can readily release fibres when disturbed. Common applications of friable ACMs are sprayed or trowelled surfacing materials (e.g. sprayed fireproofing and textured coatings) as well as mechanical and thermal insulations. Non-friable materials will generally release fibres only when cut, broken or have deteriorated to the point where the binding agents of the material begin to fail. Common non-friable ACMs include drywall joint compound, plaster, textile products (gaskets etc.) and asbestos cement (Transite). It must be noted that some materials, although non-friable intact, become friable upon manipulation (i.e. plaster, ceiling tile etc.).

Bulk samples of suspected ACMs collected by GEC during the site investigation were analyzed for asbestos content at Paracel Laboratories Ltd. (Paracel) in Ottawa, Ontario. The bulk asbestos samples were analyzed using a combination of dispersion staining and Polarised Light Microscopy (PLM). This analytical method complies with the United States Environmental Protection Agency (U.S. EPA) Method 600/R-93/116 dated July, 1993. Paracel is certified under the National Institute of Science and Technology's National Voluntary Laboratory Accreditation Program (NVLAP) to perform asbestos bulk sample analysis (NVLAP No. 200812-0).

The laboratory utilizes a "positive-stop" analysis methodology and stopped analysis for the particular set of samples once asbestos concentrations at or above 0.5% is detected. Therefore, samples taken in order to satisfy the requirements of O. Reg. 278/05, were not analyzed if the previous sample was identified as asbestos-containing. **Appendix 1** presents the current asbestos analytical results obtained for the purpose of this survey.

For the purpose of this survey, GEC collected paint chip samples of predominant paint finishes within the specified project areas and submitted the samples to Paracel Laboratories for analysis.

Paracel has received its Certificate of Laboratory Proficiency from the Canadian Association of Environmental Analytical Laboratories (CAEAL) and has achieved accreditation from the Standard Council of Canada.

Analysis of paint chip samples is performed using MOE E3470 (which utilizes EPA Method 6020) which describes the multi-elemental determination of analyses by ICP-OES in environmental samples. The method measures ions produced by a radio-frequency inductively coupled plasma. Analyte species originating in a liquid are nebulized and the resulting aerosol is transported by argon gas into the plasma torch. The ions produced by high temperatures are entrained in the plasma gas and introduced, by means of an interface, into a mass spectrometer. The ions produced in the plasma are sorted according to their mass-to-charge ratios and quantified with a channel electron multiplier. Interferences must be assessed and valid corrections applied, or the data flagged to indicate problems. Interference correction must include compensation for background ions contributed by the plasma gas, reagents, and constituents of the sample matrix. Prior to analysis, samples which require total values must be acid digested using appropriate sample preparation methods.

Inductively coupled plasma-optical emission spectrometry (ICP/OES) is applicable to the determination of sub-ug/L concentrations of a large number of elements in water samples and in waste extracts or digests. When dissolved constituents are required, samples must be filtered and acid-preserved prior to analysis. No digestion is required prior to analysis for dissolved elements in water samples. Acid digestion prior to filtration and analysis is required for groundwater, aqueous samples, industrial wastes, soils, sludges, sediments, and other solid wastes for which total (acid-leachable) elements are required. **Appendix 2** presents the lead analytical results obtained for the purpose of this survey.

3.0 SURVEY LIMITATIONS

This report reflects the observations of the accessed areas and analysis of materials sampled during the current survey. Additional designated substances and hazardous materials exist outside the surveyed areas but they are beyond the scope of this survey.

GEC cannot warrant against the discovery of additional ACMs or presence of other designated substances inside wall cavities, closed bulkheads and closed ceilings due to the non-destructive nature of this survey.

The site investigation was completed by Mr. Andrew Dalziel, Senior Project Manager on January 29th, 2018. Observations expressed in this document apply only to conditions on this date and within the subject areas.

4.0 RESULTS

The results of the designated substances survey are discussed below.

4.1 Acrylonitrile

Acrylonitrile is used in production of synthetics and may be present in stable form in paints and adhesives. Over time, acrylonitrile will volatize out of these materials but it is not expected that acrylonitrile concentrations will exceed the maximum allowable Time Weighted Average limit (TWA) of 2 ppm (parts per million) of air for occupants of the structure.

4.2 Arsenic

Arsenic, or arsenic-containing compounds, may be present in stable form in paints and adhesives. Provided these materials remain in good condition, it is not expected that arsenic concentrations will exceed the maximum allowable TWA of 0.01 mg/m^3 of air for occupants of the subject area.

4.3 Asbestos

For the purpose of this survey, GEC made reference to the results obtained from previous reports associated with the NPS building. Additionally, GEC collected samples of suspect asbestos-containing materials (ACM's) identified within the proposed project areas for laboratory analysis.

Table 2 provides a summary of previously completed sampling as it relates to the current survey.

TABLE 2 – NPS BUILDING – PREVIOUS RELEVENT ASBESTOS ANALYTICAL RESULTS			
Sample Reference	**Building Material Description**	**Location of Sample(s)**	**Result & Type**
SAMPLING CONDUCTED BY PREVIOUS			
(Jacques Whitford, 2006)	**Drywall Joint Compound**	**Throughout**	**1% CH**

- **CH = Chrysotile Asbestos**
- *** Definition of an "Asbestos-containing material" as defined by the Ontario Ministry of Labour Regulation 278/05 is any material found to contain 0.5% or greater asbestos by dry weight.**

Table 3 provides results for asbestos analytical data collected during the current survey.

TABLE 3 – NPS BUILDING – SUB-BASEMENT RENOVATION PROJECT CURRENT ASBESTOS ANALYTICAL RESULTS			
Sample Reference	**Building Material Description**	**Location of Sample(s)**	**Result & Type**
SA-01 (A/B/C)	Drywall Joint Compound	Associated with the Sliding Door Surround	ND
SA-02 (A/B/C)	Ceiling Tiles, Lay-in 60cmx120cm Pinhole	Project Area	ND
SA-03 (A/B/C)	Concrete Block Mortar	Project Area	ND
SA-04 (A/B/C)	Carpet Mastic	Office Space within Project Area	ND
SA-05 (A/B/C)	Plaster Remnant Applied to Concrete Deck	Project Area	ND

- **CH = Chrysotile Asbestos**
- **ND = No Asbestos Detected**
- *** Definition of an "Asbestos-containing material" as defined by the Ontario Ministry of Labour Regulation 278/05 is any material found to contain 0.5% or greater asbestos by dry weight.**

Flooring Materials:

Flooring materials identified in the surveyed areas consisted of newer vinyl sheet flooring and carpet. Analytical results for the sampling of floor systems as they relate to this survey are summarized below:

- Three (3) samples SA-03(A/B/C) of the blue carpet mastic were collected from within the sub-basement of the NPS building. Based on the laboratory analysis, no asbestos was detected in any of the samples submitted.

Based on the on-site observations, no asbestos-containing flooring materials were observed within the project area.

Wall Systems:

Wall systems within the surveyed areas consisted of concrete block wall and gypsum board (drywall) with asbestos-containing drywall joint compound. Analytical results for the sampling of wall systems as they relate to this survey are summarized below:

- Previous samples (Jacques Whitford, 2006) of drywall joint compound were collected from within the NPS building. Based on the laboratory analysis, the drywall joint

compound was found to contain **1% Chrysotile asbestos**.

- All homogeneous drywall joint compound within the building must be treated as an ACM.
- Any manipulation of drywall with asbestos-containing drywall joint compound must be completed in accordance with the procedures outlined in O.Reg 278/05.

- Three (3) samples of drywall joint compound (Sample ID: 01A-C) associated with the sliding door surrounds were collected from within the project area. Based on the current laboratory analysis, the drywall joint compound associated with this newer installation was found to not contain asbestos. However, based on the previous sampling and the difficulty to distinguish between vintages of drywall joint compound, all drywall joint compound within the project area is considered an asbestos-containing material.
- Three (3) samples of concrete block mortar (Sample ID: 03A-C) associated with concrete block walls were collected from within the project area. Based on the laboratory analysis, no asbestos was detected in any of the samples submitted.

Based on the laboratory data as well as on-site observations, asbestos-containing drywall joint compound has been identified within the surveyed areas.

Ceiling Systems:

Ceiling systems within the surveyed areas consisted of lay-in acoustic ceiling tiles (ACT) with pinholes, and concrete deck above. Analytical results for the sampling of ceiling systems as they relate to this survey are summarized below:

- Three samples (SA-04A/B/C) of a 60cm x 120cm acoustic ceiling tile with a perpendicular fissures and pinhole pattern were collected from the project area and submitted for laboratory analysis. Based on the laboratory analysis, completed in accordance with sampling requirements outlined in O.Reg 278/05, no asbestos was identified in the samples analysed.
- Three samples (SA-05A/B/C) of plaster remnant applied to the concrete deck above the suspected ceiling were collected from the project area and submitted for laboratory analysis. Based on the laboratory analysis, completed in accordance with sampling requirements outlined in O.Reg 278/05, no asbestos was identified in the samples analysed.

Based on the laboratory data as well as on-site observations, no asbestos-containing ceiling systems were identified within the surveyed areas.

Mechanical Insulations:

Insulation on mechanical systems within the surveyed area consisted of fibreglass, or mechanical systems were uninsulated. As fibreglass is not suspected to contain asbestos, no sampling was completed of this material.

Based on the on-site observations, no asbestos-containing mechanical insulation was identified within the surveyed areas. However, based on the age of the building, and previous reports, the potential exists for asbestos-containing mechanical insulations to be present in concealed locations.

4.4 Benzene

Benzene is likely present in a stable form within roofing materials, paints and adhesives. Over time, the benzene component volatizes out of these materials and is released into the ambient air. It is expected that only trace amounts of benzene presently exist in the building materials at the site. It is unlikely that benzene emissions from the building materials on site will exceed the maximum allowable TWAEV of 0.5ppm or occupants of the subject area.

4.5 Coke Oven Emissions

Coke oven emissions are the exhaust released during the burning process of coke (pure carbon). This process was not observed and is not expected to take place within this building; therefore, it is unlikely that coke oven emission concentrations will exceed the maximum allowable TWAEV of 0.15 mg/m^3 for occupants for the subject area.

4.6 Ethylene Oxides

Ethylene oxides are used in production of many foams, adhesives and paints. Over time, ethylene oxide will volatize out of these materials and may be present in trace amounts in the ambient air in the area. It is not expected that ethylene oxide levels will become hazardous to occupants of the subject area.

4.7 Isocyanates

Isocyanates are raw materials from which all polyurethane products are made. Over time, isocyanates may volatize out of these materials but will only be present in trace amounts and are not expected to exceed the maximum allowable TWAEV of 0.005-0.02ppm (depending on type of isocyanate present) for occupants of the subject area.

4.8 Lead

In 1976, the Hazardous Products Act limited the amount of lead in interior paint to 0.5 % by weight (5,000 µg/g). Over the years, the amount of lead in paint has continued to decrease due to cooperative efforts of government and industry.

Based on site observations and current laboratory analysis, lead concentrations in painted finishes identified within the project areas were measured at 28µg/g.

TABLE 4 – NPS BUILDING – CURRENT ANALYTICAL RESULTS – JULY 2017

Sample Reference	Building/Item/Location	Surface Colour	Results (µg/g Lead)
LS-01	Concrete Deck above Suspended Ceiling	Off-White	28

Paint surfaces were generally found to be in good condition with minor localized blistering or peeling observed.

Based on the age of the building and historical applications, lead is assumed to be present in solder on joints of copper piping, caulking in bell fittings associated with cast iron drainage pipe joints and used on electrical wiring/systems (where observed within the renovation areas).

4.9 Mercury

Mercury vapour is present in fluorescent light tubes identified throughout the survey areas. Additionally, mercury may also be present within thermostats, switches and thermometers (where present).

Based on the age of the building and historical applications, mercury is also assumed to be present in painted surfaces; however, sampling of mercury in painted surfaces was not performed for the purpose of this survey.

4.10 Silica

Based on the age of the building and historical applications, silica is assumed to be present in gypsum (drywall), drywall joint compound, poured concrete, concrete block and cement mortar identified within the proposed renovation areas (where applicable).

The potential for the generation of airborne silica dust exists when manipulating any of the noted building materials.

4.11 Vinyl Chloride

Vinyl chloride may be present in paints and finishes. Over time, vinyl chloride will volatize out of these materials but will only be present in trace amounts and is not expected to exceed the maximum allowable TWAEV of 1ppm for occupants of the subject area.

5.0 RECOMMENDATIONS

5.1 Asbestos

The following recommendations are made respecting Ontario Regulation 278/05:

Project Specific Recommendations:

- Prior to the planned renovations, all drywall joint compound that will be or has the potential of being disturbed, must be removed in accordance with the procedures outlined in Ontario Regulation 278/05 as well as the PSPC Policy regarding Asbestos Management.

General Recommendations:

- Suspect materials identified during renovation and/or demolition activities not discussed in this report herein should be treated as ACMs unless proven otherwise through material specific sampling and analysis in accordance with the requirements of Ontario Regulation 278/05.
- RCMP should update their existing ACM inventory upon completion of the project.
- That the roles and responsibility of “the owner” as stipulated in Section 8 of Ontario Regulation 278/05 be recognized and adhered to including, but not limited to, notification to occupiers and workers as well as training.
- Ontario Regulation 490/09, as amended to O. Reg. 148/12 - Designated Substance -

made under the Occupational Health and Safety Act states that airborne levels of asbestos fibres should not exceed 0.1 f/cc.

5.2 Lead

In the event that any work is conducted that has the potential to create airborne lead, every employer shall take all necessary measures and procedures by means of engineering controls, work practices and hygiene practices and facilities as outlined in the Ontario Ministry of Labour Guideline - Lead on Construction Projects dated April 2011.

Every employer shall also ensure that the time-weighted average exposure of a worker to airborne lead, except tetraethyl lead, shall not exceed 0.05 milligrams lead per cubic metre of air, and in the case of exposure to tetraethyl lead 0.10 milligrams lead per cubic metre of air as per O.Reg 490/09, as amended to 148/12.

The Occupational Health and Safety Branch of the Ontario Ministry of Labour have published Guideline: Lead on Construction Projects. This document classifies all lead disturbances as Type 1, Type 2a, Type 2b or Type 3 work, and assigns alternate levels of respiratory protection and work procedures for each type of task being performed.

Lead is confirmed and/or assumed to be present in the following materials:

- Painted surfaces (confirmed);
- Caulking in cast iron drainage pipe joints (assumed);
- Solder on the joints of copper pipes (assumed); and
- Solder on electrical wiring / equipment etc. (assumed).

When piping or wiring is removed during demolition activities, copper and drainage piping or wiring can be cut a small distance (e.g., 5cm) from the joints to avoid disturbance of the solder and joint caulking suspected to contain lead.

The disposal of construction waste containing lead is controlled by Ontario Regulation 347/90 as amended to O. Reg. 302/14 – General Waste Management, under the Ontario Environmental Protection Act. Leachate tests for lead in construction waste must not exceed 5 mg/L in order to be disposed of at a local landfill without treatment.

5.3 Mercury

Mercury or mercury vapour within fluorescent light tubes and other equipment poses no risk to occupants provided the mercury containers remain intact.

Best management practice for disposal of mercury-containing light tubes is to participate in the manufacturer's recycling program or to release the material to an approved waste carrier for disposal and/or recycling.

Exposure to mercury in industrial establishments is regulated under O. Reg. 490/09, amended to O. Reg. 148/12. The TWA should not exceed 0.025 mg/m^3 for all forms except alkyl compounds. Alkyl compounds of mercury should not exceed 0.01 mg/m^3.

All waste material including switches, thermostats and thermometers, must be handled and disposed of according to O. Reg. 347, amended to O. Reg. 302/14. Leachate tests for mercury in construction waste must not exceed 0.1 mg/L in order to be disposed of at a local landfill without treatment.

5.4 Silica

Silica dust can be generated by drilling, coring, blasting, grinding, crushing and sandblasting silica-containing materials.

Prior to any renovation or demolition, ensure that all necessary measures and procedures by means of engineering controls, work practices and hygiene practices and facilities are implemented as outlined in the Ontario Ministry of Labour Guideline - Silica on Construction Projects dated April 2011

Every employer shall also ensure that the TWAEV of a worker to silica is reduced to the lowest practical level and in any event shall not exceed 0.05 milligrams per cubic metre of air by volume for cristobalite and tridymite, and 0.10 milligrams silica per cubic metre of air by volume for quartz and tripoli.

- Segregate the work area from the rest of the building to reduce the risk of exposing building occupants to silica dust. Workers leaving the work area should pass through a

designated clean room where excess dust can be brushed off clothes and facilities are available to wash dust off skin.

- The work surface should be wetted regularly to limit dust released during striking and abrasion.
- Everyone in the work area should be provided with a half-face respirator equipped with HEPA filters.
- Ensure that all necessary measures and procedures by means of engineering control, work and hygiene practices are implemented to ensure that the TWAEV of a worker to silica is reduced to the lowest practical level and in any event shall not exceed 0.05 mg/m^3 of air for cristobalite and tridymite, and 0.10 mg/ m^3 of air for quartz and tripoli.

6.0 CLOSURE

This report has been prepared for the sole benefit of the Client and their intended use. The report may not be relied upon by any other person or entity without the written consent of Greenough Environmental Consulting Inc. (GEC), and the Client.

GEC accepts no responsibility for any use that an outside party makes of this report and any reliance on decisions made based on it, are the responsibility of such parties.

This report was not intended to provide direction or procedures for the handling of designated substances and hazardous materials. Only persons with documented, current training in the safe handling of the designated substances and hazardous materials should handle them. Persons handling any of designated substances and/or hazardous materials identified in this survey, or conducting work in the vicinity of these materials are advised to consult this survey and individuals with appropriate experience and training, prior to doing so.

The conclusions presented represent the best judgment of the assessor based on current environmental standards. Due to the nature of the investigation and the limited data available, the assessor cannot warrant against undiscovered environmental liabilities.

We trust that the report meets your current requirements. Should you have any questions or concerns regarding the above, please do not hesitate to contact the undersigned.

Yours Truly,

GREENOUGH ENVIRONMENTAL CONSULTING INC.

Andrew Dalziel, C.Tech.
Senior Project Manager

APPENDIX 1

CURRENT ASBESTOS ANALYTICAL

PARACEL LABORATORIES LTD.
TRUSTED. RESPONSIVE. RELIABLE.

300 - 2319 St. Laurent Blvd
Ottawa, ON, K1G 4J8
1-800-749-1947
www.paracellabs.com

Certificate of Analysis

Greenough Environmental Consulting Inc.

29 Capital Drive
Ottawa, ON K2C 0E7
Attn: Andrew Dalziel

Client PO:
Project: 30402
Custody:

Report Date: 30-Jan-2018
Order Date: 29-Jan-2018

Revised Report

Order #: 1805112

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
1805112-01	AS-01A
1805112-02	AS-01B
1805112-03	AS-01C
1805112-04	AS-02A
1805112-05	AS-02B
1805112-06	AS-02C
1805112-07	AS-03A
1805112-08	AS-03B
1805112-09	AS-03C
1805112-13	AS-04A (Mastic)
1805112-14	AS-04B (Mastic)
1805112-15	AS-04C (Mastic)
1805112-16	AS-05A
1805112-17	AS-05B
1805112-18	AS-05C

Approved By:

Heather S.H. McGregor, BSc

Laboratory Director - Microbiology

PARACEL LABORATORIES LTD.

Order #: 1805112

Certificate of Analysis

Client: Greenough Environmental Consulting Inc.

Client PO:

Report Date: 30-Jan-2018

Order Date: 29-Jan-2018

Project Description: 30402

Asbestos, PLM Visual Estimation **MDL - 0.5%**

Paracel I.D.	*Sample Date*	*Layers Analyzed*	*Colour*	*Description*	*Asbestos Detected:*	*Material Identification*	*% Content*
1805112-01	29-Jan-18	sample homogenized	White	Drywall Joint Compound	No	Client ID: AS-01A	
						Non-Fibers	100
1805112-02	29-Jan-18	sample homogenized	White	Drywall Joint Compound	No	Client ID: AS-01B	
						Non-Fibers	100
1805112-03	29-Jan-18	sample homogenized	White	Drywall Joint Compound	No	Client ID: AS-01C	
						Non-Fibers	100
1805112-04	29-Jan-18	sample homogenized	White/Grey	Ceiling Tile	No	Client ID: AS-02A	
						Cellulose	40
						MMVF	30
						Non-Fibers	30
1805112-05	29-Jan-18	sample homogenized	White/Grey	Ceiling Tile	No	Client ID: AS-02B	
						Cellulose	40
						MMVF	30
						Non-Fibers	30
1805112-06	29-Jan-18	sample homogenized	White/Grey	Ceiling Tile	No	Client ID: AS-02C	
						Cellulose	40
						MMVF	30
						Non-Fibers	30
1805112-07	29-Jan-18	sample homogenized	Grey	Cement	No	Client ID: AS-03A	
						Non-Fibers	100
1805112-08	29-Jan-18	sample homogenized	Grey	Cement	No	Client ID: AS-03B	
						Non-Fibers	100
1805112-09	29-Jan-18	sample homogenized	Grey	Cement	No	Client ID: AS-03C	
						Non-Fibers	100
1805112-13	29-Jan-18	sample homogenized	Yellow	Mastic	No	Client ID: AS-04A (Mastic)	
						Non-Fibers	100
1805112-14	29-Jan-18	sample homogenized	Yellow	Mastic	No	Client ID: AS-04B (Mastic)	
						Non-Fibers	100
1805112-15	29-Jan-18	sample homogenized	Yellow	Mastic	No	Client ID: AS-04C (Mastic)	
						Non-Fibers	100
1805112-16	29-Jan-18	sample homogenized	Grey	Cement	No	Client ID: AS-05A	
						Non-Fibers	100
1805112-17	29-Jan-18	sample homogenized	Grey	Cement	No	Client ID: AS-05B	
						Non-Fibers	100

PARACEL LABORATORIES LTD.

Order #: 1805112

Certificate of Analysis

Client: Greenough Environmental Consulting Inc.

Client PO:

Report Date: 30-Jan-2018

Order Date: 29-Jan-2018

Project Description: 30402

Asbestos, PLM Visual Estimation **MDL - 0.5%**

Paracel I.D.	*Sample Date*	*Layers Analyzed*	*Colour*	*Description*	*Asbestos Detected:*	*Material Identification*	*% Content*
1805112-18	29-Jan-18	sample homogenized	Grey	Cement	No	Client ID: AS-05C	
						Non-Fibers	100

** MMVF: Man Made Vitreous Fibers: Fiberglass, Mineral Wool, Rockwool, Glasswool*

Analysis Summary Table

Analysis	Method Reference/Description	Lab Location	NVLAP Lab Code *	Analysis Date
Asbestos, PLM Visual Estimation	by EPA 600/R-93/116	2 - Ottawa West Lab	200812-0	30-Jan-18

** Reference to the NVLAP term does not permit the user of this report to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.*

Work Order Revisions / Comments

Revision 1. Updated report to remove samples that were not analysed.

APPENDIX 2

CURRENT LEAD ANALYTICAL

PARACEL LABORATORIES LTD.
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300 - 2319 St. Laurent Blvd
Ottawa, ON, K1G 4J8
1-800-749-1947
www.paracellabs.com

Certificate of Analysis

Greenough Environmental Consulting Inc.

29 Capital Drive
Ottawa, ON K2C 0E7
Attn: Andrew Dalziel

Client PO:
Project: 30402
Custody:

Report Date: 30-Jan-2018
Order Date: 29-Jan-2018

Order #: 1805118

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
1805118-01	LP-01

Approved By: Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis
Client: Greenough Environmental Consulting Inc.
Client PO:

Report Date: 30-Jan-2018
Order Date: 29-Jan-2018
Project Description: 30402

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Metals, ICP-OES	based on MOE E3470, ICP-OES	30-Jan-18	30-Jan-18

Sample and QC Qualifiers Notes

1- LG-CNT(Container(s) - Bottle and COC sample ID don't match -

Sample Data Revisions

None

Work Order Revisions/Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.

Certificate of Analysis
Client: Greenough Environmental Consulting Inc.
Client PO:

Report Date: 30-Jan-2018
Order Date: 29-Jan-2018
Project Description: 30402

Sample Results

Lead

Matrix: Paint
Sample Date: 29-Jan-18

Paracel ID	Client ID	Units	MDL	Result
1805118-01	LP-01	ug/g	20	28

Laboratory Internal QA/QC

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Matrix Blank									
Lead	**ND**	**20**	**ug/g**						
Matrix Duplicate									
Lead	**28.2**	**20**	**ug/g**	**27.9**			**1.0**	**30**	
Matrix Spike									
Lead	257		ug/L	ND	97.3	70-130			