

Repair of Workshops and Warehouses

1156 Rue Mill, Montréal, QC

SPECIFICATIONS - ISSUED FOR TENDER
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END OF SECTION

PART 1 GENERAL

1.1 WORK BY OTHERS

- .1 Co-operate with other Contractors in carrying out their respective works and carry out instructions from the Departmental Representative.
- .2 Co-ordinate work with that of other Contractors. If any part of work under this Contract depends for its proper execution or result upon work of another Contractor, report promptly to the Departmental Representative, in writing, any defects which may interfere with proper execution of Work.

1.2 FUTURE WORK

- .1 Insure that Work avoids encroachment into areas required for future work.

1.3 WORK SEQUENCE

- .1 Construct Work in stages to accommodate the Departmental Representative's use of premises during construction.
- .2 Co-ordinate Progress Schedule and co-ordinate with the Departmental Representative Occupancy during construction.
- .3 Maintain fire access/control.

1.4 CONTRACTOR USE OF PREMISES

- .1 Unrestricted use of site until Substantial Performance.
- .2 Limit use of premises for Work, for storage, and for access, to allow:
 - .1 The Departmental Representative occupancy.
- .3 Co-ordinate use of premises under direction of Departmental Representative.
- .4 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.
- .5 Remove or alter existing work to prevent injury or damage to portions of existing work which remain.
- .6 Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as directed by Departmental Representative.
- .7 At completion of operations condition of existing work: equal to or better than that which existed before new work started.

1.5 OCCUPANCY BY THE DEPARTMENTAL REPRESENTATIVE

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

1.6 EXISTING UTILITY SERVICES

- .1 Notify Departmental Representative and utility companies of intended interruption of services and obtain required permission.
- .2 Where Work involves breaking into or connecting to existing services, give Departmental Representative 48 hours notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize duration of interruptions. Carry out work at times as directed by governing authorities with minimum disturbance to pedestrian and vehicular traffic.
- .3 Provide alternative routes for personnel, pedestrian and vehicular traffic.
- .4 Establish location and extent of service lines in area of work before starting Work. Notify Departmental Representative of findings.
- .5 Submit schedule to and obtain approval from Departmental Representative for any shut-down or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.
- .6 Provide temporary services when directed by Departmental Representative to maintain critical building and tenant systems.
- .7 Provide adequate bridging over trenches which cross sidewalks or roads to permit normal traffic.
- .8 Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.
- .9 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.
- .10 Record locations of maintained, re-routed and abandoned service lines.
- .11 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

1.7 REQUIRED DOCUMENTS

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

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 ACCESS AND EGRESS

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

1.2 USE OF SITE AND FACILITIES

- .1 Execute work with the least possible interference or disturbance to the normal use of the premises. Make the necessary arrangements with the Departmental Representative to facilitate the execution of the prescribed work.
- .2 Maintain the existing public services and ensure access to the site for personnel and vehicles.
- .3 When security has been reduced due to the work, provide other temporary means to ensure the security of the property and the people on the site.
- .4 Protect works by temporary means until the permanent closures are completed.

1.3 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

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

1.4 EXISTING SERVICES

- .1 Notify the Departmental Representative and the utility companies of the intended interruption of services and obtain the required permission.
- .2 Where Work involves breaking into or connecting to existing services, give the Departmental Representative a 48 hours advance notice for the necessary interruption of mechanical or electrical service throughout the course of work. Keep the duration of the interruptions to a minimum. Carry out interruptions after normal working hours of occupants, preferably on weekends.
- .3 Ensure for personnel, pedestrian, and vehicular traffic.
- .4 Construct protective barriers in accordance with Section 01 56 00- Temporary Barriers and Enclosures.

1.5 SPECIAL REQUIREMENTS

- .1 Submit work schedule in accordance with Section 01 32 16.19 - Construction Progress Schedule - Bar (GANTT) Chart.
- .2 Ensure that the Contractor's personnel employed on the site become familiar with and obey the safety, fire, traffic, and security regulations.
- .3 Keep within the limits of the work and the means of ingress and egress.

- .4 Ingress and egress of the Contractor's vehicles on site is limited.

1.6 SECURITY

- .1 Provide temporary means to maintain security if it has been reduced due to the work covered by this contract.
- .2 Security clearances:
 - .1 All personnel employed on this project will be subject to security check. Obtain required clearance, as instructed, for each individual required to enter the premises.
 - .2 Obtain requisite clearance, as instructed, for each individual required to enter the premises.
 - .3 Workers and personnel will be checked daily at the start of the work shift and will be provided with pass which must be worn at all times. The pass must be returned at the end of the work shift, after exit control

1.7 BUILDING SMOKING ENVIRONMENT

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

PART 2 PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

- .1 Not Used.

END OF SECTION

PART 1 GENERAL

1.1 APPOINTMENT AND PAYMENT

- .1 The Departmental Representative will appoint the laboratory that will perform the tests, and will assume the costs of its services, except for the following:
 - .1 Inspection and testing required by laws, ordinances, rules, regulations or public policy directives.
 - .2 Inspection and testing performed exclusively for Contractor's convenience.
 - .3 Testing, adjustment and balancing of conveying systems, as well as electrical and mechanical networks and installations.
 - .4 Factory tests and certificates of conformity.
 - .5 Tests specified to be carried out by the Contractor under supervision of the Departmental Representative.
- .2 When the inspections or tests carried out by the designated test laboratory reveal the non-compliance of the work with the requirements of the contract, the Contractor must pay the cost of the additional tests or inspections that the Departmental Representative may request in order to check whether the corrections made are acceptable.

1.2 CONTRACTOR'S RESPONSIBILITIES

- .1 Provide the labour and the facilities necessary to carry out the following:
 - .1 Provide access to work for inspection and testing.
 - .2 Facilitate the inspections and tests.
 - .3 Restore the work that was disturbed by the inspections and tests.
 - .4 Allow the laboratory staff to store equipment and process samples.
- .2 Notify the Departmental Representative at least 48 hours before the operations, so that he can make an appointment with the laboratory staff and establish the test schedule.
- .3 When materials are to be tested, ship the requested quantity of representative samples to the testing laboratory.
- .4 Pay the cost of the work carried out to uncover and restore the work that was covered before the required inspections or tests were carried out and approved by the Departmental Representative.

PART 2 PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 GENERAL

1.1 ADMINISTRATIVE

- .1 The Departmental Representative must provide for the holding of project meetings throughout the course of the work, and ensure their management.
- .2 The Departmental Representative must prepare the meeting agenda.
- .3 The Departmental Representative must distribute written notice to the people concerned of the holding of each meeting four (4) days before the meeting date.
- .4 The Departmental Representative must provide a room or other space for holding meetings and make the necessary arrangements.
- .5 The Departmental Representative must preside the meetings.
- .6 The Departmental Representative must write the minutes of the meetings. List all important questions and decisions. Specify the actions undertaken by the different parties.
- .7 The Departmental Representative must make copies of the minutes and distribute them to participants and interested parties absent from the meeting within five (5) days of the meeting being held.
- .8 The Representatives of the Contractor, sub-contractors and suppliers who attend project meetings are empowered and authorized to intervene on behalf of the parties they represent.

1.2 PRECONSTRUCTION MEETING

- .1 Within 15 days after the contract award, the Departmental Representative must organize a meeting of the parties to the contract in order to discuss the administrative procedures and define the responsibilities of each.
- .2 The Departmental Representative, the Consultant, the Contractor, the major Subcontractors, the field inspectors and the supervisors have to attend the meeting.
- .3 The Departmental Representative must determine the time and location of the meeting and notify the parties concerned at least five (5) days before the meeting.
- .4 Incorporate the mutually agreed modifications to the Contractual Documents into the Agreement, prior to signing it.
- .5 The Agenda must include the following:
 - .1 Designation of the official representatives of the participants in the work.
 - .2 Schedule of Work: in accordance with Section 01 32 16.19 - Construction Progress Schedules - Bar (GANTT) Chart.
 - .3 Schedule for submission of shop drawings, product samples and color samples, according to Section 01 33 00- Submittal Procedures.

- .4 Requirements for temporary installations, site signage, offices, sheds and storage facilities, utilities and fencing, according to Section 01 52 00 - Construction Facilities.
- .5 Delivery schedule for prescribed materials and equipment.
- .6 Site security in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.
- .7 Proposed changes, change orders, procedures, required approvals, margin percentages allowed, time extensions, overtime, and other administrative requirements.
- .8 Products provided by the Owner.
- .9 Drawings to be added to the project file in accordance with Section 01 33 00 - Submittal Procedures.
- .10 Maintenance manuals in accordance with Section 01 78 00 - Closeout Submittals.
- .11 Procedures for submission and acceptance of works, and guarantees in accordance with Section 01 78 00 - Closeout Submittals.
- .12 Requests for monthly installments, administrative procedures, photos, deductions.
- .13 Appointment of inspection and testing agencies or firms.
- .14 Insurances, transcript of policies.

1.3 PROGRESS MEETINGS

- .1 The Departmental Representative must establish a calendar of meetings to be held during the course of the work and 2 weeks before the completion of the work.
- .2 The Contractor, the major Subcontractors involved in Work, the Departmental Representative, the Consultant, and the supervisors must attend the meetings.
- .3 The Departmental Representative must notify the parties at least five (5) days before the meetings are held.
- .4 The Departmental Representative must write the minutes of these meetings and send them to the participants as well as to the parties concerned absent from them, within five (5) days following each meeting being held.
- .5 The Agenda must include the following:
 - .1 The review and the approval of the minutes of the previous meeting.
 - .2 Review of the work progress since the previous meeting.
 - .3 On-site observations, problems, and conflicts.
 - .4 Problems affecting the work schedule.
 - .5 Review of the delivery schedules for products manufactured off-site.
 - .6 Procedures and corrective measures to make up for the delays in order to respect the established schedule.
 - .7 Revision of the construction schedule.
 - .8 Examination of the progress schedule, during the successive stages of the work.

- .9 Review of the schedule for submission of required documents and samples; acceleration of the process if necessary.
- .10 Maintenance of the quality standards.
- .11 Revision of the proposed modifications and their possible repercussions on the work schedule and the completion date.
- .12 Other business.

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 DEFINITIONS

- .1 Activity: Element of work performed during the course of a Project. An activity normally has an expected duration, an expected cost, and expected resource requirements. Activities can be subdivided into tasks.
- .2 Bar Chart (GANTT Chart): Graphic display of schedule-related information. In the typical bar chart, the activities or other elements of the project are presented from top to bottom, on the left of the graph while the dates are presented at the top, from left to right; the duration of each activity is indicated by a horizontal segments placed between the dates. Typically, the bar graph is generated from a commercially available computerized project management system.
- .3 Baseline: Approved initial plan (for a project, work package or activity), taking into account approved changes to the scope of the project.
- .4 Construction Work Week Five (5) day week, Monday to Friday, defining working days for the purpose of Bar (GANTT) Chart submission.
- .5 Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project element. Duration is usually expressed in days of work or weeks of work.
- .6 Master Plan: Summary program indicating the main activities and key milestones.
- .7 Milestone: Significant event in the realization of the project, usually the completion of a major deliverable.
- .8 Project Schedule: Dates set for the execution of the activities and the achievement of milestones Dynamic and detailed record of tasks or activities that must be accomplished to satisfy the milestones of a project. The monitoring and control process is based on the execution schedule for the implementation and control of the activities; and is used as basis for decision making throughout the duration of the project.
- .9 Scheduling - Project planning, monitoring and control: Global system managed by the Departmental Representative and aimed at monitoring the execution of the work with regard to determined stages or milestones.

1.2 REQUIREMENTS

- .1 Ensure that the master plan and the detail schedules are practical and that they respect the prescribed duration of the contract.
- .2 The master plan must provide for the completion of the work according to the prescribed milestones, within the agreed deadline.
- .3 The schedule must show for each activity, the time frame required for the issuance of the shop drawings, a reasonable time frame for their approval, the

order and delivery of the materials to the site, the setting place on site as well as all other relevant information.

- .4 The critical path of the project must be clearly indicated.
- .5 Limit the duration of the activities to ten (10) working days, approximately, to allow the establishment of progress reports. Provide for the separation of tasks according to specialties (minimum one (1) task per specialty).
- .6 Any modifications to the work related to the requests for additional work from the Departmental Representative or unsuspected site conditions must be incorporated into the project schedule. The Contractor must exercise due diligence in order to reorganize his schedule and avoid any additional delays. If additional delays are unavoidable, the Contractor must immediately notify the Departmental Representative and provide an update of the schedule showing the implication of the modification on the critical path of the project.
- .7 The Contractor must specify and clearly display any modifications made to the original schedule in the revised emissions. The additional work accepted by the Departmental Representative and that have an impact on the schedule must appear on the follow-up to clearly see the importance of this work on the critical path. To this follow-up, the Contractor must also append the explanations of the delays accumulated by the work and the measures he plans to put in place to meet the contractual deadline. These explanations will be discussed at the site meeting.
- .8 The Contractor must begin work immediately after providing the insurance certificate to the satisfaction of the contractual authority.
- .9 The execution schedule and the bar graph (GANTT) must take into account the restrictions imposed on the work and described in the related sections.
- .10 Divide the main stages of the execution schedule by work areas.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit documents and samples required in accordance with section 01 33 00 - Submittal Procedures.
- .2 All native files in ".mpp" and ".pdf" format must be provided to the Departmental Representative.
- .3 Submit to the Departmental Representative, no later than ten (10) working days after the contract award, a bar graph (GANTT diagram) produced by MS Project, version 2007 or more recent, which will serve as an overall base plan and will be used for the planning and the monitoring of the work, and for producing progress reports.
- .4 The execution schedule must be approved by the Departmental Representative before the mobilization of the Contractor.
- .5 The computer file of the execution calendar as well as two (2) readable paper copies must be sent to the Supervisor on Monday before noon (12pm) every two (2) weeks.

- .6 In addition to the schedule, the Contractor must, on a weekly basis, provide a detailed program indicating the activities for three (3) weeks, those planned for the current week and those planned for the following two (2) weeks. . This weekly follow-up must be given to the Supervisor every Monday before noon (12pm).

1.4 PROJECT MILESTONES

- .1 The milestones of the project are the intermediate objectives stated in the execution schedule.
 - .1 The slab on grade demolition work must be completed no later than 15 working days after the date of the contract award.
 - .2 The backfill and concrete slab work must be completed no later than 35 working days after the date of the contract award.
 - .3 The building must be closed and weatherproofed no later than 50 working days after the date of the contract award.
 - .4 Interior finishing and furnishing, as well as electrical and mechanical installations, must be completed no later than 110 working days after the date of the contract award.
 - .5 The provisional certificate of completion (substantial completion) of the work must be issued no later than 115 working days after the date of the contract award.

1.5 MASTER PLAN

- .1 Structure the execution schedule to allow the planning, the organization, and the orderly execution of the work according to the bar chart (GANTT chart).
- .2 The Departmental Representative will review the schedule and return it to the Contractor within five (5) working days.
- .3 If the calendar is deemed unusable, revise it and resubmit it no later than five (5) working days after having received it.
- .4 The accepted revised schedule will become the master plan and will be used as a baseline for updates.

1.6 PROJECT SCHEDULE

- .1 Develop a detailed execution schedule derived from the master plan.
- .2 The detailed execution schedule must at least include the steps corresponding to the following activities:
 - .1 The contract award;
 - .2 Shop Drawings, Samples;
 - .3 Permits;
 - .4 Mobilization;
 - .5 Excavation;
 - .6 Backfill;

- .7 Building footings;
- .8 Slab on grade;
- .9 Structural Steel;
- .10 Siding and Roofing;
- .11 Interior Architecture (Walls, Floors and Ceiling);
- .12 Plumbing;
- .13 Lighting;
- .14 Electrical;
- .15 Piping;
- .16 Control/regulation;
- .17 Heating, Ventilating, and Air Conditioning;
- .18 Millwork;
- .19 Fire Systems;
- .20 Testing and Commissioning;
- .21 Supplied equipment with long delivery;
- .22 Delivery dates requested in the case of materials supplied by the engineer;
- .23 Identification of materials whose delivery is critical to the schedule including:
 - .1 Date of issue and approval of drawings;
 - .2 Date of order;
 - .3 Delivery dates.
- .24 Submission:
 - .1 Shop drawings, samples and technical sheets;
 - .2 Demolition plan;
 - .3 Working methods;
 - .4 Plan of temporary work;
 - .5 The environmental protection plan;
 - .6 Contaminated soil management plan.
- .25 Substantial acceptance;
- .26 Correction of deficiencies;
- .27 Final acceptance;
- .28 Demobilization;
- .29 Final deliverable (End of project documentation).

1.7 STATUS OF WORK REPORTS

- .1 Update schedule once (1) per week to reflect changes in activities, completion of activities as well as activities in progress.
- .2 Attach to the execution schedule a narrative report which indicates the progress of the work, compares the progress to the reference schedule and presents the

current forecasts, the expected delays, the repercussions of these elements and the measures of possible mitigations.

1.8 PROJECT MEETINGS

- .1 Discuss the execution schedule during the periodic meetings held on the site; identify activities that are behind schedule and provide means to make up for these delays. Activities whose start date or end date exceed the respective approved dates appearing in the reference calendar are considered late.
- .2 Weather related delays with their remedial measures will be discussed and negotiated.
- .3 Transmit the update of the execution schedule to all stakeholders two days before the site meeting.

PART 2 PRODUCTS

2.1 NOT USED

- .1 Not used.

PART 3 EXECUTION

3.1 NOT USED

- .1 Not used.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

- .1 Not Used.

1.2 ADMINISTRATIVE

- .1 As soon as possible and in a predetermined order so as not to delay the execution of the work, submit the required documents and samples to the Departmental Representative for examination. A delay in this regard cannot constitute sufficient reason to obtain an extension of the time limit for carrying out the work and no request to this effect will be accepted.
- .2 Do not undertake work for which the deposit of documents and samples is required, before the examination of all the parts submitted is completed.
- .3 The characteristics indicated on the shop drawings, technical sheets, and samples of products and works must be expressed in metric units (SI).
- .4 When the elements are not produced or manufactured in metric units (SI) or when the characteristics are not given in metric units (SI), converted values may be accepted.
- .5 Examine documents and samples before submitting them to the Departmental Representative. By this prior verification, the Contractor confirms that the requirements applicable to the works have been or will be determined and verified, and that each of the documents and samples submitted has been examined and found to comply with the requirements of the works and Contractual Documents. Documents and samples that are not stamped, signed, dated and identified in connection with the particular project will be returned without being examined and will be considered rejected.
- .6 Notify the Departmental Representative in writing, when submitting documents and samples, of any deviations from the requirements of the Contractual Documents, and explain the reasons.
- .7 Ensure the accuracy of the measurements taken on site in relation to the adjacent structures affected by the work.
- .8 The fact that the documents and samples submitted are examined by the Departmental Representative in no way releases the Contractor from his responsibility to transmit complete and accurate documents.
- .9 The fact that the documents and samples submitted are examined by the Departmental Representative in no way releases the Contractor from his responsibility to transmit documents that comply with the requirements of the Contractual Documents..
- .10 Keep one reviewed copy of each submission on site.
- .11 Submit the required material safety data sheets, compliant with the Workplace Hazardous Materials Information System (WHMIS).

- .12 Make a detailed survey of the sections of wall that have to be repaired or replaced. Determine the exact profile of existing walls and validate their actual dimensions. Submit detailed shop drawings showing the existing profiles as well as the final profiles for each type of wall as well as the dimensions and materials to be used.

1.3 SHOP DRAWINGS AND PRODUCT DATA

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .2 Drawings must bear the seal and signature of a recognized competent engineer or one that holds a license allowing him to practice in Canada, in the province of Quebec.
- .3 The shop drawings must indicate the materials to be used as well as the construction, fixing or anchoring methods to be used, and they must contain the assembly diagrams, the details of the connections, the relevant explanatory notes and any other information necessary for the execution of the work. When works or elements are connected to other works or other elements, indicate on the drawings that there has been coordination of prescriptions, regardless of the section under which the works or adjacent elements will be supplied and installed. Make references to the specifications and to the preliminary design drawings.
- .4 Allow ten (10) days to the Departmental Representative to examine each batch of documents submitted.
- .5 Modifications made to shop drawings by the Departmental Representative are not intended to vary the contract price. If this is the case, however, notify the Departmental Representative in writing before starting the work.
- .6 Make changes to shop drawings as requested by the Departmental Representative in accordance with the requirements of the Contract Documents. When resubmitting the drawings, notify the Departmental Representative in writing of any changes that have been made in addition to those required.
- .7 Accompany submissions with transmittal letter, containing the following information:
 - .1 The date of preparation and the dates of revision;
 - .2 Project title and number;
 - .3 The name and address of the Contractor, subcontractor, supplier and manufacturer;
 - .4 The specifications' section referring to the documents submitted;
 - .5 The title and the quantity of each shop drawing, product data and sample;
 - .6 Any other relevant data.
- .8 Submissions must include the following:
 - .1 The date of preparation and the dates of revision;

- .2 Project title and number;
- .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
- .4 The Contractor's stamp, signed by Contractor's authorized representative certifying that the documents submitted are approved, that the measures taken on site have been verified, and that the assembly complies with the requirements of the Contractual Documents;
- .5 The relevant details on the portions of work concerned:
 - .1 Materials and manufacturing details;
 - .2 Layout or configuration, with dimensions, including those taken on site, as well as the clearances;
 - .3 Mounting or adjustment details;
 - .4 Characteristics such as power, flow or capacity;.
 - .5 Performance characteristics;
 - .6 Reference standards;
 - .7 Operating weight;
 - .8 Wiring diagrams;
 - .9 Single line and principles diagrams;
 - .10 Relationship to adjacent work;
 - .11 No shop drawing will be examined if it is not submitted according to the procedure described;
 - .12 Before sending the shop drawings to the Departmental Representative for verification, the Contractor must:
 - .1 Number each page;
 - .2 Point out all equipment and / or accessories that are part of the shop drawing;
 - .3 Verify if the shop drawings comply with the plans and specifications as to quality, characteristics and dimensions.
 - .13 From the day he receives the documents at his office, the Departmental Representative will have ten (10) working days to review the shop drawings;
 - .14 The verification of the shop drawings by the Departmental Representative is an intermediate step in quality control and cannot constitute an order to change the contractual documents.
 - .1 The Departmental Representative will verify the drawings submitted by the Contractor with regard to the general layout of the equipment only. The examination of this document does not in any way relieve the Contractor or the supplier of its responsibility for the accuracy of this document or for its compliance with contractual documents and site conditions. In addition, the

annotations made by the Departmental Representative on the drawings are not exhaustive.

- .15 The four (4) annotations on the Departmental Representative's verification stamp are:
 - .1 "NO CORRECTION REPORTED" means that the Contractor can proceed according to his drawing;
 - .2 "MAKE INDICATED CORRECTIONS" means that the Contractor may proceed according to his drawing and taking into account the annotations added by the Departmental Representative; the copy of the drawing becomes the official copy and the Contractor does not have to resubmit the drawing;
 - .3 "SUBMIT AGAIN" means that the information contained on the drawing is incomplete or that the drawing is incomplete, illegible, etc., and that this information does not allow the Departmental Representative to make a judgment on compliance with the plans and specifications; in such a case, the Departmental Representative may indicate on the drawing the points that the Contractor must specify or complete before resubmitting the drawing;
 - .4 "REJECTED" means that the drawing relates to materials or works that do not comply with plans and specifications; in such a case, the Contractor must send the Departmental Representative another drawing relating to what is requested in the plans and specifications.
- .16 Make changes to the shop drawings as requested by the Departmental Representative in accordance with the requirements of the contractual documents. When resubmitting the drawings, notify the Departmental Representative in writing of any changes that have been made in addition to those required.
- .9 The Contractor will be responsible for the reproduction of "shop drawings presentation sheets" and shop drawings in sufficient quantity for all subcontractors and their suppliers as well as an additional copy for the Departmental Representative and additional copies for the operating and maintenance books;
- .10 Submit one (1) electronic copy of the shop drawings prescribed in the technical sections of the specifications and in accordance with the reasonable requirements of the Departmental Representative;
- .11 If no shop drawing is required due to the use of a standard manufacturing product, submit one (1) electronic copy of the technical data sheets or manufacturer's documentation prescribed in the technical sections of the specification and required by the Departmental Representative;
- .12 Submit one (1) electronic copy of the test reports prescribed in the technical sections of the specifications and required by the Departmental Representative;

- .1 The report signed by the official representative of the test laboratory must certify that materials, products or systems identical to those proposed in the context of the work, have been tested in accordance with the prescribed requirements;
- .2 The tests must have been carried out in the three (3) years preceding the date of the contract award.
- .13 Submit one (1) electronic copy of the certificates prescribed in the technical sections of the specifications and required by the Departmental Representative;
 - .1 Documents, printed on the manufacturer's official correspondence paper and signed by a representative of the manufacturer, must certify that the products, materials, and systems supplied comply with the requirements of the specifications;
 - .2 The certificates must be dated after the contract award and indicate the project's name.
- .14 Submit one (1) electronic copy of the manufacturer's instructions prescribed in the technical sections of the specifications and required by the Departmental Representative;
 - .1 Pre-printed documents describing the installation method for the products, the equipment and the systems, including specific notices and data sheets indicating the impedances, the risks and the security measures to be implemented.
- .15 Submit one (1) electronic copy of the Manufacturer's Field Reports, prescribed in the technical sections of the specifications and required by the Departmental Representative;
- .16 Test reports and verifications having been carried out by the manufacturer's representative in order to confirm the conformity of the products, materials, or systems installed with the manufacturer's standards or instructions;
- .17 Submit one (1) electronic copy of the Operation and Maintenance Data prescribed in the technical sections of the specifications and required by the Departmental Representative;
- .18 Delete information not applicable to project.
- .19 In addition to current information, provide all additional details that apply to the project.
- .20 If upon review by the Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, one (1) electronic copy will be returned and the fabrication and the installation work may be undertaken. If the shop drawings are rejected, the annotated copy (s) will be returned and resubmission of the corrected shop drawings, through the same procedure indicated above, must be performed before the fabrication and the installation 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 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.

1.4 SAMPLES

- .1 Submit two (2) product samples for review, as specified in the technical sections of the specifications. Label the samples, indicating their origin and intended use;
- .2 Send the prepaid samples to the business office of the Departmental Representative;
- .3 Notify the Departmental Representative in writing, when presenting the product samples, of any deviations from the requirements of the Contract Documents;
- .4 When the color, pattern or texture is subject to a prescription, submit the full range of samples required;
- .5 The modifications made to the samples by the Departmental Representative are not supposed to vary the contract price. If this is the case, however, notify the Departmental Representative in writing before undertaking the work;
- .6 Make changes to the samples that may be requested by the Departmental Representative while respecting the requirements of the Contract Documents;
- .7 The examined and approved samples will become the reference standard from which the quality of materials and the quality of execution of finished and installed works will be evaluated.

1.5 MOCK-UPS

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

1.6 PHOTOGRAPHIC DOCUMENTATION

- .1 Submit, every month with the work progress report, in accordance with the directives of the Departmental Representative, one (1) copy of color photographs, in high resolution, in jpg format, presented in electronic and hard-copy format;
- .2 Project identification: the name and number of the project and the date the photograph was taken.
- .3 Number of viewpoints: four (4).
 - .1 The viewpoints and their location are to be determined by the Departmental Representative.

- .4 Frequency of photographic documentation: weekly.

1.7 CERTIFICATES AND TRANSCRIPTS

- .1 Immediately after the award of the contract, submit the documents required by the Workers' Compensation Board status.
- .2 Submit the transcription of insurance immediately after the award of the contract.

PART 2 PRODUCTS

2.1 REQUESTS FOR SUBSTITUTION

- .1 With regard to the materials or equipment specified in the contract, the Contractor who wishes to submit a request for substitution with materials or equipment which he deems equivalent must first request a written authorization from the Departmental Representative, by transmitting to him the following:
 - .1 The reasons for the substitution request;
 - .2 The price of the specified material (s) and the name of the supplier;
 - .3 The price of the material (s) of his choice and the name of the supplier;
 - .4 The amount of credit he offers to PWGSC;
 - .5 If applicable, the consequences for the entire project;
 - .6 A demonstration of the equivalence of the equipment or the materials certified by an engineer member of the Order of Engineers of Quebec (OIQ).
- .2 The establishment of the proof of equivalence is entirely the responsibility of the Contractor and includes the following:
 - .1 Provide the characteristics, technical specifications and other useful information describing the materials offered and compare them with those of the specified materials;
 - .2 Provide all the results of resistance or behavior tests required by the Departmental Representative and carried out by a recognized laboratory;
 - .3 Provide any other information, maintenance condition, test or report required by the Departmental Representative.
- .3 These materials or equipment must meet the criteria for compliance with the standards established in the contract. The Contractor must present, at the time of his request, the impacts of the substitution on other parts of the work. The Departmental Representative approves or rejects the substitutions and will only analyze the requests that include all of the required information. The Contractor is responsible for any delay caused directly or indirectly by these substitutions. Modifications to other parts of the work caused by these substitutions must be carried out at the Contractor's expense.

PART 3 EXECUTION

3.1 ARCHITECTURAL – SHOP DRAWING LIST

- .1 Here is a non-exhaustive list of architectural shop drawings. This list does not include shop drawings required for structure, mechanical or electrical. This list serves as a reminder and in no way releases the contractor from providing the shop drawings required in the contract.

- 03 35 46 Concrete Floor Hardening
- 05 51 00 Metal Stairs
- 07 21 16 Blanket Insulation
- 07 24 10.03 Exterior Finish - Direct Applied
 - Liquid vapour barrier
 - Liquid ceramic membrane
- 07 26 16 Under Slab Vapour Barrier
- 07 52 00 Modified Bituminous Membrane Roofing
- 07 62 00 Sheet Metal Flashing and Trim
- 07 84 00 Fire Stopping
- 07 92 00 Joints Sealants
 - Sealant for sound insulation
 - Interior mold resistant sealant
 - Exterior sealant
 - Sealant for floors
 - Preformed compressible and non-compressible back-up materials
- 08 11 00 Metal Doors and Frames
- 08 31 00 Access Doors and Panels
- 08 50 00 Windows
 - Fixed Window
 - Tilt and turn window
- 08 71 00 Doors Hardware
- 08 80 00 Glazing
 - Safety glass
 - Wired glass
 - Low emissivity (LOW E) glass
 - Insulating Glass Units
 - Plastic Film
- 09 21 16 Gypsum Board Assemblies
 - Standard board
 - Water-resistant board
 - Cement board
 - Resilient drywall furring
 - Insulating strip
- 09 22 16 Non-Structural Metal Framing
- 09 30 13 Ceramic Tiling
 - Ceramic floor tile (C1):
 - Ceramic wall tiles (C2)
 - Ceramic wall tiles (C3)

09 65 16	Resilient Sheet Flooring
	<ul style="list-style-type: none">• Sheet vinyl with backing (RSS1)• Sheet vinyl with backing (RSS2)• Resilient base• Primers and adhesives• Metal edge strips
09 67 23	Epoxy Floor Coatings
09 91 13	Exterior Painting
09 91 23	Interior Painting
10 14 00	Signage
10 28 10	Toilet and Bath Accessories
10 44 00	Fire Protection Specialties
10 51 13	Metal Lockers
12 48 00	Entrance Floor Grilles
14 42 00	Wheelchair Lifts

END OF SECTION

Annex A - Shop drawing - presentation sheet

PART 1 GENERAL

1.1 REFERENCE STANDARDS

- .1 Canadian General Standards Board (CGSB)
 - .1 CGSB 51-GP-51M-81 , Polyethylene Sheet for Use in Building Construction.
- .2 Transportation and Dangerous Goods Act (1999)
- .3 Canadian Council of Ministers of the Environment (CCME) Documentation

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submittals of documents and samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit, prior to start of work, a plan detailing the management of hazardous wastes. Every month, submit a written documentation of the weekly hazardous waste inspections.
- .3 Submittals for Progress Meetings: make submittals at least 24 hours.
 - .1 Updated schedule of work progress, detailing activities. Attach the results of the progress review indicating whether or not the previously determined dates for the start and end of the various stages of the work have been met, major problems and corrective measures adopted, accident reports, equipment breakdown and removal of materials and equipment.
 - .2 Copies of the air analysis results.
 - .3 Copies of transport manifests, service hours cards and receipts established by the organization responsible for the disposal of waste removed from the work area.
 - .4 Weekly copies of site entry and work area logbooks with information on worker and visitor access.
 - .5 Weekly logs documenting filter changes on HEPA vacuums, and technical inspections.
 - .6 Weekly results of air sampling data, including results of compliance checks.
 - .7 Other information required by the Departmental Representative or relevant to agenda for upcoming progress meeting.
- .4 Site Layout: within seven (7) days after the date of Notice to Proceed and prior to the mobilization of the site, submit the site layout drawings showing existing conditions and facilities, construction facilities and temporary controls and access provided by the Contractor including the following:
 - .1 Tank dismantling areas and drum sampling and staging areas.
 - .2 Equipment and personnel decontamination areas.

- .3 Means of ingress, egress and temporary traffic control facilities. Refer to Section 01 56 00- Temporary Barriers and Enclosures for traffic control.
- .4 Equipment and material staging areas.
- .5 Demolition debris stockpile areas and soil stockpile areas.
- .6 Exclusion Zones, Contaminant Reduction Zones, and other zones specified in the Contractor's site-specific Health and Safety Plan.
- .7 Grading, including contours, required to construct temporary facilities.
- .8 Wastewater treatment facilities.
- .5 Equipment Decontamination Pad: submit the equipment decontamination pad design to Departmental Representative for review prior to the start of construction.
- .6 Submit documentation verifying that hazardous materials employees have been trained, tested, and certified to safely and effectively carry out their assigned duties in accordance with Section 01 35 29.13 - Health, Safety, and Emergency Response Procedures for Contaminated Sites.

1.3 REGULATORY REQUIREMENTS

- .1 Provide measures against erosion and sediment transportation.
- .2 Comply with federal, provincial, and local anti-pollution laws, ordinances, codes, and regulations when disposing of waste materials, debris, and rubbish.
- .3 The work must meet or exceed the minimum requirements established by federal, provincial, and local laws and regulations which are applicable.
 - .1 The Contractor is responsible for complying with the modifications of these laws and regulation as they become effective.
- .4 If the requirements exceed the scope of the work or are in conflict with certain specific contractual requirements, immediately notify the Departmental Representative.

1.4 SEQUENCING AND SCHEDULING

- .1 It is prohibited to start work involving contact with materials and equipment likely to be contaminated before the decontamination facilities are operational and approved by the Departmental Representative.

1.5 EQUIPMENT DECONTAMINATION FACILITY

- .1 Before starting work involving equipment in contact with materials or equipment likely to be contaminated, build a decontamination area capable of treating the largest piece of equipment on the site that is likely to be contaminated.
- .2 Provide, operate, and maintain suitable portable, high-pressure, low-volume decontamination wash units equipped with self-contained water storage tank and pressurizing system and capable of heating and maintaining wash waters to 80 degrees Celsius and providing nozzle pressure of 1,035 kPa.

- .3 Provide, operate, and maintain the necessary equipment, pumps, and piping required to collect and contain equipment decontamination wastewater and sediment and transfer the materials to the approved storage facilities.

1.6 DRUM STAGING PAD

- .1 Provide, maintain, and operate drum staging pad as required.
- .2 Construct drum staging pad with sump capable of collecting leachate and rain runoff. Place polyethylene sheeting such that sheeting contours over top of berm, and leachate and runoff from staging pad is directed solely to sump on staging pad.

1.7 SOIL STOCKPILING FACILITIES

- .1 Provide, maintain, and operate the storage/stockpiling facilities as required.
- .2 Cover the site with a membrane in the places that will be used for the deposit, in order to prevent any contact with contaminated soils. The Contractor must have tarps designed to cover the materials deposited until the Departmental Representative asks him to evacuate the materials outside the site.

1.8 DESIGN REQUIREMENTS

- .1 Water Treatment Facility:
 - .1 Design and Operating Criteria: design water filtering plant capable of filtering water generated from dewatering excavations and work areas to meet discharge requirements of the authority having jurisdiction, capable of removing oil, suspended solids, particulates, and asbestos fibers, and filter water through 5-micron particulate filter prior to discharge.
 - .2 Ensure that the discharges from the site comply with applicable permit requirements and limitations.
 - .3 Provide piping to transfer liquid/solid mixtures, generated by dewatering operations which require water filtering, to water filtering plant.
 - .4 The installation must be able to handle liquid / solid mixtures and it must have a sufficient capacity to prevent the dewatering work from being delayed.
- .2 Piping: Use pipes of suitable material, of sufficient diameter, of construction and thickness suitable for the intended use, and having successfully undergone, before being put into water, a leakproof test with potable water, in the presence of the Departmental Representative.
- .3 Installation:
 - .1 Provide labor, equipment, materials and supplies, and perform the work required for the assembly and construction of the wastewater treatment / filtration installation..
 - .2 Cut vegetation to ground level.

- .3 Install the component of the system in accordance with the installation procedures and as indicated.
- .4 Following the installation of the system, submit it to an initial operation test in accordance with the procedures developed by the Contractor and submitted to the Departmental Representative for review.
- .5 Install piping in accordance with manufacturer's instructions and test them for leakage using potable water prior to commencing the dewatering and filtering operations.
- .4 Initial Testing: The performance of the water filtering plant will initially be determined by the Departmental Representative as follows:
- .5 Operation:
 - .1 Based on the analysis results obtained by the Departmental Representative, modify the system so that the effluent conforms to the relevant criteria or continue drying out normally, following the instructions of the Departmental Representative.
 - .2 The treatment / filtration installation must be carried out by competent people, in accordance with the manufacturer's directives and in accordance with the procedures submitted by the Contractor and approved by the Departmental Representative.
- .6 Decommissioning/Dismantling:
 - .1 Decontaminate and remove the salvageable components of the water filtering plant including the water filtering system, pumps, piping, and electrical equipment.
 - .2 Dispose of the non-salvageable equipment and materials at an approved off-site disposal facility. Decontaminate salvageable equipment within facility area as required prior to removal from site.

1.9 WASTEWATER STORAGE TANK

- .1 Provide, operate, and maintain wastewater storage tanks to store wastewaters.
- .2 Wastewater includes the handbasin, shower, and laundry, the wastewaters from Personnel Hygiene/Decontamination Facility; the water collected from dewatering operations; and the water collected from Equipment Decontamination Facility.
- .3 Store the wastewaters from dewatering operations and Equipment Decontamination Facility in separate tank from the wastewater from Personnel Hygiene/Decontamination Facility.
- .4 If the toilet facilities are provided in the Personnel Hygiene/Decontamination Facility, store the wastewater from these toilets with wastewater from the handbasins, the showers, and the laundry, for ultimate disposal off site.
- .5 Discharges: comply with applicable discharge limitations and requirements; do not discharge wastewaters to site sewer systems that do not conform to or are in violation of such limitations or requirements; and obtain the Departmental Representative's approval prior to the discharge of wastewater.

- .6 Provide pumps and piping to convey collected wastewaters to the designated wastewater storage tanks; provide wastewater storage tanks with a minimum total live capacity of 20,000 L each, such that the quality of the effluent can be analyzed and approved prior to the discharge in the sanitary sewer system.
- .7 Install the wastewater storage tanks as directed by the Departmental Representative.
- .8 Support tanks must rest on temporary aboveground foundations.
- .9 Connect pumps, piping, valves, miscellaneous items, and necessary utilities as required for the operation of facilities; and protect tanks, valves, pumps, piping, and miscellaneous items from freezing.
- .10 Do not operate wastewater storage tanks until inspected and approved by the Departmental Representative.
- .11 Notify the Departmental Representative, at least 72 hours in advance, of when wastewater storage tank is anticipated to be full.
 - .1 Do not discharge any additional liquids in the tank following the sampling done by the Departmental Representative.
 - .2 The Departmental Representative will determine the appropriate method of wastewater treatment based on the results of the sample analysis.
- .12 Wastewater must be transported and then disposed to the off-site treatment facility determined by the Contractor and approved by the Departmental Representative.
- .13 Payment for transporting and disposing of wastewater to off-site disposal facility will be made on extra work basis in accordance with Contract Documents.

1.10 DRUMS

- .1 Storage of liquid waste: Liquid waste must be stored in steel drums with a capacity of 200 liters in accordance with the Transportation and Dangerous Goods Act, with a lid that can be closed, with label indicating the nature content and filling date.
- .2 Solid waste storage: Solid waste must be stored in steel drums with a capacity of 200 liters in accordance with the Transportation and Dangerous Goods Act, with a lid that can be closed, with a label indicating the nature content and filling date.

1.11 VEHICULAR ACCESS AND PARKING

- .1 Maintenance and Use:
 - .1 Prevent contamination of access roads. Immediately remove debris and materials likely to be contaminated from access roads, in accordance with the instructions of the Departmental Representative; transport and dispose of these materials in the appropriate off-site disposal facility. Clean access roads at least once per shift.
 - .2 The Departmental Representative may collect soil samples for chemical analyses from traveling surfaces of constructed and existing access

roads prior to, during, and upon completion of Work. Clean soils that have been contaminated by the activities of the Contractor must be excavated and disposed of at no additional cost to the Departmental Representative.

1.12 DUST AND PARTICULATE CONTROL

- .1 Execute the Work in a way to minimize raising dust from construction operations.
- .2 Implement and maintain dust and particulate control measures as determined by the Departmental Representative during construction and in accordance with the provincial regulations.
- .3 Provide positive means to prevent airborne dust from dispersing into the atmosphere. Use potable water for the water misting system for dust and particulate control.
- .4 Use chemical means for water misting system for dust and particulate control only with the Departmental Representative's prior written approval.
- .5 Trucks used to transport fine or dusty materials must be equipped with appropriate means of cover.
- .6 Prevent dust from spreading to adjacent property sites.
- .7 The Departmental Representative may interrupt the work at any time if he judges that the means taken by the Contractor to reduce dust and particles are inadequate given the wind conditions on the site, or when the analyzes of the air indicates that the quantities of dust and free particles released into the atmosphere reach or exceed prescribed levels.
- .8 The work must be interrupted if the measures implemented by the Contractor to limit the emissions of dust and particles into the atmosphere are insufficient. The Contractor must state the means he intends to use to correct the situation, and he must modify the operations as necessary before resuming any activity (excavation, handling, treatment, etc.) likely to generate dust and particles.

1.13 POLLUTION CONTROL

- .1 Provide methods, means, and facilities to prevent the contamination of the soil, the water, and the atmosphere from discharge of harmful toxic substances and pollutants produced by the construction operations.
- .2 The Contractor must be prepared to intercept, clean up, and dispose of spills or releases that may occur whether on land or water. Maintain materials and equipment required for cleanup of spills or releases readily accessible on site.
- .3 Promptly report spills and releases potentially causing damage to the environment to:
 - .1 The authority having jurisdiction or interest in spills or releases including conservation authority, water supply authorities, drainage authority, road authority, and fire department.
 - .2 The Owner of the pollutant, if known.

- .3 The Person having control over the pollutant, if known.
- .4 The Departmental Representative.
- .4 Contact the manufacturer of the pollutant, if known, confirm with him the risks present, the precautions required and the cleaning or mitigation measures to be used.
- .5 Take immediate action using available resources to contain and mitigate effects on environment and persons from the spill or release.
- .6 Provide spill response materials including, containers, adsorbent, shovels, and personal protective equipment. Spill response materials that will be used to handle or transport hazardous materials or waste must always be accessible and be compatible with the type of materials to be handled.
- .7 Volatile Organic Compounds (VOC) Control:
 - .1 In addition to requirements of Section 01 35 29.13 - Health, Safety, And Emergency Response Procedures for Contaminated Sites, measure the content of volatile organic compounds, as directed by the Departmental Representative, every hour during the excavation and management of contaminated materials and equipment, and keep a record of the results of the air analyzes.
 - .2 If the air quality monitoring indicates that the release of volatile organic compounds in the air on the site boundary exceeds Level C of Personnel Protective Equipment threshold for air quality, implement corrective actions to control the volatile organic compounds.
 - .3 If the actions are not sufficient to control the release of volatile organic compounds within 1/2 hour of the identification of air quality problem, suspend the work resulting in excessive volatile organic emissions. The Departmental Representative and the Contractor must discuss additional methods that the Contractor proposes in order to control the release of volatile organic compounds.
 - .4 Make necessary changes at no additional cost to Departmental Representative prior to resuming Work.
 - .5 In addition, if the Departmental Representative's monitoring of ambient air on the site perimeter indicates unacceptable concentrations of contaminants in the air, modify the operations to minimize such off-site impacts.

1.14 EQUIPMENT DECONTAMINATION

- .1 Commence Work involving equipment in contact with potentially contaminated material only after the Equipment Decontamination Facility is operational.
- .2 Decontaminate equipment after working in potentially contaminated work areas and prior to subsequent work or travel on clean areas.
- .3 Perform the equipment decontamination on Contractor-constructed equipment decontamination pad.

- .4 At minimum, perform the following steps during the equipment decontamination: mechanically remove packed dirt, grit, and debris by scraping and brushing without using steam or high-pressure water to reduce amount of water needed and to reduce amount of contaminated rinse generated. Use high-pressure, low-volume, hot water or steam supplemented by detergents or solvents as appropriate and as approved by the Departmental Representative. Pay attention to tire treads, equipment tracks, springs, joints, sprockets, and undercarriages. Scrub surfaces with long handle scrub brushes and cleaning agent. Rinse off and collect cleaning agent. Air dry the equipment in the Clean Zone before removing from site or travelling on clean areas. Perform assessment as directed by the Departmental Representative to determine the effectiveness of the decontamination.
- .5 Maintain updated inspection record on site which includes: equipment descriptions with identification numbers or licence plates; the time and date entering the decontamination facility; time and date exiting the decontamination facility; and the name of the inspector and his confirmation of the completion of the inspection..
- .6 Each piece of equipment will be inspected by the Departmental Representative after decontamination and prior to the removal from the site and/or the travel on clean areas. The Departmental Representative has the right to require additional decontamination to be completed if deemed necessary.
- .7 Take the appropriate measures necessary to minimize drift of mist and spray during decontamination including the provision of wind screens.
- .8 Collect the decontamination wastewaters and sediments which accumulate on the equipment decontamination pad. Transfer wastewaters to the designated wastewater storage tank.
- .9 Transfer sediments to the disposal transport vehicle.
- .10 Furnish and equip personnel engaged in equipment decontamination with protective equipment including suitable disposable clothing, respiratory protection, and face shields.
- .11 The Contractor must have on hand sufficient pumping equipment, of adequate pumping capacity and the associated machinery and piping, in good working condition, for ordinary emergencies, including power outage. He must have workers with the skills necessary to operate the pumping equipment. Maintain piping and connections in good condition and leak-free.

1.15 WATER CONTROL

- .1 Maintain excavations free of water.
- .2 Protect the site from puddling or running water. Grade the site to drain. Provide water barriers as necessary to protect the site from soil erosion.
- .3 Prevent surface water runoff from leaving work areas.

- .4 Do not discharge decontaminated water, or surface water runoff, or groundwater which may have come in contact with potentially contaminated material, off site or to municipal sewers.
- .5 Prevent precipitation from infiltrating or from directly running off the stockpiled waste materials. Cover the stockpiled waste materials with an impermeable liner during periods of work stoppage including at the end of each working day and as directed by the Departmental Representative.
- .6 Direct the surface waters that have not been in contact with potentially contaminated materials to the existing surface drainage systems.
- .7 Control the surface drainage, ensuring that gutters are kept open, water is not directed across or over pavements or sidewalks except through approved pipes or properly constructed troughs, and runoff from unstabilized areas is intercepted and diverted to suitable outlet.
- .8 Dispose of water so as not to endanger the public health or safety, the property, or any part of Work completed or under construction.
- .9 Provide, operate, and maintain the necessary equipment of sufficient power or flow to keep excavations, staging pads, and other work areas free from water.
- .10 Contain water from stockpiled waste materials. Transfer potentially contaminated surface waters to wastewater storage tanks separate from wastewater from Personnel Hygiene/Decontamination Facility.
- .11 The Contractor must have on hand sufficient pumping equipment, machinery, and tankage, in good working condition, for ordinary emergencies, including power outage, and competent workers for the operation of the pumping equipment.
- .12 Contain and collect wastewaters and transfer such collected wastewaters to on-site treatment facility.

1.16 DEWATERING

- .1 Dewater various parts of Work including, without being limited to, excavations, structures, foundations, and work areas.
- .2 Employ construction methods, operating methods, and precautions that ensure Work, including excavations, are stable, free from disturbance, and dry.
- .3 The dewatering of the works can be carried out using the following methods: shielding, shoring; regulation of groundwater; regulation of surface water or open water by means of ditches, diversions, drains, pipes and / or pumps, and other measures necessary to enable Work to be carried out in dry conditions.
- .4 Provide sufficient and appropriate labour, plant, and equipment necessary to keep Work free of water including standby equipment necessary to ensure continuous operation of dewatering system.
- .5 Take precautions necessary to prevent uplift of structure or pipeline and to protect excavations from flooding and damage due to surface runoff.

- .6 Test and analyse the water generated from dewatering activities and treat it to meet the required discharge or disposal criteria.

1.17 EROSION AND SEDIMENT CONTROL

- .1 Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas, from stockpiles, staging areas, and other work areas. Prevent soil erosion and sediment transport.
- .2 Minimize the amount of bare soil exposed at once. Stabilize disturbed soils as quickly as possible. Remove vegetation, reshape the land, or otherwise manage it to reduce erosion. Remove accumulated sediment resulting from the construction activity from adjoining surfaces, drainage systems, and water courses, and repair the damage caused by soil erosion and sediment transportation as directed by the Departmental Representative.
- .3 Provide and maintain temporary measures which may include, silt fences, hay or straw bales, ditches, geotextiles, drains, berms, terracing, riprap, temporary drainage piping, sedimentation basins, vegetative cover, dikes, and other construction required to prevent erosion and migration of silt, mud, sediment, and other debris off site or to other areas of site where damage might result, or that might otherwise be required by Laws and Regulations. Make sediment control measures available during construction. Place silt fences and/or hay or straw bales in ditches to prevent sediments from escaping from ditch terminations.
- .4 Hay or Straw Bale: wire bound or string tied; securely anchored by at least 2 stakes or rebars driven through the bale and sinking into the ground to a depth of 300 to 450 mm.
- .5 Silt Fence: Pre-assembled and ready to install, consisting of a geotextile attached to posts that can be driven into the ground. Geotextile: uniform in texture and appearance, having no defects, flaws, or tears that would affect its physical properties; and contain sufficient ultraviolet ray inhibitor and stabilizers to provide minimum 2-year service life from outdoor exposure.
- .6 Net Backing: industrial polypropylene mesh joined to geotextile at both top and bottom with double stitching of heavy-duty cord, with a minimum width of 750 mm.
- .7 Posts: sharpened wood, approximately 50 mm square, protruding below the bottom of the geotextile to allow minimum 450 mm embedment; post spacing 2.4 m maximum. Securely fasten each post to geotextile and net backing using suitable staples.
- .8 Plan construction procedures to avoid damage to work or equipment from encroaching onto bodies of water or drainage ditches. In the event of damage, promptly take action to mitigate effects. Restore affected bank or bodies of water to existing condition.
- .9 Installation:

- .1 Construct temporary erosion control items as indicated. Actual alignment and/or location of various items as directed by the Departmental Representative.
- .2 Do not construct bale barriers and silt fence in flowing streams or in swales.
- .3 Check erosion and sediment control measures weekly after each rainfall; during prolonged rainfall check daily.
- .4 Bales and/or silt fence may be removed at the beginning of the work day and replaced at the end of the work day.
- .5 Whenever erosion and sediment transportation are caused by stripping vegetation, regrading, or other development, remove it from adjoining surfaces, drainage systems, and watercourses, and repair the damage as quickly as possible.
- .6 Prior to or during construction, the Departmental Representative may require the installation or construction of improvements to prevent or correct temporary conditions on site. Improvements may include berms, mulching, sediment traps, detention and retention basins, grading, planting, retaining walls, culverts, pipes, guardrails, temporary roads, and other measures appropriate to specific condition. Temporary improvements must remain in place and in operation as long as they are necessary or until otherwise specified by the Departmental Representative.
- .7 Repair damaged bales, end runs, and avoid undercutting beneath bales.
- .8 Unless specified by the Departmental Representative, remove temporary erosion and sediment control devices upon completion of Work. Spread accumulated sediments to form a suitable surface for seeding or dispose of, and shape area to permit natural drainage to the satisfaction of the Departmental Representative. Materials once removed become property of the Contractor.
- .10 Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
- .11 Do not disturb existing embankments or embankment protection.
- .12 Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.
- .13 If soil and debris from the site accumulate in low areas, storm sewers, roadways, gutters, ditches, or other areas determination as undesirable by the Departmental Representative, remove the accumulation and restore the area to its original condition.

1.18 PROGRESS CLEANING

- .1 Maintain cleanliness of the Work and the surrounding site to comply with federal, provincial, and local fire and safety laws, ordinances, codes, and regulations.

- .2 Coordinate the cleaning operations with the disposal operations to prevent accumulation of dust, dirt, debris, rubbish, and waste materials.

1.19 FINAL DECONTAMINATION

- .1 Perform a final decontamination of the construction facilities, equipment, and materials which may have come in contact with potentially contaminated materials prior to their removal from site.
- .2 Perform decontamination as prescribed, to the satisfaction of the Departmental Representative. If necessary, the Departmental Representative may ask the Contractor to carry out additional decontamination work.

1.20 REMOVAL AND DISPOSAL

- .1 Remove surplus materials and temporary facilities from the site.
- .2 Dispose of non-contaminated waste materials, litter, debris, and rubbish off site.
- .3 Do not burn or bury rubbish and waste materials on site.
- .4 Do not dispose of volatile or hazardous wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
- .5 Do not discharge wastes into streams or waterways.
- .6 Dispose of following materials at an appropriate off-site facility identified by the Contractor and approved by the Departmental Representative:
 - .1 Debris including excess construction material.
 - .2 Non-contaminated litter and rubbish.
 - .3 Disposable PPE worn during final cleaning.
 - .4 Wastewater removed from wastewater storage tank.
 - .5 Wastewater generated from final decontamination operations including wastewater storage tank cleaning.
 - .6 Lumber from decontamination pads.
- .7 Dispose of materials as directed by the Departmental Representative.
- .8 Wastewater sample and analysis: Results of analyses will determine the appropriate methods of disposal. Upon receipt of the analytical results, transfer tank contents without spills or release, as directed by the Departmental Representative, to an off-site disposal facility. Following completion of tank emptying, decontaminate the interior of the tank with a steam or high-pressure water wash supplemented by detergent. The water used to decontaminate the tank must be disposed of in the same way as the contents of the tank.
- .9 Reduce the production of hazardous waste as much as possible. Take the necessary measures to prevent clean waste from being mixed with contaminated waste.
- .10 Identify and evaluate recycling and reclamation options as alternatives to land disposal, such as:
 - .1 Hazardous wastes recycled in manner constituting disposal;

- .2 Hazardous waste burned for energy recovery;
- .3 Lead-acid battery recycling;
- .4 Hazardous wastes with economically recoverable precious metals.

1.21 RECORD KEEPING

- .1 Maintain adequate records to support information provided to the Departmental Representative regarding exception reports, annual reports, and biennial reports.
- .2 Maintain asbestos waste shipment records for a minimum of three (3) years from the date of shipment or a longer period if required by applicable laws or regulations.
- .3 Maintain bills of lading for a minimum of 375 days from the date of shipment or a longer period if required by applicable laws or regulations.

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

GENERAL NOTE: IN THIS SECTION, THE TERM "SITE" EXTENDS TO ALL THE FACILITIES LOCATED ON THE SITE WHERE THE CONSTRUCTION IS UNDERWAY (SITE ITSELF, BUILDINGS, ACCESS, INFRASTRUCTURE, PARKING AREAS, DOCKS, ETC.).

PART 2 PROVINCE OF QUEBEC

- .1 Regulation respecting occupational health and safety, R.S.Q., c. S-2.1
- .2 Safety Code for the Construction Industry, L.R.Q., c. S-2.1, r.4

2.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit documents and samples in accordance with Section 01 33 00 - Submittal Procedures;
- .2 Submit to the Departmental representative and to the CNESST the prevention program specific to the construction site, as described in the article "GENERAL REQUIREMENTS", at least 10 days before the start of the work;
- .3 The Departmental representative will examine the prevention program prepared by the Contractor for the site and will provide him with his observations within 10 working days after receiving this document. If necessary, the Contractor will revise his prevention program and resubmit it to the Departmental Representative no later than 5 days after receiving the revised program. The Departmental Representative reserves the right not to authorize the start of work on the site until the content of the prevention program is satisfactory. The Contractor must subsequently update their prevention program and submit it to the Departmental Representative if the scope of the work changes, if the Contractor's working methods differ from their initial forecasts, or for any other applicable new condition.
- .4 The review by the Departmental representative of the prevention program prepared by the Contractor for the site must not be interpreted as an approval of this program and does not in any way limit the overall responsibility of the Contractor to ensure health and safety during construction;
- .5 Submit to the Departmental Representative the reports of health and safety inspections carried out on the site by the authorized representative of the Contractor;
- .6 Submit to Departmental Representative, within 24 hours, a copy of any inspection report, correction notice, or recommendation issued by the federal, provincial, and territorial health and safety inspectors;
- .7 Submit to Departmental Representative, within 24 hours, an investigation report for any accident resulting in injury and for any incident that highlights a potential risk.

The investigation report must contain at least the following:

- .1 The date, time, and place of the accident;
 - .2 The name of the subcontractor involved in the accident;
 - .3 The number of people involved and the condition of the injured;
 - .4 Identification of witnesses;
 - .5 A detailed description of the tasks performed at the time of the accident;
 - .6 The equipment used to perform the tasks at the time of the accident;
 - .7 The corrective measures taken immediately after the accident;
 - .8 The cause of the accident;
 - .9 The preventive measures put in place to avoid a similar accident
- .8 Submit WHMIS Material Safety Data Sheets to the Departmental Representative in accordance with Section 01 33 00 - Submittal Procedures and Section 02 81 00 - Hazardous Materials. The Contractor must also keep a copy of these sheets on the site;
 - .9 Medical surveillance: where prescribed by legislation, regulation or safety program, , submit certification of medical surveillance for site personnel prior to the commencement of the work. Transmit to the Departmental Representative an additional certification for any new employee working on the site;
 - .10 Submit emergency response plan to the Departmental Representative along with a prevention program. This emergency response plan must contain the elements listed in the article "GENERAL REQUIREMENTS" of this section;
 - .11 Transmit to the Departmental Representative a copy of the training certificates for site workers, in particular for the following training courses (when applicable):
 - .1 Emergency first aid and CPR ;
 - .2 Work likely to emit asbestos dust (mandatory for all work in the presence of asbestos);
 - .3 Work in confined spaces (mandatory for all work in confined spaces);
 - .4 Lockout (mandatory for all work requiring lockout);
 - .5 Safe handling of forklifts (mandatory for any use of forklifts);
 - .6 Safe handling of lifting platforms (mandatory for any use of lifting platforms);
 - .7 Any other training required by the regulations or by the prevention program.

In addition, the certificates from the *General Health and Safety Course for construction sites*, must be available upon request on site.

- .12 Engineer's plans and certificates of conformity: the Contractor must send to the Departmental Representative and to the CNESST a copy signed and sealed by the engineer, of all the plans that are required under the Safety Code for the Construction Industry (S-2.1, r.4), any law, any regulation or any clause of the specifications or of the contract. Before anyone starts using the installation, the Contactor must also send a certificate of conformity signed by an engineer once

the installation for which these plans were designed has been completed. A copy of these documents must be available on the site at all times.

2.3 FILING OF NOTICE

- .1 Before the start of the work, send the notice of initiation to the CNESST. Send to the Departmental Representative a copy of the notice of initiation and the acknowledgment of receipt sent by the CNESST.

At the end of all the work, the closure notice must be sent to the CNESST, with a copy to the Departmental Representative.
- .2 The Contractor must assume the role of prime contractor at all times within the limits of the site and everywhere else where he must carry out the work within the framework of this project. The Contractor must recognize the prime contractor's responsibility and thus identify himself as such in the notice of initiation which he sends to the CNESST.
- .3 Contractor shall agree to install proper site separation and identification in order to maintain time and space at all times throughout life of project.

2.4 SAFETY ASSESSMENT

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

2.5 MEETINGS

- .1 Schedule and administer a Health and Safety meeting with the Departmental Representative, prior to commencement of the Work.
- .2 A decision-making representative of the contractor must attend all meetings dealing with health and safety on the site.
- .3 If there are 25 workers or more on the site, at any time during the work, the contractor must set up a site committee and hold meetings as required by the Safety Code for the Construction Industry (S-2.1, r. 4). A copy of the minutes of the site committee meetings must be sent to the Departmental Representative no later than 5 days following the date of the committee meeting.

2.6 REGULATORY REQUIREMENTS

- .1 Perform work in accordance with Section 01 41 00 - Regulatory Requirements.
- .2 Comply with all legislations, regulations and standards that are applicable to the execution of the work.
- .3 Observe the standards and regulations prescribed to ensure a normal progression of work on the land contaminated with hazardous or toxic materials.
- .4 Always use the most recent version of the standards cited in the *Safety Code for the Construction Industry* (S-2.1, r.4), notwithstanding the date indicated in this Code.

2.7 COMPLIANCE REQUIREMENTS

- .1 Comply with the Occupational Health and Safety Act, R.S.Q., c. S-2.1 and the Safety Code for the Construction Industry L.R.Q., c. S-2.1, r.4, in addition to meeting all the requirements of this Specification.

2.8 RESPONSIBILITY

- .1 The Contractor must accept and assume all the tasks and obligations normally assigned to the prime contractor under the Occupational Health and Safety Act, R.S.Q., c. S-2.1 and Safety Code for the Construction Industry L.R.Q., c. S-2.1, r.4;
- .2 The Contractor must assume responsibility for the health and safety of the people present on the site, as well as the protection of property located on the site; also assume, in the areas adjacent to the site, the protection of people and the environment insofar as they are affected by the work;
- .3 No matter the size and the location of the site, the Contractor must clearly delimit the limits of the site by physical means; it must also comply with the specific requirements of the regulations on this subject. The means chosen to delimit the site must be submitted to the Departmental Representative.
- .4 Respect, and have the employees respect, the security requirements stated in the contractual documents, ordinances, laws and local, territorial, provincial and federal regulations applicable, as well as in the prevention program prepared for the construction site.

2.9 WORK PERFORMED BY EXTERNAL CONTRACTORS

- .1 On this site, it is expected that the following work will be performed by an external contractor who is not hired by the Contractor:
 - .1 Not used
- .2 The Contractor must take the measures necessary to protect the health and safety of external contractors who are not in contractual relationship with him but who are mandated by the Departmental Representative to perform certain work. In return, these external contractors have the obligation to submit to the authority of the Contractor (prime contractor). A subordination agreement must be signed by the Contractor and by each external contractor for this purpose and given to the Departmental Representative before the start of the work by each external contractor (see the wording in the article OBS SUBORDINATION AGREEMENT).

2.10 GENERAL REQUIREMENTS

- .1 Before the initiation of the work, write a site-specific prevention program, based on the prior assessment of risks / dangers in accordance with the article "RISK / DANGER ASSESSMENT" and the article "RISKS INHERENT TO THE SITE" of this section. Implement this program and ensure the compliance of all the points until the demobilization of all site personnel. The prevention program must take into account the specific features of the project and must cover all the work carried out on the site.

The prevention program must include at least the following elements:

- .1 The company's health and safety policies;
- .2 A description of the stages of the work;
- .3 The total cost of the work, a schedule, and a planned staffing curve;
- .4 An organization chart of the health and safety responsibilities;
- .5 The physical and material organization of the site;
- .6 The identification of the risks for each stage of the work, the prevention measures according to the risks, and the methods of implementation;
- .7 The identification of the prevention measures related to the specific risks inherent in the workplace indicated in the article RISKS INHERENT TO THE SITE;
- .8 The identification of the preventive measures for the health and safety of employees and / or the public at the work site as indicated in the article SPECIFIC REQUIREMENTS FOR THE HEALTH AND SAFETY OF OCCUPANTS AND THE PUBLIC;
- .9 The required training;
- .10 The procedure in case of an accident / injury;
- .11 A written commitment from all stakeholders to respect this prevention program;
- .12 A site inspection grid based on the preventive measures;
- .13 An emergency response plan, which must contain at least the following:
 - .1 Site evacuation procedure;
 - .2 Identification of resources (police, fire department, ambulance, etc.);
 - .3 Identification of the responsible people on site;
 - .4 Identification of the first aiders;
 - .5 Communication organization chart (including the site manager and the Departmental Representative);
 - .6 Required training for those responsible for its application;
 - .7 Any other necessary information, taking into account the characteristics of the site.

The Departmental Representative will give the site evacuation procedure to the Contractor, if required; the Contractor must then align the construction site procedures with the site procedures and transmit it to the Departmental Representative.

- .2 The Departmental Representative may send his observations in writing if the prevention program contains anomalies or if it raises concerns, and he may require the submission of a revised program that will correct or eliminate these anomalies or concerns;
- .3 In addition to the prevention program, during the work, the Contractor must develop and transmit to the Departmental Representative a specific written procedure for all work presenting a high risk of accidents (example: demolition procedure, specific installation procedure , lifting plan, procedure for entering

- confined spaces, power outage procedures, etc.) or at the request of the Departmental Representative;
- .4 The Contractor must plan and organize the work so as to promote the elimination of hazards at the source or collective protection and thus minimizing the use of personal protective equipment;
 - .5 Equipment, tools or means of protection that cannot be installed or used without compromising the health and safety of workers or the public, is deemed to be inadequate for the work to be performed;
 - .6 All mechanical equipment (examples: people or material lifting devices, mechanical shovels, concrete pumps, concrete saws, without being limited to) must be inspected before their delivery to the site. The Contractor must obtain an inspection certificate signed by a mechanic and dated less than a week before the arrival of each piece of equipment on site, and keep it on site; he must give it to the Departmental Representative upon request;
 - .7 Ensure that all inspections (daily, periodic, annual, etc.) of equipment for lifting people or materials required by the current standards are carried out, and be able to provide a copy of these certificates to the Departmental Representative upon request;
 - .8 The Departmental Representative may at any time, if he suspects a defect or the risk of an accident, order the immediate shutdown of any equipment and require an inspection by a specialist of his choice.
 - .9 The Departmental Representative must be consulted for the location of gas cylinders and tanks on the site.

2.11 RISKS INHERENT TO THE SITE

- .1 In addition to the risks associated with the tasks to be performed, the personnel responsible for the work on the site will be exposed to the following risks, inherent to the place where the work will be carried out.

On the location where the work will take place, there is in particular the presence of:

- .1 Materials containing asbestos;
- .2 Materials containing lead;
- .3 Molds;
- .4 Other hazardous materials (specify);
- .5 Enclosed spaces;
- .6 Overhead power lines;
- .7 Underground services (electricity, gas, steam, aqueduct, etc.);
- .8 Laboratories;
- .9 Trees and landscaping to conserve and protect;
- .10 Potentially unstable soils;
- .11 Barbed wire fencing;
- .12 Nearby body of water;

The Contractor must carry out a site risk assessment to validate this information and see if other risks are present on the site. He must include in its prevention program all the risks that have been identified.

2.12 SPECIFIC REQUIREMENTS FOR THE HEALTH AND SAFETY OF OCCUPANTS AND THE PUBLIC

- .1 The site where the work will take place is occupied by employees and / or the public during the following periods, although these people will not have access to the Contractor's site: The Contractor must take into account the following specific requirements for the protection of employees and / or the public. These requirements must be included in the Contractor's prevention program as well as all other measures provided by the Contractor to protect the health and safety of the employees and / or the public present on the site.

2.13 UNFORSEEN HAZARDS

- .1 When unforeseen or peculiar safety-related factor, hazard, or condition occurs during the performance of Work, the Contractor must immediately stop the work, notify the person responsible on site for health and safety, put in place temporary protection measures for workers and the public, and notify the Departmental Representative verbally and in writing. The Contractor must then make the necessary modifications to the prevention program and put in place the necessary security measures so that the work can resume.

2.14 HEALTH AND SAFETY CO-ORDINATOR

- .1 If the site meets the criteria of article 2.5.3 of the Safety Code for the Construction Industry, L.R.Q., c. S-2.1, r.4, the Contractor must hire a competent and authorized security agent, and assign him full-time from the start of the work. The tasks of this person must be dedicated exclusively to the management of health and safety on the site. The security guard must meet the following criteria:
 - .1 Have a security agent certificate issued by the CNESST;
 - .2 Have at least five (5) years of experience working on a site where activities similar to those of the project are carried out;
 - .3 Have working knowledge of workplace health and safety regulations;
 - .4 Be responsible for completing the Contractor's Health and Safety training sessions and make sure that only those who have successfully completed the required training have access to the site to perform the work;
 - .5 Be responsible for implementing, enforcing daily and monitoring the site-specific Health and Safety Plan prepared by the Contractor;
 - .6 Always be on site during the execution of the work;
 - .7 Inspect the work and ensure the compliance with all regulatory requirements and those indicated in the contractual documents or the prevention program;
 - .8 Keep a daily record of his interventions and send a copy to the Departmental Representative at least once a week.

The security officer's certificate must be sent to the Departmental Representative before the start of work.

- .2 When the hiring of a security officer is not required or that this officer is hired by the Departmental Representative, the Contractor must appoint a competent person as the supervisor for health and safety, regardless of the size of the site or the number of workers present. This person must always be on site during the execution of the work and must be able to take all the measures necessary to ensure the health and the safety of all people and the property on site and in the immediate environment of the site, which could be affected by the progress of the work. The Contractor must give the name of this person to the Departmental representative before the start of work.

2.15 DISPLAY OF DOCUMENTS

- .1 Make sure that the relevant documents, articles, orders and notices are posted in a conspicuous place on the site, in accordance with the laws and regulations of the province and in consultation with the Departmental Representative.
- .2 At a minimum, the following information and documents must be posted in a place easily accessible by the workers:
 - .1 Notice of site opening;
 - .2 Identification of prime contractor;
 - .3 Company OHS policy;
 - .4 Site-specific prevention program;
 - .5 Emergency plan;
 - .6 Minutes of the site committee meetings;
 - .7 Names of the representatives to the site committee;
 - .8 Names of the first aiders;
 - .9 Intervention and correction reports issued by the CNESST

2.16 INSPECTIONS AND CORRECTIONS IN CASE OF NON-COMPLIANCE

- .1 Inspect the workplace, complete the site inspection grid and submit it to the Departmental Representative in accordance with the article "DOCUMENTS / SAMPLES TO BE SUBMITTED FOR APPROVAL / INFORMATION" in this section.
- .2 Immediately take the necessary measures to correct situations deemed non-compliant, that have been observed during the inspections mentioned in the previous paragraph or noted by the competent authority or by the Departmental Representative or his representative.
- .3 Provide the Departmental Representative with a written report of the actions taken to correct the non-compliance of health and safety issues identified.
- .4 The Contractor must grant to the security guard or, when there is no security guard, to the person responsible for health and safety, all the necessary authority to order that work be stopped and resumed when he deems it is necessary or desirable for health and safety reasons. He must ensure that the health and safety of the public and site personnel, as well as the protection of

the environment always take priority over questions related to the cost and schedule of the work.

- .5 The Departmental Representative or his representative may order the work to be stopped if the Contractor does not make the necessary corrections with regard to the conditions deemed non-compliant in terms of health and safety. Without limiting the scope of the preceding articles, he may also at any time order the work to be stopped if, according to his perception, there is a danger or a risk for the health or safety of the site personnel, the public, or for environment.

2.17 PREVENTION OF VIOLENCE

- .1 Health and safety management on Public Works and Government Services Canada's sites includes the implementation of measures to protect the psychological health of anyone who has access the site where the work takes place. Thus, in addition to physical violence, verbal abuse, bullying and harassment are not tolerated on the site. Anyone who demonstrates such gestures or behaviors will receive a warning and / or could be definitively expelled from the site by the Departmental Representative.

2.18 BLASTING

- .1 Blasting or other use of explosives is only permitted if the Departmental Representative has given written instruction on the subject;
- .2 All operations involving explosives must be carried out under the immediate supervision of a qualified blaster;
- .3 The purchase, transportation, storage and use of explosives must comply with the provisions of applicable federal and provincial laws:
 - .1 Canada: *Loi sur les explosifs* (E-17), *Règlement sur les explosifs* (C.R.C. CH. 599), norme relative aux dépôts d'explosifs de sautage de détonateurs, *Loi et Règlement sur le transport des marchandises dangereuses*.
 - .2 Québec: *Loi sur les explosifs* (E-22), *Règlement d'application sur les explosifs* (E-22, r.1), *Code de sécurité pour les travaux de construction* (S-2.1, r.4), *Règlement sur le transport des matières dangereuses*.
- .4 The Contractor must obtain all the permits required under the above-mentioned laws and regulations and keep a copy easily accessible on site.
- .5 The Contractor must facilitate the site visit and implementation of explosives as well as the inspection of vehicles used for their transportation to all government representatives and police officers who have jurisdiction over explosives.

2.19 POWDER ACTUATED DEVICES

- .1 Use powder actuated devices only after receiving a written permission from the Departmental Representative;

- .2 Anyone using a sealing gun must hold a training certificate and meet all the requirements of section 7 of the Safety Code for the Construction Industry (S-2.1, r. 4).
- .3 Any other powder actuated devices must be used according to the manufacturer's instructions and in accordance with applicable standards and regulations.

2.20 USE OF PUBLIC ROADS

- .1 When it is necessary to encroach on the public roads for operational reasons or to ensure the safety of workers, occupants or the public (e.g. use of scaffolding, cranes, excavation work, etc.), the contractor must obtain, at his own expense, all the authorizations and permits required by the competent authority.
- .2 The Contractor must install, at his own expense, all the signs, barricades and other devices required by the regulations to ensure the safety of the public and its own facilities.

2.21 LOCKOUT

- .1 For all work on equipment powered by electricity or any other energy source, the Contractor must transmit a general lockout procedure to the Departmental Representative and apply it.
- .2 The supervisory staff and all the workers involved in the work requiring the lockout must have undergone a lockout training given by a recognized organization; the Contractor must transmit the training certificates to the Departmental Representative.
- .3 Before undertaking the lockout of the equipment in an occupied site, the Contractor must coordinate his work with the site representative if the cutting of energy sources may have an impact on the site operations or on the occupants.
- .4 The Contractor must choose a qualified person as the one being responsible for the lockout and must ensure that this person drafts a lockout sheet for each piece of equipment to be locked out. The lockout sheet must be sent to the Departmental Representative at least 48 hours before the start of the work; the Departmental Representative will then have it checked by a site representative if the work is taking place in an existing building. The lockout sheet must include at least the following information:
 - .1 A description of the work to be performed;
 - .2 Identification, description and location of the circuit and / or equipment to be locked out;
 - .3 Identification of the energy sources that power the equipment;
 - .4 Identification of each cut-off point;
 - .5 Sequence of lockout and release of residual energy as well as the sequence of un-lock;
 - .6 List of lockout materials required;
 - .7 Power reset verification method;
 - .8 Name and signature of the person who wrote the file;

At the request of the Departmental Representative, the Contractor must record all this information on the site representative's form.

- .5 At the time of the lockout, the person in charge must date the card and ensure that everyone working on the locked-out circuit / equipment puts his name on the card and signs it.

2.22 ELECTRICAL WORK

- .1 The Contractor must ensure that all electrical work is carried out by qualified employees in accordance with the provincial regulations on the qualification and the professional training.
- .2 The Contractor must comply with the requirements of CSA Z462 – *Standard - Workplace Electrical Safety*.
- .3 All work on electrical equipment must be done with the power off, unless it is not possible to completely disconnect this equipment.
- .4 The Contractor must comply with all the requirements of the "Lockout" paragraph of this section.
- .5 The Contractor must notify the Departmental Representative in writing of any work that cannot be done without power and obtain his authorization. He must demonstrate to the Departmental Representative that it is impossible to do the work with the power off and provide all the information necessary to complete and obtain a permit to work with live current (work method, assessment of the level of electric arc, protective perimeter, protective equipment, etc.) before the start of the work, except in the cases of an exception provided in the CSA Z462 – *Standard - Workplace Electrical Safety*.
- .6 The work permit under tension must contain at least the following elements:
 - a) Description of the circuit's switchgear and location;
 - b) Justification of the need to carry out work with live current;
 - c) Description of the safe work practices to adopt;
 - d) Conclusions of the electric shock danger analysis;
 - e) Delimitation of the perimeter of protection against electric shocks;
 - f) Conclusions of the danger analysis of electric arc flashes;
 - g) Description of the perimeter of protection against electric arc flashes;
 - h) Description of the personal protective equipment required;
 - i) Description of the means to restrict access to unqualified persons;
 - j) Proof that an information session has taken place;
 - k) Signature of approval of live current work (by a person in authority or by the owner).
- .7 If for the operational needs of the site occupants, the site representative requires the Contractor to do work with live current, the Contractor must obtain all the information necessary to complete a permit to work with live current (work method, assessment of level of electric arc, protective perimeter, protective equipment, etc.) and have it signed by the site representative designated by the Departmental Representative before the start of work.

2.23 EXPOSURE TO ASBESTOS

It is not intended that the work covered by these specifications involves the handling of materials containing asbestos; however, if the Contractor or if the Departmental Representative or his representative discovers materials which are likely to contain asbestos, the Contractor must immediately stop the work and notify the Departmental Representative. If it is subsequently shown that these materials indeed contain asbestos, the Contractor must comply with the following requirements.

Before the start of any work likely to emit asbestos dust, the Contractor must:

- .1 Provide a written procedure identifying the level of risk of the work (low, moderate, high), as defined in section 3.23 of the Safety Code for the Construction Industry, L.R.Q., c. S-2.1, r.4, and which takes into account all the requirements of this same section.
- .2 Submit the certificates demonstrating that all workers involved in the have received the training on asbestos risks and on the procedure required in the previous paragraph.
- .3 Demonstrate the possession of all the materials and equipment necessary to comply with the procedures and for the safe execution of the work.

2.24 FUNGAL CONTAMINATION

It is not intended that the work covered by these specifications involves the handling of materials contaminated with mold; however, if the Contractor or the Departmental Representative or his representative discover materials which are likely to be contaminated by mold, the Contractor must immediately stop the work and notify the Departmental Representative. If it is later demonstrated that these materials indeed contain mold, the Contractor must comply with the following requirements.

Before the start of any work for which workers are likely to come into contact with materials contaminated by mold, the Contractor must:

- .1 Provide a written work procedure which complies with the requirements of the Safety Code for the Construction Industry, L.R.Q., c. S-2.1, r.4, as well as the requirements indicated in the document " Mold guidelines for the Canadian construction industry " published by the Canadian Construction Association (<http://www.cca-acc.com/documents/electronic/cca82/acc82.pdf>).
- .2 Demonstrate the possession of all the materials and equipment necessary to comply with the procedures and for the safe execution of the work.

2.25 EXPOSURE TO SILICA

For all indoor or outdoor work generating silica dust, the Contractor must comply with the requirements below, in addition to those of the Safety Code for the Construction Industry, L.R.Q., c. S-2.1, r.4.

- .1 Work in a humid environment or use tools with water supply to reduce dust, otherwise capture the dust at the source and retain it in a high-efficiency filter so as not to spread it in the environment.
- .2 Clean surfaces and tools with water, never with compressed air.
- .3 Sand and strip the surfaces using an abrasive containing less than 1% silica (also called amorphous silica).
- .4 Install screens or partitions to prevent migration of dust outside the work area and thus protecting other workers and the public.
- .5 Wear respiratory protection and eye protection during all operations likely to produce silica dust in accordance with the requirements of the Safety Code for the Construction Industry, L.R.Q., c. S-2.1, r.4.
- .6 Wear protective suit to prevent contamination outside the site.
- .7 Do not eat, drink or smoke in a dusty area.
- .8 Wash your hands and face before drinking, eating or smoking.

2.26 STRIPPING WITH ABRASIVE STREAM

Before the start of any stripping with abrasive blasting, the Contractor must:

- .1 Provide a written work procedure that meets the requirements of section 3.20 of the Safety Code for the Construction Industry, L.R.Q., c. S-2.1, r.4.
- .2 Demonstrate the possession of all the materials and equipment necessary to comply with the procedures and for the safe execution of the work.
- .3 All sanding and stripping work must be done with an abrasive containing less than 1% silica.

2.27 LEAD-BASED PAINT REMOVAL

- .1 Before the start of any work for which workers are likely to handle materials containing lead paint or other substances containing lead, the Contractor must:
 - .1 Provide a written procedure that meets the requirements of the Safety Code for the Construction Industry, L.R.Q., c. S-2.1, as well as the requirements indicated in the document "Lead on Construction Projects" published by the Ontario Ministry of Labor (http://www.labour.gov.on.ca/french/hs/pdf/gl_lead.pdf). In the event of differences between the Quebec regulations and the Ontario document, the most stringent requirement applies.
 - .2 Demonstrate the possession of all the materials and equipment necessary to comply with the procedures and for the safe execution of the work.

2.28 EXPOSURE TO ANIMAL FECES

Before the start of any work for which workers are likely to come into contact with materials contaminated by animal feces, the Contractor must:

- .1 Provide a written procedure that meets the requirements of the Safety Code for the Construction Industry, L.R.Q., c. S-2.1, as well as the

requirements indicated in the document " *Des fientes de pigeons dans votre lieu de travail : méfiez-vous* " published by the CNESST (http://www.csst.qc.ca/publications/100/Documents/DC100_1331_1web2.pdf)

- .2 Demonstrate the possession of all the materials and equipment necessary to comply with the procedures and for the safe execution of the work.

2.29 RESPIRATORY PROTECTION

- .1 The Contractor must ensure that all workers who must wear a respiratory protection as part of their duties have undergone training for this purpose as well as the breathing apparatus adjustment tests, in accordance with the CSA Z94.4-11, Selection, Use and Care of Respirators. Certificates of the breathing apparatus adjustment tests must be given to the Departmental Representative upon request.

2.30 PREVENTION FROM FALLING HAZARDS

- .1 Plan and organize the work so as to promote the elimination of fall hazards at the source or the collective protection and thus minimizing the use of personal protective equipment. Where personal protection against falls is required, workers must use a safety harness in accordance with CAN - CSA - Z - 259.10 - M90. The seat belt should not be used as a mean of prevention from fall hazards.
- .2 Anyone using a lifting platform (i.e scissors, telescopic, articulated, rotary, etc.) must have received the proper training for this purpose.
- .3 Wearing a safety harness is mandatory on all lifting platforms with telescopic, articulated or rotary mast.
- .4 Delimit a danger zone around each lifting platform.
- .5 Any opening in a floor or in a roof must be surrounded by a guardrail or have a cover that is fixed to the floor and resistant to the loads to which it may be subjected, regardless of the dimensions of this opening and the height of fall it represents.
- .6 Anyone working less than two meters from a place where there is a risk of falling from three (3) meters or more must use a safety harness in accordance with regulatory requirements, unless there is a guardrail or another element offering equivalent security.
- .7 Despite the regulatory requirements, the Departmental Representative may require the installation of guardrails or the use of safety harnesses for certain specific situations presenting a risk of falling from less than three (3) meters.

2.31 SCAFFOLDING

In addition to the requirements of the Safety Code for the Construction Industry, the Contractor who uses scaffolding must comply with the following requirements:

- .1 **Foundations**

- .1 Scaffolding must be installed on solid foundations so that it cannot slide or tip over.
- .2 The Contractor who wishes to install scaffolding on a roof, a roof overhang, a canopy or an attic must submit to the Departmental Representative his load calculations as well as the plans signed and sealed by an engineer and obtain his authorization before starting the work on the installation.

.2 Assembly, bracing and mooring

- .1 All scaffolding must be assembled, braced and moored in accordance with the manufacturer's instructions and the provisions of the Safety Code for the Construction Industry.
- .2 For any situation where it is necessary to remove certain elements of the scaffolding (ex. Braces), the Contractor must submit to the Departmental Representative, before assembling the scaffolding, an assembly plan signed and sealed by an engineer certifying that the assembled scaffolding will allow the work to be carried out safely, taking into account the loads that will be applied to it.
- .3 For any scaffolding structure with a span between two supports greater than three (3) meters, the Contractor must submit to the Departmental Representative, before assembling the scaffolding, an assembly plan signed and sealed by an engineer.

.3 Floors

- .1 The floors of the scaffolding must be designed and installed in accordance with the provisions of the Safety Code for the Construction Industry.
- .2 If planks are used, they must be approved and stamped, in accordance with the provisions of article 3.9.8 of the Safety Code for the Construction Industry.
- .3 Scaffolding with four sections or more (or six (6) meters) in height must have a solid floor covering the entire surface of the putlog every three (3) meters in height or fraction of three (3) meters and the elements of these floors must not at any time be moved to create intermediate bearings.

.4 Guardrail

- .1 A guardrail must be installed at all working levels.
- .2 Bracings should not be considered as a guardrail.
- .3 If the floors are not full, a guardrail must be installed just above the edge of the floor, so that there is no empty horizontal space between the floor and the guardrail.
- .4 In the case of scaffolding with four sections (or six (6) meters) and higher where solid floors are required, the guardrails must be installed at each of these landings at the start of the work and remain in place until the end of the work.

.5 Access

- .1 The Contractor must ensure that the means of access to the scaffolding do not compromise the safety of workers.
- .2 When the scaffolding floors are made of planks, ladders must be installed so that the planks that protrude do not interfere with the ascent or descent.
- .3 Notwithstanding the provisions of the Safety Code for the Construction Industry, stairs must be installed on all scaffolding with six (6) or more rows of studs and with six sections and more (or nine (9) meters) in height.

.6 Protection of the public and the occupants

- .1 When the scaffolding is installed in an area accessible to the public, the Contractor must take the means to prevent the public from accessing the scaffolding and, where applicable, the work or storage area located near these scaffolds.
- .2 The Contractor must install covered passageways, nets or other similar devices to protect workers the public and the occupants against falling objects. The means of protection chosen must be approved by the Departmental Representative.

.7 Engineering plans

- .1 In addition to those required by the *Safety Code for the Construction Industry*, the Departmental Representative has the right to request engineering plans for other types or configurations of scaffolding.
- .2 A plan signed and sealed by an engineer (registered or licensed in Province of Quebec, Canada) is required for any scaffolding on which cloth, tarpaulins or other devices that could be affected by the wind.
- .3 A certificate of conformity signed by an engineer is needed for all cases where an engineering plan is required, before a person uses the installation in question. A copy of these documents must be available on site at all times.

2.32 CONFINED SPACES

In addition to complying with the provincial regulations which apply to confined spaces, the Contractor must comply with the requirements set out in the following paragraphs.

The Departmental Representative reserves the right, depending on the nature of the risks related to the confined space, the work to be performed and / or the level of confined space skills demonstrated by the Contractor, to require the Contractor to use the services of a firm specializing in health and safety or confined spaces to analyze the risks inherent in confined spaces, to complete the entry permit, to supervise the work or for any other task related to work in confined spaces.

.1 Information on confined spaces on site

- .1 The following list presents, but is not limited to, the confined spaces which the Contractor may have to access during the course of this project.

- .2 The Contractor must take into account each of these confined spaces and must also add to this list the new confined spaces which are likely to be construct / install during this project.

.2 The person responsible for the health and safety of work in confined spaces

- .1 The Contractor must designate a person responsible for the health and safety of work in confined spaces. This person must be a qualified person, as defined in section 297 of the *Regulation respecting occupational health and safety* (S-2.1, r.13). This person must always be present whenever there is work in confined spaces and must ensure that all the regulatory requirements and the requirements set out in this section are met. In particular, he must complete and issue the confined space entry permit.

.3 Training

- .1 All people having access to a confined space, as well as the person responsible and the supervisor of the confined space, must have undergone training on how to enter in confined spaces.
- .2 All people who have to use a self-contained breathing apparatus to access confined spaces must have received training on how to use such a device.
- .3 All people chosen to be rescuers in confined space must have completed the training in confined space rescue.
- .4 Each of the training required in the preceding paragraphs must be given by a firm specializing in health and safety or in confined spaces.
- .5 The training certificates of the people indicated above must be sent to the Departmental Representative before the start of the work in confined spaces.

.4 Evaluation of the risks in confined spaces

- .1 For each of the confined spaces listed at the start of this section, the Contractor must obtain the necessary information from the site representative and assess the risks inherent in each of these enclosed spaces and which relate to:
 - a) The prevailing internal atmosphere, namely the concentration of oxygen, flammable gases and vapors, combustible dust presenting a fire or explosion hazard, as well as categories of contaminants likely to be present in this confined space or around it;
 - b) Insufficient natural or mechanical ventilation;
 - c) materials that can cause the worker to sink, to be buried or to drown, such as sand, grain or liquid;
 - d) To its interior configuration;
 - e) Pipes and conduits entering the confined space;
 - f) Energies, such as electricity, moving mechanical parts, thermal stresses, noise and hydraulic power;

- g) Ignition sources such as open flames, lighting, welding and cutting, static electricity or sparks;
 - h) Any other special circumstances, such as the presence of vermin, rodents or insects.
- .2 These risk assessments must be made by the person responsible for the health and safety of the work in confined spaces. These evaluations must be sent to the Departmental Representative for analysis at least 10 days before the scheduled date for the work in confined spaces and must also contain the following information:
- a) The location of the confined space;
 - b) A description of the confined space;
 - c) The dimensions of the confined space;
 - d) The number, location and dimensions of the openings;
 - e) The contents of the enclosed space (equipment, substances, etc.);
 - f) The date of the assessment;
 - g) The name and signature of the person who carried out the assessment and the name of his employer.

The Contractor must follow the same procedures for each of the enclosed spaces that will be constructed / installed during this project.

.5 Entry permit for confined spaces

- .1 The Contractor must send to the Departmental Representative, for analysis at least 5 days before the date scheduled for the work in confined spaces, a copy of each entry permits specific to the confined spaces in which he must access. Entry permits must be completed by the person responsible for the health and safety for work in confined spaces, and must include at least the following information:
- a) A description of the work to be performed there and the work method, including the equipment and tools required to do the work;
 - b) A description of the risks and the corresponding control measures to be taken, according to the results of the assessment of the risks inherent to the confined space made beforehand and according to the risks inherent to the work to be performed;
 - c) Safety equipment that will be used to control the risks in confined spaces (e.g. ventilator, gas detector, aspiration at source, personal protective equipment, etc.);
 - d) The rescue procedure containing at least the following:
 - .1 Means of communication between the confined space supervisor and the workers inside the confined space;
 - .2 Rescue equipment specific to each confined space;
 - .3 The confirmation that the municipality's emergency response service has been notified of the holding of work

in confined spaces specifically on this site and that they can intervene to make a rescue inside an enclosed space; otherwise the contractor must identify the site workers who will act as rescuers in the event that they must access the interior of the confined space (rescue training required);

- .4 The location of the telephone and the phone number of the municipality's emergency response service (if applicable);
 - .5 The date of the entry permit;
 - .6 The name of the person issuing the permit and the name of his employer;
 - .7 The name of the supervisor and the name of his employer;
 - .8 The names of the workers who have to enter into a confined space and the names of their respective employers.
- .2 In cases where the site representative requires the use of a site-specific confined space entry permit, the Contractor must comply with the requirements of this permit.

.6 Medical supervision

- .1 The Contractor must transmit to the Departmental Representative a medical certificate which is less than two (2) years old for all the people having to use a supplied air respirator. This certificate must confirm the ability of each person to use this type of device.
- .2 It is recommended that the people who work in the sewage collection systems or similar systems be vaccinated against diphtheria, tetanus and hepatitis "B".

.7 Requirements during work in confined spaces

- .1 Before each entry into a confined space, the person responsible must take readings of the concentration of oxygen, flammable gases and all toxic gases likely to be present and record the results of the entry permit previously required.
- .2 No worker can access the confined space if the following requirements are not met:
 - .1 the oxygen concentration must be greater than or equal to 19.5% and less than or equal to 23%;
 - .2 the concentration of flammable gases or vapors must be less than or equal to 10% of the lower explosion limit;
 - .3 the concentration of other gases must not exceed the standards provided in Schedule I of the Regulation respecting occupational health and safety (S-2.1, r.13).
- .3 If the oxygen and gas concentrations measured respect the regulatory values, the person responsible must ensure that all the preventive measures indicated on the permit are in place and must finish

- completing the entry permit (date, time, signatures, etc.) before issuing the permit and allowing access to the confined space.
- .4 An entry permit must cover only one shift; the Contractor must issue a new permit for each additional shift.
 - .5 During work inside the confined space, the concentration of gases must be continuously measured and the detector must be installed in the workers' breathing zone. If the conditions inside the confined space are such that workers may not hear / see the detector's alarm, the contractor must find a way for the confined space supervisor to monitor the concentrations while still measuring the level of the respiratory zone of workers.
 - .6 If the work is organized in such a way that workers can find themselves distant from each other in a large enclosed space, the Contractor must provide additional gas detectors.
 - .7 The Contractor must supply the gas detectors and keep them in good condition. He must be able to demonstrate that the gas detectors used have been calibrated and adjusted by the person responsible or by a qualified person in accordance to the manufacturer's recommendations. The Departmental Representative may have the accuracy of the Contractor's devices checked at any time. In the event of failure of a detection device, work must immediately be suspended, and all workers must leave the confined space.
 - .8 The gas detector manufacturer's manual must be available on site.
 - .9 The Contractor must provide a ventilation system of sufficient power to keep the contaminant concentrations below the regulatory concentration limits.
 - .10 If work generating contaminants in the air is carried out (welding, use of products, etc.), the Contractor must, if necessary, install a contaminant suction system so as to be able to comply at all times with the regulatory air quality values.
 - .11 If a gas detector alarm goes off, all workers must exit the confined space. Concentration readings must then be entered on the entry permit. The Contractor must then identify the source of contamination, neutralize it, ventilate the confined space to remove contaminant residues and only allow access to the confined space when the oxygen and gas concentrations have returned to the normal.
 - .12 No compressed gas cylinder or welding machine should be brought inside the confined spaces: this equipment must remain outside and must not block access or exit; all bottles must be properly secured.
 - .13 Tools and electrical devices used for work in confined spaces must be electrically grounded and, where necessary, explosion-proof. All equipment must be connected to a circuit breaker in the event of a ground fault or to a step-down transformer. The Contractor must, at his own expense, have a qualified electrician modify the power outlets and / or the circuit breakers that he intends to use and that do not meet these criteria.

- .14 If work in confined spaces requires hot work to be carried out, the Contractor must obtain a hot work permit and must comply with the requirements for this purpose.
- .15 The Contractor must assign a competent person to assume the duties of supervisor. The supervisor must be assigned exclusively to these duties and must remain constantly outside the confined space as long as there is a worker inside. In addition, he must:
 - .1 Make sure that the entry permit is completed, signed and displayed next to the confined space;
 - .2 Be familiar with the specific work procedure for the confined space and ensure that it is respected;
 - .3 Ensure constant communication with all workers present in the confined space. ensure that the necessary emergency equipment is in place;
 - .4 Be familiar with the auxiliary ventilation systems and ensure their proper functioning for the duration of the work;
 - .5 Prevent access to unauthorized people;
 - .6 Ensure that the conditions in the area surrounding the confined space do not affect the health and safety of workers inside the confined space.
 - .7 Initiate the emergency procedure if necessary.
- .16 The same person may assume the functions of supervisor and person responsible for the health and safety of work in confined spaces, provided that this person can meet all the requirements for these two functions.

2.33 EXCAVATION WORK

In addition to the requirements of the Safety Code for the Construction Industry, the Contractor who performs trenching or excavation work must comply with the following requirements:

- .1 Complete the following form and send it to the Departmental Representative before the excavation begins.
- .2 Send the following documents to the departmental representative, as applicable:
 - .1 plans and specifications, signed and sealed by an engineer, of the props to be put in place for excavation work; or
 - .2 engineering notice specifying the angle of the walls of the trench or excavation.

Directive de creusage

N° _____ de _____

Cette directive de creusage est fournie à titre d'exemple par la Commission de la santé et de la sécurité du travail (CSST). On y trouve les principales indications que l'employeur devrait donner à la personne responsable des travaux sur le terrain et à l'opérateur de l'engin de terrassement.

Nom de l'entreprise	
Nom du projet	N° du projet
Adresse du chantier	Date du début des travaux

Repérage

Chaînage ou axes : de _____ à _____ Plan annexé ☐ N° du plan : _____

Méthode de travail à utiliser

Tout en s'assurant que les parois ne présentent aucun danger de glissement de terrain,

☐ **creuser et étançonner** selon les plans et devis d'un ingénieur;

☐ **creuser et étançonner** en utilisant une boîte de tranchée;

☐ **creuser sans étançonner** pourvu que l'une des conditions suivantes soit respectée :

☐ le roc est sain;

☐ aucun travailleur ne descend dans la tranchée ou l'excavation;

☐ les parois sont creusées conformément à l'avis d'un ingénieur.

Dimensions du creusement (Creuser selon le profil suivant.)

	Minimale	Maximale
H Profondeur		
Lf Largeur au fond		
Ls Largeur en surface		

Mesures de sécurité

Déposer les matériaux à une distance d'au moins 1,2 mètre (4 pi) du sommet des parois.

Ne laisser aucun véhicule s'approcher à moins de 3 mètres (10 pi) du sommet des parois.

☐ Respecter le plan de l'ingénieur concernant les travaux à proximité d'une construction existante.

☐ Suivre le plan de localisation pour repérer les infrastructures souterraines.

☐ Installer le matériel de signalisation prévu par le plan de circulation (barrières, repères visuels, etc.).

☐ Affecter un ou des signaleurs au contrôle de la circulation.

☐ Respecter la méthode prévue pour le travail à proximité des lignes électriques.

☐ Mettre en place les dispositifs de protection des travailleurs, par exemple les glissières de sécurité en béton.

Nom	Fonction	
Signature	Date	N° de téléphone

Directive remise :

☐ au responsable des travaux sur le terrain ☐ à l'opérateur de l'engin de terrassement

DC 700.500 (09-03)

2.34

LIFTING LOADS WITH A CRANE OR A CRANE TRUCK

- .1 Unless otherwise specified, the Contractor must prepare a lifting plan and send it to the Departmental Representative for any lifting operation carried out using a crane or a truck-crane, at least 5 days before the start of the lifting operations covered by this plan. This lifting plan must contain at least the information listed at the end of this section.
- .2 The lifting plan must be signed and sealed by an engineer for the following lifting operations:

- .1 lifting of concrete panels;
 - .2 lifting of mechanical / electrical equipment on a roof or on floors of a building;
 - .3 lifting loads that encroach the public roads;
 - .4 lifting of large or heavy loads;
 - .5 any other lifting operation, as required by the Departmental Representative.
- .3 In addition to the above requirements, the Contractor must plan the lifting operations in a way to prevent the loads from passing over the occupied areas on a site. When it is impossible to do otherwise, the lifting plan must be signed and sealed by an engineer and must guarantee the safety of the occupants of this area; this plan must be approved by the Departmental Representative. The Departmental Representative may, if he deems it necessary, impose that the work be done during the evening and on weekend.
- .4 From the start of the work, the Contractor must send to the Departmental Representative the list of lifting plans provided for the entire duration of the work. This list must be updated if changes are made during the work.
- .5 In addition to the mechanical inspection certificate, all cranes or truck-cranes must have on board the annual inspection certificate and the crane log book.
- .6 The entire lifting area must be delimited to prevent unauthorized personnel from entering it.
- .7 The Contractor must carefully inspect all slings and lifting accessories to ensure that those in poor condition are destroyed and discarded.
- .8 The lifting of compressed gas cylinders must be done using a basket specially designed for this purpose.

MINIMUM CONTENT OF A LIFTING PLAN

- .1 Sketch showing at least the location of the crane, the surrounding facilities, the area covered by the lifting operations, the pedestrian and vehicular traffic lanes, the safety perimeter, etc.
- .2 Weight of the loads
- .3 The dimensions of the loads
- .4 A list of every lifting accessories and their respective weight
- .5 Total weight lifted
- .6 Maximum height of obstacles to be crossed
- .7 Lifting height of the loads relative to the roof surface (in the case of lifting loads to be placed on roofs)
- .8 Use of guiding cables
- .9 Type of crane used
- .10 Crane capacity
- .11 Boom length
- .12 Boom angle
- .13 Operating range of the crane

- .14 Deployment of stabilizers
- .15 Percentage of the crane's capacity used
- .16 Confirmation of verification of the lifting equipment
- .17 Identification of the crane operator and the person in charge of lifting operations with their signatures and the date.

2.35 HOT WORK

Hot work means all work using an open flame or which can produce heat or sparks such as the following work: riveting, welding, cutting, brazing, grinding, burning, heating, etc.

- .1 At the start of each shift and for each sector, the Contractor must obtain a "Hot Work Permit" issued by the site manager.
- .2 A functional portable fire extinguisher suitable for the risk of fire must be available and easily accessible within 5 m of any flame, source of sparks or intense heat.
- .3 The Contractor must designate a person to continuously monitor the risk of fire for a minimum period of one (1) hour after the end of each hot work. This person must sign the permit section for this purpose and deliver it to the site manager after the one (1) hour delay.
- .4 When hot work is carried out in areas where combustible materials are present or whose walls, ceilings or floors are made or coated with combustible materials, a final inspection of the work area must be scheduled four (4) hours after the end of the work. Unless otherwise advised by the Departmental Representative, the Contractor must designate a person to carry out this monitoring.

.2 Welding and cutting

In addition to the requirements set out in the preceding paragraphs, the Contractor must comply with the following requirements

- .1 Welding and cutting work must be carried out in accordance with the requirements of the *Safety Code for the Construction Industry*, S-2.1, r.4 and the CSA standard W117.2 *Safety in Welding, Cutting and Allied Processes*.
- .2 Use an air extraction system fitted with filters for any welding or cutting work carried out inside.
- .3 Interrupt any activity that produces flammable or combustible gases, vapors or dust in the vicinity of welding or cutting work.
- .4 Store the compressed gas cylinders on a fireproof surface and make sure the room is well ventilated.
- .5 Store all oxygen cylinders at a minimum distance of 6 meters from flammable gas cylinders (e.g. acetylene) or a combustible material such as oil or grease, unless they are separated by a partition made of non-combustible material as specified in article 3.13.4. of the *Safety Code for the Construction Industry*, S-2.1, r.4.
- .6 Store bottles away from all sources of heat.

- .7 Do not store bottles near stairs, exits, hallways and elevators.
- .8 Do not put acetylene in contact with metals such as silver, mercury, copper and brass alloys with more than 65% copper, to avoid the risk of an explosive reaction .
- .9 Verify that the arc welding equipment has the required voltage and that it is grounded.
- .10 Make sure that the wires of the electric welding machine are not damaged.
- .11 Place the welding equipment on flat ground sheltered from the weather
- .12 Put in place fireproof fabrics when the welding work is done on top of one another and where there is a risk of falling sparks.
- .13 Keep away or protect flammable or combustible materials which are less than 15 meters from welding work.
- .14 Never weld or cut on a closed container.
- .15 Do not cut, weld or do any work using an open flame on top of containers, tanks, pipes or any other container that have already contained a substance or residue of flammable or explosive products unless:
 - .1 that they have been cleaned and that air samples have been taken indicating the absence of explosive vapors; and
 - .2 arrangements have been made to ensure the safety of workers.

2.36 ROOFING WORKS

.1 Protection against falls from a height

- .1 The installation of guardrails is always mandatory ; however, the installation of a warning line is permitted to delimit work areas provided that all the requirements of articles 2.9.4.0 and 2.9.4.1 of the *Safety Code for the Construction Industry* are respected.
- .2 The guardrails must remain in place until the very end of the project. The Departmental Representative will authorize their dismantling when it can be confirmed that all the required work, inspections and corrections have been carried out.
- .3 It is mandatory to wear a safety harness for the installation of guardrails.
- .4 It is mandatory to wear a safety harness for the installation and modification of parapets or flashings, if it is necessary to temporarily move the guardrails.
- .5 It is mandatory to wear a safety harness when receiving equipment and when signaling to the crane on the edge of the void.
- .6 It is mandatory to wear a safety harness when working on the edge of a void where collective protection does not provide adequate safety.
- .7 The Contractor must provide a method of attachment and an emergency cable system in accordance with section 2.10.12 of the *Safety Code* for

the Construction Industry (LRQ, S-2.1, r.4) for each sector or different work space.

.2 Material lifting

- .1 For any winch installation, the contractor must send to the Departmental Representative the installation process recommended by the manufacturer or, if not able, an installation process signed and sealed by an engineer. The installation process must in particular take into account the maximum permissible loads, the number, the weight and the location of the counterweights and any other details that may affect the capacity and stability of the device.
- .2 The Contractor must carefully inspect all slings and lifting accessories and make sure that those in poor condition are destroyed and discarded.
- .3 The lifting of compressed gas cylinders must be done using a basket specially designed for this purpose.
- .4 For any use of a crane or truck crane, the Contractor must comply with the requirements of the paragraph " Lifting loads with a crane or a crane truck" of this section .

.3 Protection against burns

- .1 People assigned to the hot water tanks must wear long sleeves, safety glasses, and a face shield when loading the hot water tanks.
- .2 People assigned to work with bitumen or other hot liquids must wear gloves, long sleeves, and safety glasses.

.4 Fire protection

- .1 The storage and use of propane cylinders must comply with CAN / CSA-B149.2 *Propane storage and handling code*. The bottles must be stored outside, in a safe place, protected from unauthorized manipulation, in a place where there are no vehicles or equipment unless they are protected by barriers or equivalent protection.
- .2 The quantity of propane cylinders on the roof must not exceed that required for a working day and the cylinders must at all times be tied upright or held vertically in a trolley designed for this purpose.
- .3 All hot work (burning, heating, riveting, welding, cutting, grinding, etc.) must be carried out in accordance with the paragraph "Hot work" of this section.

.5 Materials and waste management

- .1 On the roof, light materials and sheet materials should be kept in containers or be securely attached. In the event of an infraction, the Departmental Representative may prohibit the storage of materials on the roof.
- .2 Waste must be disposed of progressively by a waste chute or in suitable containers; the Contractor must put in place means to prevent the waste from going upwind.
- .3 All waste must be evacuated from the roof at the end of each shift.

- .4 Unless specifically authorized by the Departmental Representative, any waste container must be placed at least 3m from any structure or building.

.6 Protection of occupants and the public

- .1 The Contractor must install covered passages, nets or other devices to protect workers, the public and occupants against falling objects in front of the entrances and exits of the building. The chosen means of protection must be approved by the Departmental Representative.
- .2 A safety perimeter must be set up on the ground under the work area to protect workers, the public and the occupants.
- .3 The ground work area, the material handling area, and the area where the hot water tank is installed must be clearly barricaded, so that occupants and the public cannot access it.
- .4 Before installing any device liable to emit gases or vapors, the Contractor must obtain the authorization of the site manager. The site manager will ensure that there is no risk of infiltration into the building's ventilation systems.

2.37 ASSEMBLY OR DISASSEMBLY OF THE METAL STRUCTURE

- .1 In addition to complying with section 3.24 of *the Safety Code for the Construction Industry* (S-2.1, r.4), the Contractor must comply with the requirements set out in the following paragraphs.
- .2 The Contractor must send the following documents to the Departmental Representative before the start of erection of metal structures:
 - .1 The assembly procedure in accordance with article 3.24.10 of *the Safety Code for the Construction Industry* (S-2.1, r.4);
 - .2 The rescue procedure for the release of a worker suspended in a safety harness within a maximum period of 15 minutes, adapted to the site and in accordance with article 3.24.4 of the same code; this procedure must be accompanied by a written confirmation that it has been tested;
 - .3 A certificate from an engineer saying that the anchor rods were installed in accordance with the anchor plan, as required in article 3.24.12 of the same code;
 - .4 The lifting procedure, if the lifting is done in one of the ways indicated in article 3.24.15 of the same code;
 - .5 The name of person chosen to be the rescuer and the rescue training certificate of this person;
 - .6 The name of the person chosen to be the first aid attendant and the first aid training certificate for this person;
- .3 The Contractor must ensure that the following documents are always available on site for consultation:
 - .1 The assembly plan from the manufacturer of the steel structure in accordance with the requirements of article 3.24.9 of the *Safety Code for the Construction Industry* (S-2.1, r.4);

- .2 The anchoring plan for the anchor rods of the posts in accordance with the requirements of article 3.24.11 of the *Safety Code for the Construction Industry* (S-2.1, r.4);

2.38 WORKS NEAR A BODY OF WATER

- .1 For all work carried out near a body of water (in particular work above water, work on a dock, work along a watercourse, etc.), the Contractor must meet the requirements of the following paragraphs in addition to meeting the requirements of the *Safety Code for the Construction Industry*.
- .2 The Contractor must plan his work so as to put in place security measures to prevent any worker from falling into the water. The use of these safety measures should be preferred over the wearing a life jacket.
- .3 Send the following documents to the Departmental Representative before the start of work:
 - .1 The description of the body of water;
 - .2 The description of the work carried out near this body of water;
 - .3 The water transporting plan adapted to the works and characteristics of the body of water;
 - .4 The rescue plan adapted to the works and characteristics of the body of water;

Each of the documents listed above must contain at least the information required in section 11 of the *Safety Code for the Construction Industry*.

If it is possible that all or part of the work takes place during the winter period, the security measures listed above must be adapted accordingly.

- .4 The Contractor must send to the Departmental Representative the training certificate required by article 11.2 of the *Safety Code for the Construction Industry*, for the following people:
 - .1 The person designated to prepare the documents required in the previous paragraph; and
 - .2 each person responsible for the transport or rescue operations.
- .5 If the rescue plan provides for the use of a lifeboat, the Contractor must transmit to the Departmental Representative the rescue workers' card or certificate of competence for rescue work, issued by Transport Canada.
- .6 The Contractor must include in his weekly inspection schedule the devices required by articles 11.4 and 11.5 of the *Safety Code for the Construction Industry*.
- .7 Make sure that there is a moored and in-water lifeboat available at each location where a worker is likely to fall into the water. However, one lifeboat can serve several places on the same site provided that the distance between each of these places and the lifeboat is less than 30 m.
- .8 When the workplace is a pier, a basin, a dock, a wharf or other similar structure, a ladder having at least two (2) steps below the surface of the water must be installed on the in front of the structure, at every 60 m.

2.39 USE OF INTERNAL COMBUSTION ENGINES INSIDE A BUILDING

- .1 In addition to complying with article 3.10.17 of the *Safety Code for the Construction Industry* (S-2.1, r.4), the Contractor must comply with the requirements set out in the following paragraphs.
- .2 The use of gasoline-powered equipment inside a building is prohibited, even if the building has openings.
- .3 The use of other equipment with internal combustion engines inside a building must be authorized by the Departmental Representative.
- .4 For any use of equipment with an internal combustion engine inside a building, even if this building has openings, the Contractor must install a ventilation system allowing the concentrations of toxic gases to be below regulatory values. Stale air must be expelled outside the building.
- .5 Before using equipment with an internal combustion engine, the Contractor must plan in writing the following:
 - .1 The number of fans to be installed;
 - .2 The power of the fans;
 - .3 The location of the fans;
 - .4 The dimensions of the openings that will be opened during the works.
- .6 During the use of equipment with an internal combustion engine, the Contractor must measure the concentration of carbon monoxide and nitrogen oxides in the working area, in the workers' breathing area; the measured concentration levels must be entered every 30 minutes in a register available for consultation.
- .7 If the work takes place in an occupied building, the Contractor must also measure the concentration of carbon monoxide and nitrogen oxides every 30 minutes in the premises adjacent to the work area and record these values in a register.
- .8 If the alarm for carbon monoxide or nitrogen oxide is triggered during the work, the Contractor must suspend the work and make the necessary corrections before resuming the work.
- .9 A portable fire extinguisher must be available at all times in the work area while using equipment with an internal combustion engine.
- .10 Equipment must be kept at a safe distance from any combustible material.
- .11 No fuel storage for equipment with an internal combustion engine is permitted inside a building.

2.40 TEMPORARY HEATING

- .1 In addition to complying with section 3.11 of the *Safety Code for the Construction Industry* (S-2.1, r.4), the Contractor must comply with the requirements set out in the following paragraphs.
- .2 A portable fire extinguisher must be available at all times near the heating devices, regardless of the type of heating used.

- .3 The devices must always be used according to the manufacturer's specifications.
- .4 If necessary, the fabrics and tarpaulins used near the heating devices must be securely attached so that they cannot be projected onto these devices, on the piping connected to these devices or on any other source of heat.
- .5 Gas cylinders must be installed in such a way as to be protected from the movement of vehicles and other equipment.
- .6 For any use of heating devices other than electric, the Contractor must install a carbon monoxide detector in the work area, near the appliances and / or workers, during the entire period when heating is used. The Contractor must immediately make the necessary corrections to the heating installations if the detector alarm rings.
- .7 The Contractor must ensure minimum surveillance of the heating devices outside working hours (evenings and weekends). He must submit a monitoring plan to the Departmental Representative before using the heating devices.

2.41 WORKS NEAR AERIAL POWER LINES

- .1 When there is an aerial power line in the work area and the Contractor chooses to apply paragraph b) of article 5.2.2 of the Safety Code for the Construction Industry (2.1, r.4), a copy of the agreement with the electrical operating company and a copy of the work process, required in article 5.2.2 b), must be sent to the Departmental Representative before the start of work indicated in these documents.

2.42 DIVING WORKS

By accepting this contract, the Contractor undertakes to comply with the following requirements:

- .1 Comply with all the requirements of the *Règlement sur la santé et la sécurité du travail* (S-2.1, r.19.1), plus spécifiquement la section XXVI.I intitulée *Travail effectué en plongée*. Also comply with CSA Z275.2 – *Règles de sécurité pour les travailleurs en plongée* ainsi que les normes CSA Z275.1 – *Caissons hyperbares* et CSA Z275.4 – *Normes de compétences pour les opérations de plongée*, the most recent editions. If there is a difference between two requirements for the same point, the most severe requirement applies.
- .2 In addition to the previous paragraph, in the case where construction work is carried out, also comply with the *Safety Code for the Construction Industry* (S-2.1, r.4).
- .3 Before the start of work, send the following documents to the Departmental Representative, according to the content required in the *Regulation respecting occupational health and safety*:
 - .1 The professional diving training certificate for each member of the diving team OR the document attesting to the recognition of the skills of these people according to the *Competency Standard for Diving Operations*, CAN / CSA Z 275.4-02, in accordance with section 312.8 of these regulations;

- .2 The first aid training certificate in the workplace of each member of the diving team;
- .3 The medical certificate of each member of the diving team;
- .4 For each dive provided for in this mandate, a diving plan containing the following elements, in addition to those required in the Regulation respecting occupational health and safety, is needed:
 - .1 the isothermal protection to be used;
 - .2 the factor of repetitive dives;
 - .3 the ascent limit without a decompression stop;
 - .4 the circumstances requiring the interruption of the dive;
 - .5 the procedures to be followed to ensure that machinery, equipment or devices that may present a risk have been locked;
 - .6 the decompression table to use, if required;
- .5 A notice confirming that a communication system with the Emergency Medical Service for diving emergencies is available at all times at the diving station.
- .4 The Contractor must consider the following particularities on the work site and adapt the content of his dive plan accordingly:
- .5 If the dive takes place at one of the following locations, send to the Departmental Representative the confirmation that the authorities concerned have been notified:
 - .1 upstream or downstream of a hydraulic structure or a submerged pipe;
 - .2 in navigable waterways;
 - .3 in port facilities.
- .6 If the diving station is more than 2 meters above the water, send to the Departmental Representative:
 - .1 the plan of the equipment used to launch the worker if an equipment other than a pod is used as the means of launching;
 - .2 the plan of the equipment used for lifting the pod or other equipment, unless the apparatus is a crane or a boom truck.
- .7 If the dive is made from a boat, send the following documents to the Departmental Representative:
 - .1 proof of qualification of the boat operator;
 - .2 boat compliance certificate issued by Transport Canada.
- .8 Before the work begins, simulate the site rescue procedure as required by section 312.31 of the *Regulation respecting occupational health and safety*.
- .9 Complete daily and transmit to the Departmental Representative a verification grid confirming the presence and good condition of the equipment required on the diving site according to the diving plan.

- .10 Make sure that all the other documents required by in section XXVI of the *Regulation respecting occupational health and safety* are always available on the site (diving logbook, diver's log, etc.).

2.43 OHS SUBORDINATION AGREEMENT

Projet : _____ Adresse : _____

ENTREPRENEUR EXTERNE

Par la présente, je m'engage à me soumettre à l'autorité de (nom de l'entreprise maître d'œuvre) _____, qui est maître d'œuvre pour le projet indiqué ci-dessus et ce, pour toute la durée de nos travaux sur le chantier. Par conséquent, je confirme que j'ai pris connaissance du programme de prévention du maître d'œuvre et je m'engage à :

- informer mes employés du contenu du programme de prévention du maître d'œuvre et à m'assurer que son contenu soit respecté en tout temps;
- fournir le programme de prévention spécifique à nos activités réalisées dans le cadre du présent projet
- informer le maître d'œuvre de mes interventions sur le chantier et à obtenir son accord avant de procéder aux travaux;
- suivre les directives en matière de santé et sécurité données par le représentant du maître d'œuvre sur le chantier et assister, selon les besoins, aux activités de formation et aux réunions santé-sécurité qu'il organise.

Nom du représentant: _____

Nom de l'entreprise : _____

Description des travaux à faire sur le chantier : _____

Dates approximatives des travaux (début-fin) : _____

Signature : _____ Date : _____

MAÎTRE D'OEUVRE

Par la présente, je m'engage à permettre à l'entreprise (nom de l'entrepreneur externe) _____ de faire des travaux dans le cadre du projet indiqué ci-dessus et, à titre de maître d'œuvre, à prendre les mesures nécessaires pour protéger la santé et à la sécurité des travailleurs qui sont sur le chantier. Advenant que l'entrepreneur refuse ou omet de se conformer à mes directives de façon répétée, je m'engage à en informer le représentant ministériel de TPSGC et à fournir les preuves documentaires de mes interventions auprès de l'entrepreneur.

Nom du représentant: _____

Nom de l'entreprise maître d'œuvre : _____

Signature : _____ Date : _____

Remettre la copie complétée et signée au représentant ministériel de TPSGC

PART 3 EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 02 41 00.08 - Demolition - Minor Works
- .2 Section 02 41 19.16 - Selective Interior Demolition
- .3 Section 02 81 00 - Hazardous Materials
- .4 Section 22 05 05 - Selective Demolition for Plumbing
- .5 Section 22 13 16.13 - Sanitary Waste and Vent Piping - Cast Iron and Copper
- .6 Section 23 05 05 - Selective Demolition for Heating, Ventilating, and Air Conditioning (HVAC)
- .7 Section 26 05 05 - Selective Demolition for Electrical.

1.2 REFERENCE STANDARDS

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2-2008 Stipulated Price Contract.
- .2 U.S. Environmental Protection Agency (EPA)/Office of Water
 - .1 EPA 832/R-92-005-92, Storm Water Management for Construction Activities, Chapter 3.
 - .2 EPA General Construction Permit (GCP) 2012.

1.3 DEFINITIONS

- .1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humans; or degrade environment aesthetically, culturally and/or historically.
- .2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit documents and samples in accordance with Section 01 33 00- Submittal Procedures.
- .2 Product Data:
 - .1 Submit required data sheets as well as manufacturer's instructions and documentation. The technical sheets must indicate the characteristics of the products, the performance criteria, the dimensions, the limits and the finish.
 - .2 Submit two (2) copies of WHMIS Safety Data Sheets (SDS) in accordance with Section 01 35 29.06- Health and Safety Requirements and Section 01 35 43- Environmental Procedures.

- .3 Before commencing the construction activities or the delivery of materials to the site, submit the Environmental Protection Plan for review and approval by the Departmental Representative.
- .4 Environmental Protection Plan must include a comprehensive overview of known or potential environmental issues to be addressed during construction.
- .5 Actions included in the Environmental Protection Plan must be presented at a level of detail that is in accordance with environmental problems and with the construction work to be carried out.
- .6 Include in Environmental Protection Plan:
 - .1 Names of the people responsible for ensuring adherence to the Environmental Protection Plan.
 - .2 Names and qualifications of the people responsible for manifesting hazardous waste to be removed from site.
 - .3 Names and qualifications of the people responsible for training site personnel.
 - .4 Description of the environmental protection personnel training program.
 - .5 Erosion and sediment control plan identifying the type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that the control measures are in compliance with erosion and sediment control plan, and the Federal, Provincial, and Municipal laws and regulations.
 - .6 Drawings indicating the locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.
 - .7 Traffic Control Plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during rainy weather.
 - .1 Plans to include measures to minimize amount of material transported onto paved public roads by vehicles or runoff.
 - .8 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use.
 - .1 Plan to include measures for marking the limits of authorized areas and methods for the protection of features to be preserved within authorized work areas.
 - .9 Spill Control Plan to include procedures, instructions, and reports to be used in the event of unforeseen spill of regulated substance.
 - .10 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.
 - .11 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, are contained on the project site.
 - .12 Contaminant Prevention Plan identifying the potentially hazardous substances to be used on the job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with the Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.

- .13 Waste Water Management Plan identifying methods and procedures for the management and discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.
- .14 A plan for the designation and protection of wetlands and historic, archaeological, cultural, and biological resources.
- .15 Pesticide treatment plan to be included and updated, as required.

1.5 FIRES

- .1 Fires and burning of rubbish on site is not permitted.

1.6 DRAINAGE

- .1 Develop and submit the Erosion and Sediment Control Plan (ESC), indicating the means that will be implemented, including work supervision and production of reports, in order to verify the compliance of these measures with the Federal, Provincial, and Municipal laws and regulations, as well as the EPA 832/R-92-005, Chapter 3.
- .2 Storm Water Pollution Prevention Plan (SWPPP) can substitute the Erosion and Sediment Control Plan.
- .3 Provide the temporary drainage and pumping, required to keep excavations and site free from water.
- .4 Ensure that pumped water into waterways, sewer or drainage systems is free of suspended materials.
- .5 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with the requirements of the local authority.

1.7 SITE CLEARING AND PLANT PROTECTION

- .1 Protect trees and plants on the site and on the adjacent properties as indicated.
- .2 Protect trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to a height of two (2) meters minimum.
- .3 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage.
 - .1 Avoid unnecessary traffic, dumping and storage of materials over root zones.
- .4 Minimize stripping of topsoil and vegetation.
- .5 Restrict tree removal to the areas designated by the Departmental Representative.

1.8 POLLUTION CONTROL

- .1 Maintain the temporary erosion and pollution control features installed under this Contract.

- .2 Control emissions from equipment and plant in accordance with the local authorities' emission requirements.
- .3 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area.
 - .1 Provide temporary enclosures where following the directives of the Departmental Representative.
- .4 Water dry materials and cover waste to prevent wind from raising dust or blowing off debris. Remove dust on temporary paths.

1.9 HISTORICAL/ARCHAEOLOGICAL CONTROL

- .1 Provide a plan that defines the procedures to be followed for the identification and protection of wetlands and historic, archaeological, cultural and biological resources of known existence on the site, and which defines other procedures to be observed in case unexpected discovery of such items, on site or in the nearby area, during construction.
- .2 The plan must include methods to assure protection of known or discovered resources and identify lines of communication between the Contractor's personnel and the Departmental Representative.

1.10 NOTIFICATION OF NONCOMPLIANCE

- .1 The Departmental Representative will notify the Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of the Contractor's Environmental Protection plan.
- .2 After receiving a notice of non-compliance, the Contractor must propose corrective measures to the Departmental Representative, and he must implement them with the approval of the Departmental Representative.
 - .1 Act only after receiving a written approval by the Departmental Representative.
- .3 The Departmental Representative will order work to stop until satisfactory corrective actions are taken.
- .4 No time extensions granted or equitable adjustments will be allowed to the Contractor for such suspensions.

PART 2 PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 EXECUTION

3.1 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
 - .1 Leave Work area clean at the end of each day.
- .2 Bury rubbish and waste materials on site where it is indicated, only after receiving a written approval from the Departmental Representative.
- .3 Ensure public waterways, storm and sanitary sewers remain free of waste and volatile materials disposal.
- .4 Final Cleaning: upon completion remove surplus materials, rubbish, tools, and equipment in accordance with Section 01 74 00- Cleaning.
- .5 Waste Management: separate waste materials for reuse or recycling in accordance with Section 01 74 19- Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

- .1 This Section references to laws, by-laws, ordinances, rules, regulations, codes, orders of Authority Having Jurisdiction, and other legally enforceable requirements applicable to Work and that already are; or become, in force during performance of Work.

1.2 RELATED REQUIREMENTS

- .1 Section 02 41 00.08 – Demolition - Minor Works
- .2 Section 02 41 19.16 – Selective Interior Demolition
- .3 Section 02 81 00 – Hazardous Materials
- .4 Section 22 05 05 - Selective Demolition for Plumbing
- .5 Section 22 13 16.13 - Sanitary Waste and Vent Piping - Cast Iron and Copper
- .6 Section 23 05 05 - Selective Demolition for Heating, Ventilating, and Air Conditioning (HVAC)
- .7 Section 26 05 05 - Selective Demolition for Electrical.

1.3 REFERENCES TO REGULATORY REQUIREMENTS

- .1 Perform Work in accordance with the National Building Code of Canada (NBC) including amendments up to tender closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.
- .2 The work must meet or exceed the requirements of the documents mentioned below Meet or exceed requirements of:
 - .1 Contract documents.
 - .2 Specified standards, codes, and referenced documents.

1.4 HAZARDOUS MATERIAL DISCOVERY

- .1 Asbestos: demolition of spray or trowel-applied asbestos is hazardous to the health. Stop work immediately when material resembling spray or trowel-applied asbestos is encountered during the demolition work. Notify the Departmental Representative.
- .2 PCB: Polychlorinated Biphenyl: stop work immediately when material resembling Polychlorinated Biphenyl is encountered during the demolition work. Notify the Departmental Representative.
- .3 Mould: stop work immediately when material resembling mould is encountered during the demolition work. Notify the Departmental Representative.

1.5 BUILDING SMOKING ENVIRONMENT

- .1 Comply with smoking restrictions and municipal by-laws.

1.6 QUALITY ASSURANCE

- .1 Regulatory Requirements: Except as otherwise specified, the Contractor shall apply for, obtain, and pay fees associated with, permits, licenses, certificates, and approvals required by regulatory requirements and Contract Documents, based on the General Conditions of the Contract and the following:
 - .1 Regulatory requirements and fees in force on the date of Bid submission, and
 - .2 A change in regulatory requirements or fees scheduled to become effective after the date of tender submission and of which public notice has been given before date of tender submission

1.7 FEES, PERMITS AND TAXES

- .1 The Contractor shall give all notices and apply for, obtain, and pay fees associated with the building rights and permits for excavation, construction, and all other services, as required by the authorities having jurisdiction in the locality.
- .2 The Contractor will be responsible for any damage and cost resulting from the failure to obtain these rights and permits.

PART 2 PRODUCTS

2.1 NOT USED

PART 3 EXECUTION

3.1 NOT USED

- .1 Not Used.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section concerned: Prepare samples of works specifically required in the specifications. The requirements of article 1.9 of this section apply to all sections of the specifications in which requests are made to provide samples of works.

1.2 INSPECTION

- .1 The Departmental Representative must have access to the works. If part of the work or works is carried out outside the site, access to this place must also be ensured for the duration of this work.
- .2 In the event that works must be subject to inspections, approvals or special tests ordered by the Departmental Representative or required under local regulations for the site; Give timely notice.
- .3 If the Contractor has covered or allowed to cover a work before it has been subjected to the required inspections, approvals or special tests, he must uncover the work in question, see to the execution of the inspections or tests required to the satisfaction of the competent authorities, and then restore the structure to its initial state.
- .4 The Departmental Representative may order the inspection of any part of the work whose conformity to the Contractual Documents is questioned. If, after examination, the work in question is declared non-compliant with the requirements of the Contractual Documents, the Contractor must take the measures necessary to bring the work in conformity with the specified requirements, and assume the costs of inspection and repair. If the work in question is declared to comply with the requirements of the Contractual Documents, the Departmental Representative will assume the costs of inspection and repair thus incurred.
- .5 The Contractor is responsible for the application of all the provisions of the quality assurance program.
- .6 The Contractor is responsible for ensuring that its subcontractors and suppliers implement the quality activities described in this section.
- .7 The Contractor, his subcontractors and suppliers must demonstrate the implementation of their quality assurance program and the conformity of their work with the drawings and technical specifications during the manufacturing and construction.

1.3 INDEPENDENT INSPECTION AGENCIES

- .1 Independent Inspection/Testing Agencies will be engaged by the Departmental Representative for purpose of inspecting and/or testing portions of Work.
- .2 Provide equipment required for executing the inspection and testing by appointed agencies.

- .3 Employment of inspection/testing agencies does not release the Contractor from his responsibility for the execution of the work in accordance with the requirements of the Contractual Documents.
- .4 If defects are revealed during inspection and/or testing, the appointed agency will request additional inspection and/or testing to ascertain full degree of the defect. The Contractor shall correct the defect and irregularities as advised by the Departmental Representative, at no additional cost to the Departmental Representative, and assume the cost of retesting and re-inspection.

1.4 ACCESS TO WORK

- .1 Allow inspection/testing agencies access to the site, and the off-site manufacturing and fabrication plants.
- .2 Cooperate to provide reasonable facilities for such access.

1.5 PROCEDURES

- .1 Notify the appropriate agency and the Departmental Representative in advance of requirement for tests, in order that attendance arrangements can be made.
- .2 Submit samples and / or materials / equipment necessary for testing in accordance with specifications, within a reasonable time and in a predetermined order so as not to delay the execution of the Work.
- .3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.6 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 the Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with the Contract Documents.
- .2 If necessary, repair without delay the works of other contractors who were damaged by such removals or replacements..
- .3 If, in the opinion of the Departmental Representative, it is not advisable to repair defective works or judged not to be in conformity with the Contractual Documents, the Employer will deduct from the contract price the difference in value between the work executed and that prescribed in the Contractual Documents, the amount of this difference being determined by the Departmental Representative.

1.7 REPORTS

- .1 Submit four (4) copies of the inspection and test reports to the Departmental Representative.
- .2 Provide copies to the manufacturer or fabricator of the material being inspected or tested and the subcontractor in charge of the work being inspected or tested.

1.8 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 the Departmental Representative and may be authorized as recoverable.

1.9 MOCK-UPS

- .1 Prepare the mock-ups specifically required in the specifications. The requirements of this article apply to all sections of the specifications in which requests are made to provide mock-ups.
- .2 Construct mock-ups at the various locations designated in the section concerned and approved by the Departmental Representative.
- .3 Prepare mock-ups for approval by the Departmental Representative within a reasonable time and in a predetermined order, so as not to delay the execution of the Work.
- .4 Failure to prepare mock-ups in ample time is not considered sufficient reason for extension of the Contract deadline and no claim for extension by reason of such default will be allowed.
- .5 If requested, the Departmental Representative will assist the Contractor in establishing a schedule for the preparation of mock-ups.
- .6 Mock-ups may remain as part of the Work.

1.10 MILL TESTS

- .1 Submit mill test certificates as required by the specification Sections.

1.11 EQUIPMENT AND SYSTEMS

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

1.12 QUALITY DOCUMENTS

- .1 Quality manual:
 - .1 The Contractor must submit his Quality Manual to the Departmental Representative for review and approval.
 - .2 If the Contractor has a quality assurance program registered with a recognized registrar, he must submit a copy of his certificate and a copy of the table of contents of his Quality Manual instead of submitting the entire Manual Quality to the Departmental Representative.
- .2 Quality plan:
 - .1 The Contractor must submit to the Departmental Representative, for review and approval, a quality plan, specific to the project. See article 1.15 for more information on the content of the Quality Plan.

- .2 The Contractor is responsible for ensuring that all of its subcontractors and suppliers implement and maintain their own quality assurance program.
- .3 Inspection and test plan (ITP):
 - .1 Before starting to work in the factory and on site, the Contractor must present his ITP and those of his subcontractors and suppliers for examination and approval by the Departmental Representative. The Contractor is always responsible for the review and approval of the ITPs of its subcontractors and suppliers.
 - .2 The Contractor is responsible for the implementation and maintenance of all the quality activities described in his ITP.
 - .3 The Contractor is responsible for ensuring that all of its subcontractors and suppliers implement and maintain the respective ITPs in place.
 - .4 See article 1.16 for more information on preparing an ITP.
- .4 Welding procedures:
 - .1 The Contractor must submit their specifications for specific welding procedures within the scope of work for review and approval. These procedures must obtain the prior authorization of the Departmental Representative. These procedures must include all tests required by the contractual specifications.
- .5 Work procedures:
 - .1 The Contractor must present his work method and that of his subcontractors specific to the scope of work for review and approval. These procedures must be in accordance with the contractual specifications.

1.13 QUALITY ORGANIZATION

- .1 The Contractor must provide details on the quality organization he intends to set up for the project.
- .2 Key personnel will not be replaced without prior notification from the Departmental Representative.
- .3 The Contractor must present the organizational chart of his subcontractors and suppliers assigned to the project.
- .4 All organizational charts must be incorporated into the Contractor's quality plan (see article 1.15).

1.14 MANUFACTURE

- .1 General:
 - .1 The Contractor must maintain in force at its facilities, for the duration of the work, the quality assurance program approved by the Departmental Representative in accordance with:
 - .1 the Contractor's Quality Manual (described in article 1.12.1) and / or;

- .2 the specific project quality plan described in article 1.15 and / or;
 - .3 the Project specific Inspection and Test Plan (ITP) described in article 1.16 and / or;
 - .4 construction and manufacturing activities described in this section.
- .2 Receipt of material by the Contractor:
 - .1 Material provided by the Departmental Representative
 - .1 If the Departmental Representative provides the Contractor with materials or equipment for the performance of any work, the Contractor must verify their condition before taking possession.
 - .2 Receipt of materials purchased by the Contractor
 - .1 The Contractor must be able to demonstrate the conformity of all materials and equipment he purchases or manufactures at all times. These quality files must be complete and available at the facilities of the Contractor, and its subcontractors and suppliers.
 - .2 The Contractor must carry out a acceptance inspection for each material received on site.
 - .3 The quality files of the Contractor, its subcontractors and suppliers must provide proof that the acceptance inspections have been carried out and that the compliance documents have been examined by the Contractor, i.e. say certificates of material analysis and inspection reports, etc.
 - .4 All materials supplied by the Contractor must be new. The origin and source of the materials must be identified. Refurbished materials are not acceptable.
 - .3 Non-conforming materials
 - .1 Non-compliant materials must be properly identified (labeled "hold" or "do not use") and / or separated in a quarantine area.
- .3 Document control:
 - .1 The Contractor must implement and maintain a document control system that allows the control of the following activities:
 - .1 Ensure that only the latest revision of the specifications, plans and procedures is accessible to the Contractor's facilities, and its subcontractors and suppliers.
 - .2 Ensure that if obsolete revisions are kept, they are identified as "Outdated".
 - .3 Provide a functional distribution system for documents, drawings, procedures, reports, etc.
 - .4 Ensure that all quality records are cataloged and stored in a controlled environment.
- .4 Identification and traceability:
 - .1 Identification

- .1 The Contractor is responsible for ensuring that all materials and equipment incorporated in the works are identified and traceable, and that they remain so until the end of the work.
- .2 Traceability
 - .1 It must be possible at any time to associate materials or equipment with the documents establishing their conformity and their inspection status.
- .5 Calibration of measuring equipment:
 - .1 The Contractor, its subcontractors and suppliers must maintain at all times a control and recall system for calibrated measurement and test equipment.
 - .2 The Contractor, his subcontractors and suppliers must keep his equipment calibration certificates at his facilities.
 - .3 The Contractor, his subcontractors and suppliers must store his measurement and test equipment in a safe and controlled place.
- .6 Inspection and testing:
 - .1 The Contractor, his subcontractors and suppliers maintain an up-to-date list of his personnel assigned to special procedures and inspection in each of the disciplines in which he is involved, with the qualifications of these personnel.
 - .2 All control and testing activities must be carried out in accordance with the technical specifications and the approved ITP.
 - .3 The Contractor, his subcontractors and suppliers must set up a notification system so that the Departmental Representative can attend the tests prescribed in the technical specifications and identified in the ITP.
- .7 Inspections performed:
 - .1 The Contractor must be able to demonstrate the inspections carried out at any time during the work.
 - .2 The inspections carried out must also be verifiable in the Contractor's quality files. Depending on the discipline, the Contractor must monitor inspection levels using annotated drawings or computerized lists or databases.
 - .3 It must be possible at any time to check the progress of inspection and testing activities, with references to the reports generated.
 - .4 Regardless of the monitoring system adopted by the Contractor, its subcontractors and suppliers, it must be possible to demonstrate that 100% of the work, inspections, tests and reports have been completed.
- .8 Final inspection:
 - .1 At the end of the various stages of manufacturing and construction, the Contractor must declare the said parts complete and compliant, present their quality records and request that the Departmental Representative carry out the final inspection.

- .2 The Departmental Representative must be informed in advance of the request for the final inspection as defined in the contractual provisions.
- .3 Upon receipt of the request for final inspection, the Departmental Representative must perform the final inspection of materials and equipment before issuing an inspection certificate.
- .9 Quality records:
 - .1 The quality records of the Contractor, its subcontractors and suppliers must include, but are not limited to, the following documents:
 - .1 the Inspection and Test Plan (ITP) approved by the Departmental Representative;
 - .2 verification lists;
 - .3 relevant inspection and test reports;
 - .4 inspection and test procedures;
 - .5 materials analysis certificates;
 - .6 certificates of compliance;
 - .7 closing reports of non-conformities;
 - .8 declarations to the competent authorities;
 - .9 plans as constructed;
 - .10 specifications of welding procedures;
 - .11 qualification records for welding procedures;
 - .12 list of welders and welder qualification certificates;
 - .13 weld repair procedures;
 - .14 approved deviations where applicable.

1.15 QUALITY PLAN

- .1 The quality plan must explicitly describe the organization, assigned personnel, quality assurance personnel, activities, responsibilities, resources, documents used and applicable quality procedures used to implement the elements, in accordance with the requirements of the standards and regulatory provisions applicable to the execution of the work.
- .2 The quality plan must include:
 - .1 The terms and definitions, including acronyms and abbreviations;
 - .2 The organizational chart of the Contractor's project team and quality assurance personnel with their qualifications, and the organizational chart of subcontractors and suppliers;
 - .3 The scope of the Contractor's work and the list of subcontractors and suppliers with their scope of action;
 - .4 The list of procedures and references of sections of the Contractor's Quality Manual;
 - .5 Document control;
 - .6 Calibration of measuring equipment;
 - .7 Quality control records;

- .8 Control of non-conforming products;
 - .9 The audit with reference to the Quality Manual section;
 - .10 Applicable corrective measures;
 - .11 Identification of product traceability;
 - .12 Handling, storage, packaging, preservation and delivery of equipment;
 - .13 Specific exclusions that will not be covered by the Quality Plan.
- .3 The terms "Quality Control Plan", "Inspection and Test Plan (ITP)" and "Monitoring Plan" are synonymous and refer to the same type of documents.

1.16 INSPECTION AND TEST PLAN

- .1 The terms "Quality Control Plan", "Inspection and Test Plan (ITP)" and "Monitoring Plan" are synonymous and refer to the same type of documents.
- .2 The purpose of this section is to define instructions applicable to the Contractor for the preparation and issuance of Inspection and Test Plans for manufacturing, construction / installation or pre-operational checks.
- .3 This specification is intended for those responsible for quality control on the project once the applicable ITPs have been submitted in accordance with the contractual requirements.
- .4 This specification includes a standardized form that the parties responsible for quality control must use in the event that the format or content of their own ITP does not meet the requirements of these instructions.
- .5 The ITP review is based on the requirements of this document.
- .6 Identification:
 - .1 ITP code including revision number and date.
 - .2 Identify the client, the project, the region and the equipment tag number.
 - .3 Identify the contract as well as the component, workload, work, discipline or system in which the ITP applies.
 - .4 Identify the person in charge of quality assurance and quality control activities in the Contractor's facilities, its subcontractors and suppliers and on the work site.
 - .5 Obtain the signatures of the people responsible for verifying and approving the ITP.
 - .6 Identify each page of the ITP (99 of 99).
- .7 Elements and stages of work execution
 - .1 This is normally based on the detailed work program. An additional level and / or specific detail may be necessary.
- .8 Quality control points
 - .1 The necessary quality control points, with a brief description of their activities, are identified for each element or step in the execution of the work.
- .9 Responsibilities

- .1 Identify positions of responsibility for quality control activities.
- .10 Frequency
 - .1 Specify percentage, frequency or sampling applicable to quality control points.
- .11 Specifications reference
 - .1 Quality control activities must be described by specific and precise references to the specified requirements, i.e. drawings, sections of technical specifications and / or applicable codes and specifications, as the case may be.
- .12 Parameters and characteristics
 - .1 Identify and list the parameters and / or characteristics to be taken into consideration at the quality control points.
- .13 Criteria and tolerances
 - .1 Identify and list the criteria and / or tolerances to be used for acceptance at the level of quality control points.
- .14 Procedures Used
 - .1 Identify and list the procedures or instructions developed to control the execution of the work or the quality control activities.
- .15 Control equipment
 - .1 Describe and identify the equipment that will be used to carry out the measurement, inspection or test. Proof of calibration must be provided.
- .16 Checklists
 - .1 The information identified in this section must be incorporated into a list which will be annexed to the ITP as an integral part of it.
- .17 Forms
 - .1 Identify the forms to be used to record the results of the quality control and append the forms to the ITP. The results thus recorded by the Contractor include an inspection and test report.
 - .2 When the forms of the Contractor, his subcontractors and suppliers and the quality control procedures are not sufficient or satisfactory, the Departmental Representative reserves the right to incorporate all of his necessary forms or quality control procedures carrying out the supplier quality control program and ensuring the fulfillment of contractual quality control requirements.
- .18 Quality records
 - .1 In the ITP, identify the types of inspection and test reports to be submitted to the Departmental Representative, in batches, or in partial deliveries, in batches of quality register. Annex the table of contents and the submission schedule for the quality register lots to the ITP.
 - .2 The Contractor, and its subcontractors and suppliers must keep records of all the documents necessary to provide objective evidence, which

- demonstrates and verifies compliance with the quality assurance requirements specified in the contract.
- .3 The Contractor is responsible for ensuring the security of these records throughout the period of the contract. The Contractor must submit quality files to the Departmental Representative on time and in the quantities specified in the contract.
- .4 Unless otherwise agreed, the original test certificates are required. When it is not possible for the Contractor to provide the Departmental Representative with the originals for reasons acceptable to the Departmental Representative, copies of the certificates and reports will only be accepted if they are individually certified as being a copy of the original.
- .5 There will be no modifications or transcriptions other than those authorized in this paragraph. The quality of certified photocopies must be clear enough to allow scanning and photocopying; otherwise, they must be subject to non-acceptance. Transposition of data from the original is not acceptable.
- .6 All documentation relating to tests and inspection must be provided with:
 - .1 project number;
 - .2 the applicable item number / tag number and / or part number;
 - .3 the designation of the project.
- .19 Traceability
 - .1 General
 - .1 Full traceability definitions and contract compliance are detailed below.
 - .2 Full traceability
 - .1 Full traceability is required for items requiring an inspection certificate. All other elements are to demonstrate the compliance of the contract. For components for which full traceability is required, the Contractor, its subcontractors and suppliers must maintain a traceability system which guarantees that the materials used can be identified with certainty towards the manufacturer's certificates of origin. The measures that will be adopted by the Contractor, its subcontractors and suppliers to achieve the objectives set are the following:
 - .1 Materials must be verified upon receipt with the manufacturer's certificates of origin for compliance with the specified requirements.
 - .2 The batches of material, the details of the specifications and of grade must be identified (by permanent marking when possible) throughout the manufacturing.
 - .3 Equipment location records must be maintained.

- .2 Before the application of the final surface treatment, a complete register of the location of the equipment must be compiled for incorporation in the manufacturing data records:
 - .1 Construction records must contain the records of location of the equipment and the manufacturer's certificates of origin.
 - .2 The harvesting records must be maintained.
 - .2 Compliance with the contract
 - .1 For items for which compliance with the contract is required, the Contractor must maintain a traceability system so that the verification of the system can confirm compliance with the requirements of the contract.
 - .2 Materials must be verified upon receipt in accordance with contract requirements. The Contractor must, for the materials which are issued in batches (for example cable, welding consumables, etc.), maintain the segregation and traceability of batches of goods, from storage to point of use.
- .20 Quality control monitoring points
 - .1 Before the start of work, the categories of quality control monitoring points must be identified during the ITP review and approval process.
 - .2 The choice of monitoring points depends on the level of monitoring selected, based on the requirements of the quality monitoring specifications.
- .21 Review
 - .1 The ITP and its appendices must be examined and accepted by the Departmental Representative and / or the quality control monitoring by the Departmental Representative before the start of the work.
 - .2 Inspection and test reports, as well as roadmaps if applicable, must be prepared and reviewed by the quality control monitoring of the Departmental Representative on an ongoing basis while the work in question progresses so that the quality record lots can be assembled before provisional acceptance.
- .22 Typical ITP form
 - .1 An example of a typical ITP form will be provided by the Departmental Representative at the start of the work. The supplier may present their own ITP format, but all the elements defined in this specification must be addressed.

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 REFERENCE STANDARDS

- .1 U.S. Environmental Protection Agency (EPA) / Office of Water
 - .1 EPA 832R92005, Storm Water Management for Construction Activities:
Developing Pollution Prevention Plans and Best Management Practices.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

1.3 INSTALLATION AND REMOVAL

- .1 Provide temporary utilities controls in order to execute work expeditiously.
- .2 Dismantle equipment and evacuate it from the site when it is no longer needed.

1.4 DEWATERING

- .1 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.

1.5 WATER SUPPLY

- .1 Provide continuous supply of potable water for construction use.
- .2 Arrange for connection with appropriate utility company and pay costs for installation, maintenance and removal.
- .3 Pay for utility charges at prevailing rates, based on General Conditions of Contract.

1.6 TEMPORARY HEATING AND VENTILATION

- .1 Provide the temporary heating required during the construction period, including attendance, maintenance and fuel.
- .2 Construction heaters used inside building must be vented to outside or be flameless type. Solid fuel salamanders are not permitted.
- .3 Provide temporary heat and ventilation in enclosed areas as required to:
 - .1 Facilitate progress of Work.
 - .2 Protect Work and products against humidity and the cold.
 - .3 Prevent moisture condensation on surfaces.
 - .4 Provide appropriate ambient temperatures and humidity levels for storage, installation and curing of materials.
 - .5 Provide adequate ventilation to meet health regulations for safe working environment.
- .4 Maintain temperatures to a minimum of 10 degrees Celsius in areas where construction is in progress.

- .5 Ventilating:
 - .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
 - .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
 - .3 Dispose of exhaust materials in a manner that will not result in harmful exposure to people.
 - .4 Ventilate storage spaces containing hazardous or volatile materials.
 - .5 Ventilate temporary sanitary facilities.
 - .6 Continue the operation of ventilation and exhaust systems for some time after the end of the work process to assure removal of harmful contaminants.
- .6 The permanent heating system of the building, is not to be used when available.
- .7 Ensure that the Date of Substantial Performance and Warranties for heating system do not start until the entire system is in as near original condition as possible and is certified by the Departmental Representative.
- .8 Pay costs the for maintaining temporary heat, when using permanent heating system.
- .9 Ensure strict monitoring of the operation of heating and ventilation equipment at all times, ensuring that the following requirements are met:
 - .1 Conform to applicable codes and standards.
 - .2 Enforce safe practices.
 - .3 Prevent abuse of services.
 - .4 Prevent damage to finishes.
 - .5 Vent direct-fired combustion units to outside.
- .10 Take full responsibility for damage to structures due to improper heating or protection conditions maintained during the work.

1.7 TEMPORARY POWER AND LIGHT

- .1 Provide and pay for the temporary supply of electric current necessary for the lighting and operation of the mechanical tools during work, up to a maximum of 230 V, 30 A..
- .2 Arrange for a connection with the appropriate utility company. Pay the costs for installation, maintenance and removal.
- .3 The power supply for cranes and other devices operating under a current with characteristics superior to those mentioned in the previous paragraph will be provided by the Departmental Representative.
- .4 Provide temporary lighting of the premises for the duration of the work and ensure the maintenance of the network. The devices must provide a level of illumination of at least 162 lux on floors and stairs.

1.8 TEMPORARY COMMUNICATION FACILITIES

- .1 The Contractor must provide temporary telecommunications facilities, including telephones, fax machines, data processing systems, including lines, and necessary equipment, for his own use and for the use of the Departmental Representative; the Contractor must ensure the connection of these installations to the main networks and assume the costs of all these.

1.9 FIRE PROTECTION

- .1 Provide and maintain temporary fire protection equipment, during the performance of the Work, required by the insurance companies having jurisdiction, the governing codes, regulations and bylaws.
- .2 Burning rubbish and construction waste materials is not permitted on Site.

PART 2 PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 EXECUTION

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to the requirements of authorities having jurisdiction.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during the construction until permanent vegetation has been established.
- .3 Remove the erosion and sedimentation controls, restore and stabilize the areas disturbed during removal.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2- 1994, Stipulated Price Contract.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.
 - .2 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.
- .3 CSA Group (CSA)
 - .1 CSA-A23.1/A23.2-F04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA-0121-M1978(R2003), Douglas Fir Plywood.
 - .3 CAN/CSA-S269.2-M1987(R2003), Access Scaffolding for Construction Purposes.
 - .4 CAN/CSA-Z321-96(R2001), Signs and Symbols for the Occupational Environment.
- .4 Public Works Government Services Canada (PWGSC) Standard Acquisition Clauses and Conditions (SACC)-ID: R0202D, Title: General Conditions 'C', In Effect as of: May 14, 2004.
- .5 U.S. Environmental Protection Agency (EPA) / Office of Water
 - .1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

1.3 INSTALLATION AND REMOVAL

- .1 Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, means of ingress/egress to fenced area and details of fence installation.
- .2 Identify areas which have to be gravelled to prevent tracking of mud.
- .3 Indicate use of supplemental or other transit area.
- .4 Provide, set up or install construction facilities in order to execute work expeditiously.
- .5 Dismantle equipment and evacuate it from the site when it is no longer needed.
- .6 Clean, level and develop the area of site installations.

1.4 SCAFFOLDING

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

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

1.5 HOISTING

- .1 Provide, operate and maintain hoists and cranes required for moving workers, materials and equipment. Make financial arrangements with Subcontractors for their use of hoists.
- .2 Hoists and cranes to be operated by qualified operators.

1.6 SITE STORAGE/LOADING

- .1 Ensure that the work is carried out within the limits indicated in the Contractual Documents. Do not unreasonably clutter the premises with materials and equipment.
- .2 Do not overload or allow the overloading of any part of the work so as not to compromise its integrity.

1.7 CONSTRUCTION PARKING

- .1 Parking will be permitted on site, provided it does not disrupt performance of Work.
- .2 Provide and maintain adequate access to project site.
- .3 Clean runways and taxi areas where used by Contractor's equipment.

1.8 SECURITY

- .1 Provide and pay for responsible security personnel to guard the site and the contents of the site after working hours and during holidays.

1.9 OFFICES

- .1 Provide office heated to 22 degrees Celsius, lighted with 750 lx and ventilated, of sufficient size to accommodate site meetings and furnished with drawing laydown table.
- .2 Provide a complete and identified first aid kit and store it in an easily accessible location.
- .3 If necessary, subcontractors must set up their own office. Tell them where they can settle.
- .4 Departmental Representative's Site office.
 - .1 Provide temporary office for the Departmental Representative.
 - .2 The inside dimensions should be minimum 3.6 m long x 3 m wide x 2.4 m high, with the floor being 0.3 m above grade, and have 4 windows opening at 50% and one lockable door.
 - .3 Insulate the office and provide heating system to maintain 22 degrees Celsius inside, when the temperature is -20 degrees Celsius outside.
 - .4 Finish inside walls and ceiling with plywood, hardboard or wallboard and paint in selected colours. Finish floor with 19 mm thick plywood.

- .5 Install electrical lighting system to provide minimum 750 lx using surface mounted shielded commercial fixtures with 10% upward light component.
- .6 Provide private washroom facilities adjacent to office, with flush or chemical type toilet, lavatory and mirror and maintain supply of paper towels and toilet tissue.
- .7 Equip office with 1 x 2 m table, 4 chairs, 6m of 300 mm wide shelving, a 3-drawers filing cabinet, one plan viewing rack and one coat rack with shelf.
- .8 Maintain it in clean condition.
- .9 The office of the Departmental Representative may be a rented space in a building or construction trailers. It must be installed five (5) days before the start of work. The office must be located less than (0.5) km from the site. Before the start of work, the site must be submitted for approval by the Departmental Representative.
- .10 The office must have the following equipment:
 - .1 One (1) work desk with one (1) swivel office chair;
 - .2 One (1) table for viewing plans measuring 1.5 m wide by 2 m long and a stool;
 - .3 One (1) meeting table, 1.5 m wide by 20 m long with twenty (20) chairs;
 - .4 One (1) plan support;
 - .5 ten (10) boxes of 8 1/2 " x 11 "paper, ten (10) boxes of 8 1/2 " x 14" paper, and five (5) boxes of 11 "x 17" paper (one (1) box = 10 x 500 sheets, 75g /m²) as well as two (2) black ink cartridges for photocopier and four (4) cartridges for fax machine;
 - .6 Two (2) legal size document binders with two (2) drawers with lock;
 - .7 One (1) copier and scanner with automatic feeder for 8 1/2 " x 11", 8 1/2 " x 14" and 11"x 17" formats;
 - .8 One (1) high speed Internet subscription with messaging service;
 - .9 One (1) distributor of cold and hot water, including drinking water supply;
 - .10 One (1) refrigerator, one (1) toaster, one (1) coffee maker and one (1) microwave of at least 1000 watts.
- .11 All of this equipment is for the exclusive use of the Departmental Representative. All equipment must be installed and be operational at least five (5) days before the start of work.
- .12 Near the office, there must be two (2) lavatories for the use of the supervisor and his representatives, including sinks, toilet paper, soap and hand paper for the duration of the contract.
- .13 Maintenance and cleaning of the premises must be carried out daily and are the responsibility of the Contractor. Housework (vacuum cleaner, emptying baskets of recycled paper in the large capacity bin, emptying

baskets of non-recyclable materials) must be carried out every day after normal office hours.

- .14 The Contractor must install waste paper baskets in each closed office, conference room and work office. A recovery service must collect the paper to be recycled weekly. In addition, a large capacity recycling bin must be provided to collect the recycled paper from each basket on a daily basis.
- .15 The Contractor must provide the Department and the Departmental Representative with a minimum number of five (5) parking spaces. These spaces must be located within the limits of the site within a radius of one hundred (100) meters from the site premises, on a surface suitable for vehicles and must be reserved for the exclusive use of the Department. Departmental parking spaces are not to be used for storage.
- .16 The Contractor must maintain the office of the supervisor until acceptance without reservation of work by the Departmental Representative and until the end of the joint measurement of quantities for final payment.
- .17 In addition to the minimum area provided for site offices, the Contractor must provide a closed place for the storage of laboratory equipment that has commercial type locks. This place must allow direct access from the outside.

1.10 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, but make sure that their location causes the least interference with work activities.

1.11 SANITARY FACILITIES

- .1 Provide sanitary facilities for workers in accordance with governing regulations and ordinances.
- .2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.
- .3 When permanent water and drain connections are completed, provide temporary water closets and urinals complete with temporary enclosures, inside the building. Permanent facilities may be used upon approval of the Departmental Representative.

1.12 CONSTRUCTION SIGNAGE

- .1 Provide and erect project sign, within three (3) weeks of signing the Contract, in a location designated by the Departmental Representative.
- .2 The sign must measure 2 m x 2 m, be made of plywood with a wooden frame and bear an inscription made by a lettering painter.

- .3 Indicate on sign, the name of the Owner, the Departmental Representative and the Contractor; the stylized lettering used will be determined by the Departmental Representative.
- .4 No other signs or advertisements, other than warning signs, are permitted on site.
- .5 Locate the project identification sign as directed by the Departmental Representative and construct as follows:
 - .1 Build concrete foundation, erect framework, and attach signboard to framing.
 - .2 Paint surfaces of signboard and framing with one coat primer and two coats enamel. Colour white on signboard face, black on other surfaces.
 - .3 Apply vinyl sign face overlay to painted signboard face in accordance with installation instruction supplied.
- .6 Signs and notices for safety and instruction must be in both official languages. Graphic symbols must comply with CAN/CSA-Z321.
- .7 Maintain approved signs and notices in good condition for the duration of the project, and dispose of them off site upon completion of the project or earlier if directed by the Departmental Representative.

1.13 PROTECTION AND MAINTENANCE OF TRAFFIC

- .1 Provide access and temporary relocated roads as necessary to maintain traffic.
- .2 Maintain and protect traffic on affected roads during the construction period except as otherwise specifically directed by the Departmental Representative.
- .3 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs
- .4 Protect travelling public from damage to people and property.
- .5 The Contractor's rolling stock used to transport materials entering or leaving the site must interfere as little as possible with public traffic.
- .6 Verify adequacy of existing roads and allowable load limit on these roads. The Contractor is responsible for repairing the damage to roads caused by the construction operations.
- .7 Construct the access and haul roads necessary.
- .8 Haul roads: constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided.
- .9 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.
- .10 Dust control: adequate to ensure safe operation at all times.
- .11 Location, grade, width, and alignment of the construction and hauling roads: subject to approval by the Departmental Representative.

- .12 Lighting: to assure full and clear visibility for full width of haul road and work areas during night work operations.
- .13 Provide snow removal during period of Work.
- .14 Upon completion of the work, remove the haul roads designated by the Departmental Representative.

1.14 CLEAN-UP

- .1 Remove construction debris, waste materials, packaging material from work site daily.
- .2 Clean dirt or mud tracked onto paved or surfaced roadways.
- .3 Store materials resulting from demolition activities that are salvageable.
- .4 Do not store new materials or recovered materials in the site installations.
- .5 The Contractor must clear the accesses and site area, if required

1.15 CONSTRUCTION SIGNS

- .1 No sign of the Contractor or its subcontractors is permitted on the site or in the vicinity thereof.

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 REFERENCE STANDARDS

- .1 Canadian General Standards Board (CGSB)
 - .1 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.
 - .2 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.
- .2 CSA Group (CSA)
 - .1 CSA-O121-M1978(R2003), Douglas Fir Plywood.
- .3 Public Works Government Services Canada (PWGSC) Standard Acquisition Clauses and Conditions (SACC)-ID: R0202D, Title: General Conditions 'C', In Effect as Of: May 14, 2004.

1.2 INSTALLATION AND REMOVAL

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

1.3 HOARDING

- .1 Erect temporary site enclosures using 38 x 89 mm construction grade lumber framing at 600 mm center to center, and 1200 x 2400 x 13 mm exterior grade fir plywood to comply with CSA O121.
- .2 Apply plywood panels vertically, flush and butt jointed, as indicated.
- .3 Provide lockable truck entrance gates and at least one pedestrian door as directed and conforming to applicable traffic restrictions on adjacent streets. Equip gates with locks and keys.
- .4 Erect and maintain pedestrian walkways with roof and side covers, complete with signs and electrical lighting as required by law.
- .5 Paint the public side of the site enclosure in selected colours with one coat primer to comply with CAN/CGSB 1.189 and one coat exterior paint to comply with CGSB 1.59. Maintain public side of enclosure in clean condition.
- .6 Erect temporary site enclosure using new 1.2 m high snow fence attached with metal wire to T-shaped posts arranged at 2.4 m center to center. Provide one (1) lockable truck gate. Maintain fence in good repair.
- .7 Provide barriers around trees and plants designated to remain. Protect them from damage by equipment and construction procedures.

1.4 GUARD RAILS AND BARRICADES

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

1.5 WEATHER ENCLOSURES

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

1.6 DUST TIGHT SCREENS

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

1.7 ACCESS TO SITE

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

1.8 PUBLIC TRAFFIC FLOW

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

1.9 FIRE ROUTES

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

1.10 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

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

1.11 PROTECTION OF BUILDING FINISHES

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

1.12 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for recycling / reuse in accordance with Section 01 74 19- 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 REFERENCE STANDARDS

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2-94, Stipulated Price Contract.
 - .2 DOC 14-2000, Design-Build Stipulated Price Contract.
 - .3 DOC 15-2000, Design-Builder/ Consultant Contract.
- .2 Within text of each specifications section, reference may be made to reference standards. List of standards reference writing organizations is contained in Section 01 41 00 - Regulatory Requirements.
- .3 Conform to these reference standards, in whole or in part as specifically requested in the specifications.
- .4 If there is question as to whether products or systems are in conformance with applicable standards, the Departmental Representative reserves the right to have such products or systems tested to prove or disprove conformance.
- .5 Cost for such testing will be borne by the Departmental Representative in the event of conformance with Contract Documents or by the Contractor in the event of non-conformance.

1.2 QUALITY

- .1 Refer to CCDC 2.
- .2 Refer to DOC 15.
- .3 Products, materials, equipment and articles incorporated in the Work shall be new, not damaged or defective, and of the best quality for the purpose intended. If requested, furnish evidence as to type, source and quality of products provided.
- .4 Procurement policy is to acquire, in cost effective manner, items containing the 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 the execution of work.
- .5 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of the previous inspections. Inspections do not relieve the Contractor from his responsibilities, but are a precaution against oversight or error. The Contractor will remove and replace defective products at his own expense and will be responsible for the delays and expenses caused by the rejection.
- .6 In case of conflict as to the quality or suitability of the products, only the Departmental Representative may make a decision based on the requirements of the Contract Documents.

- .7 Unless otherwise specified in the specifications, promote a certain uniformity by ensuring that materials or elements of the same type come from the same manufacturer.
- .8 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.3 AVAILABILITY

- .1 Immediately upon signing the Contract, review the product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify the Departmental Representative of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.
- .2 In event of failure to notify the Departmental Representative at the commencement of Work and should it subsequently appear that Work may be delayed for such reasons, the Departmental Representative reserves the right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.4 STORAGE, HANDLING AND PROTECTION

- .1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with the 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 suspected to be 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, panel materials, or lumber on flat, solid supports and keep clear of ground. Provide a slope for moisture flow out.
- .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 the satisfaction of the Departmental Representative.
- .9 Touch-up damaged factory finished surfaces to the Departmental Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.5 TRANSPORTATION

- .1 Pay costs of transportation of products required the execution of the Work.
- .2 Transportation cost of products supplied by Owner will be paid for by the Departmental Representative. Unload, handle and store such products.

1.6 MANUFACTURER'S INSTRUCTIONS

- .1 Unless otherwise indicated in the specifications, install or erect products in accordance with the manufacturer's instructions. Do not rely on labels or enclosures provided with the products. Obtain written instructions directly from manufacturers.
- .2 Notify the Departmental Representative in writing, of conflicts between specifications and manufacturer's instructions, so that the Departmental Representative will establish the course of action.
- .3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes the Departmental Representative to require removal and re-installation at no increase in Contract Price or Contract Time.

1.7 QUALITY OF WORK

- .1 Ensure that the Quality of Work is of the highest standard, executed by workers experienced and skilled in the respective duties for which they are employed. Immediately notify the Departmental Representative if the executed Work is such as to make it impractical to produce required results.
- .2 Do not employ anyone unskilled in their required duties. The Departmental Representative reserves the right to require the dismissal from the site, for workers deemed incompetent or careless.
- .3 Only the Departmental Representative can settle disputes concerning the quality of work execution and the skills of the workers, and his decision is final.

1.8 CO-ORDINATION

- .1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.
- .2 It is the Contractor's responsibility to ensure the coordination of work and the installation of openings, sleeves and accessories.

1.9 CONCEALMENT

- .1 In finished areas conceal pipes, ducts and wiring in the floors, walls and ceilings, except where indicated otherwise.
- .2 Before installation inform the Departmental Representative of any abnormal situation. Install as directed by the Departmental Representative.

1.10 REMEDIAL WORK

- .1 Refer to CCDC 2
- .2 Refer to DOC 15

- .3 Perform the remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Coordinate the work to be carried out on the contiguous structures affected, as required.
- .4 Perform remedial work by specialists familiar with the materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.11 LOCATION OF FIXTURES

- .1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.
- .2 Inform the Departmental Representative of any problem that may be caused by the choice of the location of an appliance and proceed with the installation according to his instructions.

1.12 FASTENINGS

- .1 Provide metal fastenings and accessories in same texture, colour and finish as the 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 Sections of the specifications.
- .4 It is important to determine the spacing of the anchors taking into account the limit loads and the shear strength in order to ensure a permanent frank anchorage. Pegs made of wood or any other organic materials are not accepted.
- .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.

1.13 FASTENINGS - EQUIPMENT

- .1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for intended use.
- .2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use No. 304 stainless steel for exterior areas.
- .3 The bolt must not exceed the top of the nuts by a length greater than their diameter.
- .4 Use plain type washers on equipment, sheet metal and use soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel materials and equipment.

1.14 PROTECTION OF WORK IN PROGRESS

- .1 Prevent overloading any parts of the building. Do not cut, drill or sleeve load bearing structural member, unless specifically indicated in written approval from the Departmental Representative.

1.15 EXISTING UTILITIES

- .1 When it comes to making connections to existing networks, perform them at the times fixed by the competent local authorities while minimizing interference with the work in progress, the movement of pedestrians and vehicles / or the occupants of the building.
- .2 Protect, relocate or maintain existing service utilities. When services are encountered, cap off in a manner approved by the authority having jurisdiction. Stake and 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 REFERENCE STANDARDS

- .1 Owner's identification of existing survey control points and property limits.

1.2 QUALIFICATIONS OF SURVEYOR

- .1 Qualified registered land surveyor, licensed to practise in the Place where the Work is carried out, acceptable to Departmental Representative.

1.3 SURVEY REFERENCE POINTS

- .1 Existing base horizontal and vertical control points are designated on drawings.
- .2 Locate, confirm and protect control points prior to starting the site work. Preserve permanent reference points during the construction.
- .3 Make no changes or relocations without prior written notice to the Departmental Representative.
- .4 Report to the Departmental Representative when a reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
- .5 Require surveyor to replace control points in accordance with original survey control.

1.4 SURVEY REQUIREMENTS

- .1 Establish two (2) permanent bench marks on site, based on the benchmarks already established according to control points. Record locations, with horizontal and vertical data in Project Record Documents.
- .2 Establish lines and levels, then determine locations and layout using surveying instruments.
- .3 Stake for grading, fill and topsoil placement, as well as landscaping features.
- .4 Stake slopes and berms.
- .5 Establish pipe invert elevations.
- .6 Stake batter boards for foundations.
- .7 Establish foundation, column locations, and floor elevations.
- .8 Establish lines and levels for mechanical and electrical work.

1.5 EXISTING SERVICES

- .1 Before starting the work, establish the location and the extent of the service lines in the area of Work and notify the Departmental Representative of the findings.
- .2 Remove abandoned service lines within 2m of the structures. Cap or seal lines at cut-off points as directed by Departmental Representative.

1.6 LOCATION OF EQUIPMENT AND FIXTURES

- .1 The location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.
- .2 Locate equipment, fixtures and distribution systems to provide minimum interference and to maximize the usable space and in accordance with the manufacturer's recommendations for safety, access and maintenance.
- .3 Inform the Departmental Representative of impending installation and obtain his approval for their actual location.
- .4 Submit field drawings to indicate the relative position of various services and equipment when required by the Departmental Representative.

1.7 RECORDS

- .1 Maintain a detailed and precise record of the surveying and verification work as it progresses.
- .2 Upon completion of foundations and major site improvements, prepare a certified survey showing dimensions, locations, angles and elevations of the Work.
- .3 Record the locations of maintained, re-routed and abandoned service lines.

1.8 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit the name and address of the Surveyor to the Departmental Representative.
- .2 Upon request of the Departmental Representative, submit documentation to verify the accuracy of the field engineering work.
- .3 Submit a certificate signed by the surveyor certifying and noting the elevations and locations of the completed Work, both compliant and non-compliant with the Contractual Documents.

PART 2 PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

- .1 Not Used.

END OF SECTION

PART 1 GENERAL

1.1 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit a written request before cutting and patching work that may affect the following:
 - .1 The structural integrity of elements of the project.
 - .2 Integrity of weather-exposed or moisture-resistant elements;
 - .3 The efficiency, maintenance or safety of operational elements;
 - .4 The aesthetic qualities of the visible elements;
 - .5 The work of the Owner or another contractor.
- .3 Include in request:
 - .1 The identification of the project.
 - .2 Location and description of affected Work.
 - .3 Statement on the necessity for cutting or patching.
 - .4 Description of the proposed Work, and products to be used.
 - .5 Alternatives to cutting and patching.
 - .6 The impact of cutting and patching on the work carried out by the Owner or by another contractor.
 - .7 Written permission of the affected contractor.
 - .8 Date and time when the work will be executed.

1.2 MATERIALS

- .1 Materials / equipment allowing to carry out an identical installation.
- .2 Any modification concerning materials / equipment must be the subject of a request for substitution in accordance with Section 01 33 00 - Submittal Procedures.

1.3 PREPARATION

- .1 Inspect the site in order to examine the existing conditions and identify the elements likely to be damaged or moved during the cutting and patching work.
- .2 After having exposed the elements, inspect them in order to identify any condition likely to influence the execution of the work.
- .3 The beginning of the cutting or patching means the acceptance of the existing conditions.
- .4 Provide supports to assure the structural integrity of the surroundings; provide devices and methods to protect other portions of project from damage.
- .5 Provide protection for surfaces that could be exposed to the weather as a result of the exposure of the work; keep excavations free of water.

1.4 EXECUTION

- .1 Execute the cutting, fitting, patching, excavation and fill work necessary to complete Work.
- .2 Adjust the different elements together so that they integrate well with the rest of the work.
- .3 Uncover the work so as to allow the execution of work which, for one reason or another, should have been done at another time.
- .4 Remove and replace defective and non-conforming Work.
- .5 Remove samples of installed Work for testing.
- .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 are not allowed to be used 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 When crossing fire resistant walls, ceilings or floors, completely block the voids around the openings with fire resistant material, in accordance with Section 07 84 00 – Fire stopping, over the entire thickness of the crossed element
- .13 Refinish surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing the entire unit.
- .14 Unless otherwise specified, conceal piping, air ducts and wiring in the walls, ceilings and floors of rooms and finished areas.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for their recycling /reuse in accordance with Section 01 74 19- 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 REFERENCE STANDARDS

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2-2008, Stipulated Price Contract.

1.2 PROJECT CLEANLINESS

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

1.3 FINAL CLEANING

- .1 Upon substantial completion of Work, remove surplus materials, tools as well as equipment and construction materials which are no longer necessary for the execution of the rest of the Work.
- .2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.

- .3 Prior to the final review remove the surplus products, tools, construction machinery and equipment.
- .4 Remove waste products and debris including those caused by the Owner or other Contractors.
- .5 Remove waste materials from site at regularly scheduled times or dispose of them as directed by the Departmental Representative. Do not burn waste materials on site, unless approved by the Departmental Representative.
- .6 Make arrangements with and obtain permits from the authorities having jurisdiction for the disposal of wastes and debris.
- .7 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.
- .8 Remove stains, spots, marks, scratches and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, floors and ceilings.
- .9 Clean lighting reflectors, lenses, and other lighting surfaces.
- .10 Vacuum clean and dust building interiors, behind grilles, louvres and screens.
- .11 Wax, seal, shampoo or prepare floor finishes, as recommended by the manufacturer.
- .12 Examine finishes, accessories and materials to ensure that they meet prescribed requirements in terms of operation and quality of the execution.
- .13 Sweep and clean sidewalks, steps and other exterior surfaces; sweep or rake the rest of the field.
- .14 Remove dirt and other disfiguration from exterior surfaces.
- .15 Clean and sweep roofs, gutters, areaways, and window sinks.
- .16 Sweep and wash clean paved areas.
- .17 Clean equipment and fixtures to sanitary condition; clean or replace filters of mechanical equipment.
- .18 Clean roofs, downspouts, and drainage systems.
- .19 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.
- .20 Remove snow and ice from access road leading to the building.

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse / recycling in accordance with Section 01 74 19 - 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 SUMMARY

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

1.2 RELATED REQUIREMENTS

- .1 Section 01 51 00 – Temporary Utilities
- .2 Section 01 52 00 – Construction Facilities
- .3 Section 02 81 00 – Hazardous Materials

1.3 REFERENCE STANDARDS

- .1 American Society for Testing and Materials (ASTM):
 - .1 ASTM E1609 01, Standard Guide for Development and Implementation of a Pollution Prevention Program
- .2 Canada Green Building Council (CaGBC)
 - .1 LEED® Reference Guide for Building Design and Construction, Version 4

1.4 DEFINITIONS

- .1 Clean Waste: Untreated and unpainted; not contaminated with oils, solvents, sealants or similar materials.
- .2 Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling operations, repair and demolition.
- .3 Hazardous: Exhibiting the characteristics of hazardous substances including properties such as ignitability, corrosiveness, toxicity or reactivity.
- .4 Non hazardous: Exhibiting none of the characteristics of hazardous substances, including properties such as ignitability, corrosiveness, toxicity, or reactivity.
- .5 Non toxic: Not poisonous to humans either immediately or after a long period of exposure.
- .6 Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.
- .7 Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.
- .8 Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form; recycling does not include burning, incinerating, or thermally destroying waste.
- .9 Return: To give back reusable items or unused products to vendors for credit.
- .10 Reuse: To reuse a construction waste material in some manner on the project site.
- .11 Salvage: To remove a waste material from the project site to another site in order to resale or reuse by others.
- .12 Sediment: Soil and other debris that has been eroded and transported by storm or well production run off water.
- .13 Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.
- .14 Toxic: Poisonous to humans either immediately or after a long period of exposure.
- .15 Trash: Any product or material unable to be reused, returned, recycled, or salvaged.
- .16 Volatile Organic Compounds (VOC's): Chemical compounds common in and emitted by many building products over time through outgassing of:
 - .1 Solvents in paints and other coatings;
 - .2 Wood preservatives; strippers and household cleaners;
 - .3 Adhesives in particleboard, fiberboard, and some plywood; and foam insulation.
 - .4 When released, VOC's can contribute to the formation of smog and can cause respiratory tract problems, headaches, eye irritations, nausea,

damage to the liver, kidneys, and central nervous system, and possibly cancer.

- .17 Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.
- .18 Construction Waste Management Plan: A project related plan for the collection, transportation, and disposal of the waste generated at the construction site; the purpose of the plan is to ultimately reduce the amount of material being landfilled.

1.5 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination: Coordinate waste management requirements with all Divisions of the Work for the project, and ensure that requirements of the Construction Waste Management Plan are followed.
- .2 Preconstruction Meeting: Arrange a pre-construction meeting in accordance with Section 01 31 19 – Project Meetings, before starting any Work of the Contract, attended by the Owner, the Contractor, affected Subcontractor's and the Departmental Representative to discuss the Construction Waste Management Plan and to develop mutual understanding of the requirements for a consistent policy towards waste reduction and recycling.

1.6 SUBMITTALS

- .1 Provide required information in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Action Submittals: Provide the following submittals before starting any work of this Section:
 - .1 Draft Construction Waste Management Plan (Draft CWM Plan): Submit to the Departmental Representative a preliminary analysis of the anticipated site generated waste by listing a minimum of five (5) construction or demolition waste streams that have a potential to generate the most volume of material indicating methods that will be used to divert construction waste from landfill and source reduction strategies; the Contractor will provide commentary before the development of the Construction Waste Management Plan.
 - .2 Construction Waste Management Plan (CWM Plan): Submit a CWM Plan for this project prior to any waste removal from site and that includes the following information:
 - .1 Material Streams: Analysis of the proposed site generated waste, including material types and quantities forming part of the material flow mentioned in the Draft CWM Plan; materials removed from site destined for alternative daily cover at landfill sites and land clearing debris cannot be considered as contributing to waste diversion and will be included as a component of the total waste generated for the site.

- .2 Recycling Haulers and Markets: Investigate local haulers and markets for recyclable materials, and incorporate them into the CWM Plan.
- .3 Alternative Waste Disposal: Prepare a list of each material proposed to be salvaged, reused, recycled or composted during the course of the project, and the proposed local market for each material.
- .4 Landfill Materials: Identify materials that cannot be recycled, reused or composted and provide an explanation or a justification; the energy recovery from waste will be considered as a viable alternative diversion strategy for these materials where facilities exist.
- .5 Landfill Options: The name of the landfill where trash will be disposed of; landfill materials will form a part of the total waste generated by the project.
- .6 Materials Handling Procedures: A description of the means by which any recycled waste materials will be protected from contamination, and a description of the means to be employed in recycling the above materials consistent with requirements for acceptance by designated facilities.
- .7 Transportation: A description of the means of transportation of the recyclable materials, whether materials will be site separated and self hauled to designated centers, or whether mixed materials will be collected by a waste hauler and removed from the site, and destination of materials.

1.7 PROJECT CLOSEOUT SUBMISSIONS

- .1 Record Documentation: Submit as constructed information in accordance with Section 01 78 00 – Closeout Submittals as follows:
 - .1 Construction Waste Management Report (CWM Report): Submit a CWM Report for this project submittal requirements and that includes the following information:
 - .1 Accounting: Submit information indicating total waste produced by the project.
 - .2 Composition: Submit information indicating types of waste material and quantity of each material.
 - .3 Diversion Rate: Submit information indicating total waste diverted from landfill as a percentage of the total waste produced by the project.
 - .4 Diversion Documentation or Transportation Documentation: Submit copies of transportation documents or shipping manifests indicating the weights of materials, and other evidence of disposal indicating final location of waste diverted from landfill and waste sent to landfill.

- .5 Alternative Daily Cover (ADC): Submit quantities of material that were used as ADC at landfill sites, and that form a part of the total waste generated by the project.
- .6 Multiple Waste Hauling: Compile all information into a single CWM Report where multiple waste hauling and diversion strategies were used for the project.
- .7 Photographs: Submit photographs of waste diversion facilities documenting the location and the signage describing the usage of waste separation containers.

1.8 QUALITY ASSURANCE

- .1 Resources for the Development of Construction Waste Management Report (CWM Report): The following sources may be useful in developing the Draft Construction Waste Management Plan:
 - .1 Recycling Haulers and Markets: Investigate local haulers and markets for recyclable materials, and incorporate into CWM Plan.
 - .2 Waste-to-Energy Systems: Investigate local waste-to-energy incentives where systems for diverting materials from landfill for reuse or recycling are not available.

1.9 DELIVERY, STORAGE AND HANDLING

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

PART 2 PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 EXECUTION

3.1 (CWM PLAN) IMPLEMENTATION

- .1 Manager: The Contractor is responsible for designating an on site party or parties responsible for instructing workers and overseeing and documenting results of the CWM Plan for the project.
- .2 Distribution: Distribute copies of the CWM Plan to the site foreman, each Subcontractor, the Owner, the Departmental Representative and other site personnel as required.
- .3 Instruction: Provide on-site instruction of the appropriate separation, handling, and recycling, salvage, reuse, composting and return methods being used for the project to the Subcontractor's at the appropriate stages of the project.
- .4 Separation Facilities: Lay out and label a specific area to facilitate separation of materials for potential recycling, salvage, reuse, composting and return:
 - .1 Recycling and waste bin areas are to be kept neat and clean and clearly marked in order to avoid contamination of materials.
 - .2 Hazardous wastes shall be separated, stored, and disposed of in accordance with local regulations.
- .5 Progressive Documentation: Submit a monthly summary of waste generated by the project to ensure that waste diversion goals are on track with project requirements:
 - .1 Submission of waste summary can coincide with application for progress payment, or similar milestone event as agreed upon between the Owner, the Contractor and the Departmental Representative.
 - .2 Monthly waste summary shall contain the following information:
 - .1 The amount in tonnes or m³ of buried materials and the location of the material landfilled,
 - .2 The amount in tonnes or m³ of materials diverted from landfill
 - .3 Indication of the progress based on the total waste generated by the project and the percentage of materials diverted from landfill.

3.2 SUBCONTRACTOR'S RESPONSIBILITY

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

3.3 SAMPLE CONSTRUCTION WASTE MANAGEMENT FORMS

- .1 The sample waste tracking form below can be used by the Contractor to establish their own forms for recording management of construction waste:

Material Stream	Diverted Waste by Report Date	Total	Units				
Sept	Oct	Nov	Dec				
Material Streams Contributing to Credit	Plastic	1.25	2.5	10	5	18.75	m ³
Carpet	2.5	2.5	2.5	0	7.5	m ³	
Paper/Cardboard	5	2.5	2.5	5	15	m ³	
Clean Wood	0	25	0	1.25	26.25	m ³	
Metal	1.25	2.5	5.5	7	16.25	m ³	
Gypsum Board	2.5	2.5	4	5	14	m ³	
Brick/Concrete	10.5	2.5	5.5	8.75	27.25	m ³	
Asphalt Shingles	10	0	0	0	10	m ³	
Total Diverted Waste	135	m ³					
Material Streams not Contributing to Credit	Landfill	10.75	7.5	15	10	43.25	m ³
Screen Fines (ADC)	5	1.25	0	2.5	8.75	m ³	
150 mm Minus (ADC)	1.25	1.25	5	5.5	13	m ³	
Total Landfill/ADC Waste	65	m ³					
Total Waste	200	m ³					
Percent Diverted	67.5	%					

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2-2008, Stipulated Price Contract.
 - .2 DOC 14-2000, Design-Build Stipulated Price Contract.
 - .3 DOC 15-2000, Design-Builder/ Consultant Contract.
- .2 Canadian Environmental Protection Act (CEPA)
 - .1 SOR/2008-197, Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations.

1.2 ADMINISTRATIVE REQUIREMENTS

- .1 Acceptance of Work Procedures:
 - .1 Contractor's Inspection: The Contractor must conduct inspections of the Work, identify deficiencies and defects, and repair as required to conform to the Contract Documents.
 - .1 Notify the Departmental Representative in writing once the Contractor's inspection has been completed, and submit a document attesting that the corrections have been made.
 - .2 Then submit a request for the work to be inspected by the Departmental Representative.
 - .2 Departmental Representative's Inspection:
 - .1 The Departmental Representative and the Contractor are to inspect the Work and identify defects and deficiencies.
 - .2 The Contractor will correct the Work as directed.
 - .3 Completion of Tasks: submit a written document in English and in French certifying that the tasks have been performed as follows:
 - .1 The Work is completed and has been inspected and is found to comply with the requirements of the Contract Documents.
 - .2 Deficiencies and defects detected during the inspections have been corrected.
 - .3 The equipment and systems have been tested, balanced, adjusted and are fully operational.
 - .4 The certificates required by the Utility companies, the Fire Commissioner and/or the Boiler Inspection Branch have been submitted
 - .5 The necessary training in the operation of devices, materials and systems has been given to the staff of the Departmental Representative.
 - .6 The Commissioning of the mechanical devices, materials and systems is completed in accordance with Sections 01 79 00 – Demonstration and Training and 01 91 13 - General

Commissioning Requirements and a copy of the report final commissioning was submitted to the Departmental Representative.

- .7 The Work is completed and ready to be submitted for final inspection.
- .4 Final Inspection:
 - .1 When all the tasks mentioned above have been completed, submit a request for the work to be subject to the final inspection, which will be carried out jointly by the Departmental Representative and the Contractor.
 - .2 When the Work is incomplete according to the Departmental Representative, complete the elements that have not been executed and request a re-inspection.
- .5 Declaration of Substantial Performance: when Departmental Representative considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.

1.3 FINAL CLEANING

- .1 Clean in accordance with Section 01 74 00- Cleaning.
 - .1 Remove surplus materials, excess materials, rubbish, tools and equipment.
- .2 Waste Management: separate waste materials for recycling and reuse in accordance with Section 01 74 19- 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 REFERENCE STANDARDS

- .1 Canadian Environmental Protection Act (CEPA)
 - .1 SOR/2008-197, Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations.

1.2 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-warranty Meeting:
 - .1 Convene meeting, one (1) week prior to the contract completion, with the Departmental Representative, in accordance with Section 01 31 19-Project Meetings to:
 - .1 Verify the Project requirements.
 - .2 Review the warranty offered by the Departmental Representative and the manufacturer's installation instructions.
 - .2 The Departmental Representative will establish communication procedures to:
 - .1 Notifying construction warranty defects.
 - .2 Determine priorities for type of defects.
 - .3 Determine reasonable response time.
 - .3 Provide the name, telephone number and address of the company authorized for construction warranty work action.
 - .4 Ensure that the company is located within local service area of warranted construction, is continuously available, and is responsive to inquiries for warranty work action.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Two (2) weeks prior to the Substantial completion of the Work, submit to the Departmental Representative, four (4) final copies of the operating and maintenance manuals in French.
- .3 Provide spare parts, maintenance materials and special tools of the same quality and manufacture as the products provided in the Work.
- .4 Provide evidence, if requested, for the type, source and quality of the products supplied.

1.4 FORMAT

- .1 Present data in the form of an instruction manual.
- .2 Binders: vinyl, hard covered, 3 'D' ring, loose-leaf 219 x 279 mm with spine and face pockets.

- .3 When multiple binders are used correlate data into related consistent groupings.
 - .1 Identify contents of each binder on spine.
- .4 On the cover page of each binding must be indicated the designation of the document, that is to say "Project Record Documents ", typed or marked in block letters, the designation of the project as well as the table of contents.
- .5 Arrange content by process flow or by systems, under the Specification's Section numbers and the sequence of the Table of Contents.
- .6 Provide, for each product and each system, a tab divider on which the description of the product and the list of the main pieces of equipment must be typed.
- .7 Text must consist of printed data provided by the manufacturer or typed data.
- .8 The drawings must be provided with reinforced punched binder tab.
 - .1 Bind in with text; fold the larger drawings to size of the text pages.
- .9 Provide 1:1 scaled CAD files in .dwg format, on CD.

1.5 CONTENTS - PROJECT RECORD DOCUMENTS

- .1 Table of Contents for Each Volume: provide the title of the project;
 - .1 Date of submission of the documents;
 - .2 The name, the addresses, and telephone numbers of the Departmental Representative and Contractor with the name of their representatives.
 - .3 Schedule of products and systems, indexed to the content of the volume.
- .2 For each product or system:
 - .1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
- .3 Product Data: mark each sheet as to identify the specific products and component parts, and the data applicable to the installation; delete inapplicable information.
- .4 Drawings: the drawings complete the technical sheets and illustrate the relationship between the various elements of the equipment and systems; they include the control and principle diagrams.
- .5 Typewritten Text: as required to supplement the product data.
 - .1 Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.
- .6 Training: refer to Section 01 79 00- Demonstration and Training.

1.6 AS -BUILT DOCUMENTS AND SAMPLES

- .1 Maintain on site, for the Departmental Representative, one record copy of:

- .1 Contract Drawings.
- .2 Specifications.
- .3 Addenda.
- .4 Change Orders and other modifications to Contract.
- .5 Reviewed shop drawings, product data, and samples.
- .6 Field test records.
- .7 Inspection certificates.
- .8 Manufacturer's certificates.
- .2 Store record documents and samples in the field office, separated from documents used for construction.
 - .1 Provide files, racks, and secure storage.
- .3 Label the documents and classify them according to the list of section numbers indicated in the table of contents of this Project Manual.
 - .1 Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition.
 - .1 Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by the Departmental Representative.

1.7 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

- .1 Record information on a set of blue line opaque drawings,.
- .2 Record information using felt tip marking pens, and maintaining separate colours for each major system.
- .3 Record information concurrently with construction progress.
 - .1 Do not conceal Work until required information is recorded.
- .4 Contract Drawings and shop drawings: mark each item to record the actual construction as it is, including:
 - .1 Measured depths of the elements of foundation in relation to the finished first floor datum.
 - .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
 - .4 Field changes of dimension and detail.
 - .5 Changes made by change orders.
 - .6 Details not on the original Contract Drawings.
 - .7 Referenced Standards to related shop drawings and modifications.
- .5 Specifications: mark each item to record actual construction as it is, including:

- .1 The name of the Manufacturer, the trade name, and the catalogue number of each product actually installed, particularly optional items and substitute items.
- .2 Changes made by Addenda and change orders.
- .6 Other Documents: maintain field test records, manufacturer's certifications, inspection certifications, required by individual specifications sections.
- .7 Provide digital photos, if requested, for site records.

1.8 FINAL SURVEY

- .1 Submit final site survey certificate in accordance with Section 01 71 00 - Examination and Preparation, certifying that elevations and locations of completed Work are in compliance or non-compliance with the Contract Documents.

1.9 EQUIPMENT AND SYSTEMS

- .1 For each item of equipment and each system include a description of the unit or system, and component parts.
 - .1 Give function, normal operation characteristics and limiting conditions.
 - .2 Include performance curves, with engineering data and tests, and the complete list and the commercial number of the parts that can be replaced.
- .2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.
- .3 Include the installed colour coded wiring diagrams.
- .4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences.
 - .1 Include regulation, control, stopping, shut-down, and emergency instructions.
 - .2 Include summer, winter, and any special operating instructions.
- .5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair and reassembly instructions; and the alignment, adjusting, balancing, and checking instructions.
- .6 Provide servicing and lubrication schedule, and the list of lubricants required.
- .7 Include manufacturer's printed operation and maintenance instructions.
- .8 Provide descriptions of the sequence of operations prepared by the various manufacturers of the control and regulation devices.
- .9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- .10 Provide control diagrams for installed control / regulation devices, prepared by different manufacturers.

- .11 Provide the Contractor's coordination drawings, with the installed colour coded piping diagrams.
- .12 Provide list of valve labeling numbers, indicating location and function of each fixture, and reference to control and block diagrams.
- .13 Provide a list of original manufacturer's spare parts with current prices and recommended quantities to keep in stock.
- .14 Include test and balancing reports as specified in Section 01 45 00- Quality Control.
- .15 Additional requirements: as specified in individual Specification sections.

1.10 MATERIALS AND FINISHES

- .1 Building products, applied materials, and finishes: provide product data, with catalogue number, size, composition, and colour and texture designations.
 - .1 Provide information for re-ordering custom manufactured products.
- .2 Provide instructions regarding cleaning agents and methods as well as the recommended cleaning and maintenance schedules, and indicate the precautions to be taken against harmful methods and harmful products.
- .3 Moisture-protection and weather-exposed products: provide the manufacturer's recommendations for cleaning agents and methods as well as recommended cleaning and maintenance schedules, and indicate the precautions to be taken against harmful methods and harmful products.
- .4 Additional requirements: according to the prescriptions of the various technical sections of the Specifications.

1.11 MAINTENANCE MATERIALS

- .1 Spare Parts:
 - .1 Provide spare parts, in quantities specified in various technical sections of the Specifications.
 - .2 Provide items of same manufacture and quality as the items used in the Work.
 - .3 Deliver and store spare parts at the location indicated by the Departmental Representative.
 - .4 Receive and catalogue all items.
 - .1 Submit inventory list to the Departmental Representative.
 - .2 Include the approved list in the Maintenance Manual.
 - .5 Obtain receipt for delivered products and submit prior to final payment.
- .2 Extra Stock Materials:
 - .1 Provide replacement materials and equipment in the quantities indicated in the various technical sections of the Specifications.
 - .2 Provide items of same manufacture and quality as the items used in the Work.

- .3 Deliver and store replacement materials / equipment at the location indicated by the Departmental Representative.
- .4 Receive and catalogue replacement materials and equipment.
 - .1 Submit inventory list to the Departmental Representative.
 - .2 Include the approved list in the Maintenance Manual.
- .5 Keep a receipt for all materials and equipment delivered and submit it before the final payment.
- .3 Special Tools:
 - .1 Provide special tools, in quantities specified in the various technical sections of the Specifications.
 - .2 Provide items with tags identifying their associated function and equipment.
 - .3 Deliver and store special tools at the location indicated by the Departmental Representative.
 - .4 Receive and catalogue special tools.
 - .1 Submit inventory list to the Departmental Representative.
 - .2 Include the approved list in the Maintenance Manual.

1.12 DELIVERY, STORAGE AND HANDLING

- .1 Store the spare parts, maintenance materials, and special tools in a manner to prevent damage or deterioration.
- .2 Store the spare parts, maintenance materials, and special tools in their original packaging kept in good condition and bearing the manufacturer's seal and label intact.
- .3 Store items likely to be damaged by weather in weatherproof enclosures.
- .4 Store paints and freezable materials in a heated and ventilated room.
- .5 Evacuate damaged or deteriorated items or products, replace them with new ones at no additional cost, and submit these to the Departmental Representative for review.

1.13 WARRANTIES AND BONDS

- .1 Develop a warranty management plan that contains all the information relevant to Warranties.
- .2 Thirty (30) days before the meeting on Warranties prior to the completion of the work, submit the warranty management plan to the Departmental Representative for approval.
- .3 Warranty management plan must include the required actions and documents to assure that the Departmental Representative receives the warranties to which it is entitled.
- .4 The plan must be presented in a narrative form and it must contain sufficient details to be used and understood later by the personnel responsible for maintenance and repairs.

- .5 Prior to each monthly pay estimate, submit to the Departmental Representative, for approval, the warranty information made available during the construction phase.
- .6 Assemble the approved information in binder, submit upon acceptance of the work and organize the binder as follows:
 - .1 Separate each guarantee and bond by means of tab divider sheets marked according to the content of the table of contents.
 - .2 Make a list the subcontractor, supplier, and manufacturer, with the name, address, and telephone number of the designated responsible personnel for each.
 - .3 Obtain warranties and bonds, executed in duplicate by the subcontractors, suppliers, and manufacturers, within ten (10) days after the completion of the applicable item of work.
 - .4 Verify that documents are in proper form, contain full information, and are notarized.
 - .5 Co-execute submittals when required.
 - .6 Retain warranties and bonds until time specified for their submittal.
- .7 Except for the elements put into service with the authorization of the Owner, do not change the date of entry into force of the warranty before the date of substantial completion of work has been determined.
- .8 Four (4) months and nine (9) months after the date of receipt of the work, carry out a warranty inspection in the company of the Departmental Representative.
- .9 The warranty management plan must include or indicate what follows:
 - .1 Roles and responsibilities of personnel associated with the warranty process, including points of contact and telephone numbers within the organizations of Contractors, subcontractors, manufacturers or suppliers involved.
 - .2 Listing and status of delivery of Certificates of Warranty for extended warranty items, to include roofs, motors, pumps, transformers, HVAC balancing, fire protection, alarm systems, commissioned systems, sprinkler systems, lightning protection systems.
 - .3 Provide a list for each warranted equipment, item, feature of construction or system, indicating for each:
 - .1 The name of equipment, item, feature of construction or system.
 - .2 The model and serial numbers.
 - .3 The location where they are installed.
 - .4 The name and phone numbers of the manufacturers or suppliers.
 - .5 The name, address and telephone number of distributors of spare parts and replacement materials / equipment.
 - .6 Warranties and terms of warranty: include one-year overall warranty of construction. Indicate the equipment, item, feature of construction or system that have extended warranties and show the warranty expiration dates for each.

- .7 Cross-reference to warranty certificates as applicable.
- .8 The effective date and the expiration date of the warranty.
- .9 A summary of the maintenance activities to be carried out to maintain the warranty.
- .10 Cross-Reference to specific pertinent Operation and Maintenance manuals.
- .11 The name and telephone number of the organization and of the people to call for warranty service.
- .12 Typical response time and repair time expected for various warranted equipment.
- .4 The Contractor's plans and intentions for attendance the four (4) and nine (9) month post-construction warranty inspections.
- .5 The labeling procedure for elements, materials and systems covered by an extended warranty, and its progress.
- .6 Post copies of instructions near selected pieces of equipment where operation is critical for warranty and/or safety reasons.
- .10 Respond in timely manner to verbal or written notification of required construction warranty repair work.
- .11 All verbal instructions must be followed by written instructions.
 - .1 The Departmental Representative may bring an action against the Contractor if the Contractor does not comply with his obligations.

1.14 WARRANTY TAGS

- .1 At the time of the installation, tag each element, material or system covered by a warranty. Use durable, water and oil resistant tags approved by the Departmental Representative.
- .2 Attach tags using copper wire and spray waterproof silicone coating on the wire.
- .3 Leave the date of receipt until the work is accepted for occupancy.
- .4 Tags must include the information and signatures indicated below.:
 - .1 Type of product/material.
 - .2 Model number.
 - .3 Serial number.
 - .4 Contract number.
 - .5 Warranty period.
 - .6 Inspector's signature.
 - .7 Contractor's signature.

PART 2 PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

- .1 Section Includes:
 - .1 This section is limited to portions of the Building Management Manual (BMM) provided to Departmental Representative by Contractor.
- .2 Acronyms:
 - .1 BMM - Building Management Manual.
 - .2 Cx - Commissioning.
 - .3 HVAC - Heating, Ventilation and Air Conditioning.
 - .4 PI - Product Information.
 - .5 PV - Performance Verification.
 - .6 TAB - Testing, Adjusting and Balancing.
 - .7 WHMIS - Workplace Hazardous Materials Information System.

1.2 GENERAL REQUIREMENTS

- .1 Standard letter size paper 216 mm x 279 mm.
- .2 Methodology used to facilitate updating.
- .3 Drawings, diagrams and schematics to be professionally developed.
- .4 Electronic copy of data to be in a format accepted and approved by Departmental Representative.

1.3 APPROVALS

- .1 Prior to commencement, co-ordinate requirements for preparation, submission and approval with Departmental Representative.

1.4 GENERAL INFORMATION

- .1 Provide Departmental Representative the following for insertion into appropriate Part and Section of BMM:
 - .1 Complete list of names, addresses, telephone and fax numbers of contractor, sub-contractors that participated in delivery of project - as indicated in Section 1.2 of BMM.
 - .2 Summary of architectural, structural, fire protection, mechanical and electrical systems installed and commissioned - as indicated in Section 1.4 of BMM.
 - .1 Including sequence of operation as finalized after commissioning is complete as indicated in Section 2.0 of BMM.
 - .3 Description of building operation under conditions of heightened security and emergencies as indicated in Section 2.0 of BMM.

- .4 System, equipment and components Maintenance Management System (MMS) identification - Section 2.1 of BMM.
- .5 Information on operation and maintenance of architectural systems and equipment installed and commissioned - Section 2.0 of BMM.
- .6 Information on operation and maintenance of fire protection and life safety systems and equipment installed and commissioned - Section 2.0 of BMM.
- .7 Information on operation and maintenance of mechanical systems and equipment installed and commissioned - Section 2.0 of BMM.
- .8 Operating and maintenance manual - Section 3.2 of BMM.
- .9 Final commissioning plan as actually implemented.
- .10 Completed commissioning checklists.
- .11 Commissioning test procedures employed.
- .12 Completed Product Information (PI) and Performance Verification (PV) report forms, approved and accepted by Departmental Representative.
- .13 Commissioning reports.

1.5 CONTENTS OF OPERATING AND MAINTENANCE MANUAL

- .1 For detailed requirements refer to Section 01 78 00 - Closeout Submittals.
- .2 Departmental Representative to review and approve format and organization within 12 weeks of award of contract.
- .3 Include original manufactures brochures and written information on products and equipment installed on this project.
- .4 Record and organize for easy access and retrieval of information contained in BMM.
- .5 Include completed PI report forms, data and information from other sources as required.
- .6 Inventory directory relating to information on installed systems, equipment and components.
- .7 Approved project shop-drawings, product and maintenance data.
- .8 Manufacturer's data and recommendations relating: manufacturing process, installation, commissioning, start-up, O M, shutdown and training materials.
- .9 Inventory and location of spare parts, special tools and maintenance materials.
- .10 Warranty information.
- .11 Inspection certificates with expiration dates, which require on-going re-certification inspections.
- .12 Maintenance program supporting information including:
 - .1 Recommended maintenance procedures and schedule.
 - .2 Information to removal and replacement of equipment including, required equipment, points of lift and means of entry and egress.

1.6 LIFE SAFETY COMPLIANCE (LSC) MANUAL

- .1 Samples of LSC Manual will be available from Departmental Representative.
- .2 Content of Manual:
 - .1 All possible Emergency situations modes including: presence of fire and smoke, power failure, loss of water or pressure, chemical spills and refrigerant release.
 - .2 Failure of elevators and escalators.
 - .3 HVAC emergencies and fuel supply failures.
 - .4 Intrusion and security breach.
 - .5 Emergency provisions for natural disasters, bomb threats and other disruptive situations.
 - .6 Dedicated emergency generators for high security projects, medical facilities and computer systems.
 - .7 Emergency control procedures for fire, power and major equipment failure.
 - .8 Emergency contacts and numbers.
 - .9 Manual to be readily available and comprehensible to non- technical readers.

1.7 SUPPORTING DOCUMENTATION FOR INSERTION INTO SUPPORTING APPENDICES

- .1 Provide Departmental Representative supporting documentation relating to installed equipment and system, including:
 - .1 General:
 - .1 Finalized commissioning plan.
 - .2 WHMIS information manual.
 - .3 Approved "as-built" drawings and specifications.
 - .4 Procedures used during commissioning.
 - .5 Cross-Reference to specification sections.
 - .2 Architectural and structural:
 - .1 Inspection certificates, construction permits.
 - .2 Roof anchor log books.
 - .3 PV reports.
 - .3 Fire prevention, suppression and protection:
 - .1 Test reports.
 - .2 Smoke test reports.
 - .3 PV reports.
 - .4 Mechanical:
 - .1 Installation permits, inspection certificates.
 - .2 Piping pressure test certificates.
 - .3 Ducting leakage test reports.

- .4 TAB and PV reports.
 - .5 Charts of valves and steam traps.
 - .6 Copies of posted instructions.
- .5 Electrical:
 - .1 Installation permits, inspection certificates.
 - .2 TAB and PV reports.
 - .3 Electrical work log book.
 - .4 Charts and schedules.
 - .5 Locations of cables and components.
 - .6 Copies of posted instructions.
- .2 Assist Departmental Representative with preparation of BMM.

1.8 LANGUAGE

- .1 English and French Language to be in separate binders.

1.9 IDENTIFICATION OF FACILITY

- .1 When submitting information to Departmental Representative for incorporation into BMM, use following system for identification of documentation:

1.10 USE OF CURRENT TECHNOLOGY

- .1 Use current technology for production of documentation. Emphasis on ease of accessibility at all times, maintain in up-to-date state, compatibility with user's requirements.
- .2 Obtain Departmental Representative's approval before starting Work.

PART 2 PRODUCTS

2.1 NOT USED

- .1 Not used.

PART 3 EXECUTION

3.1 NOT USED

- .1 Not used.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

- .1 This Section includes the following:
 - .1 Demolition and removal of buildings and structures
 - .2 Demolition and removal of site improvements adjacent to a building or structure being demolished
 - .3 Demolition and removal of concrete foundations
 - .4 Removing below grade construction
 - .5 Disconnecting, capping or sealing, and removing site utilities

1.2 RELATED REQUIREMENTS

- .1 Section 02 81 00- Transportation and disposal of hazardous materials
- .2 Section 31 23 33 - Excavation, creusage de tranchée et remblayage

1.3 REFERENCE STANDARDS

- .1 CSA Group (CSA)
 - .1 CSA S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures.
- .2 Department of Justice Canada (Jus)
 - .1 Canadian Environmental Assessment Act (CEAA), 2012
 - .2 Canadian Environmental Protection Act (CEPA), 2012
 - .1 SOR/2003-2, On-Road Vehicle and Engine Emission Regulations.
 - .2 SOR/2006-268, Regulations Amending the On-Road Vehicle and Engine Emission Regulations
 - .3 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34
 - .4 Motor Vehicle Safety Act (MVSA), 1995
 - .5 Hazardous Materials Information Review Act, 1985
- .3 National Fire Protection Association (NFPA)
 - .1 NFPA 241 - 96, Standard for Safeguarding Construction, Alteration, and Demolition Operations
- .4 National Research Council Canada (NRC)
 - .1 National Building Code of Canada 2015(NBC).
 - .2 National Fire Code of Canada 2015(NFC).
- .5 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S660-08, Standard for Nonmetallic Underground Piping for Flammable and Combustible Liquids

- .2 ULC/ORD-C58.15-1992, Overfill Protection Devices for Flammable Liquid Storage Tanks
- .3 ULC/ORD-C58.19-1992, Spill Containment Devices for Underground Flammable Liquid Storage Tanks
- .6 U.S. Environmental Protection Agency (EPA)/Office of Water
 - .1 EPA CFR 86.098-10, Emission standards for 1998 and later model year Otto-cycle heavy-duty engines and vehicles
 - .2 EPA CFR 86.098-11, Emission standards for 1998 and later model year diesel heavy-duty engines and vehicles
 - .3 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.4 DEFINITIONS

- .1 Demolition: rapid destruction of building following removal of hazardous materials.
- .2 Hazardous Materials: dangerous substances, dangerous goods, hazardous commodities and hazardous products, may include but not limited to: asbestos PCB's, CFC's, HCFC's poisons, corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or other material that can endanger human health or wellbeing or environment if handled improperly.
- .3 Waste Management Coordinator (WMC): Contractor representative responsible for supervising waste management activities as well as coordinating related, required submittal and reporting requirements.
- .4 Construction Waste Management Plan (CWM Plan): Written plan addressing opportunities for reduction, reuse, or recycling of materials prepared in accordance with Section 01 74 19- Waste Management and Disposal.
- .5 Construction Waste Management Report (CWM Report): Written report identifying actual materials that formed CWM Plan for reduction, reuse, or recycling of materials prepared in accordance with Section 01 74 19- Waste Management and Disposal.

1.5 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination: Coordinate with Representative for the material ownership including but not limited to:
 - .1 Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Representative's property, demolished materials shall become Contractor's property and shall be removed from Project site.
 - .2 Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to Representative that may be encountered during demolition remain Representative's property.
- .2 Pre-Demolition Meetings:

- .1 Convene pre-installation meeting 1 week prior to beginning work of this Section, with Representative and Contractor in accordance with Section 01 31 19- Project Meetings.
- .3 Scheduling:
 - .1 Employ necessary means to meet project time lines without compromising specified minimum rates of material diversion.
 - .2 In event of unforeseen delay notify the Representative in writing.

1.6 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Action Submittals: Provide the following submittals before starting any work of this Section:
 - .1 Shop Drawings: Submit drawings stamped and signed by professional engineer registered or licensed in Province as follows:
 - .2 Submit in accordance with Sections 01 33 00 - Submittal Procedures and 01 74 19 - Waste Management and Disposal.
 - .3 Schedule of Demolition Activities: Coordinate with Section 01 32 16.16- Construction Progress Schedule.
- .2 Informational Submittals: Provide the following submittals when requested by the Departmental Representative:
 - .1 Qualification Data: Submit information for companies and personnel indicating their capabilities and experience to perform work of this Section including; but not limited to, lists of completed projects with project names and addresses, names and addresses of Departmental Representatives and Representative, for work of similar complexity and extent.

1.7 QUALITY ASSURANCE

- .1 Regulatory Requirements: Ensure Work is performed in compliance with CEPA, CEAA, TDGA and the applicable Provincial/Territorial and Municipal regulations.
- .2 Comply with hauling and disposal regulations of Authority Having Jurisdiction.
- .3 Standards: Comply with ANSI A10.6 and NFPA 241.

1.8 SITE CONDITIONS

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

- .4 Environmental protection:
 - .1 Ensure Work is done in accordance with Section 01 35 43-Environmental Procedures.

1.9 EXISTING CONDITIONS

- .1 Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - .1 Hazardous materials will be as defined in the Hazardous Materials Act.
 - .2 Hazardous materials will be removed by Representative before start of the Work.

PART 2 PRODUCTS

2.1 EQUIPMENT

- .1 Equipment and heavy machinery:
- .2 On-road vehicles to: CEPA-SOR/2006-268, Regulations Amending the On-Road Vehicle and Engine Emission Regulations and CEPA-SOR/2003-2, On-Road Vehicle and Engine Emission Regulations.
- .3 Off-road vehicles to: EPA CFR 86.098-10 and EPA CFR 86.098-11.
- .4 Machinery running only while in use, except where extreme temperatures prohibit shutting machinery down.

PART 3 EXECUTION

3.1 EXAMINATION

- .1 Survey existing conditions and correlate with requirements indicated to determine extent of demolition required.
- .2 Review Project Record Documents of existing construction provided by Representative.
- .3 Representative does not guaranty that existing conditions are the same as those indicated in Project Record Documents.
- .4 Inventory and record the condition of items being removed and salvaged.
- .5 When unanticipated mechanical, electrical, or structural elements are encountered, investigate and measure the nature and extent of the element.
- .6 Promptly submit a written report to Departmental Representative.
- .7 Engage a professional engineer to perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during demolition operations.
- .8 Verify that hazardous materials have been remediated before proceeding with demolition operations.

3.2 PREPARATION

- .1 Temporary Erosion and Sedimentation Control:
 - .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to: requirements of authorities having jurisdiction.
- .2 Protection of In-Place Conditions:
 - .1 Prevent movement, settlement, or damage to adjacent and landscaping features, and parts of building, utilities, structures, to remain in place. Provide bracing and shoring required.
 - .2 Keep noise, dust, and inconvenience to occupants to minimum.
 - .3 Protect building systems, services and equipment.
 - .4 Provide temporary dust screens, covers, railings, supports and other protection as required.
 - .5 Do Work in accordance with Section 01 35 29.06- Health and Safety Requirements.
- .3 Demolition/Removal:
 - .1 Demolish parts of structure as indicated.
 - .2 Removal of Pavements, Curbs and Gutters:
 - .1 Square up adjacent surfaces to remain in place by saw cutting or other method approved by Departmental Representative.
 - .2 Protect adjacent joints and load transfer devices.
 - .3 Protect underlying and adjacent granular materials.
 - .3 Remove parts of existing building to permit new construction.
 - .4 Trim edges of partially demolished building elements to tolerances as defined by Departmental Representative to suit future use.
 - .5 At end of each day's work, leave Work in safe and stable condition.
 - .6 Protect interiors of parts not to be demolished from exterior elements at all times.
 - .7 Demolish to minimize dusting. Keep materials wetted as directed by Representative.
 - .8 Only dispose of material specified by selected alternative disposal option as directed by Representative.
- .4 Remove following materials and equipment, store, protect, and reinstall in new building, using qualified tradesmen:
 - .1 Doors on the main floor (2x)
 - .2 Exterior window tiles to restore

3.3 SITE RESTORATION & REPAIRS

- .1 Below Grade Areas: Rough grade below grade areas ready for further excavation or new construction.

- .2 Below Grade Areas: Completely fill below grade areas and voids resulting from structure demolition operations with satisfactory soil materials according to backfill requirements in Section 31 23 33.
- .3 Site Grading: Uniformly rough grade area of demolished construction to a smooth surface, free from irregular surface changes.
- .4 Provide a smooth transition between adjacent existing grades and new grades.
- .5 General: Promptly repair damage to adjacent construction caused by demolition operations.
- .6 Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.
- .7 Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.

3.4 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00- Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00- Cleaning.
- .3 Refer to demolition drawings and specifications for items to be salvaged for reuse.
- .4 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19- Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

- .1 This Section includes the following:
 - .1 Demolition and removal of selected portions of interior building components and finishes.
 - .2 Repair procedures for selective demolition operations.
- .2 This section does not include the following:
 - .1 Removal of hazardous materials or asbestos abatement.
 - .2 Demolition of exterior building components or structural elements.
 - .3 Mechanical or electrical equipment, except as required to make minor modifications to allow the work to be completed.
- .3 Drawings contain details that suggest directions for solving some of the major demolition and removal requirements for this project; Contractor is required to develop these details further by submitting a demolition plan prepared by a professional engineer employed by the Contractor.

1.2 RELATED REQUIREMENTS

- .1 Section 02 81 01- Hazardous Substances
- .2 Section 09 21 16 - Gypsum Board Assemblies
- .3 Section 09 30 13 - Ceramic Tiling
- .4 Section 09 65 16- Resilient Sheet Flooring

1.3 REFERENCE STANDARDS

- .1 American National Standards Institute (ANSI)
 - .1 ANSI A10.8 2011, Safety Requirements for Scaffolding
- .2 American Society for Testing and Materials (ASTM):
 - .1 ASTM C475/C475M-15, Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board
- .3 CSA Group (CSA)
 - .1 CSA S350 M1980 (R2003), Code of Practice for Safety in Demolition of Structures
- .4 Department of Justice Canada (Jus)
 - .1 Canadian Environmental Assessment Act (CEAA), 2012
 - .2 Canadian Environmental Protection Act (CEPA), 2012
 - .1 SOR/2003-2, On-Road Vehicle and Engine Emission Regulations

- .2 SOR/2006-268, Regulations Amending the On-Road Vehicle and Engine Emission Regulations
- .3 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34
- .4 Motor Vehicle Safety Act (MVSA), 1995
- .5 Hazardous Materials Information Review Act, 1985
- .5 National Fire Protection Association (NFPA)
 - .1 NFPA 241 13, Standard for Safeguarding Construction, Alteration, and Demolition Operations

1.4 DEFINITIONS

- .1 Demolish: Detach items from existing construction and legally dispose of them off site, unless indicated to be removed and salvaged or removed and reinstalled.
- .2 Remove and Salvage: Detach items from existing construction and deliver them to Representative.
- .3 Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.
- .4 Existing to Remain: Existing items of construction that are not removed and that are not otherwise indicated as being removed, removed and salvaged, or removed and reinstalled.
- .5 Waste Management Coordinator (WMC): Contractor representative responsible for supervising waste management activities as well as coordinating related, required submittal and reporting requirements.
- .6 Draft Construction Waste Management Plan (Draft CWM Plan): Detailed inventory of materials in building indicating estimated quantities of reuse, recycling and landfill, prepared in accordance with Section 01 74 19 - Waste Management and Disposal and as follows:
 - .1 Involves quantifying by volume/weight amounts of materials and wastes generated during construction, demolition, deconstruction, or renovation project.
- .7 Construction Waste Management Plan (CWM Plan): Written plan addressing opportunities for reduction, reuse, or recycling of materials prepared in accordance with Section 01 74 19- Waste Management and Disposal.
- .8 Construction Waste Management Report (CWM Report): Written report identifying actual materials that formed CWM Plan for reduction, reuse, or recycling of materials prepared in accordance with Section 01 74 19- Waste Management and Disposal.
- .9 Hazardous Substances: Dangerous substances, dangerous goods, hazardous commodities and hazardous products may include asbestos, mercury and lead, PCB's, poisons, corrosive agents, flammable substances, radioactive substances, or other material that can endanger human health or wellbeing or environment if handled improperly as defined by the Federal Hazardous Products Act (RSC 1985) including latest amendments.

1.5 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination: Coordinate with Representative for the material ownership as follows:
 - .1 Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Representative's property, demolished materials shall become Contractor's property and shall be removed from Project site.
 - .2 Coordinate selective demolition work so that work of this Section adheres to aesthetic criteria established by the Drawings and specified dimensions with all elements in planes as drawn, maintaining their relationships with all other building elements.
 - .3 Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to Representative that may be encountered during selective demolition remain Representative's property:
 - .1 Carefully remove and salvage each item or object in a manner to prevent damage and deliver promptly to Representative.
 - .2 Coordinate with Representative's archaeologist or historical adviser, who will establish special procedures for removal and salvage.
- .2 Pre Demolition Meeting: Convene pre-installation meeting 1 week prior to beginning work of this Section, with Representative and Contractor in accordance with Section 01 31 19- Project Meetings to:
 - .1 Confirm extent of salvaged and demolished materials
 - .2 Review Contractor's demolition plan
 - .1 Verify existing site conditions adjacent to demolition work
 - .2 Coordination with other construction sub trades
- .3 Hold project meetings every week.
- .4 Ensure subcontractor representatives, project manager, WMC, site supervisor and key personnel attend.
- .5 WMC must provide written report on status of waste diversion activity at each meeting.
- .6 Representative will provide written notification of change to meeting schedule established upon contract award 24 hours prior to scheduled meeting.

1.6 ACTION AND INFORMATION SUBMITTALS

- .1 Informational Submittals: Provide the following submittals when requested by the Representative:
 - .1 Qualification Data: Submit information for companies and personnel indicating their capabilities and experience to perform work of this Section including; but not limited to, lists of completed projects with

project names and addresses, names and addresses of architects and owners, for work of similar complexity and extent.

1.7 QUALITY ASSURANCE

- .1 Regulatory Requirements: Perform work as follows; use most restrictive requirements where differences occur between the municipal, provincial and federal jurisdictions:
 - .1 Provincial and Federal Requirements: Perform work in accordance with governing environmental notification requirements and regulations of the Authority Having Jurisdiction.
 - .2 Municipal Requirements: Perform hauling and disposal operations in accordance with regulations of Authority Having Jurisdiction.
- .2 Qualifications: Provide proof of qualifications when requested by Representative:
 - .1 Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project:
 - .1 Conform to the provincial Occupational Health and Safety Act and Regulation.
 - .2 Conform to Workers' Compensation Board Regulations.
 - .3 Conform to City of local municipal bylaws and regulations governing this type of work.

1.8 SITE CONDITIONS

- .1 Representative assumes no responsibility for condition of areas to be selectively demolished:
 - .1 Conditions existing at time of Pre Bid Site Review will be maintained by Representative as far as practical.
- .2 Discovery of Hazardous Substances: It is not expected that Hazardous Substances will be encountered in the Work; immediately notify Representative if materials suspected of containing hazardous substances are encountered and perform the following activities:
 - .1 Refer to Section 01 41 00– Regulatory Requirements for directives associated with specific material types.
 - .2 Hazardous materials will be as defined in the Hazardous Materials Act.
 - .3 Hazardous materials will be removed by Representative before start of the Work.
 - .4 If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Representative. Hazardous materials will be removed by Representative under a separate contract or as a change to the Work.
- .3 Hazardous Substances: Hazardous Substances are present in building to be selectively demolished. A report on the presence of Hazardous Substances is available at the Representative's offices for review and use:

- .1 Examine report to become aware of locations where hazardous materials are present.
- .2 Coordinate with Section 02 81 01.
- .3 Do not disturb Hazardous Substances or items suspected of containing Hazardous Substances.

PART 2 PRODUCTS

2.1 TEMPORARY SUPPORT STRUCTURES

- .1 Design temporary support structures required for demolition work and underpinning and other foundation supports necessary for the project using a qualified professional engineer registered or licensed in province of the Work.

2.2 DESCRIPTION

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

2.3 DEBRIS

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

2.4 EQUIPMENT

- .1 Provide all equipment required for safe and proper demolition of the building interiors indicated.

2.5 REPAIR MATERIALS

- .1 Use repair materials identical to existing materials:
 - .1 If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
 - .2 Use a material whose installed performance equals or surpasses that of existing material.
 - .3 Comply with material and installation requirements specified in individual Specification Sections.
- .2 Floor Patching and Levelling Compounds: Cement based, trowelable, self levelling compounds compatible with specified floor finishes; gypsum based products are not acceptable for work of this Section.

- .3 Concrete Unit Masonry: Lightweight concrete masonry units, and mortar, cut and trimmed to fit existing opening to be filled. Provide standard hollow core units, square end units and bond beam units as indicated on drawings.
- .4 Prefinished Sheet Steel: Prefinished sheet steel, colour to match existing radiation cabinets, bent and profiled to match existing radiation cabinets.
- .5 Gypsum Board Patching Compounds: Joint compound to ASTM C475/C475M, bedding and finishing types thinned to provide skim coat consistency to patch and prepare existing gypsum board walls ready for new finishes in accordance with Section 09 21 16 – Gypsum Board Systems.
- .6 Hoarding and Dust Screens: Refer to Section 01 50 00 for stud framing and gypsum board sheathing materials.

2.6 EXISTING MATERIALS

- .1 Confirm with Representative any materials that appear to be in re-usable condition prior to disposal.
- .2 Confirm with Representative any materials scheduled for re use that are not in re-usable condition prior to installation.

PART 3 EXECUTION

3.1 EXAMINATION

- .1 Verify that utilities have been disconnected and capped.
- .2 Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- .3 Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.
- .4 Notify the Departmental Representative where existing mechanical, electrical, or structural elements conflict with intended function or design:
 - .1 Investigate and measure the nature and extent of conflict and submit a written report to Departmental Representative.
 - .2 Departmental Representative will issue additional instructions or revise drawings as required to correct conflict.
- .5 Perform surveys as the work progresses to detect hazards resulting from selective demolition activities.

3.2 UTILITY SERVICES

- .1 Coordinate existing services indicated to remain and protect them against damage during selective demolition operations in accordance with Section 01 35 16.
- .2 Locate, identify, disconnect, and seal or cap off indicated utilities serving areas to be selectively demolished.
 - .1 Arrange to shut off affected utilities with utility companies.

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

3.3 PREPARATION

- .1 Identify and mark all equipment and materials identified to be retained by Representative or to be re used in subsequent construction. Separate and store items to be retained in an area away from area of demolition and protect from accidental disposal.
- .2 Post warning signs on electrical lines and equipment that must remain energized to serve other areas during period of demolition.
- .3 Confirm that all electrical and telephone service lines entering buildings are not disconnected.
- .4 Do not disrupt active or energized utilities crossing the demolition site.
- .5 Provide and maintain barricades, warning signs, protection for workmen and the public during the full extent of the Work. Read drawings carefully to ascertain extent of protection required.
- .6 Mark all materials required to be re used, store in a safe place until ready for re installation.
- .7 Adjust all junction boxes, receptacles and switch boxes flush with new wall construction where additional layers to existing construction are indicated.
- .8 Remove permanent marker lines used or found on exposed surfaces and at surfaces indicated for subsequent finish materials. Mechanically remove permanent marker lines and associated substrates where permanent marker lines occur and patch surface. Sealing or priming over permanent marker lines is not acceptable.

3.4 CONCRETE SLAB REINFORCING

- .1 Locate location of reinforcing steel in concrete slabs prior to cutting or coring using non destructive, non ionizing radio frequency locators.
- .2 Core concrete slabs to avoid reinforcing steel, electrical conduit or water pipes; adjust core location and coordinate with Engineer where slab features interfere with core drilling.

- .3 Notify the Engineer immediately for further instructions where coring or cutting will damage existing slab features.

3.5 SELECTIVE DEMOLITION

- .1 Demolish and dismantle work in a neat and orderly manner and in strict accordance with all regulations.
- .2 At end of each day's work, leave Work in safe condition so that no part is in danger of toppling or falling.
- .3 Demolish in a manner to minimize dusting and to prevent migration of dust.
- .4 Selling or burning of materials on the site is not permitted.
- .5 Remove concrete bases by cutting and chipping, take precautions against slab cracking and degradation. Grind edges smooth, fill and make level with self levelling grout.
- .6 Fill all openings in concrete block walls with concrete masonry units, coursing to match existing, prepare ready to receive new finishes to match existing.
 - .1 Provide bond beams in new openings cut into existing concrete masonry unit walls.
 - .2 Provide finished end masonry units to patch and repair for new jamb sections in existing concrete masonry unit walls.
- .7 Fill all openings in gypsum board walls with gypsum board and steel framing to match existing, skim coat to make wall smooth and even.
- .8 Demolish existing carpet, resilient flooring and adhesive remnants as follows:
 - .1 Vacuum existing carpet thoroughly, prior to removal, using vacuum equipped with power head/sweeper.
 - .2 Apply fine mist water spray to carpet as required to minimize dust generation during removal. Avoid spraying near electrical outlets.
 - .3 Demolish existing carpet and resilient floor finishes, remove and dispose of off site.
 - .4 Remove adhesive to the greatest extent possible using scrapping tools and as follows:
 - .1 Do not use solvent based cleaners to remove adhesive remnants.
 - .2 Lightly shot blast or grind floor using machine designed for purpose to remove adhesive remnants.
 - .3 Vacuum floor ready for application of skim coating.
 - .4 Repair all slab depressions and damage with cementitious patching compound.
 - .5 Skim coat floor with minimum 1 mm thick cementitious floor underlayment compatible with new flooring materials.
 - .5 Floor substrate shall be smooth, free from ridges and depressions, and adhesive remnants that could telegraph through resilient flooring materials and carpets.

- .6 Recycle materials in accordance with Section 01 74 19 – Waste Management and Disposal.
- .9 Demolish existing ceramic tile finishes. Remove setting bed or adhesive to the greatest extent possible using mechanical scrapping tools and as follows:
 - .1 Saw cut edge of tile for clean and even transition joint between existing tile to remain and new flooring materials
 - .2 Lightly shot blast or grind floor to remove remnants of setting materials
 - .3 Vacuum floor ready for application of skim coating
 - .4 Repair all slab depressions and damage with cementitious patching compound. Skim coat floor with minimum 1 mm thick cementitious floor underlayment compatible with new flooring materials
- .10 Demolish completely all ceiling panels and grid as indicated.
- .11 Remove all wall coverings scheduled for demolition. Patch and repair wall surfaces with skim coat of gypsum board joint compound leaving wall surfaces smooth and even ready for new wall finishes.
- .12 Patch and repair all walls, floor and ceilings damaged during demolition with material matching adjacent walls, prepare ready for new finishes.
- .13 Patch and repair all radiation cabinets, mechanical equipment and electrical fixtures damaged or exposed during demolition to match adjacent finished surfaces.

3.6 PATCHING AND REPAIRING

- .1 Floors and Walls:
 - .1 Where walls or partitions that are demolished extend from one finished area into another, patch and repair floor and wall surfaces in the new space.
 - .2 Provide a level and smooth surface having uniform finish colour, texture, and appearance.
 - .3 Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform colour and appearance.
 - .4 Patch with durable seams that are as invisible as possible.
 - .5 Provide materials and comply with installation requirements specified in other Sections of these Specifications.
 - .6 Where patching occurs in a painted surface, apply primer and intermediate paint coats over patch and apply final paint coat over entire unbroken surface containing patch. Provide additional coats until patch blends with adjacent surfaces.
 - .7 Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
- .2 Ceilings: patch, repair, or re hang existing ceilings as necessary to provide an even plane surface of uniform appearance.

3.7 PROTECTION

- .1 Prevent debris from blocking drainage inlets and systems and ground draining, and protect material and electrical systems and services that must remain in operation.
- .2 Arrange demolition and shoring work so that interference with the use of adjoining areas by the Representative and users is minimized.
- .3 Maintain safe access to and egress from occupied areas adjoining.
- .4 Provide and maintain fire prevention equipment and alarms accessible during demolition.

3.8 CLEANING

- .1 Develop Construction Waste Management Plan related to Work of this Section and in accordance with Section 01 74 19– Waste Management and Disposal.
- .2 Waste Management: Separate waste materials for recycling and reuse in accordance with Section 01 74 19- Waste Management and Disposal, and as follows:
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.
- .3 Divert excess materials from landfill to site approved Departmental Representative.
- .4 Promptly as the Work progresses, and on completion, clean up and remove from the site all rubbish and surplus material. Remove rubbish resulting from demolition work daily.
- .5 Maintain access to exits clean and free of obstruction during removal of debris.
- .6 Keep surrounding and adjoining roads, lanes, sidewalks, municipal rights of way clean and free of dirt, soil or debris that may be a hazard to vehicles or persons.
- .7 Transport material designated for alternate disposal using approved facilities, receiving organizations and haulers listed in CWM Plan and in accordance with applicable regulations.
 - .1 Written authorization from Departmental Representative is required to deviate from haulers, facilities, receiving organizations listed in CWM Plan.
- .8 Dispose of materials not designated for alternate disposal in accordance with applicable regulations.
 - .1 Disposal facilities must be those approved of and listed in CWM Plan.
 - .2 Written authorization from Departmental Representative is required to deviate from disposal facilities listed in CWM Plan.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

- .1 Canadian Environmental Protection Act, 1999 (CEPA 1999)
 - .1 Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations (SOR/2005-149).
- .2 Department of Justice Canada (Jus)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDG Act) 1992, (c. 34).
 - .2 Transportation of Dangerous Goods Regulations (T-19.01-SOR/2001-286).
- .3 Green Seal Environmental Standards (GS)
 - .1 GS-11-2008, 2nd Edition, Paints and Coatings.
 - .2 GS-36-00, Commercial Adhesives.
- .4 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
 - .1 WHMIS Safety Data Sheets (SDS).
- .5 National Research Council Canada (NRC)
 - .1 National Fire Code of Canada 2015(NFC).
- .6 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
 - .1 SCAQMD Rule 1113-A2007, Architectural Coatings.
 - .2 SCAQMD Rule 1168-A2005, Adhesive and Sealant Applications.

1.2 DEFINITIONS

- .1 Dangerous Goods: product, substance, or organism specifically listed or meets hazard criteria established in Transportation of Dangerous Goods Regulations.
- .2 Hazardous Material: product, substance, or organism used for its original purpose; and is either dangerous goods or material that will cause adverse impact to environment or adversely affect health of persons, animals, or plant life when released into environment.
- .3 Hazardous Waste: hazardous material no longer used for its original purpose and that is intended for recycling, treatment or disposal.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for hazardous materials and include product characteristics, performance criteria, physical size, finish and limitations.

- .2 Submit two copies of WHMIS Safety Data Sheets (SDS) in accordance with Sections 01 35 43- Environmental Procedures and 01 35 29.06- Health and Safety Requirements to Departmental Representative for each hazardous material required prior to bringing hazardous material on site.
- .3 Submit hazardous materials management plan to Departmental Representative that identifies hazardous materials, usage, location, personal protective equipment requirements, and disposal arrangements.
- .4 Hazardous waste classification: identify waste codes applicable to each hazardous waste material based on applicable federal and provincial acts, regulations, and guidelines. Waste profiles, analyses, and classification submitted to contract offices for review and approval.
- .3 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 Low-Emitting Materials: submit listing of adhesives and sealants as well as paints and coatings used in building, comply with VOC and chemical component limits or restrictions requirements.
 - .3 Spill response: establish spill response procedures. Comply with applicable requirements according to classification of waste material. Designate an emergency coordinator and emergency contacts for comprehensive emergency response and incident mitigation.
 - .4 Record keeping: contractor is responsible for maintaining adequate records of handling, storing, and shipping of hazardous materials.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions and Section 01 61 00- Common Product Requirements.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Transport hazardous materials and wastes in accordance with Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial regulations.
 - .1 When exporting hazardous waste to another country, ensure compliance with Export and Import of Hazardous Waste and Hazardous Recyclable Materials Regulations.
- .4 Storage and Handling Requirements:

- .1 Co-ordinate storage of hazardous materials with Departmental Representative and abide by internal requirements for labelling and storage of materials and wastes.
- .2 Store and handle hazardous materials and wastes in accordance with applicable federal and provincial laws, regulations, codes, and guidelines.
- .3 Store and handle flammable and combustible materials in accordance with National Fire Code of Canada (NFC) requirements.
- .4 Keep no more than 45 litres of flammable and combustible liquids such as gasoline, kerosene and naphtha for ready use.
 - .1 Store flammable and combustible liquids in approved safety cans bearing the Underwriters' Laboratory of Canada or Factory Mutual seal of approval.
 - .2 Storage of quantities of flammable and combustible liquids exceeding 45 litres for work purposes requires the written approval of the Departmental Representative.
- .5 Transfer of flammable and combustible liquids is prohibited within buildings.
- .6 Transfer flammable and combustible liquids away from open flames or heat-producing devices.
- .7 Solvents or cleaning agents: non-flammable or have flash point above 38 degrees C.
- .8 Store flammable and combustible waste liquids for disposal in approved containers located in safe, ventilated area. Keep quantities to minimum.
- .9 Observe smoking regulations, smoking is prohibited in areas where hazardous materials are stored, used, or handled.
- .10 Storage requirements for quantities of hazardous materials and wastes in excess of 5 kg for solids, and 5 litres for liquids:
 - .1 Store hazardous materials and wastes in closed and sealed containers.
 - .2 Label containers of hazardous materials and wastes in accordance with WHMIS.
 - .3 Store hazardous materials and wastes in containers compatible with that material or waste.
 - .4 Segregate incompatible materials and wastes.
 - .5 Ensure that different hazardous materials or hazardous wastes are stored in separate containers.
 - .6 Store hazardous materials and wastes in secure storage area with controlled access.
 - .7 Maintain clear egress from storage area.
 - .8 Store hazardous materials and wastes in location that will prevent them from spilling into environment.
 - .9 Have appropriate emergency spill response equipment available near storage area, including personal protective equipment.

- .10 Maintain inventory of hazardous materials and wastes, including product name, quantity, and date when storage began.
- .11 When hazardous waste is generated on site:
 - .1 Co-ordinate transportation and disposal with Departmental Representative.
 - .2 Comply with applicable federal, provincial and municipal laws and regulations for generators of hazardous waste.
 - .3 Use licensed carrier authorized by provincial authorities to accept subject material.
 - .4 Before shipping material obtain written notice from intended hazardous waste treatment or disposal facility it will accept material and it is licensed to accept this material.
 - .5 Label containers with legible, visible safety marks as prescribed by federal and provincial regulations.
 - .6 Only trained personnel handle, offer for transport, or transport dangerous goods.
 - .7 Provide photocopy of shipping documents and waste manifests to Departmental Representative.
 - .8 Track receipt of completed manifest from consignee after shipping dangerous goods. Provide photocopy of completed manifest to Departmental Representative.
 - .9 Report discharge, emission, or escape of hazardous materials immediately to Departmental Representative and appropriate provincial authority. Take reasonable measures to control release.
- .12 Ensure personnel have been trained in accordance with Workplace Hazardous Materials Information System (WHMIS) requirements.
- .13 Report spills or accidents immediately to Departmental Representative. Submit a written spill report to Departmental Representative within 24 hours of incident.
- .5 Develop Construction Waste Management Plan related to Work of this Section.
- .6 Packaging Waste Management: remove for reuse and return by manufacturer of padding, pallets, packaging materials and crates as specified in Construction Waste Management Plan in accordance with Section 01 74 19- Waste Management and Disposal.

PART 2 PRODUCTS

2.1 MATERIALS

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

- .2 Maintain WHMIS Safety Data Sheets (SDS) in proximity to where materials are being used. Communicate this location to personnel who may have contact with hazardous materials.
- .3 Sustainability Characteristics:
 - .1 Adhesives and Sealants in accordance with Section 07 92 00-Joint Sealants.
 - .1 Adhesives and Sealants: maximum VOC limit to SCAQMD Rule 1168
 - .2 Coatings, Primers and Paints in accordance with manufacturer's recommendations for surface conditions and Section 09 91 23-Interior Painting.
 - .1 Primer: maximum VOC limit 250 g/L to SCAQMD Rule 1113.
 - .2 Paints: maximum VOC limit 50 g/L to SCAQMD Rule 1113.
 - .3 Coatings: maximum VOC limit to SCAQMD Rule 1113.
- .4 Spill Response Materials: provide spill response materials which can be used for absorbing/shoveling and containing hazardous materials.
- .5 Provide personal protective equipment.

PART 3 EXECUTION

3.1 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00- Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00- Cleaning.
- .3 Waste Management: separate waste materials for recycling and reuse in accordance with Section 01 74 19- Waste Management and Disposal.
 - .1 Dispose of hazardous waste materials in accordance with applicable federal and provincial acts, regulations, and guidelines.
 - .2 Recycle hazardous wastes for which there is approved, cost effective recycling process available.
 - .3 Send hazardous wastes to authorized hazardous waste disposal or treatment facilities.
 - .4 Burning, diluting, or mixing hazardous wastes for purpose of disposal is prohibited.
 - .5 Disposal of hazardous materials in waterways, storm or sanitary sewers, or in municipal solid waste landfills is prohibited.
 - .6 Dispose of hazardous wastes in timely fashion in accordance with applicable provincial regulations.

- .7 Minimize generation of hazardous waste to maximum extent practicable. Take necessary precautions to avoid mixing clean and contaminated wastes.
- .8 Identify and evaluate recycling and reclamation options as alternatives to land disposal, such as:
 - .1 Hazardous wastes recycled in manner constituting disposal.
 - .2 Hazardous waste burned for energy recovery.
 - .3 Lead-acid battery recycling.
 - .4 Hazardous wastes with economically recoverable precious metals.

END OF SECTION

PARTIE 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures
- .2 Section 03 30 05 - Concrete Cast in place short form

1.2 SUBMITTALS

- .1 Shop Drawings Submit two copies of manufacturer's literature, to include:
Product Data Sheets, and appropriate Material Safety

1.3 WASTE MANAGEMENT AND DISPOSAL

- .1 Collect and separate plastic, paper packaging and corrugated cardboard in
accordance with Waste Management Plan.
- .2 Place materials defined as hazardous or toxic in designated containers.
- .3 Ensure emptied containers are sealed and stored safely.
- .4 Use trigger operated spray nozzles for water hoses.
- .5 Designate cleaning area for tools to limit water use and runoff.

PARTIE 2 PRODUCT

2.1 PRODUCT TYPES

- .1 Anti-corrosion coating and bonding agent
- .2 2 component quick setting repair mortar with corrosion inhibitor
- .3 A one-component, early strength-gaining, cementitious patching mortar
- .4 Polymere-modified, cementitious, trowel-grade mortar, plus migrating corrosion
inhibitor
- .5 Structural epoxy adhesive paste humidity resistant
- .6 Super-low viscosity resin injection

2.2 PRODUCT PROPERTIES

- .1 Anti-corrosion coating and bonding agent
 - .1 Three-component, water-based epoxy resin, anti-corrosion coating and
bonding agent
 - .2 Bond Strength CAN A23.2-6B
Concrete 2-3 MPa (290-435 psi)
Steel 1-2 MPa (145-290 psi)

Bond Strength 14 days, ASTM C882*
Wet on wet 20.7 MPa (3003 psi)
12 h open time 13.8 MPa (2002 psi)
VOC Content < 10 g/L

- .2 2 component quick setting repair mortar with corrosion inhibitor
 - .1 High performance, polymer-modified, two-component, fast-setting, non sag cementitious mortar
 - .2 Modulus of Elasticity ASTM C469 7 days ~ 17 GPa (2.4 x 10⁶ psi)
Tensile Splitting Strength ASTM C496 21 days ~ 5 MPa (725 psi)
Bond Strength ASTM C882 24 hours ~ 7 MPa (1015 psi)
Bond Strength CAN A23.2-6B 28 days Greater than concrete
Rapid Chloride Permeability ASTM C1202 28 days Very low - between 100 and 1000 Coulombs
Freeze/Thaw Durability Test ASTM C666 Modulus of elasticity greater than 90% after 300 cycles
- .3 A one-component, early strength-gaining, cementitious patching mortar
 - .1 One-component, early strength-gaining, cementitious, patching mortar for vertical and overhead concrete repair
 - .2 Density ASTM C 185 2075 kg/m³ (130 lb/ft³)
Compressive Strength ASTM C109, MPa (psi) 24 hrs 15 (2175)
Modulus of Elasticity ASTM C469, GPa (psi) 7 days 23 (3.3 x 10⁶)
Tensile Splitting Strength ASTM C496, MPa (psi) 21 days 4 (580)
Bond Strength CAN A23.2-6B, MPa (psi) 35 MPa (5075 psi) air entrained concrete substrate 7 days 1.5 (217)
- .4 Polymere-modified, cementitious, trowel-grade mortar, plus migrating corrosion inhibitor
 - .1 A polymer-modified, with migrating corrosion inhibitor added, cementitious, two-component, fast-setting, trowel-grade, easy-to-use patching mortar
 - .2 Compressive Strength ASTM C109, MPa (psi) 24 hours ~ 18 (2610)
Modulus of Elasticity ASTM C469 7 days 23 GPa (3.3 x 10⁶ psi)
Tensile Splitting Strength ASTM C496 21 days ~ 5.5 MPa (797 psi)
Bond Strength ASTM C882 24 hours ~ 9 MPa (1305 psi)
28 days ~ 19 MPa (2755 psi)
Rapid Chloride Permeability ASTM C1202
28 days Very low - between 100 and 1000 Coulombs
Freeze/Thaw Durability Test ASTM C666 Modulus of elasticity greater than 90% after 300 cycles
VOC Content < 0.5 g/L
- .5 Structural epoxy adhesive paste humidity resistant

- .1 A two-component, solvent-free, moisture-insensitive, high-modulus, high-strength, structural epoxy paste adhesive.
- .2 Compressive Strength ASTM D695, MPa (psi) 28 days 83 (12 040)
Tensile Properties ASTM D638 14 days Tensile strength 24 MPa (3480 psi) Modulus of elasticity 5.13 GPa (7.4 x 105 psi)
Flexural Properties ASTM D790 14 days Flexural strength 42 MPa (6090 psi)
Shear Strength ASTM D732 14 days 19 MPa (2755 psi)
Bond Strength ASTM C882 2 days Dry cure 28 MPa (4060 psi) 14 days Wet cure 22 MPa (3190 psi)
Water Absorption ASTM D570 7 days 24 h boil 0.29 %
VOC Content ≤10 g/L
- .6 Super-low viscosity resin injection
 - .1 A solvent-free, two-component, moisture-insensitive, epoxy resin system. It is a multipurpose, high-strength adhesive formulated specifically for grouting both dry and damp cracks either by gravity feed or pressure injection.
 - .2 Final Cure ASTM D695 (75% ultimate strength) 2 days
Compressive Strength ASTM D695 28 days 61 MPa (8847 psi)
Modulus of Elasticity ASTM D695 28 days 1.8 GPa (2.6 x 105 psi)
Tensile Strength ASTM D638 14 days 37 MPa (5366 psi)
Tensile Elongation ASTM D638 14 days 3.8%
Shear Strength ASTM D732 14 days 30 MPa (4351 psi)
VOC Content 0 g/L

PARTIE 3 EXECUTION

3.1 PREPARATION, MIXING AND APPLICATION, CLEANING

- .1 Follow manufacturer's specifications regarding preparation, mixing and application, as well as cleaning.

3.2 FIELD QUALITY CONTROL

- .1 All work must be inspected by the engineer or the inspector provided by the Ministry Representative.

END OF SECTION

PARTIE 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures
- .2 Section 07 92 00 - Joint Sealing

1.2 REFERENCES

- .1 Canadian Standards Association (CSA)
 - .1 CAN/CSA-A23.1-14, Concrete Materials and Methods of Concrete Construction.
 - .2 CAN/CSA-O86.14 Engineering Design in Wood (Limit States Design).
 - .3 CSA O121-[M1978] (R2003), Douglas Fir Plywood.
 - .4 CSA O151-09, Canadian Softwood Plywood.
 - .5 CSA O153-[M1980] (R2008), Poplar Plywood.
 - .6 CAN3-O188.0-[M78], Standard Test Methods for Mat-Formed Wood Particleboards and Waferboard.
 - .7 CSA O437 Series-[93] (R2011), Standards for OSB and Waferboard.
 - .8 CSA S269.1-[1975](R2003), Falsework for Construction Purposes.
 - .9 CAN/CSA-S269.3-[M92] (R2008), Concrete Formwork.
- .2 Council of Forest Industries of British Columbia (COFI)
 - .1 COFI, Exterior Plywood for Concrete Formwork.

1.3 SHOP DRAWINGS

- .1 Submit shop drawings for formwork and falsework in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate method and schedule of construction, shoring, stripping and re-shoring procedures, materials, arrangement of joints, special architectural exposed finishes, ties, liners, and locations of temporary embedded parts. Comply with CSA S269.1, for falsework drawings. Comply with CAN/CSA-S269.3 for formwork drawings.
- .3 Indicate formwork design data, such as permissible rate of concrete placement, and temperature of concrete, in forms.

- .4 Each shop drawing submission shall bear stamp and signature of qualified professional engineer registered or licensed in Province of Quebec, Canada.

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away from children.
- .4 Use sealers, form release and stripping agents that are non-toxic, biodegradable and have zero or low VOC's.

PARTIE 2 PRODUCTS

2.1 MATERIALS

- .1 Formwork materials:
 - .1 For concrete without special architectural features, use wood and wood product formwork materials to CSA-O121, CAN/CSA-O86.1, CSA O437 Series or CSA-O153.
 - .2 For architecturally exposed concrete, use formwork materials such as smooth fiberglass or equivalent. Submit product information for approval by the ministerial representative.
- .2 Form ties:
 - .1 For concrete not designated 'Architectural', use removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm dia. in concrete surface.
 - .2 For Architectural concrete, use snap ties complete with plastic cones and light grey concrete plugs.
- .3 Form release agent: biodegradable.
- .4 Form stripping agent: colorless mineral oil, biodegradable, free of kerosene, with viscosity between 70 and 110s Saybolt Universal at 40°C, flashpoint minimum 150°C, open cup.
- .5 **Filling the formwork cones:**
 - .1 **Pre-mixed product containing a non-metallic aggregate, cement, plasticizer and water reducer, of consistency suitable for sealing and capable of achieving a compressive strength of 50 MPa at 28 days.**
 - .2 **Fill all conical cavities left after removal of plastic cones on the ends of the form ties with mortar. Moisten previously as requested by the manufacturer. After the mortar has been placed, smooth the surface well so that it merges with the surrounding concrete surfaces. Ensure curing.**
- .6 Sealant: to Section 07 92 00 - Joint Sealing.

PARTIE 3 EXECUTION

3.1 FABRICATION AND ERECTION

- .1 Verify lines, levels and centers before proceeding with formwork/falsework and ensure dimensions agree with drawings.
- .2 Fabricate and erect falsework in accordance with CSA S269.1 and COFI Exterior Plywood for Concrete Formwork.
- .3 Refer to architectural drawings for concrete members requiring architectural exposed finishes.
- .4 Do not place shores and mud sills on frozen ground.
- .5 Provide site drainage to prevent washout of soil supporting mud sills and shores.
- .6 Fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CAN/CSA-A23.1.
- .7 Align form joints and make watertight. Keep form joints to minimum.
- .8 Use 25 mm chamfer strips on external corners and/or 25 mm fillets at interior corners, joints, unless specified otherwise.
- .9 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.
- .10 Construct forms for architectural concrete, and place ties as indicated and/or as directed. Joint pattern not necessarily based on using standard size panels or maximum permissible spacing of ties.
- .11 Build in anchors, sleeves, and other inserts required to accommodate work specified in other sections. Assure that all anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.
- .12 Clean formwork in accordance with CAN/CSA-A23.1, before placing concrete.
- .13 **Use a template to be sure to place the anchor bolts accurately. For the exact locations and levels of the anchor bolts, refer to the structural plans.**

3.2 REMOVAL AND RESHORING

- .1 Leave formwork in place for following minimum periods of time after placing concrete.
 - .1 2 days for footings, walls and sides of beams.
- .2 Re-use formwork and falsework subject to requirements of CAN/CSA-A23.1.
- .3 **The time periods specified above represent a cumulative number of hours, days or fractions of days, not necessarily consecutive, during which the ambient temperature has remained at least 10 ° C.**
- .4 **Remove formwork when concrete has reached 70% of its design strength or after the minimum curing period previously indicated, whichever comes first, and**

immediately replace the appropriate props.

- .5 The curing of the concrete must continue for 7 days, The Contractor must plan to apply the curing to any stripped surface before this period of 7 days.
- .6 Formwork, props and braces must not be removed before the concrete is reached the resistance required to support the dead load and any construction overload. The contractor is solely responsible for safety during formwork removal. The live load indicated on the plans must not be exceeded during construction.

3.3 FORMWORK TEMPERATURE

- .1 At the time of the concrete casting, keep the formwork at a temperature above 10

END OF SECTION

PARTIE 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures
- .2 Section 03 30 05 - Cast in Place Concrete (short form)

1.2 MEASUREMENT PROCEDURES

- .1 Include reinforcement costs in items of concrete work in Section 03 30 05 - Cast-In-Place Concrete (short form).

1.3 REFERENCES

- .1 American Concrete Institute (ACI)
 - .1 SP-66-04, ACI Detailing Manual 2004.
 - .1 ACI 315 99, Details and Detailing of Concrete Reinforcement.
 - .2 ACI 315R-04, Manual of Engineering and Placing Drawings for Reinforced Concrete Structures.
- .2 Canadian Standards Association (CSA International)
 - .1 CSA A23.1-14/A23.2 14, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA A23.3 14, Design of Concrete Structures.
 - .3 CAN/CSA G30.18 -09, Billet Steel Bars for Concrete Reinforcement, A National Standard of Canada.
 - .4 CSA G40.20/G40.21 04, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- .3 Reinforcing Steel Institute of Canada (RSIC)
 - .1 RSIC-2004, Reinforcing Steel Manual of Standard Practice.

1.4 CALCULATION REQUIREMENTS

- .1 Design of the steel structure following CAN/CSA A23.3-14 (R2014)

1.5 SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prepare reinforcement drawings in accordance with RSIC Manual of Standard Practice and ACI 315.
- .3 Submit shop drawings including placing of reinforcement and indicate:
 - .1 Bar bending details.

- .2 Lists.
- .3 Quantities of reinforcement.
- .4 Sizes, spacings and locations with identifying code marks to permit correct placement without reference to structural drawings.
- .4 Detail lap lengths and bar development lengths to CSA A23.3, unless otherwise indicated.
- .5 Quality Assurance:
 - .1 Mill Test Report: upon request, provide Ministerial Representative with certified copy of mill test report of reinforcing steel, minimum four (4) weeks prior to beginning reinforcing work.
 - .2 Upon request submit in writing to Ministerial Representative proposed source of reinforcement material to be supplied.
- .6 The contractor shall be the sole responsible for the proper placement of all reinforcing steel. A conformity attestation must be provided by the contractor before each pour.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Waste Management and Disposal:
 - .1 Separate waste materials for reuse and recycling.
 - .2 Place materials defined as hazardous or toxic in designated containers.

PARTIE 2 PRODUCTS

2.1 MATERIALS

- .1 Substitute different size bars only if permitted in writing by Ministerial Representative.
- .2 Reinforcing steel: billet steel, grade 400, deformed bars to CAN/CSA-G30.18, unless indicated otherwise.
- .3 Reinforcing steel: weldable low alloy steel deformed bars to CAN/CSA-G30.18.
- .4 Cold-drawn annealed steel wire ties: to ASTM A497/A497M.
- .5 Deformed steel wire for concrete reinforcement: to ASTM A497/A497M.
- .6 Welded steel wire fabric: to ASTM A185/A185M.
 - .1 Provide in flat sheets only.
- .7 Chairs, bolsters, bar supports, spacers: to CSA-A23.1/A23.2.
- .8 Plain round bars: to CSA-G40.20/G40.21.
- .9 The synthetic fiber reinforcing for slab-on-grade shall have a concentration of 2.4 kg/m.cu.
- .10 Fiber reinforcing shall be added on site or at the shop in strict accordance with manufacturer specifications.

- .11 When specified on drawings, fiber reinforcing must be type:
- * « STRUX® 90/40
 - * « PERFORMAX » from Fabro Polymers 50mm or,
 - * « TF-STRAND SF » from Euclid Chemicals or,
 - * « FORTA FERRO » from Optimet

2.2 FABRICATION

- .1 Fabricate reinforcing steel in accordance with CSA-A23.1/A23.2, ACI 315 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.
- .1 ACI 315R unless indicated otherwise.
 - .2 Obtain Ministerial Representative's approval for locations of reinforcement splices other than those shown on placing drawings.
 - .3 Upon approval of Ministerial Representative, weld reinforcement in accordance with CSA W186.
 - .4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

2.3 SOURCE QUALITY CONTROL

- .1 Upon request inform Ministerial Representative of proposed source of material to be supplied.

PARTIE 3 EXECUTION

3.1 FIELD BENDING

- .1 Do not field bend or field weld reinforcement except where indicated or authorized by Ministerial Representative.
- .2 When field bending is authorized, bend without heat, applying slow and steady pressure.
- .3 Replace bars, which develop cracks or splits.

3.2 PLACING REINFORCEMENT

- .1 Place reinforcing steel as indicated on placing drawings and in accordance with CSA-A23.1/A23.2.
- .2 Use plain round bars as slip dowels in concrete
 - .1 Paint portion of dowel intended to move within hardened concrete with one coat of asphalt paint.
 - .2 When paint is dry, apply thick even film of mineral lubricating grease.

- .3 Concrete cover to reinforcing steel shall be:
 - .1 Cast against & permanently exposed to earth: 75mm
 - .2 Exposed to earth or weather:
 - .1 20M & larger: 50mm
 - .2 5M & smaller: 40mm
 - .3 Not exposed to weather or earth:
 - .1 Slabs, walls and joists (35M & smaller): 25mm
 - .2 Beams, girders and columns: Main reinforcement, ties, stirrups, spirals: 40mm
- .4 Ask the Ministerial Representative to accept the reinforcements and their installation before pouring the concrete .
- .5 Ensure that the integrity of the reinforcement coating is preserved during concrete pouring.
- .6 Ensure that the reinforcement is clean, free of dirt, formwork oil or other contaminants. Clean the reinforcing elements before pouring the concrete.
- .7 The spacing of the bar supports in the formwork must not exceed 72 times the smallest diameter of the supported bars nor 1000 mm x 1000 mm.
- .8 The contractor is responsible for providing the support bars which are not shown on the plans but required for installation
- .9 The use of pebbles, pieces of stone, wood or pipes to support the frame is prohibited.
- .10 The technique of lifting with a hook the reinforcement and / or the trellis at the time of casting is prohibited.

3.3 REINFORCEMENT TEMPERATURE

- .1 At the time of concrete pouring, the temperature of the steel present in the formwork must not be lower.

3.4 OVERLAPS AND MECHANICAL JOINTS

- .1 Overlap reinforcement as shown on typical drawings and details
- .2 The lengths of overlap and the lengths of extension of the bars beyond the critical points must comply with standard CSA-A23.3. Unless otherwise indicated in the drawings, all overlaps will be of class "B" (1.3 Lc), in accordance with table 17b overlap in traction for upper reinforcement of the manual of recommended standards of the Institute of reinforcing steel. of Canada (IAAC)
- .3 Obtain prior approval from the Ministerial Representative for reinforcement overlap locations other than those shown on the plans.
- .4 Overlap the wire mesh sheets on a surface of at least 10%, but never less than one mesh.

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Section 03 20 00
CONCRETE REINFORCING
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FIN DE LA SECTION

PARTIE 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures

1.2 REFERENCES

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM D 1751 99, Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
 - .2 ASTM C 260, Standard Specification for Air Entraining Admixtures for Concrete.
 - .3 ASTM C 494, Standard Specification for Chemical Admixtures for Concrete.
 - .4 ASTM C 1017, Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
 - .5 ASTM C 1116, Standard Specification for Fiber Reinforced Concrete.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB 19.24 M90, Multicomponent, Chemical Curing Sealing Compound.
- .3 Canadian Standards Association (CSA)
 - .1 CAN/CSA A23.1 14, Concrete Materials and Methods of Concrete Construction.
 - .2 CAN/CSA A23.2 14, Methods of Test for Concrete.
 - .3 CAN/CSA A3000 98 A5 98, Portland Cement.
 - .4 CAN/CSA G30.5 M1983(R1998), Welded Steel Wire Fabric for Concrete Reinforcement.
 - .5 CAN/CSA G30.18 M92(R1998), Billet Steel Bars for Concrete Reinforcement.

1.3 SUBMITTALS

- .1 Shop Drawings
 - .1 Submit placing drawings prepared in accordance with plans to clearly show size, shape, location and all necessary details of reinforcing.
 - .2 Submit drawings showing formwork and falsework design to: CAN/CSA A23.1.
 - .3 Drawings to bear stamp and signature of qualified professional engineer registered or licensed in province of Quebec, Canada.
- .2 Concrete mix

- .1 Submit concrete mix formulas indicating all materials and their constituents as well as cement type, curing products, admixtures, and synthetic fibres if relevant.
- .3 Submit location of joints to Ministerial Representative for review.

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.
- .2 Place materials defined as hazardous or toxic in designated containers.
- .3 Ensure emptied containers are sealed and stored safely.
- .4 Use trigger operated spray nozzles for water hoses.
- .5 Designate cleaning area for tools to limit water use and runoff.

PARTIE 2 PRODUCT

2.1 MATERIALS

- .1 Cement: hydraulic cement or blended hydraulic cement Type GUB.
- .2 Reinforcing bars: to CAN/CSA-G30.18, Grade 400.
- .3 Welded steel wire fabric: to CAN/CSA-30.5.
- .4 Premoulded joint filler:
 - .1 Bituminous impregnated fibreboard: to ASTM D1751.
- .5 Joint sealer/filler: grey to CAN/CGSB-19.24, Type 1, Class B.
- .6 Synthetic fibres: to ASTM C 1116, 4.1.3, Type III.
- .7 Other concrete materials: to CAN/CSA-A23.1.
- .8 See architecture for locations and sealant details
- .9 The non-shrink grout under the base plates must have a resistance at 28 days of 45 MPa minimum.

2.2 MIXES

- .1 All concrete work shall conform to CSA-A23.1-09.
- .2 Concrete strength at 28 days shall be: see next point.
- .3 Exposure class shall be as according to Table 1 in CAN/CSA-A23.1:

item	f ¹ c	classe
Pile cap	35 MPa	F-2
Foundation walls / grade beams	25 MPa	F-2
Slab on grade	25 MPa	N

Concrete topping	25 MPa	N
Slab on deck	25 MPa	N
Stairs, walls, exterior slab on grade	32 MPa	C-2
Structural slab	30 MPa	N
Exterior structural slab	35 MPa	C-1

- .4 Concrete must contain large aggregates of a maximum nominal thickness of 20 mm with a water/cement ratio in accordance with CAN/CSA-A23.1
- .5 Concrete slump shall be as per CAN/CSA-A23.1:
 - .1 Foundation walls and footings: 75 mm
 - .2 Columns, beams and slabs: 100 mm
 - .3 Other concrete: 50 mm
- .6 Concrete exposed to frost cycles must contain 5-8% of entrained air (perimeter foundation walls, exterior slabs etc.)
- .7 Admixtures: must conform to CAN/CSA-A23.1 and the relevant ASTM norms (ASTM C 260, ASTM C494, ASTM C 1017).
- .8 Synthetic fibres: Only to be used in slabs on grade. Must conform to CAN/CSA-A23.1 and ASTM C 1116, 4.1.3, Type III.

PARTIE 3 EXECUTION

3.1 PREPARATION

- .1 Obtain written authorization from Ministerial Representative before placing concrete.
 - .1 Give at least 24 hours notice before the start of concrete work.
 - .2 Also notify the test laboratory designated by the Ministerial Representative at least 24 hours in advance of the holding of this work.
- .2 Concrete pumping will only be allowed once the materials and dosage formula have been approved.
- .3 When concrete is pumped, concrete formulas must be adjusted accordingly. Concrete must retain its characteristics until it leaves the pump line.
- .4 For all concrete placed using a concrete pump, the first 0.5 m³ of concrete or mortar pumped at the start of the use of a concrete pump must be rejected.
- .5 Ensure that reinforcement and embedded parts are not moved and that the formwork panels are securely fixed before and during the placement of the concrete.
- .6 Protect existing structures against dirt.
- .7 Clean concrete surfaces and remove stains before applying finishing products.
- .8 No load must be exerted on new concrete elements before the Ministerial Representative has authorized it.

3.2 DELIVERY, STORAGE AND CONSTRUCTION

- .1 Delivery, of concrete or mixing on site, as well as any storage of materials, admixtures, etc. must be done in accordance with CAN/CSA-A23.1
- .2 Do cast in place concrete work in accordance with CAN/CSA A23.1.
- .3 Transport time: concrete must be delivered to the site and unloaded at most within 120 minutes of mixing.
 - .1 If applicable, any modification of the maximum transport time must be accepted in writing by the Departmental Representative and the concrete producer, as indicated in CSA standard A23.1 / A23.2.
 - .2 Deviations must be submitted to the Departmental Representative for review.

3.3 INSERTS

- .1 Cast in sleeves, ties, slots, anchors, reinforcement, frames, conduit, bolts, waterstops, joint fillers and other inserts required to be built-in. Sleeves and openings greater than 100 mm x 100 mm not indicated, must be approved by Ministerial Representative.

3.4 FINISHES

- .1 Exposed formwork surfaces: troweled finish, according to CAN / CSA A23.1 standard.
- .2 Interior floor slabs requiring a smooth support: initial finish followed by a final finish comprising a mechanical trowel and a smoothing with a metal trowel, according to the CSA A23.1 standard in order to give the slab a hard finish, smooth, dense, free from imperfections.
- .3 Equipment pads: provide smooth trowelled surface.
- .4 Pavements, walks, curbs and exposed site concrete:
 - .1 Screed to plane surfaces and use aluminum, magnesium or wood floats.
 - .2 Provide round edges and joint spacings using standard tools.
 - .3 Trowel smooth to provide lightly brushed non-slip finish.

3.5 CONTROL JOINTS

- .1 Cut control joints in slabs on grade with wet diamond blade saw within 8 to 24 hours after pour at locations indicated, in accordance with CAN/CSA-A23.1 and install specified joint sealer/filler.

3.6 EXPANSION AND ISOLATION JOINTS

- .1 Install premoulded joint filler in expansion and isolation joints full depth of slab flush with finished surface .

3.7 CURING

- .1 Cure and protect concrete in accordance with CAN/CSA-A23.1.

- .1 Do not use curing compounds where bond is required by subsequent topping or coating.
- .2 For slab on grade: A wet curing period of 7 days at more than 10°. The curing types allowed are ponding, continuous sprinkling, absorptive mat, or fabric kept continuously wet.

3.8 SEALING

- .1 Following curing, apply two even coats of linseed oil mixture to clean dry surfaces, each at 8 m²/L. Allow first coat to dry before applying second coat. Apply poly-siloxane resin blend sealer at 4 m²/L.
- .2 Refer to architectural plans for concrete surfaces to be sandblasted, or special finish.

3.9 SITE TOLERANCES

- .1 Concrete floor slab finishing tolerance +/- 6mm by straightedge method, in accordance with CAN/CSA-A23.1 clause 7.5.1.4.

3.10 FIELD QUALITY CONTROL

- .1 Concrete testing: to CAN/CSA-A23.2 by testing laboratory designated and paid for by CDC Representative.
- .2 Three (3) test cylinders are required for every 75 cubic meters of concrete poured, but not less than one (1) set for each class of concrete placed in any one day.

No concrete can be poured without the reinforcement being inspected by the engineer or the inspector provided by the CDC Representative.

PARTIE 4 REPAIR

1.1 CRACK REPAIR

- .1 The length of cracks as well as their location are approximate. The full structure is not visible.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

- .1 Canada Green Building Council (CaGBC)
 - .1 LEEDv4 Canada-BD+C 2013, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package New Construction and Major Renovation.
 - .2 LEEDv4 Canada-BD+C 2013, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package Core and Shell Development.
 - .3 LEEDv4 Canada-ID+C 2013, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide For Commercial Interiors.
 - .4 LEEDv4 Canada fO+M2013, LEED (Leadership In Energy and Environmental Design): Green Building Rating System Reference Guide Existing Buildings, Operations and Maintenance.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for concrete hardener and curing compound and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit 2 copies of WHMIS SDS in accordance with Sections 01 35 29.06- Health and Safety Requirements and 01 35 43- Environmental Procedures.
- .3 Sustainable Design Submittals:
 - .1 Construction Waste Management:
 - .1 Submit project Waste Management Plan highlighting recycling and salvage requirements.
 - .2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating 75 % of construction wastes recycled or salvaged.
 - .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.
 - .2 Submit evidence, when Supplementary Cementing Materials (SCMs) used, to certify reduction in cement from Base Mix to Actual SCMs Mix, as percentage.

- .3 Regional Materials: submit evidence project incorporates required percentage 10 % 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.

1.3 QUALITY ASSURANCE

- .1 Quality Assurance: in accordance with Section 01 45 00- Quality Control.
- .2 Minimum 4 weeks prior to starting concrete floor hardening work, provide proposed quality control procedures for review by Departmental Representative on following items:
 - .1 Hardening.
 - .2 Slip resistant finish.
- .3 Mock-Ups:
 - .1 Provide site mock-up for concrete hardening work indicating methods and materials, and procedures proposed to achieve concrete finishes in accordance with Section 01 45 00 – Quality Control, and to comply with following requirements, using materials indicated for completed work:
 - .1 Build mock-ups in location and of size as directed by Departmental Representative.
 - .2 Obtain Departmental Representative's acceptance of mock-ups before starting construction; mock-up used throughout construction period and used as standard of acceptance for subsequent architectural concrete work.
 - .3 Mock-up may form part of permanent structure when accepted by Departmental Representative; repair or replace unacceptable mock-ups at no additional cost to Owner.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions and with Section 01 61 00- Common Product Requirements.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials in dry location, indoors, off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.
- .4 Develop Construction Waste Management Plan related to Work of this Section.
- .5 Packaging Waste Management: remove for reuse and return by manufacturer of padding, crates, pallets, packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 19- Waste Management and Disposal.

1.5 SITE CONDITIONS

- .1 Temporary lighting: Minimum 1200 W light source, placed 2.5 m above floor surface, for each 40 m² of floor being finished.
- .2 Electrical power: Sufficient electrical power to operate equipment normally used during construction.
- .3 Work area: Water tight protection against rain and detrimental weather conditions.
- .4 Temperature:
 - .1 Maintain minimum 10 degrees C ambient temperature from 7 days before installation to minimum 48 hours after completion of Work and maintain relative humidity maximum 40 % during same period.
 - .2 Maintain minimum 10 degrees C substrate temperature.
- .5 Moisture: Ensure concrete substrate is within moisture limits prescribed by flooring manufacturer.
- .6 Ventilation:
 - .1 Departmental Representative will arrange for ventilation system operated during installation of concrete floor hardeners. Ventilate area of work as directed by Departmental Representative by use of approved portable supply and exhaust fans.
 - .2 Ventilate enclosed spaces in accordance with Section 01 51 00- Temporary Utilities.
 - .3 Provide continuous ventilation during and for 48 hours minimum after coating application.

PART 2 PRODUCTS

2.1 FLOOR HARDENER

- .1 Water-soluble, inorganic, silicate-based hardener and dust proofing compound.
 - .1 Colour: Transparent
 - .2 Compressive Strength (ASTM C109) 41,4 Mpa
 - .3 Comparative Abrasive Resistance (Taber abraser, CS-17 wheel, 1000g, load, 1000 revolutions) : 6g loss
 - .4 Moisture Retention (ASTM C156) : 63g loss

2.2 SLIP RESISTANT ABRASIVE AGGREGATE

- .1 Emery aggregate: crushed emery, minimum 50 % aluminum oxide.
- .2 Homogeneous aluminum oxide, minimum 95 %.
- .3 Ferric oxide, minimum 25 %.
- .4 Silicon carbide.

2.3 COLOURING AGENT

- .1 Non-metallic type cement colouring agent, selected by Departmental Representative.

PART 3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of site conditions previously installed under other Sections or Contracts are acceptable for concrete hardener and curing compound application 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 FLOOR HARDENING

- .1 Apply floor hardener aggregate
- .2 Apply slip resistant coating on floor surfaces as scheduled.
- .3 Apply in accordance with manufacturer's written instructions.

3.3 SLIP RESISTANT FINISH

- .1 Apply slip resistive aluminum granule finish where indicated before final floating in accordance with manufacturer's written instructions and as follows:
 - .1 Uniformly spread manufacturer's recommended rate of dampened slip resistive aluminum granules over surface in 1 or 2 applications.
 - .2 Tamp aggregate flush with surface; do not force below surface.
 - .3 Apply float finishing after broadcasting and tamping.
 - .4 Lightly work surface with steel wire brush or abrasive stone and water to expose slip resistive aluminum granules after curing.

3.4 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00- Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00- Cleaning.
- .3 Waste Management: separate waste materials for reuse, recycling in accordance with Section 01 74 19- Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.5 PROTECTION

- .1 Protect finished installation until floor treatment has completely cured.
- .2 Repair damage to adjacent materials caused by concrete floor hardener installation.

END OF SECTION

PARTIE 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures

1.2 SUBMITTALS

- .1 Product specifications with recommended design values and physical characteristics for epoxy dowels, expansion and undercut anchors.
- .2 Manufacturer's installation instructions.
- .3 Record Documents: Project record documents for installed materials in accordance with Division 1 Closeout Submittals Section.

1.3 WASTE MANAGEMENT AND DISPOSAL

- .1 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.
- .2 Place materials defined as hazardous or toxic in designated containers.
- .3 Ensure emptied containers are sealed and stored safely.
- .4 Use trigger operated spray nozzles for water hoses.
- .5 Designate cleaning area for tools to limit water use and runoff.

PARTIE 2 PRODUCT

2.1 MATERIALS

- .1 Bolts and Studs: ASTM A307; ASTM A449 where "high strength" is indicated on the Drawings.
- .2 Carbon and Alloy Steel Nuts: ASTM A563.
- .3 Carbon Steel Washers: ASTM F436.
- .4 Carbon Steel Threaded Rod: ASTM A36; or ASTM A193 Grade B7; or ISO 898 Class 5.8.
- .5 Wedge Anchors: ASTM A510; or ASTM A108.
- .6 Stainless Steel Bolts, Hex Cap Screws, and Studs: ASTM F593.
- .7 Stainless Steel Nuts: ASTM F594.
- .8 Zinc Plating: ASTM B633.
- .9 Hot-Dip Galvanizing: ASTM A153.
- .10 Metric Anchor Bolts, Screws, and Studs: ISO 898 Part 1.
- .11 Metric Anchor Nuts: EN 24033.

- .12 Metric Anchor Stainless Steel Bolts, Screws, and Studs: ISO 3506 Part 1.
- .13 Metric Anchor Stainless Steel Nuts: ISO 3506 Part 2.
- .14 Reinforcing Dowels: CSA G30.18

2.2 DRILLED-IN ANCHORS

- .1 Wedge Anchors: Wedge type, torque-controlled, with impact section to prevent thread damage complete with required nuts and washers. Provide anchors with length identification markings. Type and size as indicated on Drawings.
 - .1 Interior Use: Unless otherwise indicated on the Drawings, provide carbon steel anchors with zinc plating in accordance with ASTM B633, Type III Fe/Zn 5 (SC1).
 - .2 Exterior Use: As indicated on the Drawings, provide stainless steel anchors. Stainless steel anchors shall be AISI Type 316 stainless steel provided with stainless steel nuts and washers of matching alloy group and minimum proof stress equal to or greater than the specified minimum full-size tensile strength of the externally threaded fastener. Stainless steel nuts shall conform to ASTM F594 unless otherwise specified. Avoid installing stainless steel anchors in contact with galvanically dissimilar metals.
- .3 Anchor screw: type of screw. Drilling a forehole requires an ANSI-compatible wick of the same diameter as the ankle; the installation of the ankle must be done with the help of a shock wreed. The ankles must have an identification mark stamped on their head indicating the diameter and length of the head. The type and size of the ankles should match those shown in the drawings.
 - .1 Indoor use: Unless otherwise stated on the designs, provide ordinary steel pegs with zingage equivalent to the DIN EN ISO 4042 (8m min.).μ
 - .2 High-load, controlled torque (metric) expansions: The ankles must undergo secondary expansion under load and be equipped with a device that prevents rotation during installation. The type and size of the ankles should match those shown in the drawings.
- .1 Indoor use: Unless otherwise stated on the designs, provide ordinary steel pegs made from ISO 898 Part 1 materials with zinging equivalent to ASTM B633, Type III Fe/Zn 5 (5m min.).μ
- .2 Outdoor use: In accordance with designs, provide stainless steel pegs stainless steel pegs are made from ISO 3506 Part 1 materials that have corrosion resistance equivalent to that of AISI stainless steel [316]. Also provide stainless steel nuts and washers belonging to the same alloy group with a conventional elasticity limit equal to or greater than the minimum traction resistance of the external threading fixer. Stainless steel nuts must comply with ISO 3506 Part 2, unless otherwise stated. Avoid contacting stainless steel ankles with galvanic dissimilar metals.
- .3 Sticky chevilles (cartouche): Threaded steel rods, sockets or frame studs with nuts; washers; adhesive distribution system consisting of hybrid mortar or polymer; manufacturer's installation instructions. The type and size of the ankles should match those shown in the drawings.

- .3 Indoor use: Unless otherwise stated on the designs, provide as-sized asSA36, ASTM A 193, Type B7 or ISO 898 type 5.8 zinging with ASTM B633 type III Fe/Zn 5 (SC1)
- .4 Outdoor use: In accordance with the designs, provide AISI 316 stainless steel pegs as well as stainless steel nuts and washers belonging to the same alloy group with a conventional elasticity limit equal to or greater than the resistance to minimal traction of the external threading fastener. All nuts must comply with ASTM F594 unless otherwise stated. Avoid contacting stainless steel ankles with galvanic dissimilar metals.
- .5 Rebar studs must meet CSA G30.18, grade 400.

PARTIE 3 EXECUTION

3.1 INSTALLATION

- .1 To drill holes, use carbide-tipped drills and wicks, a hollow wick system, and or drills that use diamond drill crowns. The diameter of the wicks must correspond to that designated by the manufacturer of the ankles. Unless otherwise stated on the drawings, all holes must be drilled perpendicular to the concrete surface.
 - Drill holes: When it is permitted to install pegs in core holes, use crowns with corresponding tolerances, as directed by the manufacturer. Properly clean the drilled hole in accordance with the manufacturer's instructions.
 - Built-in elements: Determine the position of frames and other recessed elements before drilling holes for the ankles. Be vigilant when drilling or drilling to avoid damage to frames or other recessed elements. Inform the engineer if any frames or other recessed elements were affected during drilling. Take the necessary precautions to avoid damage to pre-stress frames, electrical cable and telecommunications cable ducts, and gas lines.
 - Support material resistance: Unless otherwise stated, avoid drilling holes in concrete or masonry before concrete, mortar or grout has reached its nominal strength.
- .2 Install the anchor pegs in accordance with the manufacturer's instructions.
- .3 Expansion hold anchors, high-load expansion sheath anchor pegs and form-locked ankles: Protect the nets while the anchor pegs are installed. High load expansion sheath pegs must be installed so that the sheath is fully engaged in the element to be attached. Squeeze the ankles to the torque recommended by the manufacturer with a dynamometric key. Once the ankle is tight at 10% of the prescribed torque value, do not rotate the nut more than 7 times to reach the prescribed torque. If the prescribed torque is not reached after the required number of turns, the ankle must be removed and replaced, unless the engineer indicates otherwise.
- .4 Sticky pads: Clean all holes in accordance with manufacturer's instructions to remove drilling residue and other loose material before the adhesive is laid. Fill the hole with adhesive from the bottom of the hole to the surface to avoid air bubbles in the adhesive. Follow the manufacturer's recommendations to properly mix the adhesive components. Inject enough adhesive into the hole to make sure the ring space fills the ring space completely to the surface. Remove excess adhesive from

the surface. To ensure that the ankles are well centered in the holes, stall them with the help of an appropriate device. Avoid moving or loading the ankles before the end of the manufacturer's prescribed hardening period.

.5 Sticky capsules: Perform drilling and installation operations in accordance with manufacturer's instructions. Clean all holes to remove drilling residue and any loose material before the adhesive is laid. Remove water from the bottom of drilled holes to provide a dry surface. The adhesive capsules must be installed using the tools recommended by the manufacturer. Avoid moving or loading the ankles before the end of the manufacturer's prescribed hardening period.

.6 Follow the manufacturer's recommendations regarding the recommended temperature for the installation of cartridge injection adhesive pegs and adhesive capsules.

3.2 REPAIRING DEFECTIVE STRUCTURES

- .1 Remove and replace improperly placed or defective ankles. Fill empty anchor holes and clog fastening points with non-metallic, zero-pull, high-strength mortar. Ankles that do not meet the test load and torque requirements must be considered defective.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures .
- .2 Section 09 91 23 – Painting -New interior works

1.2 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM A 500 Grade C Specification for Structural Steel (HSS Sections).
 - .2 ASTM A 193/A193M-01b, Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service.
 - .3 ASTM A 325-02, Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
 - .4 ASTM A 325M-00, Specification for High-Strength Bolts for Structural Steel Joints Metric.
 - .5 ASTM A 490M-00, Specification for High-Strength Steel Bolts, Classes 10.9 and 10.9.3, for Structural Steel Joints (Metric).
- .2 .Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-85.10-99, Protective Coatings for Metals.
- .3 Canadian Institute of Steel Construction (CISC)/Canadian Paint Manufacturer's Association (CPMA).
 - .1 CISC/CPMA 1-73b, Quick-Drying, One-Coat Paint for Use on Structural Steel.
- .4 Canadian Standards Association (CSA International)
 - .1 CAN/CSA G40.20-13/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CAN/CSA-S16-14, Limit States Design of Steel Structures.
 - .4 CAN/CSA-S136-12 Cold Formed Steel Structural Members.
 - .5 CSA-136-12, Commentary on CSA Standard S136.
 - .6 CSA W47.1-09, Certification of Companies for Fusion Welding of Steel Structures.
 - .7 CSA W48-06 (R2011), Filler Metals and Allied Materials for Metal Arc Welding.
 - .8 CSA W55.3-08, Certification of companies for resistance welding of steel and aluminum.
 - .9 CSA W59-03 (R2008), Welded Steel Construction (Metal Arc Welding) Metric.

- .5 Master Painters Institute
 - .1 MPI-INT 5.1-98, Structural Steel and Metal Fabrications.
 - .2 MPI-EXT 5.1-98, Structural Steel and Metal Fabrications.
- .6 The Society for Protective Coatings (SSPC)
 - .1 SSPC SP-6/NACE No. 3-00, Commercial Blast Cleaning.

1.3 CALCULATION REQUIREMENTS

- .1 Design of the steel structure according to CAN / CSA S16.1-14 requirements
- .2 Design details and connections in accordance with requirements of CAN/CSA-S16 to resist forces, moments, shears and allow for movements indicated.
- .3 Shear connections:
 - .1 Beam support reactions for connection design shall be, unless otherwise specified, based on the following percentages of the total load listed in the BEAM LOAD TABLES (Part 5 – CISC Handbook):
 - Non-composite beams: 65%
 - Composite beams: 100%
 - Add to this value reactions from other beams near the connection, from supported column loads and from vertical components of brace forces, where present.
- .4 Submit sketches and design calculations stamped and signed by qualified professional engineer licensed in Province of Quebec, Canada for non-standard connections.

1.4 SHOP DRAWINGS

- .1 Submit shop drawings including fabrication and erection documents and materials list in accordance with Section 01 33 00 - Submittal Procedures
 - .1 The shop drawings must clearly indicate all the details of shaping and assembly, including cuts, notches, assemblies, holes, anchors and welds.
 - .2 Prepare shop drawings taking into account all related works. Perform the required coordination to avoid any conflict.
 - .3 Use symbols defined in CSA W59 to represent welds.
 - .4 The Specialized Contractor shall not undertake the shaping and manufacture of fabricated metals until the shop drawings have been approved by the Ministerial Representative.
 - .5 The shop drawings submitted must bear the seal and signature of a qualified engineer recognized and authorized to practice in Canada, in the province of Quebec.
 - .6 Shop drawings must indicate or show the materials, the thickness of the core, the finishes, the assemblies, the joints, the method of anchoring and

the number of anchoring devices, supports, elements reinforcement, details and accessories.

- .2 Erection drawings: indicate details and information necessary for assembly and erection purposes including:
 - .1 Description of methods.
 - .2 Sequence of erection.
 - .3 Type of equipment used in erection.
 - .4 Temporary bracings.
- .3 Ensure Fabricator drawings showing designed assemblies, components and connections are stamped and signed by qualified professional engineer licensed in the province of Quebec, Canada.

1.5 SAMPLES

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

1.6 QUALITY ASSURANCE

- .1 Submit one (1) copy of mill test reports four (4) weeks prior to fabrication of structural steel.
 - .1 Test reports: submit test reports certifying that the products, materials and equipment meet the requirements for physical characteristics and performance criteria. These test reports must be certified by qualified metallurgists licensed to practice in Canada.
 - .2 Certificates: submit documents signed by the manufacturer, certifying that the products, materials and equipment meet the requirements for physical characteristics and performance criteria.

1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 35 21, Appendix B - Waste Management
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material in appropriate on-site for recycling in accordance with Waste Management Plan.
- .4 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.
- .5 Divert unused paint material from landfill to official hazardous material collections site approved by Consultant.
- .6 Do not dispose of unused paint materials into sewer systems, into lakes, streams, onto ground or in other location where it will pose health or environmental hazard. .

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Structural steel: to CAN/CSA-G40.20/G40.21 Grade as indicated 350W for rolled sections and ASTM A500 Grade C for HSS Sections.
- .2 Anchor bolts: to CAN/CSA-G40.20/G40.21, Grade 300W.
- .3 High strength anchor bolts: to ASTM A 193/A 93M, Grade B7.
- .4 Bolts, nuts and washers: to ASTM A 325 and ASTM A 325M.
- .5 Welding materials: to CSA W48 Series and/or CSA W59 and certified by Canadian Welding Bureau.
- .6 Shop paint primer: to CPMA -1-GP-73A.
- .7 Hot dip galvanizing: galvanize steel, where indicated, to CAN/CSA-G164, minimum zinc coating of 600 g/m².
- .8 Shear studs: to CSA W59, Appendix H.

2.2 FABRICATION

- .1 Fabricate structural steel in accordance with CAN/CSA-S16 and in accordance with reviewed shop drawings.
- .2 Continuously seal members by continuous welds where indicated. Grind smooth.

2.3 SHOP PAINTING

- .1 Clean, prepare surfaces and shop prime structural steel in accordance with CAN/CSA-S16 except where members to be encased in concrete . Touch up with the same primer on site.
- .2 Clean members, remove loose mill scale, rust, oil, dirt and other foreign matter. Prepare surface according to SSPC-SP-6.
- .3 Apply one coat of primer in shop to steel surfaces to achieve minimum dry film thickness as per the recommendations of the manufacturer:
 - .1 Surfaces to be encased in concrete.
 - .2 Surfaces to receive field installed stud shear connections.
 - .3 Surfaces and edges to be field welded.
 - .4 Faying surfaces of friction-type connections.
 - .5 Below grade surfaces in contact with soil.
- .4 Apply paint under cover, on dry surfaces when surface and air temperatures are above 5 degrees C
- .5 Maintain dry condition and 5 degrees C minimum temperature until paint is thoroughly dry.
- .6 Strip paint from bolts, nuts, sharp edges and corners before prime coat is dry.
- .7 All permanently exposed members shall be hot dip galvanized. All exposed field connections shall have a coating of zinc-rich paint.
- .8 The surfaces of elements in direct contact with concrete shall not be primed.

PART 3 EXECUTION

3.1 GENERAL

- .1 Structural steel work: in accordance with CAN/CSA-S16.
- .2 Welding: in accordance with CSA W59.
- .3 Companies to be certified under Division 1 or 2.1 of CSA W47.1 for fusion welding of steel structures and/or CSA W55.3 for resistance welding of structural components.

3.2 MARKING

- .1 Mark materials in accordance with CAN/CSA G40.20/G40.21. Do not use die stamping. If steel is to be left in unpainted condition, place marking at locations not visible from exterior after erection.
- .2 Match marking: shop mark for fit and match.

3.3 ERECTION

- .1 Erect structural steel, as indicated and in accordance with CAN/CSA-S16 and in accordance with reviewed erection drawings.
- .2 Field cutting or altering structural members to approval of ministerial representative.
- .3 Clean with mechanical brush and touch up shop primer to bolts, rivets, welds and burned or scratched surfaces at completion of erection.
- .4 Continuously seal members by continuous welds where indicated. Grind smooth.

3.4 FIELD QUALITY CONTROL

- .1 Inspection and testing of materials and workmanship will be carried out by testing laboratory designated by ministerial representative.
- .2 Provide safe access and working areas for testing on site, as required by testing agency and as authorized by ministerial representative.
- .3 Submit test reports to ministerial representative within one (1) week of completion of inspection.

3.5 FIELD PAINTING

- .1 Paint in accordance with Section 09 91 23 – Interior Painting.
 - .1 Touch up damaged surfaces and surfaces without shop coat with primer to SSPC-SP-6 except as specified otherwise. Apply in accordance with CAN/CGSB 85.10.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM A 53/A 53M-12, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - .2 ASTM A269M-15a, Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
 - .3 ASTM A307-14, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- .2 CSA Group
 - .1 CSA G40.20-13/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CAN/CSA G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CSA S16-14, Design of Steel Structures.
 - .4 CSA W48-14, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
 - .5 CSA W59-13, Welded Steel Construction (Metal Arc Welding) Metric.
- .3 Green Seal Environmental Standards (GS)
 - .1 GS-11-2011, Paints and Coatings.
- .4 The Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual - current edition.
- .5 ULC Standards
 - .1 UL 2768-2011, Architectural Surface Coatings.
 - .2 UL 2760-2011, Surface Coatings - Recycled Water-borne.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for tubing, pipe, sections, plates, bolts and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit two copies of WHMIS SDS in accordance with Section 01 35 29.06- Health and Safety Requirements.
 - .1 For finishes, coatings, primers, and paints applied on site: indicate VOC concentration in g/L.
- .3 Shop Drawings:

- .1 The shop drawings must clearly indicate all the details of shaping and assembly, including cuts, notches, assemblies, holes, anchors and welds.
- .2 Prepare shop drawings taking into account all related works. Perform the required coordination to avoid any conflict.
- .3 Use the symbols defined in the CSA W59 standard to represent the welds.
- .4 The Specialized Contractor shall only undertake the shaping and manufacture of fabricated metals when the shop drawings have been approved by the Departmental Representative.
- .5 The shop drawings submitted must bear the seal and signature of a qualified engineer recognized and authorized to practice in Canada, in the province of Quebec.
- .6 Shop drawings must indicate or show the materials, the thickness of the core, the finishes, the assemblies, the joints, the method of anchoring and the number of anchoring devices, supports, elements reinforcement, details and accessories.

1.3 QUALITY ASSURANCE

- .1 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certifications: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 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, in dry location, off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.
- .4 Develop Construction Waste Management Plan related to Work of this Section.
- .5 Packaging Waste Management: remove for reuse by manufacturer and return of pallets, padding, crates, packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 19- Waste Management and Disposal.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Steel sections and plates: to CSA G40.20/G40.21, Grade 300W.
- .2 Steel pipe: to ASTM A53/A53M standard weight, galvanized finish.
- .3 Welding materials: to CSA W59.
- .4 Welding electrodes: to CSA W48 Series.
- .5 Bolts and anchor bolts: to ASTM A307.
- .6 Aluminum sheet: plain or embossed according to indications of a finish thickness and color indicated.
- .7 Stainless steel tubing: to ASTM A269, Type commercial grade 302 seamless welded with AISI No. 4 finish.
- .8 Grout: non-shrink, non-metallic, flowable, 15 MPa at 24 hours.

2.2 FABRICATION

- .1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
- .2 Use self-tapping shake-proof flat headed screws on items requiring assembly by screws or as indicated.
- .3 Where possible, fit and shop assemble work, ready for erection.
- .4 Exposed welds continuous for length of each joint. File or grind exposed welds smooth and flush.

2.3 FINISHES

- .1 Galvanizing: hot dipped galvanizing with zinc coating 600 g/m² to CAN/CSA-G164.
- .2 Chromium plating: chrome on steel with plating sequence of 0.009 mm thickness of copper 0.010 mm thickness of nickel and 0.0025 mm thickness of chromium.
- .3 Shop coat primer: MPI- INT 5.1A and MPI- EXT 5.1B.
- .4 Zinc primer: zinc rich, ready mix to MPI-INT EXT 5.2C in accordance with chemical component limits and restrictions requirements and VOC limits of GS-11.

2.4 ISOLATION COATING

- .1 Isolate aluminum from following components, by means of bituminous paint:
 - .1 Dissimilar metals except stainless steel, zinc, or white bronze of small area.
 - .2 Concrete, mortar and masonry.
 - .3 Wood.

2.5 SHOP PAINTING

- .1 Primer: VOC limit 250 g/L maximum to GS-11.
- .2 Apply one shop coat of primer to metal items, with exception of galvanized or concrete encased items.
- .3 Use primer unadulterated, as prepared by manufacturer. Paint on dry surfaces, free from rust, scale, grease. Paint when temperature minimum 7 degrees C.
- .4 Clean surfaces to be field welded; do not paint.

2.6 ANGLE LINTELS

- .1 Steel angles: galvanized, sizes indicated for openings. Provide 150 mm minimum bearing at ends.
- .2 Weld or bolt back-to-back angles to profiles as indicated.
- .3 Finish: shop painted.
 - .1 Primer: VOC limit 250 g/L maximum to GS-11 when applied onsite.

2.7 CORNER GUARDS

- .1 Not Used.

2.8 ACCESS LADDERS

- .1 Not Used.

2.9 TRENCH COVERS AND FRAMES

- .1 Steel fabricate from 6 mm thick raised pattern plate set in L 55 x 55 x 6 frame. Include anchors at 1200 mm on centre for embedding in concrete. Supply trench covers in 1200 mm removable lengths.
- .2 Finish: galvanized.
 - .1 Primer: maximum VOC limit 250 g/L to GS-11 when applied onsite.

2.10 CHANNEL FRAMES

- .1 Fabricate frames from steel, sizes of channel and opening as indicated.
- .2 Weld channels together to form continuous frame for jambs and head of openings, sizes as indicated.
- .3 Weld 25 mm x 500 mm x 4.8 mm thick strap anchors to channel jamb frame at 400 mm spacing
- .4 Finish: prime coat painted.

PART 3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts acceptable for metal fabrications installation in accordance with manufacturer's written instructions.
 - .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 remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 ERECTION - GENERAL

- .1 Do welding work in accordance with CSA W59 unless specified otherwise.
- .2 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
- .3 Provide suitable means of anchorage acceptable to Departmental Representative such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.
- .4 Exposed fastening devices to match finish and be compatible with material through which they pass.
- .5 Supply components for work by other trades in accordance with shop drawings and schedule.
- .6 Make field connections with bolts to CSA S16.
- .7 Deliver items over for casting into concrete and building into masonry together with setting templates to appropriate location and construction personnel.
- .8 Touch-up rivets, field welds, bolts and burnt or scratched surfaces with primer after completion of:
 - .1 Primer: maximum VOC limit 250 g/L to GS-11.
- .9 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.
 - .1 Primer: maximum VOC limit 250 g/L to GS-11.

3.3 CORNER GUARDS

- .1 Not Used.

3.4 ACCESS LADDERS

- .1 Not Used.

3.5 TRENCH COVERS

- .1 Install trench covers in locations as indicated.

3.6 CHANNEL FRAMES

- .1 Install steel channel frames to openings as indicated.

3.7 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00- Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00- Cleaning.
- .3 Waste Management: separate waste materials for recycling, reuse in accordance with Section 01 74 19- Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.8 PROTECTION

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

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

- .1 American National Standards Institute/National Association of Architectural Metal Manufacturers (ANSI/NAAMM)
 - .1 ANSI/NAAMM MBG 531-15, Metal Bar Grating Manual.
- .2 ASTM International
 - .1 ASTM A 53/A5 3M-12, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - .2 ASTM A 307-14, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
 - .3 ASTM F3125/F3125M-15A, Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions.
- .3 Canada Green Building Council (CaGBC)
 - .1 LEEDv4 Canada-BD+C 2013, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package New Construction and Major Renovation.
 - .2 LEEDv4 Canada-BD+C 2013, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package Core and Shell Development.
 - .3 LEEDv4 Canada-ID+C 2013, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide For Commercial Interiors.
 - .4 LEEDv4 Canada fO+M 2013, LEED (Leadership In Energy and Environmental Design): Green Building Rating System Reference Guide Existing Buildings, Operations and Maintenance.
- .4 CSA Group
 - .1 CSA G40.20–13/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CAN/CSA G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CSA W59-13, Welded Steel Construction (Metal Arc Welding).
- .5 Green Seal Environmental Standards (GS)
 - .1 GS-11-2011, 3rd Edition, Paints and Coatings.
- .6 National Association of Architectural Metal Manufactures (NAAMM)
 - .1 AMP 510-92, Metal Stair Manual.
- .7 The Master Painters Institute (MPI)

- .1 Architectural Painting Specification Manual - current edition.
- .8 The Society for Protective Coatings (SSPC)
 - .1 Systems and Specifications Manual, Volume 2, 2014 Edition.
- .9 ULC Standards
 - .1 UL 2768-2011, Architectural Surface Coatings.
 - .2 UL 2760-2011, Surface Coatings - Recycled Water-borne.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for stairs and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit 2 copies of WHMIS SDS in accordance with Section 01 35 43 - Environmental Procedures and 01 35 29.06- Health and Safety Requirements.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Quebec, Canada.
 - .2 Indicate construction details, sizes of steel sections and thickness of steel sheet.
- .4 Sustainable Design Submittals:
 - .1 Construction Waste Management:
 - .1 Submit project Waste Management Plan highlighting recycling and salvage requirements.
 - .2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating 50% of construction wastes 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 content, and total cost of materials for project.
 - .3 Regional Materials: submit evidence 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 paints and coatings and adhesives and sealants used in building, showing compliance with VOC and chemical component limits or restrictions requirements.

1.3 QUALITY ASSURANCE

- .1 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certifications: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section with 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 in dry location, indoors, off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect stairs from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.
- .4 Develop Construction Waste Management Plan related to Work of this Section.
- .5 Packaging Waste Management: remove for reuse and return by manufacturer of padding, packaging materials, crates, pallets, as specified in Construction Waste Management Plan in accordance with Section 01 74 19- Waste Management and Disposal.

PART 2 PRODUCTS

2.1 SYSTEM DESCRIPTION

- .1 Design Requirements:
- .2 Design metal stair, balustrade and landing construction and connections to National Building Code of Canada (NBC) vertical and horizontal live load requirements.
- .3 Detail and fabricate stairs to NAAMM Metal Stairs Manual.

2.2 MATERIALS

- .1 Steel sections: to CSA G40.20/G40.21 Grade 300 W.
- .2 Steel plate: to CSA G40.20/G40.21, Grade 260 W.
- .3 Steel pipe: to ASTM A53/A53M, standard weight, schedule 40 seamless black.
- .4 Steel tubing: to CSA G40.20/G40.21, Grade 300W, with a wall at least 3 mm thick, of dimensions, thicknesses and shape as indicated.
- .5 Welding materials: to CSA W59.

- .6 Bolts: to ASTM A307.
- .7 High strength bolts: to ASTM A F3125/F3125M.

2.3 FABRICATION

- .1 Fabricate in accordance with NAAMM, Metal Stair Manual.
- .2 Weld connections where possible, otherwise bolt connections. Countersink exposed fastenings, cut off bolts flush with nuts. Make exposed connections of same material, colour and finish as base material on which they occur.
- .3 Accurately form connections with exposed faces flush:
 - .1 Make mitres and joints tight.
 - .2 Make risers of equal height.
- .4 Grind or file exposed welds and steel sections smooth.
- .5 Shop fabricate stairs in sections as large and complete as practicable.

2.4 STEEL PAN STAIRS

- .1 Fabricate stairs with closed riser steel pan construction.
- .2 Form treads and risers from 3 mm thick steel plate. Secure treads and risers to L 35 x 35 x 5 horizontal and vertical welded to stringers.
- .3 Form wall stringers from MC 310 x 15.8 or as indicated.
- .4 Form outer stringers from MC 310 x 15.8 with 5mm thick plate fascia welded on.
- .5 Form landings from 3 mm thick steel plate, reinforced by L 55 x 55 x 6 mm spaced at 400 mm on centre.
- .6 Provide clip angles for fastening of furring channels, where applied finish indicated for underside of stairs and landings.
- .7 Extend stringers around mid landings to form steel base.
- .8 Close ends of stringers where exposed.

2.5 PIPE/TUBING BALUSTRADES

- .1 Construct balusters and handrails from steel pipe.
- .2 Cap and weld exposed ends of balusters and handrails.
- .3 Terminate at abutting wall with end flange.

2.6 BAR BALUSTRADES

- .1 Construct balustrades and handrails according to the indications on the drawings
- .2 Weld balustrades to stringers as indicated.

2.7 FINISHES

- .1 Galvanizing: hot dipped galvanizing with zinc coating 600 g/m² to CAN/CSA-G164.
- .2 Shop coat primer: to in accordance with chemical component limits and restrictions requirements and VOC limits of UL 2760 and UL 2768.

2.8 SHOP PAINTING

- .1 Clean surfaces in accordance with Steel Structures Painting Council Manual Volume 2.
- .2 Apply one coat of shop primer except interior surfaces of pans.
- .3 Apply two coats of primer of different colours to parts inaccessible after final assembly.
- .4 Use primer as prepared by manufacturer without thinning or adding admixtures. Paint on dry surfaces, free from rust, scale, grease. Minimum temperature for painting 7 degrees C.
- .5 Do not paint surfaces to be field welded.

PART 3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts acceptable for metal stairs and ladders 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 INSTALLATION OF STAIRS

- .1 Install in accordance with NAAMM, Metal Stair Manual.
- .2 Install plumb and true in exact locations, using welded connections wherever possible to provide rigid structure. Provide anchor bolts, bolts and plates for connecting stairs to structure.
- .3 Hand items over for casting into concrete or building into masonry to appropriate trades together with setting templates.
- .4 Do welding work in accordance with CSA W59 unless specified otherwise.
- .5 Touch up shop primer to bolts, welds, and burned or scratched surfaces at completion of erection.

3.3 INSTALLATION OF PLASTIC HANDRAIL

- .1 Apply plastic handrails in accordance with manufacturer's printed instructions, using recommended tools.
- .2 Make joints and mitres neat, tight and inconspicuous. Remove surplus material from joint. Provide solid return at exposed ends of handrail.

3.4 CLEANING

- .1 Perform cleaning as soon as possible after installation to remove construction and accumulated environmental dirt.
- .2 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.
 - .1 Leave Work area clean at end of each day.
- .3 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning.
- .4 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19- Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.
- .5 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

3.5 PROTECTION

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

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 07 52 16 – Modified Bituminous Membrane Roofing
- .2 Section 07 62 00 – Sheet Metal Flashing and Trim
- .3 Section 09 90 00 – Interior, Exterior Paints and Coatings

1.2 REFERENCES

- .1 American National Standards Institute/National Particleboard Association (ANSI/NPA)
 - .1 ANSI/NPA A208.1-2009, Particleboard.
- .2 CSA International
 - .1 CSA O121-08, Douglas Fir Plywood.
 - .2 CSA O141-05(R2009), Softwood Lumber.
 - .3 CSA O151-09, Canadian Softwood Plywood.
- .3 Forest Stewardship Council (FSC)
 - .1 FSC-STD-01-001-2004, FSC Principle and Criteria for Forest Stewardship.
- .4 National Lumber Grades Authority (NLGA)
 - .1 Standard Grading Rules for Canadian Lumber 2010.
- .5 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
 - .1 SCAQMD Rule 1113-A2011, Architectural Coatings.
 - .2 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.
- .6 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S706-09, Standard for Wood Fibre Insulating Boards for Buildings.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for wood products and accessories and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Quebec, Canada.

- .2 Wood Certification: submit vendor's or manufacturer's Chain-of-Custody Certificate number for CAN/CSA-Z809 or FSC or SFI certified wood.
- .3 Low-Emitting Materials:
 - .1 Submit listing of adhesives, sealants, paints and coatings used in building, showing compliance with VOC and chemical component limits or restriction requirements.
 - .2 Submit listing of composite wood products used in building, stating that they contain no added urea-formaldehyde resins, and laminate adhesives used in building, stating that they contain no urea-formaldehyde.

1.4 QUALITY ASSURANCE

- .1 Lumber by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
- .2 Plywood, particleboard, OSB and wood based composite panels in accordance with CSA and ANSI standards.
- .3 Sustainable Standards Certification:
 - .1 Certified Wood: submit listing of wood products and materials used in accordance with CAN/CSA-Z809 or FSC or SFI.

1.5 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 off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect wood from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Sort and recycle waste in accordance with section 01 74 19 - Waste Management and Disposal.
- .2 Develop a waste reduction plan for the work covered by this section, in accordance with section 01 74 19 - Waste Management and Disposal.
- .3 Collect and sort all packaging materials made of paper, plastic, polystyrene, corrugated cardboard and place them in appropriate bins installed on site for recycling, in accordance with the waste reduction plan.
- .4 Management of packaging waste: recover packaging waste for reuse / re-use and return of pallets, cases, quilting, other packaging materials by their manufacturer, according to the directives of the reduction plan of waste and, in accordance with section 01 74 19 - Waste Management and Disposal.

PART 2 PRODUCTS

2.1 FRAMING STRUCTURAL

- .1 Lumber: softwood, S4S, moisture content 19% (S-dry) or less in accordance with following standards:
 - .1 CSA O141.
 - .2 NLGA Standard Grading Rules for Canadian Lumber.
- .2 Furring, blocking, nailing strips, grounds, rough bucks, cants, curbs, fascia backing and sleepers:
 - .1 Board sizes: "Standard" or better grade.
 - .2 Dimension sizes: "Standard" light framing or better grade.

2.2 PANEL MATERIALS

- .1 Douglas fir plywood (DFP): complies with CSA O121, "construction" classification, "standard" category.
 - .1 Without urea-formaldehyde.
- .2 Douglas fir plywood (DFP): complies with CSA O121, "construction" classification, "exterior" category.
 - .1 Without urea-formaldehyde.

2.3 ACCESSORIES

- .1 Sealants: in accordance with Section 07 92 00 - Joint Sealants.
- .2 Nails, plugs and jumpers: the use of nails, plugs and jumpers is prohibited.
- .3 Bolts: 12.5 mm diameter unless indicated otherwise, complete with nuts and washers.
- .4 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, explosive actuated fastening devices, recommended for purpose by manufacturer.
- .5 Adhesive: one-component, polymer-based and water-repellent.
 - .1 Adhesion strength (ASTM D-905) : 27 560 kPa
 - .2 Solids : 52%
 - .3 Calculated VOC (less water) : 5,6 g/L
 - .4 Flashpoint : >93 °C
 - .5 Freeze/thaw stability : stable
 - .6 Temperature application : Above 8.3 °C
 - .7 Water resistance: Pass the standard ANSI/HPVA
- .6 Fastener Finishes:
 - .1 Galvanizing: to ASTM A123/A123M, use galvanized fasteners for interior highly humid areas.

PART 3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of 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 INSTALLATION

- .1 Proceed as required by NBC and in accordance with the following requirements.
- .2 Install furring and blocking as required to space-out and support casework, cabinets, wall and ceiling finishes, facings, fascia, soffit, siding electrical equipment mounting boards, and other work as required.
- .3 Install furring to support siding applied vertically where there is no blocking and where sheathing is not suitable for direct nailing.
 - .1 Align and plumb faces of furring and blocking to tolerance of 1:600.
- .4 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work.
- .5 Install wood cants, fascia backing, nailers, curbs and other wood supports as required and secure using galvanized fasteners.
- .6 Install sleepers as indicated.
- .7 Use dust collectors and high quality respirator masks when cutting or sanding wood panels.
- .8 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
- .9 Countersink bolts where necessary to provide clearance for other work.

3.3 ASSEMBLY

- .1 Assemble, anchor, fix, attach and brace the elements so as to provide them with the necessary solidity and rigidity.
- .2 If necessary, mill the holes so that the bolt heads do not protrude.

3.4 MATERIAL USAGE

- .1 Supply and install the panels required for mounting the electrical equipment, as indicated. Use 19 mm thick G1S plywood panels, placed on a frame of 19 mm x

38 mm elements, reinforced with elements of the same size placed at intervals of not more than 300 mm.

3.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.6 PROTECTION

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

3.7 PAINT

- .1 Paint plywood panels and wood elements with fire retardant paint system no. INT 9.2J. Refer to Section 09 91 23 Interior Painting

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 07 92 00- Joint Sealants: Sealant materials and application.
- .2 Section 09 91 23- Interior Painting: Site finishing materials and application.

1.2 REFERENCE STANDARDS

- .1 American National Standards Institute (ANSI)
 - .1 ANSI/ASME 18.6.1 1981 (R2012)Wood Screws (Inch Series).
 - .2 ANSI/BHMA A156.9-2010, Cabinet Hardware.
 - .3 ANSI/BHMA A156.11-2014, Cabinet Locks.
 - .4 ANSI/BHMA A156.16-2013, Auxiliary Hardware.
 - .5 ANSI/BHMA A156.18-2012, Materials and Finishes.
 - .6 ANSI/BHMA A156.20-2006, Strap and Tee Hinges and Hasps.
 - .7 ANSI A208.1-09, Particleboard.
 - .8 ANSI A208.2-09, Medium Density Fiberboard (MDF) for Interior Applications.
 - .9 ANSI/HPVA HP-1-10, Standard for Hardwood and Decorative Plywood.
- .2 Architectural Woodwork Manufacturers Association of Canada (AWMAC)
 - .1 Architectural Woodwork Standards (AWMAC AWS), 2014.
- .3 ASTM International
 - .1 ASTM A 153/A 153M-16, 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 F1667-13Standard Specification for Driven Fasteners: Nails, Spikes and Staples.
- .4 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-11.3-M87, Hardboard.
 - .2 CAN/CGSB-71.20-M88, Adhesive, Contact, Brushable.
 - .3 CAN/CGSB-71.19-M88, Adhesive, Contact, Sprayable.
- .5 CSA Group (CSA)
 - .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 O151-14, Canadian Softwood Plywood.
 - .5 CSA O153-M1980 (R2014), Poplar Plywood.

- .6 CAN/CSA-Z809-08(R2013), Sustainable Forest Management.
- .6 Forest Stewardship Council (FSC)
 - .1 FSC-STD-01-001-2004, FSC Principle and Criteria for Forest Stewardship.
- .7 Green Seal Environmental Standards (GS)
 - .1 GS-11-2015, Paints, Coatings, Stains and Sealers.
 - .2 GS-36-2013, Adhesives for Commercial Use.
- .8 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (SDS).
- .9 National Electrical Manufacturers Association (NEMA)
 - .1 ANSI/NEMA LD-3-05, High-Pressure Decorative Laminates (HPDL).
- .10 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
 - .1 SCAQMD Rule 1113-A2011, Architectural Coatings.
 - .2 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.
- .11 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 and Departmental Representative.
 - .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 SDS in accordance with Sections 01 35 43- Environmental Procedures and 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 two sets of shop drawings for initial review in accordance with requirements of Division 01. Revise as directed, submit six copies for final acceptance and distribution.
- .3 Indicate details of construction, profiles, jointing, fastening and other related details.
 - .1 Scales: profiles full size , details half full size.
- .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.

.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 to match designer sample. For veneers with transparent finish submit three samples to illustrate range and colour of grain expected.
- .3 Submit duplicate samples of laminated plastic for each specified colour selection.
- .4 Submit duplicate samples of laminated plastic joints, edging, cutouts and post-formed profiles.
- .5 Furnish four samples of each lumber and composite panel material to Contractor for preparation of field applied finish samples in accordance with Section 09 91 23 Interior Painting.
- .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 SUSTAINABLE DESIGN SUBMITTALS

- .1 Submit for following characteristics:
 - .1 Recycled Content.
 - .2 Regional Materials.
 - .3 Low-Emitting Materials.
 - .4 Salvaged or recovered lumber.
- .2 Submit manufacturer's Chain-of-Custody Certificate number for CAN/CSA-Z809 or FSC or SFI certified wood.
 - .1 Submit manufacturer's FSC Chain-of-Custody Certificate number.
- .3 Submit ASTM E1333 test report for formaldehyde emissions from composite wood products showing compliance with specified limits.
- .4 Submit product data indicating compliance with other specified sustainable design characteristics.

1.6 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.
- .2 Independent inspection/testing agency will be engaged by Departmental Representative for purpose of inspecting and/or testing Work of this Section.
 - .1 Cost of inspection and testing services will be borne by Departmental Representative.
- .3 Mock-ups:
 - .1 Construct mock-ups in accordance with Section 01 45 00- Quality Control .
 - .2 Shop prepare one wall cabinet, counter top, base cabinet unit and shelving unit, complete with hardware shop applied finishes, and install where directed by Departmental Representative.
 - .3 Allow 24 hours for inspection of mock-up by Departmental Representative before proceeding with Work.
 - .4 When accepted, mock-up will demonstrate minimum standard for Work.
 - .5 Do not proceed with work prior to receipt of written acceptance of mock-up by Departmental Representative.
 - .6 Accepted mock-up may remain as part of finished work.

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 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 and 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 19- 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: contain no added formaldehyde.
 - .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 GS-36.

2.2 QUALITY GRADE

- .1 Provide all materials and perform all fabrication in accordance with AWMAC AWS Custom Grade except where specified otherwise
- .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.

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 19 mm unless indicated otherwise.
 - .1 Use moisture resistant grade 2-M-2 or 2-M-3 for countertops and splash-backs to receive plumbing fixtures.
- .2 MDF (medium density fibreboard) core: to ANSI A208.2, density 769 kg/m², Grade
 - .1 Use moisture resistant MR grade for countertops and splash-backs to receive plumbing fixtures.

2.5 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: HGL to suit application, 1.2 mm thick.
 - .3 Colour:
 - .1 Counter : Pionite - SG211 - Ingot Gray.
 - .2 Cabinet : Pionite - ST606 - Taupe
 - .2 Edge finishing for doors, drawer fronts, shelves and false fronts:
 - .1 HPDL to match face.
 - .3 Laminated plastic adhesive:
 - .1 Adhesive: contact adhesive to CAN/CGSB-71.20.

2.6 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.

2.7 LAMINATED PLASTIC CASEWORK FABRICATION

- .1 Do laminated plastic fabrication in compliance with NEMA LD3, Annex A and specified AWMAC AWS quality grade.
- .2 Ensure adjacent parts of continuous laminate work match in colour and pattern.
- .3 Veneer laminated plastic to core material in accordance with adhesive manufacturer's instructions. Ensure core and laminate profiles coincide to provide continuous support and bond over entire surface. Use continuous lengths up to 3000 mm. Keep joints 600 mm from sink cutouts.
- .4 Use straight self-edging laminate strip for flatwork to cover exposed edge of core material. Chamfer exposed edges uniformly at approximately 20 degrees. Do not mitre laminate edges.
- .5 Apply laminate backing sheet to reverse side of core of plastic laminate work.
- .6 Apply laminated plastic liner sheet to interior of cabinetry.
- .7 Drawer Construction:
 - .1 Sides: Premium grade: 7-ply 16mm veneer core with HPDL faces.
 - .2 Bottoms: Hardwood plywood of same species as drawer sides, thickness 6 mm.
 - .3 Joinery: Meeting requirements of AWMAC for Grade specified.
 - .4 Drawer bottoms fully housed into sides and sub front and mechanically fastened to back or plowed into back.

2.8 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: Nickel
 - .2 Semi-exposed hardware: Manufacturer's standard finish.
- .3 Casework door hinges: concealed European style Grade II hinges minimum 120° opening
- .4 Other hinges: concealed
- .5 Pulls: contemporary style metal rear mount, brushed nickel finish, 265mm long.
- .6 Shelf rests: shelf rest installed in holes drilled, type B04013, with open shelf rests.
- .7 Drawer slides:
 - .1 Slide type: 304 stainless steel ball bearing, safety catch, side mounting.
 - .2 Extension and capacity: full extension meeting requirements of AWMAC AWS for type and size of drawer.
 - .3 File drawer slides: full extension.
- .8 Pull up shelf supports: adjustable tension, lock in up position self supports, type B06033.

2.9 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.
- .4 Sealant: in accordance with Section 07 92 00- Joint Sealants.

2.10 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.
 - .5 Pattern: solid printed pattern.
 - .6 Finish: satin.
- .2 Core material: 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: 3 mm PVC edge.

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 and after receipt of written approval to proceed from the Departmental Representative.

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 74 00- Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00- Cleaning.
 - .1 Clean outside and inside surfaces of millwork.
 - .2 Remove excess glue, pencil and ink marks from surfaces.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19- 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 23.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM C553-13, Standard Specification for Mineral Fibre Blanket Thermal Insulation for Commercial and Industrial Applications.
 - .2 ASTM C665-12, Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
 - .3 ASTM C1320-10, Standard Practice for Installation of Mineral Fiber Batt and Blanket Thermal Insulation for Light Frame Construction.
- .2 Canada Green Building Council (CaGBC)
 - .1 LEED Canada-NC Version 1.0-2004, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations (including Addendum 2007).
 - .2 LEED Canada-CI Version 1.0-2007, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide For Commercial Interiors.
 - .3 LEED Canada 2009 for Design and Construction-2010, LEED Canada 2009 for Design and Construction Leadership in Energy and Environmental Design Green Building Rating System Reference Guide.
 - .4 LEED Canada for Existing Buildings, Operations and Maintenance-2009, LEED Canada 2009 Leadership In Energy and Environmental Design Green Building Rating System Reference Guide.
- .3 CSA Group
 - .1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
 - .2 CSA B149 PACKAGE-10, Consists of B149.1, Natural Gas and Propane Installation Code and B149.2, Propane Storage and Handling Code.
- .4 Underwriters Laboratories of Canada (ULC)
 - .1 CAN/ULC-S604-2012, Standard for Factory-Built Type A Chimneys.
 - .2 CAN/ULC-S702-2012 , Standard for Mineral Fibre Insulation for Buildings.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for blanket insulation and include product characteristics, performance criteria, physical size, finish and limitations.

- .3 Certificates:
 - .1 Submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .4 Test Reports:
 - .1 Submit certified test reports showing compliance with specified performance characteristics and physical properties.
- .5 Sustainable Design Submittals:
 - .1 Construction Waste Management:
 - .1 Submit project 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 content, and total cost of materials for project.

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00- Common Product Requirements and with manufacturer's written instructions.
- .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 specified materials from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.
- .4 Develop Construction Waste Management Plan related to Work of this Section.
- .5 Packaging Waste Management: remove for reuse and return by manufacturer of padding, crates, pallets, packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 19- Waste Management and Disposal.

PART 2 PRODUCTS

2.1 INSULATION

- .1 Acoustic Insulation: Batt and blanket mineral fibre: to CAN/ULC-S702.

- .1 Type: 1.
- .2 Thickness: as indicated.
- .3 Flame Spread Index (ASTM E84, CAN/ULC S102) : 0
- .4 Smoke Developed Index (ASTM E84, CAN/ULC S102) : 0
- .5 Determination of Non-Combustibility of building material (CAN/ULC S114) : incombustible

2.2 ACCESSORIES

- .1 Insulation clips:
 - .1 Impale type, perforated 50 x 50 mm cold rolled carbon steel 0.8 mm thick, adhesive back, spindle of 2.5 mm diameter annealed steel, length to suit insulation, 25 mm diameter washers of self-locking type.
- .2 Nails: galvanized steel, length to suit insulation plus 25 mm, to CSA B111.
- .3 Staples: 12 mm minimum leg.
- .4 Tape: as recommended by manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

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

3.2 INSULATION INSTALLATION

- .1 Install insulation to maintain continuity of thermal protection to building elements and spaces and to ASTM C1320.
- .2 Fit insulation closely around electrical boxes, pipes, ducts, frames and other objects in or passing through insulation.
- .3 Do not compress insulation to fit into spaces.
- .4 Keep insulation minimum 75 mm from heat emitting devices such as recessed light fixtures, and minimum 50 mm from CSA B149.1 and CSA B149.2 type L or B vents.
- .5 Do not enclose insulation until it has been inspected and approved by Departmental Representative.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19- Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM B117-11, Standard Practice for Operating Salt Spray (Fog) Apparatus.
 - .2 ASTM C67-13a, Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile.
 - .3 ASTM C144-11, Standard Specification for Aggregate for Masonry Mortar.
 - .4 ASTM D968-05(2010), Standard Test Methods for Abrasion Resistance of Organic Coatings by the Falling Abrasive.
 - .5 ASTM D2247-11, Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.
 - .6 ASTM E72-13a, Standard Test Methods of Conducting Strength Tests of Panels for Building Construction.
 - .7 ASTM E695-03(2009), Standard Method for Measuring Relative Resistance of Wall, Floor, and Roof Construction to Impact Loading.
 - .8 ASTM G154-12a, Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials.
- .2 Canada Green Building Council (CaGBC)
 - .1 LEED Canada-NC Version 1.0-2004, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations (including Addendum 2007).
 - .2 LEED Canada-CI Version 1.0-2007, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide For Commercial Interiors.
 - .3 LEED Canada 2009 for Design and Construction-2010, LEED Canada 2009 for Design and Construction Leadership in Energy and Environmental Design Green Building Rating System Reference Guide.
 - .4 LEED Canada for Existing Buildings, Operations and Maintenance-2009, LEED Canada 2009 Leadership In Energy and Environmental Design Green Building Rating System Reference Guide.
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.162-2004, Emulsion Coating for Stucco and Masonry.
 - .2 CAN/CGSB-19.24-M90, Multicomponent, Chemical-Curing Sealing Compound.
- .4 CSA Group
 - .1 CSA A3000-13, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

- .5 Underwriters Laboratories of Canada (ULC)
 - .1 CAN/ULC-S101-07, Standard Methods of Fire Tests of Building Construction and Materials.
 - .2 CAN/ULC-S102.2-10, Standard Methods for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies.
 - .3 CAN/ULC-S134-13, Standard Method of Fire Test of Exterior Wall Assemblies.

1.2 DEFINITIONS

- .1 Liquid vapor barrier: Water-based product which when applied to a surface, forms a hard, flexible and monolithic coating, which prevents water and moisture from entering through the wall.
- .2 Liquid ceramic membrane: liquid application material, containing ceramic particles which reflect, refract and dissipate energy. It forming a flexible coating of very high adhesion and a texture giving it the appearance of canvas.
- .3 Facing joint: joint with function that is both aesthetic and practical (ease of installation). Acts as a facing joint for the grooves, cheeks and engravings, which also serve as a starting and stopping point for the application of the finishing plaster.
- .4 Direct application coating system: coating system applied directly to rigid coating plates. This type of system differs from insulation and coating systems in that it does not include insulation.

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 direct applied exterior finishes and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit 2 copies of WHMIS SDS in accordance with Sections 01 35 43- Environmental Procedures and 01 35 29.06- Health and Safety Requirements.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Quebec, Canada.
 - .2 Indicate wall layout, details, connections, expansion joints, finish system, installation sequence, including interface with fascias, walls, air barriers, vapour retarders and other components.
- .4 Samples:
 - .1 Submit 300 x 300 mm sample of each colour of finished soffit system prior to fabrication of mock-up .

1.4 QUALITY ASSURANCE

- .1 Quality Assurance:
 - .1 Installer: company or person specializing in application of exterior finish system (direct applied) approved by manufacturer.
 - .2 Installation of exterior finish system by applicators certified by manufacturers of system used.
 - .3 Submit certification to Departmental Representative prior to commencement of work.
- .2 Mock-ups:
 - .1 Construct mock-up in accordance with Section 01 45 00- Quality Control.
 - .1 On a section of wall 1 m long x 1 m wide, make a sample of the proposed system, including and showing the color, texture and finish.
 - .2 Construct mock-up where directed by Departmental Representative.
 - .3 Allow 48 hours for inspection of mock-up by Departmental Representative before proceeding with work.
 - .4 When accepted, mock-up will demonstrate minimum standard for work, and may remain as part of finished work.

1.5 ACCEPTABLE MATERIALS OR PRODUCTS

- .1 When materials or products are prescribed by their trademark, consult the Instructions to Bidders for the procedure to follow regarding the request for approval of replacement materials or products.

1.6 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 in dry location, off ground, indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect specified materials from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

1.7 AMBIENT CONDITIONS

- .1 Temperature, relative humidity, moisture content.
 - .1 Apply exterior finish system components at temperatures, relative humidity, and substrate moisture content and substrate temperature in accordance with manufacturer's written instructions.

- .2 Maintain ambient temperature above 10 degrees C during base coat application and until cured minimum 48 hours.
- .3 Maintain ambient temperature above 10 degrees C during finish coat application and until cured minimum 48 hours.

1.8 WARRANTY

- .1 With regard to Section 07 24 10.03 - Exterior Finish - Direct Applied, the 12 month warranty period prescribed in the General Conditions is extended to 120 months.

PART 2 PRODUCTS

2.1 SYSTEM DESCRIPTION

- .1 Performance requirements: ensure installed modified polymer (soft) coat wall system has following performance properties:
 - .1 Comply with CAN/ULC-S134.
 - .2 Finish abrasion resistance: falling sand method to ASTM D968, no deleterious effects.
 - .3 Finish salt spray resistance: to ASTM B117, after 300 hours exposure to 5% salt spray solution - no effects.
 - .4 Accelerated weathering (accelerated aging): according to ASTM G23 standard, no effect after 3000 hours.
 - .5 Permeability: according to ASTM E96.

2.2 SURFACE PREPARATION

- .1 Conditioner: water based, clear conditioner/sealer compatible with system materials, recommended by system manufacturer.
- .2 Leveller: polymer-modified, cement-based, reinforced levelling compound.

2.3 BASECOAT

- .1 Liquid vapour barrier: water-based coating for concrete walls. The thickness when dry is 250µ per layer. Acceptable products:
 - .1 Perm: 0.08
 - .2 Type: Acrylic
 - .3 Pigmentation content: 50.1%
 - .4 Type of solvent: Water
 - .5 Solid content: 72%
 - .6 Acceptable products: "Astec WPM9" from Isotherm or a replacement product approved by addendum in accordance with the Instructions to Bidders.

2.4 FINISH COAT

- .1 Liquid ceramic membrane: water-based coating for primed concrete interior and exterior walls. The thickness when dry is 200um per layer. The final system must have a thickness of 450um. The color is at the choice of the Departmental Representative.
 - .1 Weight / gal: 10.2 lbs
 - .2 Solid by weight: 58%
 - .3 Solid by volume: 55%
 - .4 Coverage: 57-74 sq.ft./gal.
 - .5 Dry film thickness: 15 mills
 - .6 Tension force: 110.4 PSI
 - .7 Type of Solvent: Water
 - .8 Base Pigment: Titanium
 - .9 Acceptable products: "Astec 900" from Isotherm or a replacement product approved by addendum in accordance with the Instructions to Bidders.

2.5 ACCESSORIES

- .1 Accessories: corner beads, casing beads, stop beads, and accessories, as recommended by exterior finish system manufacturer to suit system components.

2.6 EXPANSION JOINTS

- .1 Not used

2.7 MATERIALS: SITE MIX

- .1 Cement: to CSA A3000, Type GU.
- .2 Sand: dry bag.
 - .1 For white cement: silica sand, 30-50 mesh.
 - .2 For grey cement: mortar sand to ASTM C144.
- .3 Water: potable.

2.8 MIXES

- .1 General:
 - .1 Mixer: high speed, clean and rust free.
 - .2 Mixing pail: clean and rust free.
 - .3 Mixes: additive free.
- .2 Conditioner: mix in accordance with manufacturer's written instructions.
- .3 Leveller: mixed to uniform consistency in accordance with manufacturer's written instructions.

- .4 Basecoat: mixed to uniform consistency in accordance with manufacturer's written instructions.
- .5 Finish coat: mixed to uniform consistency in accordance with manufacturer's written instructions.

PART 3 EXECUTION

3.1 ACCEPTABLE INSTALLERS

- .1 Specialized contractor accredited by Isotherm-Astec or Specialized contractors accredited by the manufacturer of the equivalent product approved

3.2 MANUFACTURER'S INSTRUCTIONS

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

3.3 EXAMINATION

- .1 Inspect and verify condition of existing substrate surfaces for contamination, surface absorption, chalkiness, cracks, damage, deterioration, moisture content, moisture damage, and tolerances.
 - .1 Substrate tolerance not greater than 6mm per 2500 mm in accordance with manufacturer's written instructions.
- .2 Report deviations from specified requirements or other conditions that might adversely affect exterior finish system installation in writing to Departmental Representative.
- .3 Proceed with Work only after receipt of written approval from Departmental Representative.

3.4 PREPARATION

- .1 Protection:
 - .1 Protect adjacent surfaces from damage resulting from Work of this section.
 - .2 Protect finished Work from water penetration at end of each day or on completion of each section of Work.
 - .3 Protect installation from moisture for 48 hours minimum after completion of each portion of Work.
- .2 Surface preparation:
 - .1 Ensure environmental and site conditions are suitable for installation of system.
 - .2 Prepare existing surfaces in accordance with manufacturer's written instructions.
 - .3 Clean surfaces using pressurized water 2500 to 3000 psi with TSP (Tri-sodium phosphate) additive.

- .4 Repair any drain, orifice and any weakened or damaged underlying layer. Seal joints, cracks and holes. Seal all exposed cracks, joints and connection points with a 100% acrylic sealing compound.
- .5 Rusted metal surfaces must be pre-treated with a rust preventive primer for metal. A second coat may be necessary if the surface is too rusty or porous.

3.5 INSTALLATION

- .1 Basecoat and finish Coat Application:
 - .1 Apply basecoat and finish coat in accordance with manufacturer's written installation instructions.
 - .2 Apply coats to a clean and dry surface
 - .3 Apply coats either by spraying, with a brush or roller, according to the manufacturer's recommendations.
 - .4 Apply finish in continuous application, and work towards wet edge.
 - .5 Do not install separate batches of finish coat side by side.
 - .6 Do not apply finish into or over sealant joints.
 - .7 Do not apply finish over irregular or unprepared surfaces.
- .2 Basecoat
 - .1 Transparent water-based vapor barrier, compatible with the products used for the realization of the coating system and recommended by the manufacturer.
 - .1 Apply the product at a minimum thickness of 200µ (wet) ensuring uniform coverage, in accordance with the manufacturer's written instructions.
 - .2 Apply base coat directly on existing wall.
 - .3 Let dry 48 hours.
 - .4 Apply a second coat of the product.
 - .5 Let dry 48 hours.
- .3 Finish coat applied to vertical surfaces and ceiling:
 - .1 Liquid ceramic membrane: reinforced compound, based on hydraulic binders modified by polymers.
 - .1 Apply the product at a minimum thickness of 200µ (wet) ensuring uniform coverage, in accordance with the manufacturer's written instructions.
 - .2 Apply finishing plaster directly on existing wall.
 - .3 Let dry 48 hours.
 - .4 Apply a second coat of the product.
 - .5 Let dry 48 hours.
- .4 Finishing coat applied to the roof:
 - .1 Liquid ceramic membrane: reinforced compound, based on hydraulic binders modified by polymers.

- .1 Apply the product at a minimum thickness of 200 μ (wet) ensuring uniform coverage, in accordance with the manufacturer's written instructions.
- .2 Apply finishing plaster on new roof.
- .3 Let dry 48 hours.
- .4 Apply a second coat of the product.
- .5 Let dry 48 hours.

3.6 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00- Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00- Cleaning.
 - .1 Remove insulation material spilled during installation and leave work area ready for application of wall board.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19- Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

PART 1 GENERAL

1.1 SECTION CONTENT

This section describes the requirements for, but not limited to, the supply and installation of vapor barrier polyethylene part of the concrete slabs on grade.

1.2 REFERENCES

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM D 1709 - 09 Standard Test Methods for Impact Resistance of Plastic Film by the Free-Falling Dart Method.
 - .2 ASTM E 96 - Standard Test Methods for Water Vapor Transmission of Materials.
 - .3 ASTM E 154 - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs.
 - .4 ASTM E 1643 - Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.
 - .5 ASTM E 1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.
 - .6 ASTM F 1249-01 Standard Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor.
- .2 American Concrete Institute (ACI)
 - .1 ACI 302.1R-96 Vapor Barrier Component (plastic membrane) is not less than 10 mils thick.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and datasheet and include:
 - .1 Product characteristics.
 - .2 Performance criteria.
 - .3 Limitations.
- .3 Submit two copies of Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS).
- .4 Quality assurance submittals:

- .1 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .2 Instructions: submit manufacturer's installation instructions and comply with written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.

1.4 ENVIRONMENTAL REQUIREMENTS

- .1 Product not intended for improper use, or permanent exposure to weather.
- .2 Do not apply on frozen ground.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
 - .1 Protect prefabricated constructions against moisture and damages during their delivery or after.
 - .2 Store prefabricated constructions in well ventilated premises protected against moisture or extreme temperature variations.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect cabinetry from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

1.6 1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 Sort and recycle waste in accordance with section 01 74 19 - Waste Management and Disposal.
- .2 Develop a waste reduction plan for the work covered by this section, in accordance with section 01 74 19 - Waste Management and Disposal.
- .3 Collect and sort all packaging materials made of paper, plastic, polystyrene, corrugated cardboard and place them in appropriate bins installed on site for recycling, in accordance with the waste reduction plan.
- .4 Management of packaging waste: recover packaging waste for reuse / re-use and return of pallets, cases, quilting, other packaging materials by their manufacturer, according to the directives of the reduction plan of waste and, in accordance with section 01 74 19 - Waste Management and Disposal.

PART 2 PRODUCTS

2.1 SHEET VAPOUR BARRIER

- .1 Plastic vapour retarder
 - .1 Specification: polyolefin-based resin/chemical membrane, to ASTM E 1745 as follows:
 - .1 Maximum water vapour permeance (ASTM E-96): 0.0063 Perms
 - .2 Puncture Resistance (ASTM D1709 Method B): >3200 grams
 - .3 Tensile Strength (ASTM E154 Section 9): 12.61 kN/m
 - .4 Water Vapor Permeance After wetting and drying (ASTM E154 section 8 and ASTM E96 Procédure B: 0.0052 perms
 - .5 Water Vapor Permeance Resistance to Plastic Flow and Elevated Temperature (ASTM E-154 Section 11 and ASTM E-96 Procedure B) : 0.0057 Perms
 - .6 Water Vapor Permeance Effect Low Temperature and Flexibility (ASTM E-154, Section 12 and ASTM E-96, Procedure B): 0.0052 perms
 - .7 Water Vapor Permeance Resistance to Deterioration From Organisms and Substances in Contacting Soil (ASTM E-154, Section 13 and ASTM E-96 Procedure B): 0.0052 perms

2.2 ACCESSOIRES

- .1 Joint sealing tape: air tight adhesive tape, apply with light pressure, type recommended by manufacturer of vapor barrier, 100 mm wide.
- .2 Sealant: compatible with vapor barrier used and recommended by manufacturer. Compliant with Section 07 92 00 - Joint Sealants.
- .3 Molded vapor barrier elements to manufacturer's recommendations.
- .4 Hose clamps
 - .1 Fabricate hose clamps with vapor barrier material and pressure sensitive tape according to manufacturer's instructions.

PART 3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for vapour retarder installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of 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 MANUFACTURERS INSTRUCTIONS

- .1 Conformance: comply with manufacturer's written requirements, recommendations and specifications including all available data sheets, instructions relative to maintenance and handling, storage and product installation, and technical instructions in data sheets.

3.3 PREPARATION

- .1 Prepare surfaces in accordance with manufacturer's written instructions.
- .2 Level, compress or roll ground or granulate below slab base

3.4 INSTALLATION

- .1 Install vapour barrier in accordance with manufacturer's written instructions and to ASTM E 1643-98.
- .2 Ensure services are installed and inspected prior to installation of retarder.
- .3 Install sheet vapour retarder on warm side of exterior ceiling wall, assemblies prior to installation of gypsum board to form continuous barrier.
- .4 Use sheets of largest practical size to minimize joints.
- .5 Unroll vapour barrier where slab will be poured. Cut to dimensions if required.
- .6 All joints and connections, lateral or butt jointed, will overlap width 150 mm, cover up with joint sealing tape, 100 mm wide. The area where tape is applied should be free of dust, dirt and moisture so as to allow maximum self-adhesion.
- .7 Inspect for continuity. Repair punctures and tears with sealing tape before work is concealed.

3.5 PERIMETER SEALS

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

3.6 VAPOUR BARRIER TRAVERSAL

- .1 Seal protrusions as per manufacturer's written indications.

3.7 CLEANING

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

- .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.
 - .1 Remove insulation material spilled during installation and leave work area ready for application of wall board.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

- .1 ASTM International Inc.
 - .1 ASTM C726-05, Standard Specification for Mineral Fiber Roof Insulation Board.
 - .2 ASTM C728-05, Standard Specification for Perlite Thermal Insulation Board.
 - .3 ASTM C1177/C1177M-06, Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
 - .4 ASTM C1396/C1396M-06a, Standard Specification for Gypsum Board.
 - .5 ASTM D41-05, Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.
 - .6 ASTM D312-00(2006), Standard Specification for Asphalt Used in Roofing.
 - .7 ASTM D448-03a, Standard Classification for Sizes of Aggregate for Road and Bridge Construction.
 - .8 ASTM D2178-04, Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing.
 - .9 ASTM D6162-00a, Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fibre Reinforcements.
 - .10 ASTM D6163-00e1, Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fibre Reinforcements.
 - .11 ASTM D6164-05, Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.
 - .12 ASTM D6222-02e1, Standard Specification for Atactic Polypropylene (APP) Modified Bituminous Sheet Materials Using Polyester Reinforcement.
 - .13 ASTM D6223-02e1, Standard Specification for Atactic Polypropylene (APP) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcement.
 - .14 ASTM D6509-00, Standard Specification for Atactic Polypropylene (APP) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcement.
- .2 Canadian General Standards Board (CGSB)
 - .1 CGSB 37-GP-9Ma-83, Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing.
 - .2 CGSB 37-GP-56M-80b(A1985), Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing.

- .3 CAN/CGSB-51.33-M89, Vapour Barrier Sheet, Excluding Polyethylene, for Use in Building Construction.
- .3 Canadian Roofing Contractors Association (CRCA)
 - .1 CRCA Roofing Specifications Manual-1997.
- .4 CSA Group (CSA)
 - .1 CSA A123.21-04, Standard Test Method for the Dynamic Wind Uplift Resistance of Mechanically Attached Membrane-Roofing Systems
 - .2 CSA-A123.3-05, Asphalt Saturated Organic Roofing Felt.
 - .3 CSA-A123.4-04, Asphalt for Constructing Built-Up Roof Coverings and Waterproofing Systems.
 - .4 CSA A231.1-06, Precast Concrete Paving Slabs.
 - .5 CSA O121-08, Douglas Fir Plywood.
 - .6 CSA O151-04, Canadian Softwood Plywood.
- .5 Factory Mutual (FM Global)
 - .1 FM Approvals - Roofing Products.
- .6 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (SDS).
- .7 Underwriters Laboratories' of Canada (ULC)
 - .1 CAN/ULC-S701-05, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.
 - .2 CAN/ULC-S702.2-03, Standard for Mineral Fibre Thermal Insulation for Buildings.
 - .3 CAN/ULC-S704-03, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.
 - .4 CAN/ULC-S706-02, Standard for Wood Fibre Thermal Insulation for Buildings.

1.2 ADMINISTRATIVE REQUIREMENTS

- .1 Convene pre-installation meeting one week prior to beginning waterproofing Work, with Departmental Representative and roofing contractor's representative in accordance with Section 01 32 16.07- Construction Progress Schedules - Bar (GANTT) Chart to:
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions.
 - .3 Co-ordination with other building subtrades.
 - .4 Review manufacturer's installation instructions and warranty requirements.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

- .2 Product Data:
 - .1 Provide two copies of most recent technical roofing components data sheets describing materials' physical properties and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Provide two copies of WHMIS SDS in accordance with Sections 01 35 43- Environmental Procedures and 01 35 29.06- Health and Safety Requirements, and indicate VOC content for:
 - .1 Primers.
 - .2 Asphalt.
 - .3 Sealers.
 - .4 Filter fabric.
- .3 Provide shop drawings:
 - .1 Indicate flashing and control joints, details.
- .4 Manufacturer's Certificate: certify that products meet or exceed specified requirements.
- .5 Test and Evaluation Reports: submit laboratory test reports certifying compliance of membrane with specification requirements.
- .6 Manufacturer's Installation Instructions: indicate special precautions required for seaming the membrane.
- .7 Manufacturer's field report: in accordance with Section 01 45 00- Quality Control.
- .8 Reports: indicate procedures followed, ambient temperatures and wind velocity during application.

1.4 QUALITY ASSURANCE

- .1 Installer qualifications: company or person specializing in application of modified bituminous roofing systems with 5 documented experience.

1.5 FIRE PROTECTION

- .1 Fire Extinguishers:
 - .1 Maintain one cartridge operated type or stored pressure rechargeable type with hose and shut-off nozzle,
 - .2 ULC labelled for A, B and C class protection.
 - .3 Size 9 kg on roof per torch applicator, within 6 m of torch applicator.
- .2 Maintain fire watch for 1 hour after each day's roofing operations cease.

1.6 DELIVERY, STORAGE, AND HANDLING

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

- .1 Safety: comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of asphalt, sealing compounds, primers and caulking materials.
 - .2 Provide and maintain dry, off-ground weatherproof storage.
 - .3 Store rolls of felt and membrane in upright position. Store membrane rolls with salvage edge up.
 - .4 Remove only in quantities required for same day use.
 - .5 Place plywood runways over completed Work to enable movement of material and other traffic.
 - .6 Store sealants at +5 degrees C minimum.
 - .7 Store insulation protected from weather, daylight and deleterious materials.
- .3 Packaging Waste Management: remove for reuse and return by manufacturer of packaging materials, pallets, padding and crates in accordance with Section 01 74 19- Waste Management and Disposal.
- .1 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.
 - .2 Fold up metal banding, flatten and place in designated area for recycling.

1.7 SITE CONDITIONS

- .1 Ambient Conditions
 - .1 Do not install roofing when temperature remains below -18 degrees C for torch application, or to manufacturers' recommendations for mop application.
 - .2 Minimum temperature for solvent-based adhesive is -5 degrees C.
- .2 Install roofing on dry deck, free of snow and ice, use only dry materials and apply only during weather that will not introduce moisture into roofing system.

1.8 WARRANTY

- .1 With regard to Section 07 52 00 - Modified bitumen membrane roofs, the 12 month warranty period prescribed in the General Conditions is extended to 60 months.

PART 2 PRODUCTS

2.1 PERFORMANCE CRITERIA

- .1 It is essential that the different materials forming part of the roofing system are compatible with each other. Provide the Departmental Representative with a written declaration certifying that the materials and components of the roofing system, as used, are compatible.
- .2 Cover system: in accordance with CSA A123.21 standard with regard to dynamic resistance to tearing under the action of wind.

Submit a document issued by a certified testing laboratory, demonstrating that the specified roof system has been tested according to CSA A 123.21-10, Standard test method for dynamic resistance to tearing under the action of wind or systems. The test results must demonstrate that the roofing system has a dynamic pullout resistance (RDA) of -1.1 kPa for the current surface, of -1.5 kPa at the perimeters and of -3.3 kPa at the corners of the roof.

2.2 DECK PRIMER

- .1 Primer: Primer for concrete surfaces, composed of SBS synthetic rubbers, resins known for their adhesion and volatile solvents, compliant with standard CGSB 37-GP-9Ma.
 - .1 Density at 20°C: 0.79 kg / L
 - .2 Color: Red
 - .3 Solid content: 24%
 - .4 Viscosity, Brookfield at 25°C: 200cP.

2.3 VAPOUR BARRIER

- .1 Vapour barrier (PV1): self-adhesive membrane, composed of bitumen modified with SBS polymers and a woven trilaminar polyethylene on the surface. The self-adhesive underside is covered with a detachable silicone film.
 - .1 Surface: Woven with trilaminar polyethylene
 - .2 Underside: Detachable silicone film
 - .3 Thickness: 0.8 mm
 - .4 Dimensions: 40.8 x 1.14 m
 - .5 Weight: 0.77 kg / m²
 - .6 Tensile strength L / T: 9.5 / 13kN / m
 - .7 Elongation at break L / T: 33/25%
 - .8 Resistance to static puncture: 400 N
 - .9 Tear resistance L / T: 423/458 N
 - .10 Water absorption: 0.1% max
 - .11 Water vapor permeability 1.7 ng / Pa.s.m²
 - .12 Air permeability: <0.001 L / s • m²

2.4 POLYISOCYANURATE INSULATION

- .1 Insulation (ISO1): Polyisocyanurate thermal insulation panel, composed of a core with closed cellular structure between organic coatings reinforced with glass fibers.
 - .1 Thermal resistance (LTTR) (CAN / ULC S704-11) 50.80mm: 1.00 RSI
 - .2 Compressive strength (ASTM D1621): 172 kPa
 - .3 Density (ASTM D1622): 32 kg / m³
 - .4 Linear dimensional stability (ASTM D2126): <0.5%
 - .5 Flame spread (ASTM E84): 40-60

2.5 MEMBRANE

.1 Underlay panel

- .1 Description: High performance underlayment panel composed of a bitumen membrane modified with SBS polymers with a non-woven polyester reinforcement and covered with a hot-melt plastic film. The membrane is laminated in the factory on an insulating support panel of high density polyisocyanurate.
 - .1 Membrane thickness: 2.2 mm
 - .2 Thickness of the support panel: 12.7mm
 - .3 Total thickness: 14.9mm
 - .4 Membrane reinforcement: non-woven polyester
 - .5 Thermal resistance (ASTM C518): 0.44 RSI
 - .6 Compressive strength (ASTM D1621): 550 to 759 kPa
 - .7 Dimensional stability (ASTM D2126) <0.5% linear change
 - .8 Water absorption (ASTM C209): <3% of the volume
 - .9 Mold resistance (ASTM D3273): Passed.

.2 Choice of colors for the granules of the finishing membranes

- .1 For common surfaces: gray
- .2 For sidewalks: gray

.3 Finishing membrane for the current surface

- .1 Description: High performance finishing membrane composed of modified bitumen with SBS polymers and a composite reinforcement. The surface is protected by colored granules and the underside is covered with a hot-melt plastic film. Meets CSA A123.23-15, Type C, Class 1.
 - .1 Thickness: 4.0mm
 - .2 Reinforcement: composite
 - .3 Dimension 8x1m
 - .4 Surface: granules
 - .5 Underside: Hot melt plastic film

2.6 ACCESSORY MEMBRANES

.1 Cover strip

- .1 Description: covering strip composed of bitumen modified with SBS polymers and a composite reinforcement. Both sides are covered with a hot melt plastic film. The tape is used to seal the transverse overlaps.
- .2 Thickness: 2.5mm
- .3 Reinforcement: Composite
- .4 Weight: 3.3 kg / m²
- .5 Surface: Hot melt plastic film
- .6 Sub-Surface: Hot-melt plastic film

2.7 ADHESIVE

- .1 Two component, low expansion polyurethane adhesive.
 - .1 Viscosity, Brookfield at 25°C (ASTM D2556):
 - .1 Part A: 1,800 cP
 - .2 Part B: 2,800 cP
 - .2 Cream time: 15sec
 - .3 Rise time: around 2 minutes
 - .4 Full cure time: 15 minutes.

2.8 FLAME-CUTTING MEMBRANE

- .1 Description: Flame-retardant membrane composed of bitumen modified with SBS polymers and a glass fleece reinforcement. The surface is sanded and the self-adhesive underside is covered with a removable silicone film. It is designed to prevent the penetration of the flame into any void, space or opening before the installation of a membrane installed with the torch.
 - .1 Thickness: 1.6mm
 - .2 Frame: Glass veil
 - .3 Surface: Sanded
 - .4 Underside: Self-adhesive, covered with a removable silicone film.
 - .5 Low temperature flexibility (CAN / CGSB-37.56-M): -35°C

2.9 ADDITIONAL WATERPROOFING PRODUCTS

- .1 Sealants
 - .1 Description: Multipurpose sealant based on SBS modified bitumen, fibers, minerals and solvents; compatible with bitumen-based materials.
 - .2 Density at 20°C: 1.12kg / l
 - .3 Application temperature: -10 to 35°C
 - .4 Operating temperature range: -40 to 80°C
 - .5 Solid content: 83%
 - .6 Drying time: 4 to 24 hours, depending on the temperature and the amount applied.
- .2 Sealant
 - .1 Description: waterproofing coating based on bitumen and polyurethane mono component.
 - .2 Density at 25°C: 1.07Kg / L
 - .3 Solid content: 80%
 - .4 Elongation at break (ASTM D412): 500%
 - .5 Tensile strength (ASTM D412): 1.35 MPa
 - .6 Peel resistance (ASTM D903): 102.3 N
 - .7 Tear resistance (ASTM D5147 sec.7): 253.5N

2.10 BITUMEN

- .1 Asphalt: conforms to CAN / CSA A123.4, type 2.

2.11 CARPENTRY

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

2.12 CANT STRIPS

- .1 Cut from pressure-treated wood material, to measure 140 mm on slope.

2.13 FASTENERS

- .1 Covering to steel deck: No. 10 flat head, self tapping, Type A or AB, cadmium plated screws. Recommend FM Approved screw and plate assemblies.
- .2 Insulation to deck: coated insulation fasteners and galvanized plates must meet FM Approval for wind uplift and corrosion resistance, as recommended by insulation manufacturer.

PART 3 EXECUTION

3.1 QUALITY OF WORK

- .1 Examine the support, execute the preparatory work and install the cover in accordance with the Devis, Couvertures manual, of the AMCQ roofers / roofing contractors, especially with regard to fire safety.
- .2 Do priming in accordance with manufacturers written recommendations.
- .3 The interface of the walls and roof assemblies will be fitted with durable rigid material providing connection point for continuity of air barrier.
- .4 Assembly, component and material connections will be made in consideration of appropriate design loads, with reversible mechanical attachments.

3.2 EXAMINATION OF ROOF DECKS

- .1 Verification of Conditions:
 - .1 Inspect with Departmental Representative deck conditions including parapets, construction joints, roof drains, plumbing vents and ventilation outlets to determine readiness to proceed.
- .2 Evaluation and Assessment:
 - .1 Prior to beginning of work ensure:
 - .1 Decks are firm, straight, smooth, dry, free of snow, ice or frost, and swept clean of dust and debris. Do not use calcium or salt for ice or snow removal.
 - .2 Curbs have been built.
 - .3 Roof drains have been installed at proper elevations relative to finished roof surface.

- .4 Plywood and lumber nailer plates have been installed to deck, walls and parapets as indicated.
- .3 Do not install roofing materials during rain or snowfall.

3.3 PROTECTION OF IN-PLACE CONDITIONS

- .1 Cover walls, walks, sloped roofs and adjacent work where materials hoisted or used.
- .2 Use warning signs and barriers. Maintain in good order until completion of Work.
- .3 Clean off drips and smears of bituminous material immediately.
- .4 Dispose of rain water off roof and away from face of building until roof drains or hoppers installed and connected.
- .5 Protect roof from traffic and damage. Comply with precautions deemed necessary by Departmental Representative.
- .6 At end of each day's work or when stoppage occurs due to inclement weather, provide protection for completed Work and materials out of storage.
- .7 Metal connectors and decking will be treated with rust proofing or galvanization.

3.4 APPLICATION OF THE PRIMER LAYER

- .1 Wood, metal, concrete, masonry surfaces or gypsum waterproofing supports will receive a coat of primer at a rate of 0.3 to 0.5 L / m² (no primer is required on prepainted metals). All application surfaces must be free of rust, dust and residues which could adversely affect adhesion. The surface coated with primer must be covered with the membrane as soon as possible (the same day in the case of self-adhesive membranes).

3.5 INSTALLING THE SELF-ADHESIVE VAPOR BARRIER

- .1 The primer must be dry when installing the vapor barrier.
- .2 Starting from the bottom of the slope, unroll the membrane on the surface without making it adhere so as to be able to align it. Do not remove the detachable silicone film immediately.
- .3 Align the roller parallel to the grooves in the steel decking. Provide continuous support for all membrane overlaps.
- .4 Clear one end of the detachable silicone plastic film in order to adhere to the surface of this part of the membrane. Then remove this protective film at an angle of 45 °, so as to avoid causing wrinkling of the membrane.
- .5 Overlap adjacent rollers 75 mm (3 in) and 100 mm (4 in). All cross joints will be 150 mm (6 in.). Space the transverse joints at least 300 mm (12 in.).
- .6 When the vapor barrier is installed directly on a steel deck, provide a thin sheet of metal under the transverse overlaps.

3.6 INSULATION APPLICATION

- .1 Adhere insulation with specified adhesive applied in beads spaced 305mm on running surface, 305mm on perimeters and 305mm at corners.

3.7 FABRICATION OF LAMINATED PANELS AND UNDERCOAT IN THE FACTORY

- .1 Adhere the underlayment panels with the specified adhesive applied in cords spaced 305mm on the running surface, 305mm on the perimeters and 305mm in the corners.

3.8 FITTING REINFORCEMENT GUSSETS

- .1 Install reinforcement gussets vis-à-vis all interior and exterior angles.
- .2 Install the gussets by heat sealing after the implementation of the underlay.

3.9 INSTALLATION OF THERMOSELDED REINFORCEMENT MEMBRANES

- .1 Install the reinforcement membranes according to the indications of the typical details illustrated in the technical documentation of the membrane manufacturer.

3.10 FITTING THE HEAT-WELDABLE FINISH LAYER ON THE CURRENT PART

- .1 Use starting rollers with double braid for the first selvedge. If a starter roller is not used, the longitudinal overlap covered with granules must be degreased by driving the granules into the bitumen heated with a torch, over a width of 75 mm (3 in).
- .2 Unroll the waterproofing membrane on the underlayment, taking care to align the edge of the first selvedge with the edge of the roof.
- .3 At transverse overlaps, cut at an angle the corner of the area that will be covered by the next membrane roll.
- .4 Each edge will overlap the previous one laterally following the line provided for this purpose, and will overlap 150 mm (6 in) at the ends. Space the transverse joints at least 300 mm (12 in.).
- .5 Weld the top coat with a blowtorch on the underlayment to create a slight overflow of bitumen (3 to 6 mm) (0.12 in. To 0.25 in.).
- .6 Make sure to proceed without overheating the membranes and their reinforcements.
- .7 Avoid the formation of folds, swellings or fishy mouths.
- .8 Avoid traffic on finished surfaces; use rigid protectors if necessary.

3.11 CANTS

- .1 Install cants over rigid insulation.
- .2 Apply hot bitumen to receiving surface and embed cant firmly by hand.
 - .1 Fasten wood cants to wood insulation stops.

- .3 Angle cut cants to fit tightly on back and bottom where roof to wall angle varies from 90 degrees.

3.12 EXECUTION OF SEALING IN VARIOUS DETAILS

- .1 Install waterproofing membranes to various roof details as indicated in the standard details illustrated in the manufacturer's technical documentation.

3.13 FIELD QUALITY CONTROL

- .1 Inspections:
 - .1 Inspection and testing of roofing application will be carried out by testing laboratory designated by Departmental Representative.
 - .2 Departmental Representative will pay for tests as specified in Section 01 45 00- Quality Control.
 - .3 Inspection and testing of roofing application will be carried out by testing laboratory designated by Departmental Representative.
 - .4 Costs of tests will be paid by Owner.

3.14 CLEANING

- .1 Remove bituminous markings from finished surfaces.
- .2 In areas where finished surfaces are soiled caused by work of this section, consult manufacturer of surfaces for cleaning advice and complying with their documented instructions.
- .3 Repair or replace defaced or disfigured finishes caused by work of this section.
- .4 Waste Management: separate waste materials for recycling and reuse in accordance with Section 01 74 19- Waste Management and Disposal.
 - .1 Place materials defined as hazardous or toxic in designated containers.
 - .2 Clearly label location of salvaged material's storage areas and provide barriers and security devices.
 - .3 Ensure emptied containers are sealed and stored safely.
 - .4 Divert unused aggregate materials from landfill to local facility for reuse as reviewed by Departmental Representative.
 - .5 Unused paint and coating material must be disposed of at official hazardous material collections site as reviewed by Departmental Representative.
 - .6 Unused adhesive, sealant and asphalt materials must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.
 - .7 Dispose of unused adhesive material at official hazardous material collections site approved by Departmental Representative.
 - .8 Dispose of unused sealant material at official hazardous material collections site approved by Departmental Representative.
 - .9 Dispose of unused asphalt material at official hazardous material collections site approved by Departmental Representative.

- .10 Divert unused gypsum materials from landfill to recycling facility as reviewed by Departmental Representative.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

- .1 The Aluminum Association Inc. (AAI)
 - .1 AA Aluminum Design Manual 2015Part VIII Guidelines for Aluminum Sheet Metal Work in Building Construction.
 - .2 AAI DAF45-2003(R2009), Designation System for Aluminum Finishes.
- .2 American Architectural Manufacturers Association (AAMA)
 - .1 AAMA 611-14Voluntary Specifications for Anodized Architectural Aluminum.
 - .2 AAMA 621-02Voluntary Specifications for High Performance Organic Coatings on Coil Coated Architectural Hot Dipped Galvanized (HDG) and Zinc-Aluminum Coated Substrates.
 - .3 AAMA 2603-15, Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
 - .4 AAMA 2604-13Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
 - .5 AAMA 2605-13Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
- .3 American National Standards Institute (ANSI)
 - .1 ANSI/SPRI/FM 4435/ES-1, Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems 2011.
- .4 ASTM International
 - .1 ASTM A240/A240M-16, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
 - .2 ASTM A606/A606M-15, Standard Specification for Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance.
 - .3 ASTM A 653/A 653M-15e1, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .4 ASTM A755/A755M-16e1Standard Specification for Steel Sheet, Metallic coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
 - .5 ASTM A 792/A 792M-10(2015), Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
 - .6 ASTM B32-08(2014), Standard Specification for Solder Metal.

- .7 ASTM B209-14 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- .8 ASTM B 370-12, Standard Specification for Copper Sheet and Strip for Building Construction.
- .9 ASTM D 523-14, Standard Test Method for Specular Gloss.
- .10 ASTM D1970/D1970M-15a Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
- .11 ASTM D4587-11 Standard Practice for Fluorescent UV-Condensation Exposures of Paint and Related Coatings.
- .12 ASTM F1667-15 Standard Specification for Driven Fasteners: Nails, Spikes and Staples.
- .5 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-51.32-M77, Sheathing, Membrane, Breather Type.
- .6 Canadian Roofing Contractors Association (CRCA)
 - .1 Roofing Specifications Manual 2012.
- .7 Canadian Sheet Steel Building Institute (CSSBI)
 - .1 CSSBI S8-2008 Quality and Performance Specification for Prefinished Sheet Steel Used for Building Products.
 - .2 CSSBI B17-2002 Barrier Series Prefinished Steel Sheet: Product Performance & Applications.
 - .3 CSSBI Sheet Steel Facts #12 2003 Fastener Guide for Sheet Steel Building Products.
- .8 CSA Group
 - .1 CSA A123.3-05(2015), Asphalt Saturated Organic Roofing Felt.
 - .2 CSA A123.22-08(2013) Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
- .9 FM Global
 - .1 Property Loss Prevention Data Sheets 1-49 Perimeter Flashing.
- .10 Green Seal Environmental Standards
 - .1 Standard GS-11-2015, Paints, Coatings, Stains, and Sealers.
 - .2 Standard GS-36-2013, Adhesives for Commercial Use.
- .11 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (SDS).
- .12 Sheet Metal and Air Conditioning Contractors Association of North America (SMACNA)
 - .1 Architectural Sheet Metal Manual (2012)
 - .2 Residential Sheet Metal Guidelines (2001)

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00- Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature including product specifications and technical data sheets for sheet metal flashing fasteners and accessory materials. Include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit two copies WHMIS SDS - Material Safety Data Sheets in accordance with Sections 01 35 43- Environmental Procedures and 01 35 29.06- Health and Safety Requirements.
- .3 Shop Drawings:
 - .1 Submit shop drawings for all sheet metal fabrications.
 - .2 Indicate sheet thickness, flashing dimensions and fastenings. Include anchorage, expansion joints and other provisions for thermal movement.
 - .3 Submit manufacturer's catalogue cut sheets for manufactured items.
- .4 Samples:
 - .1 Submit duplicate 50 x 50 mm samples of each type of sheet metal material, finishes and colour.

1.3 PRE-INSTALLATION MEETING

- .1 Include sheet metal flashing and trim on agenda of pre-installation meetings of affected sections.

1.4 MOCK-UPS

- .1 Include flashings in mock-ups as specified for work of other affected sections.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00- Common Product Requirements.
- .2 Handle and store flashing materials to prevent creasing, buckling, scratching, or other damage.
- .3 Waste Management and Disposal:
 - .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 19- Waste Management and Disposal.

PART 2 PRODUCTS

2.1 SUSTAINABILITY CHARACTERISTICS

2.2 BASE SHEET METAL MATERIALS

- .1 Provide sheet metal in base metal thickness specified. Where no thickness specified, provide base sheet metal in thickness recommended in SMACNA

Architectural Sheet Metal Manual for type of item being fabricated, but not less than the thickness required by the authority having jurisdiction.

- .2 Zinc coated steel sheet: commercial quality, according to ASTM A653/A653M standard, designation zinc coating Z275.
- .3 Stainless steel sheet: according to ASTM A240 / A240M standard, grade 304, in no.4 brushed finish.

2.3 PREFINISHED STEEL SHEET

- .1 Prefinished steel with factory applied primer and polyvinyl chloride heat-cured topcoat.
 - .1 Class F1S.
 - .2 Colour selected by Departmental Representative from the full range of standard colour offered by the manufacturer.
 - .3 Specular gloss: 30 units +/- 5 in accordance with ASTM D523.
 - .4 Coating thickness: not less than 200 micrometres.
 - .5 Resistance to accelerated weathering for chalk rating of 8, colour fade 5 units or less and erosion rate less than 20 % to ASTM D45878 as follows:
 - .1 Cycle #4 General Metal Coatings.
 - .2 Exposure period: 2000 hours.

2.4 PREFINISHED ALUMINUM SHEET

- .1 Finish exposed surfaces of aluminum components in accordance with AA DAF45 and AAMA 611.
- .2 Appearance and properties of anodized finishes designated by Aluminum Association as Architectural Class 1, Architectural Class 2.

2.5 ACCESSORIES

- .1 Isolation coating: alkali resistant bituminous paint.
- .2 Pourable sealer: proprietary two-part polyurethane pourable sealer designed for sealing penetration pockets.
 - .1 Maximum VOC limit 50 g/L to GSES GS-36.
- .3 Loose laid underlay for metal flashing: dry sheathing to CAN/CGSB-51.32.
- .4 Self-adhesive membrane underlay and tie-in membrane for metal flashings: To CSA A123.22 or ASTM D1970.
- .5 Sealants: See Section 07 92 00 – Joint Sealants
- .6 Cleats and hook strips: of same material, and temper as sheet metal, minimum 50 mm wide. Thickness same as sheet metal being secured.
- .7 Fasteners: of same material as sheet metal and concealed.
- .8 Washers: in the same material as the sheet used, 1 mm thick, with rubber gaskets.

- .9 Touch-up paint: as recommended by the manufacturer of the pre-finished sheet.
- .10 Fasteners: only screw type fasteners with an acceptable corrosion protection layer are permitted.
- .11 For membrane drilling work, the fastening devices must only be of the screw type.

2.6 FABRICATION

- .1 Metal flashings and other sheet metal elements must be shaped in accordance with the details recommended by the AMCQ and the indications.
- .2 Fabricate aluminum flashings and other sheet aluminum work in accordance with AAI-Aluminum Sheet Metal Work in Building Construction.
 - .1 For aluminum sheet metal flashing, trim and fabrications to be anodized, complete forming prior to anodizing.
- .3 Unless otherwise specified, make simple stapling joints.
- .4 Make corner joints with concealed overlaps of 25 mm.
- .5 Form pieces in 2400 mm maximum lengths.
 - .1 Make allowance for expansion at joints.
- .6 Hem exposed edges on underside 12 mm.
 - .1 Mitre and seal corners with sealant.
- .7 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.
- .8 Apply isolation coating to metal surfaces to be embedded in concrete or mortar.

2.7 METAL FLASHINGS

- .1 Form flashings, copings and fascias to profiles indicated.

2.8 REGLETS AND CAP FLASHINGS

- .1 Embedding etching strips to be placed flush to receive flashings and metal counter flashings must be shaped and incorporated into concrete and masonry works, in accordance with the details of the drawings and details recommended by the AMCQ. Elements must have oval mounting holes and be secured with steel / plastic washer fasteners.

2.9 EAVES TROUGHS AND DOWNPIPES

- .1 Form eaves troughs and downpipes from aluminum, 0.81 mm thick.
- .2 Sizes and profiles as indicated.
- .3 Provide goosenecks, outlets, strainer baskets and necessary fastenings.
- .4 Form 600 x 600 mm splash pans from 0.81 mm thick.

PART 3 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 INSTALLATION

- .1 Install sheet metal work as detailed.
- .2 Use concealed fastenings except where approved before installation.
- .3 Provide underlay under sheet metal.
 - .1 Secure in place and lap joints 100 mm.
 - .2 Provide self-adhesive membrane to tie into adjacent assemblies.
- .4 Counterflash bituminous flashings at intersections of roof with vertical surfaces and curbs.
 - .1 Flash joints using as detailed.
- .5 Lock end joints and caulk with sealant.
- .6 Install surface mounted reglets true and level, and caulk top of reglet with sealant.
- .7 Insert metal flashing into reglets to form weather tight junction.
- .8 Turn top edge of flashing into recessed reglet or mortar joint minimum of 25 mm. Lead wedge flashing securely into joint.
- .9 Caulk flashing at cap flashing with sealant.
- .10 Install pans, where shown around items projecting through roof membrane.
- .11 Where flashing installed with mechanical fasteners, install fasteners in slots or oversize holes to allow expansion and contraction of flashings.
- .12 Provide isolation coating or impervious self-adhesive membrane to separate aluminum items from concrete and masonry.

3.3 EAVES TROUGHS AND DOWNPIPES

- .1 Install eaves troughs and secure to building at 750 mm on centre with eaves trough spikes through spacer ferrules.
 - .1 Slope eaves troughs to downpipes as indicated.
 - .2 Seal joints watertight.
- .2 Install downpipes and provide goosenecks back to wall.
 - .1 Secure downpipes to wall with straps at 1800 mm on centre; minimum two straps per downpipe.
- .3 Install splash pans as indicated.

3.4 CLEANING

- .1 Proceed in accordance with Section 01 74 00- Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.
- .3 Leave work areas clean, free from grease, finger marks and stains.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

- .1 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (SDS).
- .2 National Research Council Canada (NRC)
 - .1 National Building Code of Canada 2015 (NBC).
- .3 Underwriter's Laboratories of Canada (ULC)
 - .1 ULC-S115-1995, Fire Tests of Fire stop Systems.

1.2 DEFINITIONS

- .1 Fire Stop Material: device intended to close off opening or penetration during fire or materials that fill openings in wall or floor assembly where penetration is by cables, cable trays, conduits, ducts and pipes and poke-through termination devices, including electrical outlet boxes along with their means of support through wall or floor openings.
- .2 Single Component Fire Stop System: fire stop material that has Listed Systems Design and is used individually without use of high temperature insulation or other materials to create fire stop system.
- .3 Multiple Component Fire Stop System: exact group of fire stop materials that are identified within Listed Systems Design to create on site fire stop system.
- .4 Tightly Fitted; (ref: NBC Part 3.1.9.1(1) and 9.10.9.6(1)): penetrating items that are cast in place in buildings of non-combustible construction or have "0" annular space in buildings of combustible construction.
 - .1 Words "tightly fitted" should ensure that integrity of fire separation is such that it prevents passage of smoke and hot gases to unexposed side of fire separation.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00- Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit two copies of WHMIS SDS - Material Safety Data Sheets in accordance with Section 02 81 01- Hazardous Materials.
- .3 Shop Drawings:
 - .1 Submit shop drawings to show location, proposed material, reinforcement, anchorage, fastenings and method of installation.
 - .2 Construction details should accurately reflect actual job conditions.

- .4 Samples:
 - .1 Submit duplicate 300 x 300 mm samples showing actual fire stop material proposed for project.
- .5 Quality assurance submittals: submit following in accordance with Section 01 45 00- Quality Control.
 - .1 Test reports: in accordance with CAN-ULC-S101 for fire endurance and CAN-ULC-S102 for surface burning characteristics.
 - .1 Submit certified test reports from approved independent testing laboratories, indicating compliance of applied fire stopping with specifications for specified performance characteristics and physical properties.
 - .2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
 - .3 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence and cleaning procedures.
 - .4 Manufacturer's Field Reports: submit to manufacturer's written reports within 3 days of review, verifying compliance of Work, as described in PART 3 - FIELD QUALITY CONTROL.

1.4 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Installer: person specializing in fire stopping installations approved by manufacturer.
- .2 Pre-Installation Meetings: convene pre-installation meeting one week prior to beginning work of this Section, with Departmental Representative and the contractor's representative in accordance with 01 32 16.07- Construction Progress Schedule - Bar (GANTT) Chart to:
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions.
 - .3 Co-ordination with other building subtrades.
 - .4 Review manufacturer's installation instructions and warranty requirements.
- .3 Site Meetings: as part of Manufacturer's Services described in PART 3 - FIELD QUALITY CONTROL, schedule site visits, to review Work, at stages listed.
 - .1 After delivery and storage of products, and when preparatory Work is complete, but before installation begins.
 - .2 Twice during progress of Work at 25% and 60% complete.
 - .3 Upon completion of Work, after cleaning is carried out.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Packing, shipping, handling and unloading:

- .1 Deliver, store and handle materials in accordance with Section 01 61 00- Common Product Requirements.
- .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .3 Deliver materials to the site in undamaged condition and in original unopened containers, marked to indicate brand name, manufacturer, ULC markings.
- .2 Storage and Protection:
 - .1 Store materials in dry location, indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.
- .3 Waste Management and Disposal:
 - .1 Separate waste materials for recycling and reuse in accordance with Section 01 74 19- Waste Management and Disposal.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Fire stopping and smoke seal systems: in accordance with CAN-ULC-S115.
 - .1 Asbestos-free materials and systems capable of maintaining effective barrier against flame, smoke and gases in compliance with requirements of CAN-ULC-S115 and not to exceed opening sizes for which they are intended and conforming to specified special requirements described in PART 3.
 - .2 Fire stop system rating: in accordance with NBC requirements.
- .2 Service penetration assemblies: systems tested to CAN-ULC-S115.
 - .1 One-component, self-leveling silicone sealant without primer.
 - .1 Color: red
 - .2 Skin formation time: 75 minutes at 25°C
 - .3 Walling term: 48 hours at 25°C
 - .4 Density: 1.15
 - .5 Hardness (ASTM D2240): 5
 - .6 Elongation at break (ASTM D412): 600%
 - .7 Movement capacity (ASTM C719): + 100/50%
 - .8 Tensile strength (ASTM D412): 98.5kg / cm²
 - .9 Peel strength (ASTM 0794) 15.7 lb
 - .2 Incombustible sparkling cement mortar, reinforced with fibers.
 - .1 Density: 600 ± 40 kg / m³
 - .2 Compressive strength (28 days): 3.3 ± 0.3 MPa
 - .3 Withdrawal: none

- .4 Non-combustible (CAN / ULC-S114): Classified non-combustible.
- .5 Thermal Conductivity (ASTM C-518): 0.197 W / m. °K at 24°C
- .3 Service penetration fire stop components: certified by test laboratory to CAN-ULC-S115.
- .4 Fire-resistance rating of installed fire stopping assembly in accordance with NBC.
- .5 Fire stopping and smoke seals at openings intended for ease of re-entry such as cables: elastomeric seal.
- .6 Fire stopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control: elastomeric seal.
- .7 Primers: to manufacturer's recommendation for specific material, substrate, and end use.
- .8 Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.
- .9 Damming and backup materials, supports and anchoring devices: to manufacturer's recommendations, and in accordance with tested assembly being installed as acceptable to authorities having jurisdiction.
- .10 Sealants for vertical joints: non-sagging.

PART 3 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 PREPARATION

- .1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials.
 - .1 Ensure that substrates and surfaces are clean, dry and frost free.
- .2 Prepare surfaces in contact with fire stopping materials and smoke seals to manufacturer's instructions.
- .3 Maintain insulation around pipes and ducts penetrating fire separation without interruption to vapour barrier.
- .4 Mask where necessary to avoid spillage and over coating onto adjoining surfaces; remove stains on adjacent surfaces.

3.3 INSTALLATION

- .1 Install fire stopping and smoke seal material and components in accordance with manufacturer's certified tested system listing.
- .2 Seal holes or voids made by through penetrations, poke-through termination devices, and unpenetrated openings or joints to ensure continuity and integrity of fire separation are maintained.
- .3 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.
- .4 Tool or trowel exposed surfaces to neat finish.
- .5 Remove excess compound promptly as work progresses and upon completion.

3.4 SEQUENCES OF OPERATION

- .1 Proceed with installation only when submittals have been reviewed by Departmental Representative.
- .2 Install floor fire stopping before interior partition erections.
- .3 Metal deck bonding: fire stopping to precede spray applied fireproofing to ensure required bonding.
- .4 Mechanical pipe insulation: certified fire stop system component.
 - .1 Ensure pipe insulation installation precedes fire stopping.

3.5 FIELD QUALITY CONTROL

- .1 Inspections: notify Departmental Representative when ready for inspection and prior to concealing or enclosing fire stopping materials and service penetration assemblies.
- .2 Manufacturer's Field Services:
 - .1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - SUBMITTALS.
 - .2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
 - .3 Schedule site visits, to review Work, as directed in PART 1 - QUALITY ASSURANCE.

3.6 CLEANING

- .1 Proceed in accordance with Section 01 74 00- Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.
- .3 Remove temporary dams after initial set of fire stopping and smoke seal materials.

3.7 SCHEDULE

- .1 Fire stop and smoke seal at:
 - .1 Penetrations through fire-resistance rated masonry, concrete, and gypsum board partitions and walls.
 - .2 Edge of floor slabs at curtain wall and precast concrete panels.
 - .3 Top of fire-resistance rated masonry and gypsum board partitions.
 - .4 Intersection of fire-resistance rated masonry and gypsum board partitions.
 - .5 Control and sway joints in fire-resistance rated masonry and gypsum board partitions and walls.
 - .6 Penetrations through fire-resistance rated floor slabs, ceilings and roofs.
 - .7 Openings and sleeves installed for future use through fire separations.
 - .8 Around mechanical and electrical assemblies penetrating fire separations.
 - .9 Rigid ducts: greater than 129 cm² : fire stopping to consist of bead of fire stopping material between retaining angle and fire separation and between retaining angle and duct, on each side of fire separation.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM C919-08, Standard Practice for Use of Sealants in Acoustical Applications.
- .2 Canada Green Building Council (CaGBC)
 - .1 LEED Canada-NC Version 1.0-2004, LEED (Leadership in Energy and Environmental Design): Green Building Rating System for New Construction and Major Renovations (including Addendum 2007).
 - .2 LEED Canada-NC-2009, LEED (Leadership in Energy and Environmental Design): Green Building Rating System for New Construction and Major Renovations 2009.
 - .3 LEED Canada-CI Version 1.0-2007, LEED (Leadership in Energy and Environmental Design): Green Building Rating System for Commercial Interiors.
 - .4 LEED Canada-EB: O&M-2009, LEED (Leadership in Energy and Environmental Design): Green Building Rating System for Existing Buildings: Operations and Maintenance 2009.
- .3 Canadian General Standards Board (CGSB)
 - .1 CGSB 19-GP-5M-1984, Sealing Compound, One Component, Acrylic Base, Solvent Curing (Issue of 1976 reaffirmed, incorporating Amendment No. 1).
 - .2 CAN/CGSB-19.13-M87, Sealing Compound, One-component, Elastomeric, Chemical Curing.
 - .3 CGSB 19-GP-14M-1984, Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing (Reaffirmation of April 1976).
 - .4 CAN/CGSB-19.17-M90, One-Component Acrylic Emulsion Base Sealing Compound.
 - .5 CAN/CGSB-19.24-M90, Multi-component, Chemical Curing Sealing Compound.
- .4 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.
- .5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (SDS).
- .6 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
 - .1 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 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 SDS in accordance with Sections 01 35 43- Environmental Procedures and 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 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.

1.3 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.

1.4 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 indoors, off ground, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Store and protect joint sealants from nicks, scratches, and blemishes.
- .3 Replace defective or damaged materials with new.
- .4 Develop Construction Waste Management Plan related to Work of this Section.
- .5 Packaging Waste Management: remove for reuse by manufacturer and return of pallets, crates, padding, packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 19- Waste Management and Disposal.

1.5 SITE CONDITIONS

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

1.6 ENVIRONMENTAL REQUIREMENTS

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of Material Safety Data Sheets (SDS) acceptable to Health Canada.
- .2 Ventilate area of work by use of approved portable supply and exhaust fans.

PART 2 PRODUCTS

2.1 SEALANT MATERIALS

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

- .2 When low toxicity caulks are not possible, confine usage to areas which off gas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off gas time.
- .3 Where sealants are qualified with primers use only these primers.

2.2 SEALANT MATERIAL DESIGNATIONS

- .1 Sealant for sound insulation: in accordance with ULC S115, ITS (STC) 52 minimum.
 - .1 Solid: 65%
 - .2 Flame spread (ASTM E84): 15
 - .3 Density: 1.04
 - .4 Movement capacity (ASTM C719 UL2079) $\pm 33\%$
 - .5 Peel resistance (ASTM C794): 15 to 25 depending on the substrate
 - .6 Color: White.
- .2 Interior mold resistant sealant: elastomeric latex sealant.
 - .1 Base polymer: Advanced acrylic polymer
 - .2 Volatile: water
 - .3 Weight % solids: 78%
 - .4 Odor: very mild
 - .5 Service temperature range: -34°C to 82°C
 - .6 Mildew resistance: Cured caulk is mold & mildew resistant
 - .7 Dynamic joint movement (ASTM C719) $\pm 25\%$
 - .8 Color: To be chosen by the Departmental Representative from the manufacturer's complete colour selection.
- .3 Exterior sealant: gun-grade, multi-component, chemically –curing, polyurethane sealant.
 - .1 Solids: 99%
 - .2 Low temp. Flexibility (ASTM C793): Passes at -9°C
 - .3 Hardness, durometer scale "A" (ASTM C661): 30 \pm 3
 - .4 Skin time (ASTM C679): 3hr
 - .5 Tack free time (23°C-50%RH): 19 hr
 - .6 Movement capability (ASTM C719): $\pm 50\%$
 - .7 Color: To be chosen by the Departmental Representative from the manufacturer's complete colour selection.
- .4 Sealant for floors: elastomeric two-component sealant, of superior quality based on polyurethane in accordance with standard CAN / CGSB 19.24-M90, approved by the USDA and approved by the Canadian Agency for food inspection.
 - .1 Joint movement: $\pm 50\%$
 - .2 Tear resistance ASTM D624: 7.88 N / 'mm

- .3 Tensile strength at break: 0.62 mPa
- .4 ASTM C679 cure rate
 - .1 Touch dry: 8-10 hours
 - .2 Final: 3 days
- .5 Color To be chosen by the Departmental Representative.
- .5 Preformed compressible and non-compressible back-up materials:
 - .1 Polyethylene, urethane, neoprene or vinyl foam:
 - .1 Extruded 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/m³ 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.
- .6 Preformed sealants:
 - .1 The sealer system will be pre-formed, pre-compressed and self-expanding. The expansion foam will be cellular foam impregnated with a water-based acrylic polymer, which cannot be dried.
 - .1 Resistance to mold: Excellent
 - .2 Temperature difference (ASTM C711): -40 °C to 85 °C
 - .3 Tensile strength (ASTM D3574): 145 kPa
 - .4 Thermal Conductivity (ASTM C518) 0.05 w / m°C

2.3 SEALANT SELECTION

- .1 Perimeters of exterior openings where frames meet exterior facade of building (i.e. brick, block, precast masonry).
- .2 Cornice and wash (or horizontal surface joints).
- .3 Exterior joints in horizontal wearing surfaces (as itemized).
- .4 Seal interior perimeters of exterior openings as detailed on drawings.
- .5 Interior control and expansion joints in floor surfaces.
- .6 Perimeters of interior frames, as detailed and itemized.
- .7 Joints at tops of non-load bearing masonry walls at the underside of poured concrete.
- .8 Perimeter of bath fixtures (e.g. sinks, tubs, urinals, stools, water closets, basins, vanities).
- .9 Exposed interior control joints in drywall.

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 74 00- Cleaning.
 - .1 Leave Work area clean at end of each day.
 - .2 Clean adjacent surfaces immediately.
 - .3 Remove excess and droppings, using recommended cleaners as work progresses.
 - .4 Remove masking tape after initial set of sealant.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00- Cleaning.
- .3 Waste Management: separate waste materials for recycling and reuse in accordance with Section 01 74 19- Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.8 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 REFERENCE STANDARDS

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A653/A653M-06a, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .2 ASTM B29-03, Standard Specification for Refined Lead.
 - .3 ASTM B749-03, Standard Specification for Lead and Lead Alloy Strip, Sheet and Plate Products.
- .2 Canada Green Building Council (CaGBC)
 - .1 LEED Canada-NC Version 1.0-2004, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations (including Addendum 2007).
 - .2 LEED Canada-CI Version 1.0-2007, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide For Commercial Interiors.
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.
 - .2 CGSB 41-GP-19Ma-84, Rigid Vinyl Extrusions for Windows and Doors.
- .4 CSA Group (CSA)
 - .1 CSA-G40.20-04/G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CSA W59-03, Welded Steel Construction (Metal Arc Welding).
- .5 Canadian Steel Door Manufacturers' Association (CSDMA)
 - .1 CSDMA, Recommended Specifications for Commercial Steel Doors and Frames, 2000.
 - .2 CSDMA, Selection and Usage Guide for Commercial Steel Doors, 1990.
- .6 National Fire Protection Association (NFPA)
 - .1 NFPA 80-99, Standard for Fire Doors and Fire Windows.
 - .2 NFPA 252-03, Standard Methods of Fire Tests of Door Assemblies.
- .7 South Coast Air Quality Management District (SCAQMD), California State
 - .1 SCAQMD Rule 1113-04, Architectural Coatings.
 - .2 SCAQMD Rule 1168-05, Adhesives and Sealants Applications.
- .8 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S701-01, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

- .2 CAN/ULC-S702-97, Standard for Thermal Insulation, Mineral Fibre, for Buildings.
- .3 CAN/ULC-S704-03, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.
- .4 CAN4-S104-M80, Standard Method for Fire Tests of Door Assemblies.
- .5 CAN4-S105-M85, Standard Specification for Fire Door Frames Meeting the Performance Required by CAN4-S104.

1.2 SYSTEM DESCRIPTION

- .1 Design Requirements:
 - .1 Design exterior frame assembly to accommodate to expansion and contraction when subjected to minimum and maximum surface temperature of -35 degrees C to 35 degrees C.
 - .2 Maximum deflection for exterior steel entrance screens under wind load of 1.2 kPa not to exceed 1/175th of span.
 - .3 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104 NFPA 252 for ratings specified or indicated.
 - .4 Provide fire labelled frames for openings requiring fire protection ratings. Test products in conformance with CAN4-S104 and listed by nationally recognized agency having factory inspection services.

1.3 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 Province of Quebec, Canada.
 - .2 Indicate each type of door, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, 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 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.
- .4 Provide samples in accordance with Section 01 33 00- Submittal Procedures.
- .5 Submit one 300 x 300 mm corner sample of each type of frame.
 - .1 Show glazing stops, butt cutout, snap-on trim with clips and 300 mm long removable mullion connection.

1.4 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 19- 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 channel : 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
- .2 Stiffened: face sheets welded, insulated core.
 - .1 Fibreglass: to CAN/ULC-S702, semi-rigid Type
 - .1 Expanded polystyrene: CAN/ULC-S701.
 - .2 Polyurethane: to CAN/ULC-S704 rigid, modified poly/isocyanurate, closed cell board. Density 32 kg/m
- .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, 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.

- .1 Maximum VOC limit 50 g/L to GC-03.

2.5 PAINT

- .1 Field paint steel doors and frames in accordance with Sections 09 91 23- Interior Painting and 09 91 13- Exterior Painting. Protect weatherstrips from paint. Provide final finish free of scratches or other blemishes.
 - .1 Maximum VOC emission level 50 g/L to GS-11.

2.6 ACCESSORIES

- .1 Door silencers: single stud rubber/neoprene type.
- .2 Exterior top caps: rigid polyvinylchloride extrusion conforming to CGSB 41-GP-19Ma.
- .3 Fabricate glazing stops as formed channel, minimum 16 mm height, accurately fitted, butted at corners and fastened to frame sections with counter-sunk oval head sheet metal screws.
- .4 Metallic paste filler: to manufacturer's standard.
- .5 Fire labels: metal riveted.
- .6 Sealant: refer to Section 07 92 00 – Joints Sealants.
- .7 Glazing: tempered glass refer to Section 08 80 50 - Glazing
- .8 Make provisions for glazing as indicated and provide necessary glazing stops.
 - .1 Provide removable stainless steel glazing beads for use with glazing tapes and compounds and secured with countersunk stainless steel screws.
 - .2 Design exterior glazing stops to be tamperproof.

2.7 FRAMES FABRICATION GENERAL

- .1 Fabricate frames in accordance with CSDMA specifications.
- .2 Fabricate frames to profiles and maximum face sizes as indicated.
- .3 Exterior frames: 1.6 mm welded and thermally broken type construction.
- .4 Interior frames: 1.6 mm welded type construction.
- .5 Blank, reinforce, drill and tap frames for mortised, templated hardware, electronic hardware, using templates provided by finish hardware supplier. Reinforce frames for surface mounted hardware.
- .6 Protect mortised cutouts with steel guard boxes.
- .7 Prepare frame for door silencers, 3 for single door, 2 at head for double door.
- .8 Manufacturer's nameplates on frames and screens are not permitted.
- .9 Conceal fastenings except where exposed fastenings are indicated.
- .10 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.

- .11 Insulate exterior frame components with polyurethane insulation.

2.8 FRAME ANCHORAGE

- .1 Provide appropriate anchorage to floor and wall construction.
- .2 Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb.
- .3 Provide 2 anchors for rebate opening heights up to 1520 mm and 1 additional anchor for each additional 760 mm of height or fraction thereof.
- .4 Locate anchors for frames in existing openings not more than 150 mm from top and bottom of each jambs and intermediate at 660 mm on centre maximum.

2.9 FRAMES: WELDED TYPE

- .1 Welding in accordance with CSA W59.
- .2 Accurately mitre or mechanically joint frame product and securely weld on inside of profile.
- .3 Cope accurately and securely weld butt joints of mullions, transom bars, centre rails and sills.
- .4 Grind welded joints and corners to a flat plane, fill with metallic paste and sand to uniform smooth finish.
- .5 Securely attach floor anchors to inside of each jamb profile.
- .6 Weld in 2 temporary jamb spreaders per frame to maintain proper alignment during shipment.

2.10 DOOR FABRICATION GENERAL

- .1 Doors: swing type, flush, with provision for glass and/or louvre openings as indicated.
- .2 Exterior doors: insulated hollow steel construction. Interior doors: honeycomb construction.
- .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 PVC 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.

2.11 DOORS: HONEYCOMB CORE CONSTRUCTION

- .1 Form face sheets for exterior doors from 1.6 mm sheet steel with polyurethane core laminated under pressure to face sheets.
- .2 Form face sheets for interior doors from 1.6 mm sheet steel with honeycomb core laminated under pressure to face sheets.

2.12 THERMALLY BROKEN DOORS AND FRAMES

- .1 Fabricate thermally broken doors by using insulated core and separating exterior parts from interior parts with continuous interlocking thermal break.
- .2 Thermal break: rigid polyvinylchloride extrusion conforming to CGSB 41-GP-19Ma.
- .3 Fabricate thermally broken frames separating exterior parts from interior parts with continuous interlocking thermal break.
- .4 Apply insulation.

PART 3 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 INSTALLATION GENERAL

- .1 Install labelled steel fire rated doors and frames to NFPA 80 except where specified otherwise.
- .2 Install doors and frames to CSDMA Installation Guide.

3.3 FRAME INSTALLATION

- .1 Set frames plumb, square, level and at correct elevation.
- .2 Secure anchorages and connections to adjacent construction.
- .3 Brace frames rigidly in position while building-in. Install temporary horizontal wood spreader at third points of door opening to maintain frame width. Provide vertical support at centre of head for openings over 1200 mm wide. Remove temporary spreaders after frames are built-in.
- .4 Make allowances for deflection of structure to ensure structural loads are not transmitted to frames.
- .5 Caulk perimeter of frames between frame and adjacent material.
- .6 Maintain continuity of air barrier and vapour retarder.

3.4 DOOR INSTALLATION

- .1 Install doors and hardware in accordance with hardware templates and manufacturer's instructions and Section 08 71 00- Doors Hardware.
- .2 Provide even margins between doors and jambs and doors and finished floor and thresholds as follows.
 - .1 Hinge side: 1.0 mm.
 - .2 Latchside and head: 1.5 mm.
 - .3 Finished floor, noncombustible sill, thresholds and top of carpet: 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 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 REFERENCE STANDARDS

- .1 Canada Green Building Council (CaGBC)
 - .1 LEED Canada-NC Version 1.0-2004, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations (including Addendum 2007).
 - .2 LEED Canada-CI Version 1.0-2007, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide For Commercial Interiors.
- .2 Green Seal Environmental Standards (GS)
 - .1 GS-11-2008, 2nd Edition, Paints and Coatings.
- .3 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
 - .1 SCAQMD Rule 1113-A2007, Architectural Coatings.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for access door components and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Quebec, Canada.
 - .2 Submit catalogue details for each type of door illustrating profiles, dimensions and methods of assembly.
- .4 Samples:
 - .1 Submit for review and acceptance of each unit.
 - .2 Samples will be returned for inclusion into work.
 - .3 Submit 1 of each type of hand entry access door.
 - .4 Submit one 300 x 300 mm corner sample of each type of body entry door.
- .5 Sustainable Design Submittals:
 - .1 Construction Waste Management:
 - .1 Submit project 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 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 paints and coatings used in building, showing compliance with VOC and chemical component limits or restriction requirements.

1.3 CLOSEOUT SUBMITTALS

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

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, off ground, indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect access doors from nicks, scratches, and blemishes.
 - .3 Apply temporary protective coating to finished surfaces. Remove coating after installation.
 - .1 Use coatings in accordance with manufacturer's written instructions that are easily removable.
 - .2 Leave protective coating in place until final cleaning of building.
 - .4 Replace defective or damaged materials with new.
- .4 Develop Construction Waste Management Plan related to Work of this Section.
- .5 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, padding, crates, packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 19- Waste Management and Disposal.

PART 2 PRODUCTS

2.1 ACCESS DOORS

- .1 Sizes: as follows unless indicated:
 - .1 For body entry: 800 x 800 mm minimum.
 - .2 For hand entry: 450 x 450 mm minimum.
- .2 Construction: rounded safety corners, concealed hinges, screwdriver latch, anchor straps, able to open 180 degrees.
- .3 Materials:
 - .1 Tiled or marble surfaces : stainless steel with brushed satin or polished finish.
 - .2 Other areas: prime coated steel.

2.2 EXCLUSIONS

- .1 Lay-in tile ceilings: use unobtrusive identification locators.

PART 3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for access door 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 INSTALLATION

- .1 Installation: locate access doors within view of equipment and ensure equipment is accessible for operating, inspecting, adjusting, servicing without using special tools.
 - .1 Tiled surfaces: in accordance with Section 09 30 13- Ceramic Tiling.
 - .2 Install gypsum board surfaces: in accordance with Section 09 21 16- Gypsum Board Assemblies.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00- Cleaning.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00- Cleaning.

- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19- Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.4 PROTECTION

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

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

- .1 Aluminum Association (AA)
 - .1 AA DAF 45OL-03(R2009), Designation System for Aluminum Finishes.
- .2 ASTM International (ASTM)
 - .1 ASTM A 123/A 123M-15, Standard Specification for Zinc (Hot-Dip galvanized) Coatings on Iron and Steel Products.
 - .2 ASTM E 1748-95(2009), Standard Test Method for Evaluating the Engagement Between Windows and Insect Screens as an Integral System.
- .3 Canada Green Building Council (CaGBC)
 - .1 LEEDv4 Canada-BD+C 2013, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package New Construction and Major Renovation.
 - .2 LEEDv4 Canada-BD+C 2013, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package Core and Shell Development.
 - .3 LEEDv4 Canada-ID+C 2013, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide For Commercial Interiors.
 - .4 LEEDv4 Canada fO+M 2013, LEED (Leadership In Energy and Environmental Design): Green Building Rating System Reference Guide Existing Buildings, Operations and Maintenance.
- .4 CSA Group (CSA)
 - .1 AAMA/WDMA/CSA 101/1.S.2/A440-11(R2016), NAFS - North American Fenestration Standard for Windows, Doors, and Skylights.
 - .2 CSA A440S1-09, Canadian Supplement to AAMA/WDMA/CSA 101/1.S.2/A440, NAFS - North American Fenestration Standard for Windows, Doors, and Skylights.
 - .3 CAN/CSA-A440.2-14/A440.3-14, Fenestration energy performance/User guide to CSA A440.2, Fenestration energy performance.
 - .4 CAN/CSA-A440.4-07(R2016), Window, Door, and Skylight Installation
 - .5 CAN/CSA-Z91-02(R2013), Health and Safety Code for Suspended Equipment Operations.
 - .6 CAN/CSA-Z809-08, Sustainable Forest Management.
- .5 Forest Stewardship Council (FSC)
 - .1 FSC-STD-01-001 V5-2-2015, FSC Principle and Criteria for Forest Stewardship.
- .6 Green Seal (GS)

- .1 GS-11-11, Paints and Coatings.
- .7 Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual - current edition.
 - .1 MPI #79, Primer, Alkyd, Anti-Corrosive for Metal.
- .8 South Coast Air Quality Management District (SCAQMD)
 - .1 SCAQMD Rule 1113-A2016, Architectural Coatings.
 - .2 SCAQMD Rule 1168-A2005, Adhesives and Sealants.
- .9 Sustainable Forestry Initiative (SFI)
 - .1 SFI-2010-2014Standard.
- .10 Screen Manufacturers Association (SMA)
 - .1 SMA 1201R-2012 Specification for Insect Screens for Windows, Sliding Doors and Swinging Doors.

1.2 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-Installation Meetings:
 - .1 Convene pre-installation meeting 1 week prior to beginning work of this Section, with Departmental Representative and Contractor's Representative in accordance with Section 01 31 19- Project Meetings to:
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions.
 - .3 Co-ordination with other construction subtrades.
 - .4 Review manufacturer's written installation instructions and warranty requirements.
- .2 Sequencing: sequence with other work in accordance with Section 01 32 16.19

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 windows and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit 2 copies of WHMIS SDS in accordance with Sections 01 35 29.06- Health and Safety Requirements and 01 35 43- Environmental Procedures
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Quebec, Canada.
 - .2 Indicate materials and details in full size scale for head, jamb and sill, profiles of components, interior and exterior trim, junction between

- combination units, elevations of unit, anchorage details, location of isolation coating, description of related components and exposed finishes, fasteners, and caulking. Indicate location of manufacturer's nameplates.
- .3 Indicate locations, dimensions, openings and requirements of related work.
- .4 Samples:
 - .1 Submit for review and acceptance of each unit.
 - .2 Samples returned for inclusion into work.
 - .3 Submit one representative model of each type window.
 - .4 Include frame, sash, sill, glazing and weatherproofing method, insect screens, surface finish and hardware. Show location of manufacturer's nameplates.
 - .5 Include 150 mm long samples of head, jamb, sill, meeting rail to indicate profile.
- .5 Test and Evaluation Reports:
 - .1 Submit test reports from approved independent testing laboratories, certifying compliance with specifications.
 - .2 All test reports that reference the NAFS must include, on the first page, a summary of the results including, at minimum:
 - .1 The product manufacturer.
 - .2 The type of product.
 - .3 The model number/series number.
 - .4 The primary product designation.
 - .5 The secondary product designation.
 - .1 Positive design pressure.
 - .2 Negative design pressure.
 - .3 Water penetration resistance test pressure.
 - .4 Canadian air infiltration and exfiltration levels.
 - .6 The test completion date.
 - .3 The report will also contain the following information:
 - .1 Test dates.
 - .2 Report preparation dates.
 - .3 Test information retention period.
 - .4 Location of testing facilities.
 - .5 Full description of test samples, including:
 - .1 Finish.
 - .2 Condensation resistance.
 - .3 Safety drop - vertical sliding windows only.
 - .4 Block operation - sliding windows only.
 - .5 Sash strength and stiffness.

- .6 Sash pull-off - vinyl windows.
 - .7 Forced entry resistance.
 - .8 Mullian deflection - combination and composite windows.
 - .6 Complete description of amendments, as applicable.
 - .7 Conclusion.
 - .8 Drawings signed by the testing laboratory, if provided.
- .6 Sustainable Design Submittals:
 - .1 Construction Waste Management:
 - .1 Submit project Waste Management Plan highlighting recycling and salvage requirements.
 - .2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating 75 % of construction wastes recycled or salvaged.
 - .2 Regional Materials: submit evidence 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 Wood Certification: submit manufacturer's Chain-of-Custody Certificate number for CAN/CSA-Z809 or FSC or SFI certified wood.
 - .4 Low-Emitting Materials:
 - .1 Submit listing of sealants, paints, primers and coatings used in building, comply with VOC and chemical component limits or restriction requirements.
 - .2 Submit listing of laminate adhesives used in building, stating they contain no urea-formaldehyde and composite wood products used in building, stating they contain no added urea-formaldehyde resins.

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 windows for incorporation into manual.
- .3 Warranty Documentation: submit warranty documents specified.

1.5 QUALITY ASSURANCE

- .1 Test and Evaluation Reports:
 - .1 Submit test reports from approved independent testing laboratories, certifying compliance with specifications.
 - .2 Test reports that reference the NAFS include, on the first page, a summary of the results including, at minimum:
 - .1 Product manufacturer.
 - .2 Type of product.
 - .3 Model number/series number.

- .4 Primary product designation.
- .5 Secondary product designation.
 - .1 Positive design pressure.
 - .2 Negative design pressure.
 - .3 Water penetration resistance test pressure.
 - .4 Canadian air infiltration and exfiltration levels.
- .6 Test completion date.
- .3 Report to contain the following information:
 - .1 Test dates.
 - .2 Report preparation dates.
 - .3 Test information retention period.
 - .4 Location of testing facilities.
 - .5 Full description of test samples, including:
 - .1 Finish.
 - .2 Condensation resistance.
 - .3 Safety drop - vertical sliding windows only.
 - .4 Block operation - sliding windows only.
 - .5 Sash strength and stiffness.
 - .6 Sash pull-off - vinyl windows.
 - .7 Forced entry resistance.
 - .8 Mullian deflection - combination and composite windows.
 - .6 Complete description of amendments, as applicable.
 - .7 Conclusion.
 - .8 Drawings signed by the testing laboratory, if provided.
- .2 Certifications: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .3 Mock-Up:
 - .1 Provide site mock-up for work of this Section indicating methods and materials, and procedures proposed to achieve final results in accordance with Section 01 45 00– Quality Control, and to comply with following requirements, using materials indicated for completed work:
 - .1 Build mock-ups in location and of size as directed by Departmental Representative.
 - .2 Obtain Departmental Representative's acceptance of mock-ups before starting construction; mock-up used throughout construction period as standard of acceptance for subsequent work.
 - .3 Mock-up may form part of permanent structure when accepted by; repair or replace unacceptable mock-ups at no additional cost to Owner.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Sections 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, in dry location, off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect windows from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.
- .4 Develop Construction Waste Management Plan related to Work of this Section.
- .5 Packaging Waste Management: remove for reuse and return by manufacturer of crates, packaging materials pallets, padding, as specified in Construction Waste Management Plan in accordance with Section 01 74 19- Waste Management and Disposal.

1.7 WARRANTY

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

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Materials: to AAMA/WDMA/CSA 101/I.S.2/A440 supplemented as follows:
- .2 Windows by same manufacturer.
- .3 Profiles:
 - .1 Frame:
 - .1 The frame will be composed of tubular aluminum profiles of alloy 6063-T5, thus increasing rigidity, the walls of which will be 1.6 mm thick. Non-tubular exterior profile with optional 1.4 mm thick walls.
 - .2 The aluminum extrusions of the frame will be connected by 2 extruded bars of nylon polyamide reinforced with 25% fiberglass, with a width of 37 mm and a thickness of 1.8mm. The bars will be crimped with aluminum extrusions mechanically so as to obtain an integral assembly resistant to a minimum shear of 360 kg over a length of 100 mm.
 - .3 The window sill room will have water drainage holes.

- .4 The assembled frame sections will have an overall thickness of 51 mm and a depth of 152 mm.
- .2 Glazing beads:
 - .1 Interior glazing beads, 12.5 mm high, will be made of tubular aluminum profiles of alloy 6063-T5, whose walls will be 1.4 mm thick.
 - .2 The glazing beads will be designed for snap-on installation without screws, thus facilitating the change of the sealed unit from the inside.
- .4 Gasket:
 - .1 The tilt-and-turn window will be fitted on its perimeter with 2 seals with a total of 3 points of continuous contact between the frame and the shutter. The main seal will be integrated in the frame and the other in the flap.
 - .2 The seals will be inserted by pressure in a groove suitable for this purpose allowing the replacement thereof easily in case of breakage. In addition, they will be designed to fill part of the cavity between the frame and the flap, reducing the convection of air between the hot and cold parts of the frame - flap assembly, reducing the overall conductance. (Ug) from the window.
- .5 Glass: in accordance with section 08 80 00 - Glazing.
- .6 Mosquito nets: Installed and retained outside the window frame, by 4 hooks mechanically fixed to the mosquito net, vis-à-vis each opening shutter, and will be easily removable from the inside and the outside. The mosquito net will be made of an aluminum profile frame, assembled by assembly brackets retained by insertion into the aluminum frame. The wick will be made of fiberglass or aluminum, with an 18 x 16 mesh sieve of 625 mm², held at its frame by a polyvinyl chloride profile.
- .7 Frame:
 - .1 J-shaped interior frame extension molding made of 14mm aluminum extrusions. Mechanically installed in the interior frame of the window to receive gypsum or a wooden frame to be painted or covered with PVC.
 - .2 38 mm and / or 63 mm inner frame extension molding and 38 mm outer frame extension molding made of aluminum extrusions. These moldings, installed mechanically on the surface of the interior and / or exterior window frame, will ensure better adhesion and sealing with the installation membrane.
 - .3 The cavity of the thermal barrier will be filled with solid polystyrene to reduce the convection of air between the hot part and the cold part of the frame, thus reducing the overall conductance (Ug) of the window frame.
- .8 Sealants

- .1 VOC content of not more than 250 g / L, according to SCAQMD regulation 1168.

2.2 FABRICATION

- .1 Fabricate in accordance with AAMA/WDMA/CSA 101/I.S.2/A440 supplemented as follows:
- .2 Fabricate units square and true with maximum tolerance of plus or minus 1.5 mm for units with a diagonal measurement of 1800 mm or less, and plus or minus 3 mm for units with a diagonal measurement over 1800 mm.
- .3 Face dimensions detailed maximum permissible sizes.
- .4 Brace frames to maintain squareness and rigidity during shipment and installation.
- .5 Finish steel clips and reinforcement with 380 g/m² zinc coating to ASTM A123/A123M.

2.3 ENAMEL COATING

- .1 Enamel coating: in accordance with AAMA/WDMA/CSA 101/I.S.2/A440, including appendices, supplemented as follows:
 - .1 Colour: White K1285

2.4 ISOLATION COATING

- .1 Isolate aluminum from following components, by means of isolation coating:
 - .1 Dissimilar metals except stainless steel, zinc, or white bronze of small area.
 - .2 Concrete, mortar and masonry.
 - .3 Wood.

2.5 GLAZING

- .1 Glaze windows in accordance with AAMA/WDMA/CSA 101/I.S.2/A440.

2.6 HARDWARE

- .1 Main mechanism composed of a multipoint mechanism ensuring the retention of the shutter to the frame thanks to two (2) or three (3) anchoring points, depending on the dimensions of the window.
- .2 Cam handle in contemporary design made of aluminum - zinc alloy. The maximum dimensions of the handle assembly will be 28mm wide and 152mm high.
- .3 Shutter connecting rods, inserted directly into aluminum extrusions of the "Euro Groove" type. A rotation of the handle of 90 °, upwards allows an opening of the internal wing type, a rotation of the handle of 180 ° upwards allows an opening of rocking inwards (hopper).
- .4 Locking plates (keepers) in stainless steel, installed on the frame and combined with the strikes of the connecting rods of the door shutter, will maintain the

shutter in the closed position. The adjustment of the locking system will be done directly on the strikes of the shutter connecting rods.

- .5 The shutter will have two (2) visible interior hinges, made of aluminum-zinc alloy, with a total capacity of 80 kg / shutter.
- .6 The pivot and the retaining plates used to fix the hinges of the frame and the shutter, will be made of stainless steel and allow an adjustment in height, width and depth.
- .7 The screws for fixing the hinges, in stainless steel, will be accessible when the shutter is in the open position allowing them to be replaced in the event of breakage.
- .8 A controlled stroke type opening mechanism (to limit the opening to 100mm) may be installed for safe ventilation.

2.7 AIR BARRIER AND VAPOUR RETARDER

- .1 Equip window frames with site installed vapour retarder material for sealing to building vapour retarder as follows:
 - .1 Material: identical to, or compatible with, building air barrier and vapour retarder materials to provide required air tightness and vapour diffusion control throughout exterior envelope assembly.
 - .2 Material width: adequate to provide required air tightness and vapour diffusion control to building vapour retarder from interior.

PART 3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts acceptable for product 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 INSTALLATION

- .1 Window installation:
 - .1 Install in accordance with AAMA/WDMA/CSA 101/I.S.2/A440 .
 - .2 Arrange components to prevent abrupt variation in colour.
- .2 Sill installation:

- .1 Install metal sills with uniform wash to exterior, level in length, straight in alignment with plumb upstands and faces. Use one piece at each location.
- .2 Cut sills to fit window opening.
- .3 Secure sills in place with anchoring devices located at ends joints of continuous sills and evenly spaced 600 mm on centre in between.
- .4 Fasten expansion joint cover plates and drip deflectors with self tapping stainless steel screws.
- .5 Maintain 6 to 9 mm space between butt ends of continuous sills. For sills over 1200 mm in length, maintain 3 to 6 mm space at each end.
- .3 Caulking:
 - .1 Seal joints between windows and window sills with sealant. Bed sill expansion joint cover plates and drip deflectors in bedding compound. Caulk between sill upstand and window-frame. Caulk butt joints in continuous sills.
 - .2 Apply sealant in accordance with Section 07 92 00- Joint Sealants. Conceal sealant within window units except where exposed use is permitted by Departmental Representative.

3.3 FIELD QUALITY CONTROL

- .1 Have manufacturer of products supplied under this Section review Work involved in handling, installation/application, protection and cleaning of its products, and submit written reports in acceptable format to verify compliance of Work with Contract.
- .2 Manufacturer's field services: provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
- .3 Schedule site visits to review Work at stages listed:
 - .1 After delivery and storage of products, and when preparatory Work on which Work of this Section depends completed, but before installation begins.
 - .2 Twice during progress of Work at 25% and 60% complete.
 - .3 Upon completion of Work, after cleaning carried out.
- .4 Obtain reports within 3 days of review and submit.

3.4 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00- Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00- Cleaning.
- .3 Waste Management: separate waste materials for recycling and reuse in accordance with Section 01 74 19- Waste Management and Disposal.

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

3.5 PROTECTION

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

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

- .1 American National Standards Institute (ANSI) / Builders Hardware Manufacturers Association (BHMA)
 - .1 ANSI/BHMA A156.1-2000, American National Standard for Butts and Hinges.
 - .2 ANSI/BHMA A156.2-2003, Bored and Preamsembled Locks and Latches.
 - .3 ANSI/BHMA A156.3-2001, Exit Devices.
 - .4 ANSI/BHMA A156.4-2000, Door Controls - Closers.
 - .5 ANSI/BHMA A156.5-2001, Auxiliary Locks and Associated Products.
 - .6 ANSI/BHMA A156.6-2005, Architectural Door Trim.
 - .7 ANSI/BHMA A156.8-2005, Door Controls - Overhead Stops and Holders.
 - .8 ANSI/BHMA A156.10-1999, Power Operated Pedestrian Doors.
 - .9 ANSI/BHMA A156.12-2005, Interconnected Locks and Latches.
 - .10 ANSI/BHMA A156.13-2002, Mortise Locks and Latches Series 1000.
 - .11 ANSI/BHMA A156.14-2002, Sliding and Folding Door Hardware.
 - .12 ANSI/BHMA A156.15-2006, Release Devices - Closer Holder, Electromagnetic and Electromechanical.
 - .13 ANSI/BHMA A156.16-2002, Auxiliary Hardware.
 - .14 ANSI/BHMA A156.17-2004, Self-closing Hinges and Pivots.
 - .15 ANSI/BHMA A156.18-2006, Materials and Finishes.
 - .16 ANSI/BHMA A156.19-2002, Power Assist and Low Energy Power - Operated Doors.
 - .17 ANSI/BHMA A156.20-2006, Strap and Tee Hinges and Hasps.
- .2 Canada Green Building Council (CaGBC)
 - .1 LEED Canada-NC Version 1.0-2004, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations (including Addendum 2007).
 - .2 LEED Canada-CI Version 1.0-2007, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide For Commercial Interiors.
- .3 Canadian Steel Door and Frame Manufacturers' Association (CSDMA)
 - .1 CSDMA Recommended Dimensional Standards for Commercial Steel Doors and Frames - 2009.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for 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 Construction Waste Management:
 - .1 Submit project 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.
 - .3 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 content, and total cost of materials for project.
 - .4 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.

1.3 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.

1.4 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 fire exit hardware, locksets and door closers.

1.5 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.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00- Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 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.
 - .4 Replace defective or damaged materials with new.
- .5 Develop Construction Waste Management Plan related to Work of this Section.
- .6 Packaging Waste Management: remove for reuse by manufacturer and return of padding, packaging materials, crates, and pallets, as specified in Construction Waste Management Plan in accordance with Section 01 74 19- Waste Management and Disposal.

PART 2 PRODUCTS

2.1 HARDWARE ITEMS

- .1 Use one manufacturer's products only for similar items.

2.2 HARDWARE ARTICLES FOR DOORS

- .1 The function of the hardware will be as listed in the architectural hardware groups at the end of this section. The quality of the grade 1 and 2 hardware is acceptable.
- .2 All lock strikes will be supplied with dustproof boxes.
- .3 The sub-contractor is required to prepare his tender with the materials, accessories and devices specified in the specifications and drawings.

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 Supply keys in duplicate for every lock in this Contract.
- .2 Supply 3 master keys for each master key or grand master key group.
- .3 Stamp keying code numbers on keys and cylinders.
- .4 Supply construction cores.
- .5 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 Install key control cabinet.
- .7 Use only manufacturer's supplied fasteners.
 - .1 Use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.
- .8 Remove construction cores when directed by 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 74 00- Cleaning.
 - .1 Leave Work area clean at end of each day.
 - .2 Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacturer's instructions.
 - .3 Remove protective material from hardware items where present.
 - .4 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00- Cleaning.
- .2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19- Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.4 DEMONSTRATION

- .1 Keying System Setup and Cabinet:
 - .1 Set up key control system with file key tags, duplicate key tags, numerical index, alphabetical index and key change index, label shields, control book and key receipt cards.
 - .2 Place file keys and duplicate keys in key cabinet on their respective hooks.
 - .3 Lock key cabinet and turn over key to Departmental Representative.
- .2 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 locksets door closers and fire exit hardware.
- .3 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

HARDWARE GROUP: 01

DOOR(S):

EA-4 EB-5

<u>QTÉ</u>	<u>DESCRIPTION</u>	<u>IDENTIFICATION PRODUIT</u>	<u>FINI</u>	<u>MFR</u>
3	HEAVY DUTY HINGE(S)	5BB1HW 114 X 101 FNA	652	IVE
1	CURRENT TRANSFER	EPT10 CON	✓ 689	VON
1	ELECTRIC ANTI-PANIC LOCK	LX-RX-98-L-F-E996-17-FSE-CON 24 VDC	✓ 626	VON
1	ROD CYLINDER	20-021 X CMC	626	SCH
1	PERMANENT CYLINDER	SUBJECT TO EXISTING KEY	626	
1	DOOR CLOSER	4040XP EDA X ST-3068	689	LCN
1	KICK PLATE(S)	8400 254MM B-NH-A X LARG. REQ.	630	IVE
1	WALL STOP	WS401/402CVX	626	IVE
1	GASKETING	188SBK X 1/HEAD & 2/JAMB.	BK	ZER
1	DROP DOWN THRESHOLD	355AA X LARG. REQ.	AA	ZER
1	WIRE HARNESS	CON-26 (IN THE DOOR)		SCH
1	WIRE HARNESS	CON-6W (IN THE FRAME)		SCH
1	CONTROL	SEE ELECTRICAL	✓	
1	CARD READER	SEE ELECTRICAL	✓	
1	CONTACT	679-05HM	✓ BLK	SCE
1	POWER MONITOR & RELAYS	PS902 BBK 900-4R KL900 120/240 VAC	✓ LGR	SCE
1	CONNECTION DIAGRAM	AS PER OPERATIONAL PROCEDURE	✓	

HARDWARE GROUP 01 – OPERATIONAL PROCEDURE:

- presentation of a valid card momentarily unlocks the electrified trim of the anti-panic lock.
- free issue at any time, the exit request indicates an exit allowed to access control.
- lx switch monitors the projection state of the bolt.
- magnetic contact monitors the open / closed state of the door.
- in an electrical interruption situation, the exterior lock falls by default to the locked position, access by key only. The pushed side remains free at the end.

HARDWARE GROUP: 02

DOOR(S):

111

<u>QTÉ</u>	<u>DESCRIPTION</u>	<u>IDENTIFICATION PRODUIT</u>	<u>FINI</u>	<u>MFR</u>
3	HEAVY DUTY HINGE(S)	5BB1HW 114 X 101 FNA	652	IVE
1	CURRENT TRANSFER	EPT10	✓ 689	VON
1	STOREROOM LOCK WITH REQUEST FOR EXIT	L9080P 17B RX XL11-422 X CMC	✓ 626	SCH
1	PERMANENT CYLINDER	SUBJECT TO EXISTING KEY	626	
1	ELECTRIC STRIKE	6211 FSE DS CON X VOLTAGE	✓ 630	VON
1	DOOR OPERATOR	4631 CS X FLUSH CEILING MOUNT X ST-3554 WMS	✓ 689	LCN
2	ACTIVATION DEVICE	8310-856	✓ 630	LCN
2	PROTECTIVE ESCUTCHEON	8310-874	✓ 689	LCN
2	KICK PLATE(S)	8400 254MM B-NH-A X LARG. REQ.	630	IVE
1	GASKETING	188SBK X 1/HEAD & 2/JAMB.	BK	ZER
1	DROP DOWN THRESHOLD	355AA X LARG. REQ.	AA	ZER
1	WALL STOP	WS401/402CVX	626	IVE
1	CONTROL	SEE ELECTRICAL	✓	
1	CARD READER	SEE ELECTRICAL	✓	
1	CONTACT	679-05HM	✓ BLK	SCE
1	POWER MONITOR & RELAYS	PS902 BBK 900-4RL-FA KL900 120/240 VAC	✓ LGR	SCE
1	CONNECTION DIAGRAM	AS PER OPERATIONAL PROCEDURE	✓	

HARDWARE GROUP 02 - OPERATIONAL PROCEDURE:

- Presentation of a valid card momentarily unlocks the electric strike allowing manual or motorized access.
- free issue at any time, the exit request indicates an exit allowed to access control.
- the external activation device is only functional when the electric strike is unlocked, the lock state of the strike indicated by integrated ds switch.
- interior activation device functional at all times.
- magnetic contact monitors the open / closed state of the door.
- in an electrical interruption situation, the exterior lock falls by default to the locked position, access by key only. The pushed side remains free at the end.
- in a fire alarm situation, the door closes and engages, the electric strike remains secure, thus ensuring the fire separation of the assembly.

HARDWARE GROUP: 03

DOOR (S):

EA-1

<u>QTÉ</u>	<u>DESCRIPTION</u>	<u>IDENTIFICATION PRODUIT</u>	<u>FINI</u>	<u>MFR</u>
3	HEAVY DUTY HINGE(S)	5BB1HW 114 X 101 FNA	630	IVE
1	CURRENT TRANSFER	EPT10 CON	✓ 689	VON
1	ELECTRIC ANTI-PANIC LOCK	LX-RX-QEL-98-NL-CON 24 VDC	✓ 626	VON
1	ROD CYLINDER	20-021 X CMC	626	SCH
1	PERMANENT CYLINDER	SUBJECT TO EXISTING KEY	626	
1	RECESSED DOOR STOP	SERIE 100SE ADJ	630	GLY
1	DOOR OPERATOR	4642 (LONG/REG) FLUSH CEILING MOUNT X ST-3554 WMS	✓ 689	LCN
2	ACTIVATION DEVICE	8310-856	✓ 630	LCN
2	PROTECTIVE ESCUTCHEON	8310-874	✓ 689	LCN
1	KICK PLATE(S)	8400 254MM B-NH-A X LARG. REQ.	630	IVE
1	RAIN DROP GUARD	142AA X LARG. CADRE	AA	ZER
1	SEAL SET	429AA X 1/HEAD & 2/JAMB.	AA	ZER
1	DOOR SWEEP	39A X LARG. PORTE	A	ZER
1	THERMALY BROKEN THRESHOLD	626A-223 X LARG. REQ.	A	ZER
1	WIRE HARNESS	CON-26 (IN THE DOOR)		SCH
1	WIRE HARNESS	CON-6W (IN THE FRAME)		SCH
1	CONTROL	SEE ELECTRICAL	✓	
1	CARD READER	SEE ELECTRICAL	✓	
2	PUSH BUTTON	660-PB	✓ 628	SCE
1	CONTACT	679-05HM	✓ BLK	SCE
1	POWER MONITOR & RELAYS	PS902 BBK 900-4RL KL900 120/240 VAC	✓ LGR	SCE
1	CONNECTION DIAGRAM	AS PER OPERATIONAL PROCEDURE	✓	
1	INTERCOM & CAMERA	SEE ELECTRICAL		

Note: install the anti-panic lock strike on # 429 at the jamb.

Note: install the shoe of the door closer on # 429 at the head, do not cut.

Note: remote unlocking button on the ground floor and at the reception.

HARDWARE GROUP 03 - OPERATIONAL PROCEDURE:

- presentation of valid card momentarily retracts the electrified panic lock allowing manual or motorized access.
- the external activation device is only functional when the anti-panic lock is retracted, projection state indicated by integrated lx switch.
- interior activation device functional at all times.
- remote unlocking using the two buttons (one on the ground floor, the second at the reception).
- free issue at any time, the exit request indicates an exit allowed to access control.
- magnetic contact monitors the open / closed state of the door.
- in an electrical interruption situation, the exterior lock falls by default to the locked position, access by key only. the pushed side remains free at the end.

HARDWARE GROUP: 04

DOOR (S):

107 208 209

<u>QTÉ</u>	<u>DESCRIPTION</u>	<u>IDENTIFICATION PRODUIT</u>	<u>FINI</u>	<u>MFR</u>
3	HINGES	5BB1HW 114 X 101 FNA	652	IVE
1	STOREROOM LOCK	L9080P 17B X CMC	626	SCH
1	PERMANENT CYLINDER	SUBJECT TO EXISTING KEY	626	
1	DOOR OPERATOR	4631 X ST-3554 WMS	✓ 689	LCN
1	ELECTRIC STRIKE	6211 FSE CON	✓ 630	VON
1	JUNCTION BOX	JB7		VON
1	LOGIC RELAY	CX-33	✓	CAM
1	"PUSH TO LOCK" BUTTON	CM-45/8F55SF1	✓ 630	CAM
2	ILLUMINATED PUSH PLATE SWITCHES	CM-45/4F55SF1	✓ 630	CAM
1	"ASSISTANCE REQUIRED" BUTTON	CMAF540SO-F (FRENCH/ENGLISH)	✓ 630	CAM
1	BILINGUAL SIGN	CM-SF20A	BLC	CAM
1	LIGHT / SOUND INDICATOR	CM-AF141SO-FE (ENGLISH/FRENCH)	✓ BLC	CAM
1	POWER SUPPLY BOX	PS902 900-8F KL900	✓ LGR	SCE
1	DOOR CONTACT	679-05HM/WD (SELON MATÉRIAU)	✓ BLK	SCE
1	KICK PLATE(S)	8400 254MM B-NH-A X LARG. REQ.	630	IVE
1	KICK PLATE(S)	8400 152MM B-NH-A X LARG. REQ.	630	IVE
1	WALL STOP	WS401/402CVX	626	IVE
1	CONNECTION DIAGRAM	AS PER OPERATIONAL PROCEDURE		

HARDWARE GROUP 04 - OPERATIONAL PROCEDURE:

- exterior activation device illuminated green, and operational, when released, the electric strike is free. when the room is locked, the activation device turns red.
- interior button "push to lock" locks the electric strike and makes the exterior activation button non-functional (the button will become illuminated in red)
- interior activation device (operational at all times) for assisted exit of the door opener, or leaving the room manually, resets the system for the next user (door contact resets the system)
- emergency call system with audible and visual signal in the situation of a user in distress.
- when the room is occupied, the activation devices and the "push to lock" button are illuminated in red. (green when free).

HARDWARE GROUP: 05

DOOR (S):

207

<u>QTÉ</u>	<u>DESCRIPTION</u>	<u>IDENTIFICATION PRODUIT</u>	<u>FINI</u>	<u>MFR</u>
3	HINGES	5BB1 114 X 101 FNA	652	IVE
1	PRIVACY LOCK WITH OCC. IND.	L9440 17B L583-363 L283-724	626	SCH
1	DOOR CLOSER ADJ. CLOSING SPEED	1461 DEL EDA FC	689	LCN
1	KICK PLATE(S)	8400 254MM B-NH-A X LARG. REQ.	630	IVE
1	KICK PLATE(S)	8400 152MM B-NH-A X LARG. REQ.	630	IVE
1	WALL STOP	WS401/402CVX	626	IVE

HARDWARE GROUP: 06

DOOR (S):

100A

<u>QTÉ</u>	<u>DESCRIPTION</u>	<u>IDENTIFICATION PRODUIT</u>	<u>FINI</u>	<u>MFR</u>
8	HEAVY DUTY HINGE(S)	5BB1HW 114 X 101 FNA	652	IVE
1	CONSTANT LATCHING FLUSH BOLT	FB51P	630	IVE
1	ANTI-DUST STRIKE	DP2	626	IVE
1	CORRIDOR W/DEADBOLT	L9456P 17B 10-072 7/8" LIP L583- 363 X CMC	626	SCH
1	PERMANENT CYLINDER	SUBJECT TO EXISTING KEY	626	
1	COORDINATOR	COR X FL X LARG. REQ.	628	IVE
2	MOUNTING BRACKET	SERIE MB	689	IVE
2	RECESSED DOOR STOP	SERIE 100S ADJ	630	GLY
2	DOOR CLOSER ADJ. CLOSING SPEED	4041 DEL EDA ST-1754 X ST- 3068	689	LCN
4	PROTECTION PLATE(S)	8402 863MM X B-CS X LARG. REQ.	630	IVE
1	GASKETING	188SBK X 1/HEAD & 2/JAMB.	BK	ZER
2	DROP DOWN THRESHOLD SURFACE	367AA X LARG. REQ.	AA	ZER
1	ACOUSTIC ASTRAGAL	383AA X HAUT. REQ.	AA	ZER

HARDWARE GROUP: 07

DOOR (S):

101C

<u>QTÉ</u>	<u>DESCRIPTION</u>	<u>IDENTIFICATION PRODUIT</u>	<u>FINI</u>	<u>MFR</u>
8	HEAVY DUTY HINGE(S)	5BB1HW 114 X 101 FNA	652	IVE
1	CONSTANT LATCHING FLUSH BOLT	FB51P	630	IVE
1	ANTI-DUST STRIKE	DP2	626	IVE
1	CORRIDOR W/DEADBOLT	L9456P 17B 10-072 7/8" LIP L583- 363 X CMC	626	SCH
1	PERMANENT CYLINDER	SUBJECT TO EXISTING KEY	626	
1	COORDINATOR	COR X FL X LARG. REQ.	628	IVE
2	RECESSED DOOR STOP	SERIE 100S ADJ	630	GLY
2	DOOR CLOSER ADJ. CLOSING SPEED	4041 DEL REG ST-1630	689	LCN
2	MOUNTING PLATE	4040XP-18TJ	689	LCN
4	PROTECTION PLATE(S)	8402 863MM X B-CS X LARG. REQ.	630	IVE
1	GASKETING	188SBK X 1/HEAD & 2/JAMB.	BK	ZER
2	DROP DOWN THRESHOLD SURFACE	367AA X LARG. REQ.	AA	ZER
1	ACOUSTIC ASTRAGAL	383AA X HAUT. REQ.	AA	ZER

HARDWARE GROUP: 08

DOOR (S):

104a

<u>QTÉ</u>	<u>DESCRIPTION</u>	<u>IDENTIFICATION PRODUIT</u>	<u>FINI</u>	<u>MFR</u>
8	HEAVY DUTY HINGE(S)	5BB1HW 114 X 101 FNA	652	IVE
1	CONSTANT LATCHING FLUSH BOLT	FB51P	630	IVE
1	ANTI-DUST STRIKE	DP2	626	IVE
1	CORRIDOR W/DEADBOLT	L9456P 17B 10-072 7/8" LIP L583- 363 X CMC	626	SCH
1	PERMANENT CYLINDER	SUBJECT TO EXISTING KEY	626	
1	COORDINATOR	COR X FL X LARG. REQ.	628	IVE
2	RECESSED STOP / RESTRAINT ARM	SERIE 100H ADJ	630	GLY
2	DOOR CLOSER ADJ. CLOSING SPEED	4041 DEL REG ST-1630	689	LCN
2	MOUNTING PLATE	4040XP-18TJ	689	LCN
4	PROTECTION PLATE(S)	8402 863MM X B-CS X LARG. REQ.	630	IVE
1	GASKETING	188SBK X 1/HEAD & 2/JAMB.	BK	ZER
2	DROP DOWN THRESHOLD SURFACE	367AA X LARG. REQ.	AA	ZER
1	ACOUSTIC ASTRAGAL	383AA X HAUT. REQ.	AA	ZER

HARDWARE GROUP: 09

DOOR (S):

106

201

210

<u>QTÉ</u>	<u>DESCRIPTION</u>	<u>IDENTIFICATION PRODUIT</u>	<u>FINI</u>	<u>MFR</u>
3	HINGES	5BB1 114 X 101 FNA	652	IVE
1	STOREROOM LOCK	L9080P 17B X CMC	626	SCH
1	PERMANENT CYLINDER	SUBJECT TO EXISTING KEY	626	
1	DOOR CLOSER ADJ. CLOSING SPEED	1461 DEL HD FC	689	LCN
1	KICK PLATE(S)	8400 254MM B-NH-A X LARG. REQ.	630	IVE
1	KICK PLATE(S)	8400 152MM B-NH-A X LARG. REQ.	630	IVE
1	WALL STOP	WS401/402CVX	626	IVE
1	GASKETING	188SBK X 1/HEAD & 2/JAMB.	BK	ZER
1	DROP DOWN THRESHOLD	355AA X LARG. REQ.	AA	ZER

HARDWARE GROUP: 10

DOOR (S):

108

<u>QTÉ</u>	<u>DESCRIPTION</u>	<u>IDENTIFICATION PRODUIT</u>	<u>FINI</u>	<u>MFR</u>
3	HINGES	5BB1 114 X 101 FNA	652	IVE
1	STOREROOM LOCK	L9080P 17B X CMC	626	SCH
1	PERMANENT CYLINDER	SUBJECT TO EXISTING KEY	626	
1	DOOR CLOSER ADJ. CLOSING SPEED & BUTÉE	1461 DEL SCUSH FC	689	LCN
2	KICK PLATE(S)	8400 254MM B-NH-A X LARG. REQ.	630	IVE
1	GASKETING	188SBK X 1/HEAD & 2/JAMB.	BK	ZER
1	DROP DOWN THRESHOLD	355AA X LARG. REQ.	AA	ZER

HARDWARE GROUP: 11

DOOR (S):

204

<u>QTÉ</u>	<u>DESCRIPTION</u>	<u>IDENTIFICATION PRODUIT</u>	<u>FINI</u>	<u>MFR</u>
3	HINGES	5BB1 114 X 101 FNA	652	IVE
1	STOREROOM LOCK	L9080P 17B X CMC	626	SCH
1	PERMANENT CYLINDER	SUBJECT TO EXISTING KEY	626	
1	KICK PLATE(S)	8400 254MM B-NH-A X LARG. REQ.	630	IVE
1	KICK PLATE(S)	8400 152MM B-NH-A X LARG. REQ.	630	IVE
1	WALL STOP	WS401/402CVX	626	IVE

HARDWARE GROUP: 12

DOOR (S):

205

<u>QTÉ</u>	<u>DESCRIPTION</u>	<u>IDENTIFICATION PRODUIT</u>	<u>FINI</u>	<u>MFR</u>
3	HEAVY DUTY HINGE(S)	5BB1HW 114 X 101 FNA	652	IVE
1	CORRIDOR W/DEADBOLT	L9456P 17B L583-363 X CMC	626	SCH
1	PERMANENT CYLINDER	SUBJECT TO EXISTING KEY	626	
1	KICK PLATE(S)	8400 254MM B-NH-A X LARG. REQ.	630	IVE
1	KICK PLATE(S)	8400 152MM B-NH-A X LARG. REQ.	630	IVE
1	WALL STOP	WS401/402CVX	626	IVE
1	GARNITURE COUPE-SON	770AA-S X 1/HEAD & 1/JAMB.	AA	ZER
1	DROP DOWN THRESHOLD SURFACE	367AA X LARG. REQ.	AA	ZER

HARDWARE GROUP: 13

DOOR (S):

206

<u>QTÉ</u>	<u>DESCRIPTION</u>	<u>IDENTIFICATION PRODUIT</u>	<u>FINI</u>	<u>MFR</u>
1	HEAD TUBE	BY GLASS DOOR MANUFACTURER		
1	PIVOT SET	BY GLASS DOOR MANUFACTURER		
1	PULL HANDLE SET	PR 9266F 915MM X 508MM C/C X MTG. « P » (BACK TO BACK)	630- 316	IVE
1	RECESSED DOOR CLOSER WITH STOP AND RETAINER IN OPEN POSITION.	BY GLASS DOOR MANUFACTURER		
1	SIMPLE STOP	BY GLASS DOOR MANUFACTURER		
2	SUSPENSION PLATES	BY GLASS DOOR MANUFACTURER		

Note: door, frame, hardware and accessories by supplier of glass partitions. provide the parts and accessories required for the complete assembly.

HARDWARE GROUP: 14

DOOR (S):

EA-3

<u>QTÉ</u>	<u>DESCRIPTION</u>	<u>IDENTIFICATION PRODUIT</u>	<u>FINI</u>	<u>MFR</u>
3	HINGE(S)	5BB1 114 X 101 FNA	652	IVE
1	STOREROOM LOCK	L9080P 17B X CMC	626	SCH
1	PERMANENT CYLINDER	SUBJECT TO EXISTING KEY	626	
1	DOOR CLOSER	4040XP REG X ST-2795	689	LCN
1	KICK PLATE(S)	8400 254MM B-NH-A X LARG. REQ.	630	IVE
1	KICK PLATE(S)	8400 152MM B-NH-A X LARG. REQ.	630	IVE
1	WALL STOP	WS401/402CVX	626	IVE
1	GASKETING	188SBK X 1/HEAD & 2/JAMB.	BK	ZER
1	DROP DOWN THRESHOLD	355AA X LARG. REQ.	AA	ZER

HARDWARE GROUP: 15

DOOR (S):

EB-2

<u>QTÉ</u>	<u>DESCRIPTION</u>	<u>IDENTIFICATION PRODUIT</u>	<u>FINI</u>	<u>MFR</u>
3	HEAVY DUTY HINGE(S)	5BB1HW 114 X 101 FNA	652	IVE
1	ANTI-PANIC LOCK	98-L-F-17	626	VON
1	ROD CYLINDER	20-021 X CMC	626	SCH
1	PERMANENT CYLINDER	SUBJECT TO EXISTING KEY	626	
1	RECESSED DOOR STOP	SERIE 100S ADJ	630	GLY
1	DOOR CLOSER	4040XP EDA X ST-3068	689	LCN
1	KICK PLATE(S)	8400 254MM B-NH-A X LARG. REQ.	630	IVE
1	KICK PLATE(S)	8400 152MM B-NH-A X LARG. REQ.	630	IVE
1	GASKETING	188SBK X 1/HEAD & 2/JAMB.	BK	ZER
1	DROP DOWN THRESHOLD	355AA X LARG. REQ.	AA	ZER

HARDWARE GROUP: 16

DOOR (S):

EB-3

<u>QTÉ</u>	<u>DESCRIPTION</u>	<u>IDENTIFICATION PRODUIT</u>	<u>FINI</u>	<u>MFR</u>
3	HINGE(S)	5BB1 114 X 101 FNA	652	IVE
1	STOREROOM LOCK	L9080P 17B X CMC	626	SCH
1	PERMANENT CYLINDER	SUBJECT TO EXISTING KEY	626	
1	DOOR CLOSER	4040XP EDA X ST-3068	689	LCN
1	KICK PLATE(S)	8400 254MM B-NH-A X LARG. REQ.	630	IVE
1	KICK PLATE(S)	8400 152MM B-NH-A X LARG. REQ.	630	IVE
1	WALL STOP	WS401/402CVX	626	IVE
1	GASKETING	188SBK X 1/HEAD & 2/JAMB.	BK	ZER
1	DROP DOWN THRESHOLD	355AA X LARG. REQ.	AA	ZER

HARDWARE GROUP: 17

DOOR (S):

EB-1

<u>QTÉ</u>	<u>DESCRIPTION</u>	<u>IDENTIFICATION PRODUIT</u>	<u>FINI</u>	<u>MFR</u>
3	HEAVY DUTY HINGE(S)	5BB1HW 114 X 101 FNA	630	IVE
1	CURRENT TRANSFER	EPT10 CON	✓ 689	VON
1	ELECTRIC ANTI-PANIC LOCK	LX-RX-QEL-98-NL-CON 24 VDC	✓ 626	VON
1	ROD CYLINDER	20-021 X CMC	626	SCH
1	PERMANENT CYLINDER	SUBJECT TO EXISTING KEY	626	
1	RECESSED DOOR STOP	SERIE 100SE ADJ	630	GLY
1	DOOR OPERATOR	4642 (LONG/REG) FLUSH CEILING MOUNT X ST-3554 WMS	✓ 689	LCN
2	ACTIVATION DEVICE	8310-856	✓ 630	LCN
2	PROTECTIVE ESCUTCHEON	8310-874	✓ 689	LCN
1	KICK PLATE(S)	8400 254MM B-NH-A X LARG. REQ.	630	IVE
1	RAIN DROP GUARD	142AA X LARG. CADRE	AA	ZER
1	SEAL SET	429AA X 1/HEAD & 2/JAMB.	AA	ZER
1	DOOR SWEEP	39A X LARG. PORTE	A	ZER
1	THERMALY BROKEN THRESHOLD	626A-223 X LARG. REQ.	A	ZER
1	WIRE HARNESS	CON-26 (IN THE DOOR)		SCH
1	WIRE HARNESS	CON-6W (IN THE FRAME)		SCH
1	CONTROL	SEE ELECTRICAL	✓	
1	CONTACT	679-05HM	✓ BLK	SCE
1	POWER MONITOR & RELAYS	PS902 BBK 900-4RL KL900 120/240 VAC	✓ LGR	SCE
1	CONNECTION DIAGRAM	AS PER OPERATIONAL PROCEDURE	✓	

NOTE: install the anti-panic lock strike on # 429 at the jamb.

HARDWARE GROUP 17 - OPERATIONAL PROCEDURE:

- presentation of valid card momentarily retracts the electrified panic lock allowing manual or motorized access.
- the external activation device is only functional when the anti-panic lock is retracted, projection state indicated by integrated lx switch.
- interior activation device functional at all times.
- free issue at any time, the exit request indicates an exit allowed to access control.
- magnetic contact monitors the open / closed state of the door.
- in an electrical interruption situation, the exterior lock falls by default to the locked position, access by key only. the pushed side remains free at the end.

HARDWARE GROUP: 18

DOOR (S):

MP1 MP2

<u>QTÉ</u>	<u>DESCRIPTION</u>	<u>IDENTIFICATION PRODUIT</u>	<u>FINI</u>	<u>MFR</u>
3	HEAVY DUTY HINGE(S)	5BB1HW 114 X 101 FNA	652	IVE
1	CLASSROOM LOCK	L9070P 17B X CMC	626	SCH
1	PERMANENT CYLINDER	SUBJECT TO EXISTING KEY	626	
1	ELECTRIC STRIKE	6211 FSE DS CON X VOLTAGE	✓ 630	VON
1	RECESSED DOOR STOP	SERIE 100SE ADJ	630	GLY
1	DOOR OPERATOR	4642 (LONG/REG) FLUSH CEILING MOUNT X ST-3554 WMS	✓ 689	LCN
2	ACTIVATION DEVICE	8310-856	✓ 630	LCN
2	PROTECTIVE ESCUTCHEON	8310-874	✓ 689	LCN
2	KICK PLATE(S)	8400 254MM B-NH-A X LARG. REQ.	630	IVE
1	WIRE HARNESS	CON-6W (IN THE FRAME)		SCH
1	CONTACT	679-05HM	✓ BLK	SCE
1	POWER MONITOR & RELAYS	PS902 BBK 900-4RL KL900 120/240 VAC	✓ LGR	SCE
1	CONNECTION DIAGRAM	AS PER OPERATIONAL PROCEDURE	✓	

HARDWARE GROUP 18 - OPERATIONAL PROCEDURE:

- interior & exterior button operational when the person lift is not in operation.
- Magnetic contact monitors the state of the open / closed door to signal its state to the hoist mechanism.
- locking status of the electric strike signaled to the person lift via the ds switch.

HARDWARE GROUP: 19

DOOR (S):

211B

<u>QTÉ</u>	<u>DESCRIPTION</u>	<u>IDENTIFICATION PRODUIT</u>	<u>FINI</u>	<u>MFR</u>
3	HEAVY DUTY HINGE(S)	5BB1HW 114 X 101 FNA	652	IVE
1	SERRURE MORTE FCT. CLASSE	L463P XB11-720 X CMC	630	SCH
1	PERMANENT CYLINDER	SUBJECT TO EXISTING KEY	626	
1	PUSH PLATE	8200 100MM X 405MM CFC	630	IVE
1	PULL PLATE	8303 205MM (100MM X 405MM) CFC	630	IVE
1	RECESSED STOP / RESTRAINT ARM	SERIE 100H ADJ	630	GLY
1	DOOR CLOSER ADJ. CLOSING SPEED	4041 DEL REG ST-1630	689	LCN
1	MOUNTING PLATE	4040XP-18TJ	689	LCN
1	KICK PLATE(S)	8400 254MM B-NH-A X LARG. REQ.	630	IVE
1	KICK PLATE(S)	8400 152MM B-NH-A X LARG. REQ.	630	IVE

HARDWARE GROUP: 20

DOOR (S):

EA-2

<u>QTÉ</u>	<u>DESCRIPTION</u>	<u>IDENTIFICATION PRODUIT</u>	<u>FINI</u>	<u>MFR</u>
3	HEAVY DUTY HINGE(S)	5BB1HW 114 X 101 FNA	652	IVE
1	CURRENT TRANSFER	EPT10 CON	✓ 689	VON
1	ELECTRIC ANTI-PANIC LOCK	LX-RX-QEL-98-NL-F-CON 24 VDC	✓ 626	VON
1	ROD CYLINDER	20-021 X CMC	626	SCH
1	PERMANENT CYLINDER	SUBJECT TO EXISTING KEY	626	
1	DOOR OPERATOR	4642 CS X ST-3554 WMS	✓ 689	LCN
2	ACTIVATION DEVICE	8310-856	✓ 630	LCN
2	PROTECTIVE ESCUTCHEON	8310-874	✓ 689	LCN
1	KICK PLATE(S)	8400 254MM B-NH-A X LARG. REQ.	630	IVE
1	WALL STOP	WS401/402CVX	626	IVE
1	GASKETING	188SBK X 1/HEAD & 2/JAMB.	BK	ZER
1	DROP DOWN THRESHOLD	355AA X LARG. REQ.	AA	ZER
1	WIRE HARNESS	CON-26 (IN THE DOOR)		SCH
1	WIRE HARNESS	CON-6W (IN THE FRAME)		SCH
1	CONTROL	SEE ELECTRICAL	✓	
1	CARD READER	SEE ELECTRICAL	✓	
1	CONTACT	679-05HM	✓ BLK	SCE
1	POWER MONITOR & RELAYS	PS902 BBK 900-4RL-FA KL900 120/240 VAC	✓ LGR	SCE
1	CONNECTION DIAGRAM	AS PER OPERATIONAL PROCEDURE	✓	

HARDWARE GROUP 20 - OPERATIONAL PROCEDURE:

- presentation of valid card momentarily retracts the electrified panic lock allowing manual or motorized access.
- the external activation device is only functional when the anti-panic lock is retracted, projection state indicated by integrated lx switch.
- interior activation device functional at all times.
- free issue at any time, the exit request indicates an exit allowed to access control.
- magnetic contact monitors the open / closed state of the door.
- in an electrical interruption situation, or in a fire alarm situation, the exterior lock falls by default into the locked position, access by key only. the pushed side remains free at the end.

HARDWARE GROUP: 21

DOOR (S):

104b

<u>QTÉ</u>	<u>DESCRIPTION</u>	<u>IDENTIFICATION PRODUIT</u>	<u>FINI</u>	<u>MFR</u>
4	HEAVY DUTY HINGE(S)	5BB1HW 114 X 101 FNA	652	IVE
1	CORRIDOR W/DEADBOLT	L9456P 17B X CMC	626	SCH
1	PERMANENT CYLINDER	SUBJECT TO EXISTING KEY	626	
1	RECESSED STOP / RESTRAINT ARM	SERIE 100H ADJ	630	GLY
1	DOOR CLOSER ADJ. CLOSING SPEED	4041 DEL REG ST-1630	689	LCN
1	MOUNTING PLATE	4040XP-18TJ	689	LCN
2	PROTECTION PLATE(S)	8402 863MM X B-CS X LARG. REQ.	630	IVE
1	GASKETING	188SBK X 1/HEAD & 2/JAMB.	BK	ZER
1	DROP DOWN THRESHOLD SURFACE	367AA X LARG. REQ.	AA	ZER

FIN DE LA SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM C542-05, Standard Specification for Lock-Strip Gaskets.
 - .2 ASTM D790-07e1, Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
 - .3 ASTM D1003-07e1, Standard Test Method for Haze and Luminous Transmittance of Plastics.
 - .4 ASTM D1929-96(R2001)e1, Standard Test Method for Determining Ignition Temperature of Plastics.
 - .5 ASTM D2240-05, Standard Test Method for Rubber Property - Durometer Hardness.
 - .6 ASTM E84-10, Standard Test Method for Surface Burning Characteristics of Building Materials.
 - .7 ASTM E330-02, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
 - .8 ASTM F1233-08, Standard Test Method for Security Glazing Materials and Systems.
- .2 Canada Green Building Council (CaGBC)
 - .1 LEED Canada-NC Version 1.0-2004, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations (including Addendum 2007).
 - .2 LEED Canada-CI Version 1.0-2007, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide For Commercial Interiors.
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-12.1-M90, Tempered or Laminated Safety Glass.
 - .2 CAN/CGSB-12.2-M91, Flat, Clear Sheet Glass.
 - .3 CAN/CGSB-12.3-M91, Flat, Clear Float Glass.
 - .4 CAN/CGSB-12.4-M91, Heat Absorbing Glass.
 - .5 CAN/CGSB-12.6-M91, Transparent (One-Way) Mirrors.
 - .6 CAN/CGSB-12.8-97, Insulating Glass Units.
 - .7 CAN/CGSB-12.8-97(Amendment), Insulating Glass Units.
 - .8 CAN/CGSB-12.9-M91, Spandrel Glass.
 - .9 CAN/CGSB-12.10-M76, Glass, Light and Heat Reflecting.
 - .10 CAN/CGSB-12.11-M90, Wired Safety Glass.
 - .11 CAN/CGSB-12.12-M90, Plastic Safety Glazing Sheets.

- .12 CAN/CGSB-12.13-M91, Patterned Glass.
- .4 Environmental Choice Program (ECP)
 - .1 CCD-045-95(R2005), Sealants and Caulking Compounds.
- .5 Glass Association of North American (GANA)
 - .1 GANA Glazing Manual - 2008.
 - .2 GANA Laminated Glazing Reference Manual - 2009.
- .6 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
 - .1 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.

1.2 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-Installation Meetings:
 - .1 Convene pre-installation meeting 1 week prior to beginning work of this Section, with Contractor's Representative and Departmental Representative in accordance with Section 01 31 19- Project Meetings 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.
- .2 Arrange for site visit with Departmental Representative prior to start of Work to examine existing site conditions adjacent to demolition Work.
- .3 Hold project meetings every week.
- .4 Ensure project manager, subcontractor representatives, key personnel, site supervisor attend.
- .5 Departmental Representative will submit written notification of change to meeting schedule established upon contract award 24 hours prior to scheduled meeting.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for glass, sealants, and glazing accessories and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Quebec, Canada.
- .4 Samples:

- .1 Submit for review and acceptance of each unit.
- .2 Samples will be returned for inclusion into work.
- .3 Submit samples of each type of glazing element for review and acceptance.
- .5 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .6 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
 - .1 Submit analysis of glass under provisions of Section 01 45 00- Quality Control.
 - .2 Submit shop inspection for glass.

1.4 CLOSEOUT SUBMITTALS

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

1.5 QUALITY ASSURANCE

- .1 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .2 Mock-ups:
 - .1 Construct mock-ups in accordance with Section 01 45 00- Quality Control.
 - .2 Construct mock-up to include glass, plastic, glazing, and perimeter air barrier and vapour retarder seal.
 - .3 Mock-up will be used:
 - .1 To judge quality of work, substrate preparation, operation of equipment and material application.
 - .2 For testing to determine compliance with performance requirements. Perform tests as follows:
 - .4 Locate where directed.
 - .5 Allow 24 hours for inspection of mock-up before proceeding with work.
 - .6 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of finished work.

1.6 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.
 - .4 Replace defective or damaged materials with new.
- .4 Develop Construction Waste Management Plan related to Work of this Section.
- .5 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, padding, crates and packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 19- Waste Management and Disposal.

1.7 AMBIENT CONDITIONS

- .1 Ambient Requirements:
 - .1 Install glazing when ambient temperature is 10 degrees C minimum. Maintain ventilated environment for 24 hours after application.
 - .2 Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Design Criteria:
 - .1 Ensure continuity of building enclosure vapour and air barrier using glass and glazing materials as follow:
 - .1 Utilize inner light of multiple light sealed units for continuity of air and vapour seal.
 - .2 Size glass to withstand wind loads, dead loads and positive and negative live loads to ASTM E330.
 - .3 Limit glass deflection to 1/200 flexural limit of glass with full recovery of glazing materials.
- .2 Flat Glass:
 - .1 Safety glass: to CAN/CGSB-12.1, transparent 10mm thick
 - .1 Type 2-tempered.
 - .2 Class B-float .
 - .3 Category 1.
 - .2 Wired glass: to CAN/CGSB-12.11, 6mm thick.
 - .1 Type 1-polished both sides (transparent).

- .2 Wire mesh styles 3-square.
- .3 Low emissivity (LOW E) glass, performance requirements:
 - .1 Light transmission: 81%
 - .2 Solar energy transmission: 62%
 - .3 Solar Energy
 - .1 Heat gain coefficient: 0.70
 - .2 Attenuation coefficient: 0.81
 - .4 Thermal properties:
 - .1 U value winter night: 0.28 Btu / hr-ft²-F
 - .2 U value Summer day: 0.21 Btu / hr-ft²-F
 - .3 R-value: 3.52
- .3 Insulating Glass Units:
 - .1 Insulating glass units: to CAN/CGSB-12.8, double unit, 3mm thick.
 - .1 Glass: to CAN/CGSB-12.3, CAN/CGSB-12.10, CAN/CGSB-12.2, CAN/CGSB-12.4 and CAN/CGSB-12.1.
 - .2 Glass thickness: 3 mm each light.
 - .3 Inter-cavity space thickness: 19 mm with low conductivity spacers.
 - .4 Glass coating: surface number 3 low "E"
 - .5 Inert gas fill: argon.
- .4 Plastic Film
- .5 Sealant: in accordance with Section 07 92 00- Joint Sealants.

2.2 ACCESSORIES

- .1 Setting blocks: EPDM, silicone or neoprene, 80-90 Shore A durometer hardness to ASTM D2240, to suit glazing method, glass light weight and area.
- .2 Spacer shims: silicone or 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 compound with integral resilient tube spacing device, 10-15 Shore A durometer hardness to ASTM D2240; coiled on release paper; colour: black.
 - .2 Closed cell polyvinyl chloride foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume 2 %, designed for compression of 25 %, to effect an air and vapour seal.
- .4 Glazing splines: resilient polyvinyl chloride or silicone, extruded shape to suit glazing channel retaining slot, colour: black.
- .5 Glazing clips: manufacturer's standard type.
- .6 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: EXTERIOR WET/DRY METHOD (PREFORMED TAPE AND SEALANT)

- .1 Perform work in accordance with GANA Glazing Manual for glazing installation methods.
- .2 Cut glazing tape to length and set against permanent stops, 6 mm below sight line. Seal corners by butting tape and dabbing with sealant.
- .3 Apply heel bead of sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete continuity of air and vapour seal.
- .4 Place setting blocks at 1/4 points, with edge block maximum 150 mm from corners.
- .5 Rest glazing on setting blocks and push against tape and heel head of sealant with sufficient pressure to attain full contact at perimeter of light or glass unit.
- .6 Install removable stops with spacer strips inserted between glazing and applied stops 6 mm below sight line.
- .7 Fill gap between glazing and stop with sealant to depth equal to bite of frame on glazing, maximum 9 mm below sight line.
- .8 Apply cap head of sealant along void between stop and glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.4 INSTALLATION: INTERIOR WET/DRY METHOD (TAPE AND SEALANT)

- .1 Perform work in accordance with GANA Glazing Manual for glazing installation methods.
- .2 Cut glazing tape to length and install 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 to ensure full contact at perimeter of light or unit.
- .5 Install removable stops, with spacer shims inserted between glazing and applied stops at 600 mm intervals, 6 mm below sight line.
- .6 Fill gaps between light and applied stop with sealant to depth equal to bite on glazing, to uniform and level line.
- .7 Trim protruding tape edge.

3.5 INSTALLATION: MIRRORS

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

3.6 INSTALLATION: PLASTIC FILM

- .1 Install plastic film with adhesive, applied in accordance with film manufacturer's instructions.
- .2 Place without air bubbles, creases or visible distortion.
- .3 Fit tight to glass perimeter with razor cut edge.

3.7 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00- Cleaning.
 - .1 Leave Work area clean at end of each day.
 - .1 Remove traces of primer, caulking.
 - .2 Remove glazing materials from finish surfaces.
 - .3 Remove labels.
 - .4 Clean glass and mirrors using approved non-abrasive cleaner in accordance with manufacturer's instructions.
 - .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00- Cleaning.
- .2 Waste Management: separate waste materials for recycling and reuse in accordance with Section 01 74 19- Waste Management and Disposal.

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

3.8 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 REFERENCE STANDARDS

- .1 Aluminum Association (AA)
 - .1 AA DAF 45-03(R2009), Designation System for Aluminum Finishes.
- .2 American Society for Testing and Materials (ASTM)
 - .1 ASTM C475-02(2015), Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
 - .2 ASTM C514-04(2014), Standard Specification for Nails for the Application of Gypsum Board.
 - .3 ASTM C557-03(2009)e1, Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing.
 - .4 ASTM C840-16, Standard Specification for Application and Finishing of Gypsum Board.
 - .5 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 0.112 in. (2.84 mm) in Thickness.
 - .6 ASTM C1002-14, 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.
 - .7 ASTM C1047-14a, Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
 - .8 ASTM C1177/C1177M-13, Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
 - .9 ASTM C1178/C1178M-13, Standard Specification for Glass Mat Water-Resistant Gypsum Backing Board.
 - .10 ASTM C1280-13a, Standard Specification for Application of Gypsum Sheathing.
 - .11 ASTM C1396/C1396M-14a, Standard Specification for Gypsum board.
- .3 Association of the Wall and Ceilings Industries International (AWCI)
 - .1 AWCI Levels of Gypsum Board Finish-GA-214-2015.
- .4 Canada Green Building Council (CaGBC)
 - .1 LEED Canada-NC Version 1.0-2004, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations (including Addendum 2009).
 - .2 LEED Canada-CI Version 1.0-2007, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide For Commercial Interiors.
- .5 Canadian General Standards Board (CGSB)

- .1 CAN/CGSB-51.34-M86(R1988), Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
- .2 CAN/CGSB-71.25-M88, Adhesive, for Bonding Drywall to Wood Framing and Metal Studs.
- .6 Green Seal Environmental Standards (GS)
 - .1 GS-11-2008, 2nd Edition, Paints and Coatings.
- .7 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
 - .1 SCAQMD Rule 1113-A2007, Architectural Coatings.
 - .2 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.
- .8 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S102-10, Standard Method of Test of Surface Burning Characteristics of Building Materials and Assemblies.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for gypsum board assemblies and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Submit gypsum board assembly drawings stamped and signed by professional engineer registered or licensed in Province of Quebec, Canada.
 - .2 Indicate components such as fastener type, dimensions, spacing and locations at gypsum board edges, ends and in field of board as well as installation methods. Components and work to confirm to ASTM C 840 standard specification for application and finishing of gypsum board.
 - .3 Indicate type of joint compound, and number of joint compound layers.
 - .4 Indicate number and location of electrical boxes for wall and ceiling.
- .4 Samples:
 - .1 Submit for review and acceptance of each component specified or necessary for complete installation. Include technical descriptive data.
 - .2 Submit duplicate 300 x 300 mm size samples of vinyl faced gypsum board and 300 mm long samples of cornice cap, vinyl mouldings, insulating strip, corner and casing beads.
 - .3 Samples will be returned for inclusion into work.
- .5 Certifications:
 - .1 Submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

- .6 Sustainable Design Submittals:
 - .1 Construction Waste Management:
 - .1 Submit project 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 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.

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00-Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address and applicable standard designation.
- .3 Exercise care in unloading gypsum board materials shipment to prevent damage.
- .4 Storage and Handling Requirements in accordance with ASTM C 840–16:
 - .1 Store gypsum board assemblies materials level flat indoors, in dry location, off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect gypsum board assemblies from nicks, scratches, and blemishes.
 - .3 Protect gypsum board from direct exposure to rain, snow, sunlight, or other excessive weather conditions.
 - .4 Protect ready mix joint compounds from freezing, exposure to extreme heat and direct sunlight.
 - .5 Protect from weather, elements and damage from construction operations.
 - .6 Handle gypsum boards to prevent damage to edges, ends or surfaces.

- .7 Protect prefinished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.
- .8 Replace defective or damaged materials with new.
- .5 Develop Construction Waste Management Plan related to Work of this Section.
- .6 Packaging Waste Management: remove for reuse and return by manufacturer of packaging materials, crates, padding, pallets, as specified in Construction Waste Management Plan in accordance with Section 01 74 19- Waste Management and Disposal.

1.4 AMBIENT CONDITIONS

- .1 Maintain temperature 10 °C minimum, 21 °C maximum for 48 hours prior to and during application of gypsum boards and joint treatment, and for 48 hours minimum after completion of joint treatment.
- .2 Apply board and joint treatment to dry, clean, frost free surfaces.
- .3 Ventilation: ventilate building spaces as required to remove excess moisture that would prevent drying of joint treatment material immediately after its application.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Standard board: to ASTM C1396/C1396M—14 Type X, thickness as indicated, 1200 mm in width and maximum useful length, with squared edges at the ends and bevelled edges on the sides.
- .2 Water-resistant board: to ASTM C1396/C1396M—14 Type X, thickness as indicated, 1200 mm wide and as long as possible
- .3 Cement board: in accordance with ASTM C1288, 15.8 mm thick.
- .4 Drywall furring channels: 0.5 mm core thickness galvanized steel channels for screw attachment of gypsum board.
- .5 Resilient drywall furring: 0.5 mm base steel thickness galvanized steel for resilient attachment of gypsum board.
- .6 Screws for interior partitioning, self-tapping with anticorrosive coating with "Phillips" trumpet heads of appropriate lengths and dimensions: in accordance with standard ASTM C954.
- .7 Stud adhesive: to CAN/CGSB-71.25.
- .8 Laminating compound: as recommended by manufacturer, asbestos-free.
- .9 Casing beads, corner beads, control joints and edge trim: to ASTM C1047, zinc-coated by electrolytic process, 0.5 mm base thickness, perforated flanges, one piece length per location.
- .10 Sealants: in accordance with Section 07 92 00- Joint Sealants.

- .1 Acoustic sealant: in accordance with Section 07 92 00- Joint Sealants.
- .11 Polyethylene: to CAN/CGSB-51.34, Type 2.
- .12 Insulating strip: rubberized, moisture resistant, 3 mm thick closed cell neoprene strip, 92 mm wide, with self-sticking permanent adhesive on one face, lengths as required.
- .13 Joint compound: to ASTM C475, asbestos-free.

2.2 FINISHES

- .1 Texture finish: asbestos-free standard white texture coating and primer-sealer, recommended by gypsum board manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for gypsum board assemblies 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 ERECTION

- .1 Do application and finishing of gypsum board to ASTM C840-16 except where specified otherwise.
- .2 Do application of gypsum sheathing to ASTM C1280-13a.
- .3 Erect hangers and runner channels for suspended gypsum board ceilings to ASTM C840-16 except where specified otherwise.
- .4 Support light fixtures by providing additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.
- .5 Install work level to tolerance of 1:1200.
- .6 Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers and grilles.
- .7 Install 19 x 64 mm furring channels parallel to, and at exact locations of steel stud partition header track.
- .8 Furr for gypsum board faced vertical bulkheads within and at termination of ceilings.
- .9 Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.

- .10 Install wall furring for gypsum board wall finishes to ASTM C840–16, except where specified otherwise.
- .11 Furr openings and around built-in equipment, cabinets and access panels.
- .12 Furr duct shafts, beams, columns, pipes and exposed services where indicated.
- .13 Erect drywall resilient furring transversely across, spaced maximum 600 mm on centre and not more than 150 mm from ceiling/wall juncture. Secure to each support with 25 mm drywall screw.
- .14 Install 150 mm continuous strip of 12.7 mm gypsum board along base of partitions where resilient furring installed.

3.3 APPLICATION

- .1 Apply gypsum board after bucks, anchors, blocking, sound attenuation, electrical and mechanical work have been approved.
- .2 Apply single or double layer gypsum board to metal furring or framing using screw fasteners. Maximum spacing of screws 300 mm on centre.
 - .1 Single-Layer Application:
 - .1 Apply gypsum board on ceilings prior to application of walls to ASTM C840-16.
 - .2 Apply gypsum board on walls vertically or horizontally, providing sheet lengths that will minimize number of board edges or end joints.
 - .2 Double-Layer Application:
 - .1 Install gypsum board for base layer and exposed gypsum board for face layer.
 - .2 Apply base layer to ceilings prior to base layer application on walls; apply face layers in same sequence. Offset joints between layers at least 250 mm.
 - .3 Apply base layers at right angles to supports unless otherwise indicated.
 - .4 Apply base layer on walls and face layers vertically with joints of base layer over supports and face layer joints offset at least 250 mm with base layer joints.
- .3 Apply double layer gypsum board to concrete block surfaces, where indicated, using laminating adhesive.
 - .1 Comply with gypsum board manufacturer's recommendations.
 - .2 Brace or fasten gypsum board until fastening adhesive has set.
 - .3 Mechanically fasten gypsum board at top and bottom of each sheet.
- .4 Exterior Soffits and Ceilings: install exterior gypsum board perpendicular to supports; stagger end joints over supports. Install with 6 mm gap where boards abut other work.

- .5 Apply water-resistant gypsum board where wall tiles to be applied. Apply water-resistant sealant to edges, ends, cut-outs which expose gypsum core and to fastener heads.
- .6 Apply 12 mm diameter bead of acoustic sealant continuously around periphery of each face of partitioning to seal gypsum board/structure junction where partitions abut fixed building components. Seal full perimeter of cut-outs around electrical boxes and ducts.
- .7 Arrange vinyl-faced gypsum board symmetrical about openings and wall areas, with butt joints.
- .8 Apply board using stud adhesive on furring or framing.
- .9 Install ceiling boards in direction that will minimize number of end-butt joints. Stagger end joints at least 250 mm.
- .10 Install gypsum board on walls vertically to avoid end-butt joints. At stairwells and similar high walls, install boards horizontally with end joints staggered over studs, except where local codes or fire-rated assemblies require vertical application.
- .11 Install gypsum board with face side out.
- .12 Do not install damaged or damp boards.
- .13 Locate edge or end joints over supports. Stagger vertical joints over different studs on opposite sides of wall.

3.4 INSTALLATION

- .1 Erect accessories straight, plumb or level, rigid and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners accurately, free from rough edges. Secure using contact adhesive for full length.
- .2 Install casing beads 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 Construct control joints of preformed units set in gypsum board facing and supported independently on both sides of joint.
- .6 Provide continuous polyethylene dust barrier behind and across control joints.
- .7 Locate control joints at changes in substrate construction at approximate 15 m spacing on ceilings and at approximate 10 m spacing on long corridor runs.
- .8 Install control joints straight and true.
- .9 Ensure that screws or nails are properly applied in process of attaching gypsum board to framing without damaging of gypsum board edges and ends.

- .10 Construct expansion joints as detailed, at building expansion and construction joints. Provide continuous dust barrier.
- .11 Install expansion joint straight and true.
- .12 Install cornice cap where gypsum board partitions do not extend to ceiling.
- .13 Fit cornice cap over partition, secure to partition track with two rows of sheet metal screws staggered at 300 mm on centre.
- .14 Splice corners and intersections together and secure to each member with 3 screws.
- .15 Install access doors to electrical and mechanical fixtures specified in respective sections.
 - .1 Rigidly secure frames to furring or framing systems.
- .16 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.
- .17 Gypsum Board Finish: finish gypsum board walls and ceilings to following levels in accordance with AWCI Levels of Gypsum Board Finish:
 - .1 Levels of finish:
 - .1 Level 0: no tapping, finishing or accessories required.
 - .2 Level 1: embed tape for joints and interior angles in joint compound. Surfaces free of excess joint compound; tool marks and ridges are acceptable.
 - .3 Level 2: embed tape for joints and interior angles in joint compound and apply one separate coat of joint compound over joints, angles, fastener heads and accessories; surfaces free of excess joint compound; tool marks and ridges are acceptable.
 - .4 Level 3: embed tape for joints and interior angles in joint compound and apply two separate coats of joint compound over joints, angles, fastener heads and accessories; surfaces smooth and free of tool marks and ridges.
 - .5 Level 4: embed tape for joints and interior angles in joint compound and apply three separate coats of joint compound over joints, angles, fastener heads and accessories; surfaces smooth and free of tool marks and ridges.
 - .6 Level 5: embed tape for joints and interior angles in joint compound and apply three separate coats of joint compound over joints, angles, fastener heads and accessories; apply a thin skim coat of joint compound to entire surface; surfaces smooth and free of tool marks and ridges.
- .18 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.
- .19 Fill screw head depressions with joint and taping compounds to bring flush with adjacent surface of gypsum board, invisible after surface finish is completed.

- .20 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.
- .21 Completed installation smooth, level or plumb, free from waves and other defects and ready for surface finish.
- .22 Apply one coat of white primer sealer over surface to be textured. When dry apply textured finish in accordance with manufacturer's instructions.
- .23 Mix joint compound slightly thinner than for joint taping.
- .24 Apply thin coat to entire surface using trowel or drywall broad knife to fill surface texture differences, variations or tool marks.
- .25 Allow skim coat to dry completely.
- .26 Remove ridges by light sanding or wiping with damp cloth.

3.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00- Cleaning.
 - .1 Leave Work area clean at end of each day.
 - .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00- Cleaning.
- .2 Waste Management: separate waste materials for recycling and reuse in accordance with Section 01 74 19- Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.6 PROTECTION

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

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM C645-14e1, Standard Specification for Nonstructural Steel Framing Members.
 - .2 ASTM A653/A653M-07, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanized) by the Hot-Dip Process.
 - .3 ASTM C754-15, Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
- .2 Canada Green Building Council (CaGBC)
 - .1 LEEDv4 Canada-BD+C 2013, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package New Construction and Major Renovation.
 - .2 LEEDv4 Canada-BD+C 2013, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package Core and Shell Development.
 - .3 LEED Canada-ID+C2013, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide For Commercial Interiors.
 - .4 LEEDv4 Canada fO+M2013, LEED (Leadership In Energy and Environmental Design): Green Building Rating System Reference Guide Existing Buildings, Operations and Maintenance.
- .3 Underwriter's Laboratories (UL) Environmental Standards
 - .1 UL-2768–2011, Architectural Surface Coatings.
 - .2 Surface Coatings - Recycled Water-Borne. UL-2760–2011
- .4 The Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual - current edition.
 - .1 MPI #26, Primer, Galvanized Metal, Cementitious.
- .5 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
 - .1 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for metal framing and include product characteristics, performance criteria, physical size, finish and limitations.

- .2 Submit 2 copies of WHMIS SDS in accordance with Sections 01 35 29.06- Health and Safety Requirements and 01 35 43 - Environmental Procedures
- .3 Samples:
 - .1 Submit duplicate 300 mm long samples of non-structural metal framing.
- .4 Sustainable Design Submittals:
 - .1 Construction Waste Management:
 - .1 Submit project Waste Management Plan highlighting recycling and salvage requirements.
 - .2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 50 % of construction wastes were recycled or salvaged.
 - .3 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 content, and total cost of materials for project.
 - .4 Regional Materials: submit evidence that project incorporates required percentage.

1.3 QUALITY ASSURANCE

- .1 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

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 indoors, in dry location, off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect metal framing from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.
- .4 Develop Construction Waste Management Plan related to Work of this Section.
- .5 Packaging Waste Management: remove for reuse and return, by manufacturer of crates, packaging materials, padding, pallets, as specified in Construction

Waste Management Plan in accordance with Section 01 74 19- Waste Management and Disposal.

PART 2 PRODUCTS

- .1 Non-load bearing channel stud framing: to ASTM C645, 0.91 mm thickness hot dipped zinc-coated (galvanized) steel sheet in accordance with ASTM A653, Z180, for screw attachment of gypsum.
 - .1 Knock-out service holes at 460 mm centres.
- .2 Floor and ceiling tracks: to ASTM C645, in widths to suit stud sizes, and as follows:
 - .1 Slotted Deflection 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 at 25 mm on centre along length of runner; tested and certified for use in fire rated wall construction.
 - .2 Double Runner Deflection Track: Outside runner using 50 mm flanges; inner runner 33 mm; maintaining 25 mm minimum deflection space.
 - .3 Deep Leg Deflection Track: Top runner having 50 mm down standing legs; maintaining 13 mm minimum deflection space.
 - .4 Base Runner: Bottom track with 33 mm upstanding legs.
- .3 Furring Channels: Commercial steel sheet in accordance with ASTM A653, Z180, hot dipped zinc-coated (galvanized), as follows:
 - .1 Hat Shaped, Rigid Furring Channels: ASTM C645, 0.75 mm thickness x 22 mm deep.
 - .2 Resilient Furring Channels: 0.46 mm thickness x 13 mm deep members designed to reduce sound transmission having asymmetrical face attached to single flange by a slotted leg (web).
- .4 Metal channel stiffener: 38 mm thick cold rolled steel, coated with rust inhibitive coating.
- .5 Acoustical sealant: in accordance with Section 07 92 00- Joint Sealants.
- .6 Insulating strip: rubberized, moisture resistant, 3 mm thick closed cell neoprene strip, 92 mm wide, with self-sticking permanent adhesive on one face, lengths as required.

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 non-structural metal framing application 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 after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 ERECTION

- .1 Erect partitions in accordance with framing requirements of ASTM C754.
- .2 Align partition tracks at floor and ceiling and secure at 600 mm on centre maximum.
- .3 Install damp proof course under stud shoe tracks of partitions on slabs on grade.
- .4 Place studs vertically at 50 mm from abutting walls, and at each side of openings and corners.
 - .1 Position studs in tracks at floor and ceiling. Cross brace steel studs as required to provide rigid installation to manufacturer's instructions.
- .5 Erect metal studding to tolerance of 1:1000.
- .6 Attach studs to bottom and ceiling track using screws.
- .7 Co-ordinate simultaneous erection of studs with installation of service lines. Align web openings when erecting studs.
- .8 Co-ordinate erection of studs with installation of door/window frames and special supports or anchorage for work specified in other Sections.
- .9 Provide two studs extending from floor to ceiling at each side of openings wider than stud centres specified.
 - .1 Secure studs together, 50 mm apart using column clips or other approved means of fastening placed alongside frame anchor clips.
- .10 Install heavy gauge single jamb studs at openings.
- .11 Erect track at head of door/window openings and sills of sidelight/window openings to accommodate intermediate studs.
 - .1 Secure track to studs at each end, in accordance with manufacturer's instructions.
 - .2 Install intermediate studs above and below openings in same manner and spacing as wall studs.
- .12 Frame openings and around built-in equipment, cabinets, access panels, on four sides. Extend framing into reveals. Check clearances with equipment suppliers.
- .13 Provide 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.
- .14 Install steel studs or furring channel between studs for attaching electrical and other boxes.

- .15 Extend partitions to ceiling height except where noted otherwise on drawings.
- .16 Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs.
 - .1 Use 50 mm leg ceiling tracks.
- .17 Install continuous insulating strips to isolate studs from uninsulated surfaces.
- .18 Install two continuous beads of acoustical sealant and insulating strip under studs and tracks around perimeter of sound control partitions.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00- Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00- Cleaning.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19- Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.4 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by non-structural metal framing application.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

- .1 American National Standards Institute (ANSI)/Ceramic Tile Institute (CTI)
 - .1 ANSI A108.1-99, Specification for the Installation of Ceramic Tile (Includes ANSI A108.1A-C, 108.4-.13, A118.1-.10, ANSI A136.1).
 - .2 CTI A118.3-92, Specification for Chemical Resistant, Water Cleanable Tile Setting and Grouting Epoxy and Water Cleanable Tile Setting Epoxy Adhesive (included in ANSI A108.1).
 - .3 CTI A118.4-92, Specification for Latex Cement Mortar (included in ANSI A108.1).
 - .4 CTI A118.5-92, Specification for Chemical Resistant Furan Resin Mortars and Grouts for Tile Installation (included in ANSI A108.1).
 - .5 CTI A118.6-92, Specification for Ceramic Tile Grouts (included in ANSI A108.1).
- .2 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C144-04, Specification for Aggregate for Masonry Mortar.
 - .2 ASTM C207-06, Specification for Hydrated Lime for Masonry Purposes.
 - .3 ASTM C847-06, Specification for Metal Lath.
 - .4 ASTM C979-05, Specification for Pigments for Integrally Coloured Concrete.
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-51.34-M86(R1988), Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
 - .2 CGSB 71-GP-22M-78(AMEND.), Adhesive, Organic, for Installation of Ceramic Wall Tile.
 - .3 CAN/CGSB-75.1-M88, Tile, Ceramic.
 - .4 CAN/CGSB-25.20-95, Surface Sealer for Floors.
- .4 Canada Green Building Council (CaGBC)
 - .1 LEED Canada-NC Version 1.0-2004, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations (including Addendum 2007).
 - .2 LEED Canada-CI Version 1.0-2007, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide For Commercial Interiors.
- .5 CSA Group (CSA)
 - .1 CSA A123.3-05, Asphalt Saturated Organic Roofing Felt.
 - .2 CAN/CSA-A3000-03(R2006), Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

- .6 South Coast Air Quality Management District (SCAQMD), California State
 - .1 SCAQMD Rule 1168-05, Adhesives and Sealants Applications.
- .7 Terrazzo Tile and Marble Association of Canada (TTMAC)
 - .1 Tile Specification Guide 09 30 00 2006/2007, Tile Installation Manual.
 - .2 Tile Maintenance Guide 2000.

1.2 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.
 - .1 Include manufacturer's information on:
 - .1 Ceramic tile, marked to show each type, size, and shape required.
 - .2 Chemical resistant mortar and grout (Epoxy and Furan).
 - .3 Cementitious backer unit.
 - .4 Dry-set cement mortar and grout.
 - .5 Divider strip.
 - .6 Elastomeric membrane and bond coat.
 - .7 Reinforcing tape.
 - .8 Levelling compound.
 - .9 Latex cement mortar and grout.
 - .10 Commercial cement grout.
 - .11 Organic adhesive.
 - .12 Slip resistant tile.
 - .13 Waterproofing isolation membrane.
 - .14 Fasteners.
- .3 Provide samples in accordance with Section 01 33 00- Submittal Procedures.
 - .1 Base tile: submit duplicate, 300 x 300 mm sample panels of each colour, texture, size, and pattern of tile.
 - .2 Floor tile: submit duplicate, 300 x 300 mm sample panels of each colour, texture, size, and pattern of tile.
 - .3 Trim shapes, bullnose cap and cove including bullnose cap and base pieces at internal and external corners of vertical surfaces, each type, colour, and size.
 - .4 Adhere tile samples to 11 mm thick plywood and grout joints to represent project installation.

1.3 QUALITY ASSURANCE

- .1 Quality Assurance Submittals:
 - .1 Manufacturer's Instructions: manufacturer's installation instructions.

- .2 Manufacturer's Field Reports: manufacturer's field reports specified.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Packing, shipping, handling and unloading:
 - .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 recycling and reuse in accordance with Section 01 74 19- Waste Management and Disposal.

1.5 AMBIENT CONDITIONS

- .1 Maintain air temperature and structural base temperature at ceramic tile installation area above 12 degrees C for 48 hours before, during, and 48 hours after, installation.
- .2 Do not install tiles at temperatures less than 12 degrees C or above 38 degrees C.
- .3 Do not apply epoxy mortar and grouts at temperatures below 15 degrees C or above 25 degrees C.

1.6 MAINTENANCE

- .1 Extra Materials:
 - .1 Provide maintenance materials in accordance with Section 01 78 00- Closeout Submittals.
 - .2 Provide minimum 2% of each type and colour of tile required for project for maintenance use. Store where directed.
 - .3 Maintenance material same production run as installed material.

PART 2 PRODUCTS

2.1 FLOOR TILE

- .1 Ceramic floor tile (C1): to CAN/CGSB-75.1
 - .1 Dimensions: 300mm x 300mm
 - .2 Water absorption: $\leq 0.3\%$
 - .3 Breaking load: $\geq 1700\text{N}$
 - .4 Impact resistance: 0.86
 - .5 Abrasion resistance: 120 +/- 30 mm³
 - .6 Color: Mosa - Terra Maestricht - 204 V agate gray.

2.2 WALL AND CEILING TILE

- .1 Ceramic wall tiles (C2): in accordance with CAN / CGSB-75.1 standard; border elements, as required.

- .1 Dimensions: 150mm x 150mm
- .2 Water absorption :> 10%
- .3 Breaking load: ≥ 300 N
- .4 Flexural strength: ≥ 16 N / mm²
- .5 Color: Mosa - MURAL BLEND - 30090 Mid warm gray # 4.
- .2 Ceramic wall tiles (C3): in accordance with CAN / CGSB-75.1 standard; border elements, as required.
 - .1 Dimensions: 150mm x 150mm
 - .2 Water absorption :> 10%
 - .3 Breaking load: ≥ 300 N
 - .4 Flexural strength: ≥ 16 N / mm²
 - .5 Color: List of colors:
 - .6 Mosa - MURAL BLEND - 31010 bright white

2.3 BASE TILE

- .1 Base: coved; type, size, colour and texture to match adjacent flooring material.

2.4 TRIM SHAPES

- .1 Conform to applicable requirements of adjoining floor and wall tile.
- .2 Use slip resistant trim shapes for horizontal surfaces of showers, overflow ledges, recessed steps, shower curbs, drying area curbs, and stools.
- .3 Use trim shapes sizes conforming to size of adjoining field wall tile, including existing spaces, unless specified otherwise.
- .4 Internal and External Corners: provide trim shapes as follows where indicated.
 - .1 Bullnose shapes for external corners including edges.
 - .2 Coved shapes for internal corners.
 - .3 Special shapes for:
 - .1 Base to floor internal corners to provide integral coved vertical and horizontal joint.
 - .2 Base to floor external corners to provide bullnose vertical edge with integral coved horizontal joint. Use as stop at bottom of openings having bullnose return to wall.
 - .3 Wall top edge internal corners to provide integral coved vertical joint with bullnose top edge.
 - .4 Wall top edge external corners to provide bullnose vertical and horizontal joint edge.
- .5 Cove and bullnose shapes elements must be provided for bathrooms and showers.

2.5 MORTAR AND ADHESIVE MATERIALS

- .1 Cement: to CSA-A5, type 10.

- .2 Sand: to ASTM C144, passing 16 mesh.
- .3 Hydrated lime: to ASTM C207.
- .4 Latex additive: formulated for use in cement mortar and thin set bond coat.
- .5 Water: potable and free of minerals and chemicals which are detrimental to mortar and grout mixes.
- .6 Adhesives:
 - .1 Maximum VOC limit 65 g/L to SCAQMD Rule 1168.

2.6 BOND COAT

- .1 Latex Cement mortar: to ANSI A108.1, two-component universal dry-set mortar.

2.7 GROUT

- .1 Colouring Pigments:
 - .1 Pure mineral pigments, limeproof and nonfading, complying with ASTM C979.
 - .2 Colouring pigments to be added to grout by manufacturer.
 - .3 Job coloured grout are not acceptable.
 - .4 Use in Commercial Cement Grout, Dry-Set Grout, and Latex Cement Grout.
- .2 Latex Cement Grout: to ANSI A108.1, fast curing, high early strength, polymer-modified, stain resistant, sanded mix for floors, unsanded mix for walls and floors with polished tiles commercial tile grout.

2.8 ACCESSORIES

- .1 Reinforcing mesh: 50 x 50 x 1.6 x 1.6 mm galvanized steel wire mesh, welded fabric design, in flat sheets.
- .2 Cleavage plane: polyethylene film to CGSB 51-34.
- .3 Metal lath: to ASTM C847 galvanized finish, 10 mm rib at 2.17 kg/m².
- .4 Transition Strips: purpose made metal extrusion; anodized aluminum.
- .5 Reducer Strips: purpose made metal extrusion; anodized aluminum; maximum slope of 1:2.
- .6 Prefabricated Movement Joints: purpose made, having a Shore A Hardness not less than 60 and elasticity of plus or minus 40 percent when used in accordance to TTMAC Detail 301EJ.
- .7 Sealant: in accordance with Section 07 92 00- Joint Sealants.
- .8 Floor sealer and protective coating: to tile and grout manufacturers recommendations.
- .9 Bonded waterproof membrane and vapour barrier
 - .1 Pliable, sheet-applied, bonded waterproofing membrane and vapour barrier with limited crack-bridging capabilities. Made of a soft

polyethylene covered on both sides with a special fleece webbing to anchor the membrane in the thin-set mortar.

.1 Thickness: 8 mil.

2.9 MIXES

.1 Cement:

.1 Scratch coat: 1 part cement, 1/5 to 1/2 parts hydrated lime to suit job conditions, 4 parts sand, 1 part water, and latex additive where required. Adjust water volume depending on water content of sand.

.2 Slurry bond coat: cement and water mixed to creamy paste. Latex additive may be included.

.3 Mortar bed for floors: 1 part cement, 4 parts sand, 1 part water. Adjust water volume depending on water content of sand. Latex additive may be included.

.4 Mortar bed for walls and ceilings: 1 part cement, 1/5 to 1/2 parts hydrated lime to suit job conditions, 4 parts sand and 1 part water. Adjust water volume depending on water content of sand. Latex additive may be included.

.5 Levelling coat: 1 part cement, 4 parts sand, minimum 1/10 part latex additive, 1 part water including latex additive.

.6 Bond or setting coat: 1 part cement, 1/3 part hydrated lime, 1 part water.

.7 Measure mortar ingredients by volume.

.2 Dry set mortar: mix to manufacturer's instructions.

.3 Organic adhesive: pre-mixed.

.1 Adhesives: maximum VOC limit 65 g/L to SCAQMD Rule 1168.

.4 Mix bond and levelling coats, and grout to manufacturer's instructions.

.5 Adjust water volumes to suit water content of sand.

2.10 PATCHING AND LEVELLING COMPOUND

.1 Cement base, acrylic polymer compound, manufactured specifically for resurfacing and leveling concrete floors. Products containing gypsum are not acceptable.

.2 Have not less than the following physical properties:

.1 Compressive strength - 25 MPa.

.2 Tensile strength - 7 MPa.

.3 Flexural strength - 7 MPa.

.4 Density - 1.9.

.3 Capable of being applied in layers up to 50 mm thick, being brought to feather edge, and being trowelled to smooth finish.

.4 Ready for use in 48 hours after application.

2.11 CLEANING COMPOUNDS

- .1 Specifically designed for cleaning masonry and concrete and which will not prevent bond of subsequent tile setting materials including patching and leveling compounds and elastomeric waterproofing membrane and coat.
- .2 Materials containing acid or caustic material are not acceptable.

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 WORKMANSHIP

- .1 Do tile work in accordance with TTMAC Tile Installation Manual 2006/2007, "Ceramic Tile", except where specified otherwise.
- .2 Apply tile or backing coats to clean and sound surfaces.
- .3 Fit tile around corners, fitments, fixtures, drains and other built-in objects. Maintain uniform joint appearance. Cut edges smooth and even. Do not split tiles.
- .4 Maximum surface tolerance 1:800.
- .5 Make joints between tile uniform and approximately 1.5 mm wide, plumb, straight, true, even and flush with adjacent tile. Ensure sheet layout not visible after installation. Align patterns.
- .6 Lay out tiles so perimeter tiles are minimum 1/2 size.
- .7 Sound tiles after setting and replace hollow-sounding units to obtain full bond.
- .8 Make internal angles square, external angles rounded
- .9 Use bullnose edged tiles at termination of wall tile panels, except where panel abuts projecting surface or differing plane.
- .10 Install divider strips at junction of tile flooring and dissimilar materials.
- .11 Allow minimum 24 hours after installation of tiles, before grouting.
- .12 Clean installed tile surfaces after installation and grouting cured.
- .13 Make control joints as required. Make joint width same as tile joints. Fill control joints with sealant in accordance with Section 07 92 00- Joint Sealants. Keep building expansion joints free of mortar and grout.

3.3 WALL TILE

- .1 Install in accordance with TTMAC detail

3.4 FLOOR TILE

- .1 Install in accordance with TTMAC detail

3.5 BASE TILE

- .1 Install in accordance with TTMAC detail

3.6 STAIR TREADS

- .1 Install in accordance with TTMAC detail

3.7 FLOOR SEALER AND PROTECTIVE COATING

- .1 Apply in accordance with manufacturer's instructions.

3.8 FIELD QUALITY CONTROL

- .1 Manufacturer's Field Services:
 - .1 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

3.9 CLEANING

- .1 Proceed in accordance with Section 01 74 00- Cleaning.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM F1303-04(2014), Standard Specification for Sheet Vinyl Floor Covering with Backing.
- .2 Canada Green Building Council (CaGBC)
 - .1 LEED Canada-NC Version 1.0-2004, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations (including Addendum 2007).
 - .2 LEED Canada-CI Version 1.0-2007, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide For Commercial Interiors.
 - .3 LEED Canada 2009 for Design and Construction-2010, LEED Canada 2009 for Design and Construction Leadership in Energy and Environmental Design Green Building Rating System Reference Guide.
 - .4 LEED Canada for Existing Buildings, Operations and Maintenance-2009, LEED Canada 2009 Leadership In Energy and Environmental Design Green Building Rating System Reference Guide.
- .3 South Coast Air Quality Management District (SCAQMD)
 - .1 SCAQMD Rule 1113-13, Architectural Coatings.
 - .2 SCAQMD Rule 1168-A2011, Adhesive and Sealant Applications.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for resilient sheet flooring 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, 300 mm long feature strips, base, treads, nosing, edge strips.
- .4 Sustainable Design Submittals:
 - .1 Construction Waste Management:
 - .1 Submit project Waste Management Plan highlighting recycling and salvage requirements.
 - .2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 50 % of construction wastes were recycled or salvaged.

- .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 content, and total cost of materials for project.
- .3 Regional Materials: submit evidence that project incorporates required percentage 10 % 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.

1.3 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 Extra materials one piece and from same production run as installed materials.
 - .3 Identify each roll of sheet flooring and each container of adhesive.
 - .4 Deliver to Departmental Representative, upon completion of the work of this section.
 - .5 Store where directed by Departmental Representative.

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 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 Develop Construction Waste Management Plan related to Work of this Section.
- .5 Packaging Waste Management: remove for reuse by manufacturer and return of packaging materials, padding, pallets, crates, as specified in Construction Waste Management Plan in accordance with Section 01 74 19- Waste Management and Disposal.

1.5 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 Sheet vinyl with backing (RSS1): to ASTM F1303, commercial.
 - .1 Type: I - PVC binder content 90%.
 - .2 Total thickness: 2.0 mm
 - .3 Wear layer: 2.0 mm
 - .4 Total basis weight: 2,950 g / m²
 - .5 Declared acoustic efficiency: 4dB
 - .6 Color: Sphera Element - 50039 Navy from Forbo or a replacement product approved by addendum in accordance with the Instructions to Bidders.
- .2 Sheet vinyl with backing (RSS2): to ASTM F1303, commercial.
 - .1 Type: I - PVC binder content 90%.
 - .2 Total thickness: 2.0 mm
 - .3 Wear layer: 2.0 mm
 - .4 Total basis weight: 2,950 g / m²
 - .5 Declared acoustic efficiency: 4dB
 - .6 Color: Sphera Element - 50031 Coal from Forbo or a replacement product approved by addendum in accordance with the Instructions to Bidders.
- .3 Resilient base: continuous, top set, complete with premoulded end stops and external corners:
 - .1 Type: vinyl.
 - .2 Style: cove.
 - .3 Thickness: 3.17 mm.
 - .4 Height: 101.6 mm.
 - .5 Lengths: cut lengths minimum 2400 mm.
 - .6 Colour: 197 SHADED WG from Johnsonite or a replacement product approved by addendum in accordance with the Instructions to Bidders.
- .4 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.
- .5 Sub-floor filler and leveller: as recommended by flooring manufacturer for use with their product.
- .6 Metal edge strips:
 - .1 Aluminum extruded, smooth, polished stainless steel with lip to extend under floor finish, shoulder flush with top of adjacent floor finish.
- .7 External corner protectors: stainless steel, type recommended by flooring manufacturer.
- .8 Edging to floor penetrations: stainless steel type recommended by flooring manufacturer.
- .9 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 Remove existing resilient flooring.
- .2 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.
- .3 Clean floor and apply filler; trowel and float to leave smooth, flat hard surface. Prohibit traffic until filler cured and dry.
- .4 Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with sub-floor filler.
- .5 Seal concrete slab to resilient flooring manufacturer's printed instructions.

3.4 APPLICATION: FLOORING

- .1 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.
- .2 Apply adhesive uniformly using recommended trowel. Do not spread more adhesive than can be covered by flooring before initial set takes place.
- .3 Lay flooring with seams parallel to building lines to produce a minimum number of seams. Border widths minimum 1/3 width of full material.
- .4 Run sheets in direction of traffic. Double cut sheet joints and continuously seal according to manufacturer's printed instructions.
- .5 Heat weld seams of linoleum sheet flooring in accordance with manufacturer's printed instructions.
- .6 As installation progresses, and after installation roll flooring with 45 kg minimum roller to ensure full adhesion.
- .7 Cut flooring around fixed objects.
- .8 Install feature strips and floor markings where indicated. Fit joints tightly.
- .9 Install flooring in pan type floor access covers. Maintain floor pattern.
- .10 Continue flooring over areas which will be under built-in furniture.
- .11 Continue flooring through areas to receive movable type partitions without interrupting floor pattern.
- .12 Terminate flooring at centreline of door in openings where adjacent floor finish or colour is dissimilar.
- .13 Install metal edge strips at unprotected or exposed edges where flooring terminates.

3.5 APPLICATION: BASE

- .1 Lay out base to keep number of joints at minimum.
- .2 Clean substrate and prime with one coat of adhesive.
- .3 Apply adhesive to back of base.
- .4 Set base against wall and floor surfaces tightly by using 3 kg hand roller.
- .5 Install straight and level to variation of 1:1000.
- .6 Scribe and fit to door frames and other obstructions. Use premoulded end pieces at flush door frames.
- .7 Cope internal corners. Use premoulded corner units for right angle external corners. Use formed straight base material for external corners of other angles.
- .8 Use toeless type base where floor finish will be carpet, coved type elsewhere.
- .9 Install toeless type base before installation of carpet on floors.

- .10 Heat weld base in accordance with manufacturer's printed instructions.

3.6 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00- Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00- Cleaning.
 - .1 Clean flooring base surfaces to flooring manufacturer's printed instructions.
- .3 Waste Management: separate waste materials for recycling and reuse in accordance with Section 01 74 19- Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.7 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 ABBREVIATIONS AND ACRONYMS

- .1 w.f.t. Wet Film Thickness

1.2 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM C307-03(2012), Standard Test Method for Tensile Strength of Chemical-Resistant Mortar, Grouts, and Monolithic Surfacing.
 - .2 ASTM C413-01(2012), Standard Test Method for Absorption of Chemical-Resistant Mortars, Grouts, and Monolithic Surfacing.
 - .3 ASTM C579-01(2012), Standard Test Method for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing and Polymer Concretes.
 - .4 ASTM C580-02(2012), Standard Test Method for Flexural Strength and Modulus of Elasticity of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes.
 - .5 ASTM C882/C882M-13a, Standard Test Method for Bond Strength of Epoxy-Resin Systems Used With Concrete By Slant Shear.
 - .6 ASTM C883-89, Standard Test Method for Effective Shrinkage of Epoxy-Resin Systems Used with Concrete.
 - .7 ASTM D638-10, Standard Test Method for Tensile Properties of Plastics.
 - .8 ASTM D1044-13, Standard Test Method for Resistance of Transparent Plastics to Surface Abrasion.
 - .9 ASTM D1308-02(2013), Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes.
 - .10 ASTM D2047-11, Standard Test Method for Static Coefficient of Friction of Polish-Coated Floor Surfaces as Measured by the James Machine.
- .2 NACE International
 - .1 NACE SPO188-06, Discontinuity (Holiday) Testing of Protective Coatings on Conductive Substrates.
- .3 Underwriters Laboratories of Canada (ULC)
 - .1 CAN/ULC-S102.2-07, Method of Test for Surface Burning Characteristics of Flooring, Floor Covering and Miscellaneous Materials and Assemblies.
- .4 United States Military Standards (MIL)
 - .1 MIL-D-3134J-1989, Deck Covering Materials.

1.3 SUMMARY

- .1 This section includes a resin floor covering with epoxy component.

- .2 Application method: trowel by hand or mechanically with metal blade.

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 epoxy floor coatings and include product characteristics, performance criteria, physical size, finish and limitations.
 - .1 Submit 2 copies of WHMIS SDS in accordance with Sections 01 35 29.06- Health and Safety Requirements and 01 35 43- Environmental Procedures. Indicate VOC's during application and curing.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Quebec, Canada.
 - .2 Drawings to indicate project layout, including details at drains, upstands, doors, changes in flooring materials, and wall bases.
- .4 Samples:
 - .1 Submit duplicate 300 x 300 x 6 mm thick samples of each colour of epoxy floor coating.
- .5 Certificates:
 - .1 Submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .6 Test Reports:
 - .1 Submit certified test reports from independent testing laboratories indicating compliance with specifications for specified performance characteristics and physical properties.
- .7 Sustainable Design Submittals:
 - .1 Construction Waste Management:
 - .1 Submit project Waste Management Plan highlighting recycling and salvage requirements.
 - .2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 50 % of construction wastes were recycled or salvaged.
 - .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 content, and total cost of materials for project.

1.5 QUALITY ASSURANCE

- .1 Installer Qualifications: company or person experienced in performing work of this section approved by epoxy flooring material manufacturer.
- .2 Construct mock-ups in accordance with Section 01 45 00- Quality Control.
- .3 Site meetings: the controls carried out on site by the manufacturer, prescribed in the article on-site PART 3 - FIELD QUALITY CONTROL, must include site visits at the following stages:
 - .1 once the products have been delivered and stored on site, and the preparatory work and other preliminary work completed, but before the start of work to implement the work;
 - .2 two (2) times during the progress of the work, that is to say once the work is completed at 25% then at 60%;
 - .3 once work is completed and cleaning is completed

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00- Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials in dry location, off ground, indoors 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 Develop Construction Waste Management Plan related to Work of this Section.
- .5 Packaging Waste Management: remove for reuse by manufacturer and return of crates, packaging materials, pallets, padding, as specified in Construction Waste Management Plan in accordance with Section 01 74 19- Waste Management and Disposal.

1.7 SITE CONDITIONS

- .1 Ambient Conditions:
 - .1 Moisture: ensure substrate is within moisture limits prescribed by manufacturer.
 - .2 Temperature: maintain ambient temperature in accordance with manufacturer's written instructions.
 - .3 Relative humidity: maintain relative humidity in accordance with manufacturer's written instructions.
 - .4 Safety: comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials.

1.8 WARRANTY

- .1 Warranty: five (5) years against delamination of epoxy flooring system from substrate, and other failure of system to provide complete, integral, seamless floor covering meeting specified performance requirements.

PART 2 PRODUCTS

2.1 RESIN FLOOR COVERINGS

- .1 Epoxy Resin (PE) Flooring: according to the requirements of the project, the products that can be used are the following.
 - .1 Spreading and coverings rich in liquid will not be accepted and will be excluded from the bid.
- .2 Characteristics of the coating:
 - .1 Color and pattern: choose from the manufacturer's full range.
 - .2 Surface: smooth.
 - .3 Integrated plinth: height in mm to be determined
 - .4 Total coating thickness: nominal thickness of 6 mm
- .3 Coating components: the manufacturer's standard components which are compatible with each other are as follows.
 - .1 Primer:
 - .1 Resin: epoxy
 - .2 Formula: two (2) components entirely composed of solids
 - .3 Application method: squeegee and roller
 - .4 Number of coats: one (1)
 - .2 Mortar:
 - .1 Resin: epoxy
 - .2 Formula: three (3) components entirely composed of solids
 - .3 Application method: trowel with metal blade
 - .1 Thickness of layers: nominal thickness of 6 mm
 - .2 Number of layers: one
 - .4 Aggregates: mixture of pigmented aggregates
 - .3 Top layer:
 - .1 Resin: epoxy
 - .2 Formula: two (2) components entirely composed of solids
 - .3 Type: pigmented
 - .4 Finish: standard
 - .5 Number of layers: one
- .4 Physical properties of the coating: provide a resin floor covering which has the following minimum physical properties when tested according to the methods indicated:

- .1 Compressive strength: 10,000 psi after 7 days in accordance with ASTM C579
- .2 Tensile strength: 1,750 psi in accordance with ASTM C307
- .3 Flexural strength: 4,000 psi in accordance with ASTM C580
- .4 Water absorption: <1% in accordance with ASTM C413
- .5 Mechanical shock resistance: > 160 lb-in in accordance with ASTM D2794
- .6 Flammability: class 1 in accordance with ASTM E-648
- .7 Hardness: 85 to 90, Shore D, in accordance with ASTM D2240

2.2 MANUFACTURER

- .1 Epoxy flooring materials from same manufacturer.
- .2 Ensure compatibility for epoxy flooring materials including primers, resins, hardening agents, finish coats and sealer coats.

2.3 ACCESSORY MATERIALS

- .1 Filling and filling product: resin-based product manufactured or approved by the manufacturer of resin floor coverings and recommended by the latter for the use mentioned.
- .2 Joint sealer: type recommended or manufactured by the manufacturer of resin floor coverings for the type of service and condition of the joints mentioned.

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 epoxy floor coating applications 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 PREPARATION

- .1 Prepare substrate surfaces in accordance with epoxy floor coating material manufacturer's instructions.

3.3 PREPARATION OF CONCRETE FLOOR SUBSTRATES

- .1 Ensure work penetrating substrate has been completed before preparing substrate and applying coating.
- .2 Protect coated surfaces, equipment, fixtures and fittings.

- .3 Clean and prepare surfaces in accordance with manufacturer's instructions.
 - .1 Chemical cleaning: clean surfaces with detergent, trisodium phosphate or other proprietary concrete cleaner.
 - .2 Mechanical cleaning: Mechanically clean concrete surfaces using mechanical cleaning scabblers, impact tools or scarifiers tool in accordance with manufacturer's written instructions.
 - .3 Blast Cleaning: blast clean concrete surface using sandblasting, waterblasting or shot blasting.
 - .4 Acid etching: clean concrete surface with acid to remove sufficient cement paste to provide a roughened surface.
 - .5 Flame cleaning: clean concrete floor surfaces with a multi-flame oxy-acetylene blowpipe flame cleaning machine; blowpipe speed 0.02 m/s - 0.03 m/s.

3.4 INSTALLATION

- .1 Comply with manufacturer's instructions.
- .2 Prime clean concrete subfloor as recommended by manufacturer.
- .3 Apply epoxy sub-floor filler to cracks, depressions and low spots to achieve floor level to a tolerance of 1:500; allow to cure.
- .4 Prime concrete and subfloor filler substrate surfaces as recommended by manufacturer.
- .5 Install epoxy floor coating material at the rate and to thickness required to achieve complete conformance with the specified performance requirements.
- .6 Coved base: apply the coved base mixture to the wall surfaces before applying the floor covering. Apply the coved base according to the manufacturer's details and written instructions, including those relating to the laying of strips, mixing, priming, trowelling, sanding and applying the top coat. Round the interior and exterior corners.
 - .1 Coved base: 100 mm high

3.5 FIELD QUALITY CONTROL

- .1 Inspections: notify Departmental Representative when ready for inspection.
- .2 Manufacturer's Field Services:
 - .1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - SUBMITTALS.
 - .2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
 - .3 Schedule site visits, to review Work, as directed in PART 1 - QUALITY ASSURANCE.

3.6 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19- Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.7 PROTECTION

- .1 Protection: protect installed product and finish surfaces from damage during construction.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

- .1 Canada Green Building Council (CaGBC)
 - .1 LEED Canada-NC Version 1.0-2004, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations (including Addendum 2007).
 - .2 LEED Canada-CI Version 1.0-2007, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide for Commercial Interiors.
 - .3 LEED Canada 2009 for Design and Construction-2010, LEED Canada 2009 for Design and Construction Leadership in Energy and Environmental Design Green Building Rating System Reference Guide.
 - .4 LEED Canada for Existing Buildings, Operations and Maintenance-2009, LEED Canada 2009 Leadership In Energy and Environmental Design Green Building Rating System Reference Guide.
- .2 Environmental Protection Agency (EPA)
 - .1 Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, EPA Method 24 - Surface Coatings.
 - .2 SW-846, Test Method for Evaluating Solid Waste, Physical/Chemical Methods.
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (SDS).
- .4 Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual - current edition.
 - .2 Standard GPS-1-12, MPI Green Performance Standard.
 - .3 Standard GPS-2-12, MPI Green Performance Standard.
- .5 National Research Council Canada (NRC)
 - .1 National Fire Code of Canada 2015(NFC).
- .6 Society for Protective Coatings (SSPC)
 - .1 Systems and Specifications, SSPC Painting Manual 2011.

1.2 QUALITY ASSURANCE

- .1 Qualification
 - .1 The Contractor must have at least five (5) years of experience in performing similar work, supporting references. In this regard, he must provide the list of the last three (3) comparable projects in which he has participated, specifying the name and location of the project, the

- contract authority responsible for the estimate and the name of the project manager.
- .2 The painting work must be carried out by qualified workers in accordance with the regulations in force in the local jurisdiction.
- .3 Apprentices may also be hired on the condition that they work under the direct supervision of a qualified worker, in accordance with the regulations governing this trade.
- .4 Comply with the most recent MPI requirements for exterior paint work, including those relating to surface preparation and the application of primer or print paint.
- .5 The products used must appear on the List of approved products given in the MPI Painting Specification Manual and all the products forming the paint system chosen must come from the same manufacturer.
- .6 Paint products such as linseed oil, shellac and turpentine must be of very high quality and compatible with the other coating products used, as required. They must come from an approved manufacturer cited in the MPI Painting Specification Manual.
- .7 Keep purchase slips, invoices and documents making it possible to establish, at the request of the Departmental Representative, the conformity of the work to the specified MPI requirements.
- .8 Quality standard
 - .1 Walls: no visible defect at a distance of 1000 mm, at an angle of 90 degrees to the surface examined.
 - .2 Soffits: no visible defect by an observer on the ground, at an angle of 45 degrees to the surface examined, under the final lighting provided.
 - .3 The color and gloss of the top coat must be uniform over the entire surface examined.

1.3 PERFORMANCE REQUIREMENTS

- .1 Environmental performance requirements
 - .1 The paint products used must comply with the requirements governing the obtaining of the "Environmental Choice" label E3 from MPI, granted according to the volatile organic compound (VOC) content determined according to method number 24 of Environmental Protection. Agency (EPA).
 - .2 Ecological performance requirements according to MPI GPS-1 standard.

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Scheduling
 - .1 Provide work schedule for various stages of painting to Departmental Representative approval. Provide schedule minimum of 48 hours in advance of proposed operations.
 - .2 Obtain written authorization from Departmental Representative for changes in work schedule.

- .3 Schedule new additions to existing building coordinate painting operations with other trades.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide in accordance with Section 01 33 00- Submittal Procedures.
- .2 Product Data:
 - .1 Provide manufacturer's instructions, printed product literature and data sheets for paint and paint products and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit 2 copies of WHMIS SDS in accordance with Sections 01 35 29.06- Health and Safety Requirements and 01 35 43- Environmental Procedures.
- .3 Submit a complete file for all products used. Indicate all the products of which each system is composed, specifying the information below for each of them.
 - .1 Product name, type and use.
 - .2 Manufacturer's product number.
 - .3 Colour numbers .
 - .4 MPI Environmentally Friendly classification system rating.
 - .5 Manufacturer's Material Safety Data Sheets (SDS).
- .4 Samples:
 - .1 Provide 200 x 300 mm duplicate sample panels of each paint with specified paint or coating in colours, gloss/sheen and textures required to MPI Architectural Painting Specification Manual standards submitted on following substrate materials:
 - .1 plate steel 3 mm for finishes over metal surfaces.
 - .2 13 mm birch plywood for finishes over wood surfaces.
 - .3 50 mm concrete block for finishes over concrete or concrete masonry surfaces.
 - .4 13 mm gypsum board for finishes over gypsum board and other smooth surfaces.
 - .5 10 mm siding for finishes over wood surfaces.
 - .2 When approved, samples shall become acceptable standard of quality for appropriate on-site surface with one of each sample retained on-site.
 - .3 Provide full range of available colours where colour availability is restricted.

1.6 CLOSEOUT SUBMITTALS

- .1 Provide in accordance with Section 01 78 00- Closeout Submittals.
- .2 Operation and Maintenance Data: Provide operation and maintenance data for painting materials for incorporation into manual.
- .3 Include :
 - .1 Product name, type and use.

- .2 Manufacturer's product number.
- .3 Colour numbers.
- .4 MPI Environmentally Friendly classification system rating.

1.7 MAINTENANCE MATERIAL SUBMITTALS

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

1.8 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Contractor: to have a minimum of 5 years proven satisfactory experience. When requested, provide list of last 3 comparable jobs including, job name and location, specifying authority, and project manager.
 - .2 Qualified journeypersons as defined by local jurisdiction to be engaged in painting work
 - .3 Apprentices: may be employed provided they work under direct supervision of qualified journeyperson in accordance with trade regulations.
 - .4 Conform to latest MPI requirements for exterior painting work including preparation and priming.
 - .5 Materials: in accordance with MPI Painting Specification Manual "Approved Product" listing and from a single manufacturer for each system used.
 - .6 Retain purchase orders, invoices and documents to prove conformance with noted MPI requirements when requested by Departmental Representative.
 - .7 Standard of Acceptance:
 - .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
 - .2 Soffits: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.
 - .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.
- .2 Mock-Ups:
 - .1 When requested by Departmental Representative or Paint Inspection Agency, prepare and paint designated surface, area, room or item to requirements specified herein, with specified paint or coating showing selected colours, number of coats, gloss/sheen, textures and quality of

- work to MPI Painting Specification Manual standards for review and approval.
- .2 Construct mock-ups in accordance with Section 01 45 00- Quality Control.
 - .1 Submit 900mm x 900mm
 - .2 Mock-up will be used:
 - .1 To judge quality of work, substrate preparation, operation of equipment and material application and skill to MPI Architectural Painting Specification Manual standards.
 - .3 Locate where directed
 - .4 Allow 24 hours for inspection of mock-up before proceeding with Work.
 - .5 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of finished work.

1.9 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.
 - .1 Labels: to indicate:
 - .1 Type of paint or coating.
 - .2 Compliance with applicable standard.
 - .3 Colour number in accordance with established colour schedule.
- .3 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 Observe manufacturer's recommendations for storage and handling.
 - .3 Store materials and supplies away from heat generating devices.
 - .4 Store materials and equipment in well ventilated area with temperature range 7 degrees C to 30 degrees C.
 - .5 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Departmental Representative. After completion of operations, return areas to clean condition to approval of Departmental Representative.
 - .6 Remove paint materials from storage only in quantities required for same day use.
 - .7 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.
 - .8 Fire Safety Requirements:

- .1 Provide one 9 kg dry chemical fire extinguisher adjacent to storage area.
- .2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
- .3 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada (NFC).
- .9 Replace defective or damaged materials with new.

1.10

WASTE MANAGEMENT AND DISPOSAL

- .1 Sort waste for recycling and reuse / reuse in accordance with section 01 74 19 - Waste management and disposal.
- .2 Paints, stains, wood preservatives and other related products (thinners, solvents, etc.) must be treated as hazardous materials, the disposal of which is subject to various regulations. Information on relevant legislative provisions can be obtained from provincial ministries responsible for the environment and government agencies in the region.
- .3 Products that cannot be reused must be treated as hazardous waste and disposed of properly.
- .4 Place products and materials designated hazardous or toxic, including used tubes and containers of adhesive and sealant, in areas or containers intended to receive hazardous waste.
- .5 To reduce contamination of soil or watercourses and sanitary and storm sewer systems, strictly comply with the following directives.
 - .1 Keep the washing water used in the case of paints and other water-based products so as to allow the collection by filtration of the deposited materials.
 - .2 Keep cleaning products, thinners, solvents and excess paint in containers designated for this purpose, and dispose of them in an appropriate manner.
 - .3 Keep rags that have been soaked in oil and solvent during painting for the recovery of contaminants and proper disposal or cleaning, as applicable.
 - .4 Take the necessary measures for the removal of contaminants in accordance with the regulations for hazardous waste.
 - .5 Allow empty paint containers to dry before disposal or recycling (in regions with appropriate facilities).
- .6 Where there is a paint recycling service, collect excess paint, classify it by type of product and plan for its transportation to a collection or recycling facility.
- .7 Set aside and protect surplus and uncontaminated finishing products. Entrust the collection of these products to responsible employees, people or organizations who can reuse or re-process them and report on the quantities thus recycled. Provide appropriate transportation arrangements, if necessary.

- .8 Close and seal the containers of partially used adhesives and sealants, and store them at a moderate temperature in a well ventilated and fireproof place.

1.11 SITE CONDITIONS

.1 Ambient Conditions:

.1 Heating, Ventilation and Lighting:

- .1 Do not perform painting work unless adequate and continuous ventilation and sufficient heating facilities are in place to maintain ambient air and substrate temperatures above 10 degrees C for 24 hours before, during and after paint application until paint has cured sufficiently.
- .2 Where required, provide continuous ventilation for seven days after completion of application of paint.
- .3 Co-ordinate use of existing ventilation system with Departmental Representative and ensure its operation during and after application of paint as required.
- .4 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.
- .5 Perform no painting work unless a minimum lighting level of 323 Lux is provided on surfaces to be painted. Adequate lighting facilities to be provided by General Contractor.

.2 Temperature, Humidity and Substrate Moisture Content Levels:

- .1 Unless specifically pre-approved by specifying body, Paint Inspection Agency and, applied product manufacturer, perform no painting work when:
 - .1 Ambient air and substrate temperatures are below 10 degrees C.
 - .2 Substrate temperature is over 32 degrees C unless paint is specifically formulated for application at high temperatures.
 - .3 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's prescribed limits.
 - .4 Relative humidity is above 85 % or when dew point is less than 3 degrees C variance between air/surface temperature.
 - .5 Rain or snow are forecast to occur before paint has thoroughly cured or when it is foggy, misty, raining or snowing at site.
- .2 Perform no painting work when maximum moisture content of substrate exceeds:
 - .1 12 % for concrete and masonry (clay and concrete brick/block).

- .2 15 % for hard wood.
- .3 17 % for soft wood.
- .4 12 % for plaster and gypsum board.
- .3 Conduct moisture tests using a properly calibrated electronic Moisture Meter, except test concrete floors for moisture using a simple "cover patch test".
- .4 Test concrete, masonry and plaster surfaces for alkalinity as required.
- .3 Application Requirements:
 - .1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.
 - .2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits noted herein.
 - .3 Apply paint when previous coat of paint is dry or adequately cured.
 - .4 Apply paint finishes when conditions forecast for entire period of application fall within manufacturer's recommendations.
 - .5 Do not apply paint when:
 - .1 Temperature is expected to drop below 10 degrees C before paint has thoroughly cured.
 - .2 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's limits.
 - .3 Surface to be painted is wet, damp or frosted.
 - .6 Provide and maintain cover when paint must be applied in damp or cold weather. Heat substrates and surrounding air to comply with temperature and humidity conditions specified by manufacturer. Protect until paint is dry or until weather conditions are suitable.
 - .7 Schedule painting operations such that surfaces exposed to direct, intense sunlight are scheduled for completion during early morning.
 - .8 Remove paint from areas which have been exposed to freezing, excess humidity, rain, snow or condensation. Prepare surface again and repaint.
 - .9 Paint occupied facilities in accordance with approved schedule only. Schedule operations to approval of Departmental Representative such that painted surfaces will have dried and cured sufficiently before occupants are affected.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Only paint materials listed in latest edition of MPI Approved Products List (APL) are acceptable for use on this project.
- .2 Paint materials for paint systems: to be products of single manufacturer.
- .3 Only qualified products with E3 "Environmentally Friendly" rating are acceptable for use on this project.
- .4 Paints, coatings, adhesives, solvents, cleaners, lubricants, and other fluids, to be as follows:
 - .1 water-based, water clean-up and water soluble.
 - .2 Biodegradable and non-flammable.
 - .3 Be manufactured without compounds which contribute to ozone depletion in upper atmosphere.
 - .4 Be manufactured without compounds which contribute to smog in the lower atmosphere.
 - .5 Do not contain methylene chloride.
- .5 Water-borne surface coatings must be manufactured and transported in a manner that steps of processes, including disposal of waste products arising there from, will meet requirements of applicable governmental acts, by-laws and regulations including, for facilities located in Canada, Fisheries Act and Canadian Environmental Protection Act (CEPA).
- .6 Water-borne surface coatings must not be formulated or manufactured with aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium or their compounds.
- .7 Water-borne surface coatings and recycled water-borne surface coatings must have flash point of 61.0 degrees C or greater.
- .8 Both water-borne surface coatings and recycled water-borne surface coatings must be made by a process that does not release:
 - .1 Matter in undiluted production plant effluent generating a 'Biochemical Oxygen Demand' (BOD) in excess of 15 mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.
 - .2 Total Suspended Solids (TSS) in undiluted production plant effluent in excess of 15 mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.
- .9 Water-borne paints and stains, recycled water-borne surface coatings and water borne varnishes must meet a minimum "Environmentally Friendly" E2 rating.
- .10 Recycled water-borne surface coatings must contain 50 % post-consumer material by volume.
- .11 Recycled water-borne surface coatings must not contain:
 - .1 Lead in excess of 600.0 ppm weight/weight total solids.

- .2 Mercury in excess of 50.0 ppm weight/weight total product.
- .3 Cadmium in excess of 1.0 ppm weight/weight total product.
- .4 Hexavalent chromium in excess of 3.0 ppm weight/weight total product.
- .5 Organochlorines or polychlorinated biphenyls (PCBS) in excess of 1.0 ppm weight/weight total product.
- .12 The following must be performed on each batch of consolidated post-consumer material before surface coating is reformulated and canned. These tests must be performed at a laboratory or facility which has been accredited by the Standards Council of Canada.
 - .1 Lead, cadmium and chromium are to be determined using ICP-AES (Inductively Coupled Plasma - Atomic Emission Spectroscopy) technique no. 6010 as defined in EPA SW-846.
 - .2 Mercury is to be determined by Cold Vapour Atomic Absorption Spectroscopy using Technique no. 7471 as defined in EPA SW-846.
 - .3 Organochlorines and PCBs are to be determined by Gas Chromatography using Technique no. 8081 as defined in EPA SW-846.

2.2 COLOURS

- .1 Submit proposed Colour Schedule to Departmental Representative for approval after Contract award.
- .2 Colour schedule will be based upon selection of 5 base colours and 3 accent colours. No more than 8 colours will be selected for entire project and no more than 3 colours will be selected in each area.
- .3 Selection of colours will be from manufacturers' full range of colours.
- .4 Where specific products are available in restricted range of colours, selection will be based on limited range.
- .5 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats if requested by Departmental Representative.
- .6 For deep and ultra deep colours 4 coats may be required.

2.3 MIXING AND TINTING

- .1 Perform colour tinting operations prior to delivery of paint to site. On-site tinting of painting materials is allowed only with Departmental Representative's written permission.
- .2 Mix paste, powder or catalyzed paint mixes in accordance with manufacturer's written instructions.
- .3 Add thinner to paint manufacturer's recommendations. Do not use kerosene or organic solvents to thin water-based paints.
- .4 Thin paint for spraying according in accordance with paint manufacturer's instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to Departmental Representative.

- .5 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity.
- .6 Deep and ultra deep colors; 4 coats may be required.

2.4 GLOSS/SHEEN RATINGS

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

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

- .2 Concrete Vertical Surfaces: (including horizontal soffits)
 - .1 EXT 3.1A - Latex satin finish (over alkali-resistant primer) finish.
- .3 Concrete Horizontal Surfaces: decks
 - .1 EXT 3.2C - Epoxy deck coating, slip resistant.
- .4 Structural Steel and Metal Fabrications:
 - .1 EXT 5.1A - Quick dry enamel semi-gloss (over q.d. primer) finish.
- .5 Galvanized Metal: not chromate passivated
 - .1 EXT 5.3A - Latex semi-gloss (over cementitious primer) finish.

PART 3 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 GENERAL

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

3.3 EXAMINATION

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

- .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.
- .2 Exterior repainting work: inspected by MPI Accredited Paint Inspection Agency (inspector) acceptable to specifying authority and local Painting Contractor's Association. Painting contractor to notify Paint Inspection Agency minimum of one week prior to commencement of work and provide copy of project repainting specification and Finish Schedule.
- .3 Exterior surfaces requiring repainting: inspected by both painting contractor and Paint Inspection Agency who will notify Departmental Representative in writing of defects or problems, prior to commencing repainting work, or after surface preparation if unseen substrate damage is discovered.
- .4 Where assessed degree of surface degradation of DSD-1 to DSD-3 before preparation of surfaces for repainting is revealed to be DSD-4 after preparation, repair or replacement of such unforeseen defects discovered are to be corrected, as mutually agreed, before repainting is started.
- .5 Where "special" repainting or recoating system applications (i.e. elastomeric coatings) or non-MPI listed products or systems are to be used, paint or coating manufacturer to provide as part of work, certification of surfaces and conditions for specific paint or coating system application as well as on site supervision, inspection and approval of their paint or coating system application as required at no additional cost to Departmental Representative.

3.4 PREPARATION

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

- .5 Use water-based cleaners in place of organic solvents where surfaces will be repainted using water based paints.
- .6 Many water-based paints cannot be removed with water once dried. Minimize use of kerosene or such organic solvents to clean up water-based paints.
- .4 Clean metal surfaces to be repainted by removing rust, dirt, oil, grease and foreign substances in accordance with MPI requirements. Remove such contaminants from surfaces, pockets and corners to be repainted by brushing with clean brushes, blowing with clean dry compressed air, or brushing/vacuum cleaning as required.
- .5 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before priming and between applications of remaining coats. Touch-up, spot prime, and apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.
- .6 Do not apply paint until prepared surfaces have been accepted by Departmental Representative.
- .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.

3.5 EXISTING CONDITIONS

- .1 Conduct moisture testing of surfaces to be painted using a properly calibrated electronic moisture meter, except test concrete floors for moisture using a simple "cover patch test" and report findings to Departmental Representative. Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.
- .2 Maximum moisture content as follows:
 - .1 Stucco: 12 %.
 - .2 Concrete: 12 %.
 - .3 Clay and Concrete Block/Brick: 12 %.
 - .4 Hard Wood: 15 %.
 - .5 Soft Wood: 17 %

3.6 PROTECTION

- .1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore such surfaces as directed by Departmental Representative.
- .2 Protect items that are permanently attached such as Fire Labels on doors and frames.
- .3 Protect factory finished products and equipment.
- .4 Protect passing pedestrians, and general public in and about building.

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

3.7 APPLICATION

- .1 Method of application to be as approved by Departmental Representative. Apply paint by brush, air sprayer, airless sprayer or roller. Conform to manufacturer's application instructions unless specified otherwise.
- .2 Brush and Roller Application:
 - .1 Apply paint in a uniform layer using brush and/or roller of types suitable for application.
 - .2 Work paint into cracks, crevices and corners.
 - .3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
 - .4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces to be free of roller tracking and heavy stipple unless approved by Departmental Representative.
 - .5 Remove runs, sags and brush marks from finished work and repaint.
- .3 Spray Application:
 - .1 Provide and maintain equipment that is suitable for intended purpose, capable of properly atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
 - .2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
 - .3 Apply paint in a uniform layer, with overlapping at edges of spray pattern.
 - .4 Brush out immediately runs and sags.
 - .5 Use brushes to work paint into cracks, crevices and places which are not adequately painted by spray.
 - .6 Wood, stucco, concrete, cement masonry units CMU's and brick; if sprayed, must be back rolled.
- .4 Use dipping, sheepskins or daubers when no other method is practical in places of difficult access and when specifically authorized by Departmental Representative.
- .5 Apply coats of paint as continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.

- .6 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.
- .7 Sand and dust between coats to remove visible defects.
- .8 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as projecting ledges.
- .9 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

3.8 MECHANICAL/ELECTRICAL EQUIPMENT

- .1 Unless otherwise specified, paint exterior exposed conduits, piping, hangers, duct work and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as noted otherwise.
- .2 Do not paint over nameplates.
- .3 Paint fire protection piping red.
- .4 Paint natural gas piping yellow.
- .5 Paint steel electrical light standards. Do not paint outdoor transformers and substation equipment.

3.9 FIELD QUALITY CONTROL

- .1 Exterior painting and decorating work to be inspected by MPI Accredited Paint Inspection Agency (inspector) acceptable to specifying authority and local Painting Contractor's Association. Painting contractor will notify Paint Inspection Agency a minimum of one week prior to commencement of work and provide a copy of project painting specification, plans and elevation drawings (including pertinent details) as well as Finish Schedule.
- .2 Exterior surfaces requiring painting to be inspected by Paint Inspection Agency who will notify Departmental Representative and General Contractor in writing of defects or problems, prior to commencing painting work, or after prime coat shows defects in substrate.
- .3 Where "special" painting, coating or decorating system applications (i.e. elastomeric coatings) or non-MPI listed products or systems are to be used, paint or coating manufacturer to provide as part of this work, certification of surfaces and conditions for specific paint or coating system application as well as on site supervision, inspection and approval of their paint or coating system application as required at no additional cost to Departmental Representative.
- .4 Standard of Acceptance:
 - .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
 - .2 Ceilings: no defects visible from floor at 45 degrees degrees to surface when viewed using final lighting source.
 - .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

- .5 Field inspection of painting operations to be carried out by independent inspection firm as designated by Departmental Representative.
- .6 Advise Departmental Representative when surfaces and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.
- .7 Cooperate with inspection firm and provide access to areas of work.
- .8 Retain purchase orders, invoices and other documents to prove conformance with noted MPI requirements when requested by Departmental Representative.

3.10 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 – Cleaning:
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 – Cleaning.
- .3 Waste Management: separate waste materials for recycling and reuse in accordance with Section 01 74 19 - Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.11 RESTORATION

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

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 Canada Green Building Council (CaGBC)
 - .1 LEED Canada-NC Version 1.0-2004, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations (including Addendum 2007).
 - .2 LEED Canada-CI Version 1.0-2007, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide for Commercial Interiors.
 - .3 LEED Canada 2009 for Design and Construction-2010, LEED Canada 2009 for Design and Construction Leadership in Energy and Environmental Design Green Building Rating System Reference Guide.
 - .4 LEED Canada for Existing Buildings, Operations and Maintenance-2009, LEED Canada 2009 Leadership In Energy and Environmental Design Green Building Rating System Reference Guide.
- .2 Environmental Protection Agency (EPA)
 - .1 Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, EPA Method 24 - Surface Coatings.
 - .2 SW-846, Test Methods for Evaluating Solid Waste: Physical/Chemical Methods.
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (SDS).
- .4 Master Painters Institute (MPI)
 - .1 The Master Painters Institute (MPI)/Architectural Painting Specification Manual (ASM) - current edition.
 - .2 Standard GPS-1-12, MPI Green Performance Standard.
 - .3 Standard GPS-2-12, MPI Green Performance Standard.
- .5 National Research Council Canada (NRC)
 - .1 National Fire Code of Canada 2015(NFC).
- .6 Society for Protective Coatings (SSPC)
 - .1 SSPC Painting Manual, Volume Two, 8th Edition, Systems and Specifications Manual.

1.2 ADMINISTRATIVE REQUIREMENTS

- .1 Scheduling:
 - .1 Submit work schedule for various stages of painting to Departmental Representative for review. Provide schedule minimum of 48 hours in advance of proposed operations.

- .2 Obtain written authorization from Departmental Representative for changes in work schedule.
- .3 Schedule new additions to existing building coordinate painting operations with other trades.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide in accordance with Section 01 33 00- Submittal Procedures.
- .2 Product Data:
 - .1 Provide manufacturer's instructions, printed product literature and data sheets for paint and paint products and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit 2 copies of WHMIS SDS in accordance with Sections 01 35 43- Environmental Procedures and 01 35 29.06- Health and Safety Requirements.
 - .3 Confirm products to be used are in MPI's approved product list.
- .3 Upon completion, provide records of products used. List products in relation to finish system and include the following:
 - .1 Product name, type and use.
 - .2 Manufacturer's product number.
 - .3 Colour numbers.
 - .4 MPI Environmentally Friendly classification system rating.
 - .5 Manufacturer's Material Safety Data Sheets (SDS).
- .4 Samples:
 - .1 Submit full range colour sample chips to indicate where colour availability is restricted.
 - .2 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 Architectural Painting Specification Manual standards submitted on following substrate materials:
 - .1 plate steel 3 mm for finishes over metal surfaces.
 - .2 13 mm birch plywood for finishes over wood surfaces.
 - .3 50 mm concrete block for finishes over concrete or concrete masonry surfaces.
 - .4 gypsum board 13 mm for finishes over gypsum board and other smooth surfaces.
 - .5 10 mm siding for finishes over wood surfaces.
 - .3 Retain reviewed samples on-site to demonstrate acceptable standard of quality for appropriate on-site surface.
- .5 Test reports: Provide certified test reports for paint from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties.
 - .1 Lead, cadmium and chromium: presence of and amounts.

- .2 Mercury: presence of and amounts.
- .3 Organochlorines and PCBs: presence of and amounts.
- .6 Certificates: Provide certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties. MPI Gateway #.
- .7 Manufacturer's Instructions:
 - .1 Provide manufacturer's installation application instructions.
- .8 Sustainable Design Submittals:
 - .1 Construction Waste Management:
 - .1 Provide project Waste Management Plan highlighting recycling and salvage requirements.
 - .2 Provide calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 50 % 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 content, and total cost of materials for project.
 - .3 Regional Materials: Provide evidence that project incorporates required percentage.
 - .4 Low-Emitting Materials:
 - .1 Provide listing of adhesives and sealants as well as paints and coatings used in building, showing compliance with VOC and chemical component limits or restriction requirements.

1.4 CLOSEOUT SUBMITTALS

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

1.5 MAINTENANCE MATERIAL SUBMITTALS

- .1 Extra Stock Materials:
 - .1 Provide maintenance materials in accordance with Section 01 78 00- Closeout Submittals .

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

1.6 QUALITY ASSURANCE

.1 Qualifications:

- .1 Contractor: to have a minimum of 5 years proven satisfactory experience. When requested, provide list of last 3 comparable jobs including, job name and location, specifying authority, and project manager.
- .2 Qualified journeypersons as defined by local jurisdiction to be engaged in painting work.
- .3 Apprentices: may be employed provided they work under direct supervision of qualified journeyperson in accordance with trade regulations.
- .4 Conform to latest MPI requirements for exterior painting work including preparation and priming.
- .5 Materials: in accordance with MPI Painting Specification Manual "Approved Product" listing and from a single manufacturer for each system used.
- .6 Retain purchase orders, invoices and documents to prove conformance with noted MPI requirements when requested by Departmental Representative.
- .7 Standard of Acceptance:
 - .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
 - .2 Soffits: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.
 - .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

.2 Mock-Ups:

- .1 When requested by Departmental Representative or Paint Inspection Agency, prepare and paint designated surface, area, room or item to requirements specified herein, with specified paint or coating showing selected colours, number of coats, gloss/sheen, textures and quality of work to MPI Painting Specification Manual standards for review and approval.
- .2 Construct mock-ups in accordance with Section 01 45 00- Quality Control.
 - .1 Provide 900 mm x 900 mm
 - .2 Mock-up will be used:
 - .1 To judge quality of work, substrate preparation, operation of equipment and material application and skill to MPI Architectural Painting Specification Manual standards.
 - .3 Locate where directed

- .4 Allow 24 hours for inspection of mock-up before proceeding with Work.
- .1 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of finished work.

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.
 - .1 Labels: to indicate:
 - .1 Type of paint or coating.
 - .2 Compliance with applicable standard.
 - .3 Colour number in accordance with established colour schedule.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Observe manufacturer's recommendations for storage and handling.
 - .3 Store materials and supplies away from heat generating devices.
 - .4 Store materials and equipment in well ventilated area with temperature range 7 degrees C to 30 degrees C.
 - .5 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Departmental Representative. After completion of operations, return areas to clean condition to approval of Departmental Representative.
 - .6 Remove paint materials from storage only in quantities required for same day use.
 - .7 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.
 - .8 Fire Safety Requirements:
 - .1 Provide one 9 kg dry chemical fire extinguisher adjacent to storage area.
 - .2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
 - .3 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada (NFC).
- .4 Develop Waste Reduction Work plan related to Work of this Section. .
- .5 Packaging Waste Management: remove for reuse by manufacturer and return of packaging materials, padding, pallets, crates, as specified in Construction Waste

Management Plan in accordance with Section 01 74 19- Waste Management and Disposal.

1.8 SITE CONDITIONS

.1 Ambient Conditions:

.1 Heating, Ventilation and Lighting:

- .1 Ventilate enclosed spaces
- .2 Provide heating facilities to maintain ambient air and substrate temperatures above 10 degrees C for 24 hours before, during and after paint application until paint has cured sufficiently.
- .3 Provide continuous ventilation for 7 days after completion of application of paint.
- .4 Co-ordinate use of existing ventilation system with Departmental Representative and ensure its operation during and after application of paint as required.
- .5 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.
- .6 Provide minimum lighting level of 323 Lux on surfaces to be painted.

.7 Temperature, Humidity and Substrate Moisture Content Levels:

- .1 Unless pre-approved written approval by Paint Inspection Agency Authority and product manufacturer, perform no painting when:
 - .1 Ambient air and substrate temperatures are below 10 degrees C.
 - .2 Substrate temperature is above 32 degrees C unless paint is specifically formulated for application at high temperatures.
 - .3 Substrate and ambient air temperatures are not expected to fall within MPI or paint manufacturer's prescribed limits.
 - .4 The relative humidity is under 85% or when the dew point is more than 3 degrees C variance between the air/surface temperature. Paint should not be applied if the dew point is less than 3 degrees C below the ambient or surface temperature. Use sling psychrometer to establish the relative humidity before beginning paint work.
 - .5 Rain or snow are forecast to occur before paint has thoroughly cured or when it is foggy, misty, raining or snowing at site.
 - .6 Ensure that conditions are within specified limits during drying or curing process, until newly applied

- coating can itself withstand 'normal' adverse environmental factors.
- .2 Perform painting work when maximum moisture content of the substrate is below:
 - .1 12 % for concrete and masonry (clay and concrete brick/block). Allow new concrete and masonry to cure minimum of 28 days.
 - .2 15 % for hard wood.
 - .3 17 % for soft wood.
 - .4 12 % for plaster and gypsum board.
- .3 Test for moisture using calibrated electronic Moisture Meter. Test concrete floors for moisture using "cover patch test".
- .4 Test concrete, masonry and plaster surfaces for alkalinity as required.
- .8 Surface and Environmental Conditions:
 - .1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.
 - .2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits.
 - .3 Apply paint when previous coat of paint is dry or adequately cured.
- .9 Additional interior application requirements:
 - .1 Apply paint finishes when temperature at location of installation can be satisfactorily maintained within manufacturer's recommendations.
 - .2 Apply paint in occupied facilities during silent hours only. Schedule operations to approval of Departmental Representative such that painted surfaces will have dried and cured sufficiently before occupants are affected.

Part 2 Products

2.1 PERFORMANCE REQUIREMENTS

- .1 Environmental Performance Requirements:
 - .1 Provide paint products meeting MPI "Environmentally Friendly" E2 ratings based on VOC (EPA Method 24) content levels.
 - .2 Green Performance in accordance with MPI Standard GPS-1.

2.2 MATERIALS

- .1 Only Paint materials listed in the MPI Approved Products List (APL) are acceptable for use on this project.

- .2 Provide paint materials for paint systems from single manufacturer.
- .3 Only qualified products with E2 "Environmentally Friendly" rating are acceptable for use on this project.
- .4 Conform to latest MPI requirements for interior painting work including preparation and priming.
- .5 Provide paint products meeting MPI "Environmentally Friendly" E2 ratings based on VOC (EPA Method 24) content levels.
- .6 Use MPI listed materials having minimum rating where indoor air quality (odour) requirements exist.
- .7 Paints, coatings, adhesives, solvents, cleaners, lubricants, and other fluids to be:
 - .1 Water soluble, Water-based and Water clean-up
 - .2 Non-flammable and biodegradable
 - .3 Be manufactured without compounds which contribute to ozone depletion in the upper atmosphere.
 - .4 Be manufactured without compounds which contribute to smog in the lower atmosphere.
 - .5 Do not contain methylene chloride, chlorinated hydrocarbons, toxic metal pigments.
- .8 Ensure manufacture and process of both water-borne surface coatings and recycled water-borne surface coatings does not release:
 - .1 Matter in undiluted production plant effluent generating 'Biochemical Oxygen Demand' (BOD) in excess of 15 mg/L to natural watercourse or sewage treatment facility lacking secondary treatment.
 - .2 Total Suspended Solids (TSS) in undiluted production plant effluent in excess of 15 mg/L to natural watercourse or a sewage treatment facility lacking secondary treatment.
- .9 Water-borne paints and stains, recycled water-borne surface coatings and water borne varnishes to meet minimum "Environmentally Friendly" E2 rating.
- .10 Recycled water-borne surface coatings to contain 50% post-consumer material by volume.
- .11 Recycled water-borne surface coatings must not contain:
 - .1 Lead in excess of 600.0 ppm weight/weight total solids.
 - .2 Mercury in excess of 50.0 ppm weight/weight total product.
 - .3 Cadmium in excess of 1.0 ppm weight/weight total product.
 - .4 Hexavalent chromium in excess of 3.0 ppm weight/weight total product.
 - .5 Organochlorines or polychlorinated biphenyls (PCBS) in excess of 1.0 ppm weight/weight total product.

2.3 COLOURS

- .1 Submit proposed Colour Schedule to Departmental Representative for review after Contract award.

- .2 Colour schedule will be based upon selection of 5 base colours and 3 accent colours. No more than 8 colours will be selected for entire project and no more than 3 colours will be selected in each area.
- .3 Selection of colours will be from manufacturers full range of colours.
- .4 Where specific products are available in restricted range of colours, selection based on limited range.
- .5 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats, if requested by Departmental Representative.
- .6 For deep and ultra deep colours; 4 coats may be required.

2.4 MIXING AND TINTING

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

2.5 GLOSS/SHEEN RATINGS

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

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

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

2.6 INTERIOR PAINTING SYSTEMS

- .1 Concrete vertical surfaces: including horizontal soffits:
 - .1 INT 3. 1A - Latex Satin finish (over alkali-resistant primer).
- .2 Structural steel and metal fabrications: columns, beams, joists:
 - .1 INT 5.1A - Quick dry enamel gloss (over Q.D. alkyd primer) finish.
- .3 Galvanized metal: doors, frames, railings, misc. steel, pipes, overhead decking, and ducts.
 - .1 INT 5.3A - Latex finish traditional gloss (over cementitious primer) finish.
- .4 Spray textured surfaces: ceilings:
 - .1 INT 9.1A - Latex flat finish spray application only.
- .5 Plaster and gypsum board: gypsum wallboard, drywall, "sheet rock type material", and textured finishes:
 - .1 INT 9.2A - Latex Satin finish (over latex primer/sealer).
 - .2 INT 9.2J - W.B. Fire Retardant coating (ULC rated).

2.7 SOURCE QUALITY CONTROL

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

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 GENERAL

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

3.3 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable to be painted in accordance with manufacturer's written instructions.
 - .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.
- .2 Interior repainting work: inspected by MPI Accredited Paint Inspection Agency (inspector) acceptable to specifying authority and local Painting Contractor's Association. Painting contractor to notify Paint Inspection Agency minimum of one week prior to commencement of work and provide copy of project repainting specification and Finish Schedule.
- .3 Interior surfaces requiring repainting: inspected by both painting contractor and Paint Inspection Agency who will notify Departmental Representative in writing of defects or problems, prior to commencing repainting work, or after surface preparation if unseen substrate damage is discovered.
- .4 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.
- .5 Maximum moisture content as follows:
 - .1 Stucco, plaster and gypsum board: 12 %.
 - .2 Concrete: 12 %.
 - .3 Clay and Concrete Block/Brick: 12 %.
 - .4 Hard Wood: 15 %.
 - .5 Soft Wood: 17%.

3.4 PREPARATION

- .1 Protection (not applicable to new painting work):
 - .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.
 - .4 Protect passing pedestrians and general public in and about the building.
- .2 Surface Preparation (not applicable to new painting work):

- .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 "PEINTURE FRAICHE / WET PAINT" signs in occupied areas as painting operations progress. Signs to approval of Departmental Representative.
- .3 Clean and prepare surfaces in accordance with MPI Architectural Painting Specification Manual requirements. Refer to MPI Manual in regard to specific requirements and as follows:
- .1 Remove dust, dirt, and other surface debris by vacuuming, wiping with dry, clean cloths or compressed air.
 - .2 Wash surfaces with a biodegradable detergent and bleach where applicable and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.
 - .3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
 - .4 Allow surfaces to drain completely and allow to dry thoroughly.
 - .5 Prepare surfaces for water-based painting; water-based cleaners should be used in place of organic solvents.
 - .6 Use trigger operated spray nozzles for water hoses.
 - .7 Many water-based paints cannot be removed with water once dried. Minimize use of mineral spirits or organic solvents to clean up water-based paints.
- .4 Clean following surfaces with high pressure water washing.
- .5 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pre-treatment as soon as possible after cleaning and before deterioration occurs.
- .6 Where possible, prime non-exposed surfaces of new wood surfaces before installation. Use same primers as specified for exposed surfaces.
- .1 Apply 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 Carried out during shop priming: clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with MPI requirements. Remove traces of blast products from surfaces, pockets and corners to be painted by blowing with clean dry compressed air, vacuum cleaning or brushing with clean brushes.

- .9 Touch up of shop primers with primer as specified.
- .10 Do not apply paint until prepared surfaces have been accepted by Departmental Representative.

3.5 EXISTING CONDITIONS

- .1 Conduct moisture testing of surfaces to be painted using properly calibrated electronic moisture meter, except test concrete floors for moisture using simple "cover patch test" and report findings to Departmental Representative. Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.
- .2 Maximum moisture content as follows:
 - .1 Stucco: 12%.
 - .2 Concrete: 12 %.
 - .3 Clay and Concrete Block/Brick: 12 %.
 - .4 Hard Wood: 15 %.
 - .5 Soft Wood: 17% .

3.6 APPLICATION

- .1 Method of application to be as approved by Departmental Representative. Apply paint by air sprayer, brush, roller or airless sprayer. Conform to manufacturer's application instructions unless specified otherwise.
- .2 Brush and Roller Application:
 - .1 Apply paint in uniform layer using brush and/or roller type suitable for application.
 - .2 Work paint into cracks, crevices and corners.
 - .3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
 - .4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces free of roller tracking and heavy stipple.
 - .5 Remove runs, sags and brush marks from finished work and repaint.
- .3 Spray application:
 - .1 Provide and maintain equipment that is suitable for intended purpose, capable of atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
 - .2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
 - .3 Apply paint in uniform layer, with overlapping at edges of spray pattern. Back roll first coat application.
 - .4 Brush out immediately all runs and sags.
 - .5 Use brushes and rollers to work paint into cracks, crevices and places which are not adequately painted by spray.

- .4 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access.
- .5 Apply coats of paint continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
- .6 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.
- .7 Sand and dust between coats to remove visible defects.
- .8 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as tops of interior cupboards and cabinets and projecting ledges.
- .9 Finish closets and alcoves as specified for adjoining rooms.
- .10 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.
- .11 Wood, drywall, plaster, stucco, concrete, concrete masonry units and brick; if sprayed, must be back rolled.

3.7 MECHANICAL/ELECTRICAL EQUIPMENT

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

3.8 SITE TOLERANCES

- .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.

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

3.9 FIELD QUALITY CONTROL

- .1 Interior painting and decorating work to be inspected by a MPI Accredited Paint Inspection Agency (inspector) acceptable to specifying authority and local Painting Contractor's Association. Painting contractor will notify Paint Inspection Agency a minimum of one week prior to commencement of work and provide a copy of project painting specification, plans and elevation drawings (including pertinent details) as well as a Finish Schedule.
- .2 Interior surfaces requiring painting to be inspected by Paint Inspection Agency who will notify Departmental Representative and General Contractor in writing of defects or problems, prior to commencing painting work, or after prime coat shows defects in substrate.
- .3 Where "special" painting, coating or decorating system applications (i.e. elastomeric coatings) or non-MPI listed products or systems are to be used, paint or coating manufacturer will provide as part of this work, certification of surfaces and conditions for specific paint or coating system application as well as on site supervision, inspection and approval of their paint or coating system application as required at no additional cost to Departmental Representative.
- .4 Standard of Acceptance:
 - .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
 - .2 Ceilings: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.
 - .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.
- .5 Field inspection of painting operations to be carried out by independent inspection firm as designated by Departmental Representative.
- .6 Advise Departmental Representative when surfaces and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.
- .7 Cooperate with inspection firm and provide access to areas of work.
- .8 Retain purchase orders, invoices and other documents to prove conformance with noted MPI requirements when requested by Departmental Representative.

3.10 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00- Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00- Cleaning.

- .3 Waste Management: separate waste materials for recycling and reuse in accordance with Section 01 74 19- Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.11 RESTORATION

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

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

- .1 Aluminum Association (AA)
 - .1 AA DAF 45-03(R2009), Designation System for Aluminum Finishes.
- .2 ASTM International
 - .1 ASTM A123/A123M-13, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .2 ASTM A653/A653M-13, Standard Specification for Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by Hot-Dip Process.
 - .3 ASTM B32-08, Standard Specification for Solder Metal.
 - .4 ASTM B456-11e1, Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.
- .3 Canadian General Standards Board (CGSB)
 - .1 CGSB 31-GP-107Ma-90, Non-Inhibited Phosphoric Acid Base Metal Conditioner and Rust Remover.
 - .2 CGSB 41-GP-6M-1983, Sheets, Thermosetting Polyester Plastics, Glass Fibre Reinforced.
- .4 CSA Group
 - .1 CSA W47.2-11, Certification of Companies for Fusion Welding of Aluminum.
 - .2 CSA W59-13, Welded Steel Construction (Metal Arc Welding).
 - .3 CSA W59.2-M1991(R2013), Welded Aluminum Construction.
- .5 Canadian Sheet Steel Building Institute (CSSBI)
 - .1 CSSBI SSF 6-2012, Sheet Steel Facts #6, Metallic Coated Sheet Steel for Structural Building Products.
- .6 Green Seal (GS)
 - .1 GS-11-2013, Standard for Paints and Coatings.
 - .2 GS-36-2013, Adhesives for Commercial Use.
- .7 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (SDS).
- .8 South Coast Air Quality Management District (SCAQMD)
 - .1 SCAQMD Rule 1113-13, Architectural Coatings.
 - .2 SCAQMD Rule 1168-A2011, Adhesive and Sealant Applications.
- .9 Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual - current edition.

- .1 MPI #76, Quick Dry Alkyd Metal Primer.
- .2 MPI #96, Quick Dry Enamel Gloss.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for signage and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Quebec, Canada.
 - .2 Submit catalogue sheets full size templates.
 - .3 Indicate materials, thicknesses, sizes, finishes, colours, construction details, removable and interchangeable components, access panels, mounting methods, schedule of signs.
 - .4 Submit drawn-to-scale details for individually fabricated lettering indicating word and letter spacing.
- .4 Samples:
 - .1 Submit duplicate representative sample of each type sign, sign image and mounting method including, but not limited to: graphics, cast letters, sign box installation method, channel letters, and wall plates fixed mounting installation method.

1.3 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.

1.4 QUALITY ASSURANCE

- .1 Welding Certification in accordance with CSA W47.2.

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 off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect specified materials from nicks, scratches, and blemishes.

- .3 Replace defective or damaged materials with new.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Sheet aluminum: anodizing quality.
- .2 Prefinished sheet aluminum: plain utility sheet with manufacturer applied baked enamel finish to designation AA 0.0076 mm thick on face and 0.25 mm thick on back.
- .3 Acrylic sheet: polymethylmethacrylate (PMMA) cast sheet suitable for intended use in sign fabrication, colours as indicated.
- .4 Fibreglass sheet: to CGSB 41-GP-6M, flat sheet, smooth finish, colours as indicated.
- .5 Engraving sheet: lamicoid 3.2 mm thick plastic sheet, black core.
- .6 Welding materials: to CSA W59.
- .7 Solder: to ASTM B32, Type Sn50.
- .8 Self-stick foam tape: 1.6 mm thick, 352.4 kg/m³ density polyurethane open-cell foam tape for sign purposes, with synthetic self-stick adhesive on both sides.
 - .1 Width: to suit sign sizes.
- .9 Adhesives, paints, sealants and solvents for acrylic sheet: type recommended by sheet manufacturer for applicable condition.
- .10 Acrylic top-coat: clear, non-yellowing, exterior grade, satin finish, acrylic polyester resin protective coating, compatible with acrylic, fibreglass or metal surface of type recommended by sheet manufacturer.

2.2 SIGN GRAPHICS

- .1 Sign graphics: well defined, arranged for balanced appearance, and properly word and letter spaced.
- .2 Silk screen process: apply 2 multi colour photographic produced silk screen printed images to face side of transparent sign faces; face side of opaque sign faces.
- .3 Engraving: apply sign images using pantograph mechanical engraving machine to obtain incised letters to match Departmental Representative's sample.
- .4 Self-stick vinyl film: individual letters and numerals and symbols die cut from 0.1 mm thick integral colour, matte finish, exterior grade PVC film, with self-stick adhesive backing.

2.3 WALL PLATES

- .1 Plastic wall plates:
 - .1 Fabricate from acrylic sheet 6.4 mm thick. Sizes as indicated.
 - .2 Sign graphics: apply by engraving.

- .2 Metal wall plates:
 - .1 Fabricate from sheet aluminum sign plates, minimum 6.4 mm thick, with baked enamel finish.
 - .1 Sizes as indicated.
 - .2 Sign graphics: apply by engraving.
- .3 Fixed mounting:
 - .1 Prepare wall plates for fixing by concealed tamperproof clips to match Departmental Representative's approval.
 - .2 Include back-up plates for fixing to uneven surfaces where required.

2.4 DOOR PLATES

- .1 Fabricate sign faces of colour anodized aluminum.
 - .1 Size: as indicated.
- .2 Sign graphics: apply by engraving.
- .3 Interchangeable mounting:
 - .1 Supply door plates with approved type, semi-concealed, retaining holders that permit quick but vandal-resistant interchange of sign face.
 - .2 Exposed fasteners not permitted.
 - .3 Exposed portions to match sign face.
- .4 Fixed mounting: use self-stick foam tape.
- .5 Mounting on transparent surfaces: use self-stick foam tape. Include blank back-up plate for opposite side.
- .6 Washroom pictographs: cut-out figures without backgrounds.

2.5 FABRICATION

- .1 Fabricate signs in accordance with details, specifications and shop drawings.
- .2 Build units square, true, accurate to size, free from visual or performance defects.
- .3 Fit and securely join sections to obtain tight, closed joints.
- .4 Allow for thermal movement without distortion of components.
- .5 Exposed inconspicuous fasteners of same finish and colour as base material permitted where approved by Departmental Representative.
- .6 Polish exposed edges of plastic or metal to smooth, slightly convex profile.
- .7 Apply bituminous paint to aluminum in contact with dissimilar metals, concrete or masonry.
- .8 Manufacturer's nameplates on sign surface permitted in non visible locations in completed work.

2.6 FINISHES

- .1 Baked enamel:
 - .1 One coat of conditioner to CGSB 31-GP-107M one coat of MPI #76 primer.
 - .2 At least two coats of MPI # 96.
 - .3 One coat on interior surfaces.
 - .4 Individually bake each coat.

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 signage 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 INSTALLATION

- .1 Manufacturer's Instructions: compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and data sheets.
- .2 Erect and secure signs plumb and level at elevations as directed by Departmental Representative.
- .3 Comply with sign manufacturer's installation instructions and approved shop drawings.
- .4 Mechanical attachment:
 - .1 To concrete or solid masonry: use lag screws and expansion bolts or screws and fibre plugs, as appropriate for stresses involved.
 - .2 To hollow masonry: use toggle bolts or equivalent.
 - .3 To steel: use bolts with nut and lock washers, self-tapping screws.
 - .4 To wood: use screws.
 - .5 Secure into framing members behind stud walls or above ceilings.
 - .6 Mechanical fasteners on exterior: non-staining, non-ferrous type.
 - .7 Fabricate special fasteners as required for installation conditions.
 - .8 Mechanical fasteners and methods of attachment subject to Departmental Representative's approval.

- .1 Obtain Departmental Representative's approval before fixing to structural steel.
- .5 Adhesive attachment:
 - .1 Use self-stick adhesive foam tape to manufacturer's instructions to fix sign and prevent "rocking".
 - .2 Keep tape maximum 1.6 mm from edges.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning.
 - .1 Leave signs clean.
 - .2 Remove debris from interior of sign boxes.
 - .3 Touch up damaged finishes.
- .3 Waste Management: separate waste materials for recycling and reuse in accordance with Section 01 74 19- Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

- .1 ASTM International (ASTM)
 - .1 ASTM A167-99(2009), Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
 - .2 ASTM B456-03, Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.
 - .3 ASTM A653/A653M-09, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .4 ASTM A924/A924M-09, Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.81-M90, Air Drying and Baking Alkyd Primer for Vehicles and Equipment.
 - .2 CAN/CGSB-1.88-92, Gloss Alkyd Enamel, Air Drying and Baking.
 - .3 CGSB 31-GP-107MA-90, Non-inhibited Phosphoric Acid Base Metal Conditioner and Rust Remover.
- .3 CSA Group (CSA)
 - .1 CAN/CSA-B651-04, Accessible Design for the Built Environment.
 - .2 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00- Submittal Procedures.
- .2 Product Data:
 - .1 Provide manufacturer's printed product literature and data sheets and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Quebec, Canada.
 - .2 Indicate size and description of components, base material, surface finish inside and out, hardware and locks, attachment devices, description of rough-in-frame, building-in details of anchors for grab bars.
- .4 Samples:
 - .1 Submit samples
 - .2 Samples will be returned for inclusion into work.

- .5 Sustainable Standards Certification:
 - .1 Low-Emitting Materials: submit listing of laminate adhesives used in building, verifying that they contain no urea-formaldehyde.

1.3 CLOSEOUT SUBMITTALS

- .1 Provide maintenance data for toilet and bath accessories for incorporation into manual specified in Section 01 78 00- Closeout Submittals.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- .1 Tools:
 - .1 Provide special tools required for assembly, disassembly or removal for toilet and bath accessories in accordance with requirements specified in Section 01 78 00- Closeout Submittals.
 - .2 Deliver special tools to 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 off ground, in dry location, indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect toilet and bathroom accessories from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.
- .4 Packaging Waste Management: remove for reuse by manufacturer, and return of padding, crates, packaging materials and pallets, in accordance with Section 01 74 19- Waste Management and Disposal.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Sheet steel: to ASTM A653/A653M with ZF001 designation zinc coating.
- .2 Stainless steel sheet metal: to ASTM A167, Type nuance 304, finish no. 4.
- .3 Sustainability Characteristics:
 - .1 Laminate Adhesives.
 - .1 Urea Formaldehyde Free.
- .4 Stainless steel tubing: Nuance 304, commercial quality, no longitudinal joints wall thickness 1.2mm.

- .5 Fasteners: concealed screws and bolts hot dip galvanized, exposed fasteners to match face of unit. Expansion shields fibre, lead or rubber as recommended by accessory manufacturer for component and its intended use.

2.2 COMPONENTS

- .1 Toilet tissue dispenser: surface mounted, for two rolls of standard 5 ½ "(133 mm) core paper, type 304 stainless steel case with satin finish, hinged front panel, refill indicator slot and key lock; can hold 1,800 sheets per roll.
- .2 Hand towel and bin dispensers: wall type, for semi-recessed mounting, approximate width of 440 mm, height of 1429 mm; exterior in type 304 stainless steel (0.8 mm thick) with satin finish; suitable for dispensing paper towels, roll-fold sheets (600 towels) or multiple-fold sheets (800 towels); container for soiled towels with a minimum capacity of 12 gal. (45.5 l), removable, in stainless steel type 304 with a satin finish, with lockable door, fixed to the frame by a grooved lock, with hemmed upper edges.
- .3 Soap dispensers: liquid soap, push valve, 155 mm high spout, 1.2 L self-contained tank; piston and valve assembly in stainless steel; black molded plastic push button; tamper-evident filling device; for surface mounting; visible metal elements in stainless steel type 304, with satin finish. Can be operated with one hand.
- .4 Trash cans for sanitary napkins: stainless steel with satin finish, for recessed mounting; continuous hinged door, self-closing, with engraved inscription recessed (universal symbol); removable container, made of plastic (polyethylene), fitted with two slots for hanging on the door hooks.
- .5 Hand dryer: approved by the ULC revision service and approved by the CSA.
 - .1 Installation: surface mounted.
 - .2 Wall box: polycarbonate
 - .3 Motor: 1000 W digital brushless DC motor.
 - .4 Type of heating: none
 - .5 Drying time measurement: 12 seconds
 - .6 Air speed: 690 km / h
 - .7 Sound power: 79 dB (A)
 - .8 Operation: Capacitive proximity sensor, without contact with the device.
 - .9 Time before automatic shutdown of the device: 30 seconds
- .6 Shower curtains: opaque, vinyl coated fabric, antibacterial, flame retardant, self-extinguishing.
- .7 Shower curtain hooks: type 304 stainless steel, for use on a rod of 25 or 32 mm in diameter.
- .8 Shower curtain rods: type 304 stainless steel tube with satin finish, 25 mm outside diameter, variable length (see plans), with chrome plated plastic flanges bright polish 35 mm in diameter, rods and anchors capable of withstanding a pulling force of 0.9 kN downwards.

- .9 Grab bars: Type 304 stainless steel tube with satin finish, 32 mm (1 ¼ in.) In diameter, 18 gauge wall thickness (1.2 mm), with wall flanges 80 mm in diameter, with concealed screws welded to the tube bar; supplied with steel support plates and necessary accessories; bars and anchors capable of withstanding a downward tensile force of 2.2 kN. See architectural drawings for length and configuration.
- .10 Clothes hooks: type 304 stainless steel with satin finish, welded construction projecting 30 mm.
- .11 Tilt mirrors: wall type, fixed, 6 mm thick, with mirror frame in stainless steel 19 x 19 mm in stainless steel 304 with satin finish and with wall frame with integrated wall suspension.
- .1 Shelf surface mounted, 200 deep, 400 wide, stainless steel.

2.3 FABRICATION

- .1 Weld and grind joints of fabricated components flush and smooth. Use mechanical fasteners only where approved.
- .2 Wherever possible form exposed surfaces from one sheet of stock, free of joints.
- .3 Brake form sheet metal work with 1.5 mm radius bends.
- .4 Form surfaces flat without distortion. Maintain flat surfaces without scratches or dents.
- .5 Back paint components where contact is made with building finishes to prevent electrolysis.
- .6 Hot dip galvanize concealed ferrous metal anchors and fastening devices to CAN/CSA-G164.
- .7 Shop assemble components and package complete with anchors and fittings.
- .8 Deliver inserts and rough-in frames to job site at appropriate time for building-in. Provide templates, details and instructions for building in anchors and inserts.
- .9 Provide steel anchor plates and components for installation on studding and building framing.

2.4 FINISHES

- .1 Chrome and nickel plating: to ASTM B456, satin finish.
- .2 Baked enamel: condition metal by applying one coat of metal conditioner to CGSB 31-GP-107Ma, apply one coat Type 2 primer to CAN/CGSB-1.81 and bake, apply two coats Type 2 enamel to CAN/CGSB-1.88 and bake to hard, durable finish. Sand between final coats. Colour selected from standard range by Departmental Representative.
- .3 Manufacturer's or brand names on face of units not acceptable.

PART 3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrates and surfaces to receive toilet and bathroom accessories previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's instructions prior to toilet and bathroom accessories installation.
- .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 from Departmental Representative.

3.2 INSTALLATION

- .1 Install and secure accessories rigidly in place as follows:
 - .1 Stud walls: install steel back-plate to stud prior to plaster or drywall finish. Provide plate with threaded studs or plugs.
 - .2 Hollow masonry units, existing plaster or drywall: use toggle bolts drilled into cell or wall cavity.
 - .3 Solid masonry, marble, stone or concrete: use bolt with lead expansion sleeve set into drilled hole.
 - .4 Toilet and shower compartments: use male to female through bolts.
- .2 Install grab bars on built-in anchors provided by bar manufacturer.
- .3 Use tamper proof screws/bolts for fasteners.
- .4 Fill units with necessary supplies shortly before final acceptance of building.
- .5 Install mirrors in accordance with Section 08 80 00- Glazing.

3.3 ADJUSTING

- .1 Adjust toilet and bathroom accessories components and systems for correct function and operation in accordance with manufacturer's written instructions.
- .2 Lubricate moving parts to operate smoothly and fit accurately.

3.4 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00- Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00- Cleaning.
- .3 Waste Management: separate waste materials for recycling and reuse in accordance with Section 01 74 19- Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.5 PROTECTION

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

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 06 10 00 - Rough Carpentry
- .2 Section 07 92 00 - Joints Sealants

1.2 REFERENCE STANDARDS

- .1 Canada Green Building Council (CaGBC)
 - .1 LEED Canada-CI Version 1.0-2007, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide For Commercial Interiors.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-44.40-01, Steel Clothing Locker.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Provide manufacturer's printed product literature and data sheets for the metal lockers and include the product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by a professional engineer registered or licensed in the province of Québec, Canada.
 - .2 Indicate on drawings: the type and class of locker, the thicknesses of metal, the fabricating and assembly methods, the assembled banks of lockers, the filler panels, numbering, locking method, hooks, ventilation method, finishes, rods, and handles.
- .4 Samples:
 - .1 Submit two (2) 50 x 50 mm samples of the colour and finish on the actual base metal.
 - .2 Samples will be returned to be included into the work.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00- Common Product Requirements.
- .2 Delivery and Acceptance Requirements:
 - .1 Deliver the materials to the site in the original factory packaging, labelled with the manufacturer's name and address.
- .3 Storage and Handling Requirements:

- .1 Store materials indoors, off ground, in clean, dry, well-ventilated area and in accordance with the manufacturer's recommendations.
- .2 Store and protect the metal lockers from nicks, scratches, and blemishes.
- .3 Replace defective or damaged lockers with new ones.
- .4 Packaging Waste Management: recover packaging waste materials to be reuse, in accordance with Section 01 74 19- Waste Management and Disposal.

PART 2 PRODUCTS

2.1 MANUFACTURED UNITS

- .1 Lockers: Large individual locker: in accordance with standard CAN/CGSB-44.40, Type 1-Single full-height locker, Type 2 - Double tier locker.
 - .1 Size: 915mm wide x 610mm deep x 1830mm high
 - .2 Assembly: welded construction.
 - .3 Top: flat
 - .4 Front: open
 - .5 Sides: perforated
 - .6 Safety box with lock
 - .7 Storage canteen for valuables
 - .8 Lower shelf that can be used as a bench
 - .9 Upper shelf
 - .10 Hanging bar
 - .11 Color: To be chosen by the Departmental Representative from the full range of colors offered by the manufacturer

2.2 ACCESSORIES

- .1 Additional 915mm long hanging bar between the lockers.

PART 3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates and surfaces to receive metal lockers previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's instructions prior to metal locker installation.
- .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 from Departmental Representative.

3.2 INSTALLATION

- .1 Assemble and install lockers in accordance with manufacturer's written instructions.
- .2 Securely fasten lockers to grounds and nailing strips.
- .3 Install wall trim around recessed locker banks.
- .4 Install filler panels (false fronts) where indicated and where obstructions occur.
- .5 Install finished end panels to exposed ends of locker banks.
- .6 Install locker numbers locks.

3.3 ADJUSTING

- .1 Adjust metal lockers for correct function and operation in accordance with manufacturer's written instructions.
- .2 Lubricate moving parts to operate smoothly and fit accurately.

3.4 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00- Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00- Cleaning.
- .3 Waste Management: separate waste materials for recycling and reuse in accordance with Section 01 74 19- Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.5 PROTECTION

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

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 03 30 00 - Cast-in-Place Concrete.
- .2 Section 03 35 00 - Concrete Finishing.
- .3 Section 07 92 00 - Joint Sealants

1.2 REFERENCES

- .1 The Aluminum Association.
 - .1 Aluminum Standards and Data 2009 Metric SI.
- .2 American Society for Testing and Materials International, (ASTM).
 - .1 ASTM B117 - 09 Standard Practice for Operating Salt Spray (Fog) Apparatus.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets and include product characteristics, performance criteria, physical size, finish and limitations, in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Shop Drawings:
 - .1 Submit required shop drawings in accordance with Section 01 33 00 – Submittal Procedures.
 - .2 Shop drawings must indicate dimensions, as well as location and dimensions of recessed areas to receive products specified in this section.

1.4 CLOSEOUT SUBMITTALS

- .1 Provide maintenance data for toilet and bath accessories for incorporation into manual specified in Section 01 78 00- Closeout Submittals.
- .2 Provide operation and maintenance data for repair or replacement of worn parts.

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

- .2 Store and protect toilet and bathroom accessories from nicks, scratches, and blemishes.
- .3 Replace defective or damaged materials with new.
- .4 Packaging Waste Management: remove for reuse by manufacturer, and return of padding, crates, packaging materials and pallets, in accordance with Section 01 74 19- Waste Management and Disposal.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Supply and install, at locations and dimensions indicated on drawings of entrance floor grilles
- .2 All aluminum components are fabricated of 6061-T6 alloy.
- .3 Deflection under live load:
 - .1 Floor grilles to be conceived to accept a uniform load of 1794 Newton applied on a surface of 100 mm square in order to not exceed a deflection of 1/180" for a span of 1220 mm.
- .4 Perimeter frame to be extrusion in shape of "Z" as model "TT ", for installation on finished floor. At installation, a silicone joint must be applied between the frame and the finished flooring in order to prevent water infiltrations.
- .5 Slats are "T " shape, dimensions: 9,5mm x 3 mm x 25 mm. Spacing between slats must not exceed 4.7 mm Total depth 35 mm, from finished floor.
- .6 Spacing of slats and retaining rods to comply with required load capacity. Grilles to be supplied in sections having dimensions easy to manipulate, to facilitate maintenance.
- .7 Frames to be furnished without a basin. A waterproofing coat shall be applied to concrete surfaces to prevent water infiltrations.
- .8 Sections to have a friction coefficient of 1, 10 and a cleaning efficiency of 59%. Percentage of openings of 40%.
- .9 Deformation under lateral load must not exceed 11 (visual) after application of a maximum load of 6130 Newton (1380 pounds) at an angle of 45 degrees in relation to surface.
- .10 All grille sections to comply to ASTM B117 and able to be subjected to a salty fog for 1000 hours without noticeable changes.
- .11 The manufacturer must be able to confirm this data and provide to Departmental Representative necessary documents at the same time as the shop drawings.

2.2 ACCESSORIES / OPTIONS

- .1 Locks, GB - 46 (only) 4 per grille: all grille sections will be provided with GB-46 locks. GB-46 locks are made of galvanized steel and Teflon and are secured under grille sections by the manufacturer. The locks will be supplied with a special key in order to use (one per vestibule). All locks must be lubricated

(BSRS 2000 water resistant grease) during final implementation of the grilles by General Contractor.

- .2 Lifting hooks: all grilles will be supplied with lifting hooks to facilitate handling sections without effort or risk of damaging grille surface (one per vestibule).
- .3 All frame sections will be provided with noise-blocking cushion as specified by manufacturer. Its function is to reduce noise and vibration that may occur between frame and grille.
- .4 Sealants: mold resistant silicone in accordance with Section 07 92 00 – Joint Sealants.

2.3 BARRIER COATINGS

- .1 Aluminium surfaces should be coated with a bituminous paint so as to be isolated from the following materials:
 - .1 Metals of different nature, with the exception of stainless steel, zinc and white bronze (in small quantities).
 - .2 Concrete, mortar and other masonry materials.
 - .3 Wood

PART 3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrates and surfaces to receive floor grilles previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's instructions prior to floor grille installation.
- .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 from Departmental Representative.

3.2 INSTALLATION:

- .1 Install entrance floor grilles square and level with the floor finish in order to permit easy handling of all sections. All sections of frame and intermediate supports must be level and firmly supported on all their length in order to prevent any long term deflection. Repair concrete screed around the grille once in place, with a non-retracting grout.
- .2 Grilles are to be installed only at the end of the works to protect them from any damage. All frames and basins must be cleaned before placing on them the grille sections in order to not exceed the level of the finished floor. All sound deafening cushions damaged during construction must be replaced before final inspection. Protect grille surfaces during construction. Install hinges or notches if required. Ensure all latches are locked if required, and apply grease.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00- Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00- Cleaning.
- .3 Waste Management: separate waste materials for recycling and reuse in accordance with Section 01 74 19- Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.4 PROTECTION

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

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

- .1 American National Standards Institute/Hardwood Plywood and Veneer Association (ANSI/HPVA)
 - .1 ANSI/HPVA HP-1-2009, Standard for Hardwood and Decorative Plywood Hardwood.
- .2 ASTM International
 - .1 ASTM A480/A480M-13, Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet and Strip.
 - .2 ASTM A653/A653M-11, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .3 ASTM A1008/A1008M-12a, Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.
 - .4 ASTM B221M-13, Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes Metric.
- .3 Canada Green Building Council (CaGBC)
 - .1 LEED Canada for Existing Buildings, Operations and Maintenance-2009, LEED Canada 2009 Leadership In Energy and Environmental Design Green Building Rating System Reference Guide.
- .4 CSA Group
 - .1 ASME A17.1/CSA B44-2010, Safety Code for Elevators and Escalators (Bi-National standard, with ASME A17.1).
 - .2 CSA B355-09(R2013), Lifts for Persons with Physical Disabilities.
 - .3 CSA C22.1-12, Canadian Electrical Code, Part 1 (22nd Edition), Safety Standard for Electrical Installations.
 - .4 CSA C22.2 No. 77-95(R2009), Motors with Inherent Overheating Protection.
 - .5 CSA C22.2 No.141-10, Emergency Lighting Equipment.
 - .6 CSA G40.20/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .7 CSA O121-08(R2013), Douglas Fir Plywood.
 - .8 CSA O151-09, Canadian Softwood Plywood.
 - .9 CSA W59-03(R2008), Welded Steel Construction (Metal Arc Welding).
- .5 Green Seal (GS)
 - .1 GS-11-11, Standard for Paints and Coatings.

- .6 Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual - current edition.
 - .1 MPI #26 Primer, Galvanized Metal, Cementitious.
 - .2 MPI #47 Alkyd, Interior, Semi-Gloss.
 - .3 MPI #76 Primer, Alkyd, Quick Dry, for Metal.
- .7 National Electrical Manufacturers Association (NEMA)
 - .1 ANSI/NEMA LD-3-05, High-Pressure Decorative Laminates.
- .8 South Coast Air Quality Management District (SCAQMD)
 - .1 SCAQMD Rule 1113-11, Architectural Coatings.
- .9 Underwriters Laboratories of Canada (ULC)
 - .1 CAN4-S104-M80(R1985), Standard Method for Fire Tests of Door Assemblies.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures.
- .2 Product Data:
 - .1 Submit the manufacturer's instructions, printed product literature and data sheets for wheelchair lifts and include the product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Provide product data for:
 - .1 The signal and operating fixtures, operating panels, indicators.
 - .2 The lift interior design and components.
 - .3 The doors and frame details.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by a professional engineer registered or licensed in the province of Québec, Canada.
 - .2 Include the following on the layout drawings:
 - .1 Relevant details concerning the pumping unit controller, piping, and other components in machine room.
 - .2 The size and location of the lift, guide rails, buffers and other components found in the hoistway.
 - .3 The spacing between the supports of the guide rails as well as the maximum loads that can be exerted on them.
 - .4 Reactions at points of support.
 - .5 The weight of the main components.
 - .6 The dimensions of the clearances provided at each end of the hoistway, as well as those of the reserves provided for the movement of the cabin beyond the extreme landings.

- .7 The location of the circuit breaker, or disconnect switch, light switch and feeder extension points that can be found in the machine room.
- .8 The rating of the drive motor and fused disconnect.
- .9 The location, in the hoistway, for connection of travelling cables for the telephone and for the cabin lights.
- .10 The outside diameter and wall thickness of the cylinder, plunger and piping, as well as the working pressure.
- .11 The length of the plunger and the cylinder.
- .3 Include the following on the general arrangement drawings:
 - .1 The type, the size, and the location of the hoistway entrances showing details of fastening to the hoistway structure.
 - .2 The platform design showing details of construction and equipment devices.
- .4 Sustainable Design Submittals:
 - .1 Construction Waste Management:
 - .1 Submit the project Waste Management Plan and Waste Reduction Workplan highlighting the 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 a list of the recycled content products used, including details of the required percentages or recycled content materials and products, showing their costs and percentages of post-industrial and post-consumer content, and the total cost of the materials for the project.
 - .3 Regional Materials: submit evidence that the project incorporates required percentage Regional Materials.
 - .4 Low-Emitting Materials:
 - .1 Submit a list of the adhesives and sealants used in the building; they must comply with the VOC and chemical component limits or restriction requirements.
 - .5 Wood Certification: submit the manufacturer's Chain-of-Custody Certificate number for CAN/CSA-Z809 or FSC or SFI certified wood.
- .5 Manufacturer's Field Reports: submit the specified manufacturer's field reports.

1.3 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00- Closeout Submittals.
- .2 Operation and Maintenance Data: submit the operation and maintenance data for the wheelchair lifts, which must be incorporation into the manual.

- .1 These files must record the actual location of the equipment, the names of the manufacturers and suppliers, the location of the conduits / electrical boxes and concealed accessories, and the switches.
 - .2 The operating and maintenance sheets must include a description of the lift operation and control including the motor and pump unit, the door operation, the signals, the emergency power operation, and the special or non-standard features provided.
 - .3 Provide parts catalogues with the complete list of equipment replacement parts with the equipment description and the identifying numbers.
 - .4 Provide a legible schematic of hydraulic piping and wiring diagrams covering the electrical equipment installed, including the changes made in the final work, as well as the symbols used to identify the equipment installed in the hoistway and in the machine room.
 - .5 Provide a lubrication chart.
 - .6 Provide a schedule of maintenance tasks indicating the frequency of their execution.
- .3 Maintenance Service Contracts:
- .1 Provide a complete service and maintenance of the lift system and its components during the 12 month lift contract warranty period.
 - .2 Comply with requirements ASME A17.1/CSA B44 on Maintenance of Elevators, and comply with any other local competent authority.
 - .3 Provide a bound log book on site as directed by the Departmental Representative, designed to contain necessary information required by local authority.
 - .4 Regularly and systematically ensure the inspection, cleaning, adjustment and lubrication of the equipment, as indicated in the schedule of maintenance tasks.
 - .5 Maintenance must include checking and correcting, if necessary, the hydraulic fluid level as well as repairing or replacing, if necessary, the worn or defective parts.
 - .6 For replacements, use only genuine parts produced by manufacturer of specific equipment.
 - .7 Provide an emergency call back service for this maintenance period at no additional cost.
 - .8 The Contractor must provide documents demonstrating his competence and experience with regard to the maintenance of the devices covered by this section.
 - .9 The Contractor must have at his disposal, near the work site, a sufficient number of parts for routine replacements and emergencies, and have at his service qualified maintenance workers, who can go to the premises within a reasonable time and be able to complete the work quickly.
 - .10 Perform maintenance work using competent personnel, employed and supervised by the lift manufacturer.

- .11 Do not assign or transfer the maintenance service to another agent or subcontractor without the prior written consent of the Departmental Representative.

1.4 QUALITY ASSURANCE

- .1 Sustainable Design Closeout Documentation
 - .1 Sustainable Standards Certification:
 - .1 Certified Wood: submit listing of wood products and materials used in accordance with CAN/CSA-Z809 or FSC or SFI.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with the manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to the site in the original factory packaging, labelled with the manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials indoors, in clean, dry, well-ventilated area in accordance with the manufacturer's recommendations.
 - .2 Store and protect the wheelchair lifts from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.
- .4 Develop a Waste Reduction Workplan for the Work covered by this Section.
- .5 Packaging Waste Management: recover the packaging materials in order to reuse them, as specified in the Construction Waste Management Plan.

PART 2 PRODUCTS

2.1 SYSTEM DESCRIPTION

- .1 Design Requirements:
 - .1 A lift, with automatic iso-leveling in both directions with telescopic cylinder and piston, with direct action located in the hoistway itself.

2.2 LIFT CHARACTERISTICS

- .1 Rated Net Capacity: 341 kg
- .2 Rated Speed: 0.12 m/sec.
- .3 Travel Distance (nominal): 4090mm
- .4 No. of Stops: 2
- .5 No. of Openings: 2 side openings
- .6 Platform: 1675mm x 1055mm
- .7 Hoistway entrance frame opening sizes: 1700mm x 1390mm

- .8 Door Operation: automatic.

2.3 LIFT PERFORMANCE

- .1 Provide smooth acceleration and deceleration of the lift without perceptible steps so that passengers are not inconvenienced.

2.4 CONTINUOUS PRESSURE OPERATION

- .1 The lift must be operated a by continuous pressure on mushroom head type control buttons located in the cabin.
- .2 Constant pressure on the UP or DOWN button must cause the cabin to move in the desired direction; the cabin must stop when the button is released.
- .3 Provide UP and DOWN hall call buttons mounted on the wall with stainless steel faceplate adjacent to each hoistway entrance. Constant pressure on one of the call buttons must cause the cabin to move in the desired direction.
- .4 Arrange the controller so that when the cabin's call button is pressed, the hall's button circuit is rendered inoperative and remains so until the adjustable time period has elapsed after the lift has stopped and the door has opened and closed.

2.5 MATERIALS AND COMPONENTS

- .1 Use the major platform lift components from the standard product line of only one manufacturer unless otherwise approved by the Departmental Representative.
- .2 Use combinations of elements which have been proven to work in at least two (2) such installations during a period of at least one (1) year, and which have given satisfactory performance under normal service conditions. . Provide the names and addresses of the owners or administrators of the buildings where such combinations of main elements have been tested.
- .3 Rolled steel sections, shapes, and rods: according to CSA G40.20/G40.21.
- .4 Sheet steel: according to ASTM A653/A653M and to ASTM A1008, with commercial bright finish.
 - .1 Maximum VOC limit 50 g/L according to GS-11.
- .5 Stainless steel: according to ASTM A480M, Type, 304, No. 4 finish.
 - .1 Maximum VOC limit 50 g/L according to GS-11.
- .6 Aluminum: to ASTM B221M, extruded 6063 alloy with T6 temper.
 - .1 Maximum VOC limit 50 g/L according to GS-11.
- .7 Plywood: according to CSA O121, good two sides.
- .8 Plastic laminate: according to ANSI/NEMA LD-3, type 1B.
- .9 Primer for galvanized surfaces: according to MPI #26.
 - .1 Paint: maximum VOC limit 250 g/L according to GS-11.
- .10 Primer for plain steel surfaces: according to MPI #76.

- .1 Paint: maximum VOC limit 50 g/L according to GS-11.
- .11 Finish paint: according to MPI #47, alkyd enamel semi-gloss, for machinery, color indicated by the Departmental Representative.
- .1 Paint: maximum VOC limit 50 g/L according to GS-11.

2.6 SOUND ISOLATION

- .1 Provide sound isolation for bearing surfaces of the platform frame.
- .2 Mount the motor, pump and control valve assembly on rubber sound isolation pads.
- .3 Provide sound isolation couplings in the pipeline between the pump and the cylinder.
- .4 The noise produced by the pump set must not exceed 60 dBA, reading must be taken at a distance of 1 m from the unit's envelope.

2.7 GUIDES

- .1 Equip car with guides mounted on top and bottom of car frame.
- .2 Provide each guide with durable, oil resistant running on finished rail surfaces.
- .3 Approved lift guide shoes (minimum 4, nylon with steel inserts, shoes) or roller slide guides must be used.

2.8 ELECTRICAL COMPONENTS

- .1 Use steel compression fittings where electrical metallic tubing is used. Fittings with set screws are acceptable only with separate grounding conductor installed in the same raceway.
- .2 Do not use armoured flexible metal conduit as a grounding conductor.

2.9 POWER SUPPLY

- .1 Power: use alternating current (AC) power supply
- .2 Lighting: use single-phase power supply

2.10 LUBRICATION

- .1 Grease fittings: used to lubricate bearings that require periodic lubrication and adapting to the same grease gun.
- .2 Grease cups: automatic compression feed type.
- .3 Lubrication points: visible and easily accessible.

2.11 LIFT PLATFORM

- .1 Platform: consisting of a steel frame, filled with wood or steel subflooring (floor covering support).
- .2 Provide rubber sheet flooring surface.

2.12 LIFT ENCLOSURE

- .1 Walls: solid, minimum 1200 mm in height.
- .2 Lift enclosure: steel frames with clapboard panels, removable from the inside of the cabin enclosure, color of the finish as indicated by the Departmental Representative.
- .3 Construct panels: in one piece from floor to soffit, securely bolted together and to adjoining members with light proof joints and reinforced to provide rigidity.
- .4 Equip sides with 1 mm thick stainless steel kick plates that are minimum 200 mm in height.
- .5 Telephone: hands free emergency telephone housed in a telephone cabinet, dialling automatically to the 24 hours accessible service commissioner's desk. The telephone wiring include in the hoistway.
- .6 Telephone Cabinet: Engrave telephone symbol that is 75 mm in height on the cabinet cover and where we can see the wording "In case of emergency, push the button , wait for the answer"/« En cas d'urgence, appuyer sur le bouton pour demander de l'aide », in engraved letters of at least 6 mm in height and painted with an orange phosphorescent paint. Identify the lift number on the inside of the cover.
- .7 Provide a clear lift entrance height of no less than the hoistway entrance.
- .8 Floor finish: non-skid rubber sheet flush with sill, with securely held front edge.
- .9 Lighting: fluorescent lighting mounted in the drop ceiling with 13 mm x 13 mm aluminum egg crate. Minimum 2 fluorescent lamps with separate energy saving ballasts.
- .10 Handrail: made of 40 mm diameter tubular chrome plated stainless steel located on the control station wall, with both ends turned against the wall.
- .11 Emergency operation: battery operated light fixture, battery operated lowering device and alarm to be activated upon normal building power failure. Provide sealed type dry cell rechargeable battery with automatic recharging system.
- .12 Where required by the enforcing authority, furnish stainless steel licence holders in each elevator cabin to suit certificate issued by the enforcing authority. Design the holder with hidden or tamper proof fastening.

2.13 HOISTWAY DOORS AND ENTRANCES

- .1 Hoistway doors and frames - Ground floor: steel covered in 1.5 mm thick baked enamel paint. Stainless steel fascia panels.
- .2 Hoistway door and frame - Other Floor: Stainless steel fascia panels.
- .3 Door and frame construction: ULC rated for with 1-1/2 hours fire rating.
- .4 Frames: bolted construction.
- .5 Doors: 915 mm x 1200 mm swing type, automatic operation with recessed or surface mounted chain driven door operator.
- .6 Stainless steel kick plate

- .7 Mechanical interlock mechanism and electric contacts complying with the CSA requirements.
- .8 Three (3) sets of heavy duty ball bearing hinges and plates. Hidden hinges for automatic doors.

2.14 OPERATING PANEL AND BUTTONS

- .1 Operating panel containing mushroom head type constant pressure buttons corresponding to the floors served, emergency stop/alarm button, light switch and On/Off key switch mounted on a removable stainless steel panel to totally enclose the lift controller.
- .2 Single riser with UP and DOWN buttons at intermediate landings, and single call button at terminal landings, each with integral illumination, and key switches mounted on a stainless steel faceplate.

2.15 FINISHING

- .1 Structural metal surfaces: must be free of all traces of rust, oil or grease, be cleaned with solvent, and then covered with two (2) coats of primer.
 - .1 Primers: maximum VOC limit of 250 g/L according to GS-11.
- .2 Machine room components and cabinets: must be cleaned and free of all traces of grease, and then be covered with one (1) coat of primer and two (2) coats of enamel paint.
 - .1 Primers: maximum VOC limit of 50 g/L according to GS-11.
- .3 Field welds: must be free of all traces of oxidation and residue, be cleaned with a wire brush, and then covered with two (2) coats of primer.
 - .1 Primers: maximum VOC limit of 250 g/L according to GS-11.
- .4 Galvanized surfaces: must be clean with neutralizing solvent; and then covered with one (1) coat of primer.
 - .1 Primers: maximum VOC limit of 250 g/L according to GS-11.
- .5 Wood surfaces not exposed to public view: must be covered with one (1) coat of printing paint and then two (2) layers of enamel paint.
 - .1 Primers: maximum VOC limit of 50 g/L according to GS-11.
- .6 Steel surfaces coated with baked enamel paint must be cleaned and free of any grease, be covered with one (1) coat of zinc oxide primer paint and two (2) coats of colored semi-gloss enamel paint, the colour as selected by the Departmental Representative; the primer and the top coat should be applied by spraying and should be baked in the oven
 - .1 Primers: maximum VOC limit of 50 g/L according to GS-11.

2.16 CYLINDER AND PLUNGER

- .1 Plunger: of the hydraulic cylinder must be made of steel tubes of choice, perfectly bored, and having a surface finish of 0.0008 mm or more.

- .2 At the top of the cylinder include a stuffing box and packing gland with self-adjusting gasket or seal, requiring no external adjustment.

2.17 PUMPING UNIT

- .1 Integral unit combining a motor, a pump, valves and a reservoir in one enclosure and integrally mounted with the solid state controller.
- .2 It is important to properly secure the pumping unit to prevent any lateral displacement.
- .3 The casing of the pumping unit must be fitted with removable or hinged panels to ensure quick access to the equipment requiring adjustment and maintenance.
- .4 Use positive displacement screw-type pump, with multiple V-belt connection to drive the motor or with direct connection between the drive motor and the pump through flexible coupling.

2.18 OIL STORAGE TANK

- .1 The oil storage tank must have a capacity equal to the volume of oil required to move the platform to the upper extreme level, plus a reserve of at least 10%.
- .2 Oil level indicator: to clearly show minimum permissible oil level.
- .3 A gauge glass must be provided to indicate oil level if the top of the tank is more than 1.2 m above the floor level.

2.19 LOW OIL CONTROL

- .1 A low oil pressure switch must be designed to allow the platform lift to descend to the lower terminal landing if the level of oil in the tank is insufficient.

2.20 MOTOR

- .1 At normal voltage, the starting torque (locked rotor) of the lifting device motor must be at least 150%, and the stopping torque, at least 200%.
- .2 A plate bearing all the indications on the motor connection must be placed on the motor.
- .3 Motor starting current must not be greater than four (4) times the current required for a full load stroke.
- .4 Include a class B motor insulation.
- .5 Include a manually reset integral overheating protection, in accordance with standard CSA C22.2 No. 77.

2.21 MUFFLER

- .1 Minimize transmission of fluid pulsations in the pipeline between the pumping unit and the cylinder head with a blow-out proof muffler.

2.22 PIPING

- .1 The piping elements must be assembled by means of screw couplings or mechanical couplings to prevent any dislocation of the connections.
- .2 Welding is permitted providing that the interior of the pipe is thoroughly cleaned after welding or where the welding method prohibits introduction of foreign material into the interior of the pipe.
- .3 The welders must be fully qualified for pressure vessel welding and must meet the requirements of standard CSA W59.
- .4 Once installed, the piping must be easily accessible for maintenance purposes.

2.23 WIRE ROPE DRIVE TYPE LIFT

- .1 The drive unit must be a single worm geared machine with motor, brake, gearing and driving pocket or drum mounted on or integral with cast iron or steel bedplate.
- .2 Drive unit: totally autonomous, enclosed, self-contained, and located as indicated.
- .3 Brake: spring applied, electromagnetically released quietly operated by direct current.
- .4 Steel worm: integral with worm shaft and with a ball or roll bearing thrust unit to withstand the worm thrust in both directions.
- .5 The bronze gears must be accurately machined to match the steel worm.
- .6 The drive unit must be designed to allow the removal of the thrust unit without having to dismantle the adjacent elements.
- .7 The drive unit must be equipped with lubrication devices and oil-tight inspection holes used to check the condition of the worm screw as well as that of the gear contact points.

2.24 EMERGENCY LIGHTING

- .1 Battery operated emergency lighting equipment, that comply with standard CSA C22.2 No.141, to provide general illumination and 2 lx minimum illumination in the cabin containing operating panels and telephone cabinet for 1 hour minimum.
- .2 Key operated switch for manual testing of unit from within lift enclosure must be provided.

2.25 BILINGUAL MARKINGS

- .1 Engrave the identification and instructions at least 0.25 mm deep, on the operating panels and on the signal equipment in both English and French except where design is such that inference is obvious and readily understood. Submit to the Departmental Representative the proposed inscription and graphic designs details for approval.

2.26 LIFT TYPE

- .1 The proposed lifting device must include a direct action plunger, a pumping unit, an storage tank and magnetic control valves
- .2 Locate the pumping unit and the associated control equipment in the machine room as indicated.

PART 3 EXECUTION

3.1 EXAMINATION

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

3.2 INSPECTION

- .1 Verify that the hoistway, pit and machine room are ready for the equipment installation.
- .2 Verify that the shaft and openings are of the correct size and within the tolerances.
- .3 Confirm that the electrical power is available and that it meets the correct characteristics.
- .4 Report defects in writing to the Departmental Representative.

3.3 INSTALLATION

- .1 Install the components needed in the hoistway and machine room. Install the piping between the hoistway plunger and the pumping unit.
- .2 Design and install the cylinder and the plunger plumb. Ensure that the assembly operates with a minimum of friction.
- .3 Mount the motor and pumping unit. Place it on structural supports and bearing plates. Securely fasten it to building supports to prevent lateral displacement.
- .4 Install piping so that it is easily accessible for maintenance purposes.
- .5 Arrange equipment in the machine room so functioning equipment and other equipment can be removed for repairs or replacement without dismantling or removing other equipment components. Arrange for a clear passage to the access door. Accommodate equipment in space as indicated.

- .6 Erect the guide rails using metal shims with lockwashers under the nuts and threaded bolts. Compensate for the expansion and the contraction of the guide rails.
- .7 Use splice plates and guide rails with contact surfaces accurately machined to form smooth joints.
- .8 Bolt or weld the brackets directly to the structural steel hoistway framing.
- .9 Anchor the guide rails in the pit so as not to reduce the effectiveness of the waterproofing.
- .10 Install the hoistway door frames and the headers in the hoistway walls. Set the entrances in vertical alignment with the lift openings and aligned with plumb hoistway lines.
- .11 Mount on the machine room wall, a copy of the master schematic wiring diagrams in a plastic enclosure.
- .12 Mount on the machine room wall, a lubrication chart in plastic enclosure.
- .13 Restrict access to the machine and electrical control equipment to the authorized personnel only, using integral locks and keys.
- .14 Co-ordinate the installation of doors, frames, structural supporting angles, headers, fascias or toe guards.

3.4 TOLERANCES

- .1 Lift movement on guide rails: smooth movement without any perceptible vibration, oscillation or lateral movement.
- .2 Guide rail alignment: plumb and parallel to each other.

3.5 FIELD QUALITY CONTROL

- .1 Site Tests:
 - .1 Perform and meet the inspection tests in accordance with standard CSA B355 and as required by the jurisdictional authorities.
 - .2 Supply the instruments needed and execute the specific tests.
 - .3 Furnish the test and approval certificates issued by the jurisdictional authorities.
 - .4 Test the stop ring and the hydraulic system by moving the cabin in the UP direction, up to the stop ring, at rated load.
 - .5 Provide a two (2) weeks written notice to the Departmental Representative of the date and time of tests to be done.

3.6 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
 - .1 Leave the Work area clean at the end of each day.
- .2 Remove protective coverings from finished surfaces and components.
- .3 Clean surfaces and components ready for inspection.

- .4 Touch up and restore to new condition, damaged or defaced factory finished surfaces.
- .5 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.
- .6 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19- Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.7 ADJUSTING

- .1 Adjust floor levelling feature at each floor.
- .2 Design and adjust the equipment to achieve smooth acceleration and deceleration of the lift without perceptible steps, so adjusted as not to cause passenger discomfort.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 33 00 – Documents and samples to submit.

1.2 MEASUREMENT PROCEDURES

- .1 Excavated materials will be measured in cubic meters in their original location.
 - .1 Excavation quantities measured will be actual volume removed within following limits:
 - .1 Width for trench excavation as indicated.
 - .2 Width for excavation for structures as indicated.
 - .3 Depth from ground elevation immediately prior to excavation, to elevation indicated on the plans.
 - .2 Backfilling to authorized excavation limits will be measured in cubic meters for each type of material specified.

1.3 REFERENCE STANDARDS

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C117-[04] , Standard Test Method for Material Finer than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C136-[05] , Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .3 ASTM D422-63[2002] , Standard Test Method for Particle-Size Analysis of Soils.
 - .4 ASTM D698-[00ae1] , Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³) (600 kN-m/m³).
 - .5 ASTM D1557-[02e1] , Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³) (2,700 kN-m/m³).
 - .6 ASTM D4318-[05] , Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.1-[88] , Sieves, Testing, Woven Wire, Inch Series.
 - .2 CAN/CGSB-8.2-[M88] , Sieves, Testing, Woven Wire, Metric.
- .3 CSA Group (CSA)
 - .1 CAN/CSA-A3000-[03] , Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
 - .1 CSA-A3001-[03] , Cementitious Materials for Use in Concrete.

- .2 CSA-A23.1/A23.2-[04] , Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
- .4 U.S. Environmental Protection Agency (EPA)/Office of Water
 - .1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.4 DEFINITIONS

- .1 Excavation classes: Classes of excavation will be recognized; common excavation and rock excavation.
 - .1 Rock: solid material in excess of 1.00 m³ and which cannot be removed by means of heavy duty mechanical excavating equipment. Frozen material not classified as rock.
 - .2 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.
- .2 Unclassified excavation: excavation of deposits of whatever character encountered in Work.
- .3 Topsoil:
 - .1 Material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.
 - .2 Material reasonably free from subsoil, clay lumps, brush, objectionable weeds, and other litter, and free from cobbles, stumps, roots, and other objectionable material larger than 25 millimeters in any dimension.
- .4 Waste material: excavated material unsuitable for use in Work or surplus to requirements.
- .5 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.
- .6 Recycled fill material: material, considered inert, obtained from alternate sources and engineered to meet requirements of fill areas.
- .7 Unsuitable materials:
 - .1 Weak, chemically unstable, and compressible materials.
 - .2 Frost susceptible materials:
 - .1 Fine grained soils with plasticity index less than 10 when tested to ASTM D4318, and gradation within limits specified when tested to [ASTM D422] [ASTM C136] : Sieve sizes to [CAN/CGSB-8.1] [CAN/CGSB-8.2] .
- .2 Table

Sieve Designation	% passing
2.00 mm	[100]

0.10 mm	[45 - 100]
0.02 mm	[10 - 80]
0.005 mm	[0 - 45]

.3 Coarse grained soils containing more than [20] % by mass passing 0.075 mm sieve.

.8 Unshrinkable fill: very weak mixture of cement, concrete aggregates and water that resists settlement when placed in utility trenches, and capable of being readily excavated.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Quality Control: in accordance with Section [01 45 00- Quality Control] :

.1 Submit condition survey of existing conditions as described in EXISTING CONDITIONS article of this Section.

.2 Submit for review by Departmental Representative proposed methods as described in PART 3 of this Section.

.3 Preconstruction Submittals:

.1 Submit construction equipment list for major equipment to be used in this section prior to start of Work.

.2 Submit records of underground utility locates, indicating: location plan of relocated and abandoned services, as required, clearance record from utility authority and location plan of existing utilities as found in field.

.4 Samples:

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

.2 Inform Departmental Representative at least [4] weeks prior to beginning Work, of proposed source of fill materials and provide access for sampling.

1.6 QUALITY ASSURANCE

.1 Qualification Statement: submit proof of insurance coverage for professional liability.

.2 Submit design and supporting data at least [2] weeks prior to beginning Work.

.3 Design and supporting data submitted to bear stamp and signature of qualified professional engineer registered or licensed in Quebec , Canada.

.4 Keep design and supporting data on site.

.5 Health and Safety Requirements:

.1 Do construction occupational health and safety in accordance with Section [01 35 29.06- Health and Safety Requirements]

1.7 WASTE MANAGEMENT AND DISPOSAL

- .1** Separate waste materials for recycling in accordance with Section [01 74 19- Waste Management and Disposal] .
- .2** Divert excess materials from landfill to local recycling facility for reuse as directed by Departmental Representative.

1.8 EXISTING CONDITIONS

- .1** Examine and respect recommendations of environmental report no. 16702114-200-EN-R-001-A, prepared by Stantec. Follow the requirements of the environmental report for slope and stability of excavations.
- .2** Buried services:
 - .1** Before commencing work verify location of buried services on and adjacent to site.
 - .2** Arrange with appropriate authority for relocation of buried services that interfere with execution of work: pay costs of relocating services.
 - .3** Remove obsolete buried services within 2 m of foundations: cap cut-offs.
 - .4** Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.
 - .5** Prior to beginning excavation Work, notify applicable Departmental Representative establish location and state of use of buried utilities and structures. Departmental Representative to clearly mark such locations to prevent disturbance during Work.
 - .6** Confirm locations of buried utilities by careful test excavations.
 - .7** Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered.
 - .8** Where utility lines or structures exist in area of excavation, obtain direction of Departmental Representative before re-routing
 - .9** Record location of maintained, re-routed and abandoned underground lines.
 - .10** Confirm locations of recent excavations adjacent to area of excavation.
- .3** Existing buildings and surface features:
 - .1** Conduct, with Departmental Representative, condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, wires, rail tracks, pavement, survey bench marks and monuments which may be affected by Work.
 - .2** Protect existing buildings and surface features from damage while Work is in progress. In event of damage, immediately make repair as directed by Departmental Representative.

- .3 Where required for excavation, cut roots or branches as directed by Departmental Representative.

PART 2 PRODUCT

2.1 MATERIALS

- .1 Type 1 and Type 2 fill: properties to Section [31 05 16- Aggregate Materials] and the following requirements:
 - .1 Crushed, pit run or screened stone, gravel or sand.
 - .2 Gradations to be within limits specified when tested to [ASTM C117] [ASTM C136] . Sieve sizes to [CAN/CGSB-8.2] [CAN/CGSB-8.1] .
 - .3 All backfill material as well as all bearing soils shall be samples and tested as required to conform to the requirements of the local authority and to prevent any soil swelling or heaving.
 - .4 Remove any organic and soft materials encountered in area of footings and slab-on-grade prior to backfilling.

PART 3 EXECUTION

3.1 SITE PREPARATION

- .1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.
- .2 Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly.

3.2 PREPARATION /PROTECTION

- .1 Protect existing features in accordance to applicable local regulations.
- .2 Keep excavations clean, free of standing water, and loose soil.
- .3 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.
- .4 Protect buried services that are required to remain undisturbed.

3.3 STRIPPING OF TOPSOIL

- .1 Begin topsoil stripping of areas as indicated by Departmental Representative after area has been cleared of grasses and removed from site.
- .2 Stockpile in locations as directed by Departmental Representative.

- .1 Stockpile height not to exceed 2 m and should be protected from erosion.

3.4 STOCKPILING

- .1 Stockpile fill materials in areas designated by Departmental Representative .
 - .1 Stockpile granular materials in manner to prevent segregation.
- .2 Protect fill materials from contamination.
- .3 Implement sufficient erosion and sediment control measures to prevent sediment release off construction boundaries and into water bodies.

3.5 EXCAVATION

- .1 Advise Departmental Representative at least [7 days] in advance of excavation operations for initial cross sections to be taken.
- .2 Remove concrete and other obstructions encountered during excavation.
- .3 Excavation must not interfere with bearing capacity of adjacent foundations.
- .4 Do not disturb soil within branch spread of trees or shrubs that are to remain.
 - .1 If excavating through roots, excavate by hand and cut roots with sharp axe or saw.
- .5 For trench excavation, do not leave open more than 15m at end of day's operation.

3.6 FILL TYPES AND COMPACTION

- .1 Use types of fill as indicated or specified below. Compaction densities are percentages of maximum densities obtained from ASTM D698
 - .1 Exterior side of perimeter walls: fill to subgrade level. Compact to 95 % of corrected maximum dry density.
 - .2 Within building area: fill to underside of base course for floor slabs. Compact to 95 % of corrected maximum dry density.

3.7 BACKFILLING

- .1 Do not proceed with backfilling operations until completion of following:
 - .1 Departmental Representative has inspected and approved installations.
- .2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
- .3 Do not use backfill material which is frozen or contains ice, snow or debris.

3.8 RESTORATION

- .1 Upon completion of Work, remove waste materials and debris as directed by Departmental Representative.
- .2 Replace topsoil.
- .3 Reinstall lawns to elevation which existed before excavation.
- .4 Reinstall pavements disturbed by excavation to thickness, structure and elevation which existed before excavation.
- .5 Clean and reinstall areas affected by Work.

3.9 FOUNDATIONS

- .1 Examine and respect recommendations of environmental report.
- .2 The subgrade under the slab on grade must have a bearing capacity of 7.2 kPa min. The contractor is responsible to have the quality of the soil verified before pouring concrete slab.
- .3 New footings shall rest on undisturbed soil.
- .4 Over-excavation shall be backfilled with 20 MPa concrete at 28 days under footings. All over-excavation and backfill material required will be at the contractor's cost.
- .5 During winter protect bearing strata from freezing.

END OF SECTION

R.101200 – CLAC –Reconstruction des ateliers Mill

Versions française et anglaise Mesures d'atténuation - AIB

1. Ne jamais faire de brûlage dans une aire patrimoniale protégée, sauf si Parcs Canada l'autorise.	Burning is not permitted within the protected heritage site unless authorized by Parks Canada.
2. Entreposer les sols sur une bâche de plastique ou un géotextile et les recouvrir, ou les entreposer dans tout autre type de dispositif de confinement hermétique. Les toiles devront être fixées solidement afin d'éviter qu'elles soient soulevées par le vent.	Store soils on tarp or geotextile and cover them, or store them in any other type of container. The tarps should be securely fastened to prevent it from being blown up by the wind.
3. Arroser les matériaux secs, si possible, et recouvrir les déchets afin d'éviter que le vent ne soulève la poussière ou n'entraîne les débris. Contenir la poussière sur les routes utilisées par les travailleurs (y compris les routes temporaires).	If possible, wet down dry materials and cover rubbish to prevent blowing dust and debris. Control dust on roads used by workers (including temporary one).
4. Éviter de laisser tourner inutilement les moteurs lorsque les véhicules sont à l'arrêt.	Turn off engines of gas-powered equipment and vehicles when not being used.
5. S'assurer que les systèmes d'échappement et antipollution de la machinerie/matériel de construction soient maintenus en bon état.	Make sure antipollution exhaust systems of machinery are kept in proper working condition.
6. Respecter la réglementation municipale en vigueur (Règlement 90 de la Communauté métropolitaine de Montréal) en ce qui a trait aux émissions de poussières dans l'air.	Comply with applicable local regulations (Regulations 90 of the Communauté métropolitaine de Montréal) in regard to air emissions.
7. Favoriser l'utilisation de produits d'isolation ayant un contenu recyclé et ayant de faibles émissions.	Encourage the use of recycled-containing and low-emitting insulation product.
8. Respecter la réglementation municipale en vigueur en ce qui a trait au climat sonore.	Comply with applicable local noise regulations.
9. Élaborer un plan d'intervention en cas de déversement avant le début des travaux.	Prior work begins, implement an emergency spill control plan.
10. Veiller à ce que tous les travailleurs sur place soient informés du plan d'intervention en cas de déversement qu'ils connaissent l'emplacement des trousseaux de nettoyage et les dispositifs de confinement, et les utilisent.	All relevant personnel at the construction site shall be aware of spill emergency response procedures, the location and use of relevant equipment and materials.
11. Suivre tous les règlements et codes applicables à la gestion et à la manutention de déchets dangereux.	Follow all applicable dangerous waste management regulations and code of practice.

<p>12. Avoir de l'équipement de confinement des déversements sur place. Veiller à ce qu'il y ait sur place une trousse d'intervention d'urgence en cas de déversement, renfermant le matériel absorbant et les bermes nécessaires pour contenir 110 % du plus important déversement possible pendant les travaux (aux endroits où l'équipement est utilisé et aux stations de ravitaillement, de lubrification et de réparation).</p>	<p>Have spill containment equipment on site. Ensure there is a spill emergency response kit on site, containing absorbent material and berms necessary to contain 110% of the largest possible spill during the work (where equipment is used and at refueling and maintenance site).</p>
<p>13. Confiner et nettoyer tout déversement dès qu'il est possible de le faire en toute sécurité. En cas de déversement important, suspendre les travaux jusqu'à ce que le déversement ait été adéquatement confiné et nettoyé.</p>	<p>Contain and recover any spill material as soon as it is secured to do so. In case of a large spill, work shall be suspended until the spill is contained and cleaned.</p>
<p>14. En cas d'incident environnemental, aviser Parcs Canada, le service d'urgence d'Environnement Canada (1-866-283-2323) et toute autre autorité compétente en matière d'urgence environnementale.</p>	<p>In the event of an accidental spill, it shall be reported immediately to Parks Canada, Environment and Climate Change Canada, Environmental Emergency Centre (1-866-283-2333) and other relevant authorities.</p>
<p>15. Récupérer à la source et éliminer tout contaminant conformément aux lois, aux politiques et aux règlements en vigueur. Le chantier sera inspecté par un employé de Parcs Canada pour s'assurer que les travaux ont été achevés conformément aux critères établis.</p>	<p>Collect and dispose of any contaminant in accordance with applicable laws, policies and regulations. The site will be inspected by Parks Canada to ensure that the work has been completed in accordance with established criteria.</p>
<p>16. Avant l'arrivée sur le chantier, veiller à ce que l'équipement soit correctement réglé, propre et exempt de contaminants, en bon état de marche, exempt de fuites (p. ex. carburant, huile ou graisse) et doté de pare-étincelles et de dispositifs anti-émissions standard.</p>	<p>Prior mobilization, ensure that the vehicles and equipment used are kept in perfect working order and exempt of contamination, leaks (i.e. fuel and lubricant). Equipment must be equipped with fire screen and exhaust systems</p>
<p>17. Effectuer le ravitaillement en carburant sur un tapis à carburant imperméable avec une berme ou dans un contenant. Nettoyer les fuites et les déversements qui surviennent pendant le ravitaillement et éliminer adéquatement les matières contaminées. Ne jamais éliminer ou déposer du carburant dans l'environnement ou dans un plan d'eau.</p>	<p>Refuel on a waterproof surface, with a berm or in a container. Clean up leaks and spills that occur during refueling and properly dispose of contaminated material. Never dispose of or deposit fuel in the environment or in a body of water.</p>

18. Sauf indication contraire, confiner les déchets et les transporter vers un lieu d'enfouissement approuvé en dehors de l'aire patrimoniale protégée de Parcs Canada; couvrir les déchets pendant le transport. Retirer du chantier tous les matériaux de construction à la fin du projet.	Unless otherwise specified, confine waste and dispose it to an approved landfill outside the heritage site. Cover waste during transport. Remove all construction materials from the site at the end of the project.
19. Éliminer l'excédent de béton à une installation adéquate à l'extérieur de l'aire patrimoniale protégée administrée par Parcs Canada. Si un excédent de béton doit être déversé des camions-pompes avant le transport à l'extérieur de l'aire protégée, il doit être déposé dans un endroit approuvé par Parcs Canada, puis enlevé après son durcissement afin d'être éliminé à une installation approuvée.	Dispose of excess concrete at a suitable facility outside the heritage site. If excess concrete is to be spilled from pump trucks prior to transportation outside the site, it must be deposited in an area approved by Parks Canada, then removed after hardening to be disposed of at approved site.
20. Gérer les déblais (entreposage et disposition) en fonction de leur nature (ex. : terre végétale, remblai), de leur volume et de l'importance de leur contamination (ex. : critères génériques, recommandations) selon les lois et règlements fédéraux, provinciaux et municipaux en vigueur	Manage excavated soil (storage and disposal) according to their nature, their volume and the contamination extent (generic criteria and recommendations) as well as follow all applicable federal, provincial and local Regulations.
21. Lors de la disposition des sols hors site, conserver tout document ou bordereau attestant de leur disposition dans des sites autorisés par le MELCC selon leur degré de contamination. »	Keep all records attesting of off-site soil disposal in MELCC authorized site according to their degree of contamination.
22. Lorsque les sols remis en place excèdent les recommandations du CCME en vigueur pour les secteurs résidentiel/parc et/ou le critère B du MELCC, selon les exigences de Parcs Canada, mettre un recouvrement minimal de 30 cm de sol propre, à moins d'indication contraire.	When soils exceeding Residential/Park CCME recommendation or MELCC B criteria are reused on site, cover them it at least 30 cm of clean soil, unless otherwise specified.
23. Utiliser un matériau de remblai propre, exempt de contaminants et d'espèces indésirables.	Use a clean fill material free of contaminants and invasive species.
24. La machinerie qui entre en contact avec du sol contaminé devra être nettoyée adéquatement avant d'être utilisée dans d'autres secteurs.	Equipment that was in contact with contaminated soil shall be adequately cleaned before being used in other site.
25. Mettre en place un programme adéquat de gestion pour assurer le confinement, le recyclage et l'élimination des rebuts tels que les débris métalliques, le revêtement bitumineux usagé et les débris de béton.	Implement a waste management program that includes waste storage, recycling and disposal of such as metal, pavement and concrete debris.

26. Le cas échéant, entretenir régulièrement les installations sanitaires portatives et éliminer les déchets accumulés dans une installation d'élimination appropriée. Les installations portatives doivent avoir une capacité suffisante et être gérées de façon à éviter que des déchets ne soient rejetés dans l'environnement récepteur.	As required, regularly maintain portable sanitary installations and dispose of waste to an authorized site. Capacity of portable installations shall be determined in order to avoid any waste release into the environment.
27. Le cas échéant, protéger les arbres et les arbustes adjacents au chantier de construction.	Where appropriate, protect trees and shrubs adjacent to the construction site.
28. Éviter la zone du système racinaire des arbres (minimalement la zone de projection au sol de la ramure).	Avoid the area of the tree root system (minimally the ground projection area of the canopy)
29. Le matériel et la machinerie ne peuvent être entreposés au-dessus du système racinaire des arbres.	Equipment and machinery may not be stored above the tree root system.
30. Les branches susceptibles d'être endommagées doivent être protégées ou élaguées avant le mois d'avril ou après la fin août.	Tree branches that may be damaged should be protected or pruned before April or after the end of August.
31. Limiter l'élagage ou la coupe des arbres au minimum afin de préserver le plus possible le couvert végétal.	Limit tree pruning or cutting to a minimum to preserve as much of the canopy as possible.
32. S'assurer que la machinerie terrestre est propre et exempte d'espèces envahissantes et de mauvaises herbes nuisibles à son arrivée sur le site et la maintenir dans cet état par la suite.	Ensure that machinery is clean and free of invasive species and noxious weeds when it arrives on site and maintain it in this condition thereafter.
33. Si l'élagage est prévu durant la période de nidification (entre avril et août), faire appel à un biologiste qui pourrait indiquer la présence de nids d'oiseaux, d'œufs ou de nids d'espèces protégées aux termes de la Loi sur la Convention concernant les oiseaux migrateurs.	If pruning is planned during the nesting period (April to August), a biologist shall validate the presence of bird nests, eggs or nests of species protected under the Migratory Birds Convention Act.
34. En cas de découverte de nids, de tanières ou de dortoirs, suspendre les travaux et communiquer immédiatement avec le personnel désigné de Parcs Canada pour obtenir des directives.	If nests or dens are found, suspend work and immediately contact the designated Parks Canada staff for direction.
35. Si des animaux sont observés à l'intérieur ou à proximité du chantier, leur donner la possibilité de quitter les lieux et de s'éloigner des zones de conflit potentiel.	If animals are observed in or near the work site, give them the opportunity to leave the site and move away from areas of potential conflict.

36. Effectuer une analyse d'impact sur les ressources culturelles (AIRC) afin d'identifier les mesures d'atténuation à mettre en place.	Conduct a Cultural Resource Impact Assessment (CRIA) to identify mitigation measures to be put in place.
37. Délimiter et protéger les éléments patrimoniaux sur les bâtiments.	Delineate and protect heritage features on buildings.
38. Parcs Canada doit veiller à ce que les travailleurs sur place reçoivent une formation appropriée de sensibilisation sur les ressources culturelles.	Parks Canada must ensure that on-site workers receive appropriate cultural resource awareness training.
39. Une surveillance des excavations serait nécessaire puisque des vestiges des premiers ateliers, de 1874 à 1925, pourraient encore se trouver dans les sols.	Excavation monitoring would be required since remains of the original workshops from 1874 to 1925 may still be present in the ground.
40. Une surveillance des excavations dans les ateliers est requise pour documenter l'utilisation des lieux.	Within the workshop, excavation shall be monitored to document site usage.
41. En cas de découverte de ressources culturelles (p. ex. vestiges de structures ou concentrations d'artefacts), suspendre les travaux dans le secteur immédiat, sécuriser le chantier, puis communiquer avec le personnel de Parcs Canada désigné pour obtenir des directives.	If cultural resources are discovered (e.g., remains of structures or concentrations of artifacts), suspend work in the immediate area, secure the work site, and then contact the designated Parks Canada staff for direction.
42. Fermer et marquer le chantier au moyen d'une signalisation adéquate en période active de travaux, de réparation ou d'entretien; prévoir des déviations ou des itinéraires temporaires au besoin pour les piétons si le chantier empiète sur le trottoir.	Fence and mark the work site with adequate signage during active work, repair or maintenance periods; provide temporary detours or routes for pedestrians if necessary if the work site encroaches on the sidewalk.
43. Marquer clairement les risques pour la sécurité non gérés (p. ex. trous creusés, piles de débris) avec des clôtures, des panneaux d'avertissement, des avis de fermeture de secteur ou une combinaison de ces options.	Clearly mark unmanaged safety hazards (e.g., dug holes, debris piles) with fencing, warning signs, area closure notices or a combination of these options.
44. Des précautions particulières sont à prévoir lors des travaux de déconstruction des bâtiments afin de protéger les travailleurs qui réaliseront ces travaux de décontamination du plomb et de l'amiante.	Special precautions should be taken during building deconstruction to protect workers who will be performing lead and asbestos decontamination work.