

**SWANSEA TOWN HALL RENOVATION
95 LAVINIA AVE.**

FOR

THE CITY OF TORONTO

**ISSUED FOR TENDER
19 FEBRUARY 2020**

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1.1 Work Under This Contract

- .1 It is intended that Work supplied under this Specification shall be complete in every detail for purpose required. This Contract shall include by Contractor, materials not herein mentioned, but which may be found necessary to complete or perfect any portion of Work in accordance with requirements of this Specification.

1.2 Use of Premises and Site

- .1 Confine Work to the area of the Project only.

1.3 Specifications

- .1 Each Section of Division 1 is complementary to other Sections of Division 1 and shall be read together with other Sections.
- .2 This Section co-ordinates, relates and governs Work of other Sections of the Specification.
- .3 The Specifications are apportioned into Divisions and Sections for convenience but shall be read as a whole and neither such apportionment nor anything else contained in the Contract Documents places responsibility upon the Consultant to settle disputes among Subcontractors in respect thereof.

1.4 Examination of Site, Documents, Surfaces and Conditions

- .1 Carefully examine Place of the Work and investigate, at no cost or risk to Owner, matters relating to nature of Work, means of access and egress, obstacles, rights and interests of other parties which may be interfered with during the execution of Work, conditions and limitations including obstructions, existing structures or facilities, local conditions, actual levels, character and nature of the Project, and any other consideration which may affect performance of the Work.
- .2 Carefully examine extent of Work to be performed and matters which are referred to in the Contract Documents prior to start of Work.
- .3 Examine Work to which Work is to be applied, anchored or connected, and relevant as-built conditions.
- .4 Do not Work until unsatisfactory conditions are corrected to acceptance of Consultant, Contractor and concerned Subcontractors. Commencement of Work implies acceptance of surfaces and conditions.

1.5 Quantity of Items

- .1 Where a component, device, item or part of materials or equipment is referred to in the singular number, such reference shall require the provision of as many components, devices, items or parts of material or equipment necessary to complete the Work.

1.6 Standards and Codes

- .1 Contract Forms, codes, Specifications, standards, manuals and installation, application and maintenance instructions referred to in these Specifications, unless otherwise specified, amended or date suffixed, shall be latest published editions at Bid Closing Date.

1.7 Discrepancies

- .1 Advise Consultant of any contradictions, discrepancies or errors that are found or noted.
- .2 Advise Consultant if there is any doubt as to meaning or intent thereof in Contract Documents.
- .3 Do not proceed until instructions/clarifications have been confirmed by Consultant. A failure to notify Consultant shall result in Contractor incurring responsibility for any resulting circumstances, conditions, expenses or cost.

1.8 Additional Definitions

Also refer to Definitions in CCDC 2 2008.

- .1 Wherever words "approved", "review", "acceptance", "acceptable", "satisfactory", "selected", "directed", "required", "submit", or similar words or phrases are used in standards or elsewhere in Contract Documents, it shall be understood, that words "by (to) the Consultant" follow, unless context Provides otherwise.
- .2 "Others" Defined: Others in Contract Documents refers to other trades within framework of this Contract. Any Work or material executed outside Contract is designated "NIC" (Not in Contract), "By Owner", or "By Other Contractors".

1.9 Setting Out the Work

- 1 Assume full responsibility for and execute complete layout of Work to required locations, lines and elevations.

1.10 Documents On Site

- .1 Maintain at job site, one copy of each of following:
 - .1 Contract Documents including Drawings, Specifications, Addenda, and other modifications to the Contract.
 - .2 'Reviewed' or Reviewed as Modified Shop Drawings.
 - .3 Project Construction and Shop Drawing Schedules.
 - .4 Site Instructions, Change Orders, and Change Directives.
 - .5 Field Test Reports.
 - .6 Reports by Authorities having Jurisdiction.
 - .7 Building and other applicable permits.
 - .8 Material Safety Data Sheet pursuant to WHMIS (Occupational Health & Safety Act).
 - .9 As-built Drawings recording as-built conditions, instructions, changes for structure, equipment, wiring, plumbing and Divisions 15 and 16, prior to being concealed.
 - .10 Copies of applicable codes and standards.
- .2 Make above material available to Consultant at their request.

1.11 Overloading

- .1 Take precautions and preclude overloading of any part of structure, falsework, formwork or scaffolding during progress of the Work, and make good damage resulting from such overloading.

1.12 Inserts, Anchors and Fasteners

- .1 Use only factory made, threaded or toggle type inserts as required for supports and anchors, properly sized for load to be carded. Place inserts only in members of main structure and not in any finishing material.
- .2 Where inserts cannot be placed, use factory made expansion shields for light weights only.
- .3 Fasteners stressed in withdrawal are not acceptable, except where otherwise specifically shown.
- .4 Ensure that metal fastenings are of same materials as metal components being anchored or of a metal which will not set up a galvanic action causing damage to the fastening or metal component under moist conditions.
- .5 Fastenings for prefinished materials shall be of concealed type unless otherwise indicated.
- .6 Metal fastenings and accessories shall be same texture, colour and finish as material on which they occur.

1.13 Trademark and Labels

- .1 Trademarks and labels, including applied labels, shall not be visible in finished Work in finished areas.
- .2 Remove trademarks or labels by grinding, if necessary, paint out where particular surface is being painted or, if on plated parts, replace with new plain plated or non-ferrous metal parts.
- .3 The exceptions to this requirement are trademarks and labels which are essential to obtain identification of mechanical, electrical or other equipment for maintenance and replacement purposes and for mandatory fire ratings.

1.14 Powder Actuated Fasteners

- .1 The use of Powder Actuated Fasteners is not acceptable without prior consent from the Owner.

1.15 Use of Premises Prior to Substantial Performance

- .1 Owner shall have right to enter and occupy building, in whole or in part, for purpose of placing fittings and equipment, or for other use, prior to Substantial Performance if, in opinion of the Consultant, such entry and occupancy does not prevent or interfere with the Contractor in performance of the Work. Such entry shall in no way be considered as an acceptance of Work in whole, or in part, nor shall it imply acknowledgement that terms of Agreement are fulfilled.

1.16 Interferences

- .1 Coordinate placement of equipment to ensure that components will be properly accommodated within spaces Provided prior to commencement of Work.
- .2 Take complete responsibility for remedial Work that results from failure to coordinate any aspect of Work prior to its fabrication/installation.
- .3 Ensure that accesses and clearance required by jurisdictional authorities and/or for easy maintenance of equipment are Provided in layout of equipment and services.

END OF SECTION

1.0 General

- .1 Erect Work in compliance with Contract Documents and be responsible for delays or costs resulting from failure to inspect or co-ordinate, and for any replacement or corrective work required.

1.1 Superintendence

- .1 Provide full time on site superintendent personnel and supporting staff with proven experience in erecting, supervising, testing and adjusting projects of comparable nature and complexity.
- .2 Site superintendent shall have overall authority to speak for Contractor and represent Contractor.

1.2 Dimensions

- .1 Verify dimensions on Site before commencing shop drawings. Before fabrication commences report discrepancies to Consultant in writing. Incorporate accepted variances on shop drawings and As-Built records.

1.3 Coordination

- .1 Coordinate and co-operate with work forces to ensure that Work will be carried out expeditiously and in proper sequence.
- .2 Make adjustments to allow adjustable work fit to fixed Work.

1.4 Dimension and Coordination

- .1 Take necessary job dimensions for the proper execution of the work. Assume complete responsibility for the accuracy and completeness of such dimensions, and for coordination.
- .2 Verify that work, as it proceeds, is executed in accordance with dimensions and positions indicated and maintain levels and clearances to adjacent work, as set out by requirements of Drawings, and ensure that work installed in error is rectified before construction resumes.
- .3 Check and verify dimensions referring to work and interfacing of services. Verify with trade concerned such dimensions, when pertaining to work of other trades.
- .4 **DO NOT SCALE** directly from Drawings. Obtain clarification from Consultant if there is ambiguity or lack of information on Drawings.
- .5 Details and measurements of any work which is to fit or to conform with work installed shall be taken at Place of Work.
- .6 Advise Consultant of discrepancies and omissions on Drawings and specifications which affect aesthetics, or which interfere with services, equipment or surfaces. Do not proceed with work affected by such items without clarification from Consultant.

END OF SECTION

1.1 Laws, Notices, Permits and Fees

- .1 Refer to GC 10.2.
- .2 The Building Code including amendments, shall govern the construction of the Work.
- .3 Comply with Codes, By-Laws, and Regulations of authorities having jurisdiction. Codes and regulations constitute an integral part of the Contract Documents.
- .4 Owner will apply and pay for Municipal Building Permit. Contractor shall apply and pay for other permits, licenses, deposits and certificates of inspection as part of the Contract Price.
- .5 Arrange for inspection, testing of Work and acceptance required by the authorities having jurisdiction. Be responsible for necessary preparations, provisions and pay costs.
- .6 Obtain permit required to work on Municipal rights of way. Obtain damage deposits for sidewalks, roads and services work at Contractor's expense.

END OF SECTION

PART 1 - GENERAL

1.1 Approved Alternates and Approved Equals

- .1 Named Product alternates or equals, indicated by the phrases “or approved alternate by XYZ Manufacturing” or “or approved equal by XYZ Manufacturing”, shall be interpreted to mean that named Product alternate or equal, if selected for use in lieu of indicated or specified Product, meets or exceeds performance, appearance, general arrangement, dimensions, availability, code and standards compliance, and colour of specified Product. Be responsible for costs and modifications associated with the inclusion of named Product alternate or equal at no additional cost to the Owner.
- .2 The process for proposing and approving alternates or equals shall be the same process as for proposing and approving substitutions (refer to paragraph 1.2 below)
- .3 Confirm delivery of specified items prior to proposing alternates or equals.

1.2 Substitutions

- .1 Submission of substitutes
 - .1 Proposal for substitutions of Products and materials must be submitted in accordance with procedures specified in this section.
 - .2 Consultant may review submissions, if directed by Owner, but in any case with the understanding that the Contract Time will not be altered due to the time required by the Consultant to review the submission and by the Contractor to implement the substitution in the Work.
 - .3 Consultant’s services to review substitutions will be performed on an additional services basis to their contract with the Owner. Costs of these services will be discounted from any reductions in the Contract Price that might be forthcoming from the substitution. Therefore, to be acceptable, a substitution must present a reduction in the construction cost at least equal to the cost to the Owner of the Consultant’s additional services to review the substitution. Contractor shall cover directly costs and administration associated with courier services, reproduction costs, and other direct costs associated with these substitution reviews.
- .2 Submission requirements
 - .1 Description of proposed substitution, including detailed comparative specification of proposed substitution with the specified Product.
 - .2 Manufacturer’s Product data sheets for proposed Products.
 - .3 Respective costs of items originally specified and the proposed substitution.
 - .4 Confirmation of proposed substitution delivery, in writing by Product manufacturer.
 - .5 Compliance with the building codes and requirements of authorities having jurisdiction.
 - .6 Affect concerning compatibility and interface with adjacent building materials and components.
 - .7 Compliance with the intent of the Contract Documents
 - .8 Effect on Contract Time
 - .9 Reasons for the request
- .3 Substitutions submitted on shop drawings without following requirements of this section prior to submission of the affected shop drawings will cause the shop drawings to be rejected.
- .4 Proposed substitutions shall include costs associated with modifications necessary to other adjacent and connecting portions of the Work.
- .5 Consultant’s decision concerning acceptance or rejection of proposed substitutions is final. Should it appear to the Consultant that the value of services required to evaluate the substitution exceeds

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Product Substitution Procedures

the potential reduction, the Consultant will advise the Owner that the substitution does not merit consideration before proceeding with a full evaluation. If the substitution will produce a reduction commensurate with or exceeding the value of Consultant's services to evaluate the substitution, the Consultant will request the Owner's direction to proceed with evaluation.

END OF SECTION

PART 1 - GENERAL

- 1.1 Provide labour, Products, equipment, services tools and supervision necessary for submittals. Make submittals specified in this Section to Consultant unless otherwise specified.
 - .1 Verify accuracy and completeness of submittals prior to submission.
 - .2 Verify field measurements, field construction criteria, catalogue numbers and similar data.
 - .3 Co-ordinate each submittal with requirements of the Work and the Contract Documents.
 - .4 Notify Consultant in writing at time of submission, of any deviation in submittals from requirements of the Contract Documents.
- 1.2 Prepare a schedule identifying all submittals requested within the Contract Documents and corresponding issued dates for review by the Consultant.
- 1.3 Submit in accordance with dates established under Schedule of Submittals, fabrication, manufacture, erection and installation to provide adequate time for reviews, securing necessary approvals, possible revisions and resubmittals, placing orders, securing delivery and to avoid construction delays.
- 1.4 Accompany each submittal with a letter of transmittal containing all pertinent information required for identification and checking of submittals including but not limited to the following:
 - .1 Date of initial submission and date of each subsequent submission if required.
 - .2 Project title and Consultant's project number.
 - .3 Names of:
 - .1 Contractor.
 - .2 Subcontractor.
 - .3 Supplier/manufacturer as applicable.
 - .4 Specification section numbers to which submission is related.
 - .5 Countersigned stamp of Contractor certifying that they have reviewed and accepted the submission.

PART 2 - PRODUCT DATA

- 2.1 Before delivery of Products to the Site, submit Product data for approval as specified in each section or as requested by the Consultant.
- 2.2 Submit manufacturer's Product data for systems, materials, and methods of installation proposed for use. Such literature shall identify systems, each component, and shall certify compliance of each component with applicable standards.

PART 3 - SAMPLES

- 3.1 Before delivery of Products to the Site, submit samples of Products as specified or as requested by the Consultant. Label samples as to origin and intended use in the Work and in accordance with the requirements of the Specification Sections. Samples must represent physical examples to illustrate materials, equipment or work quality and to establish standards by which completed Work is judged.
- 3.2 Ensure samples are of sufficient size and quantity, if not already specified, to illustrate:
 - .1 The quality and functional characteristics of Products, with integrally related parts and attachment devices.
 - .2 Full range of colours available.
- 3.3 Notify the Consultant in writing, at time of submission, of any deviations in samples from requirements of the Contract Documents, and state the reasons for such deviations.

- 3.4 Identify samples with Project name, Contract number, date, Contractor's name, number and description.
- 3.5 If samples are not acceptable, both samples will be returned. If samples are acceptable, one sample will be so indicated and returned. Be responsible for the cost of samples that are not accepted and for resubmission of samples.
- 3.6 Acceptable samples shall serve as a model against which the products incorporated in the work shall be judged.
- 3.7 Each Product incorporated in the Work shall be precisely the same in all details as the acceptable sample.
- 3.8 Should there be any change to the accepted sample, submit in writing for approval of the revised characteristics and resubmit samples of the Product for approval if requested.
- 3.9 When samples are very large, require assembly, or require evaluation at the Site, they may be delivered to the Site, but only with approval and as directed by Consultant.

PART 4 - SHOP DRAWINGS

- 4.1 Arrange for the preparation of shop drawings as called for in the Contract Documents or as may be reasonably requested by the Consultant. The Contractor and each Subcontractor shall operate as experts in their respective fields and all shop drawings and samples shall conform to the requirements of the Contract Documents.
- 4.2 The term "shop drawings" means drawings, diagrams, schematics, illustrations, schedules, performance charts, brochures and other data which are required to illustrate details of the Work.
- 4.3 In addition to shop drawings specified in the specification sections, submit shop drawings required by jurisdictional authorities in accordance with their requirements.
- 4.4 Shop drawings for openings, sleeving and conduit
 - .1 Prior to preparation of shop drawings, coordinate sizes of all structural openings and sleeves with respective fabricators for mechanical ducting. Adjustments to the opening sizes indicated on the Contract Drawings shall not be made without the approval of the Consultant.
 - .2 Prior to detailing structural reinforcement on shop drawings, arrange for the Engineer of structure to review formed holes, recesses and sleeving. Completely dimension openings, recesses and sleeves and relate to suitable grid lines and elevation.
 - .3 Prior to forming of the structure, arrange for the preparation of shop drawings for review by the Consultant showing embedded conduit to be cast within the structure. Shop drawings shall include conduit from all sources.
- 4.5 Shop drawings shall indicate the following minimum criteria and any additional criteria indicated in the individual specification sections requiring shop drawings:
 - .1 Clear and obvious notes of any proposed changes from the Contract Documents.
 - .2 Fabrication and erection dimension.
 - .3 Provisions for allowable construction tolerances and deflections provided for live loading.
 - .4 Details to indicate construction arrangements of the parts and their connections, and interconnections with other work.
 - .5 Location and type of anchors and exposed fastenings.
 - .6 Materials, physical dimensions including thicknesses, and finishes.
 - .7 Descriptive names of equipment.
 - .8 Mechanical and electrical characteristics when applicable.
 - .9 Information to verify that superimposed loads will not affect function, appearance, and safety of the work detailed as well as of interconnection work.
 - .10 Assumed design loadings, and dimensions and material specifications for load-bearing members.

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Submittal Procedures

- 4.6 Include in shop drawing submissions detailed information, templates, and installation instructions required for incorporation and connection of the Work.
- 4.7 Before submitting to the Consultant, review all shop drawings to verify that the Products illustrated therein conform to the Contract Documents. By this review, the Contractor agrees that it has determined and verified all field dimensions, field construction criteria, materials, catalogue numbers and similar data and that it has checked and coordinated each shop drawing with the requirements of the Work and of the Contract Documents. The Contractor's review of each shop drawing shall be indicated by stamp, date and signature of a qualified and responsible person possessing the appropriate authorization.
- 4.8 Be responsible for dimensions to be confirmed and correlated at the Site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for coordination of the Work of all subtrades.
- 4.9 Submit shop drawings for the Consultant's review with reasonable promptness and in orderly sequence so as to cause no delay in the Work nor in the work of Other Contractors. At the time of submission, notify the Consultant in writing of any deviations in the shop drawings from the requirements of the Contract Documents. The Contractor will be held responsible for changes made from the Contract Documents which are not indicated or otherwise communicated in writing with the submission.
- 4.10 Drawings submitted by the Contractor as required herein are the property of the Owner who may use and duplicate such drawings where required in association with the Work.
- 4.11 Submit shop drawings, as indicated in each section of the Work, signed and sealed by a licensed Professional Engineer registered in the place of the Work.
- 4.12 Shop drawings shall have distinct, uniform letters, numerals and line thicknesses that will ensure the production of clear legible prints and also facilitate microfilming and reduced reproduction.
- 4.13 Submissions shall be on 8.5" x 11" or 11" x 17" page format. However, in instances where catalogue items are specified, three clean copies of the manufacturer's catalogue may be submitted.
- 4.14 Shop drawings shall contain the following identification:
 - .1 Project name and Contract number.
 - .2 Applicable 5-digit Contract Specification number describing the item.
 - .3 Location (unit, level, room number, etc.).
 - .4 Name of equipment or Product.
 - .5 Name of Subcontractor or supplier.
 - .6 Signature of Contractor certifying that Shop drawing is in conformance with Contract Documents.
 - .7 On submissions subsequent to the first, the following additional identification:
 - .1 The revision number.
 - .2 Identification of the item(s) revised.
- 4.15 Dimensions and designations of elements shall be shown in the same system of measurement used on the applicable Contract Drawings.
- 4.16 The Consultant reserves the right to refuse acceptance of drawing submissions not meeting the above requirements.
- 4.17 The Consultant's review will be for conformity to the design concept and for general arrangement only and such review shall not relieve the Contractor of responsibility for errors or omissions in the shop drawings or of responsibility for meeting all requirements of the Contract Documents unless a deviation on the shop drawings has been approved in writing by the Consultant.
- 4.18 The Contractor shall make any changes in shop drawings which the Consultant may require consistent with the Contract Documents and re-submit unless otherwise directed by the

Consultant. **When re-submitting the shop drawings, the Contractor shall notify the Consultant in writing of any revisions other than those requested by the Consultant.**

- 4.19 Only drawings noted for revision and resubmission need be resubmitted.
- 4.20 File one copy of each submitted shop drawing at the Site.
- 4.21 Shop drawings submitted to Consultant that do not bear a stamp or are incomplete will not be reviewed and will be returned to Contractor, any delay in Construction Schedule as a result will be the full responsibility of the Contractor.

PART 5 - CERTIFICATES

- 5.1 Submit certificates that are required by authorities having jurisdiction or that are requested in the specification sections.
- 5.2 Clearly show on each certification the name and location of the Work, name and address of Contractor, quantity and date of shipment and delivery and name of certifying company.
- 5.3 Certificates shall verify that Products and/or methods meet the specified requirements and shall include test reports of acceptable testing laboratories to validate certificates.
- 5.4 Submit certificates in duplicate and signed by an authorized representative of the certifying company.

PART 6 - CERTIFICATION OF TRADESMEN

- 6.1 Provide certificates, at the request of the Consultant, to establish qualifications of personnel employed on the Work where such certification is required by authorities having jurisdiction, by the Consultant or by the Contract Documents.

END OF SECTION

PART 1 GENERAL

.1 GENERAL INSTRUCTIONS

- .1 Read and be governed by Conditions of the Contract and other Sections of Division 1.
- .2 The purposes of the special project procedures are as follows:
 - .1 Special project procedures shall ensure the Contractor provides full accessibility to the existing building(s) under renovation or alteration forming the Work of the Contract to the patrons, staff suppliers, other contractors, visitors and the Public.

.2 RULES AND REGULATIONS FOR CONSTRUCTION PERSONNEL

- .1 Fundamental to any and/or all rules and regulations, whether written and/or unwritten, is the fact that the Owner is the guardian of, and has full responsibility for the welfare and well-being of the patrons and staff.
- .2 The following rules and regulations shall be construed as being general in nature and designed a guide for behavior of all construction personnel, including suppliers and their employees while performing the Work of this Contract in and/or on the properties of the Owner.
- .3 Communication with the Owner's personnel and staff shall all be routed through the Consultant
- .4 Where the Work of this Contract causes results which are detrimental to the operations of the Owner, or is distressing or disturbing to patrons, staff and personnel, to the point where the Project Manager feels that such work should stop until conditions change, then such work shall stop on order of the Project Manager.
- .5 Where construction personnel perform Work of this Contract in more than one area of the building(s), such work shall be scheduled so that occupied areas are avoided during scheduled class times and activities. Where the aforementioned regulation is not possible, the Contractor shall have a frank discussion with the Project Manager and Consultant, and amicable arrangements shall be made.
- .6 Objectionable work as deemed by the Owner must cease upon notification by the Owner. Said work must be rescheduled to after hours and/or weekends as approved by the City or actions are taken by the contractor to control/eliminate the deemed objectionable work. Objectionable work includes but is not limited to the following: chipping, hammer drilling, coring, grinding of steel/concrete, torquing, or any other activities that disturb the normal function of the building.

.3 RESTRICTIONS

- .1 The Work shall be confined to the Place of the Work (Site) limits indicated on Drawings and/or within area defined by property lines. Work on the Municipal property shall be carried out under regulations of respective Municipality and authorities having jurisdiction including without any limitations any associated fees, permits, insurance or bonding required.
- .2 Assume responsibility for care, custody and control of the Place of the Work (Site) and perform the Work to extent covered in Contract Documents. Make good damage to the existing Site and existing building(s) (if any) due to the Work of this Contract.
- .3 Bring the following restrictions to the attention of the construction personnel and workers on the Work and enforce them;
- .4 Restrict construction personnel and workers to Place of the Work and necessary access routes to it. Restrict non-construction personnel from the Place of the Work (Site), except for Contractor authorized visitors.
- .5 Restrict construction activities in public, in Owner occupied areas, in locations designated to off-hours agreed in Preconstruction Meeting without additional cost to the Owner, and return these areas to normal operations as soon as possible.

4 OCCUPANCY OF THE EXISTING BUILDING(S)

- .1 The existing building(s) will remain in full use and occupancy throughout the duration of construction of the Work of this Contract. Contractor shall schedule and perform the Work of this Contract so that conflict is minimized. The approximate extent of the building that will be made available to the Contractor is identified within the Contract Documents.
- .2 Contractor shall perform the Work of this Contract in and around the existing building(s) at approved times and as mutually agreeable to the Owner, so not to inconvenience or hinder the occupation of the building(s) by the Owner, the Owner's personnel/staff and patrons.
- .3 Give the Owner a minimum of seven (7) working days written notice of intention to commence work in a room, or area(s) of existing building outside of the areas identified for Contractor us so that he may prepare the space(s). Any disruption to the operation of the facility must be requested at least 72 hours in advance of the proposed work being carried out.
- .4 Before the Work of this Contract begins and on a routine basis, construction personnel shall be thoroughly informed of the necessity to exercise **extreme** caution in any of their activities, which may interrupt an essential service serving the "occupied areas" for which an alternate supply, service or facility has not been provided.
- .5 The Owner and/or his separate contractors reserve the right to enter the area(s) of Work of this Contract for the purpose of placing and/or fitting equipment before completion of the Work of this Contract. Such entry shall not interfere with or prevent the Contractor from performing the Work of this Contract. Also, such entry shall not in any way be considered as acceptance of the Work of this Contract by the Owner, or in any way relieve the Contractor from responsibilities under Work of this Contract.
- .6 Any interruption(s) of mechanical and electrical services to "occupied areas" **must** be pre-arranged with the Consultant. Where any such interruption(s) is impossible to avoid, it shall be of the shortest duration possible and restricted to times acceptable to the Project Manager in writing. Contractor shall apply in writing to the Consultant well in *advance* of any contemplated and/or intended interruption(s).
- .7 Construction personnel shall be confined to the enclosed construction areas except when absolutely necessary to perform work and duties directly connected to the Work of this Contract. Contractor shall make arrangements with the Consultant well in advance of work and/or duties required outside the enclosed construction areas.
- .8 In order to reduce to a minimum the period of time required for Work of this Contract within the existing building(s), each area of Work of this Contract shall be pre-planned in complete detail and all materials for the entire work within the area shall be on hand or readily available. Before work in each area of the work of this Contract begins, the Contractor shall well in advance make arrangements to measure and review the areas to be *renovated* for the purposes of pre-planning.

5 RELOCATED COMPONENTS

- .1 Disconnect services on items for relocation forms part of the work of Divisions 15 and 16.
- .2 Disconnect fastening and anchorage of items to be relocated. Patch abandoned fastening and anchorage holes to match with and flush with adjacent surfaces.
- .3 Carefully relocate items indicated and repair any damage received as a result of relocation in accordance with the Owner's written directions. Install relocated items level, plumb, square and in accordance with manufacturer's instructions. Re-fasten and anchor securely in place. Services re-connection of relocated items shall form part of the work of Divisions 15 and 16.
- .4 Take delivery of existing components from the Owners storage to be incorporated in locations indicated. Modify existing items to suit new design requirements. Where modifications of the existing components is not possible to suit new locations, then augment and supply new components matching existing in every respect. Contract Price shall include for such conditions.

6 DUST FREE ENVIRONMENT

- .1 It is imperative that the Owner's operational areas remain clean and dust free. It will be the Contractor's responsibility to insure this. If the Contractor fails to maintain these conditions, the Owner reserves the right to retain the services of a professional maintenance company to fine clean the areas in question, and the invoiced costs for the cleaning services of the professional maintenance company shall be deducted from the Contractor's next progress payment.
 - .2 Be responsible to keep operational areas clean and dust free. Prevent contamination of and nuisance to adjacent areas and properties near the Work from dust by taking appropriate dust control measures. Take measures to prevent dust and dirt rising and migrating to occupied areas including return air systems and/or adjacent properties. Respond immediately to complaints of dust received from the Public, authorities having jurisdiction and the Owner.
 - .3 Adjacent work areas remaining in use by the Owner during construction period shall have furnishings and equipment covered and protected from dust under this Contract. Completely install the dust covers and prior to commencement of each of the Contractor's working periods and shall be also be removed upon the end of the Contractor's work period. If required by the Owner, the Contractor shall also provide additional dust covers and keep them in clean and usable conditions.
 - .4 Before the Work proceeds, the Contractor shall provide temporary dust-proof partitions and screens constructed as specified in this Section, sealed at the floor, walls, ceilings, or intersecting members in a manner to prevent dust and dirt infiltration into adjacent areas of the building(s).
 - .5 Contractor shall leave work area(s) remaining in use by the Owner clean and ready for use between each work period.
- 7 Temporary Rigid Dust Tight Partitions and Screens
- .1 Provide temporary dust tight partitions and screens where nature of Work requires access to floor areas above or below the floor being worked on to control dust migration and/or as specified herein and noted on Drawings. Maintain area of Work under negative pressure to prohibit migration of dust into other areas of the building. Refer also to Division 15 requirements for isolation of existing mechanical systems.
 - .2 Separate construction areas from occupied areas. Construct dust tight and wind proof screens as required to completely enclose the Work areas and the access passages to the Work areas from the other areas of the existing building(s). Maintain passage for Fire Department if required.
 - .3 Coordinate location of dust tight partitions, screens, weather barriers and doors with the Owner. Obtain the Owner's approval of installed dust tight partitions, screens, weather barriers, protective coverings and protection methods before proceeding with the renovation/alteration work.
 - .4 Protective coverings shall be fire retardant coated, dust-proof fabric of premium grade, weighing minimum of 4.3 oz/sq.yd. (145 g/m²), Polyweave® Flame -Retardant Fabric by Polytrap Products, or P9M Fire Retardant Fabric by Inland Plastics Ltd., or other manufacturer acceptable to the Owner.
 - .5 Fabricate and erect screens of 3-5/8" (92mm) metal studs at 16" (450mm) O.C., with 1/2" (13mm) gypsum board on both sides with closed joints.
 - .6 Tape or seal between adjacent boards and provide painted finish.
 - .7 Seal perimeter of cutouts around fixtures, fittings and penetrations.
 - 8 Extend screens from floor to underside of structure above unless otherwise shown, noted or approved otherwise.
 - .9 Where applicable, construct screen partitions to provide required fire resistance ratings and smoke-tight separation to the approval of the authorities having jurisdiction.
 - .10 Where exposed to the weather, fully cover the temporary screens with a heavy waterproof and dust proof fabric or polyethylene with lapped and sealed joints. Where required to have sound attenuation, fill spaces between studs with 4" (100mm) thick, glass fibre or mineral fibre insulation batts to deaden sound.

- .11 Thoroughly pack framing at junctions of screens with floors, walls and underside of structure with batt insulation and seal in a manner to prevent infiltration of dust, dirt, etc. Ensure that rooms within closed off areas which are not being altered are kept dust free.
- .12 Install temporary packing at bottom of doors through screens and to elevator entrances not being used during demolition and construction. Prevent dust seepage into existing adjacent spaces and occupied areas.
- .13 Remove screens and other temporary protection and make good damaged or blemished adjoining work when directed by the Owner and/or Consultant.
- .14 Provide daily vacuuming of construction dust from corridors and connecting areas as the Work progresses. This shall be considered a minimum requirement; increase vacuuming as necessary.

8 Protection

- .1 Protect existing services, structures, landscaping and other items required to remain and newly installed Work during construction with secure and durable coverings, barricades, hoardings or guards suitable for the various conditions and as specified herein. Protect adjacent surfaces and structures against damage which may occur from falling debris or other causes. Perform the Work in a manner to avoid damage.
- .2 The Owner's patrons, staff, personnel shall be occupying the existing building(s) during the Performance of the Work. Provide for the safety of the existing building occupants and for the security of occupied areas. Provide protection and keep clear areas that are required for access to, and exit from, occupied areas. Maintain free, safe, protected, clear passage to and from the building(s) and the work area(s), refer to the Drawings for any specific hoarding or temporary partition locations. Maintain clear and safe fire exit routes as specified herein.
- .3 Particular attention will be paid to the prevention of fire and the elimination of fire hazards which would endanger the work or adjacent building and premises. Contractor will provide and maintain all necessary fire extinguishers during the Work at all times, located at convenient and accessible points, and meeting the approval of the Owner.
- .4 Where construction operations must be executed or traffic routed over finished floors, lay minimum ¼" (6mm) thick plywood coverings tightly fitted over surface in such areas. Secure plywood to prevent movement in a manner which will not damage finished surfaces.
- .5 Where construction operations must be performed over finished roofs and waterproofed areas lay minimum ½" (13mm) thick plywood covering. Secure plywood to prevent damage and penetration of roof and waterproofed surfaces. Provide means to prevent wind uplift.
- .6 Protect, relocate and maintain active building services to adjoining areas of building(s) without interruptions, except those required for connection for the Work which shall be coordinated with the Owner as specified herein. Make good all damage.
- .7 It is essential that the existing building(s) be both water and weather-tight at all times. Therefore, the Contractor shall furnish all temporary protective enclosures, tarpaulins, etc... as may be required to protect openings made by the Work of this Contract.
- .8 Protect the existing work to remain. Provide coverings and other protection materials.
- .9 Where hoarding is required, as indicated on drawings, it shall consist of minimum 12mm plywood on temporary framing to minimum 2400mm above finished floor. Refer also to section 7.
- .10 Cover openings in equipment, ducts and pipes until final connections are made.
- .11 Protect exposed live electrical equipment during construction for personal safety.
- .12 Shield and mark live electrical parts with appropriate warnings.
- .13 Provide temporary doors for rooms containing electrical distribution equipment. Keep doors locked except when under the direct supervision of a qualified electrician.
- .14 Wherever practical lock or barricade finished areas.

- .15 As soon as construction is sufficiently advanced, enclose accessible openings to provide security. Provide temporary doors with security hardware.
 - .16 Ensure continuous security of the Work and construction equipment.
 - .17 Provide protection against the elements to maintain products and installations from damage and deterioration.
 - .18 Remove snow and ice immediately from parts of the Work except finished roofs. Do not use salt and avoid mechanical damage.
- 9 Design and Safety Requirements for Temporary Facilities
- .1 Be responsible for design, erection, operation, maintenance and removal of temporary structural and other temporary facilities.
 - .2 Engage and pay for registered professional engineering personnel skilled in the appropriate disciplines to perform these functions where required by law or by the Contract Documents, and in all cases where such temporary facilities and methods of construction are of such a nature that professional engineering skill is required to produce safe and satisfactory results.
 - .3 Submit shop drawings bearing the seal and signature of registered professional engineering personnel skilled in the appropriate disciplines, indicating and showing temporary structural and other temporary facilities and methods of construction intended for the Work.
- 10 HOURS OF WORK
- .1 Work shall be performed between the hours of 7:00am and 10:00pm, Monday to Friday, Saturday and Sunday.
 - .2 Work outside of the hours outlined above may be requested in advance by the Contractor for review/acceptance by the Owner.
- 11 Waste Containers and Bins
- .1 Provide waste containers and bins for the disposal of demolition waste and construction materials waste in compliance with the Owner's waste management requirements.
 - .2 Waste containers and bins shall be "closed box" type to prevent the waste materials from being wind blown and contaminating the Owner's property, adjacent private and Public properties.
 - .3 Sizes of the waste containers and bins shall be to fit the location(s) at the Place of the Work to the acceptance of the Project Manager and/or Consultant.
 - .4 The location(s) of the waste containers and bins shall be to the acceptance of the Owner. The Owner reserves the right to have the location(s) of the waste containers and bins re-located as required to suit the operations of the Owner and the building(s) at no additional cost to the Owner.
 - .5 Contractor and/or his subcontractors shall not use the Owner's and or the existing building's waste containers and bins for disposal of demolition waste and/or construction waste. If after investigation by the Owner, it is discovered that the Contractor and/or his subcontractors have used the Owner's and or the existing building(s) waste containers and bins for disposal of demolition waste and/or construction waste, the Owner reserves the right to back charge the said Contractor, deduct the equivalent costs from the Contractor's next progress payment for the use of the said waste containers and bins.
 - .6 If waste containers must be located on Municipal property, the Contractor shall be responsible for obtaining all necessary permissions/permits and bearing all associated costs.

END OF SECTION

PART 1- GENERAL

1.1 General Instructions

- .1 Be responsible for inspection and testing as required by the Contract Documents, statutes, regulations, by-laws, standards or codes or any other jurisdictional authority. Give the Consultant timely notice of the readiness for inspection, date and time for such inspection for attendance by the Consultant.
- .2 Verify by certification that specified products meet the requirements of reference standards specified in the applicable specification sections. Preserve all original labels, containers and packaging of products for review by Consultant.
- .3 Conduct testing, balancing and adjusting of equipment and systems specified in applicable mechanical and electrical specifications sections by independent testing company.

1.2 Inspection and Testing by the Owner

- .1 The Owner may appoint an independent inspection and testing company to carry out inspection and testing of the Work for conformance to the Contract Documents. Such costs for inspection and testing will be paid by the Owner. However, any additional inspection and testing due to non-conformance to the Contract Documents shall be at the Contractor's expense.
- .2 Inspections and testing by the Owner will be promptly made. Uncover for examination any Work covered up prior to inspection or without approval of the Consultant. Make good such Work at no cost to the Owner.
- .3 The Owner may inspect and test Products during manufacture, fabrication, shop testing, installation, construction and testing phases of the Contract. The Consultant will ascertain the quantity and quality of testing to be performed. Inspection and testing may be performed at the place of manufacture/fabrication, storage, or at the Site as designated by the Consultant. Where inspection and testing is done either during manufacture, fabrication, or at Site, ensure that proper facilities and assistance are provided.

1.3 Inspection and Testing

- .1 Source and Field Quality Control specified in Other Sections:
 - .1 This Section includes requirements for performance of inspection and testing specified under Source Quality Control and Field Quality Control in other Sections of the specifications.
 - .2 Do not include in work of this Section responsibilities and procedures that relate solely to an inspection and testing company's functions that are specified in another Section which is paid for directly by the Owner.
- .2 Do not limit responsibility for ensuring that products and execution of the work meet Contract requirements, and inspection and testing required to this end, to specified inspection and testing.

1.4 Qualifications of Inspection and Testing Companies

- .1 Inspection and testing companies to be certified by the Standards Council of Canada.
- .2 Companies engaged for inspection and testing shall provide equipment, methods of recoding and evaluation, and knowledgeable personnel to conduct tests precisely as specified in reference standards.
- .3 If requested, submit affidavits and copies of certificates of calibration made by an accredited calibrator to verify that testing equipment was calibrated and its accuracy ensured within the previous twelve months.

1.5 Tolerances for Installation of Work

- .1 Unless specifically indicated otherwise, work shall be installed plumb, level, square and straight.
 - .2 Unless acceptable tolerances are otherwise specified in specification sections or are otherwise required for proper functioning of equipment, site services, and mechanical and electrical systems:
 - .1 "Plumb and level" shall mean plumb or level within 1 mm in 1 m.
 - .2 "Square" shall mean not in excess of 10 seconds lesser or greater than 90 degrees.
 - .3 "Straight" shall mean within 1 mm under a 1 m long straightedge.
 - .4 "Flush" shall mean within:
 - .1 6 mm for exterior concrete, masonry, and paving materials.
 - .2 1 mm for interior concrete, masonry, tile and similar surfaces.
 - .3 0.05 mm for other interior surfaces.
 - .3 Allowable tolerances shall not be cumulative.
- 1.6 Reference Standards
- .1 Perform inspection and testing in accordance with Standards quoted and as required by procedures described in specified reference standards that are applicable to the work being inspected and tested.
- 1.7 Responsibilities of the Contractor
- .1 Be responsible for quality control methods and procedures to ensure performance of the work in accordance with the Contract Documents.
- 1.8 Responsibilities of Inspection and Testing Companies
- .1 Determine from specifications and Drawings the extent of inspection and testing required for Work of the Contract. Subcontractors shall notify Consultant of any omissions or discrepancies in the work inspected and/or tested.
 - .2 Perform applicable inspection and testing described in the Specifications and as maybe additionally directed.
 - .3 Provide competent inspection and testing personnel when notified by the Contractor that applicable work is proceeding. Inspection personnel shall cooperate with the Consultant and Contractor to expedite the Work.
 - .4 Subcontractors shall notify the Consultant and Contractor of deficiencies and irregularities in the Work immediately when they are observed in the course of inspection and testing.
 - .5 Inspection and testing companies shall not perform or supervise any of the Contractor's work, and shall not authorize:
 - .1 Performance of work that is not in strict accordance with the Contract Documents.
 - .2 Approval or acceptance of any part of the Work.
- 1.9 Inspection and Testing Procedures
- .1 Perform specified inspection and testing only in accordance with specified reference standards, or as otherwise approved.
 - .2 Observe and report on compliance of the Work to requirements of Contract Documents.
 - .3 Ensure that inspectors are on site or at fabricator's operations for full duration of critical operations, and as otherwise required to determine that the Work is being performed in accordance with the contract Documents.
 - .4 Identify samples and sources of materials.

- .5 Review and report on progress of the work. Report on count of units fabricated and inspected at fabricator's operations.
- .6 Observe and report on conditions of significance to work in progress at time of inspection or at fabricator's operations. Include where applicable and if critical to the work in progress:
 - .1 Time and date of inspection.
 - .2 Temperature of air, materials, and adjacent surfaces.
 - .3 Humidity of air, and moisture content of materials and adjacent materials.
 - .4 Presence of sunlight, wind, rain, snow and other weather conditions.
- .7 Include in reports all information critical to inspection and testing.
- .8 Ensure that only materials from the work and intended for use therein are tested.
- .9 Determine locations for work to be tested.

1.10 Defects

- .1 Defective products, materials and workmanship found at any time prior to Contract Completion will be rejected regardless of previous inspections, testing, and reviews of the Work. Inspections, testing, and reviews shall not relieve the Contractor from their responsibility, but are a precaution against oversight or error. Remove and replace defective and rejected products, materials, systems, and workmanship. Be responsible for delays and expenses caused by rejection.

END OF SECTION

1.0 GENERAL

1.1 DOCUMENTS

- .1 This Section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 REQUIREMENTS INCLUDED

- .1 Barriers.
- .2 Environmental Controls.
- .3 Construction Aids.
- .4 Use of the work.
- .5 Traffic controls.
- .6 Utilities.
- .7 Protection.
- .8 Office and sheds.
- .9 Signs.

1.3 REMOVAL OF TEMPORARY CONSTRUCTION

- .1 Temporary office facilities, toilets, barricades, storage sheds, utilities and other construction of temporary nature erected by the Trade Contractor shall be removed from the site by the Trade Contractor as soon as the progress of the Work will permit.

1.4 BARRIERS

- .1 Exterior Hoarding: The Contractor will -
 - .1 Erect and maintain hoarding around perimeter of work site as required by governing authorities to protect the public, workers, public and private property from injury or damage.
 - .2 Provide barricades and covered walkways required by governing authorities for public rights-of-way.
 - .3 Provide barriers around trees and plants designated to remain. Protect from damage.
- .2 Guard Rails & Barricades:
 - .1 The Contractor will administer and maintain a health and safety program. Contractor shall provide all perimeter guard rails and/or barricades to the building and at all floor openings, shafts and stairwells, etc. within the building as required by the Work. Such protection will be to the requirements of the Workers' Safety Insurance Board (WSIB).
 - .2 Trade Contractor shall remove and replace such guard rails and barricades, to accommodate the Work.
 - .3 Trade Contractor shall provide, maintain and adjust any other guard rails, barricades or safety platforms required by law and authorities having jurisdiction for protection of the Work and the workmen and for protection of the public.

1.5 ENVIRONMENTAL CONTROLS

- .1 Weather Enclosures: The Contractor will provide weathertight closures to unfinished door and window openings, tops of shafts and other openings in floors and roofs as necessary to expedite the work.
- .2 Dust Tight Screens:

- .1 The Contractor will provide dust tight screens or partitions as necessary to localize dust generating activities, and for the protection of workers and finished areas of Work and the public.
- .2 Trade Contractor shall relocate and maintain to accommodate the Work.
- .3 Dust Prevention: Trade Contractor, where necessary, shall effectively water-sprinkle and dampen the workings, and roads used in the operation, and involved portions of the site with such frequency as will satisfactorily allay any dust during all hours that work is being performed.
- .4 Noise Abatement: Trade Contractor shall comply with the requirements of Municipal and/or Provincial by-laws regarding noise abatement and shall take all necessary steps to ensure the generation and transmission of noise and vibration due to the work is kept to a minimum. Any such noise or vibration which is found to be objectionable shall be corrected at no additional cost to the Owner and to the satisfaction of the Contractor and the Consultant.
- .5 Refer to specification 01350 for assembly requirements for dust proof screens.

1.6 USE OF THE WORK

- .1 Site Storage/Loading:
 - .1 Contractor shall confine the Work and the operations of employees to limits indicated by the Contract Documents and as directed by the Owner and shall not unreasonably encumber the premises with products and materials.
 - .2 Contractor shall confine activities relevant to the work to areas within the designated working area. No fires, explosions or similar dangerous activities permitted on the site.
 - .3 Contractor shall conduct construction operations with minimum interference to adjacent roadways, sidewalks and access facilities in general and shall keep such areas free from materials, debris and equipment at all times.
 - .4 Contractor shall not load or permit to be loaded any part of the Work and existing structure with a weight or force that will endanger the Work and existing structure.

1.7 TRAFFIC CONTROL

- .1 Access to Site:
 - .1 The Contractor will provide and maintain access road, sidewalk crossings, ramps and construction runways as may be required for access to the Work.
 - .2 Contractor shall co-operate and co-ordinate his operations with the Owner.
- .2 Public Traffic Flow:
 - .1 Contractor shall provide and maintain flagpersons, traffic signals, barricades and flares/lights/lanterns as required to perform the Work and protect the public.
- .3 Construction Parking:
 - .1 Contractor shall be responsible for arranging their own parking requirements; parking shall not be provided by Owner.

1.8 TEMPORARY UTILITIES

- .1 Sanitary Facilities:
 - .1 Contractor is not permitted to use Owner's sanitary facilities.
- .2 Temporary Water
 - .1 Use of existing building water service shall be made available to the Contractor and shall be coordinated with the Owner prior to commencing work.
- .3 Temporary Heating & Enclosure:

Section 01500
Temporary Facilities & Controls

- .1 Provide for the proper heating and drying out of the building until completion by the use of appropriate heating equipment. Do not use "salamanders". Use forced hot air type heaters operated in well-ventilated locations. Protect the floors, walls and ceilings around the heating units. Ensure that no damage by staining result to finished floors during operation, servicing and refueling.
- .2 Maintain the heated parts of the building(s) or temporary enclosures at not less than 50°F (10°C), or at such temperature specifically stated in the sections of the Specifications, for the proper installation of the various Products.
- .3 Provide at the Place of the Work and ready for operation between at least October 15th and April 30th, temporary plant and equipment for heating materials and forms and for maintaining the proper temperature and humidity of the concrete during curing. Refer to and comply with the requirements of CSA A23.1/A23.2-00.
- .4 Duct carbon dioxide gas (CO₂) or other noxious or harmful gases from heaters to the exterior of the building(s).
- .4 Temporary Power & Light:
 - .1 Use of existing electrical power shall be made available to the Contractor by the Owner.
 - .2 Comply with the requirements of codes, by-laws and regulations governing temporary power and lighting at the location of the Work.
 - .3 Contractor will provide a power source on each floor in a central location. Each Subcontractor shall provide required extension cords from location where power is provided to location where it is needed.
 - .4 Contractor will arrange for general temporary lighting throughout Work areas. Each Subcontractor shall provide special task lighting required in the execution of the Work.
 - .5 Provide sufficient lighting to ensure sufficient visibility for the proper execution, safety and inspection of the Work.
 - .6 Comply with Construction Safety Association's "Temporary Wiring Standards on Job Sites", the Ontario Electrical Code, and other authorities having jurisdiction.
- .5 Temporary first Aid Facilities
 - .1 Provide site equipment and medical facilities necessary to supply first-aid service to injured personnel in accordance with regulations of the Worker's Compensation Act.

1.9 PROTECTION

- .1 Protection for Off-Site & Public Property:
 - .1 Protect surrounding private and public property from damage during performance of Work.
 - .2 Be responsible for damage incurred.
- .2 Fire Protection:
 - .1 Contractor shall provide and maintain temporary fire protection equipment during performance of Work required by insurance companies, governing codes, regulations, bylaws and authorities having jurisdiction.
 - .2 Open fires and burning of rubbish are not permitted on the site.
 - .3 Contractor shall take all necessary precautions to eliminate fire hazards and instruct Superintendent to make periodic inspections to ensure proper preventative measures are being complied with by all personnel working on the site.
 - .4 Paint and/or oil covered rags shall be stored in covered metal containers. Rubbish shall be removed daily, from building and site.
 - .5 Contractor shall comply with Provincial and Municipal fire safety requirements during the period of construction and other regulations pertaining to fire protection during construction work.

Section 01500
Temporary Facilities & Controls

- .6 Where torch cutting and electric welding are required by the Work, the trade concerned shall provide additional fire safety measures considered necessary to protect existing facilities from fire. A suitable fire extinguisher shall be provided by the applicable Trade Contractor adjacent to all welding operations.
- .7 Precautions shall be taken at all times to prevent fire by spontaneous combustion.
- .3 Protection of Building Finishes & Equipment:
 - .1 Contractor shall adequately protect his work at all stages of the operations and shall maintain the protection until his work is completed. Contractor shall remove and replace at his own expense any work and materials damaged, that cannot be repaired or restored to the Consultant's approval, due to inadequate protection being provided.
 - .2 Contractor shall be responsible for protection of existing work. If during the work, any existing work is damaged by the Trade Contractor, it shall be replaced without cost to the Owner and to the approval of the Consultant.
 - .3 Contractor shall provide, erect, and maintain adequate temporary barricades, warning signs, and lights for the protection of the public at all excavations, closures, detours, and points of danger where his work occurs outside the hoarding area.
- .4 Security:
 - .1 Security for buildings and grounds will be provided by the Contractor.

1.10 OFFICES & SHEDS

- .1 Offices & Sheds:
 - .1 Any temporary buildings, or other structures required by the Contractor, shall be provided by him in a condition and location acceptable to Owner. Contractor shall provide at his own expense, his own equipment for heating, lighting, plumbing and telephone for such buildings, subject to the approval of the Owner. Contractor may be required, at his own expense, to relocate his temporary building or buildings as often as required by the Owner to facilitate the efficient prosecution of the Work.
 - .2 First Aid: First aid facilities, including attendant, will be provided on the site by the Construction Manager, completely equipped in accordance with the requirements of the Workplace Safety Insurance Board (WSIB).

1.11 SIGNS & PUBLICITY

- .1 Signs:
 - .1 Contractor will control the use of signs. Signs or advertising shall not be placed on site without the written prior approval of Owner.
 - .2 Trade signage shall not be erected or applied prior to approval of design and placement.
- .2 Publicity: All publicity relating to this project is subject to the approval of the Owner and no mention of the project in advertising or articles in any publication will be permitted unless cleared through the Owner. Publicity or advertising implying endorsement of a product by the Owner will not be permitted.

END OF SECTION

PART 1 - GENERAL

1.1 Section Includes

- .1 Product quality, availability, storage, handling, protection, and transportation.
- .2 Manufacturer's instructions.
- .3 Quality of Work, coordination and fastenings.
- .4 Existing facilities.

1.2 Reference Standards

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2-2008, Stipulated Price Contract.
- .2 Within text of specifications, reference may be made to additional reference standards.
- .3 Conform to these standards, in whole or in part as specifically requested in specifications.
- .4 If there is question as to whether any product or system is in conformance with applicable standards, Consultant reserves right to have such products or systems tested to prove or disprove conformance.
- .5 The cost for such testing will be born by Owner in event of conformance with Contract Documents or by Contractor in event of non-conformance.
- .6 Conform to latest date of issue of referenced standards in effect on date of submission of Bids except where specific date or issue is specifically noted.

1.3 Quality

- .1 Refer to CCDC 2, GC 3.9.

1.4 Availability

- .1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for any items. If delays in supply of products are foreseeable, notify Consultant 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 Consultant at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Consultant reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.5 Storage, Handling and Protection

- .1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
- .2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.
- .3 Store products subject to damage from weather in weatherproof enclosures.
- .4 Store cementitious products clear of earth or concrete floors, and away from walls.
- .5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.
- .6 Store sheet materials, lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.

Section 01610
Basic Product Requirements

- .8 Remove and replace damaged products at own expense and to satisfaction of Consultant.
 - .9 Touch-up damaged factory finished surfaces to Consultant's satisfaction. Use touch-up materials to match original. Do not paint over name plates.
- 1.6 Transportation
- .1 Pay costs of transportation of products required in performance of Work.
 - .2 Transportation cost of products supplied by Owner will be paid for by Owner. Unload, handle and store such products.
- 1.7 Manufacturer's Instructions
- .1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.
 - .2 Notify Consultant in writing, of conflicts between specifications and manufacturer's instructions, so that Consultant may establish course of action.
 - .3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Consultant to require removal and re-installation at no increase in Contract Price or Contract Time.
- 1.8 Quality of Work
- .1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Consultant if required Work is such as to make it impractical to produce required results.
- 1.9 Co-Ordination
- .1 Ensure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.
 - .2 Be responsible for coordination and placement of openings, sleeves and accessories.
- 1.10 Concealment
- 1 In finished areas, conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.
 - .2 Before installation, inform Consultant if there is interference. Install as directed by Consultant.
- 1.11 Remedial Work
- .1 Refer to CCDC 2, GC 3.13.
- 1.12 Protection of Work in Progress
- .1 Prevent overloading of any part of building. Do not cut, drill or sleeve any load bearing structural member, unless specifically indicated without written approval of Consultant.
- 1.13 Existing Utilities
- .1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, and/or building occupants.
 - .2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

END OF SECTION

PART 1 - GENERAL

1.1 Section Includes

- .1 Progressive cleaning.
- .2 Final cleaning

1.2 Related Section

- .1 Section 01770 - Closeout Procedures.

1.3 Reference Standards

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC2 2008, Stipulated Price Contract
- .2 Additional references as per documents/contract.

1.4 Project Cleanliness

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

1.5 Final Cleaning

- .1 Refer to CCDC2, GC 3.14.

END OF SECTION

PART 1 - GENERAL

1.1 Section Includes

- 1 Administrative procedures preceding preliminary and final inspections of Work.

1.2 Related Sections

- .1 Section 01780 - Closeout Submittals

1.3 References

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 As per documents CCDC 2-2008, Stipulated Price Contract.
 - .2 Additional references as per documents/contract.

1.4 Inspection and Declaration

- .1 Contractor's Inspection: Contractor and all Subcontractors shall conduct an inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
 - .1 Notify Consultant in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.
 - .2 Request Consultant's Inspection.
- .2 Consultant's Inspection: Consultant and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Contractor shall correct Work accordingly.
- .3 Completion: submit written certificate that following have been performed:
 - .1 Work has been completed and inspected for compliance with Contract Documents.
 - .2 Defects have been corrected and deficiencies have been completed.
 - .3 Equipment and systems have been tested, adjusted and balanced and are fully operational.
 - .4 Certificates required by Boiler Inspection Branch Fire Commissioner Utility companies have been submitted.
 - .5 Operation of systems have been demonstrated to Owner's personnel.
 - .6 Work is complete and ready for Final Inspection.
- .4 Final Inspection: when items noted above are completed, request final inspection of Work by Owner, Consultant, and Contractor. If Work is deemed incomplete by Owner and Consultant, complete outstanding items and request re-inspection.
- .5 Declaration of Substantial Performance: when Owner and Consultant consider deficiencies and defects have been corrected and it appears requirements of Contract have been substantially performed, make application for certificate of Substantial Performance. Refer to CCDC 2, General Conditions Article GC 5.4 - Substantial Performance of Work for specifics to application.
- .6 Commencement of Lien and Warranty Periods: date of Owner's acceptance of submitted declaration of Substantial Performance shall be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.
- .7 Final Payment: When Owner and Consultant consider final deficiencies and defects have been corrected and it appears requirements of Contract have been totally performed, make application for final payment. Refer to documents CCDC 2, General Conditions Article GC 5.7 and terms of the documents/contract for specifics to application. If Work is deemed incomplete by Owner and Consultant, complete outstanding items and request re-inspection.
- .8 Payment of Holdback: After issuance of certificate of Substantial Performance of Work, submit an application for payment of holdback amount as per documents CCDC 2, General Conditions Article 5.5 and per the terms of the documents/contract.

END OF SECTION

PART 1 – GENERAL

- 1.1 Hand over to the Consultant comprehensive operations and maintenance manual and material suitable for the Owner's maintenance employees. Manuals shall cover all Products supplied and installed under the Contract.
- 1.2 Submit draft of the operation and maintenance manuals for the Consultant's review at least 15 days before testing systems and equipment, or as outlined as per documents. Incorporate alterations and additions, as found to be necessary during testing, and prepare the final version of the manual from the corrected draft before Turnover.
- 1.3 Submit final version of operation and maintenance manuals prior to Contract Completion.
- 1.4 Testing of systems and equipment will not be deemed to be complete until the requisite number of copies of the final version of the manuals has been handed over to the Consultant.
- 1.5 If standard literature is incorporated into the operations and maintenance manual, any irrelevant information shall be deleted, or suitably noted.
- 1.6 The manuals shall have sufficient detail in order that the Owner can totally maintain the equipment without outside help.
- 1.7 Submit all material in English.

PART 2 – FORMAT

- 2.1 Organize data in the form of an instructional manual.
- 2.2 Provide both digital copy and hard copy as follows:
 - .1 Hard copy (1): Commercial quality, 219 x 279 mm, black 3-ring binder (thickness to suit).
 - .2 Digital copies (3): CD/DVD with jewel case
- 2.3 When multiple binders are used, correlate data into related consistent groupings.
- 2.4 Cover: Identify each Manual with type or printed title "Contract Record Documents"; list title of Contract, identify subject matter of contents.
- 2.5 Arrange content by systems or process flow, under Section numbers and sequence of Table of Contents.
- 2.6 Provide tabbed fly leaf for each separate Product and system, with typed description of Product and major component parts of equipment.
- 2.7 Text: Manufacturer's printed data, or typewritten data on 20 pound paper.
- 2.8 Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

PART 3 - CONTENTS

- 3.1 Operation and maintenance manuals shall contain the following minimum information and data:
 - .1 Table of contents: Provide title of Contract; names, addresses, and telephone numbers of Consultants and Contractor with name of responsible parties; schedule of Products and systems, indexed to content of the volume.
 - .2 For each Product or system: List names, addresses and telephone numbers of Subcontractors, suppliers and service representatives, including local source of replacement supplies and parts including telephone numbers.
 - .3 Warranties: Warranties are between the Contractor and Owner. Warranties shall include, as a minimum:
 - .1 Description of warranty coverage.
 - .2 Date warranty starts.
 - .3 Date warranty expires.

- .4 Contact name, address and phone number (the Contractor shall also be responsible for advising the Owner of changes in contact information during the warranty period).
- .5 Equipment and components performance curves.
- .6 Hydro certificates.
- .4 Reports: For each Product or system provide the following:
 - .1 Manufacturer's certified reports
 - .2 Factory test reports.
 - .3 Field testing reports.
- .5 Details of design, construction and/or fabrication features, component function and maintenance requirements, to permit effective start-up, operation, maintenance, repair, modification, extension and expansion of any portion or feature of the installation.
- .6 Technical data, Product data, supplemented by bulletins, component illustrations, detailed views, technical descriptions of items and parts lists.
- .7 Schematics, interconnection lists: Manuals shall be complete with schematic and wiring diagrams, wiring interconnection lists and diagrams fully cross referenced and coordinated, printed circuit board layouts including the component identification, component parts list with electronic substitution equivalent. Provide cross referenced components lists and sequence of operations.
- .8 Trouble shooting and fault location guide: Instructions to facilitate quick return of malfunctioning equipment to operation.
- .9 Routine servicing and preventative maintenance schedule for Products and/or estimated hours required for routine servicing and preventative maintenance tasks.
- .10 List of recommended spare parts and recommended quantity of each item to be stocked based on spare part availability and re-order time.
- .11 Complete set of all reviewed shop drawings.
- .12 Product data: Mark each sheet to clearly identify specific Products and component parts, and data applicable to installation; delete inapplicable information.
- .13 Drawings: Supplement Product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams and as required in the Specifications.
- .14 Typed text: As required to supplement Product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions and as required in the Specification.

PART 4 - DRAWINGS

- 4.1 Prepare all required drawings on CAD, using Autocad Version 2006 or higher.
- 4.2 Prepare CAD drawings to meet the requirements of the Owners or Consultant's CAD Standards and Procedures.
- 4.3 Supply and hand over to the Consultant, one full sized, original whiteprint, for each final drawing prepared under this Contract. These drawings are to incorporate all addenda and changes made during the construction period.
- 4.4 Prior to Contract Completion, supply and hand over to the Consultant, one complete set of CAD Drawing Files in Autocad format on storage media acceptable to Consultant for each final drawing prepared under this Contract, including but not limited to circuit drawings, equipment layout drawings, and shop drawings.
- 4.5 Refer also to specific requirements for Divisions 15 & 16.
- 4.6 If requested, the Consultant shall provide to the Contractor for a fee, a CD containing electronic representation of the drawings. Complete and return the "Standard License Agreement" in order to receive and use the electronic files. (To be provided by Consultant upon request).

END OF SECTION

PART ONE - GENERAL

1.1 GENERAL REQUIREMENTS:

- .1 The conditions of the Contract Division 1 apply to this section in full, as if repeated herein.

1.2 SCOPE OF WORK:

- .1 This specification covers the requirements for demolition, salvage, removal, and in-place abandonment, either completely or partially, of those materials and structures so designated, including the requirements for backfilling resulting in excavations, trenches, holes, and pits.

1.3 GENERAL

- .1 Removal, abandonment, demolition, or salvage of a particular item shall be as indicated on the Drawings and herein.
- .2 The Work shall include all associated excavation, backfill, compaction, trimming, plugging, capping, filling, sealing, and preparation.

1.4 REFERENCES

- .1 Ontario Provincial Standard Specification 510 (Construction Specification for Removal)
- .2 Section 02200, Excavation, Backfill & Site Grading Specification

PART TWO - PRODUCTS

NOT APPLICABLE

PART THREE - EXECUTION

3.1 EXCAVATION, STOCKPILING AND DISPOSAL

- .1 Refer to Specification Section 02200 for requirements for excavation, stockpiling and disposal related to items indicated to be removed.
- .2 Excavation required for the Work to be carried out under this specification shall be part of the removal operation and shall be performed in a manner that leaves any portions not designated for removal undisturbed.
- .3 All materials indicated to be removed shall be disposed of legally, off-site.

3.2 REMOVAL

- .1 Removal shall be performed in a manner and with equipment that leaves undisturbed any portion not designated for removal or salvage. The broken edges of portions to be left in place that will be visible after construction shall be squared and neatly trimmed.

3.3 OTHER REMOVALS

- .1 Remove the existing on-site features, as shown on the Drawings, or as directed by the Consultant.
- .2 Remove and dispose of features legally off-site.
- .3 Reinststate affected areas to topsoil and sod or as indicated on Drawings.

3.4 BACKFILLING, COMPACTING, AND TRIMMING

- .1 Where removal or partial removal requires the filling of a trench, hole, or pit, backfilling shall be to the required grade using either excavated materials approved by the Consultant or imported

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Site Work Demolition & Removal

materials, as required, and shall include levelling and trimming of the site to match required contours and provide adequate drainage. Backfill material shall be placed according to Section 02200, Excavation, Backfill & Site Grading Specification.

3.4 RESTORATION

- .1 Restore the area of any removal operations to match the surrounding area or as otherwise indicated in the Drawings.
- .2 Restoration shall be in accordance with relevant Sections of these Specifications for each type of work.

END OF SECTION

PART 1- GENERAL

Work Included in Section

- .1 Various demolition and removals of existing and for provision of new work, as shown on architectural drawings.
- .2 Restoration of damaged or disturbed Work.
- .3 Removal of surplus materials from the site.

1.2 Related Sections

- .1 Architectural demolition requirements for existing and new work - Divisions 2 through 16.

1.3 Qualifications

- .1 Work of this Section shall be executed by a company having a minimum of five (5) years continuous experience and able to deploy adequate equipment and skilled personnel to complete Work expediently in an efficient and orderly manner.

1.4 Examination

- .1 Examine existing property. Determine nature and extent of materials to be removed.
- .2 Examine adjacent properties. Determine extent of protection required.

1.5 Salvage

- .1 Unless otherwise noted, materials from demolition shall become property of Contractor who shall promptly remove all salvageable material and debris from Site.
- .2 Do not sell material on Site.
- .3 The Owner will review Site prior to commencement of demolition and instruct the Contractor, in writing, as to the items to be retained for re-use or be turned over to the Owner.
- .4 Store material to be salvaged, neatly on wooden pallets, where directed by Owner.
- .5 Remove and store indicated items for future use by Owner. Remove, handle and transport such items to storage area designated on Drawings or to an area within the site designated by Owner. Perform such work carefully and with diligence to prevent any damage to the items during removal and in storage.

1.6 Maintaining Traffic Hauling Operations

- .1 Maintain and preserve Owner's access requirements within, to and from existing building in areas where demolition and removal work is being carried out.
- .2 Do not close, obstruct, place or store material in Owner's driveways and passageways. Conduct operations with minimum interference with roads, streets, driveways, user traffic and passageways.

1.7 Hauling Operations

- .1 Maintain roadways and paving in the hauling areas clean on a daily basis and as required by Municipal authorities.

1.8 Interruptions To Owner's Operations

- .1 There will be absolutely no interruptions to operations in adjoining areas permitted. Therefore, it is imperative that operations and machine and equipment movements, deliveries and removals are executed at time or times that will permit uninterrupted Owner's operations in and around buildings, including parking, deliveries and site and access and egress.

1.9 Safety Requirements

- .1 Undertake Work and effect arrangements required by authorities having jurisdiction for protection of public.
- .2 Coordinate posting of danger signs conspicuously around property. Close doorways and thoroughfares giving access to area of demolition with barricades.
- .3 Provide a competent, experienced supervisor in charge of the Work and on Site while Work is in progress.
- .4 Demolition of spray or trowel-applied asbestos can be hazardous to health. Stop work and notify the Construction Manager immediately should material resembling spray or trowel-applied asbestos be encountered in the course of demolition work, which has not already been identified. Do not proceed until written instructions have been received from the Owner.
- .5 Should any suspect designated substance not already identified, be encountered, cease work in the immediate area and immediately report, to the Owner. Owner is responsible for removal of designated substances.

1.10 Life and Fire Safety

- .1 Provide fire extinguishers in acceptable locations to fire prevention authorities and of type suitable to enable personnel to cope with fire occurring during progress of Work.

1.11 Demolition Drawings

- .1 Submit for approval; drawings, diagrams or details showing sequence of disassembly work and supporting structures.
- .2 Submissions, if required, are to bear stamp of qualified professional engineer registered in Province of Ontario.

1.12 Protection

- .1 Prevent movement, settlement or damage of adjacent structures, services, walks, paving, parts of existing building to remain. Make good damage caused by demolition.
- .2 Take precautions to support affected structures and, if safety of building being demolished or adjacent structures or services appears to be endangered, cease operations and notify Owner.
- .3 Provide temporary weather enclosures to requirements of Division 1.
- .4 Prevent debris from blocking surface drainage system, elevators, mechanical and electrical systems which must remain in operation.
- .5 Provide and maintain necessary fire extinguishers throughout the work to the approval of the Fire Marshal, and located at convenient and accessible points.
- .6 Protect work to remain against damage of any kind.
- .7 Protect building floors and roofing against damage from operations under this Section, including lifting, moving, rolling, etc., of materials. Use 12.7 mm (1/2") thick plywood covers with ends mechanically joined, over floor for any such handling. Over roof, provide 19 mm (3/4") thick plywood under laid with 1" thick polystyrene insulation board adhered to same. Provide same when working from, or over roof surfaces. Be responsible for repairs to flooring or roofing for any damage caused. Execute such repairs to the satisfaction of, and at no cost to Owner.

PART 2 - PRODUCTS

Not applicable

PART 3 – EXECUTION

3.1 Demolition

- .1 Execute Work in accordance with requirements of authorities having jurisdiction.
- .2 At end of each day's work, leave Site in a safe condition and erect safety barriers and lights as required. Ensure that no parts of existing structure are in danger of collapsing.
- .3 Perform demolition work where not specifically indicated, but required to make provisions for new Work.
- .4 Control dust and dirt produced during demolition in accordance with requirements of authorities having jurisdiction.
- .5 Provide any additional materials, labour and services required, not specifically mentioned or shown on Drawings, but necessary for proper completion of Work.
- .6 Cap off existing services as indicated, in accordance with requirements of jurisdictional authorities or as indicated.
- .7 Dispose of demolished materials except where noted otherwise and in accordance with authorities having jurisdiction.
- .8 Leave work in safe condition so that no part is in danger of toppling or falling. Protect interiors of areas not to be demolished from exterior elements.
- .9 Materials forming permanent part of the building that require removal become contractor's property and must be removed from site daily, unless such materials are otherwise specified or shown on Drawings to be reused under this Contract (or turned over to Owner). Remove materials not suitable for reuse as shown on Drawings (as specified) from site.
- .10 Leave building in a "broom-clean" condition on completion of work to Owner's satisfaction.
- .11 Clean existing surfaces specified to receive new applied finishes to assure proper adherence.
- .12 Clean existing surfaces to receive paint finish to paint manufacturer's written specifications and/or recommendations.
- .13 Confine operations and workers to those parts of the building which are defined on Drawings, and exercise great care not to damage existing construction beyond that necessary for the carrying out new work and make good any such damage in every respect.
- .14 Do not disturb adjacent items designated to remain in place.

END OF SECTION

PART 1 – GENERAL

1.0 General Instructions

- .1 Read and be governed by Conditions of the Contract and Sections of Division 1

1.1 Reference Standards

- .1 CAN/CSA-A23.1-94, Concrete Materials and Methods of Construction.
- .2 Construct Municipal sidewalks to requirements of jurisdictional authorities.

PART 2 – PRODUCTS

2.1 Materials

- .1 Cement: to CAN/CSA-A5-93, type 10, normal.
- .2 Water and aggregates: to CAN/CSA-A23.1-94.
- .3 Admixtures: to ASTM C 494 for air entraining admixtures.
- .4 Granular base: MTO Form 1010, Granular A.
- .5 Joint filler: 12.7mm (1/2") thick asphalt impregnated fibreboard to ASTM D1751.
- .6 Joint filler: 12.7mm (1/2") thick sponge rubber to ASTM D1752.
- .7 Lumber: plywood and wood formwork to CAN/CSA-A23.1-94.
- .8 Form stripping agent: colourless, mineral oil, free of kerosene, with viscosity minimum 70, maximum 110 second Saybolt Universal at 38°C, flashpoint minimum 150°C open cup.
- .9 Curing compound: chlorinated rubber type compound to ASTM C309-97, Type 2 (white), Class A.

2.2 Concrete Mixes

- .1 Except where indicated or specified otherwise use concrete mix designed to produce 32MPa minimum compressive strength at 28 days. Exposure to C-2 to CAN/CSA-A23.1-94.
- .2 Accelerating admixtures may be used subject to approval in cold weather. If approved use of admixture shall not relax cold weather placement requirements of CAN/CSA-A23.1-94. Use of calcium chloride is not permitted.
- .3 Provide 5-8% air entraining agent to mix to improve frost resistance. Comply with CAN/CSA-A23.1-94.

PART 3 – EXECUTION

3.1 Examination

- .1 Ensure that subgrade of compacted fill conforms to elevations and sections before placing granular base material.

3.2 Granular Base

- .1 Place granular base to minimum 150mm (6") compacted thickness, or as outlined by pavement design requirements in geotechnical report.
- .2 Compact granular base to 90% Standard Proctor density to ASTM D698-91.

3.3 Forms

Section 02514
Concrete Sidewalks and Curbs

- .1 Construct wood forms for unsupported concrete edges, to Provide straight lines and smooth flowing curved lines as indicated. Apply form stripping agent to surfaces in contact with concrete. Remove forms when concrete fully cured.
- .2 Locate saw-cut crack control joints at 6000mm (20'-0") o.c. at curbs and elsewhere where indicated and/or required.

3.4 Concrete

- .1 Maintain accurate records of poured concrete items to indicated date, location of pour, quality, air temperature and test samples taken.
- .2 Screed concrete to required levels, to tolerance of 12.7mm (1/2") in 3050mm (10'-0").
- .3 Finish concrete sidewalks with consistent directional screeded broom finish.
- .4 Provide tooled crack control joints to sidewalks at 1525mm (5'-0") o.c.
- .5 Apply curing compound to manufacturers specification.

3.5 Clean-Up

- .1 Clear away excess waste and materials and debris resulting from the Work of this section.

END OF SECTION

PART 1 - GENERAL

1.1 General Instructions

- .1 Read and be governed by Conditions of the Contract and Sections of Division 1.

1.2 Section Includes:

- .1 Design, labour, Products, equipment and services necessary for the miscellaneous and metal fabrication Work in accordance with the Contract Documents. See Architectural Drawings and Details

1.3 Quality Assurance

- .1 Execute Work of this Section only by a Subcontractor who has adequate plant, equipment, and skilled workers to perform Work expeditiously, and is known to have been responsible for satisfactory installations similar to that specified during a period of at least the immediate past five years.

1.4 Reference

- .1 ASTM A123, Specification for Zinc (Hot Dip Galvanized) Coatings on Iron & Steel Products.
- .2 ASTM A153, Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- .3 ASTM A307, Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
- .4 ASTM A653/A653M, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc- Iron Alloy-Coated (Galvanealed) by the Hot-Dip Process.
- .5 CAN/CSA-G40.20/G40.21-M, General Requirements for Rolled or Welded Structural Quality Steel/ Structural Quality Steels.
- .6 CAN/CSA G164-M, Hot Dip Galvanizing of Irregularly Shaped Articles.
- .7 CAN/CSA S16.1-M, Limit States Design of Steel Structures.
- .8 CSA S136.1-M, Commentary on CAN/CSA S136-M, Cold Formed Steel Structural Members.
- .9 CSA W47.1, Certification of Companies for Fusion Welding of Steel Structures.
- .10 CSA W48, Filler Metal and Allied Materials for Metal Arc Welding.
- .11 CSA W59-M, Welded Steel Construction (Metal Arc Welding).
- .12 CAN/CSA W117.2-M, Safety in Welding, Cutting and Allied Processes.
- .13 CAN/CGSB 1.40-M, Primer, Structural Steel, Oil Alkyd Type.
- .14 CGSB 1-GP-181, Organic Zinc Rich Primer.
- .15 CGSB 85-GP-16M, Painting Galvanized Steel.
- .16 ASTM B209M, Specification for Aluminum and Aluminum-Alloy Sheet and Plate
- .17 Steel Structures Painting Council (SSPC), Steel Structures Painting Manual, Vol. 2.
- .18 National Association of Metal Manufacturers (NAAMM) Metal Finishes Manual, 2006

1.5 Design Criteria

- .1 Work of this Section which functions to resist forces imposed by dead and liveloads shall conform to requirements of jurisdictional authorities.
- .2 Design work of this Section and applicable shop drawings shall be carried out by a qualified professional engineer licensed to practice in the Place of Work.

- .3 Design details and connections, where not shown on Drawings, in accordance with CAN/CSA-S16.1 and CSA S136.1.

1.6 Submittals

- .1 Submit shop drawings in accordance with Section 01330.
- .2 Clearly indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.
- .3 Shop drawings shall be sealed by a qualified professional engineer licensed to design structures and registered in Place of the Work.

1.8 Delivery, Storage and Handling

- .1 Label, tag or otherwise mark Work supplied for installation by other Sections to indicate its function, location in building and shop drawing designation.
- .2 Protect Work from damage during delivery, storage and handling

PART 2 - PRODUCTS

2.1 Materials

- .1 General:
 - .1 Unless detailed or specified otherwise, standard products will be acceptable if construction details and installation meet intent of Drawings and Specifications.
 - .2 Include materials, products, accessories, and supplementary parts necessary to complete assembly and installation of Work of this Section.
 - .3 Incorporate only metals that are free from defects which impair strength or durability, or which are visible. Install only new metals of best quality, and free from rust or waves and buckles, and that are clean, straight, and with sharply defined profiles.
- .2 Structural shapes, plates, and similar items: CAN/CSA-G40.20/G40.21-M, Grade 350W. Hollow structural sections: CAN/CSA-G40.20/G40.21-M, Grade 350W, Class H.
- .3 Welding materials: CSA W48 and CSA W59-M.
- .4 Fasteners: Conforming to ASTM A307, Grade A, in areas not exposed to view, use unfinished bolts with hexagon heads and nuts. In areas exposed to view, use concealed fasteners or as indicated on drawings/details.
 - .1 Stainless steel fasteners to be used at all stainless steel fabrications
- .5 Primer paint: CAN/CGSB-1.40-M or CPMA 1.73a.
- .6 Drilled inserts: Mega by ITW Construction Products or HSL by Hilti Inc. heavy-duty anchors, sizes as shown, or as per Structural.
- .7 All stainless steel to be Type 304, Blend S Finish, analysis 18-8.
 - .1 Stainless steel countertops to be 14GA (1.8mm)

2.2 FABRICATION

- .1 Verify dimensions of existing Work before commencing fabrications and report any discrepancies to the Consultant.
- .2 Fit and assemble Work in shop where possible. Execute Work in accordance with details and reviewed shop drawings.
- .3 Use self-tapping shake-proof screws on items requiring assembly by screws or as indicated. Use screws for interior metal work. Use welded connections for exterior metal Work unless otherwise found acceptable by the Consultant.

- .4 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush. Seal exterior steel fabrications against corrosion in accordance with CAN/CSA S16.1-M.
- .5 Execute shop welding to requirements specified.
- .6 Carefully make and fit details. Take special care with exposed finished Work to produce a neat and correct appearance to the Consultant's acceptance.
- .7 Assemble members without twists or open joints.
- .8 Correctly size holes for connecting Work of other trades where such can be determined prior to fabrication. Where possible, show holes on shop drawings. Place holes not to cause appreciable reduction in strength of member.
- .9 Draw mechanical joints to hairline tightness and seal countersunk screw and access holes for locking screws with metal filler where these occur on exposed surfaces.

2.3 FABRICATED ITEMS

- .1 Refer to Drawings for details of metal fabrication work and related items not specifically listed in this Section.
- .3 Where work is required to be built into work of other Sections supply such members to respective Sections.
- .4 Exterior Handrails/Guardrails H1, H2 & H3.
- .5 Support at floating vanity/counters
- .6 Miscellaneous steel brackets, supports, angles and fabrications
 - .1 Supply and install or supply for installation by trades responsible, all loose steel brackets, supports and angles where indicated, except where such brackets, supports and angles are specified under work of other Sections. Drill for countersunk screws, expansion anchors and anchor bolts.
 - .2 Unless otherwise specified, prime paint for interior installation; galvanized finish for exterior installation.

2.4 ANCHORS AND FASTENING

- .1 Use weld studs of size not larger than 10 mm for attaching miscellaneous materials and equipment to building steel. If weight of item requires larger fasteners use clips or brackets and secure by welding or through bolting.
- .2 Use self drilling expansion type concrete anchors for attaching to masonry and concrete
- .3 Use steel beam clamps of two bolt design to transmit load to beam web. Do not use C and I clamps.

2.5 WELDING

- .1 Perform welding by electric arc process.
- .2 Execute welding to avoid damage or distortion to Work. Execute welding in accordance with following standards:
 - .1 CSA W48 - for Electrodes. If rods are used, only coated rods are allowed.
 - .2 CSA W59-M and CSA W59S1-M for design of connections and workmanship.
 - .3 CAN/CSA W117.2-M - for safety.
- .3 Thoroughly clean welded joints and expose steel for a sufficient distance to perform welding operations. Finish welds smooth. Supply continuous and ground welds which will be exposed to view and finish paint.

- .4 Test welds for conformance and remove Work not meeting specified standards and replace to Consultant's acceptance.

2.6 SHOP PAINTING

- .1 Clean steel to SSPC SP6 and remove loose mill scale, weld flux and splatter.
- .2 Shop prime steel with one coat of primer paint to dry film thickness of 0.07 mm. Paint on dry surfaces, free from rust, scale, grease. Do not paint when temperature is lower than 7 deg C. Paint items under cover and leave under cover until primer is dry. Follow paint manufacturer's recommendations regarding application methods, equipment, temperature, and humidity conditions.
- .3 Shop prime galvanized steel in accordance with CGSB 85-GP-16M.
- .4 Clean but do not paint surfaces being welded in field.
- .5 Do not paint surfaces embedded in concrete, but clean as if they were to be primed.
- .6 Do not prime machine finished surfaces, but apply an effective anti-rust compound.
- .7 Take precautions to avoid damage to adjacent surfaces.

PART 3 - EXECUTION

3.1 Examination

- .1 Take site measurements to ensure that Work is fabricated to fit surrounding construction, around obstructions and projections in place, or as shown on Drawings, and to suit service locations.

3.2 Installation

- .1 Install Work plumb, true, square, straight, level, and accurately and tightly fitted together and to surrounding Work and as required for proper performance.
- .2 Include with Work of this Section anchor bolts, high tensile bolts, washers and nuts, expansion bolts, toggles, straps, sleeves, brackets, clips, and other items necessary for secure installation as required by loading and jurisdictional authorities. Weld to CAN/CSA-S16.1-94.
- .3 Countersink holes provided for wood screws where wood is attached to Work of this Section.
- .4 Attach Work to interior concrete and masonry with corrosion resistant expansion bolts to support load with a safety factor of three (3).
- .5 Attach Work to exterior concrete and masonry with non-shrink epoxy grout to support load with a safety factor of three (3).
- .6 Insulate between dissimilar metals or between metal, and masonry or concrete with bituminous paint to prevent electrolytic action.
- .7 Grout metal posts, pickets, balusters, and the like, in metal sleeves cast into concrete, with non-shrink quick setting epoxy anchor cement, unless detailed otherwise. Fabricate sleeves of 75 mm (3") minimum depth.
- .8 Hand items over for casting into concrete or building into masonry to appropriate trades together with setting templates.

3.3 Field Painting

- .1 Paint bolt heads, washers, nuts, field welds and previously unpainted items. Touch up shop primer damaged during transit and installation, with primer to match shop primer.

3.4 Adjustment and Cleaning

- .1 Remove damaged, dented, defaced, defectively finished, or tool marked components and replace with new.

3.5 Protection

- .1 Maintain protection of Work of this Section from time of installation until final finishes are applied or to final cleanup.

END OF SECTION

PART 1 - GENERAL

1.1 Definition

- .1 Architectural woodwork: Shall mean custom fabricated cabinetry, counters/countertops, wood door frames, custom fabricated wall/ceiling panels.

1.2 Quality Assurance

- .1 The "Quality Standards" of the Architectural Woodwork Manufacturers Association of Canada (AWMAC), Edition 2, 2014 together with authorized additions and amendments, shall be used as a reference standard and shall form part of this Project Specification.
- .2 Where modifications to the AWMAC Quality Standards contained within the Manual are included in this Project Specification, then such modifications shall govern in case of conflict.
- .3 Any reference in Custom or Premium grade in this Specification shall be as defined in the AWMAC Quality Standards.
- .4 Any item not given a specific quality grade shall be Premium grade as defined in the AWMAC Quality Standards.
- .5 All architectural woodwork to be used in the Project shall meet the requirements of the AWMAC Quality Standards for the particular grade specified.
- .6 References in this Specification to part and item numbers mean those parts and items contained within the AWMAC Quality Standards Manual.

1.3 Submittals

- .1 Shop Drawings:
 - .1 Prepare and submit to the Consultant for review Shop Drawings for architectural woodwork in accordance with 01330.
 - .2 Shop Drawings shall show wood and metal construction details of all architectural details of all general arrangements, locations of all service outlets: typical and special installation conditions; materials being supplied and all connections, attachments, anchorage and location of exposed fastenings, as applicable, field measured dimensions and coordination with other trade Contractors.
 - .3 Shop Drawings shall incorporate plans, elevations, sections and details for all architectural woodwork included in this Section.
 - .4 No Work shall be fabricated until the Shop Drawings have been reviewed and all other related submittals, and samples as required by the Specifications, have been approved by the Consultant.
 - .5 Submission of Consultant's Drawings for Shop Drawings is not acceptable.
- .2 Samples:
 - .1 Provide 3 samples of each plastic laminate, wood veneer and solid polymer surface to Consultant for review.
- .3 Brochures:
 - .1 Submit manufacturer's descriptive literature of specialty items not manufactured by the architectural woodwork manufacturer as required by the Consultant.

1.4 Product Handling and Storage

- .1 The architectural woodwork manufacturer and the Contractor shall be jointly responsible to make certain that architectural woodwork are not delivered until the building and storage areas are sufficiently dry so that the architectural woodwork will not be damaged by excessive changes in moisture content.

- .2 Architectural woodwork delivery, storage, and handling shall be in accordance with AWMAC Quality Standards.
- .3 Delivered, materials which are damaged in any way or do not comply with these Specifications will be rejected by the Consultant and shall be removed from the job site and replaced with acceptable materials.

1.5 Warranty

- .1 Warrant labour, materials and Workmanship against defects and deficiencies for a period of two (2) years after the date of Substantial Performance.

PART 2-PRODUCTS

2.1 Millwork

- .1 General: Use clean stock only and comply with AWMAC Quality Standards grades as indicated.
- .2 **Plastic Laminate (Plam):** 1.6 mm thick, (allow for 3 colours)
 - .1 Manufacturer: Abet Laminati, Wilsonart, Nevemar, Pionite or Formica
 - .2 Colour: to be selected by Consultant from full colour range
- .3 **Solid Polymer Fabrication (SO):** Solid, mineral based, non porous surfacing material, acrylic; not coated, laminated or of composite construction; in accordance with ANSI Z124 Type 6 and meeting the following:
 - .1 Properties:
 - .1 Tensile strength (ASTM D638-84): 6000psi.
 - .2 Tensile modulus (ASTM D638-84): 1.5 x 10 psi.
 - .3 Elongation (ASTM D638-84): 0.4%
 - .4 Hardness (Rockwell "M" Scale): 94.
 - .5 Hardness (Barcol Impressor): 60.
 - .6 Gloss – 60 deg. Gardner 9ANSI Z124-80, HUD Bulletin UM-73-84): 5 – 20.
 - .7 Colour stability (NEMA LD3): no change 200 hours.
 - .8 Wear, cleanability (ANSI Z124-80, HUD Bulletin UM-73-84): pass.
 - .9 Fire hazard (ASTM E84):
 - .1 Flame spread: maximum 15.
 - .2 Smoke developed: maximum 25.
 - .10 Water absorption (ASTM D570-81): 0.04% @ 24 hours/0.4% @ long term for 19 mm thickness sample.
 - .11 Stain resistance (ANSI Z124).
 - .2 Acceptable Manufacturers:
 - .1 Solid Surface by Wilsonart
 - .2 Corian as manufactured by DuPont.
 - .3 Staron as manufactured by Samsung.
 - .3 Colour: Wilsonart, Angel Falls 9223SS.
- .4 **Quartz (QTZ):** Solid, mineral based, non porous surfacing material, acrylic; not coated, laminated or of composite construction; in accordance with ANSI Z124 Type 6 and meeting the following:
 - .1 Properties:
 - .1 Tensile strength (ASTM D638-84): 6000psi.
 - .2 Tensile modulus (ASTM D638-84): 1.5 x 10 psi.

- .3 Elongation (ASTM D638-84): 0.4%
- .4 Hardness (Rockwell "M" Scale): 94.
- .5 Hardness (Barcol Impressor): 60.
- .6 Gloss – 60 deg. Gardner 9ANSI Z124-80, HUD Bulletin UM-73-84): 5 – 20.
- .7 Colour stability (NEMA LD3): no change 200 hours.
- .8 Wear, cleanability (ANSI Z124-80, HUD Bulletin UM-73-84): pass.
- .9 Fire hazard (ASTM E84):
 - .1 Flame spread: maximum 15.
 - .2 Smoke developed: maximum 25.
- .10 Water absorption (ASTM D570-81): 0.04% @ 24 hours/0.4% @ long term for 19 mm thickness sample.
- .11 Stain resistance (ANSI Z124).
- .2 Acceptable Manufacturers:
 - .1 Quartz by Wilsonart, Zodiaq by DuPont or equivalent.
- .3 Colour: Wilsonart Grey Lake Q1009
- .5 Hardwood lumber: moisture content 12 % or less in accordance with National Hardwood Lumber Association (NHLA) and AWMAC premium grade.
 - .1 Species: poplar where scheduled to receive paint finish, white oak where scheduled to receive stain finish.
- .6 Plywood: veneer core, softwood, 19 mm thick typical unless otherwise indicated.
 - .1 Softwood: to CSA 0151.
 - .2 Fir to CSA0121-M1978.
 - .3 Hardwood plywood: to CSA O115.
 - .4 Poplar plywood (PP): to CSA O153, standard construction
 - .5 Where plywood is used for wall construction, the Flame Spread rating must be 150 or less on any exposed surface, or any surface that would be exposed by cutting through the material in any direction.
 - .6 Where plywood is used in ceiling construction, the Flame Spread rating must be 25 or less on any exposed surface, or any surface that would be exposed by cutting through the material in any direction.
- .7 Particle board: not permitted
- .8 Medium density fibreboard (MDF): to ANSI A208.2, density 769 kg/m. Medium density fibreboard must:
 - .1 meet the performance requirements of ANSI A208.2.
 - .2 be manufactured such that formaldehyde emissions do not exceed [0.15] ppm (180 g/m) when tested in accordance with ASTM E 1333.
 - .3 contain at least [15] % recycled materials by weight.
 - .4 Where MDF is used for wall construction, the Flame Spread rating must be 150 or less on any exposed surface, or any surface that would be exposed by cutting through the material in any direction.
 - .5 Where MDF is used in ceiling construction, the Flame Spread rating must be 25 or less on any exposed surface, or any surface that would be exposed by cutting through the material in any direction.
- .9 Sealant: As per 07920.

2.2 Millwork Hardware

.1 As per Drawings/details.

2.3 Millwork Finishing - General

.1 Finish all interior millwork surfaces in plastic laminate, unless otherwise indicated.

2.4 Fabrication - General

- .1 Obtain all on-Site dimensions before fabricating items. Obtain all relevant data and incorporate provisions for items of equipment enclosed by millwork.
- .2 Verify wall alignment prior to proceeding with fabrication. Site conditions at variance with reviewed Shop Drawings shall be specifically noted on reviewed Drawings and forwarded to Consultant. Variances, due to Site conditions necessitating revisions to Shop Drawings shall be accepted prior to fabrication.
- .3 Fabricate running members in maximum standard lengths obtainable for the particular species wherever possible.
- .4 Fit all joints tight. Locate joints at points which will not interfere with, affect strength or detract from appearance of materials.
- .5 Securely fasten intersecting framing members together at corners in an approved manner. Reinforce as required for rigid assembly designed for applicable loads.
- .6 Wherever practicable, install, fit and adjust all hardware specified, in shop.
- .7 Incorporate adequate provisions for scribing and fitting to adjoining surfaces in a manner acceptable to Consultant.
- .8 Provide for and incorporate provisions to recognize inherent shrinkage characteristics of materials specified.
- .9 Casework core material: 19 mm veneer core plywood.
- .10 Casework edge trim: Plastic laminate with plastic laminate millwork and solid wood lippings with wood veneer millwork.
- .11 Plastic laminate finish at all exposed surfaces, including cabinet/drawer interiors unless noted otherwise.

2.5 Accessories

- .1 Nails and staples: to CSA B111; galvanized to CAN/CSA-G164 for exterior work, interior humid areas and for treated lumber; stainless steel finish elsewhere.
- .2 Wood screws: to CSA B35.4 stainless steel, type and size to suit application.
- .3 Splines: wood.
- .4 Adhesive: recommended by manufacturer.
- .5 Use least toxic sealants, adhesives, sealers, and finishes necessary to comply with requirements of this section.

PART 3 - EXECUTION

3.1 Job Conditions

- .1 Job conditions for installation of architectural woodwork shall be as specified under AWMAC Quality Standards.

3.2 Installation

- .1 Cabinet and Casework: Install in accordance with Section 705 of the AWMAC Quality Standards.
- .2 Panelling and Trim: Install in accordance with Section 706 of the AWMAC Quality Standards.

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- .3 Finish Hardware: Install finish hardware in accordance with Section 711 of the AWMAC Quality Standards.
- .4 All cutting and fitting of trim around fixtures and receptacles to be done as no extra cost to Contract.
- .5 Scribe countertops to wall during installation. Install silicone sealant at backsplash/wall junction at time of installation. Colour to Consultant's selection.

END OF SECTION

1.0 GENERAL

1.1 DOCUMENTS

- .1 This Section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 SUMMARY

- .1 Section Includes: Furnishing of all labour, materials, services and equipment necessary for the supply and installation of firestopping as indicated on drawings and as specified.
- .2 Related Work:
 - .1 Cast-In-Place Concrete: Section 03300
 - .2 Concrete Masonry Units: Section 04220
 - .3 Joint Sealants: Section 07920
 - .4 Gypsum Wall Board: Section 09250
 - .5 Mechanical: Division 15
 - .6 Electrical: Division 16

1.3 REFERENCES

- .1 CAN4-S115-M85, "Standard Method of Fire Tests of Firestop Systems".

1.4 SUBMITTALS

- .1 Make submittals in accordance with Section 01330 - Submittals.
- .2 Product Data: Submit three copies of manufacturer's specification and installation instructions for each type of material required. Include data substantiating that materials comply with specified requirements.
- .3 Shop Drawings: Submit shop drawings to show proposed material, reinforcement, anchorage, fastenings and method of installation. Construction details should accurately reflect actual job conditions.
- .4 Samples: Submit duplicate 300 mm x 300 mm (12" x 12") samples showing actual firestop material proposed for project.

1.5 DELIVERY, STORAGE, & HANDLING

- .1 Comply with manufacturer's recommendations for handling, storage and protection during installation.
- .2 Do not allow materials to become wet or soiled, or covered with ice or snow.

1.6 JOB CONDITIONS

- .1 Examine substrate and the conditions under which the insulation work is to be performed. Do not proceed with firestopping work until unsatisfactory conditions have been corrected.

1.7 FIRE-RESISTANCE RATINGS

- .1 Ratings of firestop systems shall be not less than the fire-resistance ratings noted on drawings and required by authorities having jurisdiction for firestopping of the floor, wall, ceiling and roof assemblies involved.
- .2 Ratings of firestop assemblies for service penetrations shall be not less than the fire-resistance rating of the floor, wall, ceiling or roof assembly being penetrated.

- .3 Use only ULC tested firestopping assemblies as approved by the Consultant prior to firestop installations.

2.0 PRODUCTS

2.1 MATERIALS

- .1 Firestopping Systems: In accordance with CAN4-S115-M85. All firestopping systems installed shall be from single manufacturer. Trade Contractors shall coordinate with General Contractor.
 - .1 Accepted Products:
 - .1 "Fire & Smoke Containment Systems" by Tremco Ltd., Construction Division.
 - .2 "Firebarrier Firestop Systems" by A/D Fire Protection Systems Inc.
 - .3 "Fire Protection Products" by Electrical Products Division/3M.
 - .4 "Firestop Systems" by Hilti (Canada) Limited.
 - .5 Or approved alternative.
 - .2 Asbestos-free materials and systems capable of maintaining an effective barrier against flame, smoke and gases in compliance with requirements of CAN4-S115-M85 and not to exceed opening sizes for which they are intended.
 - .3 Firestop System Rating: Equal to fire separation rating as noted on drawings.
- .2 Service Penetration Assemblies: Certified by ULC in accordance with CAN4-S115-M85 and listed in ULC Guide No. 40 U19.
- .3 Service Penetration Firestop Components: Certified by ULC in accordance with CAN4-S115-M85 and listed in ULC Guide No. 40 U19.13 and ULC Guide No. 40 U19.15 under the Label Service of ULC.
- .4 Fire-resistance rating of installed fire stopping assembly not less than the fire-resistance rating of surrounding floor and wall assembly.
- .5 Firestopping at openings intended for ease of re-entry such as cables: Elastomeric or resilient seal; do not use cementitious or rigid seal at such locations.
- .6 Firestopping at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control: Elastomeric or resilient seal; do not use a cementitious or rigid seal at such locations.
- .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.

3.0 EXECUTION

3.1 PREPARATION

- .1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials. Ensure that substrates and surfaces are clean, dry and frost free.
- .2 Prepare surfaces in contact with firestopping materials 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.

3.2 INSTALLATION

- .1 Install firestopping material and components in accordance with ULC certification and manufacturer's instructions.
- .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 a neat finish.
- .5 Remove excess compound promptly as work progresses and upon completion.

3.3 INSPECTION

- .1 Notify Consultant when ready for inspection and prior to concealing or enclosing firestopping materials and service penetration assemblies.

3.4 SCHEDULE

- .1 Firestop at:
 - .1 Edges of floor slabs and rated roof slabs at slab edge covers, aluminum windows/curtain wall.
 - .2 Deflection space at top of fire-resistance rated masonry and gypsum board walls.
 - .3 Intersections of fire-resistance rated masonry walls to concrete and to gypsum board walls and of fire-resistance rated gypsum board walls to concrete and to masonry.
 - .4 Penetrations through fire-resistance rated masonry, concrete and gypsum board walls.
 - .5 Penetrations through fire-resistance rated floors, ceilings and roofs.
 - .6 Openings and sleeves installed for future use through fire separations.
 - .7 Control and sway joints in fire-resistance rated masonry and gypsum board partitions and walls.
 - .8 Firestopping around mechanical and piping assemblies penetrating fire separations by Division 15 - Mechanical. Firestopping systems and products to be coordinated with this specification section.
 - .9 Firestopping around electrical assemblies penetrating fire separations by Division 16 - Electrical. Firestopping systems and products to be coordinated with this specification section.

3.5 CLEAN-UP

- .1 Remove excess materials and debris and clean adjacent surfaces immediately after application.
- .2 Remove temporary dams after initial set of fire stopping and smoke seal materials.

END OF SECTION.

PART 1 – GENERAL

1.1 SECTION INCLUDES

- .1 Labour, Products, equipment and services necessary for sealant Work in accordance with the Contract Documents.
- .2 Work of this Section does not include sealants in firestopping and smoke sealed assemblies.

1.2 REFERENCES

- .1 ASTM C834, Specification for Latex Sealants.
- .2 ASTM C920, Specification for Elastomeric Joint Sealants.
- .3 ASTM C1330, Specification for Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.

1.3 SUBMITTALS

- .1 Product data: Submit copies of Product data in accordance with the Conditions of the Contract describing type, composition and recommendations or directions for surface preparation, material preparation and material installation.
- .2 Samples: Submit following samples in accordance with the Conditions of the Contract.
 - .1 Two samples of sealant/caulking, for colour selection.
 - .2 Two samples of back-up material and primer for physical characteristics.

1.4 QUALITY ASSURANCE

- .1 Qualifications: Work of this Section shall be executed by trained applicators approved by sealant manufacturer and having a minimum of 5 years proven experience.

1.5 SITE CONDITIONS

- .1 Do not install materials when ambient air temperature is less than 5°C, when recesses are wet or damp, or to manufacturer's recommendations.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Arrange delivery of materials in original, unopened packages with labels intact, including batch number, and ensure that on-site storage is kept to a minimum. Do not store materials on site where there exists any danger of damage from moisture, direct sunlight, freezing and other contaminants.

1.7 WARRANTY

- .1 Submit a warranty for Sealant Work in accordance with General Conditions, except that warranty period is extended to 2 years. Warrant against leakage, cracking, crumbling, melting, shrinkage, running, loss of adhesion and staining adjacent surfaces. Warranty shall be for complete replacement including affected adjacent Work.

PART 2 - PRODUCTS

2.1 Materials

- .1 General:
 - .1 All materials under Work of this Section, including but not limited to, primers and sealants are to have low VOC content limits.

- .2 Use materials as received from manufacturers, without additives or adulterations. Use one manufacturer's Product for each kind of Product specified.
 - .2 Sealant **Type A**: ASTM C920, Type M, Grade NS, Class 25; Two-part, Polyurethane non-sag type, in standard colours selected.
 - .1 Sikaflex 2C-NS by Sika Canada Inc.
 - .2 Dymeric 240 by Tremco Ltd.
 - .3 Sealant **Type B**: ASTM C920, Type S, Grade NS; One-part mildew-resistant silicone, in standard colours selected.
 - .1 786 Mildew Resistant Silicone Sealant by Dow Corning Inc.
 - .2 Tremsil 200 Silicone Sealant by Tremco Ltd.
 - .4 Sealant **Type C**: ASTM C834; Pure acrylic siliconized sealant; in standard white colour (paintable).
 - .1 Tremflex 834 Siliconized Sealant by Tremco Ltd.
 - .2 CRL 800 Acrylic Latex Caulk with Silicone by CR Laurence Ltd
- 2.2 Accessories
- .1 Primers: Type recommended by material manufacturers for various substrates, primers to prevent staining of adjacent surfaces encountered on project.
 - .2 Joint backing: ASTM C1330; Round, solid section, closed cell, skinned surface, soft polyethylene foam gasket stock, compatible with primer and sealant materials, 30 to 50% oversized, Shore A hardness of 20, tensile strength 140 to 200 kPa. Bond breaker type surface.
 - .3 Bond breaker: Type recommended by material manufacturers.
 - .4 Void filler around the window frames to be one part expanding polyurethane foam.
 - .5 Cleaning agents: As recommended by material manufacturer, non-staining, harmless to substrates and adjacent finished surfaces.
- 2.3 Mixing
- .1 Follow manufacturers instructions on mixing, shelf and pot life.

PART 3 – EXECUTION

3.1 Preparation

- .1 Prepare joints to receive sealants to manufacturer's instructions. Ensure that joints are clean and dry and ferrous surfaces are free from rust and oil.
- .2 Clean recesses to receive sealant, to be free of dirt, dust, loose material, oil, grease, form release agents and other substances detrimental to sealant's performance.
 - .1 Remove lacquer or other protective coatings from metal surfaces, without damaging metal finish, using oil-free solvents. Remove rust, mill scale and coatings from ferrous metals by wire brush, grinding or sand blasting.
 - .2 Ensure recess is dry.
 - .3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings. Remove incompatible coatings as required.
- .3 Ensure that all materials in contact with sealant are compatible. Test substrate for adhesion.
- .4 Depth of recess: Maintain depth to ½ joint width up to a maximum of 13 mm and not less than 6 mm at centre of joint. For greater depth, use joint backing under. Where recess is less than specified depth, cut back surface of recess to specified recess depth.

- .5 Install polyethylene backing rod in joints 6 mm or more in width. Roll backing rod into joint. Do not stretch or bend backing rod. Install bond breaker to back of recess.
- .6 Prime sides of recess, in accordance with sealant manufacturer's instructions.
- .7 Condition products for use in accordance with manufacturer's recommendations.

3.2 Installation

- .1 Apply sealant immediately after adjoining Work is in condition to receive such Work. Apply sealant in continuous bead using gun with correctly sized nozzle. Use sufficient pressure to evenly fill joint.
- .2 Ensure sealant has full uniform contact with, and adhesion to, side surfaces of recess. Superficial painting with skin bead is not acceptable. Tool sealant to smooth stains or other defects.
 - .1 At recesses in angular surfaces, finish sealant with flat profile, flush with face of material at each side.
 - .2 At recesses in flush surfaces, finish compound with concave face, flush with face of material at each side.
- .3 Make sealant bead uniform in colour.
- .4 Cure sealants in accordance with sealant manufacturer's instructions. Do not cover up sealants until proper curing has taken place.
- .5 Immediately remove excess compound or droppings which would set up or become difficult to remove from adjacent finished surfaces, using recommended cleaners, as work progresses. Do not use scrapers, chemicals or other tools which could damage finished surfaces. Remove defective sealant.
- .6 Clean recesses and re-apply sealant.
- .7 Remove masking tape immediately after joints have been sealed and tooled.

3.3 Cleaning

- .1 Clean surfaces adjacent to joints, remove sealant smears or other soiling resulting from application of sealants. At metal surfaces, remove residue. Do not mar or damage finishes on materials adjacent to joints. Repair or replace marred or damaged materials.

3.4 Schedule of Locations

- .1 Following sealant location schedule is included for convenience and may not be complete. Examine Contract Drawings and other specification sections and determine entire extent of Work of this Section. Generally seal following locations:
 - .1 Concrete, masonry, wood and stone to metal.
 - .2 Wood to masonry, concrete and stone.
 - .3 Metal to metal.
 - .4 All dissimilar materials.
- .2 Sealant **Type A**:
 - .1 Exterior joints between masonry and steel or aluminum.
 - .2 Exterior joints between masonry and shelf angle.
 - .3 Exterior joints between steel or aluminum and concrete or masonry.
 - .4 Interior and exterior control joints, except in floors.
 - .5 Door frames, louvre frames, interior and exterior side.
 - .6 Protrusions through interior and exterior walls and floors, interior and exterior side, except where fire rated seals are required.

- .7 Seal thresholds.
- .3 Sealant **Type B**:
 - .1 Control joints in tiled areas.
 - .2 Between vanity and tile.
 - .3 Between vanity and mechanical fixtures/ittings.
 - .4 Between access panels and tile.
 - .5 Between tiles and adjacent materials.
- .4 Sealant **Type C**:
 - .1 Perimeter of interior windows.
 - .2 Perimeter of firehose cabinets.
 - .3 Junction between drywall and masonry.

END OF SECTION

PART 1 - GENERAL

1.1 Work Included

As detailed or scheduled in the contract documents, supply of:

- .1 Steel frame products including frames, transom frames (glazed or paneled), sidelight and window assemblies, fire-rated and non-rated.
- .2 Steel doors, swing type, flush, with or without embossed face sheets, with or without glazed or louvered openings, fire-rated, with or without temperature rise ratings, and non-rated.
- .3 Solid core wood doors.

1.2 References

- .1 ANSI/NFPA 80-1999, Standard for Fire Doors and Fire Windows
- .2 ASTM A653/A653M-05a, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process
- .3 ASTM C553-02, Specification for Mineral Fiber Blanket Insulation for Commercial and Industrial Applications
- .4 ASTM C578-05, Specification for Rigid, Cellular Polystyrene Thermal Insulation
- .5 ASTM C591-01, Specification for Un-Faced Pre-formed Rigid Cellular Polyisocyanurate Thermal Insulation
- .6 ASTM C592-04, Specification for Mineral Fiber Batt and Blanket Thermal Insulation for Light Frame Construction
- .7 ASTM C1289-05a, Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board
- .8 CAN4-S104-M80, Standard Method for Fire Tests of Door Assemblies
- .9 CAN4-S106-M80, Standard Method for Fire Tests of Window and Glass Block Assemblies
- .10 CGSB 41-GP-19MA (1984), Rigid Vinyl Extrusions for Windows and Doors
- .11 CSA W59-2003, Welded Steel Construction (Metal Arc Welding)
- .12 CSDMA, Recommended Dimensional Standards for Commercial Steel Doors and Frames, 2000
- .13 CSDMA, Selection and Usage Guide for Steel Doors and Frames, 1990
- .14 CSDMA, Recommended Specifications for Commercial Steel Door and Frame Products – 08 11 00, 2006
- .15 Architectural Woodwork Manufacturers Association of Canada (AWMAC)
 - .1 Quality Standards for Architectural Woodwork (Latest addition).

1.3 Submittals

- .1 Submit shop drawings in accordance with Section 01330.
- .2 Indicate each type of door, frame, steel, construction and core.
- .3 Indicate material thickness, mortises, reinforcements, anchorages, locations of exposed fasteners, openings (glazed, paneled or louvered) and arrangement of standard hardware.
- .4 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule of the Architect.

- .5 Contractor responsible for coordination and installation of products provided under this Section shall;
 - .1 Verify and provide to the contractor responsible for the supply of steel door and frame products, actual opening sizes and field conditions by field measurement before fabrication. Submittal drawings shall reflect measurements and conditions provided, and product manufactured accordingly. Coordinate field measurements with fabrication and construction schedules to avoid delays.
 - .2 Verify that substrate conditions, whether existing or installed under other Sections, are as detailed in the Architect's drawings, and are acceptable for product installation in accordance with the manufacturer's instructions.
- .6 Manufacturer shall not proceed with fabrication without receipt of approved submittal drawings and approved hardware schedule.

1.4 Warranty

- .1 Materials and workmanship shall be warranted by the manufacturer for a period of one (1) year from date of substantial performance.

PART 2 - PRODUCTS

2.1 Hollow Metal Door Materials

- .1 Acceptable Materials: Steel doors and frame product manufactured in accordance with this Specification by CSDMA members, are eligible for use on this project.
- .2 Steel: Commercial grade steel to ASTM A653, CS, Type B, Coating Designation ZF75 (A25) minimum. Minimum steel thicknesses shall be in accordance with Appendix 1 of the CSDMA, "Recommended Specifications for Commercial Steel Door and Frame Products".
 - .1 Interior Doors: Face sheets shall be 0.042 in. (1.0 mm) minimum thickness.
- .3 Door Core Materials
 - .1 Interior Doors: Fiberglass: Loose batt type, density 24 kg/m³ (1.5 pcf) minimum, conforming to ASTM C553 or ASTM C592.
- .4 Primers
 - .1 Rust inhibitive touch-up only.
- .6 Miscellaneous
 - .1 Door Silencers. Single stud rubber/neoprene type.
 - .2 Exterior Top Caps. Rigid polyvinylchloride extrusion conforming to CGSB 41-GP-19MA.

2.2 Glass and Glazing

- 1 General: All materials under work of this Section, including but not limited to, primers, coatings, sealers, sealants, adhesives and cleaners are to have low VOC content limits.
- .2 Tempered glass (**TGL**): CAN/CGSB-12.1-M, Type 2, Class B, Category II, minimum 6 mm thick, clear.

2.3 Fabrication – Hollow Metal Frame Products

- .1 Frame products shall be 16 gauge. Interior frames, transoms, sidelight and window assemblies shall be welded type construction. Exterior transom frames, sidelight and window assemblies shall be welded type construction, thermally broken.
- .2 Frame product shall be mortised, blanked, reinforced, drilled and tapped at the factory for templated hardware only, in accordance with the approved hardware schedule and templates provided by the hardware supplier.

- .3 Mortised cutouts shall be protected with steel guard boxes.
- .4 Frame product shall be reinforced only, where required, for surface mounted hardware, anchor hinges, thrust pivots, pivot reinforced hinges, or non-templated hardware. Drilling and tapping is by others, on site, at time of installation.
- .5 Provide anchorage appropriate to floor, wall and frame construction. Each wall anchor shall be located immediately above or below each hinge reinforcement on the hinge jamb and directly opposite on the strike jamb. For rebate opening heights up to and including 1520 mm (60") provide two (2) anchors, and an additional anchor for each additional 760 mm (30") of height or fraction thereof, except as indicated below. Frames in previously placed concrete, masonry or structural steel shall be provided with anchors located not more than 150 mm (6") from the top and bottom of each jamb, and intermediate anchors at 660 mm (26") on centre maximum. Fasteners for such anchors shall be provided by others.
- .6 Minimum reinforcing, anchor and other component gauges shall be in accordance with Table 1 of the CSDMA, "Recommended Specifications for Commercial Steel Door and Frame Products".
- .7 Each door opening shall be prepared for single stud rubber door silencers, three (3) for single door openings, two (2) for double door openings, except on gasketed frame product.
- .8 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.
- .9 Fire-rated frame products shall be provided for those openings requiring fire protection as determined and scheduled by the Architect. Frames, transom and sidelight assemblies shall be listed for conformance with CAN4-S104. Window assemblies shall be listed for conformance with CAN4-S106. All fire-rated frame products shall bear the label of, and be listed by a nationally recognized testing agency having a factory inspection service. Labeling shall be in accordance with NFPA 80, the listing authority's policies and label materials, and shall identify the manufacturer. Fire-rated frame products shall be constructed as listed for labeling in the Follow-Up Service Procedures/Factory Inspection Manuals issued by the listing agency to individual manufacturers
- .10 Provide grout guards fabricated from not less than 0.016 in. (0.4 mm) thick steel at all hardware mortises on frame product to be grouted.

2.4. Welded Type

- .1 Frame product shall be accurately mitered or mechanically jointed.
- .2 As defined in Appendix 2 of the CSDMA, "Recommended Specifications for Commercial Steel Door and Frame Products", frame product perimeter corner joints shall be:
 - .1 Face welded; continuously welded on the profile faces, with exposed faces filled and ground to a smooth, uniform, seamless surface.
- .3 Joints at mullions, sills and center rails shall:
 - .1 Be coped accurately, butted and tightly fitted.
 - .2 At intersecting flush profile faces, be securely welded, filled and ground to a smooth, uniform, seamless surface.
 - .3 At intersecting recessed profile faces, be securely welded to concealed reinforcements, with exposed hairline face seams.
 - .4 At all other intersecting profile elements, have exposed hairline face seams.
- .4 Welding shall conform to CSA W59.
- .5 Where frame product is to be installed prior to the adjacent partition, a floor anchor shall be securely attached to the inside of each jamb profile. Each floor anchor shall be provided with two (2) holes for securing to the floor. For conditions that do not permit the use of a floor anchor, an additional wall anchor, located within 150 mm (6") of the base of the jamb, shall be substituted.

- .6 Weld in two (2) temporary jamb spreaders per door opening to maintain proper alignment during shipment and handling, which shall not be used for installation.
- .7 Glazing stops shall be formed steel channel, minimum 16 mm (0.625") height, accurately fitted, butted at corners and fastened to frame sections with counter-sunk oval head sheet metal screws.
- .8 When required due to site access, when advised by the contractor responsible for coordination or installation, as specified on the Architect's drawings or due to shipping limitations, frame product for large openings shall be fabricated in sections as designated on the approved submittal drawings, with splice joints for field assembly and welding by others.
- .9 Prior to shipment, mark each frame product with an identification number as shown on the approved submittal drawings.
- .10 Refer to drawings/details/schedules for frame depth/throat opening sizes

2.5 Fabrication – Hollow Metal Doors

- .1 General
 - .1 Interior doors shall be welded stiffener construction. Exterior doors shall be laminated core construction.
 - .2 Longitudinal edges shall be continuously welded, filled and sanded with no visible edge seams.
 - .3 Doors shall be mortised, blanked, reinforced, drilled and tapped at the factory for template hardware only, in accordance with the approved hardware schedule and templates provided by the hardware supplier.
 - .4 Holes 12.7 mm (0.5") diameter and larger shall be factory prepared, except mounting and through-bolt holes, which are by others, on site, at time of hardware installation. Holes less than 12.7 mm (0.5") diameter shall be factory prepared only when required for the function of the device (for knob, lever, cylinder, thumb or turn pieces) or when these holes over-lap function holes.
 - .5 Doors shall be reinforced only, where required, for surface mounted hardware, anchor hinges, thrust pivots, pivot reinforced hinges, or non-templated hardware. Drilling and tapping is by others, on site, at time of installation.
 - .6 Top and bottom of doors shall be provided with inverted, recessed, welded steel channels. Exterior doors, and where otherwise scheduled by the Architect, shall be provided with flush steel top caps.
 - .7 Minimum reinforcing and component gauges shall be in accordance with Table 1 of the CSDMA, "Recommended Specifications for Commercial Steel Door and Frame Products".
 - .8 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.
 - .9 Fire-rated doors shall be provided for those openings requiring fire protection and temperature rise ratings, as determined and scheduled by the Architect. Such products shall be listed for conformance with CAN4-S104. All fire-rated doors shall bear the label of, and be listed by a nationally recognized testing agency having a factory inspection service. Labeling shall be in accordance with NFPA 80, the listing authority's policies and label materials, and shall identify the manufacturer. Fire-rated doors shall be constructed as listed for labeling in the Follow-Up Service Procedures/Factory Inspection Manuals issued by the listing agency to individual manufacturers.
 - .10 Prior to shipment, mark each door with an identification number as shown on the approved submittal drawings.
- .2 Welded Stiffener Construction (Interior Doors)
 - .1 Both face sheets for interior doors shall be formed from a sheet of 18 gauge steel.
 - .2 Doors shall be reinforced with vertical stiffeners, securely welded to each face sheet at 150 mm (6") on center maximum.

- .3 Voids between vertical stiffeners shall be filled with fiberglass batt type insulation.

PART 3 - EXECUTION

.1 Site Storage and Protection of Materials

- .1 Doors and frame product shall be removed from their wrappings or coverings upon receipt on site, be stored in a vertical position, and be spaced with blocking to permit air circulation between them.
- .2 All materials shall be thoroughly inspected upon receipt and all discrepancies, deficiencies and/or damages shall be immediately reported, in writing, to the supplier.
- .3 All damages incurred during shipment shall be noted on the carrier's Bill of Lading and immediately reported, in writing, to the supplier.
- .4 Any scratches or disfigurement of doors or frame product caused by shipping or handling shall be promptly cleaned and touched-up with a zinc-rich primer.
- .5 All materials shall be properly stored on planks or dunnage, out of water and covered to protect from damage from any cause.

.2 Installation

- .1 Prior to installation, remove temporary shipping spreaders.
- .2 Prior to installation, the area of floor on which the frame is to be installed, and within the path of the door swing, shall be checked and corrected for flatness.
- .3 Door and frame product shall be checked for correct size, swing, rating and opening number.
- .4 Caulk perimeter of frames between frame and adjacent material.
- .5 Set frames plumb, square, level and at correct elevation.
- .6 Fire-rated door and frame product shall be installed in accordance with the terms of their listings, NFPA-80, or the local Authority Having Jurisdiction (AHJ).
- .7 Secure anchorages and connections to adjacent construction.
- .8 Brace frames rigidly in position while building-in. Install wood spreaders at third points of frame rebate height to maintain frame width. Provide vertical support at centre of head for openings exceeding 1200 mm (48") in width.
- .9 During the setting of frame product, check and correct as necessary for opening width, opening height, square, alignment, twist and plumb, in accordance with the CSDMA, "Recommended Dimensional Standards for Commercial Steel Doors and Frames".
- .10 Grout guards and junction boxes are intended to protect hardware mortises and tapped holes from masonry grout of 4 in. (101 mm) maximum slump consistency that is hand troweled in place.
- .11 Frame products are not intended or designed to act as forms for grout or concrete. Grout hollow metal sections in "lifts" or take precautions otherwise to ensure that frames are not deformed or damaged by the hydraulic forces that occur during this process.
- .12 Keep hollow metal surfaces free of grout, tar, and/or other bonding materials or sealers. Promptly clean grout, tar, and/or other bonding materials or sealers off of frame product and doors.
- .13 Remove wood spreaders after frames have been built-in.
- .14 Make allowance for deflection to ensure structural loads are not transmitted to frame product.
- .15 Install doors, and hardware in accordance with hardware templates and manufacturer's instructions.
- .16 Adjust operable parts for correct clearances and function.

- .17 Install louvers, glazing and door silencers.
- .18 Finish paint in accordance with Section 09910.

END OF SECTION

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Comply with requirements listed in Division 1
- .2 Furnish, deliver and install finish hardware.
- .3 It is intended that the following list of hardware will cover finish hardware to complete the project. Bring to the Architect's attention any omissions, discrepancies that will affect work in this section during the bidding period.

1.2 QUALITY ASSURANCE

- .1 Meet all requirements of the local building code and all other applicable regulations.
- .2 Qualified suppliers must have in their employ a Certified A.H.C. (Architectural Hardware Consultant) as licensed by the Door and Hardware Institute. The supplier must have a minimum of two (2) years experience furnishing hardware for similar projects. Only firms that can extend manufacturers warranty to the project are to be considered as suppliers.
- .3 Inspection of supplied Finishing Hardware will be done by a Certified A.H.C. A complete Site Inspection Report will be issued to the Architect.

1.3 SUBMITTALS

- .1 Upon request, provide mounted samples of hardware items to be supplied.
- .2 Prepare and submit two (2) copies of a detailed hardware schedule listing product numbers, size and finishes. Include two (2) sets of catalog cuts.
- .3 Furnish other sections with two (2) complete sets of hardware templates for related fabricating and installation.
- .4 Submit for owner review and comments two (2) key schedules listing the door number, hardware heading or item, and the key group.
- .5 Where electrical hardware is to be supplied, provide wiring diagrams showing all wire termination points. Where electrical hardware is to be supplied and installed provide the contractor with riser diagrams listing the correct wire runs and back box sizes as well as 115 VAC requirements.
- .6 Where required in Division 1, provide two (2) operating manuals for the owners use. Include copies of the hardware schedule, templates, installation instructions and all maintenance data.

1.4 PRODUCT DELIVERY, HANDLING, AND STORAGE

- .1 Deliver each hardware item in its original package complete with all fasteners, keys, templates, and installation instructions required for installation.
- .2 Clearly mark each container with the door opening number and the hardware schedule item or heading number.
- .3 The contractor must store hardware delivered in a secure area. The storage area must contain adequate shelf space to hold all the hardware off the floor. Ensure the area is kept dry and clean.
- .4 When requested, package items of hardware separately for delivery to other fabricators for their installation.

1.5 WARRANTY

- .1 Provide a written warranty for a period of two (2) years for all hardware supplied and a five (5) year warranty for the door closers.
- .2 When requested provide extended warranties listed in Division 1.

PART 2 PRODUCTS

2.1 See Hardware Schedule

PART 3 EXECUTION

3.1 INSPECTION

- .1 The consultant will inspect all the door openings to ensure the specified products are supplied and installed in accordance with the manufacturers instructions. A written report will be furnished to the Architect detailing openings where products are missing, installed incorrectly or in need of proper adjustment.

3.2 INSTALLATION

- .1 The general contractor shall obtain a copy of ANSI/DHI A115.1G-94, "Installation Guide for Doors and Hardware". It is the intent of this document to be used as a reference guide in the proper handling, storage, and installation of finishing hardware, and doors and frames. This document can be obtained through the Door and Hardware Institute.
- .2 Other trades installing hardware must follow all manufacturers instructions including door closer adjustment, handing of locksets as required, and degree of door swing. Advise the consultant if door frames are not square and plumb and prevent proper door hardware installation.
 - .3 Use only the original manufactures fasteners for the installation of all hardware products. Drill and tap doors and frames, where required, to properly install finishing hardware products.
- .4 Mount hardware to suit door elevations. Match existing lockset mounting height. Unless otherwise directed by the consultant, install hardware at the following mounting heights:

Locksets	40"	(1015mm)
Exit device	40"	(1015mm)
Push/Pull	42"	(1065mm)
Deadlock	48"	(1200mm)
- .5 Manufacturers of specified products are responsible to instruct hardware installers in the proper installation methods of their products.

3.3 FIELD QUALITY CONTROL

- .1 Verify each door leaf opens closes and latches. Inspect fire rated openings to ensure they are installed in compliance with NFPA 80 requirements. Test access control system and electrified hardware devices for proper operation, owner to sign off on verification of operation. Verify electric door release hardware operates properly upon activation of the fire alarm system.
- .2 Perform bi-monthly on-site inspections during hardware installation and provide inspection reports listing progress of work, unacceptable work and corrective measures. Repair or replace as directed by the Consultant.
- .3 Before completion of the work but after the hardware has been installed, submit a certificate to the architect stating that final inspection has been made and that hardware has been checked for installation and operation by a technician from the manufacturer and hardware consultant

3.4 ADJUSTING AND CLEANING

- .1 Check and make final adjustments to each operating item of hardware on each door to ensure proper operation and function.
- .2 Adjust doors with self-closing devices or automatic closing devices for operation after the HVAC system is balanced and adjusted. Adjust spring power of non sized door closers to close and latch the door.

- .3 Hardware to be left clean and free of disfigurements.
- .4 Instruct owner personnel in the proper operation, adjustment and maintenance of hardware.
- .5 Check locked doors against approved keying schedule.

3.5 PROTECTION

- .1 Protect hardware from damage during construction. Wrap locks, panic hardware, and fire exit hardware, door pull trim with kraft paper or plastic bubble materials to protect finish from damage until date of substantial completion. Remove and reinstall or where necessary, use temporary hardware to maintain finish in new condition and maintain manufacturer's warranty.

3.6 HARDWARE SCHEDULE

- .1 See attached Schedule of Finishing Hardware

END OF SECTION

Hardware Group No. 001

For use on Door #(s):

D07 D202

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 114X114MM	652	IVE
1	EA	STOREROOM LOCK	L9080L 03A	626	SCH
1	EA	MORTISE CORBIN CYLINDER	REUSE EXISTING		C-R
1	EA	SURFACE CLOSER	1450 REG	689	LCN
1	EA	KICK PLATE	8400 205MM X 40MM LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE

VERIFY HINGES SIZE AND WEIGHT TO SUIT EXISTING DOOR AND FRAME

Hardware Group No. 002

For use on Door #(s):

D09 D11

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 127X114MM	652	IVE
1	EA	DOOR PULL, 1" ROUND	8103HD 255MM L	630	IVE
1	EA	PUSH PLATE	8200 100X405MM	626	IVE
1	EA	SURF. AUTO OPERATOR	9131 MS AS REQ (120 VAC)	ANCLR	LCN
2	EA	WALL MOUNT PUSHPLATE	8310-852T	630	LCN
2	EA	SURFACE MOUNT BOX	8310-869S	689	FAL
1	EA	KICK PLATE	8400 205MM X 40MM LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE

Hardware Group No. 003

For use on Door #(s):

D10 D114 D207

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 114X114MM NRP	652	IVE
1	EA	STOREROOM LOCK	L9080L 03A	626	SCH
1	EA	MORTISE CORBIN CYLINDER	REUSE EXISTING		C-R
1	EA	SURFACE CLOSER	1450 CUSH STD	689	LCN

VERIFY HINGES SIZE AND WEIGHT TO SUIT EXISTING DOOR AND FRAME

Hardware Group No. 004

For use on Door #(s):

D13

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 114X114MM	652	IVE
1	EA	CORRIDOR LOCK	L9456L 03A 09-544	626	SCH
1	EA	MORTISE CORBIN CYLINDER	REUSE EXISTING		C-R
1	EA	SURFACE CLOSER	1450 REG	689	LCN
1	EA	KICK PLATE	8400 205MM X 40MM LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE

VERIFY HINGES SIZE AND WEIGHT TO SUIT EXISTING DOOR AND FRAME

Hardware Group No. 006

For use on Door #(s):

D103A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 127X114MM	652	IVE
1	EA	CLASSROOM LOCK	L9070L 03A	626	SCH
1	EA	MORTISE CORBIN CYLINDER	REUSE EXISTING		C-R
1	EA	OH STOP	90S	630	GLY

Hardware Group No. 007

For use on Door #(s):

D104

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 114X114MM	652	IVE
1	EA	PASSAGE SET	L9010 03A	626	SCH
1	EA	SURFACE CLOSER	1450 HCUSH STD	689	LCN
1	EA	KICK PLATE	8400 205MM X 40MM LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE

Hardware Group No. 008

For use on Door #(s):

D203B

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 114X114MM	652	IVE
1	EA	CLASSROOM LOCK	L9070L 03A	626	SCH
1	EA	MORTISE CORBIN CYLINDER	REUSE EXISTING		C-R
1	EA	SURFACE CLOSER	1450 REG	689	LCN
1	EA	KICK PLATE	8400 205MM X 40MM LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE

VERIFY HINGES SIZE AND WEIGHT TO SUIT EXISTING DOOR AND FRAME

Hardware Group No. 009

For use on Door #(s):

D115

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 114X114MM NRP	652	IVE
1	EA	FIRE EXIT HARDWARE	22-L-F-03	689	VON
1	EA	MORTISE CORBIN CYLINDER	REUSE EXISTING		C-R
1	EA	SURFACE CLOSER	1450 REG	689	LCN
1	EA	KICK PLATE	8400 205MM X 40MM LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	188SBK PSA	BK	ZER

VERIFY HINGES SIZE AND WEIGHT TO SUIT EXISTING DOOR AND FRAME

Hardware Group No. 010

For use on Door #(s):

D18

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 127X114MM	652	IVE
1	EA	STOREROOM LOCK	L9080L 03A	626	SCH
1	EA	INTERFACE BOX	JB7		VON
1	EA	MORTISE CORBIN CYLINDER	REUSE EXISTING		C-R
1	EA	ELECTRIC STRIKE	6211 FS CON 12/16/24/28 VAC/VDC	630	VON
1	EA	SURF. AUTO OPERATOR	9131 MS AS REQ (120 VAC)	ANCLR	LCN
2	EA	ACTUATOR 4-1/2" ILLUMINATED W/SIGNAGE	CM45/4/GRS/SE1	630	CAM
1	EA	PUSH TO LOCK BUTTON ILLUMINATED W/SIGNAGE	CM45/8/GRS/SE1	630	CAM
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	ADVANCED LOGIC RELAY	CX-33		CAM
1	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	POWER SUPPLY	PS902 120/240 VAC	LGR	SCE
1	EA	EMERGENCY CALL KIT	CX-WEC11		CAM

Hardware Group No. 011

For use on Door #(s):

D19

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4	EA	HINGE	5BB1 127X114MM NRP	630	IVE
2	EA	MANUAL FLUSH BOLT	FB458 305MM	626	IVE
1	EA	DUST PROOF STRIKE	DP1	626	IVE
1	EA	CLASSROOM DEADBOLT	B663J	626	SCH
1	EA	CYLINDER PULL	GSH 980B	26D	GAL
2	EA	OH STOP & HOLDER	90H	630	GLY
2	EA	GASKETING	328AA-S	AA	ZER
1	EA	HEAD SEAL	429AA	AA	ZER
2	EA	MEETING STILE	8192AA	AA	ZER
2	EA	DOOR SWEEP	8192AA	AA	ZER
1	EA	THRESHOLD	625A-223	A	ZER

Hardware Group No. 012

For use on Door #(s):

D102

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 114X114MM	652	IVE
1	EA	PASSAGE SET	L9010 03A	626	SCH
1	EA	OH STOP	90S	630	GLY
1	EA	KICK PLATE	8400 205MM X 40MM LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE

Hardware Group No. 013

For use on Door #(s):

D103B

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 114X114MM	652	IVE
1	EA	CLASSROOM LOCK	L9070L 03A	626	SCH
1	EA	OH STOP & HOLDER	90H	630	GLY
1	EA	KICK PLATE	8400 205MM X 40MM LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE

PART 1 - GENERAL

1.1 Description of System

- .1 Non-load bearing steel framing includes non-load bearing steel studs framing members for interior framing systems (eg., partition walls, framed bulkheads, furring, etc.) as well as interior suspension systems (eg., supports for ceilings, suspended bulkheads, etc.).

1.2 References

- .1 CSA S136 North American Specification for the Design of Cold-Formed Steel Structural Members
- .2 AISI North American Standard for Cold-Formed Steel Framing – Product Data
- .3 ASTM A653/A653M Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
- .4 ASTM A641/A641M Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire
- .5 ASTM A792/A792M Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process
- .6 ASTM A1003 Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-coated for Cold-Formed Framing Members
- .7 ASTM C645 Standard Specification for Nonstructural Steel Framing Members
- .8 ASTM C754 Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products
- .9 ASTM E90 Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements]
- .10 ASTM E413 Classification for Rating Sound Insulation
- .11 ASTM E488 Standard Test Methods for Strength of Anchors in Concrete and Masonry Elements
- .12 ASTM E1190 Standard Test Methods for Strength of Power-Actuated Fasteners Installed in Structural Members
- .13 CAN/ULC S101 Standard Methods of Fire Endurance Tests of Building Construction and Materials
- .14 CSSBI LSF Technical Bulletin Volume 7, Number 1 Maximum Height Tables for Interior Non-Load Bearing Partitions.

1.3 Quality Assurance

- .1 Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate nonload bearing interior steel framing, provide materials and construction identical to those tested in assembly indicated according to CAN/ULS-S101.
- .2 STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E90 and classified according to ASTM E413.
- .3 Retain a Professional Engineer registered in the province of Ontario to design the Lightweight Steel Framing System where indicated in drawings; to prepare, seal and sign all shop drawings; and to perform field review. Shop drawings shall show both design and installation requirements.

1.4 Design Criteria

- .1 Conform to the requirements of fire-rated assemblies as scheduled in drawings/details which have been tested in accordance with CAN/ULC-S101 and provide fire resistance ratings as indicated.

Section 09110
Steel Stud Framing for Interior Partitions

- .2 For Interior non-load bearing studs, conform to minimum design thickness, web depth and flange width as outlined in CSSBI Maximum Height Tables for interior non-load bearing partitions.
- .3 A non-load bearing (non-structural) member is defined as a member in a steel-framed system which is limited to transverse (out-of-plane) load of not more than 480 PA, a superimposed axial load, exclusive of sheathing materials, of not more than 1460 N/m, or a superimposed axial load of not more than 890 N.
- .4 A load bearing (structural) stud may be used in a non-load bearing application; however, non-load bearing members (studs or track) may never be used in a load bearing (axial and/or wind loading) applications.
- .5 Track for interior walls and non-load bearing walls located at exterior walls shall have a thickness of not less than the thickness of the corresponding studs and shall have not less than 31.8 mm flanges.
- .6 Connections between light steel framing members shall be by sheet metal screws, welding or crimping.
- .7 Load bearing assemblies/applications/details:
 - .1 Design shall be based on Limit States Design principles using factored loads and resistances.
 - .2 Loads and load factors shall be in accordance with the National Building Code of Canada.

1.5 Submittals

- .1 Make submittals in accordance with Section 01330 Submittals.
- .2 Product data: For each product indicated.
- .3 Submit shop drawings clearly indicating all construction details including connections and anchor requirements. Indicate type, size and spacing of fastening devices. Indicate design loads. Include seal and signature of Professional Engineer registered in the Province of Ontario for all components requiring structural design.

PART 2 - PRODUCTS

2.1 Materials

- .1 Non-load bearing Steel Framing, General
 - .1 Steel sheet components shall comply with ASTM C645 requirements for metal, unless otherwise indicated.
 - .2 Steel for non-load bearing members shall have metallic coatings that conform to ASTM A653M or ASTM A792M with minimum metallic coating weights (mass) of Z120 and AZM150 respectively. Alternative coatings shall be permitted to be used if proven to have equivalent corrosion protection.
 - .3 Framing members shall comply with the AISI North American Standard for Cold-Formed Steel Framing (Product Data) for conditions indicated.
- .2 Suspension System Components
 - .1 Tie wire shall comply with ASTM A641/A641M zinc-coated, soft-annealed, 1.21 mm minimum diameter, or of a material and size having equivalent corrosion resistance and strength.
 - .2 Hanger attachments to concrete: Anchors shall be fabricated from corrosion-resistant materials with holes or loops for attaching wire hangers and capable of sustaining, without failure, a load equal to 2 times that imposed by construction as determined by testing by an independent testing agency according to ASTM E488.
 - .1 Type: Post-installed, expansion anchor

Section 09110
Steel Stud Framing for Interior Partitions

- .3 Power-actuated fasteners, suitable for application indicated, shall be fabricated from corrosion-resistant materials with clips or other devices for attaching hangers of type indicated, and capable of sustaining, without failure, a load equal to 2 times that imposed by construction as determined by testing by an independent testing agency according to ASTM E1190.
- .3 Hanger wire shall comply with ASTM A641/A641M zinc-coated, soft-annealed, 3.77 mm minimum diameter, or of a material and size having equivalent corrosion resistance and strength.
- .4 Carrying Channels
 - .1 Channels shall conform to ASTM C754 and shall be cold-firmed from steel with minimum 228 MPa yield strength and 1.37 mm base steel thickness.
 - .2 Channels shall have a minimum coating of Z120 galvanizing in accordance with ASTM A653/A653M. Other coatings (eg. Aluminum-zinc alloy to ASTM A792/A792M) providing equal or better corrosion protection may also be used.
 - .3 Carrying channels shall have minimum 12.7 mm wide flanges and minimum depth of 38 mm.
- .5 Furring Members
 - .1 Furring channels shall comply with the AISI North American Standard for Cold-Formed Steel Framing (Product Data) and shall have a minimum base steel thickness of 0.455 mm and with minimum 12.7 mm wide flanges and a depth of 19.1 mm.
 - .2 Steel stud shall be manufactured from steel in accordance with the AISI North America Standard for Cold-Formed Steel Framing (Product Data) and shall have a minimum base Steel thickness of 0.455 mm and depth as indicated on drawings.
 - .3 Hat-shaped, rigid furring channels shall comply with the AISI North American Standard for Cold-Formed Steel Framing (Product Data) and shall have a minimum base steel thickness of 0.455 mm and minimum depth of 22.2 mm. The minimum width of furring attachment flanges shall be 12.7 mm.
 - .4 Resilient furring channels are designed to reduce sounds transmission and shall have a minimum depth of 12.7 mm.
- .6 Steel Framing for Framed Assemblies
 - .1 Steel studs and track shall be in accordance with the AISI North American Standard for Cold-Formed Steel Framing (Product Data) and shall have minimum base steel thickness of 0.455 mm and a depth as indicated on drawings.
 - .2 Slip-Type Head Joints: Where indicated, provide one of the following:
 - .1 Deflection Track: steel sheet top track manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and width to accommodate depth of studs.
 - .2 Single Long-Leg Track: track complying with the AISI North American Standard for Cold-Formed Steel Framing (Product Data) with 50.8 mm deep flanges in thickness not less than indicated for studs, installed with studs friction-fit into top track and with continuous bridging located within 305 mm of the top studs to provide lateral bracing.
 - .3 Double-Track System: track complying with AISI North American Standard for Cold-Formed Steel Framing (Product Data), inside track with 50.8 mm deep flanges in thickness not less than indicated for studs and fastened to studs, and outer track sized to friction fit inside track.
 - .3 Flat Strap and Backing Plate
 - .1 Sheet steel for blocking and bracing in length and width indicated.
 - .2 Minimum base steel thickness is 0.455 mm.
 - .4 Channel bridging shall comply with the AISI North American Standard for Cold-Formed Steel Framing (Product Data) and shall have a minimum base steel thickness of 0.455 mm with minimum 12.7 mm wide flanges and depth of 19.1 mm.

Section 09110
Steel Stud Framing for Interior Partitions

- .5 Hat-shaped, rigid furring channels shall comply with the AISI North American Standard for Cold-Formed Steel Framing (Product Data) and shall have minimum base steel thickness of 0.455 mm, a minimum depth of 22.2 mm. The minimum width of furring attachment flanges shall be 12.7 mm.
- .6 Resilient furring channels are designed to reduce sound transmission and shall have a minimum depth 12.7 mm.
- .7 Furring channels shall comply with the AISI North American Standard for Cold-Formed Steel Framing (Product Data) and shall have a minimum base steel thickness of 0.455 mm and with minimum 12.7 mm wide flanges and a depth of 19.1 mm.
 - .1 Furring Brackets: adjustable, corrugated-edge of steel sheet with minimum base steel thickness of 0.79 mm.
 - .2 Tie wire shall comply with ASTM A641/A641M zinc-coated, soft-annealed, 1.21 mm minimum diameter, or of material and size having equivalent corrosion resistance and strength.
- .9 Z-shaped Furring: with slotted web or non-slotted web, face flange of 31.8 mm, wall attachment flange of 22.2 mm, and depth steel thickness of 0.455 mm, and depth required to fit insulation thickness indicated.
- .10 Fasteners for Metal Framing: of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates in accordance with ASTM C1002.
- .11 Isolation strip at exterior walls: provide one of the following:
 - .1 Asphalt-saturated organic felt: ASTM D226, Type 1 (no. 15 asphalt felt), perforated.
 - .2 Foam gasket: adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 3.2 mm thick, in width to suit steel stud size.

PART 3 - EXECUTION

3.1 Examination

- .1 Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance.
 - .1 Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 Preparation

- .1 Suspended Assemblies: coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangars at spacing required to support the work and that hangars will develop their full strength.
 - .1 Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.

3.3 Installation, General

- .1 Installation Standard: ASTM C754, except comply with framing sizes and spacing indicated.
 - .1 Gypsum Plaster Assemblies: also comply with requirements in ASTM C841 that apply to framing installation.
 - .2 Portland Cement Plaster Assemblies: also comply with requirements in ASTM C1063 that apply to framing installation.
 - .3 Gypsum Veneer Plaster Assemblies: also comply with requirements in ASTM C844 that apply to framing installation.

- .4 Gypsum Board Assemblies: also comply with requirements in ASTM C840 that apply to framing installation.
- .2 Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
- .3 Install bracing at terminations in assemblies.
- .4 Do not bridge building control and expansion joints with non-load bearing steel framing members. Frame both sides of joints independently.

3.4 Installing Suspension Systems

- .1 Install suspension system components in sizes and spacings indicated on drawings, but not less than those required by referenced installation standards for assembly types and other assembly components indicated.
- .2 Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.
- .3 Suspended hangers from building structure as follows:
 - .1 Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.
 - .1 Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced installation standards.
 - .2 Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.
 - .1 Size supplemental suspension members and hangers to support ceiling loads Within performance limits established by referenced installation standards.
 - .3 Wire Hangers: secure by looping and wire tying, either directly to structure or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.
 - .4 Do not attach hangers to steel roof deck unless otherwise approved.
 - .5 Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.
 - .6 Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
 - .7 Do not connect or suspend steel framing from ducts, pipes, or conduit.
- .4 For fire-resistance-rated assemblies, wire tie furring channels to supports.
- .5 Installation Tolerances: install suspension systems that are level to within 3 mm in 3.6 m measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

3.5 Installing Framed Assemblies

- .1 Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.
- .2 Install studs so flanges within framing system point in same direction.
 - .1 Space studs as follows:
 - .1 Single-layer application: 406 mm o.c., unless otherwise indicated.
 - .2 Multilayer application: 406 mm o.c., unless otherwise indicated.
 - .3 Tile backing panels: 406 mm o.c., unless otherwise indicated.

Section 09110
Steel Stud Framing for Interior Partitions

- .3 Install track floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions of structure.
 - .1 Slip-Type Head Joints: where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies due to deflection of structure.
 - .2 Door Openings: screw vertical studs at jambs to jamb anchor clips to door frames; install track section (for cripple studs) at head and secure to jamb studs.
 - .1 Install two studs at each jamb, unless otherwise indicated.
 - .2 Install cripple studs at head adjacent to each jamb stud, with a minimum 12.7 mm clearance from jamb stud to allow for installation of control joint in finished assembly.
 - .3 Other Framed Openings: frame openings other than door openings the same as required for door openings, unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
 - .4 Fire-Resistance-Rated Partitions: install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.
 - .5 Sound-Rated Partitions: install framing to comply with sound-rated assembly indicated.
 - .6 Curved Partitions
 - .1 Bend track to uniform curve and locate straight lengths so they are tangent to arcs.
 - .2 Begin and end each arc with a stud, and space intermediate stud equally along arcs. On straight lengths of not less than 2 studs at ends of arcs, place studs 150 mm o.c.
- .4 Direct Furring
 - .1 Screw to wood framing.
 - .2 Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or power-driven fasteners spaced 610 mm o.c.
- .5 Z-Furring Members
 - .1 Erect insulation as specified and hold in place with Z-furring members spaced 610 mm o.c.
 - .2 Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or power-driven fasteners spaced 610 mm o.c.
 - .3 At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than 305 mm from corner and but insulation to fit,
- .6 Installation Tolerance: install each framing member so fastening surfaces vary not more than 3 mm from the plane formed by faces adjacent framing.

END OF SECTION

PART 1 - GENERAL

1.1 References

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM C1396 Standard Specification for Gypsum Board
 - .2 ASTM C 475-94, Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
 - .3 ASTM C 514-94, Specification for Nails for the Application of Gypsum Board.
 - .4 ASTM C 557-93a, Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing.
 - .5 ASTM C 840-95, Specification for Application and Finishing of Gypsum Board.
 - .6 ASTM C 954-93, Specification for Steel Drill Screws for the Application of Gypsum Board.
 - .7 ASTM C 1047-94, Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
 - .8 ASTM C1177-08, Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing
 - .9 ASTM C1178M -08, Standard Specification for Coated Glass Mat Water Resistant Gypsum Backing Panel
 - .10 ASTM C1658-06, Standard Specification for Glass Mat Gypsum Panels
 - .11 ASTM C1629M-06, Standard Classification for Abuse Resistant Non Decorated Interior Gypsum Panel Products and Fiber Reinforced Cement Panels
 - .12 ASTM D3273-00, Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-51.34-M86, 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.
- .3 Underwriters Laboratories of Canada (ULC)
 - .1 CAN/ULC-S102-1988, Building Materials and Assemblies, Standard Method of Test for Surface Burning Characteristics of.

1.2 Site Environmental Requirements

- .1 Maintain temperature minimum 10C, maximum 21C for 48 hours prior to and during application of gypsum boards and joint treatment, and for at least 48 hours after completion of joint treatment.
- .2 Apply board and joint treatment to dry, frost free surfaces.

PART 2 - PRODUCTS

2.1 Materials

- .1 **Standard Gypsum Board: to ASTM C1396, Type X, 15.9mm (5/8" thick, 1200mm (4'-0") wide x maximum practical length.**
- .2 **Tilebacker: Acrylic coated glass mat facers with water resistant gypsum core to ASTM C1178, 15.9mm (5/8") thick unless noted otherwise, 1200mm (4'0") wide x maximum practical length. Score of 10 (no mould growth) as per ASTM D3273, or Cement Board to ASTM C1325. To be installed at all areas scheduled to receive tile/hygienic wall panel finish.**

- .3 Not used.
- .4 Steel drill screws: to ASTM C 1002.
- .5 Stud adhesive: to CAN/CGSB-71.25 ASTM C 557.
- .6 Laminating compound: as recommended by manufacturer, asbestos-free.
- .7 Shadow gap: Bailey D300 Metal trim, CGC Dur-a-bead or Nicolson Rollforming No 114, fillable edge trim, 0.55mm (0.022") base thickness commercial grade sheet steel with zinc wiped coating to ASTM A 525-93; perforated flanges; one piece length per location. To be used at the junction of all dissimilar materials and/or as detailed.
- .8 Corner bead: Bailey D100-90, 90-degree corner trim fillable edge trim, 0.55mm (0.022") base thickness commercial grade sheet steel with zinc wiped coating to ASTM A 525-93; perforated flanges; one piece length per location.
- .9 Control joints: No 093 Zinc Control Joints by CGC Inc or Nicholson Rollforming. To be installed where indicated on drawings.
- .10 Sealants: in accordance with Section 07900 - Joint Sealers.
- .11 Acoustic sealant: concealed purpose made, non-skinning, non hardening type to CAN/CGSB-19.21-M87, as manufactured by Tremco or Monsey-Bakor, USE Hickson
- .12 Sound attenuation insulation (acoustic batt insulation type 'C')
 - .1 Mineral or fiberglass sound attenuation batt or boards to ULC S702 and as required by fire rated tests.
 - .2 Thickness: full stud thickness or as otherwise stated on the Drawings and Schedule.
- .13 Joint compound: to ASTM C 475, asbestos-free. Latex resin base, possessing good adhesion, mixed with fresh, unadulterated water having no detrimental effects on compounds. Type recommended by manufacturer for application indicated.
- .14 Joint reinforcing tape; for gypsum board; 50mm (2") x 0.3mm (0.01") thick perforated paper with chamfered edges. **Use alkali resistant glass-fiber tape at tile backer locations.**
- .15 1 hour rated walls to be filled with absorptive material processed from rock or slag with a mass of at least 2.8 kg/m² for 89mm thickness and completely filling the wall cavity.

PART 3 - EXECUTION

3.1 Erection

- 1 Do application and finishing of gypsum board in accordance with ASTM C 840 except where specified otherwise.
- .2 Do application of gypsum sheathing in accordance with ASTM C 1280.
- .3 Erect hangers and runner channels for suspended gypsum board ceilings in accordance with ASTM C 840 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, 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 in accordance with ASTM C 840, except where specified otherwise.
- .11 Furr openings and around built-in equipment, cabinets, access panels, on four sides. Extend furring into reveals. Check clearances with equipment suppliers.
- .12 Furr duct shafts, beams, columns, pipes and exposed services where indicated

3.2 Application

- .1 Do not apply gypsum board until bucks, anchors, blocking, electrical and mechanical work are approved.
- .2 Apply 12 mm (1/2") 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, ducts, in partitions where perimeter sealed with acoustic sealant.

3.3 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 at 150mm oc 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 Install shadow mould at gypsum board/ceiling juncture as indicated. Minimize joints; use corner pieces and splicers.
- .6 Construct control joints of preformed units two back-to-back casing beads set in gypsum board facing and supported independently on both sides of joint.
- .7 Provide continuous polyethylene dust barrier behind and across control joints.
- .8 Locate control joints where indicated at changes in substrate construction at approximate 10m spacing on long corridor runs at approximate 15m spacing on ceilings.
- .9 Install control joints straight and true.
- .10 Construct expansion joints as detailed, at building expansion and construction joints. Provide continuous dust barrier.
- .11 Install expansion joint straight and true.
- .12 Splice corners and intersections together and secure to each member with 3 screws.
- .13 Install access doors to electrical and mechanical fixtures specified in respective Sections.
 - .1 Rigidly secure frames to furring or framing systems.
- .14 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.
- .15 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.
- .16 Fill screw head depressions with joint and taping compounds to bring flush with adjacent surface of gypsum board so as to be invisible after surface finish is completed.

**Section 09250
Gypsum Board**

- .17 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.
- .18 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for surface finish.
- .19 Mix joint compound slightly thinner than for joint taping.
- .20 Apply thin coat to entire surface using trowel or drywall broadknife to fill surface texture differences, variations or tool marks.
- .21 Allow skim coat to dry completely for walls receiving high gloss paint and where indicated.
- .22 Remove ridges by light sanding or wiping with damp cloth.
- .23 Fasten board to metal support members by metal gypsum board screws at, 9.5mm (0.374") minimum to , and 12.7mm (1/2") maximum from, center of joints. Space screw:
 - .1 At ceilings of fire rated board at 200mm (8") o.c. at edges and in field unless indicated otherwise.
 - .2 At walls of fire rated board at 200mm (8") o.c. at edges and 305mm (12") o.c. in field Locate screws opposite one another in adjacent panels unless indicated otherwise.
 - .3 At typical board walls at 400mm (16") o.c. at edges and field unless noted otherwise.
 - .4 At typical board ceilings at 305mm (12") o.c. at edges and field unless noted otherwise.
- .24 When installing fiberglass mat faced mould and moisture resistant gypsum board do so as per manufacturers recommendations. Tape joints with self adhesive fiberglass tape and embed the tape in setting type compound. Finish joint with two layers of all purpose joint compound. High build primer should be applied to surface before painting. As with regular paper faced gypsum board, in areas where gloss paint is to be applied or in areas of critical light a skim coat should be applied to the surface before priming and painting.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- .1 Labour, Products, equipment and services necessary for tile Work in accordance with the Contract Documents.

1.2 REFERENCES

- .1 ANSI A108/A118/A136.1, Installation of Ceramic Tile.
- .2 ASTM C144, Specification for Aggregate for Masonry Mortar.
- .3 CAN/CSA A3000, Cementitious Materials Compendium.
- .4 TTMAC Specification Guide 09300 Tile Installation Manual.
- .5 TTMAC, Maintenance Guide.

1.3 SUBMITTALS

- .1 Product data:
 - .1 Submit copies of manufacturer's Product data in accordance with Section 01330 indicating:
 - .1 Performance criteria, compliance with appropriate reference standard, characteristics, limitations and warranties.
 - .2 Product transportation, storage, handling and installation requirements.
 - .2 Shop drawings:
 - .1 Submit shop drawings in accordance with Section 01330 indicating:
 - .1 Tile layout, patterns, and colour arrangement.
 - .2 Perimeter conditions, junctions with dissimilar materials.
 - .3 Setting details.
 - .3 Samples:
 - .1 Submit following sample panels in accordance with Section 01330.
 - .1 Each colour, texture, size, and pattern of tile.
 - .2 Adhere tile samples to 400 x 400 x 12.5 mm thick cement board complete with selected grout colour in joints.
 - .4 Certificates: Submit manufacturer's certificates stating that materials supplied are in accordance with this specification.
 - .5 Closeout submittals: Submit recommended maintenance instructions and listing of recommended maintenance Products for incorporation into Operations and Maintenance Manuals in accordance with Section 01730.

1.4 QUALITY ASSURANCE

- .1 Perform Work of this Section by a company that is a member in good standing of the Terrazzo Tile and Marble Association of Canada with proven, acceptable experience on installations of similar complexity and scope.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver materials in adequate crates or containers with manufacturer's name and product description clearly marked.
- .2 Handle and store tiles in a manner to avoid chipping, breakage or the instruction of foreign matter. Take precautions to protect the mortar and grout admixtures from freezing or from excessive heat.

1.6 SITE CONDITIONS

- .1 Do not install Work of this Section outside of the following environmental ranges without the Consultant's and Product manufacturer's written acceptance:
 - .1 Ambient air and surface temperature: 15°C to 45°C.
 - .2 Precipitation: None.
- .2 Install temporary protection and facilities to maintain the Product manufacturer's, and specified, environmental requirements for 7 Days before, during, and 7 Days after installation.

1.7 MAINTENANCE

- .1 Submit extra tile amounting to 3% of gross area covered, allowing proportionately for each pattern and type specified and which are part of the same Production run as installed Products. Store maintenance Products as directed by the Consultant.

1.8 EXTRA MATERIAL

1. Provide extra tile and grout in accordance with Section 01780 - Closeout Submittals.
2. Provide extra materials equivalent to 3% of installed area, for each colour/format.
3. Deliver to Owner, upon completion of the work of this section and store where directed.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 General: All materials under Work of this Section, including but not limited to, primers, and sealers are to have low VOC content limits.
- .2 Tile:
 - .1 Porcelain Floor Tile (POR)**
 - .1 Regal series through full body porcelain tile, manufactured by Olympia. Flamed finish, size 24" x 24". Colour: Dark Grey
 - .2 Equivalent product as per Specification 01250.
 - .2 Ceramic Wall Tile (CER)**
 - .1 Colour & Dimension Series Wall Tile as distributed by Olympia Tile. Format 8" x 20", allow for 3 colours as follows and as scheduled:
 - .1 Artic White, matte finish.
 - .2 Silver Grey, matt finish.
 - .3 Bone, matte finish
 - .2 Equivalent product as per Specification 01250.
- .3 Thresholds: profile with sloped exposed surface, 5/32" (4 mm) tall leading edge, integrated trapezoid-perforated anchoring leg, and integrated grout joint spacer. Material: brushed stainless steel finish Type 304. Height: to suit site conditions. Acceptable product: Schluter RENO-U.
- .4 Wall edge trim: L-shaped profile with top section width to suit tile thickness and vertical wall section that together form the visible surface, integrated trapezoid-perforated anchoring leg, and integrated grout joint spacer. Material: Brushed stainless steel Type 304. Acceptable product: Schluter SCHIENE.

2.2 ACCESSORIES

- .1 Cement: CAN/CSA A3000, Type 10.
- .2 Sand: ASTM C144.

- .3 Water: Potable and free of minerals and other contaminants which are detrimental to mortar and grout mixes.
- .4 Polymer additive: Keralastic by Mapei Inc or approved alternative by Latricrete International or Flextile.
- .5 Interior Pre-mixed thin set mortars ANSI 118
 - .1 Interior wall tile: Ker 121 by Mapei, 50 PM Mortar by Flextile or approved equal
- .6 Not used
- .7 Primer: To meet specified requirements of adhesive manufacturer.
- .8 Cleaner: To conform to #1000 Series of Terrazzo, Tile and Marble Association of Canada.
- .9 Grout:
 - .1 Floors and bases (below 3 mm joint width): 'Keracolor U' by Mapei Inc. or approved alternative by Latricrete International.
 - .2 Floors and bases (3 mm to 10 mm joint width): 'Ultra/Color' by Mapei Inc. or approved alternative by Latricrete International.
 - .3 Walls (1.5 mm to 3 mm joint width): 'Ker 800' by Mapei Inc. or approved alternative by Latricrete International.
 - .4 Walls (over 3 mm joint width): 'Ultra/Colour' by Mapei Inc. or approved alternative by Latricrete International.
- .10 Joint backing: Round, closed cell, foam rod, oversized by 30% to 50%, Shore A hardness of 20, tensile strength 140 to 200 kPa.
- .11 Sealer: Oil and grease resistant, to meet specified requirements of #3000 Series of Terrazzo, Tile and Marble Association of Canada.
- .12 Sealant: In accordance with Section 07900.

2.3 MIXES

- .1 Levelling bed mix:
 - .1 1 part Portland cement.
 - .2 4 parts sand.
 - .3 part water (including polymer additive), adjusted for water content of sand.
 - .4 1/10 part polymer additive.

PART 3 - EXECUTION

3.1 SURFACE PREPARATION

- .1 Clean and dry surfaces thoroughly. Remove oil, wax, grease, dust, dirt, paint, tar, primers, form release agents, curing compound, and other foreign material from substrate surfaces which may prevent or reduce adhesion.
- .2 Neutralize any trace of strong acids or alkali from the substrate.

3.2 CONTROL JOINTS

- .1 Continue control, construction, and cold joints in the structural substrate up through the tile finish, and align with mortar joints where possible. Review joint locations on Site with the Consultant.
- .2 Install joint widths to match grout joint widths, except where a minimum width is indicated.
- .3 Install control joints in the following typical locations:
 - .1 Aligned over changes in type of substrate.

- .2 At the restraining perimeters such as walls and columns.
 - .3 Interior areas (not subject to sunlight): 6 mm minimum width, at 7320 mm o.c. maximum.
 - .4 Interior areas (subject to sunlight): 6 mm minimum width, at 3660 mm o.c maximum.
 - .5 As indicated on the Contract Drawings.
- .4 Seal control joints in accordance with Section 07900.

3.3 LEVELLING BED

- .1 Install a levelling bed on uneven substrate surfaces, level and plumb substrates in accordance with the following tolerances:
 - .1 Vertical surfaces: 3 mm in 2.4 m maximum .
 - .2 Horizontal surfaces: 6 mm in 3 m from finished levels of the surface, or better.
- .2 Clean structural substrate control joints and blow-clean with compressed air. Grout fill control joints flush to slab with levelling bed.

3.4 GENERAL INSTALLATION REQUIREMENTS

- .1 Install tiles in accordance with manufacturer's instructions and TTMAC Specification Guide 09300 Tile Installation Manual. Manufacturer's installation instructions govern over TTMAC Installation Manual.
- .2 Lay out Work to produce a symmetrical pattern with minimum amount of cutting. Ensure cut tile at room perimeter is not less than ½ full size.
- .3 Install trim to be placed under tile in locations indicated on Drawings.
- .4 Apply exterior grade mortar bed to substrate with flat trowel and press firmly into surface, apply additional mortar using notched trowel.
- .5 Set tiles in place and rap or beat with a beating block as necessary to ensure a proper bond and to level surface. Align tile for uniform joints and allow to set until firm. Clean excess mortar from surface of tile with a wet cloth or sponge while mortar is fresh.
- .6 Adjust joints between units uniform, plumb, straight, even, and true, with adjacent tile flush. Align grout joints in both directions unless indicated otherwise.
- .7 Align floor, base and wall grout joints.
- .8 Install tile accessory fittings for a complete and fully coordinated tile assembly.
- .9 Install wall tile full height unless indicated otherwise.
- .10 Cut and fit tile neatly around piping, fittings, projections and around recesses items e.g. washroom accessories. Where surface mounted equipment and accessories are installed on tile surfaces, extend tile over surfaces. Cut edges smooth, even, and free from chipping; chipped and broken edges are not acceptable.
- .11 Do not proceed with grouting until minimum 48 hours after tile has set, to prevent displacement of tiles.
- .12 Apply grout in accordance with grout manufacturer's directions to produce watertight, filled joints without voids, cracks and excess grout. Thoroughly compact and tool floor grout. Finish grout flush to edge thickness of tile and remove excess grout with soft burlap or sponge moistened with clean water.

3.5 CLEANING

- .1 Clean off excess grout with soft burlap or sponge moistened with clean water.
- .2 Polish floor and wall tile after grout has cured in accordance with TTMAC recommendations in the Maintenance Guide; do not use acid for cleaning.

- .3 Re-point joints after cleaning as required to eliminate imperfections, then re-clean as necessary. Avoid scratching tile surfaces.

3.6 JOINT BACKING AND TILE SEALANT

- .1 Install joint backing under sealant as necessary.
- .2 Install tile sealant around piping and fittings extending through tiled surfaces.
- .3 Seal tile control joints.
- .4 Seal internal tile to tile junctions. Tool to a smooth, flush surface, free from air bubbles and contamination.

3.7 PROTECTION

- .1 Prevent traffic over tiled areas, and protect tiled assemblies from weather, freezing, and water immersion, for 72 hours minimum, after final installation.
- .2 Prevent direct impact, vibration and heavy hammering on adjacent and opposite walls for 24 hours minimum, after final installation.
- .3 Cover work temporarily with building paper properly lapped and taped at joints until work has been approved by Consultant.

END OF SECTION

1 GENERAL

1.1 SECTION INCLUDES

- .1 Drawings and general conditions of Contract, including General and Supplementary Conditions and Divisions-1 Specification sections apply to work of this section

1.2 SUMMARY

- .1 Section Includes
 - .1 Acoustical ceiling panels
 - .2 Exposed gird suspension system
 - .3 Wire hangers, fasteners, main runners, cross tees, and wall angle moldings
 - .4 Perimeter Trim
- .2 Equivalent Products
 - .1 As per Section 01 25 00 – Product Substitution Procedures.
 - .2 Submittals that do not provide adequate data for the product evaluation will not be considered. The proposed substitution must meet all requirements of this section, including but not necessarily limited to, the following: Single source materials suppliers (if specified in Section 1.5); Underwriters' Laboratories Classified Acoustical performance; Panel design, size, composition, color, and finish; Suspension system component profiles and sizes; Compliance with the referenced standards.

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM):
 - .1 ASTM A 1008 Standard Specification for Steel, Sheet, Cold Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability
 - .2 ASTM A 641 Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire
 - .3 ASTM A 653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process
 - .4 ASTM C 423 Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
 - .5 ASTM C 635 Standard Specification for Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings
 - .6 ASTM C 636 Recommended Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels
 - .7 ASTM D 3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
 - .8 ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials
 - .9 ASTM E 119 Standard Test Methods for Fire Tests of Building Construction and Material
 - A. Armstrong Fire Guard Products
 - .10 ASTM E 580 Installation of Metal Suspension Systems in Areas Requiring Moderate Seismic Restraint
 - .11 ASTM E 1111 Standard Test Method for Measuring the Interzone Attenuation of Ceilings Systems
 - .12 ASTM E 1414 Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum
 - .13 ASTM E 1264 Classification for Acoustical Ceiling Products

- .2 ASHRAE Standard 62.1-2004, Ventilation for Acceptable Indoor Air Quality
- .3 Ontario Electrical Safety Code
- .4 ASCE 7 American Society of Civil Engineers, Minimum Design Loads for Buildings and Other Structures

1.4 SYSTEM DESCRIPTION

Continuous/Wall-to-Wall

1.5 SUBMITTALS

- .1 Product data:
 - .1 Submit manufacturer's technical data for each type of acoustical ceiling unit and suspension system required.
- .2 Shop Drawings:
 - .1 Shop Drawings: Layout and details of acoustical ceilings. Show locations of items which are to be coordinated with, or supported by the ceilings.
- .3 Samples:
 - .1 Submit following sample panels in accordance with Section 01330.
 - .1 Minimum 6 inch x 6 inch samples of specified acoustical panel
 - .2 8 inch long samples of exposed wall molding and suspension system, including main runner and 4 foot cross tees
- .4 Certificates: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards. For acoustical performance, each carton of material must carry an approved independent laboratory classification of NRC, CAC, and AC.
 - .1 If the material supplied by the acoustical subcontractor does not have an Underwriter's Laboratory classification of acoustical performance on every carton, subcontractor shall be required to send material from every production run appearing on the job to an independent or NVLAP approved laboratory for testing, at the architect's or owner's discretion. All products not conforming to manufacturer's current published values must be removed, disposed of and replaced with complying product at the expense of the Contractor performing the work.
- .5 Closeout submittals: Submit recommended maintenance instructions and listing of recommended maintenance Products for incorporation into Operations and Maintenance Manuals in accordance with Section 01780.

1.6 QUALITY ASSURANCE

- .1 Single-Source Responsibility: Provide acoustical panel units and grid components by a single manufacturer.
 - .1 Fire Performance Characteristics: Identify acoustical ceiling components with appropriate markings of applicable testing and inspecting organization.
 - .2 Surface Burning Characteristics: As follows, tested per ASTM E 84 and complying with ASTM E 1264 Classification.
 - .3 Fire Resistance: As follows tested per ASTM E119 and listed in the appropriate floor or roof design in the Underwriters Laboratories Fire Resistance Directory
- .2 Acoustical Panels: As with other architectural features located at the ceiling, may obstruct or skew the planned fire sprinkler water distribution pattern through possibly delay or accelerate the activation of the sprinkler or fire detection systems by channeling heat from a fire either toward or away from the device. Designers and installers are advised to consult a fire protection engineer,

NFPA 13, or their local codes for guidance where automatic fire detection and suppression systems are present.

- .3 Coordination of Work: Coordinate acoustical ceiling work with installers of related work including, but not limited to building insulation, gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Deliver acoustical ceiling units to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.
- .2 Before installing acoustical ceiling units, permit them to reach room temperature and a stabilized moisture content.
- .3 Handle acoustical ceiling units carefully to avoid chipping edges or damaged units in any way.

1.8 SITE CONDITIONS

- .1 Standard Ceilings: Do not install interior ceilings until space is enclosed and weatherproof; wet work in place is completed and nominally dry; work above ceilings is complete; and ambient conditions of temperature and humidity are continuously maintained at values near those intended for final occupancy. Building areas to receive ceilings shall be free of construction dust and debris.
- .2 HumiGuard Plus Ceilings: Building areas to receive ceilings shall be free of construction dust and debris. Products with HumiGuard Plus performance and hot dipped galvanized steel, aluminum or stainless steel suspension systems can be installed up to 120°F (49°C) and in spaces before the building is enclosed, where HVAC systems are cycled or not operating. Cannot be used in exterior applications where standing water is present or where moisture will come in direct contact with the ceiling.
- .3 HumiGuard Max Ceilings: Building areas to receive ceilings shall be free of construction dust and debris. Ceilings with HumiGuard Max performance can be installed in conditions up to 120°F (49°C) and maximum humidity exposure including outdoor applications, and other standing water applications, so long as they are installed with either SS Prelude Plus, AL Prelude Plus, or Prelude Plus Fire Guard XL suspension systems. Products with HumiGuard Max performance can be installed in exterior applications, where standing water is present, or where moisture will come in direct contact with the ceiling. Only Ceramaguard with AL Prelude Plus suspension system can be installed over swimming pools.

1.9 WARRANTY

- .1 Acoustical Panel: Submit a written warranty executed by the manufacturer, agreeing to repair or replace panels that fail within the warranty period. Failures include, but are not limited to the following
 - .1 Acoustical Panels: Sagging and warping
 - .2 Grid System: Rusting and manufacturer's defects
- .2 Warranty Period
 - .1 Acoustical panels: Ten (10) years from date of substantial completion
 - .2 Suspension: Ten (10) years from date of substantial completion
 - .3 Ceiling System: Thirty (30) years from date of substantial completion
- .3 The Warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

1.10 MAINTENANCE

- .1 Extra Materials: Deliver extra materials to Owner. Furnish extra materials described below that match products installed. Packaged with protective covering for storage and identified with appropriate labels.
 - .1 Acoustical Ceiling Units: Furnish quality of full-size units equal to 5.0 percent of amount installed, for each ceiling type/pattern.
 - .2 Exposed Suspension System Components: Furnish quantity of each exposed suspension component equal to 2.0 percent of amount installed, for each ceiling type/pattern.

2 PRODUCTS

2.1 MANUFACTURERS

- .1 Ceiling Panels: Model numbers for acoustic ceiling tiles and grid as manufactured by Armstrong World Industries, are listed to establish a standard of quality for design, function, materials, performance, workmanship, and appearance. The following manufacturers may be submitted for evaluation by the architect by following the conditions of the Product Substitutions Section 01 25 00. The architect shall be the sole judge as to the acceptability of all products submitted for substitution.
 - .1 CertainTeed.
 - .2 Canadian Gypsum Company (CGC).

2.2 ACOUSTICAL CEILING UNITS TYPE (ACT)

- .1 Surface Texture: Fine
- .2 Composition: Fiberglass
- .3 Color: White
- .4 Size: 24in X 48in X 5/8in
- .5 Edge Profile: Square
- .6 Noise Reduction Coefficient (NRC): ASTM C 423; Classified with UL label on product carton 0.95
- .7 Articulation Class (AC): ASTM E 1111; Classified with UL label on product carton 190
- .8 Flame Spread: ASTM E 1264; Class A (UL)
- .9 Light Reflectance (LR) White Panel: ASTM E 1477; 0.86
- .10 Dimensional Stability: HumiGuard Plus
- .11 Material Ingredient Transparency: Health Product Declaration (HPD); Declare Label
- .12 Life Cycle Assessment: Third Party Certified Environment Product Declaration (EPD)
- .12 Acceptable Product: OPTIMA Health Zone, 3115PB No added formaldehyde as manufactured by Armstrong World Industries, or equivalent

2.3 ACOUSTICAL CEILING UNITS TYPE 2 (REPLACEMENT TILES AT EXISTING CEILING)

- .1 Surface Texture: Smooth
- .2 Composition: Fiberglass
- .3 Color: White
- .4 Size: 24in X 24in
- .5 Edge Profile: Square
- .6 Noise Reduction Coefficient (NRC): ASTM C 423; Classified with UL label on product carton .9
- .7 Articulation Class (AC): ASTM E 1111; Classified with UL label on product carton 190

- .8 Flame Spread: ASTM E 1264; Class A (UL)
- .9 Light Reflectance (LR) White Panel: ASTM E 1477; 0.88
- .10 Dimensional Stability: HumiGuard Plus
- .11 Material Ingredient Transparency: Health Product Declaration (HPD); Declare Label
- .12 Life Cycle Assessment: Third Party Certified Environment Product Declaration (EPD)
- .13 Acceptable Product: LYRA Plant Based (PB), 8360PB No added formaldehyde as manufactured by Armstrong World Industries, or equivalent.
- .14 Schedule:
 - .1 Allow for a total quantity of 1,000 sq ft for replacement of damaged/discoloured tiles throughout existing ceiling areas – exact locations to be coordinated on site.

2.4 SUSPENSION SYSTEMS

- .1 Components: Main beams and cross tees, base metal and end detail, fabricated from commercial quality hot dipped galvanized steel complying with ASTM A 653 with aluminum cap. Main beams and cross tees are double-web steel construction with type exposed flange design. Exposed surfaces chemically cleansed, capping prefinished galvanized steel in baked polyester paint. Main beams and cross tees shall have rotary stitching.
 - .1 Structural Classification: ASTM C 635 Light Duty
 - .2 Color: White Aluminum and match the actual color of the selected ceiling tile, unless noted otherwise.
 - .3 Acceptable Product: PRELUDE Plus XL Aluminum 15/16" Exposed Tee as manufactured by Armstrong World Industries
- .2 Attachment Devices: Size for five times design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.
- .3 Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft annealed, with a yield stress load of at least three times design load, but not less than 12 gauge.
- .4 Edge Moldings and Trim: Metal or extruded aluminum of types and profiles indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations, including light fixtures, that fit type of edge detail and suspension system indicated. Provide moldings with exposed flange of the same width as exposed runner.
- .5 Accessories
 - .1 Shadow molding with ½" (13mm) reveal, exposed flange same width as exposed runners, to be used at interface with walls/bulkheads.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Do not proceed with installation until all wet work such as concrete, terrazzo, plastering and painting has been completed and thoroughly dried out, unless expressly permitted by manufacturer's printed recommendations. (Exception: HumiGuard Max Ceilings)
- .2 Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less than half width units at borders, and comply with reflected ceiling plans. Coordinate panel layout with mechanical and electrical fixtures.
- .3 Coordination: Furnish layouts for preset inserts, clips, and other ceiling anchors whose installation is specified in other sections.
 - .1 Furnish concrete inserts and similar devices to other trades for installation well in advance of time needed for coordination of other work.

3.2 PREPARATION

- .1 Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less than half width units at borders, and comply with reflected ceiling plans. Coordinate panel layout with mechanical and electrical fixtures.
- .2 Coordination: Furnish layouts for preset inserts, clips, and other ceiling anchors whose installation is specified in other sections.
 - .1 Furnish concrete inserts and similar devices to other trades for installation well in advance of time needed for coordination of other work.

3.3 INSTALLATION

- .1 Install suspension system and panels in accordance with the manufacturer's instructions, and in compliance with ASTM C 636 and with the authorities having jurisdiction.
- .2 Suspend main beam from overhead construction with hanger wires spaced 4'-0" on center along the length of the main runner. Install hanger wires plumb and straight.
- .3 Install wall moldings at intersection of suspended ceiling and vertical surfaces. Miter corners where wall moldings intersect or install corner caps.
- .4 For reveal edge panels: Cut and reveal or rabbet edges of ceiling panels at border areas and vertical surfaces.
- .5 Install acoustical panels in coordination with suspended system, with edges resting on flanges of main runner and cross tees. Cut and fit panels neatly against abutting surfaces. Support edges by wall moldings.

3.4 INTERFACE WITH OTHER WORK

- .1 Co-ordinate ceiling work to accommodate components of other sections, such as light fixtures, diffusers, speakers, sprinkler heads, to be built into acoustical ceiling components.

3.5 ADJUSTING AND CLEANING

- .1 Replace damaged and broken panels.
- .2 Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch up of minor finish damage.
 - .1 Ceiling Touch-Up Paint, (Item #5760, 8oz. bottles) (Item #5761, quart size cans), "global white" latex paint should be used to hide minor scratches and nicks in the surface and to cover field tegularized edges that are exposed to view.
- .3 Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- .1 Engineered Wood Flooring of the following types:
 - .1 Red oak flooring.

1.2 REFERENCES

- .1 Forest Stewardship Council (FSC): FSC Chain-of-Custody certification.

1.3 SUBMITTALS

- .1 Submit under provisions of Section 01 30 00 - Administrative Requirements.
- .2 Product Data:
 - .1 Manufacturer's data sheets on each product to be used.
 - .2 Preparation instructions and recommendations.
 - .3 Storage and handling requirements and recommendations.
 - .4 Typical installation methods.
 - .5 Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
 - .6 Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square representing actual product, color, and patterns.

1.4 QUALITY ASSURANCE

- .1 Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum five years documented experience.
- .2 Installer Qualifications: Company specializing in performing Work of this section with minimum two years documented experience with projects of similar scope and complexity.
- .3 Mock-Up: Construct a mock-up with actual materials in sufficient time for Architect's review and to not delay construction progress. Locate mock-up as acceptable to Architect and provide temporary foundations and support. If deemed acceptable, mock-up may form part of Work.

1.5 PRE-INSTALLATION CONFERENCE

- .1 Convene a conference approximately two weeks before scheduled commencement of the Work. Attendees shall include Architect, Contractor and trades involved. Agenda shall include schedule, responsibilities, critical path items and approvals.

1.6 DELIVERY, STORAGE, AND HANDLING

- .1 Store and handle in strict compliance with manufacturer's written instructions and recommendations.
- .2 Protect from damage due to weather, excessive temperature, and construction operations.

1.7 PROJECT CONDITIONS

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

1.8 WARRANTY

- .1 Manufacturer's Warranty: Provide 2-year material and workmanship warranty.

1.9 EXTRA MATERIAL

1. Provide extra flooring materials and adhesives in accordance with Section 01780 - Closeout Submittals.
2. Provide extra flooring materials equivalent to 5% of installed floor area, or 100 sq ft., whichever is the lesser amount.
3. Deliver to Owner, upon completion of the work of this section and store where directed.

PART 2 - PRODUCTS

2.1 Material

- .1 Description: Prefinished engineered hardwood flooring with tongue and groove finish and micro V-bevel (all four sides).
- .2 Thickness: 3/8" (10mm) overall; sawn hardwood layer 5/32" (4mm); 5-ply plywood base 15/64" (6mm).
- .3 Width: 2-9/16" (65mm).
- .4 Length: from 14" (635mm) to 46" (1,168mm).
- .5 Installation: glued.
- .6 Subfloor: wood.
- .7 Grade: select and better.
- .8 Finish: Ultraresistant finishing system made of aluminum oxide and nanosilica particle composites suspended in UV cured polyurethane.
- .9 Acceptable product:
 - .1 Alive series by Mirage.
 - .2 Equivalent products per spec 01250.

2.2 Adhesive

- .1 Adhesive: as recommended by manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Do not begin installation until substrates have been properly constructed and prepared.
- .2 If substrate preparation is the responsibility of another installer, notify Architect in writing of unsatisfactory preparation before proceeding.
- .3 Install wood flooring only after interior temperature and humidity conditions can be maintained at conditions that mimic normal temperature and humidity conditions for the permanent system.

3.2 PREPARATION

- .1 Clean surfaces thoroughly prior to installation.
- .2 Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- .1 Install in accordance with manufacturer's instructions, approved submittals and in proper relationship with adjacent construction.

3.4 CLEANING AND PROTECTION

- .1 Limit foot traffic on finished wood flooring.
- .2 Protect from damage during construction operations. Promptly repair any damaged surfaces. Remove and replace work which cannot be satisfactorily repaired.
- .3 Clean products in accordance with the manufacturer's recommendations.
- .4 Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

PART 1 - GENERAL

1.1 References

- .1 American Society for Testing and Materials (ASTM):
 - .1 ASTM F 1869 Standard Test Method for Measuring Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
 - .2 ASTM F 2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes
 - .3 ASTM F 1861 Standard Specification for Resilient Wall Base.
 - .4 ASTM F 710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
 - .5 ASTM F 1482 Standard Practice for Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring.
 - .6 ASTM E 648 Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
 - .7 ASTM E 662 Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
 - .8 ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials.
 - .9 ASTM E 492 Standard Test Method for Laboratory Measurement of Impact Sound Transmission through Floor-Ceiling Assemblies Using the Tapping Machine.
 - .10 ASTM E 989 Standard Classification for Determination of Impact Insulation Class (IIC).
- .2 National Fire Protection Association (NFPA):
 - .1 NFPA 253 Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
 - .2 NFPA 258 Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
- .3 International Standards and Training Alliance (Install):
 - .1 Install Resilient Certification.

1.2 Submittals

- .1 Product Data: Submit manufacturer's current printed Product literature, Specifications, installation instructions, and field reports in accordance with Section 01330 - Submittal Procedures.
- .2 Shop Drawings: Submit Shop Drawings to indicate materials, details, and accessories in accordance with Section 01330 - Submittal Procedures including but limited to the following:
 1. Submit a cut diagram indicating seam locations and roll direction. Use mitered seam layouts for corners when changing directions 180 degrees (e.g. when running material down corridors which bisect at a right angle), unless approved otherwise.
- .3 Samples: Submit duplicate 12" x 12" (300 mm x 300 mm) sample pieces of sheet material.

1.3 Closeout Submittals

- 1 Provide maintenance data and warranty for resilient flooring for incorporation into manual specified in Section 01780 - Closeout Submittals.

1.4 QUALITY ASSURANCE

- .1 Installer Qualifications: Installer experienced in performing Work of this section who has specialized in installation of Work similar to that required for this Project.
 - .1 Engage installer certified by flooring manufacturer
 - .2 Certificate: Submit certificate indicating installer qualification.

- .2 Regulatory Requirements:
 - .1 Fire Performance Characteristics: Provide resilient linoleum sheet flooring with the following fire performance characteristics as determined by testing Products in accordance with ASTM method indicated below by a certified testing laboratory or another testing and inspecting agency acceptable to authorities having jurisdiction:

Critical Radiant Flux: Class 1 Rating per NFPA 253 (ASTM E 648) (0.45 watts/cm² or greater).

Smoke Density: Less than 450 per NFPA 258 (ASTM E 662).
 - .2 Provide slip resistant sheet vinyl safety flooring in compliance with the following:
 - .1 Ontario Building Code (OBC), latest edition.
 - .2 City of Hamilton Barrier Free Design Guidelines, latest edition
 - .3 Workplace Safety Insurance Board (WSIB).
 - .3 Mock-Ups: Install at Project site a job mock-up using acceptable Products and manufacturer approved installation methods. Obtain Owner's and Consultant's acceptance of finish color, texture and pattern, and Workmanship standard. Comply with Division 1 Quality Control (Mock-Up Requirements) Section.
 - .1 Mock-Up Size: 3m x 3m, location as directed by Consultant.
 - .2 Incorporation: Mock-up may be incorporated into final construction upon Owner's approval.

1.5 DELIVERY, STORAGE, AND HANDLING

- .1 General: Comply with Division 1 Product Requirements Sections.
- .2 Ordering: Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
- .3 Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- .4 Storage and Protection: Store materials protected from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer.
 - .1 Material should be stored in areas that are fully enclosed and weathertight. The permanent HVAC should be fully operational, controlled and set at a minimum of 68° F (20° C) for at least 48 hours prior to the installation.

1.6 PROJECT CONDITIONS

- .1 Environmental Requirements/Conditions: In accordance with manufacturer's recommendations, areas to receive flooring should be clean, fully enclosed and weathertight. The permanent HVAC must be fully operational, controlled and set at a minimum of 68° F (20° C) for a minimum of seven days prior to, during, and seven days after the installation. The flooring material should be conditioned in the same manner for at least 48 hours prior to the installation. Areas to receive flooring shall be adequately lighted to allow for proper inspection of the substrate, installation and seaming of the flooring, and for final inspection.
- .1 Temperature Requirements: Maintain air temperature in spaces where Products will be installed for time period before, during, and after installation as recommended by manufacturer.
 - .1 Temperature Conditions: 68° F (20° C) for a minimum of seven days prior to, during, and seven days after the installation.

1.7 SEQUENCING AND SCHEDULING

- .1 Finishing Operations: Install tile flooring after finishing operations, including painting and ceiling operations, have been completed.

- .2 Concrete Curing: Do not install tile flooring over concrete substrates until substrates have cured and are dry to bond with adhesive as determined by resilient flooring manufacturer's recommended bond, moisture test, and pH test.
 - .1 It is the Flooring Contractor's responsibility to verify suitability of substrate.

1.8 WARRANTY

- .1 Project Warranty: Refer to "Conditions of the Contract" for Project warranty provisions.
- .2 Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.
 - .1 Warranty Period: Five (5) year limited warranty commencing on Date of Substantial Completion.

1.9 MAINTENANCE

- .1 Extra Materials: Deliver to Owner extra materials from same Production run as Products installed. Package Products with protective covering and identify with descriptive labels. Comply with Division 1 Closeout Submittals (Maintenance Materials) Section.
 - .1 Quantity: Furnish quantity of flooring units equal to 5% of amount installed for each colour/pattern. Extra material to be provided from same dye lot as installed material.
 - .2 Delivery, Storage and Protection: Comply with Owner's requirements for delivery, storage and protection of extra materials.

PART 2 - PRODUCTS

2.1 RESILIENT FLOORING (RES)

- .1 Product Performance Requirements
 - .1 Description: Homogeneous tile linoleum of primarily natural materials consisting of linseed oil, wood flour, and rosin binders, mixed and calendered onto a polyester backing to ensure optimum dimensional stability. Pattern and color shall extend throughout total thickness of material.
 - .2 Size: Sheets of minimum 4'-0" (1.2m) width
 - .3 Gauge: 2mm (0.80")
 - .4 Pattern and Color: As selected by Consultant from manufacturer's full pattern/color range. Allow for 2 colours.
 - .5 Adhesive: As recommended by manufacturer
 - .6 Heat welding rod to be supplied and/or recommended/approved by the resilient flooring Manufacturer.
 - .7 Acceptable product
 - .1 Marmoleum Fresco, manufactured by Forbo.
 - .2 Equivalent products per Spec 01250.
- 2 Resilient Flooring must:
 - .1 not be manufactured or formulated with heavy metals including cadmium (Cd), chromium (Cr), lead (Pb), mercury (Hg), and nickel (Ni);
 - .2 not contain > 0.01 % by weight of arsenic (As);
 - .3 not contain > 1 % by weight of tin (Sn), and zinc (Zn);
 - .4 be manufactured with recycled content; and
 - .5 not contain or be manufactured with materials derived from species listed under CITES.

- .4 The manufacturing process must adhere to Lifecycle Assessment Standards as per CAN/CSA-ISO 14040.

2.2 SLIP RESISTANT SAFETY FLOORING (SFT)

- .1 Slip Resistant Sheet Vinyl:
 - .2 Basis of Design: Walkway 20, as manufactured by Altro USA, Inc.
 - .1 Wear Layer: Homogeneous construction.
 - .2 Overall Thickness: 0.08 in (2.0 mm).
 - .3 Sheet/Roll Width: 79 in (2 m).
 - .4 Sheet/Roll Length: 66 ft (20.1 m).
 - .5 Weight: 4.79 lbs per sq yd (2.6 kg per sq m).
 - .6 Backing: Non-woven polyester and cellulose, glass fiber reinforcement.
 - .7 Slip Resistance per ASTM D 2047: ADA compliant.
 - .1 Dry: 0.8; Wet: 0.8.
 - .2 Ramp Test per DIN 11530: R10.
 - .8 Static Load Limit per ASTM F 970:1000 lbs per sq in (6894 kPa).
 - .9 Fire Performance:
 - .1 CAN/ULC - S102.2.
 - .2 ASTM E 648: Tested Class I.
 - .3 ASTM E 662: Less than 450.
 - .10 Product Identification: Winter VMI2053

2.3 ACCESSORIES

- .1 Resilient base: 100% PVC free, continuous, top set, complete with premoulded end stops and external corners:
 - .1 Type: thermoset rubber.
 - .2 Style: cove.
 - .3 Thickness: 3.17 mm.
 - .4 Height: 101.6 mm.
 - .5 Lengths: cut lengths minimum 2400 mm.
 - .6 Colour: To be determined by consultant from full colour range
 - .7 Acceptable products/manufacturers: Baseworks thermoset rubber Type TS by Johnsonite, Pinnacle by Roppe.
- .2 Metal edge strips:
 - 1. For edging between resilient sheet flooring and all other floor materials always use a flush anodized aluminum metal edging. Exact model number to be determined by the Contractor based on site conditions and height differential and to be approved by Architect prior to installation.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: Comply with manufacturer's Product data, including Product technical bulletins, Product catalog installation instructions, and Product carton instructions for installation.

3.2 EXAMINATION

- .1 Site Verification of Conditions: Verify substrate conditions (which have been previously installed under other sections) are acceptable for Product installation in accordance with manufacturer's instructions (i.e. moisture tests, bond test, pH test).
- .2 Material Inspection: In accordance with manufacturer's installation requirements, visually inspect materials prior to installation. Material with visual defects shall not be installed.

3.3 PREPARATION

- .1 Adjacent Surfaces Protection: Protect adjacent Work areas and finish surfaces from damage during Product installation.
- .2 Surface Preparation:
 - .1 Prepare concrete subfloors in accordance with Flooring Manufacturer's current printed Subfloor Preparation guidelines. All required preparation to be covered under this contract.
 - .2 Wood subfloors to conform to ASTM F1482 and manufacturers written requirements.
 - .3 Level all rough surfaces and fill cracks and marks with a patching compound compatible with Resilient Flooring.
 - .4 Mechanically remove all surface contaminants such as paint, oil, grease, varnish, adhesive as well as various other products such as treatment compounds.
 - .5 Ensure Moisture, Relative Humidity and pH tests have all been conducted and measurements meet manufacturer's recommendations, prior to installation.

3.4 INSTALLATION OF FLOORING

- .1 Install the flooring according to the latest version of Resilient Flooring Manufacturers Installation Instructions. Use the tools, adhesives, trowel types and procedures recommended in the instructions.
- .2 Acclimate the flooring in the secure storage area provided by the General Contractor that is maintained permanently or temporarily at ambient service temperature and humidity (except walk in freezers or similar), or 68°F ± 5° F and 50% relative humidity, for at least 48 hours prior to application.
- .3 When required, use a leveler following the manufacturers written instructions. The surface should be free of dust, solvents, paint, wax, varnish, oil, grease, asphalt, old adhesives, and other extraneous materials that may interfere with the bond. These should be completely removed by mechanical means only. Dustless diamond grinding or bead blasting are the preferred method to remove contaminates and bond breakers, as it also helps to level the concrete.
- .4 Prime the subfloor prior to using a suitable leveler, ensure minimum thickness is maintained if required by resilient flooring manufacturer.
- .5 Vacuum floors immediately prior to installing the flooring to remove all loose particles. If required, only use water based sweeping compounds. Do not use any wax or oil based compounds that leave behind a residue that may interfere with the adhesive bond.
- .6 Scribe, cut, fit flooring to butt tightly to vertical surfaces, permanent fixtures and built-in furniture, including pipes, outlets, edgings, thresholds, nosings, and cabinets.
- .7 Extend flooring into toe spaces, door reveals, closets, and similar openings.
- .8 Install flooring on covers for telephone and electrical ducts, and similar items occurring within finish floor areas. Maintain overall continuity of color and pattern with pieces of flooring installed on these covers.
- .9 Roll resilient flooring as required by resilient flooring manufacturer.
- .10 Finish Flooring Patterns: As selected by Consultant.

3.5 APPLICATION OF RUBBER 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.

3.6 INSTALLATION: FLASH COVE BASE

- .1 Coved Installation: Where flooring is covered up wall surfaces and other abutments, installation shall be in accordance with manufacturers written instructions, using the following accessories:
 1. At standard wall finishes: provide vinyl cap strip to accommodate sheet vinyl to a height as indicated; adhere with contact tape.
 2. At hygienic wall paneling: extend floor finish 2" (50mm) above height of cove indicated on drawings/schedules to allow wall panel to overlap top edge of flooring.
 3. At 0.75" (19.1 mm) radius coving at juncture of vertical and horizontal surfaces: Use Cove Former, install with contact tape.
 4. Top set cove base: Install in accordance with manufacturer's instructions.

3.7 CLEANING

- .1 Cleaning: Remove temporary coverings and protection of adjacent Work areas. Repair or replace damaged installed Products. Clean installed Products in accordance with manufacturer's instructions prior to Owner's acceptance. Remove construction debris from Project site and legally dispose of debris.
 - .1 Remove visible adhesive and other surface blemishes using cleaning methods recommended by floor manufacturer.
 - .2 Sweep and vacuum floor after installation.
 - .3 Do not wash floor until after time period recommended by flooring manufacturer.
 - .4 Damp mop flooring to remove black marks and soil.

3.8 PROTECTION

- .1 Protection: Protect installed Product and finish surfaces from damage during construction. Remove and legally dispose of protective covering at time of Substantial Completion.

3.9 INITIAL MAINTENANCE PROCEDURES

- .1 General: Include in Contract Sum Amount cost for initial maintenance procedures, and execute procedures after flooring installation as recommended by flooring manufacturer.

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

- .1 This section includes labor, materials and other services necessary to complete vinyl wall coverings.
- .2 Conform with requirements of all Sections of Division 1, General Requirements, as it applies to the work of this Section.

1.02 REFERENCES

- .1. General: Standards listed by reference, including revisions by issuing authority, form a part of this specification section to extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title or other designation established by issuing authority. Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation.
- .2 American Society for Testing & Materials (ASTM):
 1. AST ASTM E 84-05 Standard Test Method for Surface Burning Characteristics of Building Materials.
 2. ASTM D5420 Gardner Impact Exceeds 160 inch pounds

1.03 SYSTEM DESCRIPTION

- .1 Performance Requirements: Provide hygienic wall covering which has been manufactured and installed to maintain performance criteria stated by manufacturer without defects, damage or failure.

1.04 SUBMITTALS

- .1 Product Data: Submit manufacturer's current printed product literature, specifications, installation instructions, and field reports in accordance with Section 01330 - Submittal Procedures.
- .2 Shop Drawings: Submit shop drawings to indicate materials, details, and accessories in accordance with Section 01330 - Submittal Procedures including but limited to the following:
 1. Submit a layout diagram indicating the location of each panel and joining method.
- .3 Samples: Provide 3no 6"x6" samples of material in each colour/texture..
- .4 Quality Assurance Submittals: Submit the following:
 1. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
 2. Manufacturer's Instructions: Current published manufacturer's installation and maintenance instructions.
- .5 Closeout Submittals: Submit the following:
 1. Operation and Maintenance Data: Operation and maintenance data for installed products in accordance with Division 1 Closeout Submittals (Maintenance Data and Operation Data) Section. Include methods for maintaining installed products and precautions against cleaning materials and methods detrimental to finishes and performance.
 2. Warranty: Warranty documents specified herein

1.05 QUALITY ASSURANCE

- .1 Installer Qualifications: Installer experienced in performing work of this section who has specialized in installation of work similar to that required for this project.
- .2 Mock-ups: Install at project site a job mock-up using acceptable products and manufacturer

approved installation methods. Obtain Owner's and Consultant's acceptance of finish color, texture and pattern, and workmanship standards.

- .1 Mock-Up Size: 4' x 8'
- .2 Incorporation: Mock-up may be incorporated into final construction upon Owner's approval.
- .3 Pre-installation Meeting: Conduct pre-installation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions and manufacturer's warranty requirements.

1.06 DELIVERY, STORAGE & HANDLING

- .1 Ordering: Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
- .2 Deliver, store and handle panels in accordance with Section 01610 - Basic Material Requirements.
- .3 Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- .4 Store materials protected from exposure to harmful weather conditions, at temperature and humidity conditions recommended by manufacturer.
- .5 Store panels in temperature controlled environments. Leave protective blue film on panel until ready to use.

1.07 WASTE MANAGEMENT AND DISPOSAL

- .1 Deposit all packaging materials in appropriate container on site for recycling or reuse.
- .2 Avoid using landfill waste disposal procedures when recycling facilities are available.
- .3 Keep all discarded packaging away from children.

1.08 PROJECT CONDITIONS

- .1 Temperature Requirements: If storage temperature is below 65F (18C), hygienic wall panels must be moved to a warmer place and allowed to reach this temperature before installation. For further information, refer to manufacturer's current Installation Guide.
- .2 Maintain air temperature and structural base temperature at installation area between 65F (18C) and 80F (26C) for 48 hours before, during and 24 hours after installation.

1.09 WARRANTY

- .1 Project Warranty: Refer to Conditions of the Contract for project warranty provisions.
- .2 Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.
- .3 Warranty Period for Hygienic Wall Panels shall be 10 years commencing on Date of Substantial Completion.

1.10 EXTRA MATERIALS

- A. Provide extra materials of product and adhesives in accordance with Section 01780 - Closeout Submittals.
- C. Provide 32sqft (3m²) of extra materials in one piece and from same production run as installed materials (for each colour/texture scheduled).
- D. Clearly identify each wall panel and each container of adhesive.
- E. Deliver to Owner, upon completion of the work of this section and store where directed.

PART 2 PRODUCTS

2.01 MATERIALS

- .1 100% pure vinyl, extruded, homogenous, semi-rigid PVCu sheet containing no plasticizers or fillers. Acceptable Manufacturers:
 - .1 Whiterock as manufactured by Altro
 - .2 Equivalent products as per Specification 01250
- .2 Panels
 - .1 Thickness: 0.10" (2.5 mm); Panel Width: 4' (1.22m) Panel Height: Either 8' or 10' (2.5m or 3m); Weight 4'x8' Panel: 24 lbs (10.4 kg) Weight 4'x10' Panel: 29 lbs (12.7 kg).
 - .1 Colour: to be selected by Consultant from Standard Colour range. Allow for 3 colours.

2.02 ACCESSORIES

- .1 Vinyl welding rod: Acceptable material:
 - 1. Altro weld rod
- .2 Joint Strips/Accessories:
 - 1. Stainless Steel Capping – A865 Brushed Steel
- .3 Acrylic Adhesive: For dry, climate controlled areas, use AltroFix W49, a one-part, water-based, acrylic adhesive as recommended by manufacturer.
- .4 Polyurethane Adhesive: The default adhesive for most installations, suitable for wet area, non-climate controlled areas, and non-absorbent surfaces, use AltroFix W39, a two-part resin-based polyurethane adhesive as recommended by manufacturer. Provide written confirmation adhesive is compatible with liquid applied waterproof membrane as per item 5 below.
- .5 Acrylic polymer based, liquid applied elastomeric waterproof membrane (to be applied to tile backer substrate at all areas scheduled to receive hygienic wall panel finish): Liquid Waterproofing Membrane by USG Durock or equivalent.
- .6 Caulking and Sanitary Sealant:
 - 1. Altro Sanitary Sealant Sealant, Colour: clear.

2.03 SOURCE QUALITY

- .1 Source Quality: Obtain wall products from a single manufacturer.

PART 3 EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog, installation instructions and product label instructions for installation.

3.02 EXAMINATION

- A. Site Verification of Conditions: Verify substrate conditions, which have been previously installed under other sections, are acceptable for product installation in accordance with manufacturer's instructions.

3.03 SUBSTRATE PREPARATION

- .1 Walls should be smooth and level. High points must be removed and low points filled with filler intended for the substrate and environmental conditions.

- .2 Wall tiles must be fixed firmly to the wall. As long as the tile edges do not protrude you do not have to skim grout joints.
- .3 Surfaces must be permanently dry and free from all substances that may contribute to adhesive bond failure.
- .4 Remove loose paint and conduct an adhesive bond test with paint.
- .5 Exterior walls must be adequately damp-proofed and insulated.
- .6 Dry wall substrates should be paint ready.
- .7 Apply liquid waterproof membrane where scheduled.

3.04 PREPARATION

- .1 All surfaces must be free from dust and cleaned prior to installation. The working environment must also be dust free. Failure to comply with these conditions will reduce the bond strength between the adhesive and substrate which may cause panels to de-bond.
- .2 Very absorbent / porous substrates (particularly plaster finishes and unprimed sheetrock) must have a proprietary sealer e.g. PVA primer or similar, applied to the surface a minimum of 12 hours prior to the installation.
- .3 All electrical switches, power points etc., should be in a first fix / installation state. All electrical equipment should only be moved or altered by a qualified electrician.
- .4 All plumbing should have pipe-work removed to a first fix or installation state and "tails" left protruding from the substrate. Panels can then be drilled and slid over the pipe tails. All holes should be drilled 1/8" (3mm) oversize to allow for expansion, then sealed with Mastic caulking. Plumbing should always be done by a qualified plumber.
- .5 Hot pipes and steam pipes should be insulated and a 1/8" to 1/4" (3-6mm) expansion gap should be created when installing panels around these pipes, then sealed with Mastic caulking.
- .6 All pipes, fixing bolts, etc. extending through the panels should have a minimum 1/8" (3mm) expansion gap and be sealed using Mastic caulking.
- .7 If fitting to door frames, these must be in place prior to installation of panels.
- .8 Prior to installation, it is advisable to complete any painting which comes in contact with panels, as sealant used at junctions is non-paintable.
- .9 Panels should be stored flat and be pre-conditioned a minimum of 24 hours in ambient temperatures similar to the prevailing operational conditions.
- .10 The panels must be stored on a level flat surface off the ground (risk of condensation on the panels if stored on damp surfaces). Storage on uneven surfaces could cause the panels to distort prior to installation.
- .11 First, check the room using a 6' (2 m) level to ensure all walls are flat, paying particular attention to the corners, window reveals, and door entrances. These need to be inspected to ensure they are free of any debris or irregularities, which could prevent the panels laying flat to the substrate after the adhesive has been applied and the panel installed.

3.05 INSTALLATION

- .1 **Heat Weld System installation shall be provided throughout.** Install panels in accordance with the manufacturers current published Installation Guide. All joints should be joined by Heat Weld Application methods as detailed in manufacturers installation guide.

3.06 FIELD QUALITY REQUIREMENTS

- .1 **Manufacturer's Field Services:** Upon Owner's request, provide manufacturer's field service consisting of product use recommendations and periodic site visits for inspection of product

installation in accordance with manufacturer's instructions.

3.07 CLEANING

- .1 Panels can be cleaned with a diluted soap/detergent solution, such as Altro 44 Cleaner.
- .2 When cleaning the panel surface, we recommend the temperature of water does not exceed 140° F (60° C).
- .3 Pressure cleaning with hot water may be used with the pressure nozzle a minimum of 2 feet (600mm) away from the surface.
- .4 To reduce the buildup of static, cleaning the panels with an anti-static solution is recommended.
- .5 Stubborn stains use AltroClean 44 cleaner or equivalent alkaline cleaner.
 - .1 Remove construction debris from project site and legally dispose of debris.

3.08 PROTECTION

- .1 Do not install near open heat sources (ovens, etc). Stainless steel panels should be used in such areas.

END OF SECTION

PART 1 - GENERAL

1.1 Related Sections.

- .1 Section 01330 - Submittal Procedures.
- .2 Section 01610 - Basic Product Requirements.
- .3 Section 01780 - Closeout Submittals.

1.2 References

- .1 Architectural Painting Specifications Manual, Master Painters Institute (MPI).
- .2 Systems and Specifications Manual, SSPC Painting Manual, Volume Two, Society for Protective Coatings (SSPC).
- .3 Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 (for Surface Coatings) of the Environmental Protection Agency (EPA).
- .4 National Fire Code of Canada.

1.3 Quality Assurance

- .1 Contractor shall have a minimum of five years proven satisfactory experience. When requested, provide a list of last three comparable jobs including, job name and location, specifying authority, and project manager.
- .2 Qualified journeymen who have a "Tradesman Qualification Certificate of Proficiency" shall be engaged in painting work. Apprentices may be employed provided they work under the direct supervision of a qualified journeyman in accordance with trade regulations.
- .3 Conform to latest MPI requirements for interior painting work including preparation and priming.
- .4 Materials primers, paints, fillers, thinners, solvents, etc. shall be in accordance with MPI Painting Specification Manual "Approved Product" listing and shall be from a single manufacturer for each system used.
- .5 Other paint materials such as linseed oil, shellac, turpentine, etc. shall be the highest quality product of an approved manufacturer listed in MPI Painting Specification Manual and shall be compatible with other coating materials as required.
- .6 Retain purchase orders, invoices and other documents to prove conformance with noted MPI requirements when requested by Consultant.
- .7 Standard of Acceptance:
 - .1 Walls: No defects visible from a distance of 1000 mm at 90 degrees to surface.
 - .2 Ceilings: No defects visible from floor at 45degrees to surface when viewed using final lighting source.
 - .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

1.4 Environmental Performance Requirements

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

1.5 Scheduling of Work

- 1 Submit work schedule for various stages of painting to Consultant for approval. Submit schedule minimum of 48 hours in advance of proposed operations.
- .2 Obtain written authorization from Consultant for any changes in work schedule.

- .3 Schedule painting operations to prevent disruption of occupants in and about the building.

1.7 Quality Control

- .1 When requested by Consultant prepare and paint designated surface, area, room or item in each colour scheme to requirements specified herein, with specified paint or coating showing selected colours, gloss/sheen, textures and workmanship to MPI Painting Specification Manual standards for review and approval. When approved, surface, area, room and/or items shall become acceptable standard of finish quality and workmanship for similar on-site work.

1.8 Delivery, Handling and Storage

- .1 Deliver, store and handle materials in accordance with Section 01610 - Basic Product Requirements.
- .2 Labels shall clearly indicate:
 - .1 Manufacturer's name and address.
 - .2 Type of paint or coating.
 - .3 Compliance with applicable standard.
 - .4 Colour number in accordance with established colour schedule.
- .3 Remove damaged, opened and rejected materials from site.
- .4 Provide and maintain dry, temperature controlled, secure storage.
- .5 Observe manufacturer's recommendations for storage and handling.
- .6 Store materials and supplies away from heat generating devices.
- .7 Store materials and equipment in a well ventilated area with temperature range 7C to 30C.
- .8 Store temperature sensitive products above minimum temperature as recommended by manufacturer.
- .9 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Consultant. After completion of operations, return areas to clean condition to approval of Consultant.
- .10 Remove paint materials from storage only in quantities required for same day use.
- .11 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.
- .12 Fire Safety Requirements:
 - .1 Provide one 9 kg Type ABC dry chemical fire extinguisher adjacent to storage area.
 - .2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
 - .3 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.

1.9 Site Requirements

- .1 Heating, Ventilation and Lighting:
 - .1 Ventilate enclosed spaces
 - .2 Perform no painting work unless adequate and continuous ventilation and sufficient heating facilities are in place to maintain ambient air and substrate temperatures above 10 C for 24 hours before, during and after paint application until paint has cured sufficiently.
 - .3 Where required, provide continuous ventilation for seven days after completion of application of paint.

- .4 Coordinate use of existing ventilation system with Contractor 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 Perform no painting work unless a minimum lighting level of 323 Lux is provided on surfaces to be painted. Adequate lighting facilities shall be provided by General Contractor.
- .2 Temperature, Humidity and Substrate Moisture Content Levels:
 - .1 Unless specifically pre-approved by the specifying body, Paint Inspection Agency and the applied product manufacturer, perform no painting work when:
 - .1 Ambient air and substrate temperatures are below 10 C.
 - .2 Substrate temperature is over 32 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 The relative humidity is above 85% or when the dew point is less than 3 C variance between the 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 the maximum moisture content of the substrate exceeds:
 - .1 12% for concrete and masonry (clay and concrete brick/block).
 - .2 15% for wood.
 - .3 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 Surface and Environmental Conditions:
 - .1 Apply paint finish only 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 only to adequately prepared surfaces and to surfaces within moisture limits noted herein.
 - .3 Apply paint only when previous coat of paint is dry or adequately cured.
- .4 Additional Interior Application Requirements:
 - .1 Apply paint finishes only 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 Owner such that painted surfaces will have dried and cured sufficiently before occupants are affected

1.10 Extra Materials

- 1 Submit maintenance materials in accordance with Section 01780 - Closeout Submittals.
- .2 Submit – (one) four litre can of each type and colour of primer, stain, and finish coating. Identify colour and paint type in relation to established colour schedule and finish system.
- .3 Deliver to Contractor and store where directed.

PART 2 - PRODUCTS

2.1 Materials

- .1 Paint and fillers shall be manufacture's premium quality, of type and brand herein specified and listed under "Paint Product Recommendations" premium grade as covered in the association manual, latest edition, for specific uses and only as supplied by **Pratt & Lambert Co., Benjamin Moore & Co., Para Paints Canada Inc., ICI Paints (Canada) Inc, (Glidden), Sherwin Williams Canada Inc., Pittsbugh Paints**. Paint material such as linseed oil, shellac, turpentine and the like, and any of the materials not specifically mentioned herein but required for first class work with finish specified shall be highest quality product of approved manufacturer. Where specific products are indicated in painting schedule, use product manufacturer as specified.
- .2 Paint materials for paint systems shall be products of a single manufacturer.
- .3 Only qualified products with "Environmentally Friendly" rating are acceptable for use on this project.
- .4 Water-borne surface coatings must be manufactured and transported in a manner that steps of process, including disposal of waste products arising therefrom, will meet requirements of applicable governmental acts, by-laws and regulations including, for facilities located in Canada, Fisheries Act and Canadian Environmental Protection Act (CEPA).
- .5 Water-borne surface coatings must not be formulated or manufactured with aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavelant chromium or their compounds.
- .6 Water-borne surface coatings and recycled water-borne surface coatings must have a flash point of 61.0 C or greater.
- .7 Both water-borne surface coatings and recycled water-borne surface coatings must be made by a process that does not release:
 - .1 Matter in undiluted production plant effluent generating a 'Biochemical Oxygen Demand' (BOD) in excess of 15 mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.
 - .2 Total Suspended Solids (TSS) in undiluted production plant effluent in excess of 15 mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.
- .8 Water-borne paints and stains, recycled water-borne surface coatings and water borne varnishes must meet a minimum "Environmentally Friendly" rating.
- .9 Recycled water-borne surface coatings must contain 50 % post-consumer material by volume.
- .10 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 Hexavelant 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.
- .11 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 Consultant will provide Colour Schedule after Contract award.
- .2 Interior Colours will be based upon the selection of two (2) base colours and three (3) accent colours. No more than eight colours will be selected for the entire project and no more than three colours will be selected in each area. Include for 25% dark tones.
- .3 Exterior colors will be based on three (3) base colors and four (4) accent colors with a maximum of three (3) deep or bright color. No more than seven (6) colors will be selected for the entire project. Note that this does not include pre-finished items by others, e.g. flashings, aluminum or vinyl windows, aluminum doors, etc
- .4 Selection of colours will be from manufacturers full range of colours.
- .5 Where specific products are available in a restricted range of colours, selection will be based on the limited range.
- .6 Second coat in a three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

2.3 Mixing and Tinting

- 1 Perform colour tinting operations prior to delivery of paint to site. On-site tinting of painting materials is allowed only with Consultant's written permission.
- .2 Paste, powder or catalyzed paint mixes shall be mixed in strict accordance with manufacturer's written instructions.
- .3 Where thinner is used, addition shall not exceed paint manufacturer's recommendations. Do not use kerosene or any such organic solvents to thin water-based paints.
- .4 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity.

2.4 Gloss/Sheen Ratings

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

Gloss Level	Description	Units @ 60 degrees	Units @ 85 degrees
G1	Matte of Flat finish	0 to 5	10 max
G2	Velvet Finish	0 to10	10 to 35
G3	Eggshell Finish	10 to 25	10 to 35
G4	Satin Finish	20 to 35	35 min
G5	Semi-Gloss Finish	35 to 70	
G6	Gloss Finish	70 to 85	
G7	High Gloss Finish	➤ 85	

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

2.5 Interior Painting Systems

- .1 Plaster and Drywall: Int 9.2A Latex (G3) finish over latex sealer
- .2 Plaster and Gypsum Board Ceilings: Int 9.2A Latex (G1) finish over latex sealer
- .3 Wood trim: Int 6.4A (G5) finish over alkyd sealer.
- .4 Concrete Unit Masonry: PT: Int 4.2A Latex (G3) finish.
- .5 Structural steel & metal fabrications: Int 5.1E (G5) finish.
- .6 Galvanized metal/zinc coated steel: Int 5.3L (G5) finish
- .7 Use fire retardant paint on fire rated plywood sheets behind electrical panels.

2.6 Exterior Painting Systems

- .1 Structural steel and metal fabrications: Ext 5.1B Water based light industrial coating (G3) over inorganic zinc primer.
- .2 Galvanized metal (doors/frames/railings/etc): Ext 5.3A Latex (G5) finish

All Finishing System Codes are from the Ontario Painting Contractors Association.

PART 3 - EXECUTION

3.1 General

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

3.2 Existing Conditions

- 1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Consultant damages, defects, unsatisfactory or unfavourable conditions before proceeding with work.
- .2 Conduct moisture testing of surfaces to be painted using a properly calibrated electronic moisture meter, except test concrete floors for moisture using a simple "cover patch test" and report findings to Consultant. Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.
- .3 Maximum moisture content as follows:
 - .1 Stucco, Plaster and Gypsum Board: 12%.
 - .2 Concrete: 12%.
 - .3 Clay and Concrete Block/Brick: 12%.
 - .4 Wood: 15%.

3.3 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 Consultant.
- .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, building occupants and general public in and about the building.

- .5 Removal of electrical cover plates, light fixtures, surface hardware on doors, bath accessories and other surface mounted equipment, fittings and fastenings shall be done prior to undertaking any painting operations by General Contractor. Items shall be securely stored and re-installed after painting is completed by General Contractor.
- .6 Move and cover furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.
- .7 As painting operations progress, place "WET PAINT" signs in occupied areas to approval of Consultant

3.4 Cleaning and Preparation

- .1 Clean and prepare surfaces in accordance with MPI 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. However, minimize the use of kerosene or any such organic solvents to clean up water-based paints.
- .2 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.
- .3 Where possible, prime surfaces of new wood surfaces before installation. Use same primers as specified for exposed surfaces.
 - .1 Apply vinyl sealer to MPI #36 over knots, pitch, sap and resinous areas.
 - .2 Apply wood filler to nail holes and cracks.
 - .3 Tint filler to match stains for stained woodwork.
- .4 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.
- .5 Clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with MPI requirements. Remove traces of blast products from surfaces, pockets and corners to be painted by brushing with clean brushes, blowing with clean dry compressed air, or vacuum cleaning.
- .6 Touch up of shop primers with primer as specified in applicable section. Major touch-up including cleaning and painting of field connections, welds, rivets, nuts, washers, bolts, and damaged or defective paint and rusted areas, shall be by supplier of fabricated material.
- .7 Do not apply paint until prepared surfaces have been accepted by Consultant.

3.5 Application

- 1 Method of application to be as approved by Consultant. Apply paint by brush 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 shall be free of roller tracking and heavy stipple unless approved by Consultant
- .5 Remove runs, sags and brush marks from finished work and repaint.
- .3 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access and only when specifically authorized by Consultant.
- .4 Apply coats of paint as a continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
- .5 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.
- .6 Sand and dust between coats to remove visible defects.
- .7 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as tops of interior cupboards and cabinets and projecting ledges and behind wall mounted items.

3.6 Mechanical/Electrical Equipment

- .1 Unless otherwise specified, paint finished area exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as noted otherwise.
- .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 Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.
- .5 Do not paint over nameplates.
- .6 Keep sprinkler heads free of paint.
- .7 Paint inside of ductwork where visible behind grilles, registers and diffusers with primer and one coat of matt black paint.
- .8 Paint fire protection piping red, if required.
- .9 Paint disconnect switches for fire alarm system and exit light systems in red enamel.
- .10 Paint natural gas piping yellow.
- .11 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.
- .12 Do not paint interior transformers and substation equipment.

3.7 Field Quality Control

- .1 Advise Consultant when surfaces and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.

3.8 Restoration

- .1 Clean and re-install all hardware items removed before undertaking 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 Consultant. Avoid scuffing newly applied paint.
- .5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Consultant.

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

.1 Section Includes

Furnish, deliver and install all Toilet Partitions as indicated on the drawings and as required by actual conditions at the building. The Toilet Partitions shall include the furnishing of all necessary screws, special screws, bolts, special bolts, expansion shields and all other devices necessary for the proper installation and application of the Toilet Partitions.

1.02 REFERENCES

.1 Standard

All Toilet Partitions must be scheduled, supplied and installed in accordance with: Local Building Code, CGSB (Canadian Government Specifications Board), CSA (Canadian Standards Association), ANSI (American National Standards Institute), ADA (Americans with Disabilities Act). In all cases the above references shall be taken to mean the latest edition of that particular standard including all revisions.

1.03 SUBMITTALS

.1 Make all submittals in accordance with Section: 01300

.2 Submit detailed shop drawings. Drawings must clearly indicate all methods of attachment at floor/ceiling/walls.

.3 Submit product sheets and/or catalogue cuts, of all products listed in the shop drawings.

.4 Samples

1. Upon request, a returnable sample of the Toilet Partitions shall be submitted to the Consultant/Owner for approval not later than (10) days after requested. All samples must be properly identified including: name of supplier, and name of manufacturer.

.5 Operations and Maintenance Data

1. Provide closeout documents in accordance with Specification 01780.

2. Include at a minimum documentation relating to proper care of toilet partitions, such as required lubrications, adjustments, cleaning, etc

1.04 QUALITY ASSURANCE

.1 Supplier Qualifications

1. Toilet Partition shop drawings and Toilet Partitions shall be procured from a source of supply approved by the Consultant/Owner/Architect. Supplier is responsible for the complete Toilet Partition subcontract.

1.05 DELIVERY, STORAGE AND HANDLING

.1 Marking and Packaging

1. Toilet Partitions must be delivered to the job site in the manufacturers' original packages and marked to correspond with the approved shop drawings.

.2 Delivery

1. Toilet Partitions must be delivered in an amount of time deemed appropriate by the Consultant/Owner.

1.06 WARRANTY

- .1 Written Guarantee
 1. The Toilet Partition manufacturer shall guarantee all Toilet Partitions by written certification, for a period of (5) years from date of certified substantial performance of the project, against any defects in design, materials and workmanship. Any defects as described will be made good by the manufacturer at no additional cost to the owner.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- .1 Approved Manufacturers
 1. Hadrian Manufacturing Inc.
 2. ASI Global Partitions
 3. Bradley Corporation

2.02 MATERIALS

- .1 Construction: Doors, Panels and Pilasters shall be constructed of two sheets of type 304, Embossed stainless steel with 5WL® pattern, laminated under pressure to a "verticel" (1/2") honeycomb core for impact resistance, rigidity and sound deadening. Formed edges to be welded together and interlocked, under tension, with a roll-formed oval crown stainless steel locking bar, mitred, welded and ground smooth at the corners. Honeycomb to be of virgin, long fiber paper with a maximum 12.5mm (1/2") cell size.
- .2 Doors: Shall be 25mm (1") thick with cover sheets not less than 22-gauge (0.8mm). All doors are 1613mm (63.5") high.
- .3 Panels: Shall be 25mm (1") thick with cover sheets not less than 22-gauge (0.8mm); 20-gauge (0.9mm) available upon request. All panels are 1613mm (63.5") high. Maximum panel depth is 1473 mm (58").
- .4 Pilasters: Shall be 32mm (1.25") thick with cover sheets not less than 22-gauge (0.8mm). Pilaster tops shall be reinforced with 20-gauge channel to create extra strength and twist-free rigidity along with minimizing damage by handling and/or shipping.
- .5 Headrail: Shall be 25mm (1") by 41mm (1.625") extruded anodized # 4 brushed finish aluminum with double-ridge anti-grip design. Wall thickness to be 1.5mm (0.060") and shall be securely attached to wall and pilasters with manufacturer's fittings in such a way as to make a strong and rigid installation. All joints in headrails shall be made at pilaster.
- .6 Hardware and Fittings: All panel-to-pilaster, panel-to-wall and pilaster-to-wall connections shall be made with full height continuous channels. All door hardware shall be chrome plated zinc die castings, standard. Fasteners are 12 x 1-3/4" and 12 x 5/8" TR-27 6-lobe security screws. Doors shall be equipped with a gravity type hinge mounted on the lower pilaster hinge bracket. Door hinges shall be wrap-around style and adjustable to permit the door to rest at any position when not latched. Each door to be fitted with a combined coat hook and bumper and a concealed latch, with face mortised flush with edge strip of door. Barrier-free doors shall include thumbturn lever to activate latch without fingertip grip application. Both standard and barrier-free latches shall have a turn slot designed to allow emergency access from exterior. The combined full length extruded aluminum door stop and keeper shall have a 1/4" wide continuous rubber bumper locked in place the length of the stop. To cover the sightline gap at door hinge side, full length extruded aluminum filler channel shall be provided. The "no sightline" continuous stop and hinge filler shall be #4 brushed to match door and pilaster finish. Threaded upper hinge pin shall have a metal core and self-lubricating nylon sleeve to ensure smooth, quiet operation. Pilaster shoes shall be a welded one-piece design made from polished stainless steel. Two-piece shoes that can disassemble when kicked are unacceptable.

Stainless Steel Hardware:

- .1 All pilaster, panel and screen brackets are stamped stainless steel, #4 brushed finish.

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- .2 All door wrap around hinge brackets are cast stainless steel, #4 brushed finish.
- .3 All 12 x 1-3/4" and 12 x 5/8" TR-27 6-lobe security screws are stainless steel, #4 brushed finish.
- .4 All pilaster shoes are stainless steel (type 304), #4 brushed finish.
- .5 All inner, barrier free inner, outer, door pulls, stop and keepers, coat hooks and door castings are standard zinc die castings, #4 brushed finish.

2.03 FINISH

- .1 Type 304, Embossed stainless steel with 5WL® pattern.

PART 3 - EXECUTION

3.01 EXAMINATION

- .1 Site Preparation
 - 1. The contractor must examine all site conditions that would prevent the proper application and installation of Toilet Partitions. Any defect must be immediately identified and corrected, prior to the installation of the Toilet Partitions.

3.02 INSTALLATION

- .1 Mounting Locations
 - 1. All Toilet Partitions must be mounted according Manufacturers standard locations and those specified on the drawings.

3.03 FIELD QUALITY CONTROL

- .1 Inspection
 - 1. After installation has been completed, provide for a site inspection of all Toilet Partitions to determine that all items have been supplied and installed as per the enclosed details. Also, check the operation and adjustment of all Toilet Partitions. Any discrepancies, or malfunctioning product, must be reported to the Architect immediately.

3.04 ADJUSTMENT AND CLEANING

- .1 Final Preparation
 - 1. At final completion, Toilet Partitions shall be left clean and free from disfigurement. Make all final adjustments. Where Toilet Partitions are found defective, repair or replace or otherwise correct as directed.

3.05 PROTECTION

- .1 Site Protection
 - 1. The Contractor must provide for the proper protection of all Toilet Partitions until the owner accepts the project as complete.

3.06 TOILET PARTITION SCHEDULE

- .1 Schedule
 - 1. Provide Toilet Partitions as specified in all above sections and as per the detailed Architectural Drawings.

END OF SECTION

PART 1. GENERAL

1.1 SUMMARY

- .1 This section includes toilet and bath accessories in accordance with the Contract Documents. The Work of this Section shall include but not be limited to the following:
 - 1. Surface, partition and recessed mounted toilet and bath accessories indicated on the Drawings and Schedules.
- .2 Related work:
 - .1 Wall backing required to secure accessories
 - .2 Glazing
 - .3 Tile
 - .4 Toilet compartments
 - .5 Unit masonry
 - .6 Gypsum wallboard systems
 - .7 Plumbing fixtures
 - .8 Countertops

1.2 SUBMITTALS

- .1 Comply with requirements of Section regarding submittals.
- .2 Provide required number copies of:
 - .1 Product data sheets.
 - .2 Installation instructions.
 - .3 Service and parts manual

1.3 WORK INCLUDED

- .1 Toilet Room Accessories

1.4 REFERENCES (INCLUDING BUT NOT LIMITED TO)

- .1 Ontario Building Code (latest edition)

1.5 QUALITY ASSURANCE

- .1 Model numbers for toilet room accessories manufactured by Frost Products Limited, are listed to establish a standard of quality for design, function, materials, workmanship, and appearance. The following manufacturers may be submitted for evaluation by the architect by following the conditions of the Product Substitutions Section 01250. The architect shall be the sole judge as to the acceptability of all products submitted for substitution.
 - .1 Bobrick Washroom Equipment, Inc.
 - .2 American Specialties, Inc.
 - .3 Bradley
- .2 Accessories shall be the products of a single manufacturer.
- .3 Accessories with tumbler locks shall be keyed alike with the exception of coin boxes in vending equipment.

- .4 Regulatory Requirements
 - .1 Operation of accessories shall comply with guidelines set forth by the Ontario Building Code. Documentation and samples to be provided to architect upon request.
- .5 Samples
 - .1 Upon request submit one sample of each item specified. If more than one manufacturer is specified, submit one sample of each item for architect's review.
- 1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING
 - .1 Deliver items in manufacturer's original unopened protective packaging.
 - .2 Store materials in original protective packaging to prevent physical damage or wetting.
 - .3 Handle so as to prevent damage to accessories.
- 1.6 WARRANTY
 - .1 Furnish one year guarantee against defects in material and workmanship on all accessories.
 - .2 In addition to the above the following shall apply:
 - .1 Welded stainless steel framed mirrors shall have a fifteen year guarantee against silver spoilage.

PART 2. PRODUCTS

2.1 TOILET ROOM ACCESSORIES SCHEDULE

- .1 Provide the following toilet and bath accessories in the locations indicated on the drawings/schedules:

Type	Model/Series	Description
W1	ULINE H-7174	Soap Dispenser
W2	Hand dryer	Dyson Airblade
W2a	Hand dryer	Existing hand dryers to be reinstated
W3	Frost 941-2436TG	24"x36" Mirror, 1 per lavatory and/or as shown on drawings
W4	Bobrick B-682	Coat hook
W5	Bobrick B-253	Paper Towel Dispenser (in Kitchen 103)
W6	Bobrick B-265	Toilet paper dispenser
W7	Bobrick B-270	Sanitary napkin disposal, SS finish, surface mounted, 1 per individual unisex/female toilet and/or as shown on drawings
W8	Koala KB110-SSWM	Infant change table
W9	Frost 941-FT-2436TG	Inclined mirror, as shown on drawings.
W10a	Frost 1003 30x30 SP	30"x30" 90-degree grab bar, SS peened finish, concealed mounting snap flange, 1 per accessible toilet
W10b	Frost 1001 24 SP	24" straight grab bar, SS peened finish, concealed mounting snap flange, 1 per accessible toilet

2.2 MATERIALS

- .1 All cabinets shall be constructed of 18-8, type-304 stainless steel.
- .2 All waste receptacles shall be constructed of 18-8, type-304 stainless steel or rigid molded leak-proof plastic.
- .3 Waste receptacles or cabinets manufactured of type-400 stainless steel are not acceptable.
- .4 All tumbler locks to be fastened to accessories with lock nuts. Fastening locks to units with spring clips is not acceptable

PART 3. EXECUTION

3.1 INSPECTION

- .1 Check wall open for dimensions, plumbness of blocking or frames that would affect installation of recessed accessories. For surface mounted accessories check condition of wall and confirm installation of backing within wall.
- .2 Verify spacing of plumbing fixtures and toilet compartments that affect installation of toilet room accessories.

3.2 INSTALLATION

- .1 Install accessories at locations and heights indicated, straight, plumb and level and in accordance with manufacturer's installation instructions.
- .2 Install items with non-corrosive anchoring devices.
- .3 Installation methods shall conform to manufacturer's recommendations for backing and proper support.
- .4 Conceal evidence of drilling, cutting, and fitting to room finish.
- .5 Fit flanges of accessories snugly to wall surfaces.

3.3 ADJUSTMENT AND CLEANING

- .1 Upon completion of the work, or when directed, remove all traces of protective coatings or paper.
- .2 Adjust accessories for proper operation. Test mechanisms, hinges, locks and latches and where necessary adjust and lubricate.
- .3 Clean and polish exposed surfaces prior to final installation.
- .4 Deliver accessories schedule, keys, and parts manual as part of project closeout documents. For owner's permanent records, provide two sets of the following items of manufacturer's literature:
 - .1 Technical data sheets of each item used for the project.
 - .2 Service and parts manuals.
 - .3 Name of local representative to be contacted in the event of need of field service or consultation.

END OF SECTION

1. GENERAL

1.1 General Requirements

- 1.1.1 Comply with requirements of Division 1.

1.2 Work Included

- 1.2.1 Supply all faucets, pre-rinse fixtures, pot fillers, pressure reducing valves, regulating valves, check valves, anti-syphon devices and backflow preventers as required to conform to applicable codes.
- 1.2.2 Supply equipment complete with all electrical equipment, motors, control devices, electrical pony panels, motor starting switches complete with thermal overload protective devices, disconnect switches, heating elements, receptacles complete with stainless steel cover plates, junction boxes, pilot light, light fixtures, light bulbs, wiring materials, supply cords complete with attachment on portable equipment as shown on drawings and hereinafter specified and as may be required to form fully operative and approved equipment.
- 1.2.3 All interwiring from pre-assembled compressor and cooling coil in walk-in cooler and freezer to constitute a complete operating system.
- 1.2.4 Power cords and approved plugs to suitable configuration for mobile equipment for plug in to wall or equipment outlets.
- 1.2.5 Provide stainless steel service chases at walls or at island units, as required to conceal exposed mechanical or electrical services.
- 1.2.6 Foodservices manufacturing & fabrication criteria must be compliant with ASHRAE 189.1.
Article 6.4.2.2 sentences - a. thru f. inclusive. (page 20)
Article 7.4.3.9 (page 26)
Article 7.4.7.3 sentences - 1. thru 6. inclusive (page 29)
Article 7.4.7.4 (page 29)
Table C-14 (page 83)

1.3 Related Work Specified Elsewhere

- 1.3.1 Division 26 00 00: power supply and circuit breakers as specified in Division 26 00 00 for all Food Service Equipment, through to the junction box, load centre or wiring terminal located on the equipment. Remotely located motor starting switches required for equipment mounted, wired and connected, all in accordance with local code inspection requirements and respective manufacturer's instructions.
- 1.3.2 Division 26 00 00: All Power receptacles to suitable configuration on walls as required for mobile equipment. All electrical cords from ceiling to work tables as shown on the plan, all in accordance with local code inspection requirements and respective manufacturer's instructions. All labour that may be required by any union agreement to handle this equipment.
- 1.3.3 Division 23/26 00 00. Any and all line voltage control wiring and interlocking with fire alarm. Kitchen ventilation system must be interlocked with fire alarm.

- 1.3.4 Division 23 00 00: All control wiring between kitchen exhaust hoods, dishwasher exhaust, remote control stations, and exhaust hood fans, all in accordance with local code inspection requirements and respective manufacturer's instructions.
- 1.3.5 Services to equipment must be concealed wherever possible. SS service chases at walls or in an island location will be provided by the foodservice contractor.
- 1.3.6 Division 22 00 00: Mechanical service connections to equipment including natural gas, connections to equipment complete with shut-off valves for each item, traps, floor drains, elbows, etc. All labour that may be required by any union agreement to handle this equipment.
- 1.3.7 Division 22 00 00: Condensate drain lines from equipment c/w traps and cleanouts piped to discharge over open drains. (Including evaporator coils in refrigerated walk-in coolers).
- 1.3.8 Division 22 00 00: Recessed grease interceptors for specified food service equipment.
- 1.3.9 Section 03 30 00: Concrete curbs, pads and bases, condenser wood sleepers, depressed floor areas, expansion joints and floor insulation.
- 1.3.10 Section 09 66 50: Resilient monolithic floor finish or ceramic flooring in food service areas including interior floors of walk-in cooler and freezer floors.
- 1.3.11 General Contractor: Provision of all core hole drilling through building structural slab, walls or roof to accommodate refrigeration lines, electrical conduit, plumbing lines, steam supply and condensate return lines, gas lines, detergent lines and exhaust/make-up air ducting, etc.
- 1.3.12 Division 22/23/26 00 00: Disconnect existing equipment to be reused, reworked or relocated from their existing services and re-connect after rework or relocation.
- 1.3.13 All labour that may be required by any "Union Agreement" to handle Foodservice equipment.
- 1.3.14 Refer to 3.7. Existing Equipment – Disconnecting and removal.

1.4 Work Supplied Under This Section but Installed Under Work By Others

- 1.4.1 Floor pans and floor troughs.
- 1.4.2 Electrical disconnect boxes and electrical breaker panels (remote), if applicable.
- 1.4.3 Exhaust hood control panels, heat recovery units and rinse line injectors.
- 1.4.4 Electrical and mechanical fire pull station (remote) if applicable.
- 1.4.5 Gas valve for fire protection system.
- 1.4.6 Evaporator drain line heat tracing cable.
- 1.4.7 Ceiling Hung heat lamps and decorative lamps.

1.5 Co-Operation With Other Trades

- 1.5.1 Co-operate with the general contractor and other contractors to permit proper execution of the work.
- 1.5.2 Give timely instructions and information in writing to the General Contractor of the requirements necessary for surfaces, materials or inserts prepared and/or supplied by other Trades which will affect the work of this Section.
- 1.5.3 Provide all roughing-in dimensions and information regarding Mechanical and Electrical connections, including floor drains, utility or special purpose receptacles and details of all depressed floor areas, curbs and bulkheads.

1.6 Quality Assurance

- 1.6.1 The work of this section shall be executed by one of the following food service equipment contractors:

Williams Food Equipment, Windsor, Ont.
Hendrix Food Service Equipment, Pickering, Ont.
Nella Cutlery & Food Equipment Inc., Mississauga, Ont.
European Hotel & Restaurant Equipment Ltd., Etobicoke, Ont.
Trimen Food Service Equipment, Toronto, Ont.
Sani Metal Industries Ltd. Quebec

1.7 Submittals

- 1.7.1 Submit (1) one set of shop drawings in PDF format on 11 x 17 paper size minimum to clearly show assembly, method and location of exposed fastenings and installation details for review. Reviewed and marked up PDF will be returned to the Contractor. Do not proceed with fabrication until respective shop drawings are reviewed. In preparing shop drawings the fabricator shall verify that all component parts and assembly of each item will support the superimposed loads without deflection detrimental to function, appearance, safety or in excess of applicable bylaws.
- 1.7.2 Items of equipment to be manufactured by this Section, or to be manufactured by others, shall be completely illustrated by shop drawings, or catalogue cuts and detailed description.
- 1.7.3 Review of the drawings shall be general and shall not be intended to serve as a check, and shall not relieve this Trade from responsibility or from furnishing the materials as required in the drawings and specification.
- 1.7.4 Submit roughing in drawings within 30 days of receiving the award or letter of intent.
- 1.7.5 Floor plans and roughing-in drawings shall not be less than 1:25 scale. Equipment drawings shall be 1:10 scale plan with sections at 1:10 in sufficient number to clearly illustrate construction. Details of fitments shall be half of full size. All welds, supports and fasteners shall be clearly indicated. Overall drawing size shall match Architectural drawings.

1.8 Requirements Of Regulatory Agencies

- 1.8.1 Electrical equipment shall comply with the requirements of the Canadian Standards

Association and/or local code inspection requirements and each item of such equipment shall be accompanied by certificate or label of approval.

1.8.2 Equipment design shall comply with provincial and local municipal health department requirements and current Ontario Building Codes.

1.8.3 Steam equipment shall comply with the requirements of the inter-provincial code covering such equipment as well as local requirements and shall be provided with a certificate or label of approval.

1.8.4 Gas equipment shall comply with the requirements of the Canadian Gas Association as well as requirements of the local authority and each item shall be provided with a CGA certificate or label of approval.

1.9 Warranty

1.9.1 Warrant the equipment against defects of materials or workmanship which may develop within a period of one year from the date of completion of the project. Replace defective equipment which cannot be made good as new. Identify units with extended warranties.

1.10 Inspection

1.10.1 Inspection of the Food Service Equipment will be carried out by the Architect or his representative.

1.11 Identification

1.11.1 Provide pressure sensitive plastic labels to identify all controls. Lettering to be white on black.

1.11.2 Demonstrate the function of equipment to the Owner, at a time specified prior to opening of these facilities. Demonstration shall be carried out by a competent representative who shall also be present on the day designated for facilities start up.

1.11.3 Explain and demonstrate maintenance procedures for the equipment. Provide three (3) complete sets of operating instructions and maintenance manuals and shop drawings of fabricated equipment, hard cover bound, itemized and in sequence according to plan, prior to opening demonstration.

1.12 Services

1.12.1 Electrical supply available shall be as indicated on equipment schedule. Motors shall be 1200 or 1725 R.P.M. Outlets, conductors, shall be as specified under electrical section. Conductors shall be identified.

1.12.2 Fit portable electrical equipment with supply cords and attachment caps in accordance with the electrical characteristics and outlets specified for the equipment complete with necessary grounding conductor within the outer jacket of the supply cord.

1.12.3 Water will be supplied at local pressure. Provide pressure reducing valves where required for proper operation of the equipment.

1.13 Price Breakdown

- 1.13.1 Submit itemized individual prices for each item of equipment herein specified together with all taxes applicable for each item.
- 1.13.2 Prices shall be tendered for the exact brand of manufactured items specified.

1.14 Material Variations

- 1.14.1 Throughout the specifications, types of materials and equipment are specified by manufacturer's name and model number in order to establish minimum standards of quality and performance. Unless specifically stated otherwise the phrase "or approved equal" may be assumed to apply. It is the responsibility of the bidder to prove such equality.
- 1.14.2 Proposed substitutions to equipment specified shall be listed under material variations on the tender form. Such listing shall indicate material, make and model and complete specifications where appropriate and shall state what difference, if any, will be made in the amount of the tender for each substitution should it be accepted. Later requests will not be considered.

1.15 Dimensions

- 1.15.1 Unless specifically designated otherwise, all dimensions specified herein are expressed in millimeters.

2. PRODUCTS

2.1 Materials

- 2.1.1 Materials shall be new, first grade. Thickness herein specified shall be standard gauge for sheet and plates.
- 2.1.2 Wall thickness for tubular material shall be nominal and established after polishing.
- 2.1.3 Stainless steel shall be 18-8, type 302 or 304, number 4 finishes on exposed sides, unless otherwise specified. Hand ground finishes will not be acceptable.
- 2.1.4 Galvanized steel wherever specified shall be copperbearing sheet, 350 grams per square metre hot galvanized and finished with one coat of primer (conforming to C.G.S.B specification 85-GP-16M) and one coat of silver grey hammerloid.
- 2.1.5 Feet shall be bullet shaped stainless steel with minimum internal adjustment of 40 mm.
- 2.1.6 Hardware shall be nickel chrome plated, .127 mm thickness minimum, bright finish, unless otherwise specified.
- 2.1.7 Fastenings, screws, bolts, nuts etc., shall be stainless steel, type 302 or 304.
- 2.1.8 Casters shall be stem or plate mounted as required, diameter of wheel as specified. Units with swivel casters shall have locking devices on two swivel casters (unless foot lock is specified). All casters to have non marking cushion rubber wheels with thread guards.

2.1.9 Faucets and valves shall be supplied including pre-rinse fixtures, pot fillers, pressure reducing valves, check valves and anti-syphon valves as required for the proper operation of equipment.

2.1.10 Insulation shall be glass fibre batts, 50 mm minimum thickness with minimum density of 17.6 kg. per cubic metre.

2.2 Welding

2.2.1 Method - electric seamless using low carbon filler rod containing sufficient chromium and nickel to give approximately the same composition in welds as adjoining parts. Heli-arc welding method shall be used wherever practical. Welds shall be complete welds, strong and ductile.

2.2.2 Workmanship - free from pits, cracks, discolouration and other mechanical imperfections.

2.2.3 Joints - invisible butt welded, properly jigged and ground smooth.

2.2.4 Finish - ground smooth and polished to match adjacent surfaces.
NOTE: Spot welding, rivetting or filling with solder not acceptable.

2.3 Design and Construction

2.3.1 Surfaces of countertops, dish tables, drainboards, etc. shall be one-piece construction. All joints, including field joints, shall be welded and polished.

2.3.2 Items shall be adequately reinforced and braced to support the expected superimposed loads and be absolutely rigid with no buckling or deflection.

2.3.3 Body front on cabinets shall be welded and polished to simulate one-piece construction.

2.3.4 Finished work shall be true and plumb with no open seams or rough edges.

2.3.5 Openings for connections of plumbing and other services shall be die-stamped.

2.3.6 Plumbing and electrical service connections shall be made horizontal from the wall or bulkhead etc. at the highest point possible for a direct in line connection.

2.3.7 Obtain necessary information of china, trays, baskets, or pans and any other necessary information to determine exact dimensions of openings for trucks, dispensers, angle slides, compartment dish racks, etc.

2.3.8 Millwork cabinets shall be constructed of plastic laminate on 19 mm thick waterproof plywood dowelled, glued and screwed. (MDF board is not accepted) Interior of cabinets shall be finished with white plastic laminate throughout. Exterior finish shall be plastic laminate as selected.

2.4 Work Table Construction

2.4.1 Top: 1.6 mm s.s. on galvanized sub top.
Height: 890 mm from floor unless otherwise specified.
Edges:
Boxed: Turned down 40 mm and in 15 mm at 45 degrees.
Dished and Boxed: Up 15 mm at 45 deg., out 25 mm and down 40 mm and in 15 mm at 45 degrees.

Down Flat: Turned down 40 mm.

Splash:

Up and Folded: Turned up height as shown and folded down 15 mm.

Rolled up and Boxed: Rolled up on radius of 10 mm on horizontal plane to height specified, turned out 25 mm and down 15 mm.

2.4.2 Base: Legs and crossrails of 1.6 mm 42 mm (outside diameter) s.s. tubing, mitred and welded. Inserted through saddle and welded.

Saddles: 2.0 mm s.s. 100 x 25 mm top hat type fully enclosed stud welded to underside of table top.

Tables up to 2000 mm in length shall 4 legs and longer tables 6, unless otherwise specified or shown on drawings.

2.4.3 Undershelves: 1.6 mm s.s. as specified for individual items, removable in sections formed over crossrails at front and sides down 25 mm and in 15 mm at joint. Where side splash is specified the sides shall be turned up 75 mm and folded 15 mm. Shelves shall be 250 mm from the floor unless otherwise specified.

2.4.4 Overshelves: 1.6 mm s.s. turned down 25 mm and under 15 mm at 45 deg. front and sides.

Backsplash: Top shelf turned up 40 mm and out 30 mm over top of tube support and down 15 mm ends closed. Intermediate shelves turned up 40 mm and folded down 15 mm. Shelves supported on 25 x 25 mm x 1.6 mm s.s. square tube uprights with horizontal cantilever supports of 25 x 25 mm x 1.6 mm s.s. square tubing fully welded and polished. Uprights inserted through table splash fully welded around uprights at splash and fastened to saddle.

2.5 Utility Drawers

2.5.1 Type: Kason Industries, 304 stainless steel heavy duty welded drawer assembly model 7102C00020.

2.5.2 Insert: 508 x 508 x 127 mm Heavy Duty Thermoplastic Drawer Pan.

2.5.3 Front: 1.6 mm s.s. insulated double pan c/w integral formed handle.

2.5.4 Frame: 1.6 mm s.s. internal frame assembly.

2.5.5 Housing: 1.2 mm s.s. outer drawer housing complete full extension drawer slides, and self-closing drawer feature.

2.5.6 Locks: Cylinder type assembly complete with (2) two keys. All drawer locks keyed alike.

2.6 Sink Construction

2.6.1 Material: 2.0 mm s.s. drainboard and splash fully welded one piece.

2.6.2 Compartments: Vertical and bottom corners radiused 40 mm with bottom scored and sloped to drain.

2.6.3 Corner Drains: 38 mm dia. s.s. corner waste c/w 250 mm high brass chrome plated overflow tube with plastic seat. Assembly installed in sink corner c/w 1.2 mm s.s. perforated guard removable on s.s. clips. Drain attached by means of lock nut and washer to die stamped recess. Drain outlet c/w brass tailpiece.

- 2.6.4 Lever drains: 38 mm dia. s.s. centre lever waste as manufactured by Klein or Kenco with s.s. crumb cup drain basket or s.s. perforated plate. Drain outlet c/w brass tail piece.
- 2.6.5 Legs and Crossrails: 40 mm (outside diameter) 1.6 mm s.s. tubing mitred and fully welded, feet as specified. Legs to be attached to sink by means of s.s. leg gussets.
- 2.6.6 Edges: Front and ends rolled up on 9 mm radius 65 mm to 75 mm, out 40 mm, down 40 mm and under 15 mm at 45 degrees.
- 2.6.7 Splash: Where shown rolled up on 10 mm radius to height of 250 mm and back 50 mm at 45 degrees and down 15 mm.
- 2.6.8 Drainboards: 826 mm from floor rolled up 63 mm at outside edge with 15 mm slope to sink. Front edge to be straight horizontal line.
- 2.6.9 Faucets: Wall or deck mount commercial quality Kason, T&S, Encore or Fisher as specified for individual items. All faucets shall be brass with nickel chrome plate on exposed parts and shall be complete with integral stops on wall mounted faucets s.s. valve stems, replaceable seats, tubular swing spouts and aerators and hooded lever handles.

2.7 Counter Construction

- 2.7.1 Top: 1.6 mm s.s. on galvanized sub top all welded formed down 40 mm and in 20 mm. Food well openings turned down 25 mm with corners welded and polished or 19 mm thick Quartz (as selected by Architect) or 12 mm solid surface material on 19 mm plywood subtop.
- 2.7.2 Body: 1.0 mm s.s. turned in 40 mm, back 40 mm and returned 40 mm at openings, unless double wall is specified in which case omit 40 mm return. Where units occur on a curb base, toe space shall be 100 mm with overhang completely enclosed and sealed with clear colourless silicone sealant to 19-GP-18 M87.
- 2.7.3 Intermediate Shelf: 1.6 mm s.s. mounted on s.s. pilasters for adjustment on 25 mm centres. Pilasters to extend to within 50 mm of top and bottom. Shelf edge to turn down 25 mm and in 15 mm at front and sides with corners welded. Shelf rear turned up 75 mm and folded with 25 mm gap at rear of shelf and cabinet. At single gable pilasters shall be mounted on 40 mm s.s. fully enclosed channels for easy removal of shelf. Where removable undershelf is specified it shall be mounted on 100 mm long s.s. pilaster strip complete with s.s. clips for removal.
- 2.7.4 Bottom: 1.6 mm s.s. with rear and (2) two sides turned up 40 mm with corner welded, front turned down 40 mm and boxed.
- 2.7.5 Saddle: 2.0 mm galvanized 25 x 100 mm top hat type, fully enclosed.
- 2.7.6 Legs and Feet: 40 mm (outside diameter) s.s. tubing and adjustable feet as specified.
- 2.7.7 Overshelves: 1.6 mm s.s. turned down 25 mm and in 15 mm on all edges. Uprights 25 mm sq. s.s. tubing inserted through top and fully welded around upright at counter top.
- 2.7.8 Sneeze Guards: 9 mm tempered glass on s.s. square tube upright framing mounted as shown with 25 mm air gap at top and bottom.

- 2.7.9 Locks: Doors and drawers complete with chrome plated cylinder locks, keyed alike.
- 2.7.10 Heating Display Lights: Infrared 250 watt or 40 watt display lights General Electric c/w screw in sockets mounted to overshelf as shown. Fixture c/w 1.0 mm s.s. all welded square housing suitably sized to cover light bulb and allow removal. Housing c/w vent slots as required to prevent overheating of fixture assembly.
- 2.7.11 Hot Wells: 300 x 500 mm 1.1 kw s.s. hot food wells installed in counter with s.s. counter sunk fastening. Units complete with drain assembly, thermostat and pilot light mounted in control panel. Drains manifolded and multiplexed c/w traps and cleanouts extended to discharge over floor drain.
- 2.7.12 Lights: Low profile slim line fluorescent cool white tube light mounted to underside of overselves c/w 1.0 mm s.s. light guard constructed as shown. Light wired through on/off switch mounted in control panel c/w s.s. cover plate. Furnish fixtures c/w lamps.
- 2.7.13 Sink compartments: As specified for sink construction with s.s. crumbcup waste assembly.

2.8 Bread Drawer

- 2.8.1 Material: 1.0 mm s.s. liner with radiused corners 457 x 508 x 381 mm.
- 2.8.2 Front: 2.5 mm s.s. as per utility drawer c/w s.s. formed integral handle.

2.9 Wire Shelving

- 2.9.1 127 mm nickel chrome plated wire shelves in sections as specified for individual items. Each section c/w (5) shelves and (2) uprights.
- 2.9.2 Erection: Unless otherwise specified shelves shall be erected as follows:
First shelf 175 mm from floor with succeeding shelves 685, 1220, 1575 and 1950 mm from floor.

2.10 Hinged Door

- 2.10.1 Doors: 1.0 mm s.s. double pan construction with 15 mm honeycomb interior deadening. Liner 1.0 mm s.s. #4 finish.
- 2.10.2 Handle: As specified for utility drawers.
- 2.10.3 Hinge: Continuous s.s. piano hinge 30 mm minimum.
- 2.10.4 Catch: Roller bearing friction catch.
- 2.10.5 Lock: Cylinder type as specified for drawers, keyed alike, chrome plated.

3. EXECUTION

3.1 Installation

- 3.1.1 Supply, deliver and set in place all equipment in accordance with these specifications ready for service connections by mechanical and electrical trades.

3.2 Delivery

- 3.2.1 Unless specifically noted otherwise, items specified under this section shall be supplied to be built in as work progresses.
- 3.2.2 Protect with heavy suitable wrapping all work before delivery. Wrappings shall remain until final clean up.

3.3 Job Measurements

- 3.3.1 Visit the job and take measurements necessary to ensure accurate and proper fitting of this work into the building and around all obstructions or projections already in place and/or shown on the drawings and to suit the locations of service piping all as required to produce a neat, workmanlike installation.
- 3.3.2 Make up the equipment in sections which can easily be handled into and through the building to the final location without alteration or damage to the building or fittings already in place.

3.4 Supervision

- 3.4.1 Provide a competent supervisor for the installation of the equipment capable of supplying such information as may be required by other trades for the proper connection and completion of this contract.

3.5 Debris

- 3.5.1 Promptly remove from the site all debris and excess materials resulting from the work of this contract.

3.6 Cleaning

- 3.6.1 Clean and wipe down equipment to a dust free state.
- 3.6.2 Remove protective coverings and test and adjust operating equipment.
- 3.6.3 Re-finish damaged coatings and finishes and wipe down equipment to a dust free condition
- 3.6.4 Fit and adjust operating hardware.

3.7 Itemized Equipment

MAIN KITCHEN

Item 1 Number not Used

Item 2 Refrigerator

Quantity: 2
Size: 686 x 623 x 1995 mm high.
Type: True Reach-in Solid Swing Door Refrigerator model T-19 c/w casters two complete with brakes.
Equipment: Standard, self-closing door c/w lock, including approved cord & plug

- 120/1/60 Nema 5-15P, 8.9 Amps.
Extra: One additional shelf.
Alt. Manufacturers: Beverage Air, Continental Equal.
Note: Units must be shallow depth maximum of 625 mm deep.
- Item 3 Hand Wash Sink & Eye Wash
- Quantity: 1
Size: 483 x 584 x 250 high
Type: Elkay model WCL1923OSD3 wheelchair wash-up sink c/w T&S goose neck deck mount faucet, duo strainer and wall bracket.
Towel Dispenser: By Owner
Soap dispenser: By Owner
Note: Mount soap and towel dispenser at rear wall above sink.
Eye Wash
Type: Guardian model G1100 EyeSafe Faucet-Mounted Eyewash, adjustable aerated outlet heads and removable aerator.
Installation: Mount unit on faucet to convert into an emergency eyewash station.
Note: Faucet mounted eyewash should be used with cold or warm water only. Ready for plumbing connection by Mechanical Division.
- Item 4 Number not Used
- Item 5 Overcupboards N.I.C., By Millwork Division
- Quantity: Lot
- Item 6 Sink Counter Counter & Sink Assembly, N.I.C., By Millwork Division
- Quantity: Lot
- By Foodservice Contractor
- Faucet: Blanco Posh Classic Steel Faucet model 403827 deck mount faucet, Pull-out, dual spray, 160 degrees swivel for optimal range of motion, Insulated handspray with dual selectable spray patterns. Flexible supply lines & 3/8 compression nut for easy installation, 2.2 US GPM flow rate.
Note: Ensure the proper coordination with Millwork Division. Provide faucet holes for hot water & filtered water dispenser item 17 & 18.
Installation: Supply unit to Millwork Contractor & co-ordinate installation as shown on architectural millwork drawings.
- Item 7 Undercounter Dishwasher
- Quantity: 1
Size: 610 x 610 x 825 mm high.
Type: Hobart Model LXeH, energy star unit, capacity 32 racks per hour, comes with one peg rack and one combination rack.
Finish: Standard, stainless steel construction.
Electrical: 208/60/3 (23.9 amps.) Protective device 30 Amps.
Note: Drain to grease trap, coordinate with Mechanical Division.
Alt. Manufacturer: Meiko, Champion or approved equal.

Item 8 Microwave Oven

Quantity: 1
Size: 559 x 483 x 352 mm high.
Type: Amana Model RCS10TS 1000 watts medium volume commercial micro wave oven c/w 100 programmable menu, four stages of cooking and digital display.
Alt. Manufacturer: Celco

Item 9 Wall Oven Domestic

Quantity: 1
Size: 594 x 613 x 594 mm high.
Type: Haier Wall Oven Model HCW225RAES 2.0 cu. ft. right swing door unit, LCD display with sensor touch control, comes with two racks and baking pan.
Electrical: 208/240V, 60Hz (3.42kW/14 Amps) total electrical load.
Installation: install unit in work counter item 13 as shown on Architectural millwork drawings as prepared by the architect, ready for electrical hook up by Electrical Division.
Alt. Manufacturer: Whirlpool or equal.

Item 10 Spare Number

Item 11 Exhaust Hood

Quantity: 1
Size: 1067 x 1067 x 610 mm high.
Type: Halton GL Series Model GL-B Ceiling hung wall type exhaust hood, GF III s.s. baffle filters, installed over cooktop item 12.
Construction: 1.2 mm s.s all welded, to ULC listings.
Exhaust: 532 CFM @ 0.12" WG
Light: One LED vapour proof light fixture wired to electrical junction box in hood.
Installation: Install unit with clearances to adjacent materials as required to conform to local code and inspection requirements. Mount exhaust hood 1981 mm A.F.F.
Connections: Electrical connections interconnected in the hood interwired to controller panel.
Controller Panel: Hood starter panel to control exhaust hood fan on/off and hood light.
Enclosure: From top of hood to underside of ceiling 1.2 mm s.s. fastened with s.s. fastening.
Note:
Alt. Manufacturer: Spring Air or equal.

Item 12 Cooktop Electric Domestic

Quantity: 1
Size: 780 x 550 x 90 mm high.
Type: KitchenAid electric induction cooktop Model KICU509XSS ceramic glass cooktop, digital display.
208/240V 40 Amps
Installation: Mount unit in work counter item 13 as shown on Architectural millwork drawings as prepared by the architect, ready for electrical hook up by electrical division.

Item 13	Work Counter	N.I.C., By Millwork Division
	Quantity:	Lot
Item 14	Fire Suppression System	
	Quantity:	1
	Type:	Wet chemical fixed fire extinguishing system designed for surface protection of item 12 and exhaust hood plenum and duct work item 11, as required to constitute a fully approved system installed in accordance with N.F.P.A 96 and 17A and authorities having jurisdiction.
	Bottle:	Bottle and enclosure mounted on wall as where shown, enclosed in cabinet c/w fusible link detection device and all necessary controls with sufficient capacity installed in accordance with Canadian Underwriter's regulations and approvals by this contractor.
	Piping:	Exposed piping chrome plated.
	Fuel Shut Down:	System c/w fuel shut down device to de-energize electric supply to items protected and under hood thru a shunt trip or contactor supplied by electrical contractor.
	Micro switch:	Supply system c/w extra micro switch c/w set of dry contacts for interwiring to building fire alarm system.
	Pull Station:	(1) one remote manual pull station mounted adjacent to exit, complete with plastic cover with tamper alarm.
	Test:	Complete system to be tested, commissioned and certified by Professional Engineer as per local authority having jurisdiction.
	Manufacturer:	Safety First or Equal.
Item 15	Garbage Can & Dolly	
	Quantity:	1
	Type:	Rubbermaid model 2620 garbage can and lid and 2640 conversion dolly.
	Colour:	Gray
Item 16	Grease Trap	N.I.C., By Mechanical Division
	Quantity:	1
Item 17	Hot Water Dispenser	
	Quantity:	1
	Type:	Insinkerator model C1300 Hot Water Dispenser, swiveling gooseneck spout, easy-action lever with automatic shut-off. 2/3 gallon stainless steel tank, adjustable temperature control c/w approved cord & plug. 120V/1/60 (10.8 Amps.).
	Equipment:	Standard
	Installation:	Faucet mounted in standard sink opening or 1 1/4" drilled hole. Tank installed under counter item 6 in water supply line. Ensure the proper coordination with Millwork Division. Coordinate installation and ready for plumbing connection by Mechanical Division.
	Note:	Recommended supply pressure 30-125 psi Tank must be mounted vertically. Maximum distance between tank and dispenser head should be 16" or less.

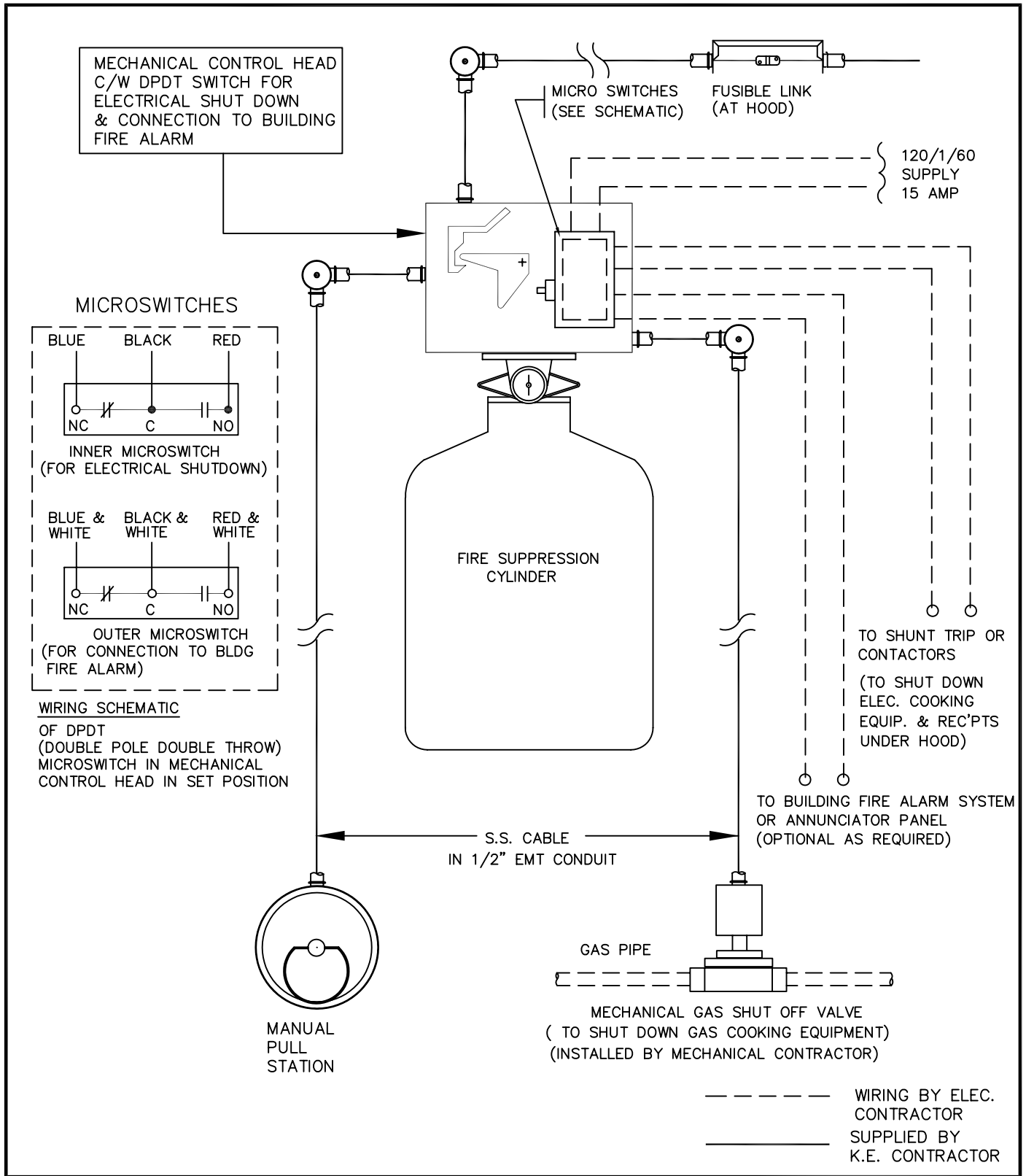
Item 18 Filtered Water Dispenser

Quantity: 1
Type: Absolute Aqua complete undersink filter system/kit/faucet.
Equipment: Standard
Installation: Faucet mounted in standard sink opening, connected through water filter undercounter.
Water Filter: Supply filtration system as per manufacturer's recommendation, installed under counter item 6 in water supply line.
Note: Ensure the proper coordination with Millwork Division.
Coordinate installation and ready for plumbing connection by Mechanical Division.

STANDARD DRAWINGS INCLUDED FORM PART OF THIS SECTION

D-68A	Fire suppression system schematic
D-68AA-F	Fire suppression system operational description

END OF SECTION



VAN VELZEN + RADCHENKO
DESIGN ASSOCIATES LIMITED
Food Service Consultants

TYPICAL WIRING SCHEMATIC
CHEMICAL SUPPRESSION SYSTEM

DATE :

SCALE : NONE

DRAWN BY : TR

CHECKED BY : NVV

NO : D-68A

Van Velzen + Radchenko Design

U.L.C. LISTED GREASE EXTRACTOR & FIRE EXTINGUISHING SYSTEM

SEQUENCE OF OPERATION

Filter Hood

IN THE EVENT OF FIRE DETECTION

AT THE FIRE EXTINGUISHING SYSTEM

In the event of fire detected by fusible link, installed as part of a fixed fire extinguishing system, the following events take place:

1. Fuel to cooking equipment is shut off automatically by means of a valve located in the main gas line servicing the equipment. This gas valve may be a mechanical or electrical solenoid device.
2. Power to electric cooking equipment and electrical circuits under the hood is shut off by means of a shunt trip breaker or contactor at the electrical distribution panel.
3. The dual micro switch, at the system cylinder, sends a signal to the building fire alarm panel.

IN THE HOOD

1. Exhaust fan continues to operate, (*Subject to local authorities*).
2. If the fire reaches the duct collar, the fusible link or the electronic thermal detection device in the exhaust hood duct automatically detects fire and closes the fire damper in the duct.

Note: The Start/Stop Buttons on the master control station should be the only means of “on/off” control of the exhaust fan.

These arrangements are in accordance with NFPA 96, and 17A – **BUT** are always subject to **LOCAL AUTHORITIES HAVING JURISDICTION**.

Sheet No. D 68 AA - F

Section 14000

City of Toronto



Swansea Town Hall

General Specifications
Section 14000 Job#: 202713



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1. General

1.1. General requirements

1. Conform to the latest editions of the CAN/CSA B44-10 and its applicable appendices and requirements as amended from time to time;
2. Conform to the latest requirements of all Technical Standards and Safety Authority requirements, TSSA Rulings and all relevant TSSA Rulings;
3. Conform to 209/01 and all code adoption documents
4. Where a conflict is noted between the Code requirement and the specifications, always comply with the code requirement;
5. Section 4 of Ontario Regulation 223/01 (Codes and Standards Adopted by Reference); and
6. Modernize the following equipment:

Building Name	Bank Name	Machine	Number Of Devices
Swansea Town Hall	Passenger Elevator	Hydraulic	1

7. all above device(s) are located at 95 Lavinia Avenue.

1.2. Scope

1. Provide labour, materials, products, equipment, and services necessary for the modernization of the elevators in compliance will all relevant codes and barrier free access under Appendix E.

1.3. Definitions of Terms

1. The term “Consultant”, as used herein, refers to “SoluCore Inc.”.
2. The term “Owner”, as used herein, refers to “City of Toronto”.
3. The term “Building”, “Site” and “Location” refers to "Swansea Town Hall".
4. The term “Address” refers to 95 Lavinia Avenue.
5. The term “Bidder”, as used herein, refers to any person or company responding to the Specification Documents for the purpose of becoming the successful Contractor.
6. The term “Elevator Contractor” or “Contractor”, as used herein, refers to any person or company contracted by the Owner to furnish labour and materials for the execution of the work herein described.
7. The term “Inspecting Authorities”, as used herein, refers to authorized agents of governments charged with the responsibility of carrying out periodic inspections and tests on vertical transportation equipment.
8. The term “Provide”, as used herein, means to supply and install new equipment.



9. "Substantial Performance" or "Substantial Completion" shall be the point at which all the new equipment has been installed, inspected and passed by the Inspecting Authorities and the elevators are operating as a group with all required features operational, as per Specification Documents 14100. The Consultant shall certify the Substantial Performance of the work.
10. "Total Performance" per building means when the entire modernization is complete as required by the Specification Documents 14000, 14100 and is so certified by the Consultant. Notwithstanding the requirements of CCDC-2 (where used), and in addition to the foregoing, Total Performance shall be achieved when the elevator performance is in compliance with Section 1400.1.50.
11. Any terms in the Specifications that are not otherwise defined shall have the definitions as given in the latest edition of the Code CAN/CSA B44-10, including where applicable, the latest supplements, for elevators, dumbwaiters, escalators and moving walks.

1.4. Tender Submittal

1. Tenders shall be submitted on the forms provided; incomplete tender forms or the absence of any required information may be grounds for rejection of tenders.
2. In submitting the signed tender forms, the Contractor is acknowledging:
 1. Familiarity with the scope of work, codes, site conditions, and requirements of the contract documents;
 2. That the equipment provided will work as specified and intended to operate within the existing environment; and
 3. That all required measurements and site condition verifications were performed.

1.5. Organization Chart

1. Provide an organizational chart indicating the names, titles, and contact persons responsible for the modernization and construction project. Also provide an emergency service number.

1.6. Assignment

1. The Contractor shall not assign any work, payment or other obligation of the resulting contract without the written consent of the Owner.

1.7. Filling Out of Bid Form

1. Tenders shall be submitted on the forms provided 202713CF; incomplete tender forms or the absence of any required information may be grounds for rejection of tenders.
2. In submitting the signed tender forms, the Contractor is acknowledging:
 1. Familiarity with the scope of work, codes, site conditions, and requirements of the contract documents;



2. That where needed, the Contractor shall be solely responsible for all submissions, variances and application to the governing authority;
3. That the equipment provided will work as specified and intended to operate within the existing environment; and
4. That all required measurements and site condition verifications were performed.

1.8. Claims for Interim Payments

1. Payments shall be based on the percentage of materials and labour progress at the site based on the following breakdown:

Contract Break Down	Passenger Elevator
Upon delivery of all material on site	40 %
Labour Progress	60 %
Total	100 %

2. A standard 10% holdback shall apply to the above amount and claims shall be subject to standard lien holdback provisions for the place of work.
3. All payments shall be made by the Owner in accordance with the following requirements:
 1. the Consultant shall certify all invoices;
 2. all invoices are subject to a 45 days term;
 3. the Contractor had submitted with the invoices current worker’s compensation clearance form;
 4. the Contractor had submitted with the invoices current proof of insurance; and
 5. all applicable statutory declaration is provided with these invoices.

1.9. Warranty

1. The elevator Contractor shall warrant the materials and workmanship of the installation and will make good any defects not due to ordinary wear and tear or improper use or carelessness that may develop within one (1) year from the date of Substantial Performance of the project.

1.10. Liability Insurance

1. Provide, during the period this contract is in force, premises liability, including public liability insurance and property damage insurance in the amount of no less than \$5,000,000 per occurrence, to be covered against any claims for damage to property or for personal injury, including death, which may arise from operation under this contract, whether such operation is by yourself or by any sub contractor or anyone directly or indirectly employed by you. The certificate shall include the Owner, its nominee (if any) and Solucore Inc. as named additional insured and shall protect the Owner, its nominee (if any) and Solucore Inc. in respect of all claims, losses, costs and



- expenses, including those by the Contractor, as if the Owner, its nominee (if any) and Solucore Inc. were separately insured
2. The liability coverage under such insurance shall be not less than \$5,000,000 for any one person injured or killed, not less than \$3,000,000 for any one accident and not less than \$1,000,000 for property damage except that property damage under automobile coverage may not be less than \$500,000.
 3. Upon completion of the contract, have in force a completed operations and products liability insurance, in the amount of \$5,000,000 inclusive, to be covered against any claims for damages to property or for personal injury, including death, which may arise after the premises liability is terminated. This insurance shall remain in force for a minimum period of two years after completion of the contract.
 4. Submit certificates of such insurance to the Owner before work begins.
 5. The certificates shall state that the insurance will not become ineffective without sufficient written notice to the Owner.
 6. The Contractor shall carry a Workmen's Compensation Insurance, which shall include full legal compensation insurance for the protection of himself and his employees
 7. Nothing in this Specification shall be construed to mean that the Contractor assumed any liability on account of accidents to persons or property, except those directly due to negligent acts or omissions of the Contractor, his employees, subcontractors, servants or agents.
 8. Other form or forms of insurance as the Owner may reasonably require from time to time in amounts and for insurance risks against which a prudent contractor providing services similar to the Services would protect itself.
 9. The Contractor shall not be held responsible or liable for any loss or damage due to any cause beyond his control, including, but not limited to, acts of government, strikes, lockouts, fire, explosion, theft, floods, riot, civil commotion, war, malicious mischief or acts of God.
 10. The Contractor shall be responsible for the payment of all: (i) insurance premiums for the insurance policies required; and (ii) deductibles payable under the insurance policies required.
 11. Contain an endorsement requiring the insurers under such policies to notify the Owner in writing at least 30 days prior to any material change or cancellation thereof.
 12. Contain a waiver in favor of the Owner of any breach of warranty clause such that the insurance policies in question shall not be invalidated in respect of the interests of the Owner by reason of a breach by the Contractor of any provision contained in such policies.
 13. Contain a clause stating that the Contractor's insurance policy will be considered as



primary insurance and shall not call into contribution any other insurance that may be available to the Owner.

14. Contain cross liability and severability of interest provisions.
15. The Contractor shall ensure that all sub-contractors have valid coverage with the same limits and wording as the same contractor as required.
16. The Contractor shall maintain a vehicle insurance policy to cover all licensed vehicles owned/leased by the Contractor to be used while providing the goods and services.
17. If the Contractor fails to maintain insurance as required by the Contract, the Owner shall have the right to provide and maintain such insurance and give evidence to the Contractor. The Contractor shall pay the cost thereof to the Owner on demand, or the Owner may deduct the cost from the amount which is due to or may become due to the Contractor.
18. If the Owner requests to have the amount of coverage provided by these policies increased, or to obtain other special insurance for this Contract, the Contractor shall endeavor forthwith to obtain such increased or special insurance at the Owner's expense as a disbursement, such increase to be added to the upset cost of this Contract.

1.11. Performance Bond

1. The successful Bidder shall provide a performance bond in the amount equal to 100% of the contract value within fifteen (15) days of notification.
2. The Owner shall have full contract cancellation right if the Contractor fails to provide a performance bond within five (5) business days following a formal request to do so.
3. The Performance Bond security shall be available to the Owner to assist in protecting itself against loss arising from any act or omission by the Contractor inconsistent with the Owner's right to accept the equipment furnished by the Contractor.
4. The rights of the Owner against the Contractor shall not be limited to the amount of the Performance Bond security if the Owner's damages exceed that amount.

1.12. Hoarding

1. Provide hoarding for the protection of the public and workers at the site. The hoarding design provided to be approved by the Owner.
2. Install temporary barriers between the hoistways as required by code.
3. The hoarding shall cover the entire entranceway and should have signage design and verbiage approved by the Owner. If access is required at multiple floors, install the barrier on these floors.
4. Provide a solid barrier with fire retardant properties. Allow access only through a lockable (36"x72") door



1.13. Removal of equipment

1. The Contractor shall at its own expense remove all unused, replaced equipment and rubbish in the machine room.

1.14. Conduct

1. Supervise your personnel so that they present a neat appearance and their movement in the building is within the requirements of their work.
2. Provide uniforms or other obvious means of identification for personnel.
3. Materials, tools and other equipment shall be stored in areas designated by the Owner where space permits. The Contractor is responsible for equipment storage.
4. Any noisy work shall be performed at times suitable to the Owner and between the hours of 08:00 - 17:00 and shall be within the limits of the local municipal, city and provincial noise by-law.
5. If work requires that more than one (1) elevator has to be out of service in the same bank, or if the only elevator which services a certain floor is removed from operation, or if the work is disruptive to the common areas, then approval of the Owner is required and the work should be provided after hours at no additional cost.
6. The rules and regulation shall be adhered to at all times while work is being performed on site. The Contractor shall endeavour to disseminate the information provided within the guideline to all field personnel and shall, at a minimum, meet or exceed the requirements of the Owner under the guidelines.
7. Parking and storage is not the responsibility of the Owner. The Owner may assist where possible in providing suitable space, but shall not be required to do so.
8. Provide the team members with proper tools and communicating equipment to eliminate loud vocal noises and shouting in the hoistway.
9. Comply with Owner's rules and regulation related to: signing, parking, storage, badges, clothing, music, language, use of facilities, etc...
10. The Contractor shall commit to regularly scheduled meetings with the Consultant and Owner to ensure that the modernization is going according to plan. The Contractor shall also provide support to the Consultant and disseminate information regarding the Work as requested and required by the Consultant.

1.15. Information with Bid

1. Provide the following information with the bid:
 1. Brochures, descriptions, and manuals (where applicable) for the major items.
 2. Detailed drawings and samples of all of the fixtures and exposed materials.
 3. Detailed start, progress and completion schedule for the work.



1.16. Codes and Ordinances

1. Supply equipment and do work in accordance with building codes, by-laws, regulations and requirements of the local, provincial and federal authorities in effect at the time of the execution of the work.
2. Supply equipment and do work in accordance with the latest edition of the CAN/CSA B44-10 Code (latest edition with relevant Sections and Supplements), and any other code, which may govern the requirements of the installation
3. Comply with the requirements of the Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials.
4. Prior to submission of the bid and throughout the duration of work, give prompt notification in writing of any regulations or requirements known to be in process that might affect the acceptability of the work.
5. If changes in codes or regulations result in extra costs, those taking effect subsequent to the date of bid submission shall be treated as an extra to the contract.
6. The Rules and Laws of ON shall apply to this Tender.

1.17. Certificates of Inspection

1. Obtain and pay for certificates of approval and all other necessary permits and inspections.
2. Prior to Substantial Performance, arrange for and pay for a safety inspection of the equipment by a Government Authority.
3. Submit, prior to Total Performance, the approved safety inspection report.

1.18. Materials and Workmanship

1. Provide all new materials and equipment.
2. Install equipment in a neat, accurate, workmanlike manner.
3. Comply with the directives of the Consultant.

1.19. Trade Marks

1. Do not apply any trademarks to the car stations without the permission of the Owner.

1.20. Fixture Type and Finish

1. Provide fixtures and finishes as requested by Owner and wherever existing ones are currently provided. Also provide 5 complete sets (a set contains two keys) of keys (for each key type) to the Owner during the technical seminar.
2. Where Braille is specified, braille marking must meet the approval of the Owner.



1.21. Ride Quality

1. The Consultant shall provide the Owner with a ride quality analysis after the modernization is completed

1.22. Machine Guarding

1. Engineer proper machine guarding compliant with Municipal, State, Provincial and Federal Authority Having Jurisdiction (AHJ) over all moving components located in the machine room. This includes but is not limited to: governors; exposed armatures; brake arms; exposed electrical and high voltage components; rotating sheaves; exposed ropes; exposed rope brake or secondary safety brake; selectors; selector tape; secondary sheaves; secondary space with moving or rotating parts; and any other rotating equipment or space considered a pinching, sheering or electrical hazard.
 1. Provide inspection ports and access to allow visual inspection without dismantling.
 2. Provide components that prevent accidental pinching hazards.
 3. Provide equipment and components that can deflect a 150 lbs falling object.
 4. Paint the components and guards with matching paint to that of the equipment being guarded.
 5. Paint all moving parts in bright yellow colour.
 6. Submit the design to the Consultant and Owner for review within 14 days from award of contract.
 7. Provide an Engineer's Letter of Certification that the guarding provided at the site meets with all the requirements of the AHJ.

1.23. Electrical Diagrams

1. Supply wiring diagrams and data as required for the execution of the work herein described including schematics for speed control, dispatching system, and interface printed circuit boards.
2. Incorporate, as part of the schematic diagrams, a reference index (road map) giving the location of electrical components and wiring interconnections for relay coils, relay contracts, field equipment, integrated circuits and other such devices, so that the position on the schematics of any of these items can be readily determined.
3. Supply, prior to the Total Performance inspection, three prints and one reproducible of the wiring and schematic diagrams revised to show changes that have been made.
4. If changes are subsequently made to the wiring or control, supply an additional two sets of marked-up prints of the schematics and field wiring diagrams showing the changes.



5. The wiring diagrams to be the property of the Owner
6. The wiring diagram shall be laminated and properly mounted on a clip board.

1.24. Maintenance Manual

1. Supply to the Owner prior to the Substantial Performance inspection, a maintenance manual as set out in the maintenance section of the specifications
2. The maintenance manual to be the property of the Owner.

1.25. Operation Manual

1. Supply to the Owner prior to the Total Performance inspection, three sets of manuals describing in detail the operation of the equipment including special features, dispatching sequences, and such items as intercom systems and security systems.
2. Set out in step-by-step form the operation for special features such as firefighter's service, independent service, code blue, emergency power service and special emergency service.
3. Supply, as part of the manual, drawings of operating panels (e.g. car panels, central control consoles) with descriptions of the function of switches and indicators.
4. The operation manual to be the property of the Owner.

1.26. Technical Seminar

1. At the time of Total Performance, arrange with the Owner to provide a seminar for the Owner's staff.
2. Include in the seminar a complete review of the documentation, operation of the equipment and demonstration of any special features.
3. Provide to the satisfaction of the Owner training on the use of the building management system when it is supplied.

1.27. Painting

1. Ensure that machine room floors, machine room equipment, hoistways equipment, oxidizing guide rails, top and bottom of car, pit as well as pit equipment are painted.
2. Paint with low odor paint products all visible sections of the pit steel. At a minimum, ensure that pit floors, pit hoistways equipment, rusted rails and pit steel are painted with Owner approved low odour, rust resistant paint.
 1. Use a transitional primer paint (low odor, mildly alkaline, tinted black);
 2. Use paint with VOC content of no more than 9 g/l; and
 3. Use SCS certified - LEED qualified paint products.
3. The Owner does not specify paints products, but an example of an approved product



can be found at (<http://www.afmsafecoat.com/canada.html>). As such, any equivalent paint is acceptable provided that it meets the requirements outlined in this section.

4. All painting to be performed at times approved by the owner.

1.28. Operating Environment

1. Arrange that the equipment be capable of operating normally and within the requirements of the Specifications when the ambient temperature is between 3.5 and 36 degrees Celsius (38 and 97 degrees Fahrenheit).
2. Arrange that the equipment be capable of operating normally and within the requirements of the Specifications when the supply voltage is within minus 10% and plus 10% of the nominal voltage and the frequency is within 5% of the nominal frequency.
3. The Current Total Harmonic Distortion (THD RMS Voltage) not to exceed 5.0% as per the IEEE 519 standards for filtering of SCR motor equipment. Where the drive does not meet this requirement, provide harmonic filters to meet this requirement.
4. Reduce Current Total Harmonic Distortion (ITHD), measured at the filter input terminals at full load, to:
 1. Less than 8% when background voltage distortion is less than 5% and voltage imbalance is less than 3%;
 2. Less than 5% when short circuit ratio (I_{sc}/I_L), as defined by IEEE Std 519, is Less than 20 and when background voltage distortion is Less than 0.5% and voltage imbalance is Less than 1%;
 3. Reduce Current Total Demand Distortion (ITDD), measured at the filter input terminals over its entire operating range, to levels defined in Item 4.1 above. ITDD is defined as the ratio of ITHD divided by the full load current (peak demand current) of the filter.
 4. Minimize the contribution to Voltage Harmonic Distortion of all VSD's equipped with the filter to Less than 5% total and Less than 3% for individual harmonics, as defined by IEEE Std 519-1992.
5. Ensure that the filter will not become overloaded by other upstream harmonic sources.
6. Ensure that the filter will not resonate with other power system components.
7. Ensure that the filter will not have compatibility problems with engine generator sets properly sized for the load.
8. Provide all necessary drive adjustments to allow for the operation of the elevators under emergency power condition in the event that the emergency power is not suitable to operate the elevators at nominal or rated speed.



1.29. Acceleration of Work

1. If the work falls behind the schedule submitted to the Owner, take action as necessary to meet the schedule, including, but not limited to, extra personnel and overtime work.
2. Pay any costs associated with this action unless the delay is caused by acts of government, civil commotion, malicious mischief, act of God or any cause beyond the control of the Contractor.

1.30. Test Data Form: Elevator

1. After completion of the work, and prior to Substantial Performance, submit a test data form certifying that the unit is complete and ready for inspection. Where the Owner has provided a specific data sheet (usually in the maintenance contract) populate said data sheet.
2. Arrange that the person responsible for the performance of the work sign this form.
3. Include a check list of the items in the Specifications as well as other performance data such as door times, operating times, starting, running, stopping currents and voltages, and in general, settings of any adjustable devices
4. List on this form safety devices, together with their settings and indicate whether they have been checked and adjusted.

1.31. Inspection of Elevators

1. The Consultant will make an acceptance inspection of each elevator after the government inspection test and before the elevator is put into service for the public. The Contractor shall assist the Consultant in the inspection
2. The Consultant will make an acceptance inspection of the complete elevator group and all group functions. The Contractor shall assist the Consultant in the inspection

1.32. Generic Maintenance

1. Arrange that the equipment can be maintained and adjusted by any competent elevator company without the use of proprietary tools, information or equipment or, if such tools, information or equipment are required, provide them.
2. Do not incorporate any running time, cycle counters or trip counters that would cause the equipment to shut down or alter its operation in any way.
3. Provide evidence that all parts needed to maintain and operate the elevating device(s) are available and can be ordered directly by the competition. Provide an affidavit of such claim as well as all supporting documents (catalogue), phone numbers, etc...

1.33. Non – Proprietary

1. All control equipment shall be non-proprietary.



2. Proof of non-proprietary shall be given in writing and documentation such as brochures and instruction manuals shall accompany the bid pricing
3. Contractor shall submit to the Owner proof substantiating the claim of non-proprietary equipment status.

1.34. Diagnostic

1. Provide non-proprietary diagnostics.
2. The control system shall provide comprehensive means of accessing the computer memory for elevator diagnostic purposes.
3. The controller shall have permanent indicators for important elevator statuses as an integral part of the controller.
4. Any tool required to change parameters such door dwell timing, nudging, securing floors etc. shall be included with the control equipment.

1.35. Modernization Flow Chart Schedule

1. Assign one team to perform the modernization.
2. Removal of a team during the modernization is forbidden and prohibited unless approved by the Owner. Failure to keep the teams on site is considered a breach of contract and is subject to financial remedies by the Owner.
3. Provide the Owner and Consultant with a modernization flow chart. The flow chart should consist of the following:
 1. The starting date.
 2. The sequence of the modernization procedures.
 3. The length of time required to complete each of the procedures.
 4. Length of time to complete the first car and each car thereafter.
 5. The completion date.
4. Following the award letter of intent, provide a complete technical brief on the mechanical and electrical requirements as well as heat dissipation and reactions
5. As such, the Owner at its discretion reserves the right to charge a penalty of \$500 per calendar day to an upset fee of \$20,000 upon the failure of the Contractor to meet the schedule submitted with the Bid.
6. Under no circumstances shall either party be liable for any loss, damage or delay due to any cause beyond either party's reasonable control, including but not limited to acts of government, strikes, lockouts, labour disputes, fire, explosion, theft, weather damage, flood, earthquake, riot, civil commotion, war, mischief or act of God.
7. In no event shall the Contractor have any liability for loss of profits, loss of business



revenue, failure to realize expected savings, other commercial or other economic loss of any kind whatsoever or for any indirect, special or consequential damages.

8. If there is any delay beyond the Contractor's reasonable control or a delay caused by the Owner, the penalty outlined in the general conditions shall not apply for the delay period.

1.36. Conflict Resolution

1. Any disputes related to this contract shall be resolved utilizing an alternative dispute resolution by a mutually accepted arbitrator to be chosen by the Owner and the Contractor take out period within thirty (30) days after written notice by one of the parties demanding binding arbitration.
2. Neither one of the parties may unreasonably withhold consent to the selection of an arbitrator, and the Owner and the Contractor will share the cost of the arbitrator equally.
3. By mutual agreement, however, the Owner and the Contractor may postpone arbitration until both parties have completed some specified but limited discovery about the dispute. The parties may also agree to replace arbitration with some other form of binding alternate dispute resolution procedure.

1.37. Venue, Jurisdiction, and Jury Waiver

1. The venue of any judicial proceedings shall be in Toronto unless otherwise agreed by the Parties. Each Party irrevocably submits to the exclusive jurisdiction of the federal and provincial courts located in Toronto unless otherwise agreed by the Parties. Each Party waives to the fullest extent permitted by law, trial by jury of all Disputes arising out of or relating to this Agreement.

1.38. Attorneys' Fees

1. If legal action, including an alternative dispute resolution process, is necessary by either Party to enforce or interpret this Agreement or resolve a Dispute arising hereunder, the prevailing Party shall be entitled to recover reasonable attorneys' fees and costs, including fees on any appeal.

1.39. Waiver

1. No waiver of the terms, provisions, conditions and covenants of this Agreement shall be binding and effective unless the same shall be in writing signed by the Parties. A waiver of any breach of the terms, provisions, conditions and covenants of this Agreement shall be for that one time only and shall not apply to any subsequent breach.

1.40. Power Saving

1. The Contractor agrees to cooperate with the Owner's Consultant by providing



information, labour or materials to determine the amount of power being saved through this modernization.

2. A utilities Consultant may be asked to measure the elevators' power consumption before and after the modernization and the Contractor's cooperation is essential

1.41. Governing Law

1. The validity and interpretation of the Specifications, and of each clause and part thereof, shall be governed by the law of the Province of ON.

1.42. Words

1. No change or modification of the Contract shall be valid unless it is in writing and signed by the Contractor and the Owner.

1.43. Additional / Hidden Costs

1. The Owner through this tender, hopes to identify and price all costs associated with the modernization. Therefore, any additional or hidden costs that the elevator Contractor is aware of must be identified.
2. Include as part of your tender over-time hours for the following or for any other similar tasks needed to complete the modernization:
 1. Testing of the fire recall, emergency power and service;
 2. Loading and transporting of material to the machine room or floors if such work is disruptive to building common areas or space.
 3. Transferring of hall call riser (from current to temporary and to permanent);
 4. Rewiring of existing dispatcher;
 5. Removal of two or more cars out of group service.

1.44. Workplace Safety and Insurance Board Coverage

1. The Contractor clearly understands and agrees that it is not , nor is anyone hired by it, covered by the Owner under the Workplace Safety and Insurance Act S.O. 1997, c16, Sch.A, as amended and the Contractor shall be responsible for and shall pay all dues and assessments payable under the Workplace Safety and Insurance Act, the Employment Insurance Act, S.C. 1996, c23 or any Act, whether Provincial or Federal, in respect of itself, its employees and operations, and shall furnish the Owner, if requested, with such satisfactory evidence that it has complied with the provisions of any such Acts. If the vendor fails to do so, the Owner shall have the right to withhold payment of such sum or sums of money due to that would be sufficient to cover its default and the Owner shall have the right to pay same.
2. The Owner is not the employer of the Contractor or its personnel under any circumstances whatsoever.



1.45. Occupational Health and Safety

1. The Contractor shall be designated as the Constructor for the purposes of the Occupational Health and Safety Act, R.S.O. 1990, c.0-1, as amended for this project and shall assume all the responsibilities of the Constructor as set out in that Act and its regulations. The foregoing shall apply notwithstanding that the Contractor is referred to as “Contractor” in this and other related document.
2. The Contractor agrees that any damages or fines that may be assessed against the Owner by reason of breach or breaches of the Occupational Health and Safety Act by the Contractor or any of its sub-contractors will entitle the Owner to set-off the damages so assessed against any monies that the Owner may from time to time owe the Contractor under this contract or any other contract whatsoever.

1.46. Non-Compliance

1. This agreement may be terminated without notice by the Owner upon non-performance of Contract terms; however, in doing so, the Owner does not waive its right to rely upon any obligations or commitments agreed to by the Contractor as part of this Contract. Specifically the Contractor will be liable for the Owner’s acquisition costs (including but not limited to administrative costs) exceeding the contract price required to obtain an alternative Contractor.
2. Where there is a question of non-performance, payment in whole or in part may be withheld at the discretion of the Owner. This action shall not prevent the Owner from taking early payment discounts otherwise applicable.

1.47. Security System

1. Assist the security contractor access the elevator car operating station, car top and provide wiring and power to install security cameras in the elevators at no additional charge.
2. Provide a junction box and separate power supply wiring from the machine room to the car top.
3. Where needed, in the event that the wiring from the camera is not needed in the machine room, connect the wiring from the halfway box and terminate the wire at the desired landing specified by the Owner.

1.48. Security Card Access

1. Assist the security contractor access the elevator car operating panels and car top and provide wiring and power to install card access in the elevators at no additional charge.
2. Provide all needed assistance and support to install card access systems in the elevators. Provide required boards or interfacing hardware to track users and identify which buttons were activated.



1.49. Hoistway Access by Others

1. The contractor shall assist the Owner and its representative by providing access to the elevator hoistway so that installation of the life support systems can be expedited at no additional cost to the Owner.

1.50. Performance

1. The purpose of this modernization is to increase reliability and maintain the elevator performance. Notwithstanding any CCDC-2 requirements or other contractual terms and conditions to the contrary, the elevator modernization shall not be considered complete unless:
 1. The elevators are performing in accordance with the specifications and performance table in 14100;
 2. The callback ratio is 0.25 call per elevator per month;
 3. Each individual elevator does not exceed two callbacks per Quarter; and
 4. Not more than one elevator is shutdown at a time.
2. The Contractor shall demonstrate compliance with the conditions noted in Section 1.50.1. , 90 days immediately prior to the date of claimed Substantial Performance. If the required performance was not achieved in the 90 days immediately prior to claimed Substantial Performance, then the contract shall be extended for an additional 120 days subsequent to that to demonstrate reliability.
3. If the Contractor can demonstrate that there were any extraordinary or extenuating circumstances which prevent it from meeting the specifications, the Owner and Consultant may, in their sole and absolute discretion, choose to waive their rights to rely upon the above terms and conditions.

1.51. Remote Elevator Monitoring System

1. Where the elevator controller is provided, ensure that the elevator system can support remote elevator monitoring that meets the intent of the following specifications:
 1. Provide either a communications protocol that communicates to SoluCore board and exchanges the information related to the operation, status and error logs from the elevator; or
 2. Provide 13 dry contacts and terminate on a terminal blocks located on top of the controller. Provide the following dry contacts: Run, Shutdown, Up, Down, Maintenance, Close limit, Open Limit, Phone button, Inspection, Independent Service, and Power failure. Provide a Top Call and Bottom Call inputs.

1.52. Singular or Plural

1. Where words are used in the singular, the bidder shall not assume that it refers to one item and it is incumbent on the Bidder to qualify that only the singular was assumed. If



the Bidder does not provide the clarification, it shall be assumed that the price shall include the replacement of the existing equipment.

2. Provide pricing to perform all the work in accordance with industry standards and as approved by the Consultant. Where the cost carried to perform singular work had been assumed, the Contractor shall clarify the cost carried herein the Clarification Document.
 1. Example of singular and plural wording includes but is not limited to:
 - (a) Replacing one hall risers where two risers exist;
 - (b) Replacing one car station when the elevator has two (main and auxiliary) stations;
 - (c) Replacing the front door locks in the elevator shaft but not replacing the rear ones;
 - (d) Providing a car buffer but not the counterweight buffer because the specification referenced a buffer and all buffers;
 - (e) Replacing one compensating chain when the site has two compensating chains;
 - (f) Replacing the front buttons but not the rear buttons;
 - (g) Replacing a door operator or an infrared detector but the elevator has two door operators (front and rear);
 - (h) Other examples would include position indicators, car directional arrows, car and counterweight governors, etc...
 2. The Contractor shall not omit any work unless CLEARLY noted in the qualification document. The Consultant shall assume that singular and plural work will be performed.
 3. The Contractor shall omit the work when the Consultant specifically indicates that the work is not required. An example of such clarifications would include:
 - (a) Replace the front door operator only;
 - (b) Provide a singular riser only;
 - (c) Delete the auxiliary car station;
 - (d) Retain the existing counterweight governor;
 - (e) Etc..

1.53. Notice of Project

1. The Contractor must provide a Notice of Project to the Ministry of Labour (MOL) prior to starting the project as set out in section 6(1) of the Regulation for Construction Projects, O. Reg. 213/91.



2. Provide a copy of the Notice of Project, sign and post it in a conspicuous place at the site for review by the Consultant and a Ministry of Labour inspector.
3. Where applicable, ensure that each subcontractor on the project provides a completed approved registration form.
4. A Contractor who submits a report under subsection 51 (1) of the Act (notice of death or injury) or gives a notice under section 52 or 53 of the Act (notice of accident, etc.) shall also provide, within 14 days after the occurrence, a professional engineer's written opinion stating the cause of the occurrence.
5. Post in a conspicuous place at the project, and keep posted while work is done, a notice setting out:
 1. The Contractor's name, and if the Contractor carries on business in a different name, the business name
 2. The address and telephone number of the Contractor's head office or principle place of business in Ontario.
 3. The address and phone number of the nearest office of the Ministry.
 4. Within 48 hours of selection for a project, the name, trade and employer of each H&S Rep or JHSC member.
6. Appoint a supervisor for each project with 5 or more workers working at the same time.
7. Establish written Emergency Procedures at a Project and ensure that they are followed in case of an emergency; Post them in a conspicuous place at the project; review them with JHSC or H&S Rep as applicable.
8. Ensure that each worker has ready access to a telephone or other system of two-way communication system on the project in the event of an emergency.
9. Keep records required by this regulation for at least one year after the project completion.
10. The Contractor shall keep the design of a horizontal life line system at the project while the system is in use.
11. The Contractor shall keep the design drawings on the project while the hoisting and rigging system is being used.
12. The Contractor shall give notice to the Ministry office located nearest the project, in person, by telephone, by fax or by electronic means before the first multi-tiered load hoisting operation is started at a project.
13. The Contractor shall make available to an inspector upon request a copy of the certification by the professional engineer who would have verified and certified the results of a test on the structural components of a scaffold and the corresponding rated load of the scaffold.



14. The Contractor shall keep at a project the design drawings and the written statement for a scaffold, while the scaffold is erected, for scaffolds designed by a professional engineer.
15. The Contractor shall keep a copy of the design drawings and the required statement on a project while the suspended scaffold or suspended platform that is subject to the requirements of the section is on the Project
16. The Contractor shall,
 1. Ensure that written measures and procedures for complying with this section are established and implemented, so that workers are adequately protected from electrical shock and burn; and
 2. Make a copy of the written measures and procedures available to every employer on the project.

1.54. Errors & Omissions

1. While the Consultant has used considerable effort to ensure an accurate representation of information in this RFP, the information contained in the RFP is supplied solely as a guideline for Bidders. The information is not guaranteed nor warranted to be accurate by the Consultant, nor is it necessarily comprehensive or exhaustive. Nothing in the RFP is intended to relieve the respondents from forming their own opinions and conclusions with respect to the matters addressed in the RFP.

2. Separate prices

2.1. Maintenance: interim

1. Not applicable.

2.2. Maintenance: warranty

1. Provide warranty maintenance for twelve months from the time of Substantial Performance of the last group. Provide 24-hour callback service free of charge.
2. Indicate the monthly rate for the warranty maintenance, bearing in mind that any component failure and other related work not arising from normal wear and tear should be covered under warranty.

2.3. Maintenance: five years all elevators

1. Provide full maintenance for five (5) years for the elevators from the time of the expiration of the warranty.
2. Indicate the monthly rate for the five (5) year maintenance and the price for all units in each building.

Section 14100

City of Toronto



Swansea Town Hall

Modernization Specifications
Section 14100 Job#: 202713
Hydraulic Elevator(s)



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1. General

1.1. General Requirements

1. Conform to General Specifications 14000 and applicable appendices.

1.2. Type: Hydraulic

1. Provide modernization equipment for 1 Hydraulic elevator(s) at 95 Lavinia Avenue, Toronto, ON.

1.3. Number of Elevators

1. Modernize 1 Hydraulic elevator(s) at 95 Lavinia Avenue, Toronto, ON.

1.4. Speed

1. Maintain the existing speed of 125 fpm.

1.5. Capacity

1. Retain the existing capacity of 2000 lbs.

1.6. Openings and Stops

1. Retain existing stops outlined in the table below:

Car	Front Door Openings	Total Front Openings	Rear Door Openings	Total Rear Openings
Car 1	R, 1*, 2	3	-	-

1.7. Related Work (**Owners Trades**)

1. All work by others shall conform to governing codes. Any other work required to complete the installation or satisfy the regulatory authorities and not specifically listed herein shall be the responsibility of the elevator contractor. To complete the elevator modernization, the following items must be performed or installed by trades other than the elevator contractor:
 1. Provide suitable machine room ventilation to maintain the machine room temperature between 10°C and 30°C.
 2. Provide where required a fused disconnect switch or circuit breaker for each elevator, with feeder branch wiring to each controller. The switches and size of wires to conform to the Canadian Electrical Code. The disconnect switches are to be mounted in a code approved location.
 3. Provide where required a 120 volt, AC, 15 Amp fused, single-phase power supply with a fused disconnect switch for each elevator, with feeder wiring to each controller for car lights. Location to be in a code approved location.



4. Provide where required a separate single-phase power supply of the same voltage as each elevator supply, with 15 Amp fused disconnect switch. Wiring to go to the first car of the group.
5. Provide where required suitable machine room lights, and convenience outlets in the machine room. The light switch is to be mounted in a code approved location.
6. Provide where required machine room smoke detector wiring to the elevator controllers.
 - (a) Provide addressable smoke detectors to each floor in the elevator landings;
OR
 - (b) Provide a second conventional zone to each floor and connect the new smoke detector to the second zone (pull stations and heat detectors on one zone, smoke detectors on the other zone)
 - (c) The use of detectors with relay bases is not an acceptable solution if connected to floor, as the relay will not function if a contact device is operated on the same circuit.
 - (d) If spare capacity is available, modify floor zones so manual stations are on separate zones.
7. Provide wiring and contacts to the elevator controllers for the operation of the special emergency service and emergency power as required by code.
8. Perform any cutting, patching and painting for the installation of new hall buttons, hall lanterns and main floor monitor panel.
9. Provide where require all pit lighting, pit ladder and sump.
10. Provide where require new phone lines connected by a reputable telephone service provider.
11. Provide where required proper grounding and ground fault interrupt receptacle in the pit and machine room.
12. Provide where required, new machine room door with frame capable of withstanding 1.5 hour fire rating.
13. Provide where needed dedicated ground wire to the three phase main disconnects.
14. Provide where required at least one set of GFI receptacle in the pit and machine room.

1.8. Cutting and Patching

1. Any cutting, patching, painting or other restorative work required to accommodate the installation of the new equipment not specifically listed herein as work by others, shall be the responsibility of the Elevator Contractor.



2. Any cutting, patching, painting or other restorative work required to accommodate the installation of the new elevator equipment including the cylinder installation where applicable shall be the responsibility of the Contractor.
3. Prior to proceeding with any such work the Contractor shall obtain approval from the Owner.

1.9. Changes in Material and Work

1. Any change or substitution in the approved equipment must have prior written approval from the Owner.
2. Any changes in the approved work must have prior written approval from the Owner.

1.10. Description of Existing Equipment



1. **NOTE: Consultant and the Owner DO NOT WARRANT that the following information is accurate or correctly reflected the status of the equipment.**

Fields	Car1
Designation	Car 1
TSSA/Installation No.	68317
Manufacturer	Otis
Sales Number	491400
Current Contractor	Otis
Date Installed	1992
Date Modernized	N/A
Control Type	LRV
Type of Elevator	Passenger
Capacity	2000 lbs.
Contract Speed	125 fpm
Motor Type	Leroy Somer IMH 160
Motor S/N	H1M94709 NG
RPM	3460
Motor HP	25
Motor FL Volts	200
Motor Amps	76
Drive Type	Allweiler SUB 140-46
Drive Method	Submersed
Machine Type	Otis AAA20390 E1
Roping Ratio	1:1
Compensation	None
Arrival Signal	Car Directional Arrows
Car Operating Panel	Main
Front Openings	R, 1*, 2
Front Door Type	SSSO
Front Door Operator Type	Otis 7782 AA
Front Door Protection	I/R





Front Door Height	84"
Front Door Width	36"
Cab Height	96"
Cab Width	68"
Cab Depth	51"
Door Closer	Spirators
Fire Service	No
Communication	Telephone
Security	No
Code Blue	No

1.11. Remote Conduit and Wiring

1. Any remote conduit and wiring interconnecting the elevator controllers and the lobby panel, elevator remote monitoring or an elevator management control system, or any other equipment provided under these specifications, and not specifically listed herein as being by others, shall be the responsibility of the elevator contractor.
2. Portions of this work may be sub-contracted with approval of the Owner. The Contractor is required to submit to the Owner the name of the Sub-contractor.

1.12. Callback Response Time

1. The maximum callback response time during the modernization in regular hours shall not exceed 20 minutes.
2. The maximum callback response time during the modernization in overtime shall be no more than 40 minutes or other mutually acceptable response time to both parties.

2. Modernization Elevator Product

2.1. Retained Equipment

1. Buffers, Pit Steel and Switches
2. Jack (Cylinder and Plunger)
3. Electrical Ducts, Troughs and Wireways
4. Car Slings
5. Cab Renovation
6. Car Apron

2.2. New Equipment

1. Reservoir tank, Motors and Pump
2. Hydraulic Valve
3. Controllers



4. Emergency Battery Lowering
5. Auxiliary Disconnect Micro Switch
6. MINI PI
7. Victaulic Piping & Coupling
8. Hydraulic pipeline identification, where required
9. Rupture Valve
10. Traveling Cables
11. Wiring
12. Hall Stations
13. Lobby Stations
14. Car Roller Guides
15. Door Operators
16. Car Directional Arrows
17. Door Protective Device
18. Car Gate Switches
19. Car Door Clutch
20. Car Stations
21. Car Restrictor
22. Floor Passing Tone
23. Crosshead Data Plate
24. Car Top Solid State Reader Head
25. Car Door Equipment
26. Car Top Inspection Station

2.3. Refurbished Equipment

1. Hall Door Equipment

3. Machine Room

3.1. Reservoir tank, Motors and Pump

1. Replace gate valves.
2. Provide a self-contained unit consisting of the following items:



1. Oil reservoir with tank cover capable of supporting 200 lbs and controller compartment with cover.
2. An oil hydraulic pump.
3. An electric motor.
4. Oil control unit to comply with Section 3.2.
5. Pump: Positive displacement type pump specifically manufactured for oil-hydraulic elevator service
 - (a) Pump shall be designed for steady discharge with minimum pulsation to give smooth and quiet operation.
 - (b) Output of pump shall not vary more than 10 percent between no load and full load on the elevator car.
3. The drive shall be by direct coupling with the pump and motor submerged in the oil reservoir. Drive type shall be determined based primarily on the load on the car, travel, and speed.
4. The motor shall be specifically designed for a heavy duty oil-hydraulic elevator service. Duty rating shall comply with specified speeds and loads.
5. Power controller shall contain electrical contactors, electro-mechanical switches and thermal overload relays. Mount components in a NEMA 1 enclosure.
6. Logic control system shall be microprocessor based and protected from environmental extremes and excessive vibrations.
7. Provide a solid state soft starting device to comply with section 3.3.
8. Provide new hydraulic oil.
9. Provide pressure gauge permanently installed fitted with a shutoff valve as per code.

3.2. Hydraulic Valve

1. Provide a new EECO /Maxton valve or equivalent to replace the existing one
2. Install new schedule 40 piping to accommodate for the installation of the new valve.
3. Provide a bi-direction two speed valve.
4. A control section including control solenoids shall direct the main valve and control:
 1. Up and down starting.
 2. Acceleration.
 3. Transition from full speed to levelling speed.
 4. Up and down stops.
 5. Pressure relief.



6. Manual lowering.
5. All of these functions shall be fully adjustable for maximum smoothness and to meet contract conditions.
6. Relief valve shall be externally adjustable and be capable of bypassing the total oil flow without increasing back pressure more than 10 percent above that required to barely open the valve.
7. Provide a valve with pressure compensation for constant down speed control. This modification of the down piston assembly delivers constant Down Speed Control between no load and full load conditions.
8. Provide a certified valve that can operate reliably between 90 psi minimum and 800 psi maximum.
9. Provide a certified valve that can operate reliably between a temperature range of 800 F (270 C) minimum, 1500 F (650 C) maximum.

3.3. Controller

1. Provide non-proprietary microprocessor controller designed to give the required operation as herein specified.
2. Provide a type 2 rated enclosure, adequately sized controller housing with appropriate venting and dust control vents.
3. Provide controller with the correct size wiring and relays.
4. Provide controller that will allow for the new Building Management System to interface with all elevating devices located in the building where required.
5. Provide a controller with a security system capable of locking out any floor or combination of floors by preventing the users from registering hall or car calls.
6. Ensure that the controller's diagnostics and parameter programming can be accessed at all times.
7. Install wiring on the controllers, whether control or field wiring, in a neat workmanlike manner and make connections to studs and terminals by means of solder or solderless lugs, or similar connecting devices.
8. Mark all components such as relays, contactors, fuses, printed circuit boards etc. clearly and permanently with designations as shown on the schematics.
9. Provide non-proprietary diagnostics.
10. The control system shall provide comprehensive means of accessing the computer memory for elevator diagnostic purposes.
11. The controllers shall have permanent indicators for important elevator statuses as an integral part of the controller.



12. The controllers shall have the capability to provide Remote Elevator Monitoring.
13. The controllers shall have the hardware to connect, interrupt, transfer power, and to protect the motor against overloads.
14. Provide means for the elevator system to restart and resume proper operation automatically in the event of a power failure.
15. The controllers shall be designed to accept as a minimum the re-programming of the following:
 1. Door Open Times.
 2. Door Close Times.
 3. Door Dwell Times.
 4. Hall Advance Time.
 5. Nudging time.
 6. Acceleration.
 7. Deceleration.
 8. Jerk Rates.
 9. Floor Parking and Options.
 10. Recall Levels.
16. The controller shall be provided with on-board diagnostics and status LEDs to aid in troubleshooting, adjusting and maintenance.
17. Permanent status LEDs shall be provided to indicate the following:
 1. Safety Circuit.
 2. Door Locks.
 3. Independent Service.
 4. Normal Service.
 5. Inspection Operation.
 6. Emergency Power.
 7. Out of Service.
 8. Drive Failure.
18. Provide on-board diagnostics to include an event monitor and fault log.
19. Do not include a system disabling maintenance timer or counter of any sort.

3.4. Automatic Rescue Device

1. Provide a new and independent auxiliary power supply.



2. Provide proper NEMA rated enclosure independent of the controller.
3. Provide all the wiring and connections to the controller from the power supply.
4. Fasten the power supply to the new controller cabinet so that it is not easily removed.
5. Energize a relay output when the battery current exceeds a threshold during the emergency operation. The elevator controller can utilize this signal and change the direction of travel to reduce battery current. This leads to saving of energy, and more rescue operations per charge.
6. Provide a device with the following capabilities:
 1. Automatic charger with battery centric circuits that prevents overcharging.
 2. LED status display with load and battery bar graphs.
 3. Automatic voltage regulation.
 4. Intelligent battery management.
 5. Load Meter.
 6. Replace Battery Indicator.
 7. Self-testing.
 8. Sine-wave output.
 9. Site wiring fault indicator.
 10. User replaceable batteries.
 11. Wide input voltage range.
 12. Input voltage 120VAC.
 13. Output voltage 120VAC.
 14. LED status light for: “replace battery” and “overload indicators”.
 15. Provide sufficient power to operate the elevator from the top landing to the lowest landing with intermediate stops.
 16. Provide sufficient power to the door operator, valve, emergency lighting, cab lighting, alarm buttons, door open button, safety circuits, down direction circuit and any other devices required for the proper operation of the elevator during power failure.
 17. Provide an additional auxiliary reserve power for no less than 10 minutes.

3.5. Auxiliary Disconnect Micro Switch

1. Auxiliary Disconnect Micro Switch
2. The micro switch should enable the auxiliary power to engage if the disconnect arm is in the “on” position but the power is not available.



3. The auxiliary switch should prevent the emergency power from engaging if the disconnect arm is in “off” position.

3.6. MINI PI

1. Assist the Owner in the initial design and GUI of the panel of the MINI PI.
2. Provide training, hardware and software support to install the Mini PI as well as all related support needed to maintain it in the future.
3. Provide and assist the Owner with the programming of the MINI PI including but not limited to providing a SDCDR-KIT for the MINI PI.
4. Ensure proper operation and function of all the position indicators.
5. Provide the Owner with a copy of the software required to program these units as well as a copy of all the related images and graphics at the end of the job.
6. The display must interface with the Elevator controls to support position, direction and status of the car and or bank.
7. The system must have software that allows the customer to change the design and transfer to each display individually.

3.7. Victaulic Piping & Coupling

1. Replace the shutoff valve, Victaulic couplings and joints in the machine room and pit.
2. Replace the hydraulic pipes with Schedule 80 piping.
 1. Provide grooved piping suitable for hydraulic Victaulic fitting.
 2. Provide new pipes from the machine room to the pit.
 3. Ensure that all piping is above ground or is protected in PVC piping if buried.

3.8. Hydraulic pipeline identification, where required

1. Provide marking to accessible piping located outside the elevator machine room or hoistway labelled “Elevator Hydraulic Line” in letters that are at least 0.75 inches high in a contrasting color.
2. The marking shall be visible after installation and applied at intervals not greater than 9 feet.
3. Provide means to prevent the marking from peeling or fading away.
4. Heat resisting paint stenciled on the piping is the preferred method.

3.9. Rupture Valve

1. Provide a rupture valve of the ball-seat valve design.
2. Provide a rupture valve with a screw-type mounting method.



3. Provide a rupture valve that prevents uncontrolled movement of the cylinder if a pipe or hose burst occurs.
4. Provide a rupture valve that interrupts the flow of oil when the pressure difference in the valve exceeds a value that corresponds to the preloading pressure.
5. Provide a pipe rupture valve which opened automatically when the pressure at the pipe is higher than that at the cylinder.
6. Provide a valve that seals the opening passage leak-free.
7. Provide a rupture valve with settable closing flow.
8. Ensure that the design is of the leak-free closing type.
9. Ensure that the design allows for proper connection to the cylinder head.
10. Mount the rupture valve directly to the cylinder and without any isolation, gate valve or noise coupling in between.
11. Provide a valve with minimal spatial requirement and a compact design.
12. Attach the rupture valve directly to the cylinders.

4. Hoistway Equipment

4.1. Hall Door Equipment

1. Completely refurbish the existing hall door interlocks and pickup assemblies.
2. Replace any worn or damaged parts including contacts rollers and beaks.
3. Replace the hall door hanger roller and gibs on ALL floors.
4. Provide fire gibs and door safety retainers where needed.
5. Supply the Owner with tactile hall entrance plates on both sides of the jamb. Install plates using permanent hardware.
6. Mark the inside of all hall doors with the correct floor designation as per code.
7. Provide new heavy duty Smartork spirators to allow the doors to close under all conditions. Achieve upto 10 lbs.' closing force in last 2 inches and 8.5 pounds in open. Remove existing spirators.
8. Replace missing or damaged sight guards. Where plastic sight guards are used, replace them with steel ones. Provide sight guard with matching material to that of the door (stainless steel, brass, baked enamel or steel).
9. Replace worn or missing rubber bumpers.
10. Provide an escutcheon emergency access hole on each elevator door complete with sleeve and unlocking mechanism to facilitate the rescuing of entrapped passengers.



11. Provide car top access at the top and lowest landings. Install the keyed access in the hall jamb at the top landing and retain the existing ones on the lowest two landings. (Drilling the hall jamb shall be performed outside the normal service hours at times suitable to the Owner).

4.2. Traveling Cables

1. Provide new elevator traveling cables. Cables to include spares: minimum of eight (8) shielded pairs of 20 AWG and two (2) coaxial cables.
2. Provide spare wires consisting of at least 10% of the total number of wires with a minimum of twenty (20) 18 ga. and two (2) 14 ga. spare wires.
3. The traveling cables should form a continuous run from the controller to the elevator cab. Do not terminate the traveling cables at a junction box under the car or in the hoistway.
4. Provide an independent and separate terminal block in the controller where special spares are terminated like the coaxial and shielded pairs. Provide a single, clear and neat labelling for the terminal block to indicate that it is for spares only.

4.3. Wiring

1. Provide new machine room, hoistway and car wiring in accordance with the Canadian Electrical Code.
2. Provide appropriate wiring for the building management system where required.

4.4. Buffers, Pit Steel and Switches

1. Maintain the car and counterweight buffers.
2. Paint the buffers and pit steel with rust inhibiting paint.
3. Replace pit slow down and terminal stop switches as well as the pit stop switch with a push to stop and turn to release type switch.
4. Thoroughly clean the pit area, pit steel and other related pit equipment to like new condition.

4.5. Hall Stations

1. Provide hall station on all floor(s) to conform to barrier free access height. Ensure that the center of the button is located at 42" from the landing floor.
2. Provide hall stations in the same metal and finish as currently existing.
3. Include for engraving to meet code requirement
4. Provide hall fixture at the lobby level to incorporate the special emergency service required under the new code.
5. Provide in each hall station two buttons (up and down) on the intermediate floors and one button on the terminal floor.



6. Provide stainless approved FLUSH mounted DUPAR US90 Optic hall stations with blue LED illumination.
7. Provide white illuminated black anodized optic braille with an up and down arrow next to the buttons to meet barrier free requirements.
8. Include for the Owner to approve design, engraving (no smoking, or emergency use of elevator) and material of hall stations
9. Comply with all aspects of Appendix E as noted in the CAN/CSA B44-10.

4.6. Lobby Stations

1. Provide a #4 brushed stainless steel flush LSL-250 remote lobby station which will be mounted at the in the vestibule or other location selected by owner. Include all engraving as required by CSA B44-10 Code.
2. Provide the following:
 1. Provide surface mounted EBX-250 emergency phone controller to be located in the machine room.
 2. The two-way communication device shall verify the operability of the telephone line automatically at least every 12 hours. If the verification means determines that the telephone line or equivalent means is not functional, an audible and illuminated visual signal shall be activated.
 3. A minimum of one visual and one audible signal shall be provided for each group of elevators controlled by a "FIRE RECALL" switch.
 4. The requirements of the visual and audible signal shall be as follows:
 - (a) The visual signal shall:
 - (i) Be located at the designated landing in the vicinity of the "FIRE RECALL" switch and visible to elevator users.
 - (ii) be labelled "ELEVATOR COMMUNICATIONS FAILURE" in red letters a minimum of 5 mm (0.25 in.) high
 - (iii) illuminate intermittently
 - (iv) continue illuminating intermittently until the telephone line or equivalent means is functional
 - (b) The audible signal shall:
 - (i) be 10 dBA minimum above ambient, but shall not exceed 80 dBA measured at the designated landing "FIRE RECALL" switch
 - (ii) sound at least once every 30 s with a minimum duration of half a second



(iii) continue to sound until silenced by authorized personnel or the telephone line or equivalent means is functional

5. The means to silence the audible signal shall be accessible only to authorized personnel. The signal when silenced shall remain silent unless activated by the next verification (every twelve hours).

4.7. New Jack (Cylinder and Plunger)

1. Retain the existing cylinder.
2. Inspect the piston and cylinder for any unusual wear or damage.
3. Provide new cylinder head packing where leak exist.

4.8. Electrical Ducts, Troughs and Wireways

1. Provide hoistway trough designed to protect electrical wiring from dust, dirt, oil, and water.
2. Provide trough designed to carry hoistway wiring, branch circuits, travelling cable wiring and other groups of conductors.
3. Provide troughs that are open on one side so wires and cables can be laid in along an entire hoistway run.
4. Provide troughs that would require no pulling of wires or cables.
5. Provide troughs with NEMA 1 rating (dust).
6. Provide dual dimensions concentric knockouts for ½" and ¾" conduits.
7. Provide connectors that would allow for sections and fittings to be rigidly joined together.
8. Provide vertical slots with ½" overlap that would allow for settling of the building. Paint the connector in contrasting colour (black or yellow) so that when the overlap is reduced it would become visibly apparent.
9. Provide troughs furnished in ANSI 49 gray polyester powder finish inside and out over phosphatized surfaces.
10. Provide a strain bars installed every 100 feet (30.5m) in vertical runs for wire support.

5. Elevator Cab

5.1. Car Slings

1. Statically balance the cars, at the halfway point in the hoistway, with the top guides removed so that the cars hang in the center between the rails.
2. Ensure that the weight of the car accurately reflects the weight on the crosshead data tag.



5.2. Car Guides

1. Provide new roller guide assemblies on the top and bottom of the car.
2. Provide roller guide assemblies with adjustable float and spring tension.
3. Provide **ELSCO** roller guide assemblies with rollers being a minimum of 6" in diameter.
4. Provide the necessary adaption bracket to facilitate the installation of the roller guides. **Note: existing is attached to the stile.**
5. Provide neoprene roller wheels.
6. Provide rollers with adjustable stops and solid spacers to eliminate "knee action".
7. Include a cover plate assembly over the rollers.
8. Provide fully adjustable guides for all rails up to ¾" width standard.

5.3. Door Operators

1. Provide new GAL MOVFE (ECI VFE2500) closed loop, heavy duty, solid-state door operator.
2. Provide non-linear, heavy duty, solid-state door operator.
3. Provide one ½ or ¾ hp motor and heavy duty sprocket, chain, belt, and sheaves.
4. Provide closed loop regulated speed performance.
5. Provide on site one hand-held keypad programming unit.
6. Provide and store the adjustments on the handheld unit.
7. Provide an operator with adjustable door obstruction reversal.
8. Provide optical cams with LED indicators.
9. Provide test switches for open, close, nudging and speed zone set up.
10. Provide universal inputs for open, close, and nudging.
11. Provide robust drive linkages to the car door.
12. Adjust the door closing force so that it does not exceed 30 lbs.
13. Provide a door operator that would automatically calculate the door weight and speed to regulate the kinetic energy. Where infrared detectors are used, the closing door system shall conform to the following requirements:
 1. The kinetic energy computed for the average closing speed as determined in accordance with 2.13.4.2.2 shall not exceed 10 J (7.37 ft-lbf).
 2. The kinetic energy computed for the actual closing speed at any point in the code zone distance defined by 2.13.4.2.2 shall not exceed 23 J (17 ft-lbf).
14. Provide new car door rollers.



15. Replace the car door track with GAL door equipment.

5.4. Car Directional Arrows

1. Provide two new CE SA-130 car directional arrows with LED indication and chime board.
2. Provide one indicator on either side of the car door.
3. Ensure that the indication is visible from the landing under normal lighting conditions.
4. Provide flush fixture that does not protrude into the doorway which reduces the door width.
5. Chime the device once in the up and twice in the down direction and maintain the direction illumination until the door closes.

5.5. Door Protective Device

1. Provide new panachrome three dimensional (3D) infrared door detection system on every car door.
2. If the door protective device detects a person or object in its path, at any point during the door closing operation, the doors shall re-open.
3. The infrared shall be equipped with red/green indicators to highlight door movement.
4. Provide a system with an eighteen foot range.
5. The detection device and door operation should be adjusted so that the doors re-open without striking any object or person.
6. Provide a three-dimensional electronic door detectors on all car doors with the following specifications:
 1. The infrared detector should provide complete door protection.
 2. Distance between beams not to exceed 1.50”.
 3. Visible light immunity of 100,000 lux.
 4. Interleaved scan.
 5. Minimal number of sensors 80.
 6. Average response time of 90 ms.
 7. Nudging capable feature.
 8. Fault code.
 9. Audible noise emitted when beam interrupted.
 10. Sensitivity adjustment.



5.6. Car Gate Switches

1. Provide new car gate switches.

5.7. Car Door Clutch

1. Provide new GAL car door clutch or Otis skate (depending on the operational requirement of the locks).

5.8. Car Stations

1. Provide new swing return Car Operating Panels (COP) in not less than 14Ga stainless steel and finishes to match the front of the cab.
2. Main panel to conform to barrier free access and current code requirements. Provide DUPAR US 90 Optic LED push buttons with car call registration feedback.
3. Panels to conform to barrier free access and current code requirements.
4. Provide concealed fastening locks.
5. Provide heavy duty hinges that can support the weight of the COP.
6. The building name and logo, car number, government number and the capacity to be engraved in the appropriate place on the return panel.
7. Owner to approve the design and material of the car stations.
8. Car stations to tentatively include the following features and layout:
 1. Hands-free emergency phone.
 2. CE EMN5.7 LCD position indicator.
 3. Dupar S1 digital bulletin board. Provide all required software, training, design, hardware support to make the system operational but exclude the internet connection.
 4. Car call buttons marked to correspond to floors served.
 5. Door open and door close buttons.
 6. Alarm button with amber illumination.
 7. Provide a hands-free telephone system with automatic dialler integrated into the car station to meet barrier-free access as well as these requirements:
 - (a) Provide a push button identified as “Phone” to initiate communication along with a speaker.
 - (b) Identify the button with a raised international symbol for telephones and Braille markings.
 - (c) Provide visual indication which is activated to acknowledge that the communication has been established. Extinguish the visual indication when the connection is terminated.



- (d) Arrange that the communication cannot be terminated from within the cab.
 - (e) Provide twin conductor shielded wiring from the cab to the elevator machine room.
 - (f) Terminate the wiring for all elevator in the machine room at a separate terminal block mounted on the side of a controller.
 - (g) Connect and program the phone to the lobby rescue station (auxiliary lobby telephone equipment) to meet the new code requirements.
 - (h) Provide equipment and wiring compatible with the building's telephone system.
 - (i) Use the lobby rescue station to connect to the elevators so that they can share one telephone line and someone calling into an elevator can select which elevator to call.
 - (j) Provide a line seizure device, including installation, to connect elevator phones (i.e. such as office fax line).
8. Provide a fire fighter switch as follows:
- (a) This key will be of a tubular, 7 pin, style 137 construction and shall have a biting code of 6143521. The key will be coded "FEO-K1".
 - (b) A three-position ("OFF," "HOLD," and "ON," in that order) key-operated switch shall be labeled "FIRE OPERATION"; provided in an operating panel in each car; and shall be readily accessible.
 - (c) The label "FIRE OPERATION" lettering shall be a minimum of 5 mm (0.25 in.) high in red or a color contrasting with a red background. It shall become effective only when Phase I Emergency Recall Operation is in effect and the car has been returned to the recall level. The switch shall be rotated clockwise to go from "OFF" to "HOLD" to "ON." The "FIRE OPERATION" switch, the "CALL CANCEL" button, the "STOP" switch], the door open button(s), the door close button(s), the additional visual signal, and the operating instructions shall be grouped together at the top of a main car operating panel behind a locked cover.
 - (d) The firefighters' operation panel cover shall be openable by the same key that operates the "FIRE OPERATION" switch.
 - (e) Ensure that when the key is in the "FIRE OPERATION" switch, the cover shall not be capable of being closed. When closed, the cover shall be self-locking.
 - (f) Where rear doors are provided, buttons for both the front and rear doors shall be provided in the firefighters' operation panel. The door open and door close buttons for the rear entrance shall be labelled "OPEN REAR" and "CLOSE REAR." All buttons and switches shall be readily accessible, located



not more than 1 800 mm (72 in.) above the floor and shall be arranged as required by Code.

- (g) The front of the cover shall contain the words “FIREFIGHTERS’ OPERATION” in red letters at least 10 mm (0.4 in.) high.
9. The following switches shall be enclosed in a service cabinet: light switch, two speed fan switch, floor passing tone disable switch, voice annunciator disable switch, inspection switch, independent service switch, USB for the MINI PI, USB for S1 screen, emergency light test switch, and emergency stop switch. Also include a GFI 110 AC Volts outlet in the service panel.
 10. Provide an EPCO TCEL emergency cab light system which uses the cab lighting for emergency lighting.
 11. The car number, government number, building name, no smoking sign and the capacity to be engraved in the appropriate place on the return panel.
 12. Provide a service panel for the security card reader in a separate compartment 8” wide by 8” height with keyed access door and a smokey lens 3.25” x 3.25”.
 13. Provide a bi-lingual male/female voice enunciator with preset and programmable floor designation:
 - (a) Provide a CE Electronics micro com style AMCUM-MMB Digitized Voice Annunciator which utilizes actual male and female voices in a system that is capable of up to 5 minutes of speech.
 - (b) Provide a system which complies with ADAAG 4.10.13 handicap code.
 - (c) The sound should be field selectable and the volume adjustable.
 - (d) The Digitized Voice Annunciator should advise at a minimum of the following:
 - (i) Direction.
 - (ii) Stay away from closing door.
 - (iii) Nudging functions.
 - (iv) Special emergency service.
 - (v) Out of service condition.

5.9. Car Restrictor

1. Provide a new Unitec Uni-Lock™ CM Door Restrictor or equivalent.
 1. Provide a collapsible door restrictor which works in conjunction with a hoistway door angle to deter passengers from exiting the car outside the landing zone.
 2. Provide a collapsible door restrictor which uses no cords, coils or other moving parts to engage and disengage.



3. Ensure that the car door remains locked when outside the door zone.

5.10. Floor passing tone

1. Provide a floor passing tone in the cab, which chimes as the elevator is passing a floor.
2. The sound should be field selectable and the volume adjustable.
3. The floor passing tone should have a disable function in the car station.

5.11. Crosshead Data Plate

1. Provide new crosshead data plate with the proper weight, date, capacity, speed and date of the elevator manufacturing and modernization.
2. Provide a tag 2.0" by 3.0" 0.12" thick aluminum with square corners, black background and silver copy.
3. Attach the tag to the crosshead using 3M adhesive backing and ensure that it is mounted on a clean background to resist casual removal.

5.12. Car Top Solid State Reader Head

1. Provide new solid state car top reader head.
2. Provide new rust resistant hoistway tape with magnetic targets.
3. Provide proper tensioning equipment to maintain the stability and strength of the hoistway tape.
4. Provide consistent stopping accuracy within $\frac{1}{8}$ ".
5. Permanently secure the magnet to the steel tape.
6. Provide low friction guides to ride along the steel tape with no more than $\frac{1}{8}$ " tolerance.

5.13. Cab Renovation

1. Retain existing cab finishes on the elevators.
2. Provide a new aluminum sill to replace the existing sill.
3. Provide a new two speed fan and stainless steel vent located on top of the elevator.
4. Assist where requested to do so in the installation of a security camera. Provide power and coaxial cable to the desired location.
5. Clad the car door in satin stainless steel.
6. Clad the strike, post jambs and return as well as the header/transom in stain stainless steel. Allow for the installation of car directional indicators. Ensure the existing fan located within the transom is removed.



5.14. Car Door Equipment

1. Replace all car door rollers.
2. Replaced car door track with GAL or OEM track.
3. Provide new car door bumpers.

5.15. Car Top Inspection Station

1. Provide on top of the car, an inspection station consisting of:
 1. An emergency stop button (red colour). The stop switch shall be permanently located on the car top and readily accessible to a person, while standing at the hoistway entrance normally used for access to the car top;
 2. Up and down continuous-pressure type inspection buttons (white colour). A separate device of the continuous-pressure type labeled “ENABLE” shall be provided adjacent to the inspection operating devices. The inspection operating devices shall become effective only when the “ENABLE” device is activated. The inspection operating devices, shall be permitted to be of the portable type provided that:
 - (a) the “ENABLE” device, and a stop switch, in addition to the stop switch required with the stationary inspection station are included in the portable unit; and
 - (b) the flexible cord is permanently attached so that the portable unit cannot be detached from the car top.
 3. On-off inspection transfer switch (green switch). The transfer switch shall be located on the car top and shall be so designed as to prevent accidental transfer from the “INSPECTION” to “NORMAL” position;
 4. Duplex electrical outlet;
 5. Provide a secondary hand-held fluorescent trouble light; and
 - (a) Provide two 13 watt fluorescent "H" tube;
 - (b) Not less than eight foot CSA listed Cord; and
 - (c) Provide a handy clip for hanging or strong magnetic base for mounting.
 6. Primary car top lighting with a guard activated by an on/off switch.

5.16. Car Apron

1. Passenger elevators currently operated in an apartment building, condominium apartment building or educational institution shall include at the entrance side with a smooth apron made of metal not less than 1.5 millimetres thick, or made of material of equivalent strength and stiffness, reinforced and braced to the car platform such that,



1. it does not extend less than the full width of the widest hoistway door opening;
2. it has a straight vertical face, extending below the floor surface of the car-platform, of not less than 1,200 millimetres, except that for an existing elevator this may be reduced where the hoistway pit is not deep enough to accommodate a larger vertical face;
3. its lower portion is bent back at an angle not less than 60 degrees and not more than 75 degrees from the horizontal; and
4. will be installed in addition to door restrictors.

6. Elevator Control and Dispatching

6.1. Grounding

1. Ground the control system and all field apparatus using colour coded bonding wire.
2. The accidental grounding or a short circuit shall not defeat any safety device, and shall not allow the elevator to start or run if any hoistway door interlock or car gate switch is not made.

6.2. Door Operation

1. Door opening shall be automatic as the car arrives at a landing, and closes at the expiration of the door open timer. Doors shall remain open for a time period as follows:
 1. A car call time shall predominate when a car call only is being answered.
 2. The hall call time shall predominate when a hall call or both a hall call and car call are being answered.
 3. A short door time shall predominate after a door reversal from the door detector or the door open button.
 4. A short door time shall predominate on a hall call or car call after the beam of the door protective device has been broken.
2. The values for the door timers shall be independently field adjustable.

Car Groups	Maximum Door Opening Time	Maximum Door Closing Time	Maximum Car Call Door Dwell Time	Maximum Hall Call Door Dwell Time	Maximum Short Door Dwell Time
Car 1	2.5 sec.	4.1 sec.	3.0 sec.	5.0 sec.	3.0 sec.

6.3. Delayed Car Operation

1. If the elevator is delayed at a landing for a predetermined adjustable time while there are calls in the system, the car shall be removed from operation.



6.4. Door Nudging Operation

1. If the elevator doors are prevented from closing for a predetermined adjustable time, the door protective device shall become inoperative, and audible signal shall sound, and the door shall close at a reduced speed. Normal door operation shall resume at the next stop.

6.5. Door Failure Protection

1. If the doors fail to fully open or close within a predetermined adjustable period due to an obstruction, further attempts to open or close shall cease and the doors shall return to the open or closed position.
2. The control system shall allow three (3) more attempts at opening or closing the doors. If unsuccessful the control system shall remove the car out of the group and shut the car down temporarily until the problem is resolved.

6.6. Performance Criteria

1. The control equipment shall be capable of operating within the specified performance criteria.
2. Flight time shall be measured from the start of the door close cycle until the doors are 3/4 open at the next landing on a one floor run.

Car Groups	Maximum Flight Time	A95 Vertical Horizontal Vibration	Maximum Jerk	Maximum Acceleration	Levelling Accuracy	Speed Variation
Car 1	13.0 sec.	6 mg	7.0 ft/sec ³	3.5 ft/sec ²	+/- 1/8"	+/- 2%

6.7. Noise Levels

1. Door operation noise level shall be taken during the door opening, closing, and reversal cycle.
2. The cab noise level shall be taken during a full run, bottom to top, and return.
3. The machine room noise level shall be taken with all cars operating.

Car Groups	Door Operation	Cab	Machine Room
Car 1	62dBA	50dBA	80dBA

6.8. Independent Service

1. Provide a key switch in the car which, when actuated will take the car out of the group operation and allow operation from the car buttons only. Door operation shall be activated by constant pressure on the door close button.
2. Independent service operation shall de-activate the hall and in car lanterns.



6.9. Inspection

1. Provide a key switch in the car which, when actuated will take the elevator out of service. An inspection-operating fixture on top of the elevator will allow the elevator to be controlled on inspection mode as per code.

6.10. Levelling

1. The control circuit shall cause the car to stop automatically at floor level regardless of load or direction of travel within $\frac{1}{8}$ " with respect to the hoistway sill.

6.11. Manual Emergency Recall Operation: Initiation

1. Arrange that special emergency service is initiated by means of the two position special emergency service keyed switch marked "EMERGENCY RECALL" in yellow lettering, in the following way:
 1. By turning the switch to the "ON" position.

6.12. Automatic Emergency Recall Operation: initiation (Optional)

1. Please note: Provide the following provisions with the understanding that the building may not be able to provide the required signal. However, include in the pricing and programming of the controller with all these features with the knowledge that only manual recall may be installed. Under no circumstances shall automatic recall not be provided unless the owner has given specific written direction that only manual recall should be installed.
 1. Arrange that special emergency service is initiated by means of the three position special emergency service keyed switch marked "FIRE RECALL" in red lettering.
 2. Arrange its positions to be marked "RESET", "OFF", and "ON" (in that order), with the "OFF" position as the center position.
 3. The "FIRE RECALL" letters shall be a minimum of 5 mm (0.25 in.) high in red or a color contrasting with a red background.
 4. Locate this switch in the lobby within sight of the elevator or all elevators in that group and shall be readily accessible.
 5. An additional key-operated "FIRE RECALL" switch, with two-positions, marked "OFF" and "ON" (in that order), shall be provided, where permitted, only at the building fire control station if available.
 6. All "FIRE RECALL" switches shall be provided with an illuminated visual signal to indicate when Phase I Emergency Recall Operation is in effect.

6.13. Automatic Emergency Recall Operation: return to designated floor

1. When special emergency service has been initiated, return the elevator to a designated floor, open the doors and maintain the doors opened.



2. In the event that special emergency service is initiated by the actuation of a device at the designated floor, return the elevator to an alternative designated floor approved by the enforcing authority.
3. Arrange the operation for this phase of special emergency service as follows:
 1. Reverse an elevator traveling away from the designated floor at the next available floor without opening its doors and cause it to proceed to the designated floor without stopping for car or hall calls.
 2. Close the doors of an elevator standing at a floor other than the designated floor under all operating modes, except on car-top maintenance, and cause it to proceed to the designated floor without stopping for car or hall calls.
 3. Give a visible and audible signal on the car.
 4. Render the emergency stop button, door protective device, door open, door close, and car and hall buttons inoperative.
 5. Park at the designated floor with the doors open.
 6. Where applicable, when on hospital service, the elevator shall conform to Section 2.27.3.1.6(h) of the B44-04 while Phase I Emergency Recall Operation is in effect. An elevator on firefighter emergency operation shall not be placed on hospital service.

6.14. Automatic Emergency Recall Operation: car operation

1. After the initiation of special emergency services and after the return to lobby procedure described above has been completed, arrange the circuits so that the elevator runs on special emergency service when the key switch in the car is in the “ON” position, using the same key as required for the return to lobby procedure above.
2. A three-position (“OFF”, “HOLD”, and “ON”, in that order) key-operated switch shall be labeled “FIRE OPERATION”; provided in an operating panel in each car; and shall be readily accessible. The label “FIRE OPERATION” lettering shall be a minimum of 5 mm (0.25 in.) high in red or a color contrasting with a red background. It shall become effective only when Phase I Emergency Recall Operation is in effect and the car has been returned to the recall level. The switch shall be rotated clockwise to go from “OFF” to “HOLD” to “ON”.
3. The key shall only be removable in the “OFF” and “HOLD” position. The “OFF”, “HOLD”, and “ON” positions shall not change the mode of operation within Phase II Emergency In-Car Operation until the car is at a landing with the doors in the normal open position.
4. When the “FIRE OPERATION” switch is in the “ON” position, the elevator shall be on Phase II Emergency In-Car Operation, for use by emergency personnel only, and the elevator shall operate as follows:



1. The elevator shall be operable only by a person in the car.
2. The car shall not respond to landing calls. Directional lanterns, where provided, shall remain inoperative. Car position indicators, where provided, shall remain operative. Landing position indicators, where provided, shall remain inoperative, except at the designated level and the building fire control station, where they shall remain operative.
3. Door open and close buttons shall be provided for power operated doors. The door open and close buttons shall be labeled “OPEN” and “CLOSE”.
4. The opening of power-operated doors shall be controlled only by a continuous-pressure door open button. If the button is released prior to the doors reaching the normal open position, the doors shall automatically reclose. On cars with multiple entrances, if more than one entrance can be opened at the same landing, separate door open buttons shall be provided for each entrance.
5. Open power-operated doors shall be closed only by continuous pressure on the door close button. If the button is released prior to the doors reaching the fully closed position, horizontally sliding doors shall automatically reopen, and vertically sliding doors shall automatically stop or stop and reopen. On cars with multiple entrances, if more than one entrance can be opened at the same landing, a separate door-close button shall be provided for each entrance.
6. Opening and closing of power-operated car doors or gates that are opposite manual swing or manual slide hoistway doors shall conform to CAN/CSA B44-04 Section 2.27.3.3.1(d) and (e).
7. All door reopening devices except the door open button shall be rendered inoperative. Full speed closing shall be permitted. Landing door opening and closing buttons, where provided, shall be rendered inoperative.
8. Every car shall be provided with a button marked “CALL CANCEL”, located in the same car operating panel as the “FIRE OPERATION” switch, which shall be effective during Phase II Emergency In-Car Operation. When activated, all registered calls shall be canceled and a traveling car shall stop at or before the next available landing.
9. Floor selection buttons shall be provided in the car to permit travel to all landings served by the car, and they shall be operative at all times as required by code. Means to prevent the operation of the floor selection buttons or door-operating buttons shall be rendered inoperative.
10. A traveling car shall stop at the next available landing for which a car call was registered. When a car stops at a landing, all registered car calls shall be canceled.
11. Means used to remove elevators from normal operation, other than as specified in this Code, shall not prevent Phase II Emergency In-Car Operation.



12. No device, which measures load, shall prevent operation of the elevator at or below the capacity and loading required.

6.15. Automatic Emergency Recall Operation: termination

1. Terminate special emergency service under the following conditions:
 1. All cars at the designated floor.
 2. All key switches associated with special emergency service in the "OFF" position.
 3. Smoke or heat sensing devices associated with special emergency service either in the normal status or the three-position special emergency service key switch turned to the off position for cancellation of special emergency service.
2. The special emergency operation shall comply with all current code regulation in force.

6.16. Emergency Power Provisions

1. The elevator contractor shall provide an affidavit confirming the proper operation of the fire recall signals and emergency generator operation.
2. Provide provisions for emergency power. Provide blank removable plates in the panels to be replaced at a later date.
3. The elevator contractor shall provide contacts on the controllers to receive signals from the normal and emergency power contacts.
4. The transfer between the normal and the emergency power shall be automatic.
5. A signal light marked "ELEVATOR EMERGENCY POWER" shall be provided in the lobby at street level to indicate emergency power is in effect.
6. The emergency power operation shall be as follows:
 1. Upon loss of normal power and receipt of emergency power the elevators shall automatically return, one at a time, to the lobby floor, or other designated floor.
 2. Any car that is unable to move on command within a preset time interval shall be bypassed and another car shall be selected.
 3. After all cars, that were able to respond to the return to lobby command, have returned to the lobby, a car(s) shall be automatically selected to provide normal elevator service.
 4. Failure of the selected car to move shall cause power to be transferred to another car.
 5. Provide an emergency power selection switch marked "ELEVATOR EMERGENCY POWER" in red lettering at the lobby at street level.
 6. The selector switch shall have a position marked "AUTO" to permit automatic power selection, and shall be locked in that position.



7. The selector switch shall have positions corresponding to the elevator identification for manual selection of emergency power operation.
7. The emergency power operation shall comply with all current code regulation in force.
8. Where the elevators' regenerative power interferes with the generator power (frequency, harmonics, etc...) causing building issues or elevators to shutdown, provide means to dissipate the regenerative power through dynamic breaking resistors.

6.17. Group Operation

1. Provide a simplex dispatcher based on a multi-tasking/multi-processing network of microcomputers.
2. As a minimum, a 32-bit embedded RISC controller which operates at 32 MHZ or faster shall be provided.
3. The dispatcher shall have the capacity for four megabytes or more of EPROM plus RAM, and shall provide up to eight industry standard serial communication ports for use with modems and other peripherals.
4. The dispatching system should monitor building traffic conditions including, but not limited to the following:
 1. Hall call demand.
 2. Number of assigned hall calls.
 3. Number of cars in operation.
 4. Number of car calls.
 5. Number of car stops.
 6. Car position.
 7. Car direction.
 8. Anticipated direction of car travel.
 9. Car loading.
 10. Car status.
 11. Car motion status.
 12. Car door status.
 13. Call waiting time.
 14. Door opening time.
 15. Door closing time.
 16. Coincidence calls.
 17. Estimated time of car arrival.



5. Provide a dispatcher which evaluates real time data and selects the best car to serve any given hall call demand.
6. Assignment of cars, by the dispatcher should be based on providing efficient handling of varying traffic demands in terms of passenger waiting time and passenger transit time.
7. The dispatching algorithm shall minimize the mean waiting time, the maximum waiting time and the number of late calls.
8. This algorithm shall cover all two-way traffic demands such as light, medium and heavy traffic situations.
9. The algorithm shall compile the required physical and statistical data and parameters that are necessary to perform the above minimization tasks.
10. The dispatcher software shall include sophisticated parking programs that provide flexible parking options allowing the user to select the most efficient parking configuration for a specific building.
11. Parking floors shall be divided into two groups:
 1. Lobby parking floors. Lobby parking floors are the floors where a lobby function is performed.
 2. Non-lobby parking floors. Non-lobby parking floors are floors where the car performs a regular parking function.
12. There shall be any number of user definable lobbies with four levels of priority to allow maximum system flexibility.
13. More than one car could park at any lobby, and the number of cars that can park at any lobby shall be field programmable.
14. There shall be 15 levels of priority for non-lobby parking floors. When all lobby parking floors are occupied, the next car that is ready to park shall park at the highest priority non-lobby floor.
15. If all the non-lobby parking floors are of the same priority, then the next car that is ready to park shall park at the closest non-lobby floor. The priorities for non-lobby parking floors shall be field programmable and more than one car could park at any non-lobby floor.
16. The group dispatcher shall allow eight different system configurations to be programmed by the user. The programmable parameters for each configuration shall include:
 1. The dispatching mode of operation.
 2. Lobby parking floors.
 3. Non-lobby parking floors.



4. Lobby operation.
5. Lobby and non-lobby parking delay timers.
6. Long wait hall call threshold times.
17. The user can invoke any of these configurations, any time of the day. There shall be up to 16 time selections for these configurations.
18. The dispatching system software shall operate as a dynamically balanced system for two-way traffic. Depending upon the traffic pattern in the building, the dispatcher shall automatically modify the mode of operation to lobby up peak, demand up peak, or demand down peak.
19. The lobby up peak mode shall be capable of being initiated by using a switch input, by manual selection from the keyboard, by a timed configuration or by automatic monitoring of load weigher inputs and/or the number of up car calls registered at the main lobby floor(s).
20. The lobby up peak program shall handle heavy incoming traffic at one or two lobby landings, at the same time or at different times. This program shall assign one or more cars to the lobby depending on the lobby up peak classification for that particular lobby.
21. The first car at the lobby shall stay with its doors open or closed for a programmable length of time. If more than one car is assigned to the lobby, then all other cars shall stay at the lobby floor with their doors closed.
22. The loading car shall stay at the lobby landing for the duration of the up peak interval, unless dispatched by the loaded car input.
23. A peak participating car is a car assigned to participate in lobby up peak operation. Depending on the level of traffic, the system shall assign a variable number of cars for lobby up peak operation.
24. All non-lobby up and down hall calls shall be assigned to non-peak participating cars.
25. The selection of cars shall be done dynamically.
26. Demand up peak or down peak mode shall be capable of being initiated by using a switch input, by selection from the keyboard, by a timed configuration, or as automatically determined by the system.
27. The demand up or down peak program shall reverse the car's direction at its highest or lowest call and cause it to travel non-stop to the highest or lowest call in the building.
28. The cars shall collect up or down calls as they are encountered until the cars are loaded to a predetermined adjustable level that shall then cause the cars to bypass hall calls until they make a high or low call reversal.
29. The next down-traveling car shall stop, reverse direction at the floor above the floor at



which the prior car's load switch operated and then collect up calls in the same manner as the previous car.

30. In the event of a malfunction of the dispatcher's communication with the other cars or failure in the network, the computers operating the individual car computers shall:
 1. Detect the malfunction and provide emergency dispatching of all in-service cars;
or
 2. The dispatching assignment shall be transmitted to the next elevator in the group.
31. The system shall automatically remove any car from the group operation if the car is delayed from responding to its demand within a field adjustable time period. The system shall automatically restore any car back to system operation when the reason for the delay has been corrected.

6.18. Remote Elevator Monitoring System

1. Provide for the controller to support remote elevator monitoring.

6.19. Ride quality improvement system

1. Provide the following information before commencement of modernization:
 1. Documentation with current ride quality readings.
 2. Should the ride quality analyzer indicate that rails are out of alignment and that the ride quality is compromised, the contractor shall re-align the rails.

7. Elevator Maintenance

7.1. Hydraulic Elevator Maintenance

1. The elevator contractor agrees to sign the Owner's maintenance agreement.
2. The elevator contractor agrees to provide labour, parts, and services necessary to maintain 1 Hydraulic elevator(s) at 95 Lavinia Avenue, Toronto, ON.
3. The elevator contractor agrees to maintain the elevators in accordance with the maintenance specifications as provided in Section 14900 of the Owner's maintenance agreement.

Section 14900

City of Toronto



Swansea Town Hall

**Maintenance Specifications
Section 14900 Job#: 202713**



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ELEVATOR FULL INCLUSIVE PREVENTATIVE MAINTENANCE CONTRACT

THIS AGREEMENT made as of the _____, 2020.

BY AND BETWEEN:

City of Toronto (hereinafter referred to as the "Owner")

c/o: _____ (hereinafter referred to as the "Manager")

Attention: _____

- and -

_____ (hereinafter referred to as the "Contractor")

THE OWNER AND THE CONTRACTOR, for good and valuable consideration the sufficiency of which is agreed, hereby agree as follows:

General Agreement and Administrative Details

1.1. Services

- 1.1.1. The Contractor shall provide and perform all full-inclusive, preventative elevator maintenance services as described in this Agreement and its Schedules herein (collectively, the "Services").
- 1.1.2. The Contractor shall do and fulfil everything indicated by this Agreement and its Schedules.
- 1.1.3. The Owner may appoint a Manager, other than the Contractor, who shall have authority to act on behalf of the Owner to the extent provided herein.
- 1.1.4. The Contractor shall be an independent contractor with respect to the Services to be performed under this Agreement. Neither the Contractor, its subcontractors or vendors, nor the employees of any of them employed in connection with such Services shall be deemed to be the agents, representatives, employees, or servants of the Owner or the Manager in the performance of Services hereunder, or any part thereof, or in any manner dealt with herein.
- 1.1.5. The Contractor shall have total control of the Services and shall effectively direct and supervise the Services so as to ensure conformity with this Agreement.
- 1.1.6. The Contractor shall be solely responsible for construction means, methods, techniques, sequences, and procedures and for co-ordinating the various parts of the Services under the Agreement.

1.2. Definitions, Term and Renewal of Agreement

- 1.2.1. The Contractor shall provide the Services for the specified term (the "Term") commencing on _____, 2020 12:00 AM (the "Commencement Date") and expiring on _____, 2025 11:59 PM (the "Expiry Date") unless otherwise terminated in accordance with this Agreement.



- 1.2.2. The Owner shall have the option of renewing this Agreement for an additional term of three (3) years, by giving written notice to the Contractor, in accordance with the provisions of this Agreement, at least ninety (90) days prior to the Expiry Date.
- 1.2.3. In the event that this Agreement is not renewed in accordance with Clause 1.2.2, the Contractor shall continue to perform Maintenance Services in accordance with this Agreement, on a month-to-month basis, until the Agreement is renewed, terminated or expires.
- 1.2.4. The term “Elevator Consultant”, as used herein, refers to “Solucore Inc.”.
- 1.2.5. The term “Building”, “Site” and “Location” refers to the building indicated in Schedule A.
- 1.2.6. The term “Address” refers to the address of the Building.
- 1.2.7. The term “Inspecting Authorities”, as used herein, refers to authorized agents of governments charged with the responsibility of carrying out periodic inspections and tests on vertical transportation equipment.
- 1.2.8. The term “Provide”, as used herein, means to supply labour and material needed to maintain the elevating Device(s).
- 1.2.9. The term “Elevator” or “Device”, as used herein, means a licensed vertical transportation equipment as defined by the ASME A17.1/CAN/CSA B44 as amended from time to time (the “Code”).
- 1.2.10. The term “Designated City” as used herein, refers to "Toronto" a city where the dispute and mediation shall take place.
- 1.2.11. Any terms in the Specifications that are not otherwise defined shall have the definitions as given in the latest edition of the Code or Standards (as hereinafter defined) as applicable, including where applicable, the latest supplements, for elevators, dumbwaiters, escalators and moving walks.

1.3. Fee

- 1.3.1. The fee be paid during the Term, by the Owner to the Contractor (the "Fee") in respect of the Services, shall be paid in equal monthly instalments (the "Monthly Instalments"), in accordance with Schedule “A” hereto, which Fee shall be inclusive of all applicable taxes and shall be subject to the annual revisions set out in clause 1.3.
- 1.3.2. The Contractor shall invoice the Owner in respect of the Monthly Instalment and in respect any overtime charges incurred in accordance with clause 1.3.5 herein, prior to the first day of every month of the Term provided conditions outlined in clause 1.4.3 are met. Subject to clause 1.5 and 1.6.4 herein, payment in respect of the invoices so rendered shall be made by the Owner within thirty (30) days date of receipt of the invoice and related data.
- 1.3.3. The Fee may be revised annually on the anniversary date of this Agreement. The



Monthly Instalment shall be increased or decreased in direct proportion to the change in the straight-time hourly rate of the Contractor (which hourly rate shall include all compensation including all fringe benefits paid to its employees and agents); provided, however, that, in no event shall the Fee be increased by more than two (2%) per cent annually during the Term of this Agreement and the Owner is advised in writing ninety (90) days prior to the effective date of the increase.

- 1.3.4. The Owner shall be responsible to pay, in addition to the Fee, any new taxes as may be imposed on the Services or the Fee, after the Commencement Date, by any government or regulatory authority having jurisdiction.
- 1.3.5. Overtime charges, where applicable, shall be paid in accordance with the Contractor's then applicable rate schedule, which rate schedule shall be submitted annually 90 days before the anniversary date of this Agreement to the Owner, together with the price increase notice taking effect on the given anniversary date, if any.

1.4. Supervision Compliance and Reporting

- 1.4.1. The Services shall be performed by the Contractor in accordance with all applicable laws, rules, codes and regulations of any government or regulatory/industry authority having jurisdiction, and in a professional manner.
- 1.4.2. All employees and agents of the Contractor shall, at all times, wear attire or uniforms which are appropriate and suitable for the due performance of the Services. The Contractor shall provide uniforms clearly displaying the Contractor's name or logo, and any other means of identification of personnel.
- 1.4.3. The Contractor may be required to provide, in an electronic format acceptable and approved by the Owner, a monthly report outlining the number of callbacks, number of hours spent per unit, maintenance work description, and any other information as may be required by or for the Owner from time to time during the Term of the Agreement, including, without limitation, such reports and information as described in this Agreement and its Schedules. This monthly report shall be submitted by the Contractor with the invoice referred herein.

1.5. Non-Performance and Owner's Right to Terminate

- 1.5.1. No payment by the Owner for Services rendered herein shall constitute acceptance of any portion of the Services which are not in accordance with the terms and conditions herein, nor shall any such payment be construed as acceptance by the Owner of deficient work
- 1.5.2. In the event that the Services are not performed to the satisfaction of the Owner, or at all, or in the event that the Contractor becomes insolvent or adjudged bankrupt, or makes a general assignment for the benefit of creditors, the Owner shall be entitled to do the following, without prejudice to any other right or remedy the Owner may have:
 - 1. terminate this Agreement in accordance with the provisions of clause 1.6 herein;



2. withhold from the Fee or Monthly Instalment an amount sufficient and reasonable to cover the cost of engaging a third party to rectify any deficiencies or complete the Services; and/or
 3. retain a third party to perform the Services, and thereafter set-off, as against the Fee or Monthly Instalment, any and all costs and expenses incurred by the Owner in connection therewith.
- 1.5.3. Except in the case of the bankruptcy or insolvency of the Contractor or in the case where Contractor makes a general assignment for the benefit of creditors, the Owner shall give the Contractor 15 days' written notice to remedy the default to the satisfaction of the Owner and to comply with its obligations under this Agreement prior to exercising any of the forgoing rights.
- 1.5.4. In the event that any legislation, including, but not limited to the Code or Standard (latest edition), or an Elevating Devices Branch ruling causes an increase in the cost of the Fee, this Agreement may be terminated by the Owner on thirty (30) days' written notice to the Contractor. An Agreement for the Services may then be re-tendered by the Owner, in its sole discretion.
- 1.5.5. This Agreement may also be terminated by the Owner, at its sole discretion, and without any obligation whatsoever on the part of the Owner or its agents for the Contractor's damages, costs, or expenses, upon thirty (30) days' written notice to the Contractor to such effect, for the following reasons, without limitation:
1. the sale of the Building;
 2. the permanent removal of the elevating equipment from service;
 3. non-completion of Maintenance Services Code including without limitation, Code Section 8.6, in two consecutive months, or twice during a twelve month period;
 4. a major modernization undertaken in respect of the elevating devices;
 5. a change in the ownership, management, or control of the Contractor; or
 6. the number of callbacks as averaged over a twelve months (12) period is in excess of 1 callback per elevator every two months (or a callback ratio greater than 0.5) provided that the callbacks are equipment related and not act of God, misuse or vandalism.
- 1.5.6. This Agreement may be terminated on fifteen (15) days' written notice by the Owner, in the event that the Contractor is notified of a default in the performance of its contractual obligations, on more than two occasions in a thirty (30) month period during the Term of this Agreement.
- 1.5.7. This Agreement may be terminated on fifteen (15) days' written notice by the Owner, in the event that the Contractor fails to provide diligent and accurate supervision or does not satisfy the reporting requirement, both as outlined in clause 1.4.



1.6. Default Notice

- 1.6.1. In case of unsatisfactory performance or substantial non-performance of the Services by the Contractor, or, otherwise for the purpose of periodic review of the Services, the Owner may, at its sole discretion, retain the services of a recognized and independent professional elevator consultant (the “Elevator Consultant”) to review and report upon the progress and adequacy of the Services. The report of the Elevator Consultant shall be binding on the parties.
- 1.6.2. If the Contractor is found to be in default of its obligations hereunder, including without limitation, if this finding is the result of the Elevator Consultant’s report, the Owner shall notify the Contractor, in writing, that the Contractor is in default of its contractual obligations and shall instruct the Contractor to correct the default within fifteen (15) days, or within a mutually agreed upon time if the Owner so chooses.
- 1.6.3. In the event that the Contractor fails to correct the default within the time specified in Clause 1.6.2, or if applicable, within a mutually agreed upon time, to the satisfaction of the Owner and the Elevator Consultant, the Owner may, in addition to any other right or remedy the Owner may have, terminate this Agreement pursuant to Clause 1.5.3, upon a further fifteen (15) days’ notice.
- 1.6.4. Notwithstanding any clause herein, while the Agreement is in effect the Contractor shall continue to perform the Services in accordance with the terms and conditions of this Agreement.
- 1.6.5. In the event that this Agreement is terminated, the Contractor shall be responsible for the costs of repair and remedy of all outstanding defects contained in the report of the Elevator Consultant or which are known to either of the parties at the time of termination.

1.7. Insurance

- 1.7.1. The Contractor shall obtain and maintain, at its sole cost and expense, during the Term of this Agreement comprehensive or commercial general liability insurance to respond to any and all incidents occurring on the Property as a result of the Contractor's presence or operations, in the minimum amount of \$5,000,000 per occurrence, including the following extensions: owners and contractors protective; products and completed operations; personal injury; occurrence basis property damage; blanket contractual, non-owned automobile liability.
- 1.7.2. In addition to the foregoing, in the event that the Services include the provision of any form of security to the Property, intentional acts coverage for prevention of bodily injury, including death, and property damage, personal injury coverage and wrongful detention coverage are required to be obtained and maintained by the Contractor, at its sole cost and expense, during the Term.
- 1.7.3. The Owner, and its nominee (if any), shall be Additional Insured on the Contractor’s “Owner’s and Contractor’s Protective Liability” policy. Such insurance shall include



cross liability and severability of interest clauses, and shall contain a provision that the insurer will not cancel or materially change or refuse to renew the insurance without first giving the Owner 30 days' prior written notice. The Contractor shall not cancel or materially change or fail to renew or otherwise default on any insurance described herein without first giving the Owner 30 days' prior written notice.

- 1.7.4. The Contractor shall also, during the Term, at its sole cost and expense, obtain and maintain employee fidelity bonds in an amount of not less than \$500,000 per occurrence.
- 1.7.5. Any and all deductibles in the Contractor's insurance policies shall be borne solely by the Contractor and shall not be recovered or attempted to be recovered from the Owner.
- 1.7.6. In addition, all such insurance policies shall be non-contributing with, and will apply only as primary and not excess to, any insurance proceeds available to the Owner, or its nominee (if any).
- 1.7.7. Such insurance shall be with insurers acceptable to the Owner and with policies in form satisfactory to, as determined from time to time by, the Owner and a copy of all certificates of insurance shall be delivered to the Owner prior to the commencement of the Term.

1.8. Workplace Safety and Insurance Board Coverage

- 1.8.1. Neither the Contractor nor its agents or employees are covered by the Owner under the following applicable Provincial Workplace Safety and Insurance legislation, as amended (the "WSIA"):

Province	Applicable Workplace and Safety Insurance Legislation
Alberta	Workers Compensation Act, RSA 2000, c W-15
British Columbia	Workers Compensation Act, RSBC 1996, c 492
Manitoba	The Workers Compensation Act, CCSM c W200
New Brunswick	Workers Compensation Act, RSNB 1973, c W-13
Newfoundland and Labrador	Workplace Health, Safety and Compensation Act, RSNL 1990, c W-11
Northwest Territories	Workers Compensation Act, SNWT 2007, c 21
Nova Scotia	Workers Compensation Act, SNS 1994-95, c 10
Nunavut	Workers Compensation Act, SNu 2007,c.15
Ontario	Workplace Safety and Insurance Act, 1997, SO 1997, c 16, Sch A
Prince Edward Island	Workers Compensation Act, RSPEI 1988, c W-7.1





Quebec	Workers Compensation Act, RSQ, c A-3
Saskatchewan	Workers Compensation Act, 1979, SS 1979, c W-17.1
Yukon	Workers Compensation Act, SY 2008, c 12 Act to Amend the Workers Compensation Act, SY 2011, c 4

and the Contractor shall be responsible for and shall pay all dues and assessments payable under the applicable WSIA, the Employment Insurance Act, S.C. 1996, c23 as amended or any other legislation, whether Provincial or Federal, in respect of the Contractor, its employees , agents and operations, and shall furnish the Owner, at the start of the Agreement, and yearly thereafter, or at any time if requested, with such satisfactory evidence that it has complied with the provisions of any such legislation. If the Contractor fails to do so, the Owner shall have the right to withhold payment of such sum or sums of money due to Contractor that would be sufficient to cover Contractor’s default and the Owner shall have the right to pay any amounts due and owing or so assessed.

1.8.2. The Owner is not the employer of the Contractor or its personnel under any circumstances whatsoever. Nothing in this Agreement shall be construed to create anything other than an arms length relationship between the parties, and other than expressly written in this Agreement, no agency relationship exists between the parties.

1.9. Occupational Health and Safety

1.9.1. The Contractor shall be designated as the following terms according to the following for purposes of the applicable Provincial Occupational Health and Safety legislation, as amended (the “OHS”), in respect of this Agreement:

Province	Applicable Occupational Health and Safety Legislation	Term
Alberta	Occupational Health and Safety Act, RSA 2000, c O-2	"employer"
British Columbia	Workers Compensation Act, RSBC 1996, c 492 Occupational Health and Safety Regulation, BC Reg 296/97	"employer"
Manitoba	Workplace Safety and Health Act, CCSM c W210	"contractor"
New Brunswick	Occupational Health and Safety Act, SNB 1983, c O-0.2	"contractor"
Newfoundland and Labrador	Occupational Health and Safety Act, RSNL 1990, c O-3	"employer"
Northwest Territories	Safety Act, RSNWT 1988, c S-1	"employer"
Nova Scotia	Occupational Health and Safety Act, SNS 1996, c 7	"constructor"
Nunavut	Safety Act, RSNWT (Nu) 1988, c S-1	"employer"





Ontario	Occupational Health and Safety Act, RSO 1990, c O.1	"constructor"
Prince Edward Island	Occupational Health and Safety Act, RSPEI 1988, c O-1.01	"constructor"
Quebec	An Act respecting Occupational health and safety, RSQ, c S-2.1	"employer"
Saskatchewan	Occupational Health and Safety Act, 1993, SS 1993, c O-1.1	"employer"
Yukon	Occupational Health and Safety Act, RSY 2002, c 159	"constructor"

and shall assume all of the corresponding responsibilities as set out in the applicable OHSA and its regulations. The foregoing shall apply notwithstanding that the Contractor is referred to as “Contractor” in this and other related documents.

- 1.9.2. The Contractor agrees that any costs, damages or fines that may be assessed against, or incurred by, the Owner by reason of breach or breaches of the OHSA by the Contractor or any of its sub-contractors will entitle the Owner to set-off the costs, damages or fines so assessed against any monies that the Owner may from time to time owe the Contractor under this Agreement or any other contract or arrangement whatsoever.
- 1.9.3. The Contractor shall be solely responsible for safety on the site and for compliance with the rules, regulations and practices required by the applicable health and safety legislation, and shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Services.
- 1.9.4. By agreeing to maintain the Elevators in accordance with the terms and conditions of this Agreement, the Contractor hereby acknowledges that it has, in its employment, duly trained, competent and qualified mechanics, who are knowledgeable and experienced in all aspects of risk assessment and planning and otherwise in the performance of the Services.
- 1.9.5. The Contractor shall supervise its mechanics to ensure that all Services, including without limitation, inspections, testing and major work are performed in accordance with the Ministry of Labour's rules, regulations and practices. The Contractor shall routinely perform an evaluation of risk related to specific tasks and moving equipment.
- 1.9.6. The Contractor shall take all proper and reasonable steps and precautions in order to avoid hazardous situations, and shall train its employees and other personnel to work safely and in accordance with an established safety program.
- 1.9.7. The Contractor shall not, in any circumstance, use machine beams or structural components without identifying the proper loading capability of the structure.

1.10. Lien Claims

- 1.10.1. In the event that a claim for lien is registered against title to the Property for which the Owner may become liable, and the registration of which claim for lien results





from any action or failure to act on the part of the Contractor, or any party for whom the Contractor is responsible in law, the Owner shall have the right to retain, out of any Fee or Monthly instalment then due, or, thereafter to become due, an amount reasonable and sufficient to completely satisfy such claim, including, without limitation, the Owner's legal expenses and costs related to such satisfaction.

1.10.2. In the event that the Fee has been completely paid to the Contractor, prior to the time at which such claim for lien arises, the Contractor shall pay to the Owner an amount reasonable and sufficient to completely satisfy such claim, including, without limitation, the Owner's damages, losses, legal expenses and costs.

1.11. Indemnity and Liability

1.11.1. The Contractor shall indemnify and hold harmless the Owner from and against all claims, demands, losses, costs, damages, actions, suits or proceedings whether in respect to losses suffered by the Owner or in respect of claims by third parties that arise out of or are attributable in any respect to the Contractor's provision of Services, what are caused by the Contractor's wrongful act, negligence or neglect or the wrongful act, negligence or neglect of anyone for whom the Contractor is responsible in law.

1.11.2. In the event that any damage is sustained to the Property by virtue of the negligent performance of the Services by the Contractor, its agents or employees, the Contractor shall, forthwith, reimburse the Owner for such damage and, shall, forthwith, restore the Property to the Owner's satisfaction.

1.11.3. Under no circumstances shall either party be liable for any damage or delay where the cause was beyond either party's reasonable control, including, but not limited to, acts of government, material and labour shortage, strikes, lockouts, labour disputes, accidents, building fire or explosion, theft, weather damage, flood, earthquake, riot, civil commotion, acts of the public enemy, war, mischief or act of God (separately and collectively "Acts of Force Majeur").

1.11.4. Without limiting the generality of the foregoing, Despite Acts of Force Majeur, the Contractor shall continue to perform the Services to the extent possible, with a view to minimizing any inconvenience to the public and the Owner.

1.11.5. The Elevator and all related equipment shall, at all times, remain the property of the Owner and the Contractor shall not assume control, possession or management of any part thereof other than in the course of the rightful performance of the Services.

1.11.6. The Contractor shall have the right to remove any part of the Elevator's equipment for the sole purpose of repairing such equipment, at its own expense.

1.11.7. The Owner agrees to provide the Contractor with unrestricted, ready and safe access to all areas of the Building where any part of the Elevator are located and to keep all machine rooms and pit areas free from water, stored materials and excessive debris within Owner's control or knowledge.



1.12. Sale of Building

1.12.1. The Owner shall not be liable to the Contractor, or to any other party, in respect of any obligations arising hereunder in the event of the sale of a Building.

1.13. Assignment

1.13.1. Neither party to this Agreement shall assign the Agreement or a portion thereof without the written consent of the other, which consent shall not be unreasonably withheld.

1.13.2. This Agreement shall enure to the benefit and be binding upon the parties hereto, their respective successors, executors, and administrators and permitted assigns.

1.14. Law of the Agreement

1.14.1. The validity and interpretation of this Agreement shall be governed by the laws of the Province of Ontario.

1.15. Rights and Remedies

1.15.1. No action or failure to act by the Owner shall constitute a waiver of any right or duty herein, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach hereunder, except as may be specifically agreed in writing by the parties hereto.

1.16. Warranty

1.16.1. The Contractor shall guarantee the materials and workmanship of any installation required for the performance of the Services. The warranty is limited to the repair or replacement, at the Contractor's discretion, of defective materials and the correction of defective workmanship for defects that are reported to the Contractor during the term of this Agreement or within a period of 90 days following the termination or expiry of this Agreement. This warranty excludes damages due to external causes such as fire, water and weather, improper use, misuse, neglect, or work by others, except where such damages are directly related to the Contractor's provision of the Services.

1.17. Entire Agreement and Revisions

1.17.1. This Agreement, Schedule A, Schedule B and Schedule C form the entire agreement between the Parties on the subjects herein and must be read together.

1.17.2. This Agreement supersedes all prior negotiations, representations, warranties, arrangements, understandings or agreements, either written or oral, relating in any manner to the Services.

1.17.3. No change or modification of this Agreement shall be valid unless made in writing and signed by the Contractor and the Owner.



1.18. Notices

1.18.1. All notices and other communications shall be in writing and shall be personally delivered to an officer or other authorized representative of the other party, or sent by facsimile or by courier, charges prepaid, as follows:

If to the Owner:

Name: _____

Address: _____

Facsimile: _____

Attention: _____

If to the Contractor:

Name: _____

Address: _____

Facsimile: _____

Attention: _____

1.18.2. Any communication which is personally delivered shall be deemed to have been validly and effectively given on the date of such delivery if such date is a business day and such delivery was made during normal business hours of the recipient; otherwise, it shall be deemed to have been validly and effectively given on the next business day.

1.18.3. Any communication which is transmitted by facsimile shall be deemed to have been validly and effectively given on the date of transmission if such date is a business day and such transmission was made during normal business hours of the recipient; otherwise, it shall be deemed to have been validly and effectively given on the next business day.

1.19. Force Majeure

1.19.1. Neither the Contractor nor the Owner shall be held liable or responsible for any failure to perform or any delay in performing any obligations under this Agreement if and to the extent that such failure or delay is the result of any event beyond the reasonable control of such party, including, but not limited to, acts of government, civil commotion, malicious mischief, flood, fire, public emergency, revolution, insurrection, riot, war or act of God.

1.20. Dispute Resolution

1.20.1. The parties shall first attempt to resolve any dispute, claim or issue arising under this Agreement (a “Dispute”) by a full exchange of information concerning the basis of the Dispute and discussion to resolve the Dispute. Thereafter, the parties shall resolve the Dispute through a two steps dispute resolution process administered in the major city closest to where the Building is situated by an alternative dispute resolution services provider (the “Resolution Services Provider”). Notwithstanding the foregoing, the Owner may seek to resolve dispute relating to preserving or protecting Owner’s proprietary rights, or for extraordinary relief such as injunction or eviction, in accordance with any available course of remedy.





- 1.20.2. The parties shall first attempt to settle the Dispute by participating in at least ten (10) hours of mediation at the offices of the Resolution Services Provider. The complaining party must notify the other party that a Dispute exists and then contact the Resolution Services Provider to schedule the mediation conference. The mediator will then be selected in accordance with the rules of the Resolution Services Provider, but the mediator must not have any real or apparent conflict of interest. The mediation will be a nonbinding conference between the parties conducted in accordance with the applicable rules and procedures of the Resolution Services Provider. Neither party may initiate arbitration proceedings until the mediation is complete. Any mediation will be considered complete:
1. if the parties enter into an agreement to resolve the Dispute;
 2. with respect to the party submitting the Dispute to mediation, if the other party fails to appear at or participate in a reasonably scheduled mediation conference; or
 3. if the Dispute is not resolved within five (5) days after the mediation is completed.
- 1.20.3. If any Dispute remains between the parties five (5) days after the mediation is complete, the parties shall submit the Dispute to final and binding arbitration (without appeal or review) in the Designated City administered by the Resolution Services Provider under its then current rules. The arbitrator must not have any real or apparent conflict of interest.
- 1.20.4. Arbitration must be initiated within one (1) year from the date on which the Dispute giving rise to the arbitration arose, and any party who fails to commence an arbitration within such one year period shall be deemed to have waived any of its affirmative rights and claims in connection with the Dispute and shall be barred from asserting such rights and claims at any time thereafter. Arbitration shall be deemed commenced by a party when the party sends a notice to the Resolution Services Provider, with a copy of the notice to the other party, identifying the Dispute and requesting arbitration. The arbitrator shall provide a reasoned opinion supporting his decision.
- 1.20.5. The parties agree to share equally the costs, including fees, of any mediator or arbitrator (referred to in this section as a “neutral”) selected or appointed under this section. As soon as practicable after selection of the neutral, the neutral or the neutral’s designated representative shall determine a reasonable estimate of the neutral’s anticipated fees and costs, and send a statement to each party setting forth that party’s equal share of the fees and costs. Each party shall, within ten (10) days after receipt of the statement, deposit the required sum with the neutral.
- 1.20.6. The venue of any mediation or arbitration shall be in the Designated City, unless otherwise mutually agreed by the parties.



1.20.7. The prevailing party in any arbitration shall be entitled to costs, and expenses relating to the arbitration, including reasonable legal fees, expenses, and disbursements, and fees, costs, and expenses relating to any mediation that did not result in a settlement and that pertains to the same issue decided under arbitration.

1.20.8. The provisions of this Section shall survive the expiration or earlier termination of this Agreement for any reason, regardless of whether a Dispute arises before or after termination of this Agreement, and regardless of whether the related arbitration proceedings occur before or after termination of this Agreement. If any part of this Section is held to be unenforceable, it shall be severed and shall not affect either the duties to mediate or arbitrate or any other part of this Section.

1.21. Venue, Jurisdiction, and Jury Waiver

1.21.1. The venue of any judicial proceedings shall be in the Designated City, unless otherwise agreed by the parties. Each party irrevocably submits to the exclusive jurisdiction of the federal and Ontario provincial courts located in the Designated City, as the case may be, unless otherwise agreed by the parties. Each party waives to the fullest extent permitted by law, trial by jury of all disputes arising out of or relating to this Agreement.

1.22. Legal Fees

1.22.1. If legal action, including an alternative dispute resolution process, is necessary by either party to enforce or interpret this Agreement or resolve a Dispute arising hereunder, the prevailing party shall be entitled to recover reasonable legal fees and costs, including fees and costs on any appeal.



Elevator and Escalator Maintenance Obligation Details

2.1. Standards of Care

2.1.1. The Contractor shall maintain all of the Elevators in the Building(s) to the latest Code Section 8.6 including all pertinent and required schedules and timing as required under the Code. In addition to the foregoing, the Contractor shall comply with the latest additions and revisions of the Municipal, Provincial, Federal and any other requirements as amended and noted by the authority having jurisdiction, which shall constitute the minimum standard of the Services to be provided by the Contractor (the "Standard"):

Province	Governing Statute	Governing Regulation(s)	Applicable Industry Codes/Standards
Alberta	Safety Codes Act, RSA 2000, c S-1	Elevating Devices Codes Regulation, Alta Reg 62/2009 Elevating Devices, Passenger Ropeways and Amusement Rides Permit Regulation, Alta Reg 286/2002)	<ul style="list-style-type: none"> • CAN/CSA-B355-00 Lifts for Persons with Physical Disabilities, including CAN/CSA s1-02 Supplement No. 1 • CAN/CSA-Z185-M87 (R2001) Safety Code for Personnel Hoists • CAN/CSA-B311-02 Safety Code for Manlifts • ASME A17.1-2007/CSA B44-07 Safety Code for Elevators and Escalators
British Columbia	Safety Standards Act, SBC 2003, c 39	Elevating Devices Safety Regulation, BC Reg 101/2004	<ul style="list-style-type: none"> • ASME A17.1-2007/CSA B44-07 • CSA Standard CAN/CSA-B311-02 with Update No. 1 of June 2003 • CSA International CAN/CSA B355-00 with Update No. 2 of March 2002, B355S1-02 Supplement No. 1 of September 2002, and Update No. 3 of October 2003 • National Standard of Canada CAN/CSA Z98-07 with Update No. 1 of February 2010 • National Standard of Canada CAN/CSA Z185-M87 (R2001) • CSA International Z267-00 • ASME A17.7-2007/CSA B44.7-07 • CSA Standard B44.2-07 • ANSI A10.22-1990 (R1998)



Manitoba	The Elevator Act, CCSM c E60	Elevator Regulation, Man Reg 97/87 R	<ul style="list-style-type: none"> • Canadian Standards Association B44 Safety Code for Elevators, Dumbwaiters, and Escalators • Canadian Standards Association Z185, Safety Code for Workmen's Hoists • Canadian Standards Association, CAN3-B355-M81, Safety Code for Elevating Devices for the Handicapped • National Standards of Canada, CAN3-Z98-N78, Passenger Ropeways
New Brunswick	Elevators and Lifts Act, RSNB 1973, c E-6	Safety Code for Elevating Devices and Amusement Devices, NB Reg 84-181	<ul style="list-style-type: none"> • CSA Standard ASME A17.1-2007/CSA-B44-07, Safety Code for Elevators and Escalators • ASME A17.1a-2008/CSA-B44a-08, Addenda to CSA Standard ASME A17.1-2007/CSA-B44-07, • CSA Standard ASME A17.7-2007/CSA-B44.7-07, Performance-based safety code for elevators and escalators • CSA Standard CAN/CSA-Z256-M87 (Reaffirmed 2001), Safety Code for Material Hoists, • CSA Standard CAN/CSA-Z185-M87 (Reaffirmed 2001), Safety Code for Personnel Hoists, • CSA Standard Z98-07, Passenger ropeways and passenger conveyors, • CSA Standard CAN/CSA-B311-02, Safety Code for Manlifts, • CSA Standard CAN/CSA-B355-00, Lifts for Persons with Physical Disabilities, and CSA Standard B355S1-02, Supplement No. 1 to CAN/CSA-B355-00
Newfoundland & Labrador	Public Safety Act, SNL 1996, c P-41.01	Amusement Rides and Elevating Devices Regulations, NLR 118/96	<ul style="list-style-type: none"> • ASME A17.1/ CSA B44 - Safety Code for Elevators and Escalators • CSA Standard B44.2 - Maintenance Requirements and Intervals for Elevators, Dumbwaiters, Escalators and Moving Walks • CAN/ CSA B311 - Safety Code for Manlifts • CAN/ CSA B355 - Lifts for Persons with Physical Disabilities • CAN/ CSA Z98 - Passenger Ropeways and Passenger Conveyors





Nova Scotia			<ul style="list-style-type: none"> • CAN/ CSA Z185 - Safety Code for Personnel Hoists • CAN/ CSA Z256 - Safety Code for Material Hoists
	Elevators and Lifts Act, SNS 2002, c 4	Elevators and Lifts General Regulations, NS Reg 46/2003	<ul style="list-style-type: none"> • CSA Standard B44, Safety Code for Elevators • CSA Standard Z185, Safety Code for Personnel Hoists • CSA Standard Z256, Safety Code for Material Hoists • CSA Standard B311, Safety Code for Manlifts • CSA Standard B355, Safety Code for Lifts for Persons with Physical Disabilities • CSA Standard Z98, Passenger Ropeways • CSA Standard B613, Private Residence Lifts for Persons with Physical Disabilities • CSA Standard B44.1, Elevators and Escalators Electrical Equipment • ASME standard A17.2, “Guide for Inspection of Elevators, Escalators and Moving Walkways” • ASME standard QEI-1-2004, “Standard for Qualification of Elevator Inspectors”
Ontario	Technical Standards and Safety Act, 2000, SO 2000, c 16	Elevating Devices, O Reg 209/01 Codes and Standards Adopted by Reference, O Reg 223/01	<ul style="list-style-type: none"> • Any applicable director’s order • Elevating Devices Code Adoption Document as amended, published by the TSSA • ASME A17.1-2007/CSA B44-07 Safety Code for Elevators and Escalators • CSA Standard B44.2-07 Maintenance requirements and intervals for elevators, dumbwaiters, escalators, and moving walks
Prince Edward Island	Elevators and Lifts Act, RSPEI 1988, c E-5	General Regulations, PEI Reg EC469/71	<ul style="list-style-type: none"> • CSA Standard CAN/CSA-B44-07 Safety Code for Elevators and Escalators • CSA Standard CAN/CSA-Z98-07 Passenger Ropeways • CSA Standard B-355-00 Lifts for Persons With Physical Disabilities • CSA Standard Appendix J, B44-04





Quebec	Building Act, R.S.Q., chapter B-1.1	Construction Code, 2000 GOQ 2, 4203 and 4437 Safety Code, 2002 GOQ 2, 4654	<ul style="list-style-type: none"> • CSA Standard CAN/CSA-Z271-98 • “Code de sécurité sur les ascenseurs et monte-charge, CAN/CSA B44-00”, including the updates of June, November and December 2003 • “CSA Standard CAN/CSA B44-00: Safety Code for Elevators” including the updates of September 2002, May and December 2003 • “Appareils élévateurs pour personnes handicapées, CAN/CSA B355-00” including the amendments of “B355S1-02 Supplément no 1 à CAN/CSA B355-00 Appareils élévateurs pour personnes handicapées” and the updates of March 2002 and October 2003 • “CSA Standard CAN/CSA B355-00: Lifts for Persons with Physical Disabilities”, including the amendments of “B355S1-02 Supplement No. 1 to CAN/CSA-B355-00, Lifts for Persons with Physical Disabilities” and the updates of March 2002 and October 2003 • “Appareils élévateurs d’habitation pour personnes handicapées, CAN/CSA B613-00”, including the update of January 2002 • “CSA Standard CAN/CSA B613-00: Private Residence Lifts for Persons with Physical Disabilities”, including the update of January 2002
Saskatchewan	Passenger and Freight Elevator Act, RSS 1978, c P-4	Passenger and Freight Elevator Regulations, 2003, RRS c P-4 Reg 2	<ul style="list-style-type: none"> • Canadian Standards Association standard B44-00 Safety Code for Elevators, including Update No.1 B44-00 September 2002 • Canadian Standards Association standard CAN/CSA Z185-M87 Safety Code for Personnel Hoists • Canadian Standards Association standard B311-02 Safety Code for Manlifts • Canadian Standards Association standard Z98-01 Passenger Ropeways, including Z98S1-02 Supplement No. 1 to CAN/CSA-Z98-01, Passenger Ropeways, December 2002 • Canadian Standards Association standard B355-00 Lifts for Persons with Physical Disabilities, including B355S1-02 Supplement No. 1 to CAN/CSA-B355-00, Lifts for Persons





- 2.1.2. The Contractor shall maintain the Elevators with a view to minimizing wear and tear on the equipment and minimizing the shut-down time and frequency of breakdowns.
- 2.1.3. The Contractor shall comply with the requirements of the Agreement and schedules, including, without limitation, Schedule C and shall perform all the applicable tasks faithfully and with requisite skill and diligence.
- 2.1.4. In order to facilitate these objectives and the Services, the Contractor shall use only competent, trained and qualified persons, supervised by the Contractor's own competent and qualified supervisors and management, fully familiar with the latest Code and Standards, applicable federal, provincial/state and local codes, Health and Safety Regulations and Workplace Hazardous Materials Information System ("WHMIS") requirements as well as the existing elevator equipment in the Buildings, as manufactured, modernized and designed, directly employed and under their supervision, as per the Standards.
- 2.1.5. The Contractor hereby acknowledges having examined the Elevators and hereby represents and warrants:
 - 1. that it is capable of maintaining, adjusting, repairing and servicing the Elevators; and
 - 2. that it has access to all parts, schematics, manuals and instructions necessary to maintain the Elevators to original performance and industry standards for the duration of this Agreement.
- 2.1.6. The Contractor shall, at all times, maintain the Elevators in good, reliable, smooth, quiet, efficient and safe working order and shall use barricades and all possible means to protect passengers or personnel from accidental use or tripping or any other hazard to life or limb.
- 2.1.7. The Contractor's employees and agents shall make all reasonable efforts to keep the Elevators in good, smooth, quiet and safe operating condition and shall report any defect which they cannot remedy within twenty-four (24) hours to the Supervisor, whereupon the Supervisor shall dispatch an adjustor/trouble shooter or a service crew on the next working day to correct such defect.
- 2.1.8. If an Elevator cannot be returned to service within twenty-four (24) hours, the Property Manager shall be notified immediately as to when such Elevator will be returned to service and what steps have been taken to avoid a recurrence of the defect in question.
- 2.1.9. The Contractor shall maintain the original speed and performance times of the Elevators to reasonable expectations and, in any event, to within maximum five per cent (5%) variance of original design and installation parameters, including



acceleration and deceleration and door opening and closing, having regard to the type of equipment and to its configuration, and shall perform all necessary adjustments as required to maintain such performances within the limits of the Standard.

- 2.1.10. The Contractor shall check and verify all changes to the control, wiring or equipment to assure safe operation at all times, and maintain the levelling within the original capability and Code and Standards requirements of the Elevators.

2.2. Inclusions

- 2.2.1. Except for the exclusions described below, the Contractor shall, at least once per month, examine, clean, maintain, lubricate and, if necessitated by normal wear and tear, repair or replace all electrical and mechanical components required for the safe, quiet and reliable operation of the Elevators, and within normal conditions keep the elevating devices operating in a safe manner in full Code and Standard conformity, including without limitation, the following:

1. Elevators:

- (a) Machines, worms, gears, shafts, thrusts, sheaves, motors, generators, armatures, rotors, commutators, windings, coils, carbon brushes, brush holders assemblies, AC or DC drive units, SCR solid state drives, tacks, brakes, brake shoes and linings, coils, linkages, governors, idlers, compensating sheaves or chain systems, controllers and dispatchers, relays, resistors, capacitors, EPROMS, ELITE PIs, microprocessors, printed circuit boards, sockets, transistors, integrated circuit modules, filters, contactors, fuses, overloads, power units, static units, phase protection mechanisms, selectors, steppers, contacts, brushes, all ropes and cables including hoist cables, governor cables, travelling cables, safety/tiller rope and selector cables or tapes, tape-heads, hall and car door hardware and switches, rollers, gibs, bearings, shafts, pulleys, chains, linkage arms, eccentrics, retainers, door operators, infrared detectors, mechanical safety edges, telephones or other elevator communication systems, battery powered emergency lighting, photo-eyes, clutches, hoistway, cab sills, limit and safety switches, car and hall push buttons and lights, indicators and lights, car top inspection stations, car slings, platforms, stabilizer systems, safety planks, LCD screens, computer systems, peripheral devices, load weighing systems, compensating chains and cables, buffers, counter-weights, top of car maintenance stations including lights, batteries, slippers or rollers, cylinders, pistons, heads, piping, couplers, hydraulic valve units, pumps, tanks, solenoids, Victaulic couplings, mufflers, gate valves, shackles, Crosbies, babbitts, babitted bearings or shackles, wedges, oil coolers, and all bearings.

2. Escalators:



- (a) To include relevant parts as noted in the above list in Section 2.2.2 as well as, without limitation, escalator specific parts like sprockets, bull-gears, travelling cable, wiring, handrails, all switches, demarcation lighting, brushes, floor plates, step chains, tension carriage, tracks, planetary gears, transmissions, guides, brakes, steps, oilers, combplates, decking, skirts, all escalator rollers, balustrades, flywheels and drive shafts.
- (b) All work noted in this Agreement related to Elevators shall extend to escalators where applicable. Escalator tests (slide test, load testing for braking distance where recommended by the Contractor or required by the governing authority, access to truss for smoke detector testing, and other such tests) shall be performed by Contractor for Escalators as for Elevators.

2.2.2. To minimize the possibility of an escalator accident, the Contractor shall:

1. Maintain the minimum possible Code/Standard clearances between the steps;
2. Ensure that the step chain tension is properly set;
3. Constantly lubricate the skirts with anti-resistive compounds to ensure low friction and test the escalator skirts to determine the step/skirt performance index;
4. Maintain the proper clearances between the step and the decking;
5. Ensure that the steps and the combplates are properly aligned;
6. Check the condition of the handrails and the clearances thereof.
7. Maintain the proper clearance and tension on the chain as not to damage the skirts and reduce the coefficient of friction index required by the Code/Standards including, without limitation, Section 8.6; and
8. Provide the site with regular interval of training to fill out the “Escalator / Moving Walk Daily Start-Up Log” and the daily start-up procedure.

2.2.3. General:

1. In addition, the Contractor shall keep the controllers clean and the wiring neat when replacing relays, diodes, resistors, static units or rectifiers.
2. All components shall be properly and securely mounted and the designations permanently marked.
3. All replacement parts of a different manufacture and or machined parts shall be properly adapted and when components are modified or modernized all redundant material and wiring removed and schematics up-dated to reflect changes.
4. All hall and car indicator lights, if not working, shall be checked and replaced monthly as part of the regular maintenance schedule. The Contractor shall clean



the machine rooms and pits whenever required and the hoistways at least once every year.

5. Overflow oil, grease and dirt in the pits shall be disposed of in accordance with all applicable safety regulations and environmental standards.
6. The elevator machine room shall be maintained in a clean and tidy condition and the floor and walls shall be painted if soiled by the ropes as required with high quality floor paint.
7. Any water problems or other building items in the hoistway, machine rooms or pits shall be reported to the Property Manager in writing.
8. Any test to ensure that the elevator equipment is safe or to determine if the components are safe, such as full load test, cylinder leakage test (with or without weights), brake test under load, or other tests deemed necessary by the Contractor.

2.3. Exclusions

- 2.3.1. The Contractor shall not be responsible for the repair to any structural elements of the Buildings, hoistway, pit or machine room, architectural finishes, pit drainage, hall doors, hall sills and frames, car doors and car cabs, floors and floor tiles, cab lights, pit and machine room lights (except for changing light bulbs), machine room heating and ventilation systems, trusses, main disconnect switches and fuses or circuit breakers, emergency transfer switches, telephone line and signal, signal contacts for the fire department service and emergency power, hydraulic buried cylinders and buried piping.
- 2.3.2. This Agreement shall not include:
 1. performance by the Contractor of any additional tests not listed in this Agreement or its Schedules or in the Code or Standards as amended from time to time;
 2. replacement of misused, abused or vandalized parts or components;
 3. installation of new additional parts or components; or
 4. compliance with directives or recommendations of insurance companies involving work which is not specified in this Agreement.
- 2.3.3. In addition, the Contractor shall not be required to install new attachments on the Elevators or parts different from those now constituting the equipment, except as direct replacements of existing components and as per this Agreement.
- 2.3.4. The Contractor shall be responsible for re-inspection costs levied by the governing authorities for deficiencies noted in their report. The re-inspection fees shall be deducted from the Fee.



2.4. Lubricants

2.4.1. The following manufacturer's approved lubricants shall be provided by the Contractor in the performance of the Services:

1. Gear oil (to be changed once a year), bearing oil or grease, hoist rope dressing (to be applied sparingly when needed), buffer oil (checked annually), dashpot oil, any door track and roller lubricants, rail oil, hydraulic oil (to be kept, cleaned and filtered, as needed) and all general lubricants.
2. Removal and disposal of oil, solvents and grease or similar substances shall be in accordance with the Standards, all applicable safety regulations and environmental standards and Workplace Hazardous Materials Information System (WHIMS).

2.5. Parts

2.5.1. The Contractor shall be responsible to ensure availability and have in constant supply frequently used and equipment-specific spare parts, lubricants and cleaning materials.

2.5.2. All other parts for the equipment shall be readily available from a central parts depot or available from manufacturers within thirty-six (36) hours, or otherwise shall be kept in constant supply of the Contractor.

1. Where the Contractor demonstrates an inability to provide replacement parts within 24 hours, the contractor shall purchase and maintain an inventory of spare printed circuits boards, encoders, brake pads, rollers, chains, sprockets, fuses, relays, transformers, valves, coils, contactors, locks, contacts, guide shoes, guide rollers, landing switches, limit switches, contact blocks, brake coil, packing, Victaulic seals, gaskets, sensors and small motors on site.
2. Section 2.5.2.1 does not apply to parts related to escalator step chains, elevator or escalator motors, drives, handrails, cylinders, pistons, bull gear, drives or other major components that cannot be handled by a single mechanic capable of lifting thirty (30) pounds.

2.5.3. Light bulbs for indicators and push buttons shall be stored on site at the Building.

2.5.4. All replacement parts shall be original and genuine manufacturer's parts or, if not genuine manufacturer's parts, approved alternatives (as approved by Manager or Elevator Consultant) which shall be designed to work with the existing circuitry, control and machinery, and not, in any event, be of a lesser quality.

2.5.5. Damaged or replaced parts, old oil, liquids and grease are to be removed from the Building and properly disposed of off-site in accordance with all applicable safety regulations and environmental standards.

2.5.6. All flammable liquids, rags and oils shall be stored in approved containers and all Safety Rules and WHIMS Regulations adhered to.



2.6. Obsolescence

- 2.6.1. The Contractor accepts the age of the Elevators and related equipment in the Building at the time of signing the Agreement and agrees to maintain these Elevators for the term, without the necessity to modernize due to obsolescence, except as per written exceptions attached to the Agreement at Schedule B.
- 2.6.2. Should any equipment or part thereof become obsolete, such equipment or part thereof shall be replaced if damaged, excessively worn or broken, due to normal use and while properly and preventively maintained, provided the Manager's express written authorization has first been received. The foregoing is applicable only if replacement parts are not available or cannot be manufactured or machined by any of the common supply and parts dealers or machine shops.
- 2.6.3. This section 2.6.3 excludes printed circuit boards, motor drives, relays, LCD screens, contactors and infrared detectors where replacement parts are readily available or interchangeable.
- 2.6.4. Payment to Contractor for the material portion of the new and different part, in excess of the old original part's value, shall be the responsibility of the Owner. The Owner shall pay the actual invoice value of the new part less estimated value of the old part if it were to be purchased from the OEM or supplier plus applicable tax and a twenty percent (20%) profit and handling.
- 2.6.5. Following the replacement of such part, it shall become part of the existing equipment and shall be maintained as per the terms of this Agreement.

2.7. Work Schedule and Hours

- 2.7.1. Unless otherwise requested by Owner, all maintenance and service work shall be performed during the Contractor's regular business hours from 7 a.m. to 5 p.m. on regular business days, Monday to Friday, excluding statutory holidays and International Union of Elevator Constructors (IUEC) declared holidays.
- 2.7.2. As a minimum, monthly maintenance visits and inspections as required by Code Section 8.6 shall be performed. The Contractor's own recommended schedule of maintenance shall become an additional part of this Agreement and shall be strictly adhered to and supervised by the Contractor. Additionally, the following periodic visits shall be applicable as follows:
 - 1. For sites that are five stories or less and containing no more than three Devices, one monthly site visit shall be required;
 - 2. For sites that are more than five stories but less than twelve stories and containing no more than seven Devices, two monthly site visits shall be required;
 - 3. For sites that are more than five stories but less than twelve stories and containing more than seven Devices, weekly site visits shall be required;



4. For sites that are more than twelve stories and containing no more than six Devices, two monthly site visits shall be required;
 5. For sites that are more than twelve stories and containing more than seven Devices, weekly site visits shall be required.
- 2.7.3. The Contractor shall provide a report every month, in an approved electronic format as described herein stating conformance to safety code and regulations and as required by the Owner, prepared by a supervisory person and submitted monthly:
1. The report shall be provided, in an electronic format, with relevant required data and monthly reports outlining the number of callbacks, mandated maintenance status, number of hours spent per unit, maintenance work description, major work requests and any other information as may be required by or for the Owner from time to time during the Term of this Agreement. The monthly reports shall be submitted by the Contractor's server automatically.
 2. The Contractor will be required to login to a web based system and either upload data manually or transfer data electronically using standard web interface methods (XML, FTP, etc...) to the Consultant's database system. The Contractor will also be required to update the status of government and Consultant directive work entered on the system by others.
 3. Failure to provide such reports and database interface with the Consultant is grounds for Agreement termination by the Owner on thirty (30) days' written notice to the Contractor.
 4. The Contractor shall demonstrate that it is capable of performing this interface prior to the commencement of the agreement and or Fee payment.
 5. Processing of the data upload shall be performed every two weeks and shall not be later than seven (7) calendar days from the due date.
- 2.7.4. Twenty-four (24) hour Emergency Service and Minor Repairs or Adjustments, seven (7) days a week, shall be included in the Fee for calls placed by the Manager, its agents or employees to the Contractor's twenty-four (24) hour phone service.
1. Emergency Service is defined as team work related to a reportable incident (under any Standard), passenger injury, no elevators in the building or other comparable incidents caused by factors other than act of God or vandalism; and
 2. Minor Repairs or Adjustments are defined as callbacks which require no more than one mechanic to cure.
- 2.7.5. Calls for "trapped persons" shall be answered within forty-five (45) minutes (under normal traffic conditions) from the time the call is received by the Contractor's service, and the Elevators shall be put in working order at that time. Calls for non-trapped persons shall be answered within two (2) hours unless the Manager is notified of the delay.



- 2.7.6. All other repairs unless noted in “Schedule A” shall be performed during regular working hours. The Contractor agrees to cover all calls, including, calls that are minor and related to malfunctioning buttons.
- 2.7.7. All vandalism related work is charged at the prevailing rate as negotiated between the parties, and the Contractor agrees to show the damages to the Owner.
- 2.7.8. If work other than Emergency Service and Minor Repairs or Adjustments is requested by the Manager to be performed outside the Contractor's regular working hours on Elevators noted in the “Importance Level” as “Regular” in Schedule A, the Owner agrees to pay the difference between regular and overtime rates at the Contractor's prevailing billing rates.
- 2.7.9. If work other than Emergency Service and Minor Repairs or Adjustments is requested by the Manager to be performed outside the Contractor's regular working hours on Elevators noted in the “Importance Level” as “Critical” in Schedule A, the Contractor agrees to perform the work at no additional charges. Where the elevators are noted as “Important” in Schedule A, the Contractor agrees to perform all major work non-stop (regular time and overtime until the unit is returned to service) at no additional charges.
- 2.7.10. Where the Contractor is required:
 1. To remove an additional Device for Safety reasons (i.e. shutting down an operating device) to replace major component or perform maintenance work on the adjacent Device;
 2. To perform disruptive work to the common area or elevator lobby;
 3. To perform noisy work (20 dBA above ambient noise); or
 4. To perform work which involves welding or smoke
 5. The work shall be performed during Building off hours (this can include weekends or other time acceptable to the Owner).
- 2.7.11. The Contractor shall inform the Manager and receive permission prior to removing any elevating device from service.

2.8. Minimum Monthly Labour

- 2.8.1. The Contractor will provide minimum monthly labour for maintenance of the equipment as follows:
 1. For the gearless elevators: 6 man-hours per elevator.
 2. For the geared elevators: 4 man-hours per elevator.
 3. For the hydraulic elevators: 2 man-hours per elevator.
 4. For the escalators: 4 man-hours per escalator.



- 2.8.2. The above noted hours cannot include major work performed by a service team initiated as part of a preventative maintenance program.
- 2.8.3. The above noted hours cannot include callbacks or minor repairs converted to maintenance hours (i.e. maintenance hours performed as part of a callback). Where callbacks coincide with the maintenance work a minimum of two (2) hours shall be deducted from the maintenance hours for the callback.
- 2.8.4. Major hours spent on mandated maintenance such as annual inspections and testing shall contribute to the minimum monthly labour and can be considered as topped up hours.
- 2.8.5. Travelling time shall not count as part of the hourly fulfilment.
- 2.8.6. On an annual basis, two weeks following the anniversary date of the Agreement, the Contractor shall provide to the Owner a detailed inventory of hours printed directly from the database and not manipulated or adjusted by human intervention. For contractual hours shorted, the Owner shall be compensated \$150 per hour for every hour not provided contractually from the Agreement amount. Failure to provide the breakdown of hours will result in suspension of Fees by the Owner until this requirement is met.

2.9. Responsibilities, Reporting, Standards

- 2.9.1. The Contractor shall render the Services and shall respond to all calls from the Owner for any conditions that require adjustments or repair.
- 2.9.2. However, it shall be the responsibility of the Owner to notify the Contractor of any observations of poor levelling of cars at landings, erratic operation of car doors, hall doors, door safety edges or infra-red screens, erratic or excessively noisy operation or any other readily apparent situation deemed to be potentially dangerous or unsafe, and the Owner shall immediately remove the Elevator from public use until such time as the Contractor's representative arrives to perform the Services.
- 2.9.3. The Contractor shall not assume the management or control of the Elevators and shall not be held responsible for any of the above conditions when not working in, on or about the Elevator, or for any situation which would not reasonably be revealed by the inspections required to be performed hereunder.
- 2.9.4. The Contractor agrees to inspect the Elevators for Code and Standard compliance and shall report in writing to the Owner any and all noted deficiencies, report forthwith any accidents, incidents or unsafe conditions to the Manager, in writing, as well as to authorities having jurisdiction and/or Elevating Devices Regulators.
- 2.9.5. The Contractor will not be responsible for any inspection reports performed by the local governing authority or Consultants reports prior to commencement of the Agreement Term, but will perform all required Services hereunder in a diligent and timely manner.



- 2.9.6. The Contractor shall check in with the Building Manager, or where available, with the security office. Parking is the responsibility of the Contractor.
- 2.9.7. Upon entering or leaving the Building, the Contractor must report to the security office and sign in/out of the 'elevator log book', including arrival/departure time. In all cases, Elevator mechanics are expected to arrive in proper uniform. The Contractor will be required to wear badges while on site.
- 2.9.8. Where voluntary compliance is prescribed by the Standards to complete an inspection report, the Contractor is required to complete the report in the time provided and where additional time is required, the Contractor shall request reasonable extension periods. When completed, the Contractor shall submit the voluntary reporting of compliance.
- 2.9.9. The Contractor shall include in the Fee an allowance for a quarterly management meeting conducted by the Manager and its Consultant to discuss callbacks and issues related to the Elevator service.
- 2.9.10. The Contractor shall be responsible for reprogramming the phone(s) on the commencement date where requested by the Owner. The Contractor shall provide twenty-four (24) hour phone service.

2.10. Dispatching

- 2.10.1. The Contractor shall, not less than twice per year, or when dispatching is not functioning to its potential, intent or design, check the dispatch system and conduct necessary tests to determine that all circuits and timers are fully functional and that the basic dispatching is working properly.
- 2.10.2. All dispatching relays and circuits, timers, parking sequence and spacing systems, call answering and generator shut-down mechanisms shall be tested on an on-going basis.
- 2.10.3. Fire safety service and emergency power operation shall be tested quarterly with the key switches and simulated under actual emergency power supply and transfer.

2.11. Logbook and Tests

- 2.11.1. The Contractor shall fully comply with all applicable rules and regulations and in accordance with the Standard during the Term hereof. The Contractor's employees shall up-date the log sheet allocated to each Elevator on a monthly basis, and shall perform at a minimum all required tests as per the Code and Standard and state in the log requirements at the intervals required. If the Contractor does not provide a monthly report to the Owner, the Owner reserves the right to withhold from the Fee or Monthly Instalment the cost to engage the services of a third party elevator Consultant to ensure that the work is being performed on the elevating devices group in question to the Standard required.



- 2.11.2. If the tests are successful, the log book in the machine room shall be duly signed and dated for each individual test or task. The Contractor shall also be responsible for keeping copies of all log book entries, which entries shall be made available for inspection within forty-eight (48) hours of a request by regulating authorities or the Owner.
- 2.11.3. The Contractor shall test the fireman's service and emergency power at least once every 6 months and sign for this test as an additional item on the logbook. The Contractor shall provide at the request of the Manager, access to the elevator shaft to test the smoke detector and/or heat sensor at no additional cost to the Owner.
- 2.11.4. Should any test fail, the Contractor shall report the same to the Authorities and to the Owner, including the reason for the failure and remedies which have been taken to rectify the problem.
- 2.11.5. The Contractor's employees shall up-date the on-site log book on an on-going basis and shall submit a time sheet on every visit, clearly stating the times and the work performed.
- 2.11.6. Unscheduled maintenance, repairs and call-backs shall also be recorded in detail.

2.12. Wiring Diagrams and Changes

- 2.12.1. The Contractor warrants that it has access to, and will maintain, the wiring diagrams, keep them clean, properly stored, legible, up-dated, protected and corresponding to the Elevators and all the circuits at all times.
- 2.12.2. Any changes to the circuits are to be made only in accordance with all applicable Standards, safety codes and regulations, and all drawings respecting such changes shall be properly marked and the Owner notified in writing.
- 2.12.3. Where changes are performed to the elevator equipment, submit an Owner’s manual outlining the changes performed, revised ladder diagrams and applicable government submissions.
- 2.12.4. The safety circuits schematics shall be verified and permanently mounted on site in the machine room.

2.13. Equipment Performance Table

2.13.1. The Elevator equipment shall be maintained in a new, good and workmanlike manner, and to the following performance criteria unless otherwise stated in Schedule “A”. At any time the Owner can request proof of performance and the Contractor shall provide a table of performance based on the values below as no additional charge and within 5 (five) business day from the time of request.

Door Type	Door Open Time(sec.)	Door Close Time(sec.)	Operating * Time(sec.)
36" CO	1.3	2.3	7.3
42" CO	1.5	2.5	7.5
48" CO	1.7	2.7	7.7
36" 2SSO	2.2	3.5	8.9



42" 2SSO	2.4	3.7	9.1
48" 2SSO	2.6	3.9	9.3
36" SSSO	2.5	3.6	9.0
42" SSSO	2.7	3.8	9.2

Door Dwell	Times
Car call:	1.0 - 1.5 sec
Hall call:	2.5 - 3.5 sec

* - These operating times are for gearless equipment installed in 1981 or later. For geared equipment add 1.0 second. For equipment installed prior to 1981 add 0.5 second.

CO - centre opening.

2SSO - two speed side opening.

SSSO - single speed side opening.

- 2.13.2. Comply with the Owner's requirements for ride quality using an EVA-625 designed and built by Physical Measurement Technologies Inc. (PMT). Apply an ISO 1999 filter to "clean" the raw data:

Ride Quality	X-axis	Y-axis	Z-axis
Peak-Peak	10 mgs	10 mgs	10 mgs
A95	6 mgs	6 mgs	6 mgs

Component	Geared	Gearless
Acceleration	3.5 (f/s2) max	4.5 (f/s2) max
Jerk	7 (f/s3) max	9 (f/s3) max
Noise	62 (db)	

- 2.13.3. Comply with the ISO8041 standards which measure the human response to vibration. The following are the general measurement methodologies set by LMAA and adopted by Solucore:

1. Place instrument in centre of elevator, Microphone at 3.0 to 3.5 feet above the floor;
2. X-axis perpendicular to the guide rails or across from the door;
3. One operator in the elevator, maximum two persons;
4. Record full run from the lowest landing to the top floor;
5. Recording starts prior to car door(s) closing and ends after they are fully open; and
6. Ride quality measurements shall be reported to include: maximum peak-to-peak and typical vibration levels for each axis, sound levels, jerk, acceleration and velocity.





2.14. Accident Reporting

2.14.1. In the event of an injury to any person working on or using the equipment, the Contractor shall take whatever action is necessary and appropriate in the circumstances to aid the injured person, and to prevent further injury to others, then advise the Owner immediately giving a verbal report, then submit to the Owner within twelve (12) hours of the accident signed written reports from each of the maintenance personnel involved.

2.15. Discounts and Shutdowns

2.15.1. An "Occupancy Discount" shall apply to the "Monthly Instalments" herein. The Occupancy Discount shall apply to any Building where the occupancy of such Building falls within the following schedule:

Occupancy %	Discount %
0% - 25%	50%
26%-45%	30%
46%-60%	20%
61%-75%	10%
76%-100%	No Discount

2.15.2. The Owner shall notify the Contractor, in writing, in advance of the applicable month, to qualify for the "Occupancy Discount" until the occupancy exceeds 75%. The applicable Monthly Instalment shall be reduced by the applicable percentage.

2.15.3. Where the Occupancy Discount of 30% or more applies, the Owner agrees to shut down one elevator for the period covered under the discount. The Contractor agrees to rotate the elevating devices to ensure that the removal of the device does not impact its long-term performance and reliability.

2.15.4. A "Quantity Discount" shall apply to the Total Price in Schedule "B", based upon the number of elevating devices (units) being maintained simultaneously by the Contractor for any full month as per the following schedule. Percentage discounts shall be applied monthly for all individual buildings and shown separately on the monthly invoice.

Quantity	Discount %
0 to 65 units	No Discount
66 to 75 units	2%
76 to 95 units	3%
96 units and over	5%

2.15.5. Where "Quantity Discounts" apply, the effective dates for additions or deletions shall apply throughout any next full month period as determined by the status of the last day of the preceding month.

2.15.6. Where callbacks are excessive (callback ratio per building greater than 0.5), the





Owner reserves the right to request that an adjuster conduct testing and troubleshooting, on a monthly basis, until the callbacks reach an acceptable level.

2.15.7. If a device is shutdown or taken out of regular service, due to unscheduled equipment failure or malfunction and for more than seventy-two (72) continuous hours, the following applies:

1. The Contractor shall communicate the nature of the problem to the Consultant in writing and provide a proposed remedy with schedule for returning the Elevator back into service;
2. An escalating daily discount as described herein shall apply (noted in percentage of the total monthly Agreement value that shall be refunded), to a maximum of the total monthly Agreement value, if a malfunction continues beyond the 7th day from the time it was reported (provided that the delay is within the Contractor's direct control) as follows:

Day 8	Day 9	Day 10	Day 11	Day 12	Day 13	Day 14	Day 15	Day 16	Day 17
1/10	2/10	3/10	4/10	5/10	6/10	7/10	8/10	9/10	1

3. Where the device repair is not possible due to difficulties with proprietary elevator equipment, the Owner reserves the right to contact a third party to assist in the repairs at the Contractor's cost.

2.16. Charges for Additional Work Not Included In Agreement

2.16.1. The Contractor agrees that charges for vandalism, misuse, overtime callbacks or any other work not included in this Agreement, will be charged at the Contractor's regular billing rates less 10% unless the Owner negotiates different rates. The following hourly charge rates will apply:

Worker Classification	Straight Time	Premium Time	Time And Half	Double Time
Helper rate less 10%	_____	_____	_____	_____
Mechanic rate less 10%	_____	_____	_____	_____
Adjuster rate less 10%	_____	_____	_____	_____
Crew rate less 10%	_____	_____	_____	_____

2.16.2. Billing rates shall be inserted at the commencement date of this Agreement. These rates will be 90% of the Contractor's regular billing rates.

2.16.3. Straight time charges apply for work performed during the regular work week. Premium rates shall apply to all overtime work covered under the Agreement. The Owner pays the premium portion and the Contractor pays for the straight time portion. Overtime at time and ½ will be charged for all overtime work unless the work is considered to be a repair involving 2 employees of the Contractor, in which case double time charges will apply. Double time charges will also apply on Sundays and statutory holidays in the Province in which the Property is located. These rates may be adjusted when the monthly Fee is adjusted and they will not increase more than 2% at any adjustment date.



2.16.4. Time tickets detailing all additional work must accompany all invoices.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the date above written.

By

City of Toronto (the "Owner")

c/o: _____ (the "Manager")

Per: _____

Name: _____

Title: _____

By

_____ (the "Contractor")

Per: _____

Name: _____

Title: _____





**SCHEDULE "A" to ELEVATOR FULL INCLUSIVE PREVENTATIVE MAINTENANCE AGREEMENT
BUILDING IDENTIFICATION AND ELEVATOR/ESCALATOR GROUPINGS**

The Agreement applies to the Building located at:
95 Lavinia Avenue, Toronto, ON Canada

The following describes the importance level of each elevator grouping in the Building and the additional requirements relating to Services on each elevator grouping:

Elevator Grouping	Importance Level	Hour Of Operation
All	Regular	Normal working hours (7:00 am to 5:00 pm) unless 2 or more of the elevators in each elevator bank is out of service; then overtime maintenance work (crew or mechanic) is included in the maintenance Agreement for causes that are not related to vandalism, misuse or act of God.
	Important	Normal working hours (7:00 am to 5:00 pm) unless noted elevating device(s) is/are out of service; then overtime work is included in the maintenance Agreement for causes that are not related to vandalism, misuse or act of God.
	Critical	After hours only. All worked shall be performed at times acceptable to Owner and is likely between the hours of 8:00 pm and 6:00 am including statutory holidays and weekends. Elevator maintenance must be scheduled in advance.

The following exceptions to the Services described herein are agreed however, in the case of conflict between the terms of this Agreement and its Schedules and this Schedule A, the terms of this Schedule A shall prevail:





**SCHEDULE "B" to ELEVATOR FULL INCLUSIVE PREVENTATIVE MAINTENANCE CONTRACT
PAYMENT INSTALMENTS**

This Schedule "B" may be amended from time to time in accordance with the Agreement terms.

Warranty Maintenance – 12 months following substantial completion

Bank Name	Number of Devices	Monthly Installments	Tax
Passenger Elevator	1		

5 Year Maintenance – expiration of warranty until the end of the contract term

Bank Name	Number of Devices	Monthly Installments	Tax
Passenger Elevator	1		

Maintenance Specifications – Section 14900





SCHEDULE "C" to the ELEVATOR FULL INCLUSIVE PREVENTATIVE MAINTENANCE AGREEMENT FURTHER PARTICULARS OF SCHEDULED MAINTENANCE SERVICES

The Contractor shall, as part of the "Services" do the following at the intervals indicated:

- 3.1. Provide a logbook for the Building Manager for the purpose of noting all burnt light bulbs and fixtures as well as all minor issues for the purpose of assisting the elevator Contractor to pinpoint issues that otherwise would have to be logged as a callback. This logbook is meant to assist the Contractor in addressing ongoing deficiencies with respect to the fixtures in the building but is not meant to absolve the mechanic from inspecting and identifying elevator issues.
 - 3.1.1. The mechanic shall check in with the Building Manager at the start of each visit and discuss the planned maintenance for the day;
 - 3.1.2. The mechanic shall at the conclusion of each site visit check in with the Building Manager and provide a report on the completed tasks achieved during the day's visit; and
 - 3.1.3. The reports can be verbal but shall be provided in writing where requested by the Manager.
- 3.2. Provide a maintenance logbook (maintenance control program) specifically designed for each device (as per the Code and Standards) to be kept in a secure location. The location of the logbook shall be on site and shall be maintained relatively up-to-date irrespective of electronic logbooks. The device logbook shall be maintained for a period of seven years.

Monthly Checks

- 3.3. Review the deficiency logbook and ensure that all LEDs, incandescent light fixture and other illuminating fixtures (position indicators, lanterns, etc...) are working as intended.
- 3.4. Review the deficiency logbook for Elevator levelling issues and at a minimum inspect the levelling accuracy of all devices in both directions for 10% of the landings per device.
- 3.5. Check the brushes in the generators, motors and any other direct current rotating device (stepper motor, selector motor, door operator motor, etc...).
- 3.6. Inspect all fuses and ensure that no wire jumpers are installed on fuses.
- 3.7. Inspect the overload and ensure that the overload is within the nominal limit and not at the maximum adjustment value.
- 3.8. Inspect the building management system and verify that the system is connected to the elevators.



3.9. Perform the following work at intervals not less than one month:

3.9.1. Wipe the controllers (inside lower tray, the back and vacuum the components);

3.9.2. All landing and car-door mechanical and electrical components shall be maintained to ensure safe and proper operation, as follows:

1. Interlocks, locks, contacts, stop switches, pit switches and emergency escape contact (stops the elevator if the lock is opened, fastened properly);
2. Door reopening devices (stopping the door operator in time, beams working properly, nudging is working);
3. Vision panels (no visible cracks, frame is secured);
4. Hoistway access switches (working properly in both directions);
5. Eccentrics and retainers (proper clearance, securely fastened);
6. Door gibbs (secured and attached to the door panel and the fire tabs are provided);
7. Pickup rollers (no significant damage is detected-specifically no missing pieces);
8. Clutch/retiring cams and assemblies;
9. Hangers (ensure that the door panel clearance is good, no rust of weak welding points and the bolts are properly and securely fastened);
10. Interconnecting means (wires are not frayed and nuts are not loose);
11. Closers (ensure that the wires are not frayed and the pressure is adequate to close the door(s) under all conditions);
12. Sight guards; and
13. Astragals and bumpers.

3.10. Inspect the safety circuit and ensure that no jumpers are attached.

3.11. Inspect the reverse phase relay for jumpers and proper operation. Also check the operation of timers and specifically dash pot oil timers.

3.12. Inspect the error logs and review the data log buffer for errors and faults. Note the repetitive ones and report back to the Building Manager the repetitive issues and your plan to address them.

3.13. Check the pits for water accumulation, dust and oil.

3.14. Check the star-delta or softstart contactor to ensure proper operation.

3.15. Rope Elevators

3.15.1. Governors shall be examined and operated by hand to determine that all parts, including the rope-grip jaw and switches, operate freely, are not excessively worn, and are free of paint.

3.15.2. Clean the car top(s) and hoistway.



- 3.15.3. Inspect and check the door closing force, door speed and operation.
- 3.15.4. Visually inspect the brake pads, pins and drum (note excessive wear, heat or for noise). The driving-machine brake shall be tested to ensure proper operation after dismantling, cleaning, replacement of brake linings or any other component, or any change affecting the operation or adjustment of the brake.
- 3.15.5. Test the alarm button and phone for proper operation.

3.16. Hydraulic Elevators

- 3.16.1. Provide an oil logbook and record the oil level on a monthly basis (regardless of the cylinder type). Also empty the oil bucket in the pit (shut elevator down and replace packing (if the bucket is overflowing) every 30 days).
- 3.16.2. The valve bypass seal is secured and intact.
- 3.16.3. Record the monthly oil level at the time of the inspection and the oil temperature.
- 3.16.4. Note in the oil logbook the amount of oil collected from drip containers and if the amount of oil loss has increased.
- 3.16.5. Inspect and check the door closing force, door speed and operation.
- 3.16.6. Clean the car top(s) and hoistway.
- 3.16.7. Clean the reservoir tank (outer surface) and wipe any excess oil accumulating on it.
- 3.16.8. Ride the elevator from the top to the bottom and note any bouncing, vibrations or odour. Correct the issues noted or prepare a work order where needed.
- 3.16.9. Test the alarm button and phone for proper operation.

3.17. Escalators and Moving Walks

- 3.17.1. Emergency stop buttons shall be tested when the escalator is operated in each direction of travel
- 3.17.2. Skirt switches shall be checked.
- 3.17.3. The speed of the handrail shall be checked to ensure that movement is in the same direction and is at substantially the same speed as the steps and to ensure that the handrail cannot be easily stalled.
- 3.17.4. Examinations shall be performed to ensure that the clearance on either side of the steps and between the steps and the adjacent skirt guard does not exceed 5 mm (3/16 in) and that the sum of the clearances on both sides does not exceed 6 mm (1/4 in).
- 3.17.5. Combplates shall be examined to ensure that:
 - 1. Not more than one tooth is missing from any individual section;
 - 2. No two adjacent teeth are missing; and



3. All leading edges of teeth are below the upper surface of the step treads.
- 3.17.6. Where skirt panels are not made of low-friction material or permanently treated with a friction-reducing material, a friction-reducing agent shall be applied.
- 3.17.7. Where skirt brushes are installed, they shall be inspected to determine if the bristles are loose or damaged.
- 3.17.8. The signage shall be inspected to ensure that they are legible and are not damaged.
- 3.17.9. Audible alarms shall be inspected to ensure that they are working.
- 3.17.10. Strobe lights and voice annunciation where provided shall be inspected to ensure that they are operating as intended.
- 3.17.11. The handrail entry switch shall be inspected for proper operation.
- 3.17.12. The skirts, decks and architectural trim shall be inspected to ensure that it is not damaged or loose.
- 3.17.13. Inspect the floor plate and ensure that it is properly fastened to the floor and that there are no loose or protruding parts.
- 3.17.14. Inspect the handrails for unusual amount of wear or dust.
- 3.17.15. Inspect the machine oil level as well as the automatic lubrication devices where provided.
- 3.17.16. Inspect the step/pallet riser, cleat and demarcation strips for unusual wear or missing sections.
- 3.17.17. Inspect the step to step or pallet to pallet clearance and ensure that it is as required by code but not more than 6 mm (1/4 in). If the value exceeds this, then corrective action shall be taken.

Six-month inspection

- 3.18. The monthly, and quarterly work shall be performed on a prescribed basis. In addition to the monthly work, the Contractor shall also perform the following work every six months:
- 3.19. Escalators and Moving Walks
 - 3.19.1. The following maintenance procedures shall be performed at intervals not exceeding every six months:
 1. The broken step-chain device shall be tested by operating the actuating device by hand.
 2. The broken drive-chain device shall be tested by operating the actuating device by hand.
 3. The step obstruction device shall be tested for proper operation.



Annual Tests

3.20. The monthly, quarterly and six monthly work shall be performed a prescribed basis. In addition to the periodic work, also perform the following work every year:

- 3.20.1. Car emergency lighting systems shall be tested.
- 3.20.2. Emergency fire service and emergency power system shall be tested.
- 3.20.3. All parts relating to free-fall, overspeed, and uncontrolled low-speed protection devices shall be examined annually to determine whether they are in safe operating condition.
- 3.20.4. The power closing force on horizontally sliding doors shall be tested to a maximum 135 N.
 - 1. Test for compliance with restrictions on opening of passenger elevator car doors; and
 - 2. Test door closing time in accordance with the recommended closing times.
- 3.20.5. Check the mechanical limits.
- 3.20.6. Check the controller fans.

3.21. Rope Elevators

3.21.1. Wire ropes shall be inspected and maintained in accordance with A17.6-2010 Standard on Elevator Suspension, Compensation and Governor Systems. At a minimum, the following procedure shall be performed:

- 1. From the rope data tag, determine
 - (a) Nominal rope diameter; and
 - (b) Rope construction (i.e., the number of strands and the number of wires per strand).
 - (c) Equalize the ropes.
 - (d) Check the sheaves for unusual wear or uneven wear.
- 2. Establish the length of a rope lay using the following guidelines:

Nominal rope diameter, in	3/8	7/16	1/2	9/16	5/8	11/16	3/4
Rope lay length, in	2-1/2	2-7/8	3-1/4	3-5/8	4-1/16	4-1/2	4-7/8

- 3. Measure the rope diameter.
- 4. Establish whether the rope is affected by corrosion (e.g., rust, red dust) or is rough.
 - (a) For ropes with visible red dust “rouge”, the ropes shall be replaced within 60 days of such discovery.



(b) For ropes with rust (surface rust) provided that the ropes are not rouged as well, the ropes can be lubricated and treated as prescribed in the code.

5. Count the number of broken wires per rope lay. For preformed ropes, perform a more rigid inspection.
6. Inspection to identify hairline breaks on flat spots of worn wires.
7. Establish whether broken wires are equally distributed in all wire strands or concentrated in one or two strands.

3.21.2. For governors that cannot be sealed, the tripping speed shall be tested.

3.22. Hydraulic Elevators

3.22.1. The relief valve setting shall be tested annually. The test shall be done by applying pressure from the pump after:

1. Closing the main shutoff valve; or
2. Inching the empty car upward to engage the plunger stop ring.

3.22.2. The relief valve setting shall be resealed if it is altered or if the seal is broken.

3.22.3. Cylinders that are exposed shall be visually inspected. Cylinders that are not exposed shall be tested for leakage. After a minimum of 15 min, a change in car position that cannot be accounted for by visible fluid leakage or temperature change shall indicate a leak in the unexposed portion of the cylinder or the piping.

3.23. Escalators and Moving Walks

3.23.1. The bull gear, drive chain sprocket and handrail drive chain bearings shall be inspected and greased.

3.23.2. The driving machine shall be flushed and the oil shall be replaced.

3.23.3. The drive chain bath shall be emptied and the oil properly discarded.

3.23.4. The anti-reversal switch shall be inspected for proper operation.

3.23.5. The secondary safeties shall be tested.

3.23.6. The speed governor shall be examined and the switch shall be tested by operating it by hand.

3.23.7. The stop switch in the machinery space shall be checked.

3.23.8. The anti-reversal mechanism switch shall be checked.

3.23.9. The step upthrust devices shall be checked.

3.23.10. The brakes shall be tested to ensure that the proper torque and stopping distance is set under all loading conditions.

3.23.11. The clearance between successive steps shall be checked to determine the wear or stretch of the step chains.



3.23.12. All Escalator components shall be cleaned and examined. These components shall include, but not be limited to:

1. Oil drip pans;
2. Upper and lower stations;
3. Steps and rollers;
4. Step frames, risers, and treads;
5. Tracks; and
6. Truss components.

Five Year Tests

3.24. The monthly, quarterly, six monthly and annual work shall be performed a prescribed basis. In addition to the periodic work, also perform the following work every five years:

3.25. Rope Elevators

- 3.25.1. For sealable governors; each time the seal on the governor is disturbed; or when inspection indicates that a retest is necessary, the governor shall be spin tested. The governor shall be resealed after the test.
- 3.25.2. Oil buffers shall be tested as specified at intervals not exceeding five years to ensure that the buffer is operating as intended.
- 3.25.3. Full-load tests shall be carried out on elevators to ensure proper operating of the safeties as well as the proper stopping distance is noted.