BID SPECIFICATIONS

PROPOSED COLD ROOM

LCBO STORE #513
204 Beech Street
Stayner, Ontario
L0M 1S0

OWNER
LIQUOR CONTROL BOARD OF ONTARIO
55 LAKE SHORE BLVD. EAST, 2ND FLOOR,
TORONTO, ONTARIO
M5E 1A4

December, 2017
DOCUMENT 00: PROCUREMENT AND CONTRACTING REQUIREMENTS

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1.01 CONTRACT DOCUMENTS
   .1 Work will be performed under one Contract; the Contract will be in the form of the Agreement between Owner and Contractor.

1.02 GENERAL CONDITIONS and SCOPE OF WORK
   .1 The General Conditions and Supplementary Conditions of the Contract will govern the performance of each Section of the Specifications. The scope of work is to supply, deliver and install a new cold room having an approximate area of 450 square feet complete with a fully double automatic sliding doors. This project also includes the installation of new impact door and the relocation of retail and warehouse shelving. The new unit is to include electrical lights as noted and all associated connections. Also the contractor will be responsible to install sign bands, perimeter wall shelving and end gables and adjust and build new bulkheads as required to suit new proposed layout. Scope also includes replacement of two cash counters and asbestos containing floor tiles.

1.03 SPECIFICATIONS
   .1 The provisions of all Sections shall apply to each attached Sections, which are included in the Specifications.
   .2 Division 1, General Requirements, of the Specifications generally specifies work and co-ordination that is the direct responsibility of the Contractor, but shall not be interpreted to define absolutely the limits of responsibility that must be established between the Contractor and his Subcontractors by their separate agreements.
   .3 Ensure that Subcontractors understand that the General Conditions of the Contract, Supplementary Conditions, and Division 1, General Requirements, apply to Sections of the Specifications governing their work.
   .4 Work in the Specifications is divided into descriptive Sections which are not intended to identify absolute contractual limits between Subcontractors, nor between the Contractor and his Subcontractors. The Contractor shall organize division of labour and supply of materials essential to complete the Project in all its parts and provide a total enclosure and protection from weather of interior spaces, as established in the General Conditions of the Contract.
   .5 It is intended that Work supplied under these Contract Documents shall be complete and fully operational in every detail for the purpose required. Including materials not herein mentioned, but which may be found necessary to complete or perfect any portion of Work in accordance with the Contract Documents.
   .6 Specifications, Schedules and Drawings are complementary and items mentioned or indicated on one may not be mentioned or indicated on the others.
   .7 Mention in the specifications or indication on the drawings of materials, Products, operations, or methods, requires that the Contractor Provide each item mentioned or indicated of the quality or subject to the qualifications noted; perform according to the conditions stated each operation prescribed; and provide labour, materials, Products, equipment and services to complete the Work.
.8 Where the singular or masculine is used in the Contract Documents, it shall be read and construed as if the plural, feminine or neuter had been used when the context or the statement so requires and as required to complete the Work, and the rest of the sentence, clause, paragraph, or Article shall be construed as if all changes in grammar, gender or terminology thereby rendered necessary had been made.

.9 Work designated as “N.I.C.” is not included in this Contract.

.10 Wherever in the Contract Documents the word "include" is used in any form, the item of Work listed following shall not be interpreted to be restricted to only those items that are listed.

.11 Wherever in the Contract Documents the words "indicated" or "shown" are used they shall apply as meaning "indicated on Drawings" or "shown on Drawings" unless the context expresses another meaning.

.12 Wherever in the Specifications it is specified that work to which reference is made shall proceed or shall meet approval, direction, selection or request of jurisdictional authorities or others, such approval, direction, selection or request shall be in writing.

.13 Wherever in the Specifications it is specified that work shall be repaired, made good or replaced, it shall be performed without any additional cost to the Owner.

1.04 CONSTRUCTION SCHEDULE

.1 Submit a construction schedule utilizing critical path method within ten (10) working days of notification of bid acceptance, for approval.

1.05 SUPERINTENDENCE

.1 A designated site superintendent having no less than 5 years of experience must be provided by the General Contractor to oversee the Work.

.2 The Site Superintendent is required to be on site at all times when work forces are present, work is being executed or deliveries are being made.

.3 The Contractor shall provide the Superintendent with a pager, cell phone or other means by which the Consultant or Owner can make contact during hours of work.

1.06 SITE PROGRESS RECORDS

.1 Maintain at site a permanent written record of progress of the Work. Make the record available at all times with copies provided when requested.

1.07 WORK BY OTHERS

.1 The Owner may be required to enter into a separate contract for the supply and/or installation of certain furniture and fixtures outside the scope of this Contract. In this event, the Contractor shall co-ordinate his work with that of the Owner's forces or subcontract to facilitate installation of such items.

1.08 EXAMINATION
.1 Site: Examine site, and ensure that each Section performing work related to site conditions has examined it, so that all are fully informed on all particulars which affect Project Work.

.2 Ensure by examination that all physical features at the Work, and working restrictions and limitations which exist are known, so that the Owner is not restricted in use of the premises for their needs.

.3 Review the entire site prior to any work.

1.09 USE OF SITE

.1 Accept full responsibility for assigned work areas from the time of Contract award until Substantial Performance of the Work.

.2 Check means of access and egress, rights and interests which may be interfered with. Do not block lanes, roadways, entrances of exits. Direct construction traffic and locate access to site as directed by municipality.

1.10 PROTECTION OF WORK, PROPERTY AND PERSONS

.1 Provide necessary methods, materials, and construction to ensure that no damage or harm to work, materials, property and persons results from the Work of this Contract.

.2 Do not store flammable materials in the building. Take necessary measures to prevent spontaneous combustion. Place cloths and other disposable materials that are a fire hazard in closed metal containers and remove them from the building every night.

1.11 SECURITY

.1 Any security service provided by the Owner is for the protection of the Owner's interest in the Work on the Site and shall not relieve the Contractor of the responsibility to protect the Site and the Work of the Contract.

1.12 SALVAGE

.1 Unless otherwise specified, materials on the site at the time of signing of Contract shall remain property of Owner.

.2 Unless otherwise specified, salvaged material resulting from construction, and surplus materials and construction debris shall become property of Contractor, who shall dispose of it away from site.

.3 Treasure, such as coins, bills, papers of value, and articles of antiquity, discovered during digging, demolition and cutting at the site shall remain property of Owner, and shall be delivered immediately into his custody.

1.13 OWNER OCCUPANCY

.1 The Owner reserves the right to occupy and use portions of the premises, whether partially or entirely completed, or whether completed on schedule or not, provided such occupancy does not interfere with the Contractor's continuing work.

.2 The store is to remain operational at all times.
1.14  SETTING OUT

.1 Before commencing work, verify lines, levels and dimensions shown on the drawing and report discrepancies in levels or dimensions to the Consultant. Be responsible for work done prior to the receipt of the Consultant’s decision regarding reported discrepancies.

1.15  WASTE AUDIT/PLANS FOR WASTE REDUCTION

.1 Comply with requirements of authorities having jurisdiction.

.2 Deliver to nearest appropriate depot all materials accepted for recycling by the region or municipality having jurisdiction over the Place of Work, including but not limited to cardboard, paper, plastic, aluminum, steel, and glass. Deliver to nearest appropriate depot all scrap and excess gypsum wallboard for recycling of this material. Pay all costs for this work.

END OF SECTION
1.01 GENERAL

.1 Co-ordination of the work of all Sections of the Specifications as required to complete the Project is the responsibility of the Contractor.

.2 The Contractor will be deemed to possess the necessary technical skills to carefully evaluate all requirements of the Contract, and to have included in the Stipulated Price all project co-ordination and supervision for the proper implementation of these requirements.

.3 Entry by the Owner's own forces and by Other Contractors shall not mean acceptance of the Work and shall not relieve the Contractor of their responsibility to complete the Contract.

.4 Placing, installation, application and connection of work by the Owner's own forces or by Other Contractors on and to the Contractor's Work shall not relieve the Contractor of his responsibility to provide and maintain the specified warranties.

.5 Coordinate with removals/installations specified in other Divisions and Other Contracts.

1.02 RELATED MECHANICAL AND ELECTRICAL WORK

.1 Co-ordination of the installation of systems specified including the interrelating operation and functioning between components of a system and between systems, is the responsibility of those performing the work of Divisions with final co-ordination the responsibility of the Contractor.

.2 Conceal pipes, ducts, control systems and electrical distribution systems within wall, floor and ceiling construction except where indicated otherwise.

.3 Ensure that service poles, pipes, conduit, wires, fill-pipes, vents, regulators, meters and similar Project service installations are located in inconspicuous locations. If not indicated on Drawings, verify location of service installations with Owner before commencing installation.

1.03 QUALITY ASSURANCE

.1 Requirements of Regulatory Agencies:
Co-ordinate requirements of jurisdictional authorities.

.2 Quality Control:

.1 Ensure that the Work meets specified requirements.

.2 Schedule, supervise and co-ordinate inspection and testing as specified in Section 01 45 00.

.3 Make payments for inspection and testing from cash allowances specified in Section 01 21 00.

.4 Schedule, supervise and co-ordinate the commissioning process as specified in Section 01 45 00.

.3 Job Records:
Maintain job records and ensure that records are maintained by Subcontractors.

1.04 SUBMITTALS

.1 Schedule and expedite submission of specified submittals.

.2 Review submittals and make comments as specified in Section 01 33 00.
.3 Ensure that each original submission, and their subsequent revisions and re-submissions are made on schedule.
.4 Consultant to provide submittals schedule, and keep updated submittals log to be reviewed at site meetings.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

.1 Ensure that conditions within the building are maintained and that the Work proceeds under conditions meeting specified environmental requirements.
.2 Ensure that protection of adjacent property and the Work is adequately provided and maintained to meet specified requirements.

1.06 WARRANTIES

.1 Ensure that warranties are provided as specified.
.2 Co-ordinate warranty conditions of interconnected work to ensure that full coverage is obtained.

1.07 CO-ORDINATION

.1 Review Contract Documents and advise the Consultant of possible conflicts between parts of the Work before preparation of shop drawings, ordering of products or commencement of affected work.
.2 Co-ordinate all work in each area and work on which subsequent work depends to facilitate mutual progress, and to prevent conflict between parts of the Work.
.3 Ensure that each Section makes known, for the information of the Contractor and other Sections, the environmental and surface conditions required for the execution of its work; and that each Section makes known the sequence of others’ work required for installation of its work.
.4 Ensure that each Section, before commencing its work, knows requirements for subsequent work and that each Section is assisted in the execution of its preparatory work by Sections whose work depends upon it.
.5 Concealment of Supports and Services:
   .1 Unless otherwise indicated on Drawings, and/or approved, conceal from view supports, braces, pipes, ducts, tubing, conduit and wiring by construction in finished areas.
   .2 Clarify with Consultant the intent of concealment wherever it is in doubt.
   .3 Ensure that concealed supports and services are installed and tested, and approved, in ample time for installation of proper concealing construction in accordance with construction schedule.
   .4 Ensure that work to be enclosed within ceiling and/or wall spaces can be so accommodated without interference with other parts of the Work.
.6 Existing equipment shall remain in present locations unless designated otherwise. Protect from damage. Remove, store and reinstall existing fixed equipment, fixtures
and components which interfere with construction and which are scheduled for relocation.

.7 Make provision for unrestricted relocation of light fixtures to replace ceiling panels at grid spaces of the same size, without interference or restriction by items located within the ceiling space.

.8 Where supports or openings are to be left for the installation of various parts of the Work furnish the necessary information to those concerned in ample time so that proper provision can be made for such items. Have cutting, drilling and other remedial work, and the subsequent patching or other work required for failing to comply with this requirement, performed at a later date at no additional Cost to Owner.

.9 Properly coordinate the work of the various Sections and trades, taking into account the existing installations to assure the best arrangement of pipes, conduits, ducts and mechanical, electrical and other equipment, in the available space. Under no circumstances will any extra payment be allowed due to the failure by the Contractor to coordinate the work. If required, in critical locations, prepare interference and/or installation drawings showing the work of the various Sections as well as the existing installation, and submit these drawings to the Owner for review before the commencement of work.

.10 Deliver materials supplied by one Section to be installed by another well before the installation begins.

.11 Ensure that setting drawings, templates, and all other information necessary for the location and installation of materials, holes, sleeves, inserts, anchors, accessories, fastenings, connections, and access panels are provided by each Section whose work requires co-operative location and installation by other Sections, and that such information is communicated to the applicable installer.

.12 Sections giving installation information in error, or too late to incorporate in the Work, shall be responsible for having additional work done which is thereby made necessary.

.13 Remove and replace work installed in error which is unsatisfactory for subsequent work.

1.08 CUTTING AND PATCHING

.1 Before cutting, drilling, or sleeving structural load-bearing elements, obtain approval of location and methods.

.2 Do not endanger the Work or property by cutting, digging, or similar activities. No Section shall cut or alter work of another Section unless such cutting or alteration is approved by the latter Section.

.3 Cut and drill with true smooth edges and to minimum suitable tolerances.

.4 Fit construction tightly to ducts, pipes and conduits to stop air movement completely. The Section performing Work that penetrates a fire, air, vapour, moisture, thermal or acoustic separation of the building shall pack voids tightly with rock wool; seal air, vapour and moisture barriers; and caulk joints as may be required to ensure that no air movement through the penetration is possible.

.5 Cutting, drilling and sleeving of work shall be done only by the Section who has installed it. The Section requiring drilling and sleeving shall inform the Section who
has installed the work to be drilled or sleeved of the location and other requirements for drilling and sleeving.

.6 Replace, and otherwise make good, damaged work.

.7 Make patches invisible in final assembly.

1.09 BUILDING DIMENSIONS

.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 which maintain levels and clearances to adjacent work, as set out by requirements of the Drawings, and ensure that work installed in error is rectified before construction resumes.

.3 Check and verify dimensions referring to the work and the interfacing of services.

.4 Do not scale directly from the Drawings. If there is ambiguity or lack of information, immediately inform the Consultant. Changes through the disregarding of this clause shall be the responsibility of the Contractor.

.5 All details and measurements of any work which is to fit or to conform with work installed shall be taken at the building.

.6 Advise Consultant of discrepancies and if there are omissions on Drawings, particularly reflected ceiling plans and jointing patterns for surfaces finishes, which affect aesthetics, or which interfere with services, equipment or surfaces. Do not proceed with work affected by such items without direction from the Owner.

.7 Provide written requirements for site conditions and surfaces necessary for the execution of respective work, and provide setting drawings, templates and all other information necessary for the location and installation of material, holes, sleeves, inserts, anchors, accessories, fastenings, connections and access panels. Inform respective contractors whose work is affected by these requirements and preparatory work.

1.10 INTERFERENCE AND COORDINATION DRAWINGS

.1 Coordinate placement of equipment to ensure that components will be properly accommodated within the spaces provided prior to commencement of work.

END OF SECTION
1.01  **PRECONSTRUCTION MEETING**

.1 As soon as possible after award of Contract, arrange a meeting between the Consultants, Subcontractors, Project Superintendents, Inspection and Representatives of others whose co-ordination is required during construction.

.2 Discuss at the meeting the means by which full co-operation and co-ordination of the participants during construction can be achieved.

.3 Document the responsibilities and necessary activities of the participants during construction as discussed, and distribute documentation to each participant.

1.02  **PROJECT MEETINGS**

.1 Hold site meetings at regular intervals during construction in order to co-ordinate the work of Subcontractors. Establish meeting schedule with Owner at the beginning of construction. Meetings shall fall at the same time of each week in which they are scheduled.

.2 Ensure that responsible representatives, from offices and site forces, of Contractor and Subcontractors attend.

.3 Inform Owner, Consultant, consultants, and the others whose attendance is required of the date of each meeting, in sufficient time to enable them to arrange for their presence.

.4 Prepare an agenda for each meeting; and make available, to all those concerned, information required for the resolution of problems to be discussed.

.5 Owner to chair meeting and to prepare and distribute meeting minutes to all parties involved in project within 48 hours.

END OF SECTION
1.01 GENERAL

.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.

.2 Submit in accordance with dates established under Section 01 11 00 for shop drawings, 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.

.3 Accompany each submittal with a letter of transmittal in duplicate 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 the submission.

.4 Allow one week for the Consultant's review of each submission.

.5 When submittals are resubmitted, transmit under a new letter of transmission.

.6 Do not carry out Work until Consultants review of submittals has been completed.

.7 Be responsible for payment of charges for delivery of submissions and resubmission to Consultant.

1.02 CONSTRUCTION SCHEDULES

.1 Submit proposed construction schedule at beginning of Project, as specified in Section 01 11 00.

.2 As construction progresses, submit up-dated construction schedules each month to Owner, Consultant, and to each Subcontractor who is included on Schedule.
1.03SHOP DRAWINGS

.1 Submit shop drawings for which submission is required in other Sections of the Specifications. Include in final shop drawings submissions detailed information, templates and installation instructions required for incorporation and connection of the work concerned. Submissions of all paint draw-downs and finish samples to be used in the Project for all relevant finishes must be submitted to the LCBO Design Co-ordinator for sign-off approval as a requirement of the Contract.

.2 In addition to shop drawings specified in other Sections, submit shop drawings required by jurisdictional authorities in accordance with their requirements.

.3 The Contractor shall check, sign, and make notations he considers necessary on shop drawings before each submission.

.4 Indicate on each submission changes from the Contract Drawings and Specifications that have been incorporated in the shop drawings. The Contractor shall be responsible for changes made from the Contract Drawings and Specifications that are not indicated or otherwise communicated in writing with the submission.

.5 Shop drawing review by Consultant or consultants is for the sole purpose of ascertaining general conformance with the design concept. This review shall not mean that Consultant and consultants warrant or represent that the information contained on the shop drawings is either accurate or complete, responsibility for which shall remain with the Contractor submitting same, and such review shall not relieve the Contractor of his responsibility for errors or omissions in the shop drawings or of his responsibility for meeting design, details and all other requirements of the Contract Documents.

.6 Contract Drawings and Specifications take precedence over shop drawings.

.7 The Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to fabrication processes or to techniques of construction and installation, and for co-ordination of the work of all Subcontractors.

.8 Incorporate only dimensional system utilized for Drawings, except where substitutes are otherwise approved. Make soft conversions from metric system to imperial, or vice versa, when required for incorporation of units of one-dimensional system into construction of the other.

.9 Show on shop drawings:

.1 Clear and obvious notes of any proposed changes from Drawings and Specifications.

.2 Fabrication and erection dimensions.

.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.

.10 Shop drawing submission procedure:

.1 General contractor to submit one copy of shop drawings on sheets not larger than 280 mm x 430 mm to respective consultants for review and comment as follows:

.1 Submit millwork shop drawings to the interior design consultant.
.2 Submit architectural shop drawings to the owner.
.2 Submit structural, electrical and mechanical shop drawings directly to the respective engineer.
.2 Owner will forward reviewed shop drawings to the architect either in hardcopy or a scanned copy by email.
.3 Architect will forward reviewed shop drawings to LCBO project coordinator for review and comment.
.4 LCBO project coordinator will review and forward a scanned copy to the general contractor and respective consultants.
.11 Shop drawings which require extensive correction will be sent back for revisions and resubmission. Otherwise, shop drawings will be sent back with review comments only.
.12 Only drawings noted for revision and resubmission need be resubmitted.
.13 Do not add new details or information to shop drawings after they have been finally reviewed, except when approval is given.
.14 Do not proceed with work dependent on shop drawing information until they have been reviewed and accepted by LCBO and LCBO consultants and verification is received from Contractor. Approval shall not relieve the Contractor of his responsibility for execution of the Work in accordance with Contract Documents.
.15 Fabricate work exactly as shown on shop drawings. If shop practice dictates revisions, revise drawings and resubmit.
.16 File one copy of each finally revised and corrected shop drawings at site.
.17 **LIST OF REQUIRED SHOP DRAWINGS TO BE SUBMITTED IN A TIMELY MANNER BY CONTRACTOR TO LCBO DESIGN CO-ORDINATOR, COPIED TO ALL RELEVANT DESIGN CONSULTANTS:**
   (This list may not reflect all shop drawings required. It is the responsibility of the contractor to insure that all requirements for submittals are met as specified.)
   **Shop Drawings required:**
   Warehouse Doors/Impact Doors
   Millwork items
   Light Fixtures

1.04 **PRODUCT DATA**
.1 Before delivery of Products to the Site, submit Product data as specified in each section or as requested by the Owner.
.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.

1.05 **SAMPLES**
.1 Not applicable
1.06  PROJECT RECORD DRAWINGS

.1 Record, as the Work progresses, work constructed differently than shown on Contract Documents. Record all changes in the Work caused by site conditions; by Owner, Consultant, Contractor, and Subcontractor originated changes; and by site instructions, supplementary instructions, field orders, change orders, addendums, correspondence, and direction of jurisdictional authorities. Accurately record location of concealed structure, and mechanical and electrical services, piping, valves, conduits, pull boxes, junction boxes and similar work not clearly in view, the position of which is required for maintenance, alteration work, and future additions. Do not conceal critical work until its location has been recorded.

.2 White prints will be provided by the Owner at no cost to the Contractor for each Section in which record drawings are required. Record changes in the Work on these prints in red ink.

.3 Dimension location of concealed work in reference to building walls, and elevation in reference to floor elevation. Indicate at which point dimension is taken to concealed work. Dimension all terminations and offsets of runs of concealed work.

.4 Make records in a neat and legibly printed manner with a non-smudging medium.

.5 Identify each record drawing as "Project Record Copy". Maintain drawings in good condition and do not use them for construction purposes.

.6 Maintain Project record drawings in a state current to Project. Such state will be considered a condition precedent for validation of applications for payment. The Consultant's visual inspection will constitute proof that record drawings are current.

.7 Provide Owner with accurate red-marked record drawings for their transfer to AutoCAD with application for Certificate of Substantial Performance. Provide AutoCAD files in version as required by Consultant. Final acceptance of the Work will be predicated on receipt and approval of record drawings.

1.07  REVISIONS SCHEDULE

.1 Contractor shall provide a Revisions and Miscellaneous Outstanding Items schedule at each site meeting.

1.08  AFFIDAVITS

.1 Submit affidavits which may be required or which may be requested in other Sections of the Specifications.

.2 Affidavits shall verify that products and/or methods meet requirements specified in the Contract Documents, and shall include test reports of approved testing laboratories to validate claims contained in affidavit.

.3 Submit affidavits in duplicate and signed and notarized by a responsible officer of the certifying company.
1.09 EXTENDED WARRANTIES
   .1 Submit the extended warranties as specified in each applicable Section of the Specifications.
   .2 Extended warranties shall commence on termination of the standard one year warranty granted in this Contract and shall be an extension of these same provisions.
   .3 Submit each extended warranty in an approved uniform format.

1.10 EXTRA MATERIALS
   .1 Supply extra materials at completion of Project as specified in other Sections of the Specifications.
   .2 Deliver extra materials as directed by the Owner to location he designates.
   .3 Extra materials submitted as specified will consist of a maximum of one box, carton, crate, unit or tub of the specified material, not exceeding 3% of the overall material used for the project. Confirm with LCBO Project Coordinator final submission of extra material.

1.12 COST BREAKDOWN
   .1 Submit a complete cost breakdown within ten (10) working days of notification of award of contract.

1.13 PROGRESS BILLING
   .1 Co-ordinate progress billing with cost breakdown.
   .2 Include gross and net value of work completed during billing period.
   .3 Include running total of gross and net value of work completed by the end of the billing period.

1.14 PRICING OF CHANGES TO WORK
   .1 Submit with quotations for changes to the work detailed estimate sheets showing initial and revised quantities of labour, materials and equipment, and the related unit costs.
   .2 Payment for use of small tools, travelling, out-of-town accommodations and preparation of price change submittals will be considered a part of overhead as specified in Supplementary General Conditions, issued under separate cover.

END OF SECTION
1.01 GENERAL

.1 Provide Labour, Products, equipment, services, tools and Supervision to ensure that Work complies with minimum acceptable standards of materials and performance of Work in accordance with codes and standards referenced in the Specification.

.2 Consider contract forms, codes, Specifications, standards, manuals, and installation and application instructions referred to in these specifications to be the latest published editions at the date of submission of the bid unless otherwise stated in the Specifications or otherwise required by the authorities having jurisdiction.

1.02 JURISDICTIONAL AUTHORITIES

.1 Where reference is made to jurisdictional authorities, it shall mean all authorities who have within their constituted powers the right to enforce the laws of the place of building.

.2 Requirements of jurisdictional authorities shall apply to the Work in precedence to the requirements of the Contract Documents, except that more stringent requirements of the Contract Documents shall take precedence over requirements of jurisdictional authorities.

.3 The Contractor shall carry out all work in full compliance with the requirements of the Municipal, Provincial and National Authorities having jurisdiction.

.4 The General Contractor and all sub-contractors shall adhere to the hours of work, the working conditions and rate of wages paid under prevailing local conditions and/or requirements, paying not less than minimum wages established by customary standard in the locality for the same or similar class of work.

.5 The General Contractor shall be responsible for obtaining and paying for the Building Permit.

.6 The Contractor shall be responsible for obtaining and paying for all other necessary permits and relative inspection fees and no work shall commence until all permits are obtained.

1.03 FIRE PREVENTION AND SAFETY

.1 Enforce fire protection methods, good housekeeping, and adherence to local and underwriter's fire regulations.

.2 Fires will not be permitted on the site. Remove combustible and non-combustible waste at regular intervals and/or when directed. Precautions shall be taken to avoid fire by spontaneous combustion. Smoking shall be prohibited, post "No Smoking" signs.

.3 Provide ULC approved fire extinguishers, and other fire fighting services and equipment except where more explicit requirements are specified as the responsibility of individual Sections.

.4 Provide and maintain in good working order at least one (1) or as many as required, 2A 10BC fire extinguisher which shall be prominently placed and on the job from commencement of work until completion.

.5 Maintain clear emergency exit paths for personnel at all times.

.6 Use only fire resistant tarpaulins and similar protective covering on site.
1.04 REQUIREMENTS OF REGULATORY AGENCIES

.1 Work shall include protection measures consisting of materials, constructions and methods required by The Occupational Health and Safety Act of the Province of Ontario, and as otherwise imposed by jurisdictional authorities to save persons and property from harm.

.2 Ensure that pollution and environmental control of construction activities are exercised as required during the Work.

.3 Except where special permission is obtained, maintain clear access for roads and sidewalks on private or public property.

.4 Maintain roads and sidewalks clear of construction materials and debris, including excavated material. Clean roads and sidewalks as frequently as required to ensure that they are cleared of materials, debris and excavated material. Ensure that all driveways designated as fire routes by authorities having jurisdiction are kept clear at all times.

.5 Remove snow and ice from sidewalks as required.

1.05 REFERENCE STANDARDS AND CODES

.1 Where edition date is not specified, consider that references to manufacturer's and, published codes, standards and specifications are made to the latest edition (revision) approved by the issuing organization, current at the date of the Specifications.

.2 Reference standards, codes, and specifications are quoted in the Specifications to establish minimum standards. Work of quality or of performance characteristics that exceeds these minimum standards will be considered to conform.

.3 Should the Contract Documents conflict with specified reference standards, codes, or specifications, the more stringent in each case shall govern.

.4 Where reference is made to manufacturer's directions, instructions or specifications they shall include full information on storing, handling, preparing, mixing, installing, erecting, applying or other matters concerning the materials pertinent to their use and their relationship to materials with which they are incorporated.

.5 Have a copy of each code, standard and specification, and manufacturer's directions, instructions and specifications, to which reference is made in the Specifications, always available at construction site.

.6 Standards, specifications, associations, and regulatory bodies are generally referred to throughout the specifications by their abbreviated designations. These are, but not necessarily limited to:

AA    -    The Aluminum Association
AAMA  -    Architectural Aluminum Manufacturers Association
ACI   -    American Concrete Institute
AISI   -    American Iron and Steel Institute
ANSI   -    American National Standards Institute
ASTM   -    American Society for Testing and Materials
AWI   -    Architectural Woodwork Institute
AWMAC  -    Architectural Woodwork Manufacturers Association
1.06 EXISTING PUBLIC SERVICE LINES

.1 Where existing public services are indicated to be removed and/or relocated, perform work in compliance with authorities having jurisdiction.

.2 Make good public roads, walkways and curbs soiled or damaged due to construction to the requirements of local authorities.

1.07 FIRE RATINGS, ASSEMBLIES AND SEPARATIONS

.1 Where a material, component, assembly, or separation is required to be fire rated, the fire rating shall be as determined or listed by one of the following testing authorities acceptable to the authorities having jurisdiction:

.1 Underwriters' Laboratories of Canada.
.2 Underwriters' Laboratories Inc.
.3 Factory Mutual Laboratories.
.4 The National Research Council of Canada.
.5 The National Board of Fire Underwriters.
.6 Intertek Testing Services.

.2 Where reference is made to only one testing authority an equivalent fire rating as determined or listed by another of the aforementioned testing authorities is acceptable if approved by authorities having jurisdiction. Obtain and submit such approval of authorities, in writing when requesting acceptance of a proposed equivalent rating or test design.

.3 Fire rated door assemblies shall include doors, frame, anchors, and hardware and shall bear label of fire rating authority showing opening classification and rating.

.4 Material having a fire hazard classification shall be applied or installed in accordance with fire rating authorities printed instructions.

.5 Fire rated assemblies shall be constructed in accordance with applicable fire test report information issued by fire rating authority. Deviation from fire test report will not be allowed.
.6 Construct fire separations as continuous, uninterrupted elements except for permitted openings. Extend fire rated walls and partitions from floor to underside of structural deck above.

.7 Fire separations may be pierced by openings for electrical and similar service outlets provided such boxes are non-combustible and are tightly fitted and sealed with a ULC approved sealant for the assembly being sealed.

.8 Construction that abuts on or is supported by a non-combustible fire separation shall be constructed so that its collapse under fire conditions will not cause the collapse of the fire separation.

.9 Do not use combustible members, fastenings, attachments and similar items to anchor electrical, mechanical or other fixtures to fire separations.

.10 At penetration through fire rated walls, ceilings or floors, completely seal voids with ULC approved firestopping material; full thickness of the construction element. In locations that require a smoke seal, provide appropriate ULC approved system installed in accordance with the manufacturer's recommendations.

END OF SECTION
1.01 GENERAL

.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.

.3 Conduct testing, balancing and adjusting of equipment and systems specified in applicable mechanical and electrical specifications sections by independent testing company.

.4 Related Requirements Specified Elsewhere:

.1 Inspections and testing required by the law, ordinances, rules and regulations of jurisdictional authorities: General Conditions of the Contract.

.2 Verification by affidavits and certification that specified products meet requirements of reference standards: In applicable Sections of the Specifications.

.3 Testing, balancing and adjusting of equipment: In applicable mechanical and electrical Sections of the Specifications.

.4 Cutting and patching: Section 01 31 13.

.5 Submission of inspection and testing reports: Section 01 33 00.

1.02 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 during manufacture, fabrication, or at Site, ensure that proper facilities and assistance are provided.
1.03 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. Such information is included in this Section for Contractor's information only.

.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.

1.04 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 recording 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.

1.05 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.

.2 The Contractor is responsible for the commissioning process in accordance with the specification Section 01 45 00

1.06 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 may be 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.

1.07 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.

1.08 TOLERANCES FOR INSTALLATION OF WORK
.1 Unless acceptable tolerances are otherwise specified in a Section 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 1mm in 1m.
   .2 "square" shall mean not in excess of 10 seconds lessor or greater than 90 degrees.
   .3 "straight" shall mean within 1mm under a 1m long straightedge.
.2 Allowable tolerances shall not be cumulative.

1.09 MOCK-UPS
.1 Not applicable

1.10 REJECTED WORK
.1 Products and installations found defective; not in accordance with the Specifications; or defaced or damaged through negligence of the Contractor, his employees or Subcontractors, or by fire, weather or any other cause will be rejected for incorporation in the Work.
.2 Remove rejected products and work from the premises immediately.
.3 Replace rejected products and installations with no delay after rejection. Provide replacement products and execute replacement installations precisely as required by the Specifications for the defective products and installations replaced. Previous inspection and payment shall not relieve the Contractor from the obligation of providing sound and satisfactory products and installations in compliance with the Specifications.

1.11 COMMISSIONING
.1 The commissioning process is an integral part of the quality control that shall be provided by the Contractor, the Sub Contractors and the System Manufacturers.
.2 The commissioning process consists of but is not limited to:
   .1 Shop drawing submittal, review and approval
   .2 The shop drawing requirements have been documented in other parts of this specification

END OF SECTION
1.01 GENERAL

.1 Products refer to new materials, manufactured components and assemblies, fixtures and equipment incorporated in the Work.

.2 Use only products of Canadian manufacture unless such products are not manufactured in Canada, are specified otherwise, or are not competitive.

.3 Products for use in the Project and on which the Bid was based shall be in production at time of Contract Document date, with a precise model and shop drawings available for viewing.

.4 Products specified by model, catalogue number, series, etc., and by manufacturer's name, which are incorporated in the Work shall be fabricated of same materials, of same quality, function and performance at the time they are produced for the Work as at date of Contract Documents.

.5 Where equivalent products are specified, or where alternatives are proposed, these products claimed by the Contractor as equivalent shall be comparable in construction, type, function, quality, performance, and, where applicable, in appearance. Where specified equivalents are used in the Stipulated Price for the Work, they shall be subject to final approval.

.6 Incorporate products in the work in strict accordance with manufacturers' directions unless specified otherwise. Manufacturer's directions, instructions and specifications, where reference is made to them, shall include full information on storing, handling, preparing, mixing, installing, erecting, applying, and other matters concerning the materials that are pertinent to their use and their relationship to materials with which they are incorporated.

.7 Products delivered to the Project site for incorporation in the Work shall be considered the property of the Owner. Maintain protection and security of products stored on the site after payment has been made for them.

.8 Do not install permanently incorporated labels, trademarks and nameplates, in visible locations unless required for operating instructions or by jurisdictional authorities.

1.02 APPROVAL OF PRODUCTS AND INSTALLATION METHODS

.1 Wherever in the Specifications it is specified that Products and installation methods shall meet approval of Authorities having Jurisdiction, underwriters, the Owner, or others, such approval shall be in writing.

1.03 PRODUCT HANDLING

.1 Manufacture, pack, ship, deliver and store products so that no damage occurs to structural qualities and finish appearance, or in any other way detrimental to their function or appearance, or both.

.2 Brace assemblies such as door frames, large window units and similar products to prevent distortion or breakage in handling.

.3 Ensure that products, while transported, stored or installed, are not exposed to an environment which would increase their moisture content beyond the maximum specified.
### SECTION 01 60 00
MATERIAL AND EQUIPMENT

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Description</th>
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<tbody>
<tr>
<td>.4</td>
<td>Schedule early delivery of products to enable the Work to be executed without delay. Before delivery, arrange for receiving at site.</td>
</tr>
<tr>
<td>.5</td>
<td>Deliver packaged products, and store until use, in original unopened wrapping or containers, with manufacturer's seals and labels intact.</td>
</tr>
<tr>
<td>.6</td>
<td>Label packaged products to describe contents, quantity and other information as specified.</td>
</tr>
<tr>
<td>.7</td>
<td>Label fire-rated products to indicate approval of Underwriters' Laboratories.</td>
</tr>
<tr>
<td>.8</td>
<td>Product handling requirements may be repeated, and additional requirements specified, in other Sections.</td>
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#### 1.04 STORAGE AND PROTECTION

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<tr>
<th>Paragraph</th>
<th>Description</th>
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<tbody>
<tr>
<td>.1</td>
<td>Store products on site or in storage areas with secure protection against all harmful environmental conditions. Prevent damage, adulteration, staining and soiling of materials while stored.</td>
</tr>
<tr>
<td>.2</td>
<td>Protect prefinished metal surfaces by protective coatings or wrappings until time of final cleanup. Protection shall be easily removable under work without damage to finishes.</td>
</tr>
<tr>
<td>.3</td>
<td>Store manufactured products in accordance with manufacturer's instructions.</td>
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<tr>
<td>.4</td>
<td>Store steel, lumber, masonry units, precast concrete work, and similar products on platforms raised clear of ground.</td>
</tr>
<tr>
<td>.5</td>
<td>Store finished products and woodwork under cover at all times.</td>
</tr>
<tr>
<td>.6</td>
<td>Storage and special protection requirements may be repeated, and additional requirements specified, in other Sections.</td>
</tr>
</tbody>
</table>

#### 1.05 SPECIFIED PRODUCTS

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<tr>
<th>Paragraph</th>
<th>Description</th>
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<tbody>
<tr>
<td>.1</td>
<td>Products specified by manufacturer's name, brand name or catalogue reference shall be the basis of the bid and shall be supplied for the Work without exception in any detail, subject to allowable substitutions as reviewed.</td>
</tr>
<tr>
<td>.2</td>
<td>Where several proprietary products are specified, any one of the several will be acceptable.</td>
</tr>
<tr>
<td>.3</td>
<td>For products specified by reference standards, the onus shall be on the supplier to establish that such products meet reference standard requirements. The Owner may require affidavits from the supplier, as specified in Section 01 33 00, or inspection and testing at the expense of the supplier, or both, to prove compliance. Products exceeding minimum requirements established by reference standards will be accepted for the Work if such products are compatible with, and harmless to, other products with which they are incorporated.</td>
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#### 1.06 SCHEDULING OF PRODUCT DELIVERY

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<tr>
<th>Paragraph</th>
<th>Description</th>
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<tbody>
<tr>
<td>.1</td>
<td>Verify that products supplied by all Sections are ordered from suppliers in sufficient time to ensure delivery for incorporation in the Work within the time limits established by approved construction schedule.</td>
</tr>
<tr>
<td>.2</td>
<td>Obtain confirmed delivery dates from product suppliers.</td>
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</tbody>
</table>
.3 Immediately inform the Owner should supplier's confirmation of delivery dates indicate that Project completion may be delayed.
.4 Submit copies of purchase orders and confirmations of delivery dates for products as may be requested.

1.07 SUBSTITUTION OF PRODUCTS DURING PROGRESS OF WORK
.1 Products substituted for those specified or approved, or both, shall be permitted only if the listed product cannot be delivered to maintain construction and if the delay is caused by conditions beyond the Contractor's control.
.2 Application for substitution will not be considered if caused by ordering of product later than date required by supplier's delivery schedule to ensure completion of the Work on schedule as approved.
.3 A substitution will be allowed only after Contractor's proof of non-availability has been reviewed by the Owner.
.4 Obtain review of substitutions. Application for approval shall be made only by Contractor. Process proposals for substituted products in accordance with procedures established for Changes in the Work.
.5 Submit, with request for substitution, documentary evidence that substituted products are equal to, or superior to, approved products, and a comparison of price and delivery factors for both specified or approved products, and proposed substitute.
.6 Review of substitutions for specified items will be performed by Owner or Owners.

1.08 WORKERS, SUPPLIERS AND SUBCONTRACTORS
.1 Assign work only to workers, suppliers, and Subcontractors who have complete knowledge, not only of the conditions of the Specifications, but of jurisdictional requirements, and reference standards and specifications.
.2 Give preference to use of local workers, suppliers, and Subcontractors wherever possible.

1.09 WORKMANSHIP
.1 Unless otherwise specified in a more detailed manner, workmanship shall be of the highest quality recognized by the trade executing the work in accordance with standard practices, by the best methods recommended by the manufacturer of the product, and as approved by the Owner.

1.10 FASTENINGS
.1 Include in the work of each Section necessary fastenings, anchors, inserts, attachment accessories, and adhesives. Where installation of devices is in work of other Sections, deliver devices in ample time for installation, locate devices for other Sections and co-operate with other Sections as they require.
.2 Do not install wood plugs or blocking for fastenings in masonry, concrete, or metal construction, unless specified or indicated on Drawings.
.3 Do not use fastenings which cause spalling or cracking of materials in which installed. Do not use powder actuated fastening devices unless specified.

.4 Use only approved driven fasteners.

.5 Install metal-to-metal fastenings fabricated of the same metal, or of a metal which will not set up electrolytic action causing damage to fastenings or components, or both. Provide separation of dissimilar metals. Use non-corrosive or galvanized steel fastenings for exterior work, and where attached to, or contained within, exterior walls and slabs. Leave steel anchors bare where cast in concrete.

.6 Install work with fastenings or adhesives in sufficient quantity to ensure permanent secure anchorage of materials, constructions, components, and equipment. Space anchors within limits of load-bearing or shear capacity.

.7 Space exposed fastenings evenly and in an organized pattern. Keep number to a minimum. Provide exposed metal fastenings of same material, texture, colour and finish as metal on which they occur.

.8 For metal shelving, ensure manufacturer/supplier provides necessary support in accordance with “LCBO Standard Details.”

1.11 DIMENSIONS

.1 Check all dimensions at the site before fabrication and installation commences and report discrepancies to the Owner.

.2 Where dimensions are not available before fabrication commences, ensure that dimensions required are agreed upon between the parties concerned.

.3 Prior to commencing work, ensure that clearances required by jurisdictional authorities can be maintained.

.4 Wall thicknesses and openings shown on the drawings may be nominal only; ascertain actual sizes at the site.

.5 Verify dimensions of shop fabricated portions of the Work at the site before shop drawings and fabrications are commenced. The Owner will not accept claims for extra expense by reason of non-compliance with this requirement.

.6 Fabricate and erect manufactured items, shop fabricated items, and items fabricated on or off site, to suit site dimensions and site conditions.

.7 In areas where equipment is to be installed, check dimensional data on equipment to ensure that area and equipment dimensions are compatible with necessary access and clearance provided. Ensure that equipment supplied is dimensionally suitable for space provided.

.8 The mechanical and electrical drawings are intended to show approximate locations of mechanical apparatus, fixtures, equipment, piping and duct runs, electrical apparatus, fixtures, outlets, equipment, units, and conduit in diagrammatic form and wherein the mechanical and electrical items are not dimensioned, consider their locations to be approximate. Check the drawings and confer with the Owner to settle the actual locations of these items as may be required to suit aesthetic and site conditions. Such relocation shall be done without change to the Contract Price.
.9 Leave areas clear where space is indicated to be reserved for future equipment, including access to such future equipment.

.10 Whether shown on the Drawings or not, leave adequate space and provision for servicing of equipment and removal and reinstallation of replaceable items such as motors, coils and tubes.

1.12 **RELOCATION OF MECHANICAL AND ELECTRICAL ITEMS**

.1 The Owner and the Owner reserve the right to relocate outlets at a later date, but prior to installation, without additional cost to Owner, assuming that the relocation per outlet does not exceed 3000 mm from the original location. No credits will be anticipated where relocation per outlet of up to and including 3000 mm reduces materials, products and labour.

.2 Should relocations per outlet exceed 3000 mm from the original location the Contract Price will be adjusted in accordance with the provisions for changes in the Contract Documents.

.3 Alter the location of pipes and other equipment, without additional cost to the Owner, if approved, provided the change is made before installation.

.4 Make necessary changes, due to lack of coordination, as required and when approved, at no additional cost, to accommodate structural and building conditions.

**END OF SECTION**
1.01 PROGRESSIVE CLEANING

.1 Ensure that spatters, droppings, soil, labels, and debris are removed from surfaces to receive finishes, before they set up. Leave work and adjacent finished work in new condition.

.2 Use only cleaning materials which are recommended for the purpose by both the manufacturer of the surface to be cleaned and of the cleaning material.

.3 Maintain premises "broom clean" at all times. Vacuum clean interior areas immediately before finish painting commences.

.4 Do not burn or bury waste material at site. Remove as often as required to avoid accumulation.

.5 Do not allow waste material and debris to accumulate in an unsightly or hazardous manner. Sprinkle dusty accumulations with water. Provide containers in which to collect waste material and debris.

.6 Control lowering of materials. Use as few handlings as possible. Do not drop or throw materials from storeys above grade.

.7 Ensure that cleaning operations are scheduled to avoid deposit of dust or other foreign matter on surfaces during finishing work and until wet or tacky surfaces are cured.

.8 Each Section shall supply the Contractor with instructions for final cleaning of his work, and for inclusion in Project Data Book as specified in each trade Section and in Section 01 33 00.

1.02 FINAL CLEANING

.1 Final cleaning to take place the night before turn over to the LCBO. Coordinate exact times with LCBO Project Coordinator and Owner.

.2 Before final inspection, replace glass and mirrors that have been broken, damaged and/or etched during construction, or which are otherwise defective.

.3 In addition to requirements for cleaning-up specified in the General Conditions of the Contract, and in Section 01 11 00, include in the Work final cleaning by skilled cleaning specialists on completion of construction.

.4 Remove temporary protections and make good defects before commencement of final cleaning.

.5 Remove dust, stains, paint spots, soil, grease, fingerprints, and accumulations of construction materials, interior and exterior to the building. Perform cleaning in accordance with installer's instructions for each material. Final cleaning of new and existing work shall include:

   .1 Washing of floors.
   .2 Cleaning and polishing of
      .1 glass.
      .2 mirrors.
      .3 porcelain, enamel, and finish metals.
      .4 washroom accessories.
   .3 Vacuum cleaning of ceilings, walls, and floors.
   .4 Cleaning of floors.
.5 Buffing and application of two light coats of wax, each buffed, of vinyl composition floor tile.
.6 Cleaning of glazed wall surfaces.
.7 Cleaning of hardware, mechanical fixtures, lighting fixtures, cover plates, and equipment, including polishing of their finish metal, porcelain, vitreous, and glass components.
.8 Removing of visible labels left on materials, components, and equipment.
.9 Maintain cleaning until Owner has taken possession of building or portions thereof.

1.03 ADJUSTING
.1 Ensure that all components of assemblies fit snugly, accurately and in true planes, and that moving parts operate positively and freely, without binding and scraping.
.2 Verify that work functions properly, and adjust it accordingly to ensure satisfactory operation. Lubricate products as recommended by the supplier.

1.04 DEMONSTRATION AND INSPECTION OF PRODUCTS AND SYSTEMS
.1 Arrange for a demonstration of systems and operating Products upon the 100% completion of their installation and prior to certification for Substantial Performance.
.2 Include in the arrangements for the attendance of the Owner, Owner, jurisdictional authorities, and personnel assigned by the Owner for the operation of the systems and/or Products.
.3 Demonstrations shall be conducted by the Subcontractor responsible for the installation of the systems and/or Product, assisted by representatives of the manufacturer or supplier. All personnel conducting the demonstration shall be completely knowledgeable of all conditions of the operating, functioning and maintenance of the systems and/or Products.
.4 Owner's representative will acknowledge the successful completion of each demonstration on a form provided by the Contractor. The form shall be agreed to by the Owner, Owner and Contractor prior to demonstration and testing.
.5 Submit copies of letters from manufacturers of Systems and/or Products before making application for certificate of Substantial Performance to verify that the Products has been installed and connected correctly, and that it is operating in a satisfactory manner. The certification shall be based upon inspection and testing of the Products by competent technical personnel. Include in letter of certification the names of personnel conducting the testing and inspection, the methods of inspection utilized, and the location in the building of the Products certified.
.6 Following submission of letters of certification and their acceptance by the Owner, the owner shall have the right to use the Products on a trial basis and for instructing their personnel in its use.
.7 During demonstration of Products and Systems, advise Owner, Owner’s staff, and Owner of location of all equipment name plates. Name plates shall be installed as specified by Owner.
1.05 FINAL INSPECTIONS AND CLOSE OUT
   .1 Submit proposed closeout procedures and schedule of inspection to Owner for approval before final inspections commence.

1.06 SUBMITTALS
   .1 Submit maintenance manual, project record drawings, and extra stock as specified in Section 01 33 00 on application for certificate of Substantial Performance.
   .2 Submit other documents as required by specified take-over procedures.
   .3 Portion of final payment will be held back until all close out documents are received by LCBO.

END OF SECTION
## SECTION 02 41 19.
### SELECTIVE DEMOLITION INTERIOR

**PART 1  GENERAL**

### DESCRIPTION

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<tr>
<td>.1</td>
<td>Section includes labour, products, tools, equipment and services necessary for Selective Structural Demolition Work in accordance with the Contract Documents.</td>
</tr>
<tr>
<td>.2</td>
<td>Restore damaged or disturbed work.</td>
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### REFERENCES

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<tr>
<td>.1</td>
<td>Division 26</td>
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### SUBMITTALS

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<tr>
<td>.1</td>
<td>Submit a demolition plan for LCBO Project Coordinator’s review in accordance with Section 01 33 00. Demolition plan shall be prepared by a qualified Professional Engineer licensed in Ontario, if structural elements are to be removed or modified.</td>
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### MAINTAINING ACCESS/BUSINESS CONTINUANCE

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<tbody>
<tr>
<td>.1</td>
<td>Maintain and preserve Owner's access requirements to all part of retail area to remain in active operation.</td>
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<tr>
<td>.2</td>
<td>Do not close, obstruct, place or store material in Owner's active retail area. Conduct operations with minimum interference to store operations.</td>
</tr>
<tr>
<td>.3</td>
<td>Provide and erect barriers as required.</td>
</tr>
<tr>
<td>.4</td>
<td>Maintain clear access to fire exits at all times.</td>
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### INTERRUPTIONS TO OWNER’S OPERATION

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<tr>
<td>.1</td>
<td>There will be absolutely no interruptions to Owner's operations permitted. Execute machine and equipment movements, deliveries and removals at time or times that will permit uninterrupted Owner's operations in and around buildings, including parking, deliveries and site access and egress.</td>
</tr>
<tr>
<td>.2</td>
<td>Where Work under this Section cannot be conducted during LBCO Regular Hours of Operation, obtain written approval from LBCO Project Coordinator to perform Work outside of LCBO’s Regular Hours of Operation.</td>
</tr>
<tr>
<td>.3</td>
<td>Carry out work in such a manner to cause a minimum of noise or interference to adjoining operations and obtain approval of Owner before proceeding with any work which may cause interference.</td>
</tr>
<tr>
<td>.4</td>
<td>Service lines to be modified for fridges, computers and any other electrical equipment, to be kept in service throughout the construction period except for brief change-over periods.</td>
</tr>
<tr>
<td>.5</td>
<td>Maintain such services. Prepare sketches and detailed schedule of work, and submit to Owner for review.</td>
</tr>
<tr>
<td>.6</td>
<td>Ensure traffic flow of LCBO staff and public is not impeded by Work under this section.</td>
</tr>
<tr>
<td>.7</td>
<td>Provide separate areas for construction work traffic as required by Owner.</td>
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</tbody>
</table>
1.06 PHASING OF WORK
   .1 Confirm with LCBO Project Coordinator phasing of work.
   .2 Submit phases work schedule to LCBO Project Coordinator for approval, in accordance with Section 01 33 00.

1.07 PROJECT CONDITIONS
   .1 Existing conditions:
      .1 The Drawings indicate the physical dimensions, existing levels and similar items being indicated where known.
      .2 All information relative to existing conditions is offered to assist the Contractor in evaluation of the Work, but with no specific representation, either expressed or implied, as to completeness or accuracy. Be responsible for any deductions or conclusions made on the basis of this information and that of any additional site inspections, if made.
   .2 Prior to beginning construction work, survey and record the existing conditions to remain in place that might be affected by the demolition operations. After demolition operations are completed, survey the conditions again and restore existing facilities to their pre-demolition condition.
   .3 Protection:
      .1 Protect work to remain against damage. Repair or replace damaged work.
      .2 Maintain in service and protect from damage the existing utilities that are to remain.
      .3 Conduct demolition operations to insure safety of all persons and to prevent damage to existing structures and utilities, construction in progress, and other property.
      .4 Conduct demolition operations and remove debris to disposal areas in a manner to insure maximum safety and minimum interference with other operations.
      .5 Protect building floor and roof against damage from operations under this Section, including lifting, moving, rolling, etc., of materials. Use 13 mm thick plywood covers with ends mechanically joined, over floor for any such handling. Over roof, provide 19 mm thick plywood underlaid with 25 mm thick polystyrene insulation board adhered to same. Provide same when working from, or over roof surfaces. Be responsible for repairs for any damage caused.
      .6 Support affected structures and, if safety of structure being demolished or adjacent structures or services appears to be endangered, take preventative measures and then cease operations and notify Owner.
      .7 Remove and dispose of all temporary work when no longer required.
      .8 Should material resembling spray or trowel applied asbestos or other Toxic or Hazardous Materials be encountered in the course of demolition, stop work, take preventative measures, and notify Owner immediately.
.9 Prevent extraneous materials from contaminating air beyond application area, by providing temporary enclosures during demolition work.

.10 Cover or wet down dry materials and waste to prevent blowing dust and debris. Control dust.

.11 Provide temporary means of exit as required for affected exits or entrances.

.12 Protect existing air intakes for existing building ventilation system. Carry out all operation so as to prevent dust entering these intakes, using dampening abatement measures and protection.

.13 Pay particular attention to prevention of fire and elimination of fire hazards which would endanger the work or adjacent buildings and premises.

.14 Keep and maintain fire extinguishers throughout the work at all times to the approval of the Fire Marshall, and located at convenient and accessible points.

1.08 COORDINATION

.1 Mechanical:

.1 Coordinate the work to facilitate removal of walls and cutting of new openings. Disconnect, remove, cap off and relocate existing lines interfering with such work. Remove and/or relocate equipment as required.

.2 Carry out alterations to existing mechanical systems as shown on Drawings and as required to interconnect new and existing systems.

.3 Do all cutting, patching and making good of existing structure required to complete mechanical work.

.4 Refer to Mechanical Division for specific requirements.

.2 Electrical:

.1 Coordinate to facilitate demolition, removals, and alteration, in existing building, disconnecting, removing and/or relocating existing wiring, fixtures, devices interfering with such work.

.2 Carry out all alterations to existing electrical, signal, and fire alarm systems as shown on Drawings and as required to interconnect new and existing systems.

.3 Do all cutting, patching, and making good of existing structure and finishes as required to complete electrical work. Remove and replace existing acoustic tile ceilings where required. Be responsible for replacement of any tile soiled or marred as a result.

.3 Owner:

.1 The Owner will remove, handle, store and/or temporarily relocate the following from areas undergoing renovations and alterations.

.1 All furnishings, files, portable machines and office equipment, records, storage cabinets, adjustable shelving, pictures and art works, clocks, signage, and the like.

.2 Drapery and track.

.3 Communications equipment.
PART 2: PRODUCTS
2.01 EQUIPMENT
   .1 Leave machinery running only while in use, except where extreme temperatures prohibit shutting machinery down.

PART 3: EXECUTION
3.01 TEMPORARY PARTITIONS OR SCREENS
   .1 Take every possible precaution to prevent dust and dirt resulting from the contract operations from entering Owner's operational areas.

3.02 PROTECTION
   .1 Prevent movement, settlement or damage of structures, services, parts of existing building to remain, and Owner’s regularly scheduled operations.
      .1 Provide bracing, shoring and underpinning as required.
      .2 Repair damage caused by demolition as directed by, and at no cost to Owner.
   .2 Support affected structures and, if safety of area being demolished or adjacent structures and services appears to be endangered, take preventative measures, stop Work and immediately notify Owner.

3.03 SAFETY CODE
   .1 Do demolition work in accordance with Owner requirements.

3.04 DEMOLITION AND REMOVAL
   .1 Carry out demolition work, removal of existing materials and equipment, and disposal of resultant debris. Proceed with demolition of, or alteration to, any portion of existing building ONLY after thorough protection of existing building has been achieved.
   .2 During demolition operations prevent dust and dirt rising.
   .3 At end of each day’s work:
      .1 Leave work in safe condition so that no part is in danger of toppling or falling.
      .2 Prevent debris from blocking mechanical and electrical systems which must remain in operation.
      .3 Ensure that demolition work does not contribute to excess air and noise pollution.
      .4 Do not dispose of waste or volatile materials such as: mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers. Ensure proper disposal procedures are maintained throughout project.
.4 Cutting:

.1 Use power operated cutting devices. Chipping will not be allowed. Commence breaking out operations only after saw cutting of the cut-off points has been performed in order to prevent damage to remainder of structure and to obtain straight and clean junctions of new and existing works.

3.05 DISPOSAL OF MATERIAL AND DEBRIS

.1 Surplus Materials: Take ownership of surplus materials and remove from site daily, unless such materials are designated to be reused or turned over to Owner.

.2 Debris: Clean up debris as it is generated. Dispose of same at end of each day's work or place in waste disposal bins and empty on a regular basis.

.3 Do not burn material on site.

3.06 CLEANING

.1 Vacuum clean and wet mop floors and wipe clean wall surfaces free of dust on completion of work.

END OF SECTION
PART 1: GENERAL

1.01 REFERENCES

.1 ASTM A153, Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
.3 ASTM A653, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
.4 CSA B111, Wire Nails, Spikes and Staples.
.5 CAN/CSA G164-M, Hot Dip Galvanizing of Irregularly Shaped Articles.
.6 CAN/CSA O80 Series M, Wood Preservation.
.7 CSA O121-M, Douglas Fir Plywood.
.8 CAN/CSA O141, Softwood Lumber.
.9 CAN/CSA O151-M, Canadian Softwood Plywood.
.10 NLGA, Standard Grading Rules for Canadian Lumber, National Lumber Grades Authority.
.11 CAN/ULC-S102, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

1.02 QUALITY ASSURANCE

.1 Lumber identification: By grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
.2 Plywood, OSB and wood based composite panel construction sheathing identification: By grade mark in accordance with applicable CSA standards.
.3 Each piece of fire retardant treated lumber shall be shop marked with the pressure treatment brand and ULC monogram respectively, In accordance with CAN/CSA O80-M.

1.03 ROUGH CARPENTRY PROTECTION

.1 Prevent damage to rough carpentry as required to maintain carpentry as for duration of project and wood life span.
.2 Provide protection to Owner’s staff, Contractor’s employees and all others coming in contact with any rough carpentry work. Refer to SK01 - 06 10 00, for plywood wall protection detail.

PART 2: PRODUCTS

2.01 LUMBER MATERIALS

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

2.02 PANEL MATERIAL AND PLYWOOD SHEATHING
   .1 Douglas fir plywood (DFP): To CSA O121, standard construction.
   .2 Canadian softwood plywood (CSP): To CSA O151, standard construction.

2.03 ACCESSORIES
   .1 Rough hardware: Nails, bolts, screws, anchors, expansion shields, and other fastenings required to frame and fix rough carpentry as follows:
      .1 Nails, spikes and staples: To CSA B111.
      .2 Bolts: ASTM A325, 12 mm diameter unless indicated otherwise, complete with nuts and washers.
      .3 Screws: Countersunk head, full thread type.
      .4 Proprietary fasteners: Toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs recommended for purpose by manufacturer.
      .5 Galvanize rough hardware exposed to the atmosphere in accordance with CAN/CSA G164-M.
      .6 Fasteners for use in pressure treated wood: Provide hot dipped galvanized fasteners complying to ASTM A153 and connectors in accordance with ASTM A653, Class G185 for non-structural members. Provide type 304 or 316 stainless steel fasteners and connectors for use in Structural, pressure treated wood.

2.04 FINISHES
   .1 Galvanizing: To CAN/CSA-G164, for galvanized fasteners for exterior work.

PART 3: EXECUTION
3.01 PREPARATION
   .1 Treat surfaces of material with wood preservative, before installation.
   .2 Re-treat surfaces exposed by cutting, trimming or boring with liberal brush application of preservative before installation.
   .3 Treat curbs, nailers, sleepers and all other roof woodwork.

3.03 INSTALLATION
   .1 Install furring and blocking as required to space-out and support other work as required.
   .2 Align and plumb faces of furring and blocking to tolerance of 1:600.
   .3 Use fire retardant lumber for blocking/framing in ceiling spaces, partitions and bulkheads.
   .4 Install rough bucks, nailers and linings to rough openings as required to provide
grounds and rough backing for frames and other work.
.5 Install wood nailers, curbs and other wood supports as required and secure using galvanized fasteners.
.6 Install plywood backboards, primed and painted white on both sides, with fire retardant paint.
.7 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
.8 Countersink bolts where necessary to provide clearance for other work.
.9 Install rough carpentry to allow for expansion and contraction of the materials.
.10 Cut work into lengths as long as practicable and with square ends. Align, level, square, plumb, and secure work permanently in place. Brace work temporarily as required. Join work only over solid backing.
.11 Bore holes true to line and to same size as bolts. Drive bolts into place for snug fit, and use plates or washers for bolthead and nut bearings. Turn up bolts and lag screws tightly when installed, and again just before concealed by other work or at completion of Work.
.12 Install 19mm plywood blocking within partitions to support upper millwork cabinets as indicated on plan and to support the communications box located within the office (refer to sketch SKE-G7 within division 26 for extent of plywood at communications box).

3.05 CLEANING
.1 Clean rough carpentry on exposed and semi-exposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas.

3.06 SCHEDULES
.1 Provide electrical equipment and other backboards for mounting electrical and other equipment as required. Use 19 mm thick plywood on 19 x 38 mm furring around perimeter and at maximum 300 mm intermediate spacing.

END OF SECTION
PART 1: GENERAL

1.01 REFERENCES
.1 ANSI A208.1, Particleboard.
.3 CSA O121-M, Douglas Fir Plywood.
.4 CAN/CSA O141, Softwood Lumber.
.5 CSA O151, Canadian Softwood Plywood.
.6 CSA O153-M, Poplar Plywood.
.7 CAN/CGSB 11.3-M, Hardboard.
.8 Forest Stewardship Council (FSC).

1.02 SUBMITTALS
.1 Shop Drawings:
.1 Submit shop drawings in accordance with Section 01 33 00.
.2 Submit shop drawings of finish carpentry Work indicating Materials, thicknesses, sizes, finishes, hardware, wood species, grades, profiles, connection attachments, shop jointing, field jointing, reinforcing, anchorage, fastener types and sizes, location of exposed fastenings, mechanical and electrical service routes, service outlets, cutout locations, and sizes. Include erection drawings, plans, elevations, sections, and details as applicable.

1.03 QUALITY ASSURANCE
.1 Work of this Section to be executed by contractor with 5 years experience in finish carpentry work of comparable complexity and scope - members of AWMAC preferred. Submit proof of experience upon Consultant’s request.
.2 Fabricate finish carpentry Work in accordance with AWMAC Quality Standards, Premium Quality materials and installation unless otherwise indicated. Perform Work in accordance with the definition of Good Workmanship as defined in the AWMAC Quality Standards.

1.04 DELIVERY, STORAGE AND HANDLING
.1 Deliver, store, and handle finish carpentry in accordance with the AWMAC Quality Standards. Control the temperature and humidity in accordance with the AWMAC recommendations, before, during, and after finish carpentry delivery, and also during storage and installation.
.2 Receive finish hardware as required.
.3 Do not deliver wood materials to site until storage areas are completed, and conditions are such that no damage will occur to them while in storage and during installation.
1.05 SITE CONDITIONS

.1 Environmental Requirements:
   .1 Ensure that relative humidity in areas where wood materials are stored and
      installed do not exceed 55%.

PART 2: PRODUCTS

2.01 MATERIALS

.1 General:
   .1 All wood and wood products to be Forest Stewardship Council (FSC) Certified.
   .2 Provide rough hardware required for finish carpentry specified in this Section.
      Use non-corrosive hardware at exterior locations.
   .3 Moisture content of wood at time of installation shall be for interior locations at
      an average of 7%, with a permitted range of individual pieces of 5% to 9%; and
      for exterior locations at an average of 12%, with a permitted range in individual
      pieces of 10% to 15%.
   .4 Use only adhesives and fastenings that develop sufficient strength for intended
      use, are non-staining, and are unaffected by the environment to which exposed.

.2 Wood:
   .1 Grade mark softwood and hardwood lumber by the appropriate association
      under authority of the National Lumber Grades Authority.
   .2 Where not exposed to view, use wood of grades suitable for fabrication, utility
      and structural needs.
   .3 Where exposed to view, use Appearance Grade wood for structural lumber, as
      otherwise specified. Meet requirements of specified AWMAC Quality Grade
      Standard, where applicable.
   .4 Ensure that surfaces exposed to view and given a natural or stained finish are
      free from markings and stains caused by milling, treatment, storage, handling
      and other causes.
   .5 Ensure that veneered panels, and solid finger jointed and edge laminated
      members, where admissible for incorporation as approved, are matched for grain
      configuration and uniformity of colour throughout all surfaces exposed to view
      which are to receive a natural or stained finish.

.3 Plywood:
   .1 Douglas Fir: To meet specified requirements of CSA O121-M, Sanded Grade,
      Good Two Sides where both sides are exposed to view, and Good One Side
      where only one side is exposed to view.
   .2 Softwood: To meet specified requirements of CSA O151, Sanded Grade, Solid
      Two Sides where both sides are exposed to view, and Good One Side where
      only one side is exposed to view.
3. Hardwood: To meet specified requirements of CSA O115 veneer core, Type 11, smooth sanded, rotary cut face veneers, Architectural Grade, Mahogany, where exposed to view and Sound Grade where not.

4. Poplar: To meet specified requirements of CSA O153-M.

4. Particleboard: To meet specified requirements of ANSI A208.1, Grade M2.

5. Plastic Laminate:
   1. For Counter Tops: Type 1, General Purpose, 1 lb Standard, 1.5 mm thick.
   2. For Postformed Counter Tops: Type 2, Postforming, 2a Standard, 1.2 mm thick.
   3. Backing Sheet: In same thickness as face sheet.
   4. Surface Finish: Furniture or similar finish selected by Consultant, except for backing sheet.
   5. Colour: Selected by Consultant from manufacturer's standard solid colour range.

6. Hardboard: To meet specified requirements of CAN/CGSB 11.3-M, Type 2.

7. Cabinet Hardware:
   1. Pulls: Clear anodized, 8 mm diameter solid aluminum wire style with 32 mm projection and 90 mm centres.
   3. Drawer Slides: Ball bearing carrier, fully extendable, of quality to operate adequately for size and capacity of drawer.
   4. Pilaster Strips: Recessed, slotted, nickel plated steel, with shelf clips to match.

8. Finishes: Paint and stain finishes in accordance with Section 09 91 00, Painting and Finishing.

2.02 FABRICATION

1. General:
   1. Assemble fabricated millwork units in units as large as possible. Design units to fit together if site assembly is required.
   2. Incorporate services, fixtures and trim in fabricated millwork units as indicated on Drawings. Make necessary cut-outs to template information.
   3. Edge plywood where specified or indicated with solid wood to match face veneer, with profiled pressure glued edge joint and finished level with plywood surfaces.
   4. Shop install cabinet hardware for doors, shelves and drawers. Recess shelf standards unless noted otherwise.

2. Trim:
   1. Rout or groove backs of flat trim members.
   2. Kerf backs or wide flat members.

3. Fastening:
   1. Fasten assemblies with nails generally, but use screws or special fasteners at critical joints where strain, and excessive usage and shrinkage is anticipated, and where required by specified quality grade standards.
   2. Glue built-up assemblies as well as nailing and screwing.
.4 Set finish nails below finished surfaces.

.4 Plastic Laminate Facing:
.1 Apply plastic laminate for counters to poplar faced, phenolic bonded plywood, or to particleboard, minimum 19 mm thick, or as otherwise indicated on Drawings. Apply plastic laminate for doors, drawer fronts, gables, etc. of cabinets to minimum 19 mm thick wood core, Birch faced plywood.
.2 Bond plastic laminate to backing with urea formaldehyde adhesive, or by methods or equal or better quality recommended by the plastic laminate manufacturer.
.3 Seal edges of cut-outs with plastic laminate, or where concealed from view by other methods that will prevent entry of moisture into core.
.4 Apply plastic laminate backing sheet to core on back side of panels faced with plastic laminate.
.5 Ensure that both face and backing sheet have been sanded in same direction.
.6 Bond plastic laminate self-edges under pressure, and bevel and finish smooth finished corners.
.7 Round corners of holes cut through plastic laminate and file them smooth.
.8 Make joints only when lengths of plastic facing exceeds 3650 mm. Butt joints together, reinforce core with 36 mm hardwood blind splines, and lock together with Tite Joint fasteners located at a maximum of 75 mm from edges.

.5 Finishing:
.1 Finish each surface of millwork to specified quality grade standard where exposed or semi-exposed. Consider that all visible surfaces are exposed, including underside surfaces above 1200 mm from floor and interiors of fitments behind glass doors. Consider that underside surfaces within 1200 mm of the floor, top surfaces more than 1829 mm above the floor, interiors or fitments behind opaque doors and the backs of fitment doors are semi-exposed.
.2 Fine sand surfaces level and smooth after fabrication.
.3 Refer to Finish Schedule for special finishing.

PART 3: EXECUTION

3.01 EXAMINATION
.1 Before commencing installation, ensure that grounds, strapping, and other constructions and surfaces to which finish carpentry is installed are satisfactory for fitting and adequate for its securement.
.2 Take site measurements of construction to which finish carpentry installations must conform, and through which access must be made, before fabricated units are delivered to site, to ensure that adaptation is not required which would result in construction delay.

3.02 PREPARATION
.1 Protection: Ensure that finish carpentry materials are protected from damage and deterioration during installation, and otherwise until Project completion.
3.03 INSTALLATION

.1 General:
  .1 Backprime exterior and interior millwork specified in this Section immediately after delivery to site under Work of Section 09 91 00. Ensure that cut ends are primed. Scrape or sand smooth surfaces by this Section. Notify those who are responsible for backpriming in sufficient time to enable them to schedule their work.
  .2 Install finish carpentry plumb, level and straight, and fasten it securely to backing to support itself and anticipated superimposed loads.
  .3 Build finish carpentry into construction as indicated on Drawings or specified in other Sections of the Specifications, or both.

.2 Trim:
  .1 Install in single lengths except where material limitation makes impossible. Stagger joints where they occur and locate over solid backing for fastening.
  .2 Install wood bases after finish flooring is laid.

.3 Cutting and Fitting:
  .1 Cut mouldings with sharp true profiles.
  .2 Cope trim and mouldings at interior corners and at returns.
  .3 Mitre trim and mouldings at exterior corners. Glue and lock shop mitres that are over 100 mm from heel to point.
  .4 Scribe and join members accurately together, and to other surfaces, to fit tightly and with flat smooth surfaces. Install trim or filler panels to close gaps.

.4 Fastening:
  .1 Fasten finish carpentry with nails generally, but use screws or special fasteners at critical joints where strain, usage and excessive shrinkage is anticipated, and where specified quality grade standards require.
  .2 Blind nail unless impossible.
  .3 Set finish nails below finished surfaces to receive putty.

.5 Finishing:
  .1 Sand wood surfaces after installation to leave surfaces in true planes and free of machine or tool marks.

3.04 ADJUSTMENT AND CLEANING

.1 Adjust hinged doors and windows to swing freely and easily, to remain stationary at any point of swing, to close evenly and tightly against stops without binding, and to latch positively when doors and windows are closed with moderate force. Ensure that when doors are installed with hinged stiles adjacent, both doors open simultaneously without binding.

.2 Adjust hardware so that latches and locks operate smoothly and without binding, and closers act positively with the least possible resistance in use. Lubricate hardware if required by supplier's instructions.
.3 Ensure that doors equipped with closers operate to close doors firmly against anticipated wind and building air pressure, and to enable doors to be readily opened as suitable for function, location and traffic.

.4 Clean hardware after installation in accordance with supplier's instructions.

.5 Sand and clean woodwork to leave free from finish defects in any exposed part.

3.05 FINISH CARPENTRY SCHEDULE

.1 General:
This schedule does not necessarily incorporate listing of all finished carpentry items to be included by this Section, but only those items which require specific description. Ensure that all Drawings and all Specifications Sections, including those for architectural, mechanical and electrical work, are consulted to establish the limits of finish carpentry included in this Section.

.2 Glazed Wood Screens:
.1 To AWMAC Custom Quality Standard.
.2 Wood: Maple, Select Grade.

.3 Cabinets:
.1 To AWMAC Custom Quality Standard.
.2 Gables, Divisions and Bottoms: 19 mm hardwood plywood.
.3 Backs: 6 mm softwood plywood.
.4 Counters: Plastic laminate of 19 mm base, self-edges, 100 mm high splashbacks with self-edges, and returned on walls at ends.
.5 Doors: 19 mm hardwood plywood with faces flush with pilasters.
.6 Closer and Filler Strips: to match doors and pilasters.
.7 Shelves: 19 mm Hardwood plywood at 300 mm O.C., adjustable on both sides of gables, not to exceed spans of 915 mm.
.8 Drawers: Solid 19 mm fronts, with lock-shoulder joints, backs rebated into sides, bottoms rebated into fronts and sides and nailed to underside of backs, with drawer stops that may be released without tools, with 6 mm softwood plywood dust panels between drawers in tiers.
.9 Toe Space: 75 mm deep by 100 mm high.
.10 Plywood Edges: With edge strips where exposed to view, and on two long edges of adjustable shelves.
.11 Hardwood Plywood: Maple where shown.
.12 Softwood Plywood: Douglas Fir, CSA O121, or softwood, CSA O151.
.13 Solid Wood Members: Select, clear hardwood as shown on detail drawings except that drawer sides, backs, kicker strips and concealed framing may be White Pine.
.14 Install hardware as specified in this Section.

.4 Built-In Counters and Coat Closets:
.1 To AWMAC Custom Quality Standard.
.2 Wood: Maple, Select Grade, where shown.

END OF SECTION
1.01  SUBMITTALS
.1 Product Data: Submit manufacturer's installation instructions.
.2 Shop Drawings:
   .1 Submit shop drawings of fabricated items prior to fabrication. Shop drawings shall clearly show materials, door elevations, head, jamb and meeting stile details including full or partial gaskets, dimensions, thickness of metals/materials, primer and locations of openings.
   .2 Correlate doors with door numbers given on Door Schedule.
   .3 Submit 100mm x 100mm sample of tinted glass panel.
.3 Closeout Submittals:
   .1 Cleaning and Maintenance instructions.
   .2 Warranty.

1.02  PRODUCT HANDLING
.1 Deliver product in manufacturer's original unopened packages with label legible and intact.
.2 Examine doors upon delivery for damage. Verify doors were shipped on edge or in upright position as indicated on packaging by manufacturer.
.3 Note specific doors shipped in other than on edge or upright position on bill of landing and contact manufacturer.
.4 Store doors at project site on edge or in upright position and under cover following manufacturer's instructions printed on carton.

1.03  WARRANTY
1 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 the Contract Conditions.
.2 Warranty Period: Two-year, commencing on Date of Substantial Completion. Warranty covers repair or replacement of defective components or labour for two years after completion of impact traffic door installation.

PART 2:  PRODUCTS
2.01  ACCEPTABLE MANUFACTURERS
.1 Durulite Retailer Traffic Door, Model #6084 RD by Chase Industries Inc. (DBA Chase Doors) complete with metal frame
.2 Eliason Corporation, meeting specifications below.
.2 Finish/Colour:
   .1 Durulite Door: Sand.
2.02 FABRICATION

1. Construct doors in accordance with details and approved shop drawings, fully welded construction with no visible seams or joints on faces or vertical edges.

2. Door Panel shall be a monolithic, one piece, hollow shell of high-impact, cross-linked polyethylene with textured finish, minimum wall thickness of 3 mm, overall panel thickness of 48 mm. Bottom, leading and back edges to have molded-in keyways to accept gaskets.

3. Door Panel Core shall be of high-density, foamed-in-place, non-CFC urethane bonded to interior of the cross-linked polyethylene shell providing an insulating R factor of 10.83.

4. Standard Hinge System:
   1. Upper hinge: self closing "V" cam design. The roller assembly design shall allow up and down and back and forth adjustments to the door. Upper hinge seal shall be black PVC with a flexible nylon reinforced vinyl skirt.
   2. Lower hinge: shall be pillow block design of ductile iron with UHMW sleeve and ductile iron lower hinge adapter which has provision for mounting an optional spring assist.
   3. Hinge Shaft: 33 mm diameter inserted with screws through tubular steel spine which is foamed -in-place during fabrication and runs full length of door.

5. Vision Panel:
   1. Single pane window to be 300 mm W x 762 mm H ADA ‘tinted’ type-20% light transmission. This shall be the total tint of both window panes per individual door panel (if applicable to supplier). Window glazing shall be 6 mm thick polycarbonate with aluminum frame recessed a minimum of 3 mm from the face of the panel. Bottom of vision panel shall be located minimum 900mm above finished floor.

6. Gaskets:
   1. Gaskets shall be 60 to 80 durometer extruded santoprene fitted into matching, pre-formed gasket key and held by friction. Gaskets have wings which seal against rounded edges of the door.
   2. Door shall be fully gasketed. Leading edge shall be blade-type. Bulb type gasket to be used on the bottom and between the back of the door and jamb. Top seal is a coextruded PVC extrusion with flexible PVC gasket.
   3. Gasket to match door colour.

7. Bumpers:
   1. From bottom of the door to underside of door window, of extra heavy duty polyethylene spring bumpers with 75 mm projection.
   2. Bumpers to be curled on warehouse side and flat on retail side.

8. Lower hinge guards on both sides of door

9. Tolerances: Width and height of each panel: +/- 6 mm.
PART 3 EXECUTION

3.1 EXAMINATION
.1 Verify that openings are ready to receive work and opening dimensions and clearances are as indicated on drawings.
.2 Coordinate with responsible entity to perform corrective work on unsatisfactory conditions.
.3 Commencement of work by installer is acceptance of opening conditions.

3.2 INSTALLATION
.1 Follow manufacturer's instructions. Coordinate sequence of installation with other work to avoid delays.
.2 Provide and install steel door frames.
.3 Install doors accurately in their respective frames with clearances, necessary anchors, hardware and accessories according to the manufacturer's data and as specified.
.4 Clean and lubricate operating parts.
.5 Adjust doors to open and close smoothly and freely without binding
.6 Check seals to ensure proper fit.

3.3 CLEANING
.1 Clean surfaces soiled by work as recommended by manufacturer.
.2 Remove surplus materials and debris from the site.

END OF SECTION
NOTE: THIS DETAIL IS ISSUED TO ILLUSTRATE THE PROPOSED FRAMING AROUND THE RETAIL TO WAREHOUSE IMPACT DOOR, IN A RETROFIT APPLICATION ONLY.
DOUBLED-UP HEAVY GAUGE STRUCTURAL STEEL STUDS. FOR DOUBLE DOORS & LARGER SPANS, USE TRIPLE STUDS. (REFER TO TABLE BELOW FOR PLYS & GAUGES) IN A NON-RETROFIT APPLICATION, GENERALLY A 5"x5" H.S. COLUMN IS USED, EITHER SIDE OF DOOR.(REFER TO DRAWINGS)

HEAVY GAUGE DOUBLE-STRUCTURAL STUDS. SIZES MAY VARY DEPENDING ON THE WALL THICKNESS. STUDS TO BE SECURELY FASTENED TO FLOOR AND ABOVE, AT U/S OF STRUCTURE.

STUD HEIGHT/GAUGE TABLE

<table>
<thead>
<tr>
<th>Height</th>
<th>Single Door Opening &lt;4'-6&quot;</th>
<th>Double Door Opening &lt;8'-0&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>8'</td>
<td>DBL. Stud each side, 18 gauge</td>
<td>Triple Stud each side, 18 gauge</td>
</tr>
<tr>
<td>10'</td>
<td>DBL. Stud each side, 18 gauge</td>
<td>Triple Stud each side, 18 gauge</td>
</tr>
<tr>
<td>12'</td>
<td>Triple Stud each side, 18 gauge</td>
<td>Triple Stud each side, 16 gauge</td>
</tr>
<tr>
<td>14'</td>
<td>Triple Stud each side, 18 gauge</td>
<td>Four Ply Stud each side, 14 gauge</td>
</tr>
<tr>
<td>16'</td>
<td>Triple Stud each side, 16 gauge</td>
<td>Four Ply Stud each side, 14 gauge</td>
</tr>
</tbody>
</table>

LINTEL BEAM STUDS TO MATCH DOOR JAMB PLYS AND GAUGES.
PART 1: GENERAL

1.01 REFERENCES

.1 ASTM C475, Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
.2 ASTM C645, Specification for Non-Load Bearing (Axial) Steel Studs, Runners (Tracks), and Rigid Furring Channels for Screw Application of Gypsum Board.
.3 ASTM C754, Specification for Steel Framing Members to Receive Screw-Attached Gypsum Board.
.4 ASTM C840, Specification for Application and Finishing of Gypsum Board.
.5 ASTM C1002, Specification for Steel Drill Screws for the Application of Gypsum Board or Metal Plaster Bases.
.6 ASTM C1047, Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base
.7 ASTM C1396, Specification for Gypsum Board.

1.02 DESIGN REQUIREMENTS

.1 Design ceiling suspension system in accordance with manufacturer's printed directions and ASTM C754.
.2 Design ceiling system for adequate support of electrical fixtures as required by the current bulletin of the Electrical Safety Authority.
.3 Design hanger anchor and entire suspension system static loading not to exceed 25% of their ultimate capacity including lighting fixture dead loads.
.4 Design suspension system to support weight of mechanical and electrical items such as air handling boots and lighting fixtures, and with adequate support to allow rotation/relocation of light fixtures.
.5 Design subframing as necessary to accommodate, and to circumvent, conflicts and interferences where ducts or other equipment prevent the regular spacing of hangers.

1.03 SUBMITTALS

.1 Product Data: Submit Product Data indicating performance criteria, compliance with appropriate reference standard, characteristics and limitations.
.2 Shop Drawings: as requested by Owner
.3 Certifications: Submit written certification stating that suspended ceiling system is designed for adequate support of electrical fixtures as required by the current bulletin of the Electrical Safety Authority.
PART 2: PRODUCTS

2.01 MATERIALS

.1 Standard board and Type ‘X’: To ASTM C1396, 13 mm, 16 mm and 19 mm thick as indicated on drawings, 1200 mm wide × maximum practical length, ends square cut, edges squared. As manufactured by CertainTeed, CGC Inc., or G-P products.

.2 Water resistant board: To ASTM C1396 treated to resist moisture, 13 mm thick, 1200 mm wide × maximum practical length. As manufactured by CertainTeed, CGC Inc., or G-P products, or approved alternate.

.3 Metal furring runners, hangers, tie wires, inserts, anchors: To ASTM C645, galvanized.

.4 Drywall furring channels: 0.5 mm (26 ga.) core thickness galvanized steel channels for screw attachment of gypsum board.

.5 Non-loadbearing channel stud framing: To ASTM C645, stud sizes and gauges as indicated, roll formed, hot dipped galvanized steel sheet, for screw attachment of gypsum board. Knock out service holes at 450 mm centres. For load bearing studs, at retrofit of an Impact Door.

.6 Floor and ceiling tracks: To ASTM C645, in widths to suit stud sizes, 32 mm flange height.

.7 Insulating strip: Rubberized, moisture resistant 6 mm thick cork or foam strip, 50 mm wide, with self sticking adhesive on one face, lengths as required.

.8 Batts not required.

.9 Security mesh: Not applicable

.10 Waterproof membrane: Not applicable

.11 Steel drill screws: To ASTM C1002.

.12 Casing beads, corner beads, control joints and edge trim: To ASTM C1047, ABS or PVC or metal, zinc-coated by hot-dip process, 0.5 mm (26 ga.) base thickness, perforated flanges, one piece length per location.

.13 Joint compound: To ASTM C475, asbestos-free.

PART 3: EXECUTION

3.01 ERECTION

.1 Do application and finishing of gypsum board in accordance with ASTM C840 except where specified otherwise.

.2 Install work level to tolerance of 1:1200.

.3 Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers, grilles.

3.02 INSTALLATION OF FRAMING

.1 Align partition tracks at floor and ceiling and secure at 400 mm o.c. maximum.
.2 Install dampproof course under stud shoe tracks of partitions on slabs on grade.

.3 Place studs vertically at spacing indicated and not more than 50 mm from abutting walls, and at each side of openings and corners. Position studs in tracks at floor and ceiling. Cross brace steel studs as required to provide rigid installation to manufacturer's instructions.

.4 Erect metal studding to tolerance of 1:1000.

.5 Co-ordinate simultaneous erection of studs with installation of service lines. When erecting studs ensure web openings are aligned.

.6 Co-ordinate erection of studs with installation of door and sidelight frames and special supports or anchorage for work specified in other Sections.

.7 Provide two studs extending from floor to ceiling at each side of openings wider than stud centres specified. Secure studs together, 50 mm apart using column clips or other approved means of fastening placed alongside frame anchor clips.

.8 Erect track at head of door to accommodate intermediate studs. Secure track to studs at each end, in accordance with manufacturer's instructions. Install intermediate studs above and below openings in same manner and spacing as wall studs.

.9 Frame openings and around built-in equipment, cabinets, access panels, on four sides. Extend framing into reveals. Check clearances with equipment suppliers.

.10 Provide blocking or furring channel secured between studs for attachment of fixtures as and where required.

.11 Install steel studs or furring channel between studs for attaching electrical and other boxes.

.12 Maintain clearance under steel deck to avoid transmission of structural loads to studs. Use extended leg ceiling tracks or double track slip joint.

.13 Install continuous insulating strips to isolate studs from uninsulated surfaces. For renovation project, use double structural studs at impact doors

**3.03 INSTALLATION OF GYPSUM BOARD**

.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 150 mm oc.

.2 Install all furring and runner channels radius to suit ceilings shown on reflected ceiling plan. Construct bulkheads and maintain curvatures as shown on the drawings.

.3 Do not apply gypsum board until bucks, anchors, blocking, electrical and mechanical work are approved.

.4 Apply single layer gypsum board to metal furring or framing using screw fasteners. Maximum spacing of screws 300 mm oc.

.5 Apply water resistant gypsum board where wall tiles to be applied and at core area. Apply water-resistant sealant to edges, ends, cut-outs which expose gypsum core and to fastener heads. Do not apply joint treatment on areas to receive tile finish.

.6 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated.
Control Joints:
.1 Construct control joints of two back-to-back casing beads set in gypsum board facing and supported independently on both sides of joint. Provide continuous dust barrier.
.2 Install control joints straight and true.
.3 Install control joints at 9000mm maximum spacing in continuous runs.
.4 Install control joints at steps in walls and bulkheads, at areas of anticipated deflection, twist, creep and sway, and at walls subject to vibration.
.8 Construct expansion joints at building expansion joints.
.9 Install access doors to electrical and mechanical fixtures specified in respective Sections, and as required for concealed mechanical and electrical installation.
.10 Rigidly secure frames to furring or framing systems.
.11 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.
.12 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.
.13 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.
.14 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.
.15 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for surface finish.

3.05 JANITOR ROOM CONSTRUCTION
.1 Wrap waterproof membrane under stud and track and up wall to protect steel from corrosion from incidental water exposure.
.2 Ensure flush transition between any board thicknesses which vary.

3.06 REPAIR
1. Make good cut-outs for services and other work, fill in defective joints, holes and other depressions with joint compound.
2. Make good defective work, and ensure that surfaces are smooth, evenly textured and within specified tolerances to receive finish treatments.

END OF SECTION
**PART 1: GENERAL**

**1.01 REFERENCES**

.1 CAN/CGSB-1.188, Filler, Block, Emulsion Type.
.2 CAN/CGSB-85.100, Painting.
.3 Master Painters Institute (MPI), Painting Specification Manual.

**1.02 SUBMITTALS**

.1 Not applicable

**1.03 QUALITY ASSURANCE**

.1 Subcontractor Qualifications: Perform painting and finishing specified in this Section only by a Subcontractor who has adequate equipment and skilled tradesmen to perform Work expeditiously, and is known to have been responsible for satisfactory applications similar to that specified during a period of at least the immediate past five years.
.2 The best practices specified in CAN/CGSB-85.100-M, Painting, shall govern for painting materials, methods and procedures, unless specified otherwise in this Section.

**1.04 DELIVERY, STORAGE AND HANDLING**

.1 Deliver to site each container sealed, and labelled with manufacturer's name, catalogue number or brand name, colour, formulation type, reducing instructions, and reference standard specification number if applicable.
.2 Store only acceptable Project materials at site, and in an area specifically set aside for purpose that is locked, ventilated, maintained at a temperature of over 4 deg.C. and protected from direct rays of sun.
.3 Ensure that health and fire regulations are complied with in storage area. Provide carbon dioxide fire extinguishers of 20 lbs. minimum capacity in each storage area while materials are contained within.

**1.05 SITE CONDITIONS**

.1 Apply finishing materials only when air and surface temperatures exceed 4 deg. C. except for 7 deg. C. for latex paint at interior locations and 21 deg. C. for lacquers and enamels.
.2 Do not apply exterior finishes in direct sunlight that raises surface temperatures above that for proper application and drying, nor in rainy, foggy or windy weather.
.3 Do not apply finishes when relative humidity is over 85%, when condensation has formed or is likely to form, nor immediately following rain, forms or formation of dew.
.4 Do not apply finishes when dust is begin raised.
.5 Do not apply finishes on porous surfaces such as concrete, gypsum board, masonry, that contain over 12% moisture.
.6 Do not finish wood surfaces that contain over 15% moisture.
.7 Ensure that all areas in which paint is applied are well-ventilated and broom clean.
SECTION 09 91 00
PAINTING AND FINISHING

1.06 MAINTENANCE MATERIALS
   .1 Submit to LCBO Project Coordinator Product data, in accordance with section 01 33 00, for each finish painting material applied. Leave no containers of any finish painting material upon project completion.

PART 2: PRODUCTS

2.01 MATERIALS
   .1 All products applied on site (internally) to be verified as Low VOC. Only products applied off-site may be without Low VOC designation.
   .2 Refer to Finish Schedule for colour selection.
   .3 Only products of manufacturers specified in Finish Schedule are acceptable provided that in each case they are approved on basis of samples submitted.
   .4 Only "Premium Grade" products produced by MPI accepted manufacturers are acceptable. Materials, such as oils, shellacs, putties, thinners, and other materials required for specified finishes shall be of the best quality produced or recommended by the manufacturer approved for supply of finish materials in which they are incorporated.
   .5 Products within each MPI paint system code: From single manufacturer.
   .6 Use only exterior grade materials for exterior surfaces.

2.02 MIXING
   .1 Paints shall be supplied ready-mixed unless otherwise specified. Do not incorporate adulterants.
   .2 Mix specified paste or powder coatings, or those that are file-catalysed at job, to meet specified requirements of manufacturer.
   .3 Pigment shall be well ground to form a soft paste in the vehicle during its storage life. Paddle mixing at job shall evenly disperse paste throughout mixture to ensure paint of smooth-flowing, easy brushing, consistency.
   .4 Mix paints only in mixing pails placed on suitably sized, non-ferrous or oxide resistant metal pans.

PART 3: EXECUTION

3.01 EXAMINATION
   .1 Verify that specified environmental conditions are ensured before commencing painting and finishing preparation and applications.
   .2 Ensure that surfaces to receive finishing materials are satisfactory for specified materials; have been provided by other Sections as specified will not adversely affect execution, permanence, or quality of applications; and can be put into an acceptable condition by means of preparation specified in this Section.
   .3 Test all surfaces for moisture content with an electronic moisture meter. Test surfaces of materials containing lime for acid-alkali balance.
.4 Maintain at site at all time until applications are completed a moisture meter, hygrometer and thermometer to verify surface and environmental conditions.
.5 Defective painting and finishing applications resulting from failure to properly test surfaces and/or from application to unsatisfactory surfaces will be considered the responsibility of this Section.

3.02 PROTECTION
.1 Cover or mask surfaces adjacent to those receiving treatment and finishing to protect materials and surfaces installed by other Sections from damage and soil. Mask instruction and specification plates attached to equipment being painted.
.2 Take particular care in storage and mixing areas that floors are protected by tarpaulins and metal pans.
.3 Place cloths and other disposable finishing materials, that are a fire hazard, in closed metal containers containing water, and remove from building every night.
.4 Ensure that the appropriate trades remove from finished surfaces store and reinstall after finishing is completed finish hardware, switch and receptacle plates, escutcheons, luminaire frames and similar items.
.5 Porous materials from which soil from finish materials cannot be completely removed shall be replaced by this Section.
.6 Post "No Smoking" signs and ensure that spark-proof electrical equipment is used in areas where inflammable painting materials are being applied.
.7 Post "Wet Paint" signs throughout freshly finished areas and remove when finishes are dry.

3.03 PREPARATION
.1 General:
.1 Vacuum clean interior areas immediately before finishing Work commences.
.2 Remove from surfaces grease, oil dirt, dust, ridges, and other soil and materials that would adversely affect the adhesion or appearance of finish coatings.
.3 Remove rust from damaged surfaces primed by other Sections and reprime.
.4 Touch up damaged prime coats on shop primed metals with same priming material. Feather out edges of hop coat and smooth repair coat into shop coat surfaces.
.5 Finish, patch and smooth surfaces to remove cracks, holes, ridges, and similar blemishes.
.6 Neutralize highly alkaline surfaces with a neutralizing wash of 4% solution of zinc sulphate. Brush off residue before painting.
.7 Scrub mildewed surfaces with a solution of tri-sodium phosphate, bleach with a solution of one part sodium hypochlorite (Javex) to three parts water, and rinse with clear water.
.2 Metal Surfaces:
  .1 Unprimed Steel: Remove weld flux and scale with scrapers, wire brushes, wire power wheels, sandblasting, chipping, or grinding as may be required. Finish surfaces smooth, and remove alkali contamination from weld flux with phosphoric acid solution. Wash with solvent.
  .2 Primed Steel: Before touch-up of prime paint, smooth out surface irregularities; clean weld joints, bolts, nuts and damaged areas with phosphoric acid solution; and wash with solvent.
  .3 Galvanized Steel: Wash thoroughly with mineral spirits, and wipe dry with completely clean cloths. Apply galvanized steel primer: Alternately, phosphatize, or apply one coat of etch type primer except where either of these treatments are specified in another Section.

.3 Wood:
  .1 Sand finish surfaces smooth with No.00 sandpaper.
  .2 Clean soiled surfaces with an alcohol wash.
  .3 Wipe off dust and other loose dirt, or vacuum clean before application of coatings.
  .4 Seal knots, pitch, and sapwood with two coats of orange shellac where painted, or an application of special sealer. Use only a clear sealer that is compatible with transparent finish.
  .5 After prime coat is dry and sanded, fill nail and screw holes, and cracks with wood filler, or with putty. Colour fillers to match wood or stain if surfaces are given clear final coatings. Smooth, sand and prime fillers when set.

3.04 APPLICATION
  .1 General:
    .1 Perform painting and finishing specified in this Section under supervision of experienced foremen, with clean equipment designed for purpose used, and under directions and specific recommendations of manufacturers whose materials are used.
    .2 Before commencing applications, arrange for a site meeting, at which conditions of surfaces and possible adaptations to suit, and use of materials and application procedures shall be discussed between Contractor, Painting Subcontractor, Consultant, and representatives of materials manufacturers.
    .3 Consult with Consultant before proceeding with application of finishes to surfaces for which a formula is not given in Specifications.
    .4 Finish glazing rebates before glazing commences.
    .5 Do not paint caulked joints.
    .6 Remove spatters from adjacent surfaces, including glass, before they set up, and by methods not harmful to the surfaces.
Finishing Methods:
.1 Apply finishing materials at proper consistency, free from brush marks, sags, crawls, streaks, runs, laps, skips, voids, pinholes, missed areas, and other perceptible defects, and with even colour, sheen and texture.
.2 Apply finishing materials to ensure full coverage, and at a rate not to exceed that recommended by the manufacturer for the applicable surface.
.3 Make clean true junctions with no overlap between adjoining applications of finish coatings.
.4 Leave all parts of mouldings and ornaments clean and true to details with no undue amount of coating in corners and depressions.
.5 Use materials of a single manufacturer in each coating system.
.6 If evidence is inconclusive that a specified coat has been applied, apply a full coat to the areas concerned.
.7 Where exposed to view, fill holes and open grain of exposed plywood edges with wood filler following prime coats. Smooth and sand before applying next coat.
.8 Paint glazing compound only after it is set and skimmed over. Remove dirt and grease from compound before painting, and without breaking skin.

Staining:
.1 Pad filler well into pores of open-grained wood with a circular rubbing motion. Clean surplus off by rubbing across the grain before filler dries.
.2 Tint filler to match wood.
.3 Stain wood to obtain a uniformity of colour over entire stained surfaces. Adjust stain colours as necessary to obtain the same colour over variations between wood pieces.

Existing Surfaces:
.1 Apply two final finish coats to match the existing painted surfaces.
.2 Primer is required only on surfaces bared by preparation.

ADJUSTMENT AND CLEANING
.1 Touch up and refinish minor defective applications.
.2 Refinish entire wall, ceiling or similar surfaces where finish is damaged or not acceptable.
.3 Remove spilled or splattered finish materials from surfaces if installations provided by other Sections. Do not mar surfaces while removing.
.4 Leave storage and mixing areas clean and in same condition as equivalent spaces in Project.

PAINTING AND FINISHING SCHEDULE
.1 General:
.1 This Section shall include painting and/or finishing of all surfaces exposed to view that have been installed with no final finish provided by the installer, unless otherwise specified.
.2 Finish interior surfaces, including objects within each area unless otherwise excluded, as indicated on Room Finish Schedule and Finish Schedule.

.3 Wall surfaces partially finished with other finish materials shall have remainder of surfaces finished as for surrounding surfaces.

.4 Finish equipment, panels, fitments, services, structure, attachments, accessories, prime coated hardware, or similar appurtenances on or near finished surfaces to match finish of the surfaces.

.5 Finish edges and tops of trim, projecting ledges, fitments, cupboards, and similar surfaces to match adjacent surfaces, whether or not they are above or beyond sight lines.

.6 Finish exposed metal housings of weatherstripping and door seals and door closers to match surface to which they are attached and which are painted or finished by this Section.

.2 Doors and Drawers:

.1 Finish wood edges of doors and drawers and edges of metal doors exposed to view with the same number of coats of material and colour as adjoining surface finishes. Where not exposed to view, finish with two coats of varnish.

.2 Paint exposed plywood edges of doors to match stained finish.

.3 Finish interior of drawers with two coats of natural varnish, except when prefinished.

.3 Include finishing of the following surfaces by this Section

.1 Steel lintels where exposed to view.

.2 Doors.

.4 Colours:

.1 Colours of paints, including shades of stains, shall be applied to match approved samples.

3.07 FINISH FORMULA SCHEDULE

.1 Exterior Primed or Galvanized Metal:

.1 Formula EXT 5.3B

Alkyd, High Gloss White Finish:

1st. Coat: Cementitious Primer.


.2 Interior Galvanized Metal:

.1 Formula INT 5.3C

Alkyd, Semi-Gloss White Finish:

1st. Coat: Cementitious primer.


.5 Interior Painted Wood:
   .1 Formula INT 6.3A
      High Performance Architectural Latex, Low Sheen Finish, Low VOC:

END OF SECTION
PART 1:  GENERAL
1.01  REFERENCES
   .1  ASTM A653/A653M, Specification for Steel Sheet, Zinc-Coated (Galvanized) or 
       Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
   .2  CAN/CGSB-11.3-M, Hardboard.
   .3  CAN/CSA-G40.20/G40.21-M, General Requirements for Rolled or Welded 
       Structural Quality Steel/ Structural Quality Steels.
   .5  CSA W59-M, Welded Steel Construction (Metal Arc Welding).

PART 2:  PRODUCTS
2.01  MATERIALS
   .1  Structural shapes, plates, and similar items: Cold rolled steel to CAN/CSA-
       G40.20/G40.21-M, Grade 400W.
   .2  Hollow structural sections: Cold rolled steel to CAN/CSA-G40.20/G40.21-M, Grade 
       350W, Class H.
   .3  Steel: Cold rolled steel to CAN/CSA-G40.20/G40.21, Grade 300W.
   .4  Fasteners: Conforming to ASTM A653/A653M bolts, nuts, washers, rivets, lock 
       washers, anchor bolts, machine screws and machine bolts Z275 zinc coated.
   .5  Welding materials: to CSA W48.1-M and CSA W59-M.
   .6  Backing sheets: Hardboard to CAN/CGSB-11.3-M, tempered, composition face, 
       finished on both sides in accordance with Section 09 91 00 to match shelving finish.

2.02  FABRICATION
   .1  The following component descriptions are based on general requirements and are 
       considered minimal. Slight variations in profiles finishes and fixturing are acceptable 
       providing the Owner has given approval to that manufacturers shelving product line, by 
       prequalification and testing.
   .2  Standards (Uprights): Perimeter post heights 2134 mm, island post heights 990 mm. 
       Brake form posts out of 2.6 mm thick (12 ga.) prime cold rolled steel. Shelving spacing 
       380 mm from top of shelf to top of shelf. Post shall be formed of 2 die-formed channels 
       spot welded together to achieve maximum strength and minimum deflection.
   .3  Shoes: Two 2.3 mm thick (13 ga.) 190 mm high die punch and formed steel plates with 
       reinforcing rib spot welded together. Shoes shall be equipped with double 4 prong 
       position system and locked in place for positive assembly with two 9.5 mm machine 
       bolts.
   .4  Levellers: Each post and shoe shall be equipped with adjustable floor levellers for easy 
       adaptation to floor irregularities.
SECTION 10 56 13
SHELVING

.5 Shelves:
.1 Each unit of perimeter shelving shall contain a base shelf plus 4 adjustable shelves.
.2 Each unit of island shelving shall contain a base shelf plus 2 adjustable shelves, unless indicated otherwise on drawings.
.3 Shelves shall be in increments of 915 mm or 1220 mm lengths to adapt to any wall measurement. Shelves shall be fabricated of 0.9 mm (20 ga.) prime cold rolled steel with 1.2 mm (18 ga.) deck reinforcement and 1.8mm (14 ga.) horizontal rear reinforcement, integral to shelves.
.6 Post (Uprights) Covers: Top cap all raw edges of vertical posts with 0.9 mm (20 ga.) steel caps to match colour of shelves.
.7 Kick Plates: Kick plates shall be manufactured of 1.2 mm (18 ga.) steel and shall be adjustable.
.8 Strapping and Supports: Shelving manufacturer/supplier shall be responsible for any strapping and supports required to secure their product to the perimeter walls.
.9 Where it may be necessary to cut shelving to fit around obstructions (such as columns), manufacture/supplier shall provide adequate perimeter support as identified in “LCBO Standard Details.”

2.03 FINISHES
.1 Not applicable. Supplied by the LCBO.

PART 3: EXECUTION
3.01 INSTALLATION
.1 Field assembly and workmanship shall be carried out by the manufacturers forces. Work shall be of the best quality and completed by workmen skilled in this trade and direct employees of the shelving manufacturer.
.2 All units shall be free standing and erected, true, level, plumb and stable.
.3 Contractor is responsible for checking site dimensions before installation to ensure proper fit of materials.
.4 All island and perimeter shelving units shall be securely anchored and bolted together in runs to form truss for extra strength and stability. Units shall be self supporting and free of movement. Individual units to have top cap braced to upright.
.5 Install kick plates so that bottom of kickplate lines up with bottom of shoe, with gap at bottom.
.6 Where perimeter shelving is located directly against a wall, install backing sheet securely anchored to back of uprights, plumb, true, and free of undulations.
.7 Secure perimeter shelving to back wall with strap anchors and fasteners to withstand lateral forces as per engineer stamped shop drawings.
.8 Where it may be necessary to cut shelving to fit around obstructions (such as columns), manufacture/supplier shall provide adequate perimeter support as identified by LCBO Project Coordinator.

3.02 CLEANING

.1 After installation of shelving remove all cartons, skids surplus materials and garbage. Thoroughly clean all floors including washing to bring floors and other surfaces to a condition that existed prior to shelving installation. All shelving is to be washed cleaned so shelves are in a ready state for stocking.

END OF SECTION
SECTION 11 41 20
PREFAB WALK-IN COOLERS AND FREEZERS

PART 1: GENERAL

1.01 REFERENCES

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

1.02 SUBMITTALS

.1 Submit shop drawings indicating:
   .1 Construction details of all equipment by drawings and manufacturers literature.
   .2 Roughing-in requirements for mechanical and electrical services.
   .3 Installation details.
   .4 Shop drawings should include a wiring schematic drawing.
.2 Commissioning/Start-Up Report:
   .1 Submit start up report indicating refrigerant type/quantity, degrees of subcooling, degrees of superheat, compressor amp draw, site glass observation, suction pressure, suction temperature, discharge pressure, discharge temperature and ambient temperature.
   .3 Provide operation and maintenance data for incorporation into manual.

1.03 QUALITY CONTROL

.1 Qualifications: Equipment shall be manufactured and installed, by a company having personnel skilled in the manufacturing and installing of prefab walk-in freezers and coolers and having continuous proven experience within last five years.

1.04 WARRANTY

.1 Extended Warranties:
   .1 Submit a warranty for the fabrication and installation of units specified in this Section as specified in the General Conditions to the Contract, except that warranty period is extended to five years for compressor parts.
PART 2: PRODUCTS

2.01 MANUFACTURERS

.1 Walk-in cooler
   All prefabricated walk-in cooler work in this section shall be by the refrigeration sub-
contractor.

.2 Condenser/Compressor and Evaporators:
   .1 Keeprite Refrigeration
      159 Roy Blvd.
      Brantford, Ontario
      N3R 7K1
      519-751-0444

       a) Condensing Unit : KEZ series
       b) Evaporator Coil : KLV series complete with white finish

2.02 MATERIALS

.1 Stainless steel sheet: To ASTM A167, type 302/304 with No. 4 finish.
.2 Galvanized steel sheet: Commercial grade to ASTM A653/A653M, with zinc coating (galvanized).
.3 Panel sheets: Prefinished steel colour Antique Linen on interior and White on exterior.
.4 Aluminium sheet: Utility sheet with "stucco" pattern finish on exterior panels and smooth finish on interior panels.
.5 Galvalume: Steel sheet with aluminium zinc alloy coating with baked on polyester finish.
.6 Sealant: To CAN/CGSB-19.13, colour to match panel.
.7 Isolating coating: To manufacturer’s recommendations.
.8 Insulation for panels and screeds: To ASTM E84, Class 3, poured type foamed-in-place polyurethane (urethane), 75 mm thick. R-Value: 29.
.9 All fluorescent lights shall be as per drawings
.10 Electrical Requirements and connections are to be verified on site to determine circuitry, phasing and breaker requirements.
### FABRICATION

.1 Manufacture in accordance with configurations shown on drawings and in conjunction with abutting and connected equipment and fixtures. Provide shop drawings for review.

.2 Panel sections: precision die formed metal pans accurately spaced and insulated. Panel edges and corners to have tongue and grooves, formed-in-place, to assure airtight, vapour proof joints using gaskets or sealants.

.3 Wall and ceiling panels: Nominal 280 mm, 584 mm and 1194 mm widths.

.4 Corner panels: 280 x 280 mm wide externally where applicable.

.5 Door panels: Insulated and finished as per exterior and interior panels (for door sizes see drawings) reinforced to prevent door panels from twisting, racking or warping. Ensure that doors will close and seal opening. Equip each door panel with:

.1 Sliding type:

.1 Insulated and finished same as panels, having 1220 mm high x 1.6 mm thick (16 ga.) stainless steel push/kick-plates on both exterior and interior.

.2 Extruded aluminium wall mounted guides with brackets, nylon clad, hardened steel ball bearing rollers and leading edge door-stay.

.3 Anti-lift feature, adjustable side-mounted door hangers and extra-duty steel door stops with rubber bumpers.

.4 Stainless steel, large exterior pull handle, recessed inside pull handle and hands-free foot treadle complete with padlocking hardware and inside safety release.

.5 Gasket kit and closing door rolls “down and in” to close with a positive seal against gaskets.

.6 Door Frame: to suit doors and as recommended by manufacturer.

.7 One digital thermometer to provide temperature readings from -51°C to 27°C and mounted on hinge side of panel approximately 1524 mm from floor. Cover sensing bulb with protective stainless steel moulding. This thermometer location and description is to be noted on the shop drawings prior to ordering for review by coordinator.

.8 Surface mounted vapour tight junction box, complete with ½” liquid tight conduit, stubbed out past exterior wall (or sleeve for conduit) for fire alarm, alarm device(s).

.9 Ceiling panels: reinforced internally and externally as required, to support evaporator and suspended ceiling and lighting. Where external reinforcement is needed and through fasteners are used, fasteners to be of low heat conducting material such as Teflon. Insert fasteners in Teflon sleeves to prevent compressing of insulation.

.10 Panel thickness and finish for exterior and interior panels exposed to normal view, 8mm core galvanized steel, factory painted, colour white for ceiling and walls.

.11 Locking devices shall be panel sections to have cam-action locking devices, spaced at maximum 915 vertically, 610 mm horizontally. Male and female lock pockets.
.12 Removable closure panels: Extend from lower edge of erected prefabricated ceiling panels to finished building ceiling. Extend cover strips or angles from building floor to ceiling closure panels between exposed ends of walk-in boxes and building wall.

.13 Horsepower rating shown are to serve as guide only. It is contractor's responsibility to include in his base quotation, units of sufficient capacity to maintain temperatures as indicated 40°F.

.14 Relays: For electrical controls refer to Electrical Division.

.15 Refer to Division 26 Electrical for service requirements, confirm if single or 3 phase on site prior to ordering equipment.

.16 Reinforce all opens to building structure as required.

2.04 REFRIGERATION EQUIPMENT

.1 Refrigeration Equipment:

.1 With 410A refrigerant, fully automatic in operation, and to conform to following minimum requirements:

.2 Condensing Units

.1 Comply with ARI Standard 520. Air cooled, motor driven integral compressor, motor starter, condenser, receiver, common base, and safety/operational controls. Receiver capacity shall be not less than 125 percent of system refrigerant charge. For Walk-in Coolers minimum of two separate condensing units used for refrigeration redundancy unless listed differently on drawings.

.2 Provide positive oil lubrication and oil level indicating device for each compressor.

.3 Pressure Switches: Automatic reset low pressure switch, and automatic or manual reset high pressure cut-out.

.4 Air Cooled Condensing Units: High efficiency Scroll type (Minimum 11.0 EER) compressor piped and automatically controlled to operate at lower head pressures during low ambient temperature conditions, designed and weather-proofed for outdoor installation, to operate satisfactorily at winter ambient temperatures down to -30 degrees C, and be provided with crankcase and receiver heaters. See drawing for condenser/compressor info.

.5 Unit to be rated 208V if available, to be verified on site.

.3 Unit Coolers

.1 Comply with ARI Standard 420. Units shall be UL listed, forced-ventilation type. See drawing for evaporator info.

.2 Provide drip pan complete with pump assembly (if required) and line to Janitor sink. Acceptable material: Pump Little Giant submersible pump complete with drain switch for automatic operation.

.4 Drain Pans: Galvanized sheet steel. Provide additional drain pans under uncovered refrigerant connections, and interconnect them with main drain pan.

.5 Defrost Provision: Walk-in Coolers; Defrost shall occur during compressor off cycle with evaporator fan running continuously, controlled by Freeaire Controller.

.6 Power to evaporator circuit provided by Freeaire Controller.

.7 All Drains from drain and drip pans must use Type M copper pipe and fittings. Drains must be supported every 1.8 meters with proper copper, copper plated or vinyl coated trapeze hangers to prevent sagging and securely attached to the cooler ceiling with threaded 10 mm rod hangers. With minimum 10mm slope per linear meter of horizontal copper drain pipe.

.4 Room Temperature Control

.1 Thermostat: Programmable digital unit

.2 Temperature setting: Walk-in Retail Cold Area/Alcove (Party Zone/Cooler area): 10° C. It is the refrigeration manufacturer’s responsibility to calibrate the equipment and ensure that the specified temperatures and defrost cycles, as approved by LCBO, are set.

.5 Room Temperature Alarms

.1 Use Controller to provide a local audible and visual over-temperature alarm with silencer switch, for each refrigerator/freezer. Locate devices in a stainless steel enclosure by the door. Where shown on the drawings provide an additional remote alarm located in an adjacent corridor.

.2 Temperature Sensor, with sensor located near the ceiling of the room

.6 Refrigerant tubing: Refer to manufacturer’s requirements.

PART 3: EXECUTION

3.01 WORKMANSHIP

.1 Erect work true-to-line, plumb, square and level with all joints aligned. Fit joints and intersecting members accurately and in true planes adequately fastened.

3.02 INSTALLATION

.1 Insulate to prevent electrolysis between metal and concrete by applying coating of asphaltic paint to metal surface, applied in accordance with manufacturer's instructions. Insulation to be dry before assembling floor panels in place.

.2 Unless otherwise indicated, install units within 25 mm of building walls, with minimum 25 mm clearance between top of unit and room ceiling. Fasten screeds to building and/or wearing floor in accordance with manufacturer's instructions.

.3 Caulk around perimeter of floor panels after installation on floor slab building floor, where applicable.

.4 Fill space between perimeter of floor panels and edge of floor depression with concrete or non-shrink grout and trowel flush with floor slab building floor.
Cut or drill holes in panels, as required, to accommodate electrical and mechanical services, runs or connections. Insert Teflon sleeves into holes and seal. After installation of services, fill remaining space with insulation.

Cap wrench access holes with an in-fitting, flush, stainless steel removable plug.

Install removable closure panels, cover strips, and angles.

Supervise installation of thresholds, heaters and urethane insulation for floors.

Site Dimensions must be verified on site before start of fabrication. Report any discrepancies in writing to Consultant.

Installation Timing - To be co-ordinated with other trades involved with this section.

Compressor to be roof mounted on sleepers in accordance with manufacturer's requirements. Co-ordinate and ensure a weather tight installation.

Ensure all openings in Work by this Section are sealed to CRCA Guidelines.

Walk-in cooler contractor to supply and install all required framing to support evaporator and all miscellaneous suspended equipment from the top chord of the roof joists.

CLEANING AND ADJUSTING

Upon completion of work, clean equipment, panels and apparatus, remove protective coverings and test and adjust operating equipment. Re-finish damaged coatings and finishes.

POWER REQUIREMENTS

For items rated at 5 Horse Power or more, use 575 volts if available.

120V provision for evaporator coil system.
PART 1: GENERAL

1.01 APPLICATION
.1 This Section specifies requirements, products, common criteria and characteristics, and methods and execution that are common to one or more Sections of Mechanical Work Divisions, and it is intended as a supplement to each Section and is to be read accordingly.

1.02 DOCUMENTS
.1 The mechanical Specification and the mechanical drawings are an integral part of the Contract Documents and are to be read accordingly.
.2 Comply with the requirements of the General Requirements Section of this Specification.
.3 The mechanical drawings are performance drawings, diagrammatic, and show approximate locations for equipment and materials. The drawings are intended to convey the scope of work and do not necessarily show architectural and structural details. The locations of materials and equipment shown may be altered (when revised layouts have been submitted and approved), to meet requirements of the material and/or equipment, other equipment and systems being installed, and of the building. Provide all fittings, offsets, transformations, and similar items required as a result of obstructions and other architectural or structural details but not shown on the mechanical drawings.

1.03 PLANNING AND LAYOUT OF WORK
.1 The exact locations and routing of mechanical and electrical services are to be properly planned, coordinated and established with all affected trades prior to installation such that the services will clear each other as well as any obstructions. Generally, give the right-of-way to piping requiring uniform pitch and locate and arrange other services to suit.
.2 All shut-off valves, balancing devices, air vents, equipment and similar products, particularly such products located above suspended ceilings, must be located for easy access for servicing and/or removal. Products which do not meet this location requirements are to be relocated at no cost.

1.04 CO-OPERATION & RELATIONSHIP WITH OTHER WORK AND TRADES
.1 Co-operate fully with all trades in such a manner as to not interfere with other work being carried on in the building. Where other work and equipment has to be installed along with mechanical work, arrange with other trades to install this work to best suit the particular condition.
.2 Examine the architectural, structural, and electrical drawings and specifications in conjunction with the mechanical drawings and specifications and be satisfied that the mechanical work as shown and specified can be performed without changes to the
building.

1.05 QUALIFICATION OF TRADESMEN

1.05.1 Maintain at the job site, at all times, qualified personnel and supporting staff, with proven experience in erecting, supervising, testing and adjusting projects of comparable nature and complexity.

1.05.2 All apprentices must always be supervised by a qualified journeyman.

1.06 CODES AND STANDARDS

1.06.1 All work is to be executed in accordance with all governing Codes, Standards, and By-laws.

1.06.2 Where any Code, Regulation, By-law, or Standard is quoted it means the current edition including all revisions or amendments at the time of the Contract. Where references are made to printed directions or recommendations, it means the current edition of such directions and recommendations.

1.06.3 All mechanical piping system work, including equipment, must comply in all respects with requirements of the Ontario Technical Standards and Safety Authority. Where required, fittings, valves, equipment, etc., must bear a CRN number.

1.06.4 All electrical items associated with mechanical equipment are to be CSA (or equivalent agency) certified electrically, or bear a stamp to indicate ESA approval.

1.07 SHOP DRAWINGS

1.07.1 Submit shop drawings in accordance with the requirements of Division 01.

1.07.2 Show on shop drawings:

1.07.2.1 Clear and obvious notes of any proposed changes from Drawings and Specifications.

1.07.2.2 Fabrication and erection dimensions.

1.07.2.3 Provisions for allowable construction tolerances and deflections provided for live loading.

1.07.2.4 Details to indicate construction arrangements of the parts and their connections, and interconnections with other work.

1.07.2.5 Location and type of anchors, and exposed fastenings.

1.07.2.6 Materials and finishes.

1.07.2.7 Physical dimensions of materials including thickness and gauges.

1.07.2.8 Descriptive names of equipment.

1.07.2.9 Mechanical and electrical characteristics when applicable.

1.07.2.10 Information to verify that superimposed loads will not affect function, appearance, and safety of the work detailed as well as of interconnected work.

1.07.2.11 Assumed design loadings, and dimensions and material specifications for load-bearing members.

1.07.2.11.1 Dimensions and dimensioned locations of proposed chases, sleeves, cuts, and holes in structural members.
.12 All shop drawings of structural components or components that are to withstand dead loads, live loads and/or wind/horizontal loads shall be sealed and signed by a registered professional engineer.

.3 LIST OF REQUIRED SHOP DRAWINGS TO BE SUBMITTED IN A TIMELY MANNER BY CONTRACTOR TO LCBO DESIGN CO-ORDINATOR, COPIED TO ALL RELEVANT DESIGN CONSULTANTS: (This list may not reflect all shop drawings required. It is the responsibility of the contractor to insure that all requirements for submittals are met as specified.)

.4 Shop Drawings required:
   Refrigeration – piping layout drawings must be manufacturer-designed

1.08 PERMITS, CERTIFICATES AND FEES

.1 Apply for, obtain and pay for all permits, licenses, inspections, examinations and fees required.

.2 Arrange for inspection of all work by authorities having jurisdiction. On completion of the work, present to the Owner the final unconditional certificates of approval of the inspecting authorities.

.3 Before starting any work, submit the required number of copies of drawings and Specifications to the authorities for their approval and comments. Comply with any changes required as part of the Contract but notify the Consultant immediately of such changes for proper processing of these requirements. Prepare and furnish any additional drawings, details or information as may be required.

1.09 RECORD DRAWINGS

.1 Record, as the Work progresses, work constructed differently than shown on Contract Documents. Record all changes in the Work caused by site conditions; by Owner, Consultant, consultant, Contractor, and Subcontractor originated changes; and by site instructions, supplementary instructions, field orders, change orders, addendums, correspondence, and direction of jurisdictional authorities. Accurately record location of concealed structure, and mechanical and electrical services, piping, valves, conduits, pull boxes, junction boxes and similar work not clearly in view, the position of which is required for maintenance, alteration work, and future additions. Do not conceal critical work until its location has been recorded.

.2 White prints will be provided by the Consultant at no cost to the Contractor for each Section in which record drawings are required. Record changes in the Work on these prints in red ink.

.3 Dimension location of concealed work in reference to building walls, and elevation in reference to floor elevation. Indicate at which point dimension is taken to concealed work. Dimension all terminations and offsets of runs of concealed work.

.4 Make records in a neat and legibly printed manner with a non-smudging medium.

.5 Identify each record drawing as "Project Record Copy". Maintain drawings in good condition and do not use them for construction purposes.

.6 Maintain Project record drawings in a state current to Project. Such state will be
considered a condition precedent for validation of applications for payment. The Consultant's visual inspection will constitute proof that record drawings are current.

.7 Provide Consultant with accurate record drawings, in hard copy with red-line mark-ups, with application for Certificate of Substantial Performance. Final acceptance of the Work will be predicated on receipt and approval of record drawings.

1.10 INSTRUCTION TO OWNER

.1 Instruct the Owner’s representatives in all respects of the operation and maintenance of mechanical systems and equipment. Obtain in writing from the Consultant a list of the Owner’s representatives qualified to receive instructions.

.2 Arrange for, and pay for services of service engineers and other manufacturers’ representatives required for instruction on specialized portions of the installation.

.3 Submit to Consultant at the time of final inspection, a complete list of systems, stating for each system:

   .1 date instructions were given to the Owner’s staff
   .2 duration of instruction
   .3 name of persons instructed
   .4 other parties present (manufacturer’s representative, consultants, etc.)

.4 The minimum time to be allocated to training shall be 16 hours. The Contractor shall provide a schedule, a list of systems and equipment for which training will be provided, names of people who will provide the training and an agenda for each session.

1.11 OPERATION AND MAINTENANCE MANUALS

Not applicable

1.12 EXISTING CONDITIONS

.1 Before submitting tenders, carefully examine the drawings, Specifications and the job site to determine and confirm the existing conditions which will or may affect the proposed work. Claims for extra payment because of failure to fulfil this condition will not be considered. Existing conditions include, without being limited to, such items as: electrical power characteristics and location; water supply and sewer sizes and location; soil conditions and space limitations.

.2 Note work performed by the Landlord and all work not performed by him as part of the Contract.

1.13 WORKPLACE SAFETY

.1 Comply with requirements of the Workplace Hazardous Materials Information System (WHMIS) regarding the use, handling, storage and disposal of hazardous materials.

.2 Comply with all requirements of Ontario Regulation 213/91, Occupational Health
and Safety Act and Regulations for Construction Projects.

.3 Submit WHMIS MSDS (Material Safety Data Sheets) for all products where required, and maintain one copy at the site in a visible and accessible location and available to all personnel.

1.14 WORK WARRANTY

.1 Include for an overall 12 month warranty period for all mechanical work materials and workmanship. The warranty period is to commence when the LCBO occupies the property.

.2 All warranty work shall be scheduled with LCBO who will determine when the work shall commence. The work to be performed shall be documented and provided to the Consultant for review. All equipment, materials and systems shall conform to the specification requirements. The cost of all work shall be the responsibility of the Contractor.

1.15 EQUIPMENT WARRANTIES

.1 Warrant all mechanical equipment against defect in material and workmanship for a period of two years from the date that the LCBO occupies the property.

.2 The equipment installer/seller is to provide for the duration of the warranty and extended warranty periods, any and all of the prescribed maintenance to any and all of the supplied components which might limit the term or otherwise invalidate the warranty.

.3 Should the Consultant determine that testing and balancing will be required after warranty work has been completed, the Contractor shall schedule and pay for the Agency who will conduct this work. Submit report to the Consultant for review.

.4 The warranty of any systems that is commissioned after the substantial performance date shall begin when that system has been commissioned and accepted by the Consultant.

1.16 PRODUCT AND PRODUCT MANUFACTURER REQUIREMENTS

.1 Products scheduled and/or specified have been selected to establish a performance and quality standard, and, in some instances, a dimensional standard. In most cases, acceptable manufacturers are stated for any products specified by manufacturer’s name and model number. The tender price may be based on products supplied by any of the manufacturers named as acceptable for the particular product. If acceptable manufacturers are not stated for a particular product, base the tender price on the products supplied by the specified manufacturers.

.2 If products supplied by a manufacturer named as acceptable are used in lieu of the manufacturer specified, be responsible for ensuring that the substituted product is equivalent in performance and operating characteristics (including energy consumption if applicable) to the specified product, and, it is to be understood that any additional costs, and changes to associated or adjacent work resulting from provision of products supplied by a manufacturer other than the specified
manufacturer is included in the tender price.

Products required to have ASME, CSA, ULC, GCA or other approval are to be properly marked or labelled indicating that the product has been approved.

1.17 ELECTRICAL POWER CHARACTERISTICS

.1 Unless otherwise shown or specified the permanent power supply is to be 600 volt, 3 phase, 4 wire, and 120/208 volt, 3 phase, 4 wire for final use.

.2 Confirm the characteristics of construction power supply.

1.18 SEASONAL EQUIPMENT/SYSTEM START UP

.1 Provide start up, testing and commissioning of any system that requires seasonal commissioning. For example if the acceptance period for the project was during the Winter then schedule start-up of the air conditioning during the Spring of the following season. Provide the necessary labour from the equipment supplier and the Balancing Contractor and the Controls Contractor. Schedule the work with LCBO and the BCC. Provide reports to the Consultant and the BCC for review.

PART 2: PRODUCTS

2.01 PIPE SLEEVES

.1 Minimum 0.635 mm thick galvanized steel with an integral flange at one end to secure the sleeve to formwork construction.

.2 Factory fabricated, flanged, high density polyethylene sleeves with reinforced nail bosses.

.3 Schedule 40 mild galvanized steel pipe with a welded-on square steel anchor and water stop plate at the sleeve midpoint.

2.02 PIPE ESCUTCHEON PLATES

.1 One-piece chrome plated brass or #4 finish type 302 stainless steel plates with screws, each sized to cover the pipe sleeve or wall or slab opening, and to fit tightly around the pipe or pipe insulation.

2.03 PIPING HANGERS AND SUPPORTS

.1 Pipe hanger and support materials, including accessories, are to be in accordance with the Manufacturers Standardization Society (MSS) Standard Practice Manual ANSI/MSS SP- 58, Pipe Hangers and Supports – Materials, Design and Manufacture.
3.01 GENERAL PIPING AND DUCTWORK INSTALLATION REQUIREMENTS

.1 Unless otherwise specified, locate and arrange horizontal pipes and ducts above or at the ceiling on floors on which they are shown, arranged so that under consideration of all other work in the area, the maximum ceiling height and/or usable space is maintained.

.2 Unless otherwise specified, install all work concealed in finished spaces, and concealed to the degree possible in partially finished and unfinished spaces. Refer to and examine the Architectural drawings and room finish schedules. to determine finished, partially finished, and unfinished area. Note that walls which are painted are considered finished.

.3 Install all pipes and ducts parallel to building lines.

.4 Neatly group and arrange all exposed work.

.5 Locate all valves, dampers and any other equipment which will or may need maintenance or repairs and which are installed in accessible construction so as to be easily accessible from access doors. Where valves, dampers and similar piping or ductwork accessories occur in vertical services in shafts, pipe spaces or partitions, locate the accessories at the floor level.

.6 Make all connections between pipes of different materials using proper approved adapters. Provide cast brass dielectric type adapters at connections between steel and copper pipe.

.7 Ensure that equipment and material manufacturers’ installation instructions are followed unless specified herein or on the drawings, and unless such instructions contradict governing codes and regulations.

.8 Carefully clean all ducts, pipe and fittings prior to installation. Temporarily cap or plug ends of pipe, ducts and equipment which are open and exposed during construction.

.9 Install piping and ductwork which are to be insulated so that they have sufficient clearance to permit insulation to be applied continuously and unbroken around the pipe or duct, except at fire barriers, in which case the insulation will be terminated at each side of the fire barrier.

3.02 INSPECTION AND CLEANING

.1 Inspect surfaces and structure prepared by other trades before performing your work. Verify that surfaces or the structure to receive your work have no defects or discrepancies which could result in poor application or cause latent defects in installation and workmanship. Report defects in writing. Installation of work will constitute acceptance of such surfaces as being satisfactory.

.2 Ensure that exposed ferrous metal products, except ductwork and piping, have at least one factory prime coat, or paint such ferrous metal products with one prime coat on the job.

.3 Clean and wire brush ferrous metal products before applying the prime coat. For factory applied finishes, repaint or refinish surfaces damaged during shipment, erection or construction work.
3.03 INSTALLATION OF PIPE SLEEVES

.1 Where pipes pass through concrete and/or masonry surfaces provide pipe sleeves as follows:
  .1 in poured concrete slabs, unless otherwise specified – minimum 0.635 mm thick flanged galvanized steel or, where permitted by governing authorities, factory fabricated plastic sleeves
  .2 in concrete or masonry walls – Schedule 40 galvanized steel pipe

.2 Size sleeves, unless otherwise specified, to leave 12 mm clearance around the pipes, or where pipe is insulated, a 12 mm clearance around the pipe insulation.

.3 Pack and seal the void between the pipe sleeves and the pipe or pipe insulation for the length of the sleeves as follows:
  .1 pack sleeves in non-fire rated interior construction with mineral wool and seal both ends of the sleeves with non-hardening silicone base caulking compound
  .2 pack sleeves in exterior walls above grade with mineral wool and seal both ends of the sleeves water-tight with approved non-hardening silicone base caulking compound unless mechanical type seals have been specified

.4 Sleeves in fire rated construction will be packed and sealed as part of the work specified.

.5 Where sleeves are required in masonry work, accurately locate and mark the sleeve position, and turn the sleeves over to the trade performing the masonry work for installation.

.6 Terminate sleeves for piping which will be exposed so that the sleeve is flush at both ends with the wall, partition or slab surface so that the sleeve may be completely covered by an escutcheon plate.

3.04 DUCT OPENINGS

.1 Duct openings, air inlet and outlet openings, fire damper and similar openings will be provided in poured concrete work, masonry drywall and other building surfaces by the trade responsible for the particular construction in which the opening is required.

3.05 SLEEVE AND FORMED OPENING LOCATION DRAWINGS

.1 Prepare and submit for review and forwarding to the concrete reinforcement detailer, drawings indicating all required sleeves, recesses and formed openings in poured concrete work. Such drawings are to be complete and accurately dimensioned and relate sleeve, recesses, and formed openings to suitable grid lines and elevation datum.

.2 Begin to prepare such drawings immediately upon notification of acceptance of Tender and award of Contract.

3.06 INSTALLATION OF PIPE ESCUTCHEON PLATES

.1 Provide escutcheon plates suitable secured over all exposed piping passing through finished building surfaces. A finished building surface is any surface with a factory
finish or that receives a site applied finish.

3.07 INSTALLATION OF FASTENING AND SECURING HARDWARE

.1 Provide all fastening and securing hardware required for mechanical work to maintain installations attached to the structure or to finished floors, walls and ceilings in a secure and rigid manner capable of withstanding the dead loads, live loads, superimposed dead loads, and any vibration of the installed products.

.2 Use fasteners compatible with structural requirements, finishes and types of products to be connected. Do not use materials subject to electrolytic action or corrosion where conditions are liable to cause such action.

.3 Where the floor, wall or ceiling construction is not suitable to support the loads, provide additional framing or special fasteners to ensure proper securement to the structure that is to support the products. Provide reinforcing or connecting supports where required to distribute the loading to the structural components.

.4 Obtain written consent before using explosive actuated fastening devices. If consent is obtained, comply with requirements of CSA Standards CAN3-Z166.1 and 2-M85.

3.08 INSTALLATION OF PIPE HANGERS AND SUPPORTS

.1 Provide all required pipe hangers and supports. Provide any additional structural steel channels, angles, inserts, beam champs and similar accessories required for hanging or supporting pipe. Unless otherwise shown or specified, hang or support pipes from the structure only.

END OF SECTION
PART 1: GENERAL

1.01 APPLICATION

.1 This Section specifies requirements, products, common criteria and characteristics, and methods, and execution that are common to succeeding Sections of Divisions 26 and 28, and it is intended as a supplement to each Section and is to be read accordingly.

1.02 REFERENCES

.1 CAN/CSA C22.2 No. 83, Electrical Metallic Tubing.
.2 CSA C22.2 No. 45, Rigid Metal Conduit
.3 CSA C22.2 No. 56, Flexible Metal Conduit and Liquid-Tight Flexible Metal Conduit.
.4 CSA C22.2 No. 38, Thermoset Insulated Wires and Cables.
.5 CSA C22.2 No. 75, Thermoplastic-Insulated Wires and Cables.
.6 CSA C22.2 No. 51, Armoured Cable.
.7 CSA C22.2 No. 127, Equipment and Lead Wires.
.8 CSA C22.2 No. 208, Fire Alarm and Signal Cable
.9 CAN/CSA C22.2 No. 18, Outlet Boxes, Conduit Boxes and Fittings.
.10 Ontario Electrical Safety Code.

1.03 DOCUMENTS

.1 The electrical Specification and the electrical drawings are an integral part of the Contract Documents and are to be read accordingly.
.2 Comply with the requirements of the General Requirements Section of this Specification.
.3 The electrical drawings are performance drawings, diagrammatic, and show approximate locations for equipment and materials. The drawings are intended to convey the scope of work and do not necessarily show architectural and structural details. The locations of materials and equipment shown may be altered (when revised layouts have been submitted and approved), to meet requirements of the material and/or equipment, other equipment and systems being installed, and of the building. Provide all fittings, offsets, conduit, boxes, conductors, and similar items required as a result of obstructions and other architectural or structural details but not shown on the electrical drawings.

1.04 PLANNING AND LAYOUT OF WORK

.1 The exact locations and routing of electrical and mechanical services are to be properly planned, coordinated and established with all affected trades prior to installation such that the services will clear each other as well as any obstructions.
.2 All boxes, receptacles, and similar products, particularly such products located above suspended ceilings, must be located for easy access for servicing and/or removal.
Products which do not meet this location requirements are to be relocated at no cost.

1.05 CO-OPERATION & RELATIONSHIP WITH OTHER WORK AND TRADES
   .1 Co-operate fully with all trades in such a manner as to not interfere with other work being carried on in the building. Where other work and equipment has to be installed along with electrical work, arrange with other trades to install this work to best suit the particular condition.
   .2 Examine the architectural, structural, and mechanical drawings and specifications in conjunction with the electrical drawings and specifications and be satisfied that the electrical work as shown and specified can be performed without changes to the building.

1.06 QUALIFICATION OF TRADESMEN
   .1 Maintain at the job site, at all times, qualified personnel and supporting staff, with proven experience in erecting, supervising, testing and adjusting projects of comparable nature and complexity.
   .2 All apprentices must always be supervised by a qualified journeyman.

1.07 CODES AND STANDARDS
   .1 All work is to be executed in accordance with all governing Codes, Standards, and By-laws.
   .2 Where any Code, Regulation, By-law, or Standard is quoted it means the current edition including all revisions or amendments at the time of the Contract. Where references are made to printed directions or recommendations, it means the current edition of such directions and recommendations.
   .3 All electrical items are to be CSA (or equivalent agency) certified electrically, or bear a stamp to indicate ESA approval.

1.08 SHOP DRAWINGS
   .1 Refer to Division 01.

1.09 PERMITS, CERTIFICATES AND FEES
   .1 Apply for, obtain and pay for all permits, licences, inspections, examinations and fees required.
   .2 Arrange for inspection of all work by authorities having jurisdiction. On completion of the work, present to the Owner the final unconditional certificates of approval of the inspecting authorities.
   .3 Before starting any work, submit the required number of copies of drawings and Specifications to the authorities for their approval and comments. Comply with any changes required as part of the Contract but notify the Owner immediately of such changes for proper processing of these requirements. Prepare and furnish any additional drawings, details or information as may be required.
Upon completion of the project, present to the Owner a copy of all reports and a signed statement to the effect that all tests have been carefully carried out as required by the Specifications and the manufacturer’s recommendations and that the equipment and installations have been inspected by all jurisdictional authorities.

1.10 DOCUMENTS REQUIRED

The following documents are to be submitted to the Owner on completion of the project as described above:

1. Electrical Inspection Certificate
2. Other Certificates Specified

1.11 RECORD DRAWINGS

Refer to Division 01.

Show on the record drawings the installed invert of any underground electrical services entering and leaving the building and the property. Dimension underground services at key points of every run in relation to the structure and the building. Record elevations of the underground services in relation to the ground floor level of the building.

1.12 INSTRUCTION TO OWNER

Instruct the Owner’s representatives in all respects of the operation and maintenance of electrical systems and equipment. Obtain in writing from the Owner a list of the Owner’s representatives qualified to receive instructions.

Arrange for, and pay for services of service engineers and other manufacturers’ representatives required for instruction on specialized portions of the installation.

Submit to Owner at the time of final inspection, a complete list of systems, stating for each system:

1. date instructions were given to the Owner’s staff
2. duration of instruction
3. name of persons instructed
4. other parties present (manufacturer’s representative, Owners, etc.)

The training shall be conducted over a minimum period of 16 hours and be completed prior to substantial performance. The Contractor shall provide a schedule, a list of systems and equipment for which training will be provided, names of people who will provide the training and an agenda for each session.

1.13 OPERATION AND MAINTENANCE MANUALS

Refer to Division 01.

Operations and Maintenance manuals shall be submitted and approved by the Owner before training shall commence.
1.14  **EXISTING CONDITIONS**

.1 Before submitting tenders, carefully examine the drawings, Specifications and the job site to determine and confirm the existing conditions which will or may affect the proposed work. Claims for extra payment because of failure to fulfil this condition will not be considered. Existing conditions include, without being limited to, such items as: electrical power characteristics and location, soil conditions and space limitations.

.2 Note work performed by the Landlord and all work not performed by him as part of the Contract.

1.15  **WORKPLACE SAFETY**

.1 Comply with requirements of the Workplace Hazardous Materials Information System (WHMIS) regarding the use, handling, storage and disposal of hazardous materials.

.2 Comply with all requirements of Ontario Regulation 213/91, Occupational Health and Safety Act and Regulations for Construction Projects.

.3 Submit WHMIS MSDS (Material Safety Data Sheets) for all products where required, and maintain one copy at the site in a visible and accessible location and available to all personnel.

1.16  **WARRANTY**

.1 Include for an overall 12 month warranty period for all electrical work materials and workmanship. The warranty period is to commence when the LCBO occupies the property.

.2 Extended warranties, where applicable, are specified with equipment. Extended warranties will commence upon expiry of the standard 12 month warranty.

.3 All warranty work shall be scheduled with LCBO who will determine when the work shall commence. The work to be performed shall be documented and provided to the Owner for review. All equipment, materials and systems shall conform to the specification requirements. The cost of all work shall be the responsibility of the Contractor.

1.17  **PRODUCT AND PRODUCT MANUFACTURER REQUIREMENTS**

.1 Products scheduled and/or specified have been selected to establish a performance and quality standard, and, in some instances, a dimensional standard. In most cases, acceptable manufacturers are stated for any products specified by manufacturer’s name and model number. The tender price may be based on products supplied by any of the manufacturers named as acceptable for the particular product. If acceptable manufacturers are not stated for a particular product, base the tender price on the products supplied by the specified manufacturers.

.2 If products supplied by a manufacturer named as acceptable are used in lieu of the manufacturer specified, be responsible for ensuring that the substituted product is
PART 2: PRODUCTS

2.01  CONDUIT

.1 EMT (Thinwall), galvanized electrical metallic tubing to CSA C22.2 No. 83, complete with factory made bends where site bending is not possible, and joints and terminations made with compression gland type insulated connectors.

.2 Rigid galvanized steel to CSA C22.2 No. 45, with exterior zinc and interior enamel coatings, galvanized threads where factory cut, red lead coated threads where site cut, factory made bends where site bending is not possible, factory made and threaded fittings and connectors, and terminations made with rigid Ericson type couplings.

.3 Galvanized steel flexible liquid-tight metallic conduit to CSA C22.2 No. 56, complete with Ideal “Steel Tough” liquid-tight flexible conduit connectors at terminations.

.4 CSA approved and labelled rigid plastic (PVC) conduit complete with site made heat gun bends for conduit to 50 mm diameter, factory made elbows in conduit larger than 50 mm diameter, solvent weld joints, factory made expansion joints where required, and terminations made with proper and suitable connectors and adaptors.

2.02  UNDERFLOOR DUCT

.1 not applicable

2.03  SURFACE RACEWAY

.1 not applicable

2.04  WALL AND CEILING OUTLET BOXES

.1 CSA approved stamped galvanized steel outlet boxes, as follows:

.1 100 mm octagonal or square for ceiling boxes complete with 9.5 mm dia. fixture stud where required

.2 100 mm square with plaster rings for recessed switches and receptacle in plaster walls

.3 masonry boxes for recessed switch, receptacle, and similar device boxes in masonry walls

.2 Equal to Crouse-Hinds Canada Ltd., CSA certified “FS” or “FD” Series cast Feraloy
and aluminium outlet boxes.

.3 Each outlet box must be suitable in all respects for the application, and complete
with suitable securing lugs, connectors suitable for connected conduit, knockouts
and, where necessary, suitable concrete rings, covers and any other required
accessory.

2.05 POWER POLES
.1 CSA approved 3.2m anodized aluminium finished power pole, dual raceway for
power and communications. 60 mm x 57 mm x 3200 mm.
.2 Acceptable manufacturers:
   .1 Wiremold ‘NP600C-10-2B’
   .2 Or approved alternate.

2.06 FLOOR OUTLET BOXES
.1 Not applicable

2.07 PULLBOXES AND JUNCTION BOXES
.1 Galvanized or prime coast plated steel, suitable in all respects for the application and
complete with screw-on or hinged covers as required and connectors suitable for
connected conduit.
.2 Crouse-Hinds Canada Ltd. “Condulet”, threaded cast Feraloy pull boxes and junction
boxes of an exact type to suit the application, each complete with screw-on gasketed
cover.
.3 The physical size of pullboxes is to be in accordance with requirements of the OESC
to suit the number and size of conduits and conductors.

2.08 CONDUCTORS AND CONNECTORS
.1 “T90 Nylon” single copper conductor to CSA C22.2 No. 75, colour coded, 90
degrees C rated, PVC insulated and nylon covered.
.2 “RW90” CSA certified, single copper conductor to CSA C22.2 No. 38, 90 degrees C
rated X-link polyethylene insulated, colour coded
.3 “AC-90” flexible armoured cable with “RW-90” conductors and bare copper ground
conductor to CSA C22.2 No. 51 (Bulletin No. 994).
.4 Conductors to and including No. 12 AWG are to be solid. Conductors in sizes larger
then No. 12 AWG are to be stranded. All branch circuit conductors are to be
constructed of 98% conductive copper and are to be approved for 600 volts.
.5 Armoured cable connectors are to be proper squeeze type connectors and plastic anti-
short bushings at terminations.
.6 Connectors for conductors in conduit are to be, unless otherwise specified, IDI
certified, 600 volts rated pressure type connectors.
2.09 LOW VOLTAGE (24 VOLT) CONDUCTORS
.1 ULC listed and labelled, CSA certified to C22.2 No. 127, No. 18 AWG “TEW” thermoplastic insulated, solid copper wire rated for 600 volt service, and 105 degrees C complete with the required number of copper conductors and colour coding.
.2 Alcatel Canada Wire Ltd. “Securex II”, FAS 105, 300 volt, 105 degree C rated fire alarm system flexible armoured cable with solid copper conductor, flame retardant PVC insulation, and red colour outer jacket, ULC listed and labelled and CSA certified to C22.2 No. 208. Cable is to be complete with an overall jacket.

2.10 CONDUCTOR PULLING LUBRICANT
.1 IDI electric (Canada) Ltd. “Ideal Yellow 77” or “Wire Lube” as required.

2.11 LOCAL LIGHTING SWITCHES
.1 Unless otherwise specified, DECORA decorator rocker type switches, 20 ampere rated, 120 volt AC, premium quality, Specification grade, white, complete with matching faceplates. Acceptable manufacturers are:
   .1 P & S
   .2 Bryant
   .3 Or approved alternate

2.12 DIMMER SWITCHES
.1 Not applicable

2.13 AUTOMATIC WALL SWITCHES
.1 Not applicable

2.14 SWITCH AND PILOT LIGHT
.1 Specification grade, premium quality, 15 ampere, 120 volt toggle type switch with a nylon faceplate (white) and a neon lamp with red lens, and connected such that the lamp is illuminated when the switch is on.

2.15 RECEPTACLES
.1 Unless otherwise specified, DECORA decorator type, U-ground, premium quality, heavy-duty, Specification grade, white, 15 ampere, 120 volt receptacles, single or duplex as shown, each suitable for side or back wiring and complete with captive mounting screws and a matching faceplate. Acceptable manufacturers are:
   .1 P & S
   .2 Bryant
   .3 Lutron
   .4 Or approved alternate
.2 As above but standard shape in lieu of decorator type.
.3 Specification grade, 15 ampere, 125 volt, duplex, premium quality, orange isolated ground receptacles, each suitable for side or back wiring and complete with a one-piece mounting strap and a white nylon faceplate.
.4 Specification grade, 15 ampere, 125 volt, duplex, premium quality, GFCI receptacles, each suitable for side or back wiring and complete with a one-piece mounting strap and a white nylon faceplate.

2.16 ACCESS DOORS
.1 Not applicable

2.17 FASTENING AND SECURING HARDWARE
.1 Drywall or plaster wall and/or ceiling fasteners – 2-wing spring toggles.

2.18 IDENTIFICATION NAMEPLATES
.1 Laminated plastic (Lamacoid) black-white-black with bevelled edges, stainless steel screws, and clear proper identification engraving. Each nameplate is to be sized to suit the equipment for which it is provided, and the required wording. Provide nameplates for all electrical service switches, panels, contactors, office switches controlling lights, screens and security shutters.

2.19 FIRESTOPPING AND SMOKE SEAL MATERIALS
.1 Asbestos-free elastomeric materials, test, listed and labelled by ULC in accordance with CAN 4-S115-M85, for installation in ULC designated firestopping and smoke seal systems to provide a positive fire, water and smoke seal and a fire resistance rating (flame, hose stream and temperature) not less than the fire rating for surrounding construction.
.2 Materials are to be compatible with abutting dissimilar materials and finishes.
.3 Acceptable manufacturers are Instant Firestop Inc., Dow Corning Canada Inc., 3M Canada Inc. and Fire-Stop Systems (Canstrut Inc.).

PART 3: EXECUTION

3.01 GENERAL CONDUIT AND CONDUCTOR INSTALLATION REQUIREMENTS
.1 Unless otherwise specified, locate and arrange horizontal conduits and conductors above or at the ceiling on floors on which they are shown, arranged so that under consideration of all other work in the area, the maximum ceiling height and/or usable space is maintained.
.2 Unless otherwise specified, install all work concealed in finished spaces, and concealed to the degree possible in partially finished and unfinished spaces. Refer to and examine the Architectural drawings and room finish schedules to determine finished, partially finished, and unfinished areas. Note that walls which are painted are considered finished.
.3 Conduit and main distribution feeders (as approved by Owner) may be exposed in unfinished areas such as electrical and mechanical rooms, unless otherwise noted on the drawings or specified herein.
.4 Install all conduits and conductors parallel to building lines.
.5 Neatly group and arrange all exposed work.
.6 Locate all electrical devices which will or may need maintenance or repairs and which are installed in accessible construction so as to be easily accessible from access doors.
.7 Ensure that equipment and material manufacturers’ installation instructions are followed unless otherwise specified herein or on the drawings, and unless such instructions contradict governing codes and regulations.
.8 Temporarily pack all open boxes located in concrete, plaster and masonry to prevent debris from entering the box.
.9 All isolated ground circuits must contain separate phase, neutral and ground conductors (i.e.: common neutral configuration is unacceptable). Conductors are to be minimum No. 12 AWG and No. 10 AWG for runs longer than 15 m.
.10 Inspect surfaces and structure prepared by other trades before performing your work. Verify that surfaces or the structure to receive your work have no defects or discrepancies which could result in poor application or cause latent defects in installation and workmanship. Report defects in writing. Installation of work will constitute acceptance of such surfaces as being satisfactory.

3.02 INSTALLATION OF CONDUIT

.1 Unless otherwise specified, provide conduit for all conductors.
.2 Conduit is to be as follows:
   .1 all conduit exposed outside the building, all conduit inside the building for electric service conductors, and all other conduit exposed inside the building and less than 1.8 m above the finished floor – rigid galvanized steel
   .2 all underground conduit – rigid PVC
   .3 for short branch circuit connectors to motorized equipment and distribution transformers, minimum length 450 mm, maximum length 600 mm with 180 degree loop where possible – galvanized steel flexible liquid-tight conduit
   .4 at points where conductors cross building expansion joints – galvanized steel flexible conduit
   .5 for conduit except as noted above – EMT
.3 Provide a separate ground conductor in all plastic conduit.
.4 Support underground conduit on a well tamped flat bed of earth, free rocks or protrusions of any kind.
.5 Support and secure surface mounted and suspended single or double runs of metal conduit at support spacing in accordance with OESC requirements by means of galvanized pipe straps, conduit clips, ring bolt type hangers, or by other proper manufactured devices.
.6 Support multiple mixed size metal conduit runs with Unistrut Ltd., Electovert Ltd.
“CANTRUSS” or Burndy Ltd. “FLEXIBLE” conduit racks spaced to suit the spacing requirements of the smallest conduit in the group.

.7 Unless otherwise noted, conduit fittings are to be constructed of the same material as the conduit and are to suitable in all respect for the application.

.8 Provide proper adaptors for joining conduits of different materials.

.9 Cut square and properly ream all site cut conduit ends.

.10 Where conductor sizes are increased to suit voltage drop requirements, increase the scheduled of specified conduit size to suit.

.11 Site made bends for all conduit must maintain the full conduit diameter with no kinking, and conduit finishes must not flake or crack when the conduit is bent.

.12 Plug ends of roughed-in conduit which are exposed during construction with approved plugs.

.13 Ensure that all conduit systems which are left empty for future wiring are clean, clear, capped and properly identified at each termination point. Provide end bushing and suitable fish wire in all such conduit.

.14 Provide two 25 mm dia. empty conduits to ceiling spaces from flush mounted panelboards located below and/or near a hung ceiling.

.15 Install horizontal conduit so that it can drain, without pockets in which water can collect.

.16 Locate conduits at least 150 mm clear of hot pipes, flues, and other such hot materials.

3.03 CONDUIT EXPANSION FACILITIES

.1 Wherever concealed or surface mounted conduits cross building expansion joints, and in maximum 30 m intervals in straight runs of conduit 30 m or longer, provide flexible conduit and expansion facilities to permit free movement without imposing additional stress or loading upon the support system, and to prevent excessive movement at joints and connections.

3.04 INSTALLATION OF UNDERFLOOR DUCT

.1 Not applicable

3.05 INSTALLATION OF SURFACE RACEWAY

.1 Not applicable

3.06 INSTALLATION OF POWER POLES

.1 Coordinate installation and wiring with millwork contractor.

.2 Install as recommended by manufacturer.

3.07 INSTALLATION OF WALL & CEILING OUTLET BOXES AND BACK BOXES

.1 Provide an outlet box or back box for each luminaire, wiring device, telephone
outlet, fire alarm system component, communications systems components, and any other such outlet.

.2 Outlet boxes flush mounted in interior construction, surface mounted in concealed interior locations, and surface mounted in exposed interior locations where the connecting conduit is EMT are to be stamped and galvanized steel outlet boxes unless otherwise noted.

.3 Outlet boxes for surface mounted exterior lighting, receptacles, and other device outlets, boxes flush mounted in exterior building surfaces, and boxes mounted in interior device locations where the connecting conduit is rigid, and for boxes in perimeter walls where insulation and vapour barrier is present, are to be “FS” or “FD” Series cast boxes unless otherwise noted.

.4 Do not install outlet or back boxes “back-to-back” in walls and partitions. Stagger such outlets and seal against noise transmission. “Thru-wall” type boxes will not be permitted for any application.

.5 The horizontal location of switches, thermostats, sensors, outlets and control devices are shown diagrammatically only, and are subject to change without extra cost providing information is given prior to installation. Outlets may be relocated up to 3 m from the original location, without change in price, as directed by the Owner or LCBO Design Coordinator. Architectural drawings and the Owner’s or LCBO Design Coordinator’s instructions have precedence over electrical drawing diagrammatic layouts.

.6 The responsibility for ensuring that all switches, thermostats and other controls are kept as close to door jambs and other openings as possible and for checking door swings prior to installation and locating switches on the lock side of the door, rests with the Contractor.

.7 Provide blank coverplates in finished areas, on existing obsolete boxes which are to remain in position.

3.08 INSTALLATION OF FLOOR OUTLET BOXES

.1 Not applicable

3.09 INSTALLATION OF PULLBOXES AND JUNCTION BOXES

.1 Provide pullboxes in conduit systems wherever shown on the drawings, and/or wherever necessary to facilitate conductor installations. Generally, conduit runs exceeding 30 m in length, or with more than three 90 degree bends are to be equipped with a pullbox installed at a convenient and suitable intermediate accessible location.

.2 Provide junction boxes wherever required and/or indicated on the drawings, including the following for the Manager’s Office:

.1 a 200 mm square, 65 mm deep junction box for connection of lighting circuits to switches

.2 a 200 mm square, 65 mm deep junction box for connection of cash receptacles
.3 Boxes in rigid conduit and EMT inside the building are to be stamped galvanized or prime coated steel.

.4 Boxes in exterior rigid conduit are to be “Condulet” cast gasketed boxes unless otherwise noted.

.5 Boxes in plastic conduit are to be rigid PVC plastic boxes.

.6 All pullboxes and junction boxes must be accessible after the work is completed.

.7 Accurately locate and identify all concealed pullboxes and junction boxes on “as-built” record drawings.

.8 Clearly identify main pull or junction boxes (excluding obvious outlet boxes) by spray painting the outside of the covers. Paint colours are to be as directed by the Owner or LCBO Design Coordinator.

.9 Provide 16x16x8 junction box for BAS transducer.

3.10 INSTALLATION OF CONDUCTORS

.1 Provide all required conductors.

.2 Conductors, unless otherwise noted, are to be as follows:

.1 in accessible suspended ceiling spaces, in stud wall construction to suspended ceiling spaces (maximum 1.5 m run permitted), and wherever else shown or specified – “AC-90” flexible armoured cable (“BX”)

.2 for isolated power system load side wiring – “RE90”

.3 for all wiring except as noted above or except as specified elsewhere – “T90 Nylon”

.3 Support “BX” armoured cable in ceiling spaces and in stud wall construction with steel two hole cable straps to “Code” requirements.

.4 Splicing of conductors #8 AWG and larger is to be done with solderless pressure type splicing connectors of the split bolt or compression sleeve type. Splices are to be insulated with filler putty and minimum of two half-lapped layers of vinyl plastic tape. Compression joints are to be made using approved hydraulic tools to assure a permanent mechanically secure high conductivity joint.

.5 Conductors up to and including #10 AWG are to be joined with hand twist plastic insulated pressure connectors having expandable tapered spring and extended skirt. Hand twist joints will not be permitted with conductors larger than #10 AWG and the number of size of conductors within each connector is to be in accordance with the manufacturer’s recommendations. Set screw connectors will not be allowed for this type of joint.

.6 Generally, conductor sizes are indicated on the drawings. Such sizes are minimum requirements and must be increased, where required, to suit the length of run and voltage drop.

.7 Colour code conductors throughout to identify phases, neutrals and ground by means of self-laminating coloured tape, coloured conductor insulation, or properly secured coloured plastic discs. Colours, unless otherwise noted, are to be as follows:

.1 phase A – red

.2 phase B – black
.3 phase C – blue  
.4 ground – green  
.5 neutral – white  
.6 control – orange  
.8 Colours for isolated power system “load” side power wiring are to be as follows:  
.1 live No. 1 – ivory  
.2 live No. 2 – orange  
.3 ground – green  
.9 When pulling wires into conduit, use lubricant and ensure that wires are kept straight and are not twisted or abraded.  
.10 Use “French Chalk” or “Talcum Powder” only for pulling in isolated power system “load” side wiring.

3.11 INSTALLATION OF LOW VOLTAGE CONDUCTORS  
.1 Provide all required low voltage conductors.  
.2 Low voltage conductors are to be No. 18 AWG “TEW” except for use in fire alarm system applications and unless otherwise noted. Provide specified fire alarm cables for fire alarm system applications or security system applications as approved by Code and local governing authorities.  
.3 Install all low voltage conductors in conduit unless otherwise noted. All conductors not installed in conduit must be FT fire rated in accordance with governing Code flame spread and smoke developed requirements.  
.4 Colour code conductors for communications systems in accordance with the system component manufacturer’s recommendations.

3.12 INSTALLATION OF LOCAL LIGHTING SWITCHES  
.1 Provide identified switches in the office to control office lighting zones.  
.2 Unless otherwise specified, switches are to be decorator type, white on horizontal surfaces, cream colour on vertical surfaces, and complete with matching faceplates.  
.4 Unless otherwise noted, switches and control devices mounting heights shall be not less than 900 mm and not more than 1200 mm above floor.  
.5 Ensure that switches located adjacent to doors are located at the strike side of the door.

3.13 INSTALLATION OF SWITCH AND PILOT LIGHT  
.1 Not applicable

3.14 INSTALLATION OF AUTOMATIC WALL SWITCHES  
.1 Not applicable

3.15 INSTALLATION OF RECEPTACLES  
.1 Provide all required receptacles.  
.2 Unless otherwise specified or shown, receptacles are to be white on horizontal
surfaces, cream colour on vertical surfaces, and equipped with matching faceplates.  
.3 Floor, ceiling and isolated ground receptacles are to be standard shape. All other receptacles are to be decorator type.  
.4 Provide GFCI duplex receptacles where receptacles are located within 1m of any water source.

3.16 SUPPLY OF ACCESS DOORS  
.1 Not applicable

3.17 INSTALLATION OF FASTENING AND SECURING HARDWARE  
.1 Provide all fasteners and similar hardware required for conduit, conductors, etc., and for equipment hanger and/or support material unless otherwise noted.  
.2 Explosive powder actuated fasteners will not be permitted unless specific written approval for their use and type has been obtained from the Owner.  
.3 Under no circumstances use ceiling suspension hangers or grids for the suspension or support of conduit and conductors.

3.18 INSTALLATION OF IDENTIFICATION NAMEPLATES  
.1 For each piece of electrical distribution equipment from the electrical source of supply up to and including panelboards, for special control panels and cabinets, and for each other piece of electrical equipment, provide engraved Lamacoid identification nameplates secured to apparatus with stainless steel screws. Nameplates are to indicate the equipment designation and the source of electrical supply.  
.2 Panelboard nameplates are to identify the panelboard number as designated on the drawings, unless otherwise instructed. Nameplates for disconnect switches, control panels, and cabinets are to outline their service and source of supply.  
.3 Provide self-adhesive identification labels on the inside and outside of each device outlet faceplate, identifying the location from which each device is fed.

3.19 GENERAL ELECTRICAL WORK TESTING  
.1 In addition to the tests required by the governing authorities, Codes and Regulations, perform the following:  
.1 after all luminaries, switches, receptacles, motors, signals, etc., are installed, whether same are installed as part of this Section of the work or by other Sections (telephone systems excepted), test all work to ensure that there are no grounds or crosses  
.2 establish and ensure proper motor rotation – measure full load running currents and check overload elements – report to the Owner any discrepancies which are found.  
.3 Document all tests on associated forms and submit to the Owner and Commissioning Agent for review and approval.
.4 Verify the electrical voltage, prior to beginning of fit up construction and at the end of construction/project completion.

3.20 BRANCH CIRCUIT BALANCING

.1 Connect all branch lighting and power circuits to panelboards so as to balance the actual (wattage) within 5%. If required, transpose branch circuits when the work is complete to meet this requirement.

.2 At the request of the Owner, perform all necessary tests to show the above requirement has been fulfilled. Make such tests after the building is occupied.

.3 Record all measurements on the associated forms and submit to the Owner and Commissioning Agent for review and approval.

END OF SECTION