THE CORPORATION OF
THE CITY OF KAWARTHA LAKES

REQUEST FOR TENDER
2025-30-CQ

Bobcaygeon-Verulam Arena
And Community Centre
Accessibility and Facility Upgrades

51 Mansfield Street, Bobcaygeon, Ontario

Prepared for:

THE CORPORATION OF THE CITY OF KAWARTHA LAKES
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APPENDICES

GENERAL CONDITIONS

: Canadian Standard Construction Document,
CCDC2 (2020) (Not Bound in this Specification)

DIVISION 1 - GENERAL REQUIREMENTS

DIVISION 2 – EXISTING CONDITIONS

DIVISION 4 - MASONRY

DIVISION 5 - METALS

DIVISION 6 – WOOD, PLASTICS, AND COMPOSITES

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

DIVISION 8 – OPENINGS

DIVISION 9 - FINISHES

DIVISION 10 - SPECIALTIES

DIVISION 26 – COMMON REQUIREMENTS FOR ELECTRICAL

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

END OF SECTION 00 10 00

LIST OF DRAWINGS

Drawing No.	Description	Drawing Date
Drawing 0.00	Cover Page	February 2025
Drawing 2.0	Removal Plans	February 2025
Drawing 2.1	General Notes and Partial Floor Plans	February 2025
Drawing 2.2	Partial Reflected Ceiling Plans	February 2025
Drawing 3.0	Front Canopy Details	February 2025
Drawing 4.0	Enlarged Plans and Details	February 2025
Drawing 5.0	Schedules	February 2025
Drawing M1.01	Legend and Specifications	April 2025
Drawing M1.02	Schedules	April 2025
Drawing M2.01	Mechanical Demolition and Renovation Plans	April 2025
Drawing E101	Details Legend and Schedule	April 2025
Drawing E102	Electrical Specifications (1 of 2)	April 2025
Drawing E103	Electrical Specifications (2 of 2)	April 2025
Drawing E201	Lighting Demolition	April 2025
Drawing E202	Power & Systems Demolition	April 2025
Drawing E301	Lighting Renovation	April 2025
Drawing E302	Power and Systems Renovation	April 2025

END OF SECTION 00 15 00

1 General

1.1 GENERAL REMARKS

.1 This Section is to be considered as additional to and complimentary with the General Conditions of the Contract which shall govern the Work of the Contractor and all Sub-contractors where applicable and shall be carefully read and adhered to.

.2 In the event of conflict Section GC 1.1.7 of the General Conditions shall govern.

1.2 EXAMINATION OF THE SITE

.1 Each Contractor shall examine the site prior to submission of a tender. No extras will be allowed for additional work due to lack of labour or equipment or difficulties encountered which could have been foreseen by close inspection of the site.

.2 Each contractor shall examine all areas, surfaces and materials on which or to which he is required to work, prior to commencement of each phase of his contract. Any conditions found unsatisfactory shall be reported to the general contractor who shall make all the necessary alterations to such unsatisfactory conditions. Failure to report unsatisfactory conditions prior to commencement of the sub-trades work will be construed as evidence that all conditions are satisfactory and the responsibility for perfect shall rest solely with the sub-contractor, without recourse to others.

.3 Unscheduled site visits are not permitted. The Bidder must arrange for any subsequent inspections with the Owner.

1.3 EXAMINATION OF DOCUMENTS

.1 Failure to report omissions, ambiguities and contradictions contained in the documents prior to tender closing shall render the trade involved responsible to comply with the Consultant’s interpretation at the time of construction.

1.4 ERROR AND OMISSIONS

.1 This Contractor shall make good all materials omitted by sub-contractor at their expense and shall ensure that the completed work includes material and workmanship as drawn and specified or intended, implied or otherwise necessary for satisfactory completion. Any errors in the drawings and specifications not reported in writing at the time of tendering will be assumed to be allowed for by this contractor and no extras will be accepted for extra work incurred due to errors or omissions.

1.5 PERMITS

.1 Permits pertaining to particular trades shall be paid for by the particular sub-trade concerned. Comply with all regulations of all public authorities having

jurisdiction.

.2 The Building Permit has been applied for and paid outside of this contract. The contractor is responsible for all other permits.

1.6 CONTRACTOR OMISSIONS

.1 Any additional work required by consultants to clarify work already indicated in documents or to correct an error by contractors may result in consultant's time to be charged back to the contractor at the consultant's hourly rate.

2 Definitions

.1 Contract Time
Add "All time limits stated in the *Contract Documents* are of the essence of the Contract"

.2 Add new definitions

Wherever the words or phrases in the left-hand column are used throughout the *Contract Documents,* they shall be understood, unless context provides otherwise, to mean the words or phrases in the right-hand column:
approved – approved by the Consultant
satisfactory – satisfactory to the Consultant
directed – directed by the Consultant
submit – submit to the Consultant
make good – make good to the Consultant's satisfaction
permitted – permitted by the Consultant
inspected – inspected by the Consultant
designated – designated by the Consultant
as indicated – as indicated on the drawings, material and finishing schedules"

GENERAL CONDITIONS OF THE STIPULATED PRICE CONTRACT

1 General Provisions

GC 1.1 CONTRACT DOCUMENTS

1. Paragraph 1.1.6: Add "The *Contractor* is responsible for all work required in the *Contract* regardless of Division in the specifications. Such Division shall not obligate the *Consultant* or *Owner* to arbitrate to establish limits of responsibility between *Contractor* and *Subcontractor.*"

2. Add new sub-paragraphs 1.1.7.5 and 1.1.7.6
   "1.1.7.5 In case of discrepancies, noted materials and annotations shall take precedence over graphic indications in the *Contract Documents.*"

   "1.1.7.6 Should reference standards and specifications conflict with the Project Specifications, the Project Specification shall govern. Should reference standards and specifications conflict with each other and if reference specifications conflict with Project Specifications, the more stringent requirement shall govern."

3. Paragraph 1.1.8: Delete in its entirety and substitute:
   "1.1.8 The consultant shall furnish to the *Contractor* without charge, 10 copies of the *Contract Documents*, exclusive of those required by jurisdictional authorities and the executed *Contract Documents.* Additional copies will be furnished to the *Contractor* at the *Consultant's* cost of reproduction, handling and sales taxes."

4. Add new paragraph:
   "1.1.13 The *Contract Documents* shall be signed in quadruplicate by the *Owner* and *Contractor.*"

PART 2 ADMINISTRATION OF THE CONTRACT

GC 2.2 ROLE OF THE CONSULTANT

5. Paragraph 2.2.6: Add the word "schedules" after the word "techniques".

6. Paragraph 2.2.6: At the end of the second sentence add "or to adhere to the construction schedule."

7. Add new paragraph:

   "2.2.19 Verbal instructions, regardless of their source, will not be binding to the Contract."

PART 3 EXECUTION OF THE WORK

GC 3.1 CONTROL OF THE WORK

8. Paragraph 3.1.2: Add the word “schedules after the word “techniques”.

GC 3.5 CONSTRUCTION SCHEDULE

9. Paragraph 3.5.1.1: Delete “prior to the first application for payment” and substitute “before the Work commences and updated with each meetings minutes.”

10. Add new paragraph:
    “3.5.1.4 Once approved this schedule shall not be altered without approval from the *Owner* and *Consultant.*”

GC 3.7 SUBCONTRACTORS AND SUPPLIERS

11. Paragraph 3.7.2: Add “*Contractor* shall not change those *Subcontractors* and *Suppliers* so identified without written permission of the *Owner*.”

GC 4.1 CASH ALLOWANCES

12. Delete paragraph 4.1.4 in its entirety and substitute new paragraph 4.1.4:

    “4.1.4 Where the actual cost of the Work under any cash allowance exceeds the amount of the allowance, any unexpected amounts from other cash allowances shall be reallocated, at the *Consultant’s* direction, to cover the shortfall, and, in that case, there shall be no additional amount added to the *Contract Price* for overhead and profit. Only where the actual cost of the Work under all cash allowances exceeds the total amount of all cash allowances shall the *Contractor* be compensated for the excess incurred and substantiated, plus an amount for overhead and profit on the excess incurred and substantiated, plus an amount for overhead and profit on the excess only, as set out in the *Contract Documents*.”

13. Delete paragraph 4.1.5 in its entirety and substitute new paragraph 4.1.5:

    “4.1.5 The net amount of any unexpended cash allowances, after providing for any reallocations as contemplated in paragraph 4.1.4, shall be deducted from the *Contract Price* by *Change Order* without any adjustment for the *Contractor’s* overhead and profit on such amount.”

14. Add new paragraph 4.1.8:

    “4.1.8 The *Owner* reserves the right to call, or to have the *Contractor* call, for the competitive bids for portions of the Work, to be paid for from cash allowances.”

PART 5 PAYMENT

GC 5.1 FINANCING INFORMATION REQUIRED OF THE OWNER

15. General Condition 5.1: Delete in its entirety.

GC 5.2 APPLICATIONS FOR PROGRESS PAYMENT

16. Add new paragraph:

"5.2.8 After the first application, the *Contractor* shall attach to all applications for payment, a statutory declarations, using CCDC form 9A-2001, that all accounts for labour, subcontracts, products, construction machinery and equipment, and other indebtedness which may have been incurred by the *Contractor* and for which the *Owner* might in any way be held responsible have been paid in full, except for amounts properly retained as a holdback or as an identified amount in dispute, are paid up to the last invoice."

GC 5.5 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF THE WORK

17. Paragraph 5.5.3: Delete in its entirety.

GC 5.7 FINAL PAYMENT

18. Paragraph 5.7.4, second line: Delete "5 days" and substitute "10 days".

19. SC 30 Add new paragraph

"5.7.5 The application for final payment will not be approved or processed by the Owner until a copy of all disposal site receipts have been submitted to the Owner's Representative, as outlined in the Designated Substances and Hazardous Materials Remedial Action Plan."

PART 6 CHANGES IN THE WORK

GC 6.2 CHANGE ORDER

20. Add new paragraph:

"6.2.3 The value of a change shall be determined in one or more of the following methods as directed by the *Consultant*:
.1 by estimate and acceptance of a lump sum.

.2 by unit prices as set out in the *Contract* or subsequently agreed upon, which shall include overhead, profit, and other

reasonable charges of the *Contractor* which shall be the total cost to the *Owner*. Adjustment to the *Contract Price* shall be based on net quantity difference from original quantity.

.3 by actual credits and cost to the *Owner*. Where additional work is required, the cost to the *Owner* shall be the actual cost plus a percentage covering overhead and profit, after all credits included in the change have been deducted.

The following percentage fee for overhead and profit shall be applied to additional work:

.1 On work performed by the *Contractor's* own forces, the *Contractor* may charge a maximum of 10% combined percentage for overhead and profit;

.2 On work performed by *Subcontractors,* the *Subcontractors* may charge a maximum of 10% combined percentage for overhead and profit. The *Contractor* may charge a maximum of 5% combined percentage for overhead and profit on work performed by the Subcontractors.

GC 6.3 CHANGE DIRECTIVE

21. Add new paragraph

"6.2.6.4 The *Contractor's* fee shall be a maximum of 10 percent combined percentage for overhead and profit on work performed by the *Contractor's* own forces. On Work performed by *Subcontractors*, the *Subcontractor's* fee shall be a maximum of 10 percent combined percentage for overhead and profit. The *Contractor's* fee on work performed by *Subcontractors* shall be a maximum of 5 percent, combined percentage on overhead and profit"

22. Paragraphs 6.3.7.5 and 6.3.7.6, "tools", "*Construction Equipment*" and "hand tools" shall only include those that have a new purchase value that is greater than $500.00.

PART 7 DEFAULT NOTICE

GC 7.1 OWNER'S RIGHT TO PERFORM THE WORK, STOP THE WORK OR TERMINATE THE CONTRACT

23. Paragraph 7.1.2: Add "Without limiting what is stated above, the *Contractor* will be considered to have failed to comply with the requirements of the Contract to a substantial degree if the *Contractor* fails to maintain in force the insurance required to be maintained by the *Contractor* under this Contract or is not in compliance with GC 10.4 WORKERS' COMPENSATION."

GC 7.2 CONTRACTOR'S RIGHT TO STOP THE WORK OR TERMINATE THE CONTRACT

24. Paragraph 7.2.3.1: Delete in its entirety.

25. Paragraph 7.2.3.4: Delete "except for GC 5.1 – FINANCING INFORMATION REQUIRED OF THE OWNER".

PART 9 PROTECTION OF PERSONS AND PROPERTY

GC 9.3 TOXIC AND HAZARDOUS SUBSTANCES AND MATERIALS

26. SC 43 Add new paragraph:

"9.3.2.3 Provide the Contractor with a copy of the Designated Substance and Hazardous Materials Assessment and a copy of the Designated Substance and Hazardous Materials Remedial Action Plan."

SC 49 Paragraph 9.3.8: Delete in its entirety and substitute:

"9.3.8 The Contractor shall indemnify and hold harmless the Owner, the Consultants, their agents and employees, from and against claims, demands, losses, costs, damages, actions, suits, or proceedings arising out of or resulting from exposure to, or presence of, toxic and hazardous substances or materials which were at the Place of Work prior to the Contractor commencing the Work."

GC 9.4 CONSTRUCTION SAFETY

27. Add new paragraph:

"9.4.2 The *Contractor* shall indemnify and hold harmless the *Owner* and the *Consultant*, their agents and employees from and against claims, demands losses, costs, damages, actions suits or proceedings by third parties that arise out of, or are attributed to, the *Contractor's* safety performance."

PART 10 GOVERNING REGULATIONS

GC 10.2 LAWS, NOTICES, PERMITS, AND FEES

28. SC 50 Add new paragraph:

"10.2.6 The Contractor shall be responsible for any and all fees associated with the disposal of all materials resulting from the Work."

GC 10.4 WORKERS COMPENSATION

29. SC 51 Add new paragraph:

"10.4.3 The Workers Compensation certificate must clearly indicate an endorsement for the Wrecking and Structural Demolition of Buildings."

PART 11 INSURANCE AND CONTRACT SECURITY

GC 11.1 INSURANCE

30. SC 55 Add new paragraph:

"11.1.1.5 Building Demolition Insurance:

The insurance policy must endorse the Demolition of Building and must be clearly indicated on the certificate of insurance. All premiums in respect to such policy shall be paid by the Contractor."

PART 12 INDEMNIFICATION – WAIVER – WARRANTY

GC 12.3 WARRANTY

31. Add new paragraphs:

"12.3.7 The *Contractor* shall commence to correct any deficiency within two working days after receiving a notice in writing from the *Owner* or the *Consultant*, and complete the Work as expeditiously as possible, except that in case the deficiency would prevent maintaining security or keep basic Upgrades essential to the ongoing business of the *Owner* and/or his tenants, operational as designed, all necessary corrections and/or installation of temporary replacements shall be carried out immediately as an emergency service. Should the *Contractor* fail to provide this emergency service within 24 hours of a request made in writing during the normal business hours of the *Contractor*, the *Owner* is authorized to carry out all necessary repairs or replacements at the *Contractor's* expense."

"12.3.8 The carrying out of replacement work and making good of defects shall be executed at times convenient to the *Owner* and this may require work outside of normal working hours at the *Contractor's* expense."

END OF SECTION 00 82 00

1.1 Contract Documents

.1 Work will be performed under one contract; bound by the Agreement between Owner and Contractor, Canadian Standard Construction Document - CCDC 2-2020 Stipulated Price Contract.

2.1 General Conditions

.1 The General Conditions of the Stipulated Price Contract, Standard Construction Document - CCDC 2-2020, and the Supplementary General Conditions, Section 00820 shall form an integral part of this Specification.

3.1 General Requirements

.1 All provisions of each Section of Division 1 shall apply to all other Divisions and Sections of the Specification.

4.1 Other Contractors

.1 Provisional work on this project, as noted below, shall be coordinated by this Contractor within the Work of his Contract.

.2 Interpretation of the limits of all Provisional work shall be the responsibility of the Consultant.

END OF SECTION 01 11 00

1.1 GENERALLY

.1 Perform all Work in or on existing building in accordance with the Specifications and Drawings and by tradesmen specializing in such work.

.2 It is to be emphasized that all Work be performed to ensure the integrity of the design and original materials of the existing facility is to be maintained.

2.1 OWNER'S USE OF EXISTING BUILDING

.1 The facility will remain closed for the duration of the Work. However, the contractor shall limit his work to the areas defined by the Work.

.2 Accommodations must be made to allow access to staff and possibly external contractors in order to maintain operation to the rest of the facility. In emergency situations the Contractor may need to relinquish control of this area until the facility is back to normal operation.

.3 The Owner shall be permitted to work within the existing building without hindrance or restrictions. No construction work will take place during the normal operating hours of the facility, which are listed in the Instructions to Bidders, unless instructed otherwise.

.4 The Owner shall have full authority to restrict access and control security to the site and throughout the entire facility. Existing service and delivery accesses are to remain operational at all times during construction.

3.1 CONTRACTOR'S USE OF EXISTING BUILDING

.1 Execute work in existing building at times approved and as mutually agreeable to Owner. Prepare a schedule and give Owner sufficient notice of intention to commence work in a room or area of existing building so that he may prepare the space and determine time work may commence.

.2 Maintain access to service and delivery entrances for use by the Owner. Maintain existing exits to provide proper and safe means of egress from all parts of existing building to open spaces at all times to the approval of the Consultant and jurisdictional authorities. Provide sufficient illumination and exit lights.

.3 Prohibit use of existing washrooms and services in building by construction personnel unless approved by the Consultant.

.4 The Contractor shall co-ordinate work and make all necessary arrangements with the Owner's security force to ensure that security of the building and control of access by construction personnel are maintained while work is in progress. All costs for additional security shall be paid for by the Contractor.

.5 The Contractor shall control and limit access of construction personnel to all areas of the existing building and ensure that construction personnel perform work only as required under the Contract and not as access to other work areas, any other purposes.

.6 The Contractor shall maintain all existing heating, air conditioning, ventilation, fire alarm and sprinkler protection, and emergency lighting at levels normal for office requirements throughout the facility during normal business hours for the Owner.

.7 No construction work causing oppressive noise, dust, fumes or hazards within the existing facility shall be carried out during business hours without the installation of temporary enclosures and the approval of the Owner. Execute all work as quietly as possible to achieve least disturbance to Owner.

4.1 PROTECTION

.1 Provide temporary dust screens and security separation at all times, to the Consultant's and Owner's satisfaction, between the Contractor's work area and the remaining operating portion of the facility and as shown on the drawings.

.2 Provide temporary, weather tight, dust tight and lockable partitions between existing building and all new Work. Weatherproof openings made in walls and roofs of existing building, immediately they are opened.

.3 Protection of existing building elements, in particular roofs, air barriers and waterproofing membranes shall be substantial enough to prevent any damage as a result of traffic over, or falling objects penetrating them.

.4 Protection of all property shall include but not be limited to equipment, furniture plantings, walkways and adjacent property other similar items whether included and noted on the drawings or not. Take all precautions to ensure that no structural damage is caused to the existing building and adjacent structures by demolition and alteration work, or by new construction.

5.1 REMOVAL OF EXISTING WORK AND SALVAGE

.1 Ensure during removal that materials, components and similar items to be reused are protected from damage. Provide all necessary supports, wrappings and other means to protect surfaces, materials and components that are to be removed or remain in place.

.2 Relocation of existing equipment shall be carried out and co-ordinated by this Contractor unless noted otherwise. The Contractor shall ensure that all material and tradesmen necessary for the disconnection and reconnection of equipment to be removed and/or relocated, either by the Contractor or the Owner, shall be present at all times during this Work and shall have available all material necessary to complete the work.

.3 Remove carefully all building elements, components, materials, and equipment noted to be relocated by the Specifications and drawings. Store and protect relocated items until built into new locations. Limit removal of items to smallest areas possible, and make good disturbed adjacent surfaces.

.4 Remove debris and accumulated dirt from existing building immediately as it accumulates. Ensure that during removal operations through the existing building

that existing work is not damaged and dirt, debris and dust are not spread.

.5 Maintain work areas in existing building constantly broom clean to avoid tracking of dirt into adjacent areas. Immediately clean up debris resulting from work of Contract that is deposited in existing building outside of work areas. Make a daily inspection to ensure that work and construction access areas are maintained clean and undamaged as specified.

.6 Carry out all cutting, fitting, patching, and replacement of existing components carefully in a manner to provide the least disturbance to all existing finished surfaces.

6.1 SHUTDOWNS AND CONNECTIONS TO EXISTING SERVICES

.1 Provide the Owner with a preliminary schedule of shutdowns of mechanical and electrical services prior to commencement of the work. Shutdowns shall be scheduled for normal working hours to cause minimum interference with normal building operations. After hours shutdowns shall take place no additional cost to the Owner. In no case shall service interruptions affect the total building.

.2 Notification of any interruption or shutdown of any mechanical or electrical service shall be made in writing by the Contractor to the Consultant accompanied by a sketch or full details of the proposed interruption at least two (2) weeks in advance of such interruption.

.3 Temporary and permanent mechanical or electrical services connections are to be made only in consultation with the appropriate governing authority and by prior arrangement. Restore all services to original condition unless specified otherwise.

7.1 REPLACEMENT WORK

.1 Make good materials, and prepare surfaces and repair all existing and new finished surfaces damaged, or disturbed in the existing building.

.2 Finish new surfaces flush with existing surfaces. Make junctions between existing and new or remedial work invisible. Make surfaces adjacent to one another of the same material, unit sizes, colour and texture. Review intended methods of making good with the Consultant prior to commencement of Work.

END OF SECTION 01 14 00

1.1 GENERALLY

.1 Cash allowances specified shall be carried, administered and co-ordinated by the General Contractor as part of the Work of his Contract.

.2 Include the General Contractor's charges for overhead and profit, on account of all Cash Allowances as specified, in the Contract Price in accordance with the General Conditions of the Stipulated Price Contract. Article GC 4.1 Cash Allowances and Article GC 4.2 Contingency Allowance.

.3 Include with each expenditure from the appropriate Allowances, all applicable taxes as specified in the General Conditions of the Stipulated Price Contract, Article GC 10.1 - Taxes and Duties. HST is extra to the amounts carried for this work.

.4 List all Allowances separately on each and every billing and expend Allowances only on the Consultant's agreement and written instructions.

.5 Credit the Owner with unused portion of all Allowances in statement of reconciliation prior to the final billing for the project. The Consultant will issue a final Change Order to cover this payment.

2.1 CASH ALLOWANCES

.1 For abatement of hazardous material:

Section 02 41 00 : Demolition

A Cash Allowance of Five Thousand Dollars ($5,000.00).

.2 For supply of hardware:

Section 08 71 00 : Door Hardware

Phase 1
A Cash Allowance of Seven Thousand Five Hundred Dollars ($7,500.00).

END OF SECTION 01 21 00

1.1 GENERALLY

.1 Specified prices shall be complete for the applicable work including statutory charges, overhead and profit, all duties and taxes imposed, and other related charges on account of such work.

2.1 PROVISIONAL ITEMS

.1 Provisional prices as noted below are to be included on the Form of Tender, shall be based on the Scope of Work described in the specifications and are to include for labour, material, delivery, handling, storage, overhead and profit and taxes of such Work measured complete in place. Expressed as an extra or credit to the sum tendered, they shall be used in calculation of the Contract Amount consistent with their acceptance or rejection by the Owners.

.2 The Provisional Prices requested are as follows:

Provisional Price No. 1
Remove and replace entire ceiling in Lobby 101 with gypsum board

Provisional Price No. 2
Remove and replace Lobby flooring with ceramic tile and athletic flooring

Provisional Price No. 3
Remove and replace athletic flooring in Dressing Rooms 102, 103, 104, 105 and 106 with new

Provisional Price No. 4
Remove and replace water closets in Dressing Rooms 102, 103, 104, 105 and 106 with new as shown on drawings

Provisional Price No. 5
Remove and replace light fixtures in second floor main hall 201 and Men's and Women's washrooms 204 and 203

Provisional Price No. 6
Construct new entrance canopy

Provisional Price No. 7
Remove and replace doors to Dressing Room 1 (106) and 2 (107) with wider door.

END OF SECTION 01 22 00

1.1 DESCRIPTION OF WORK

.1 All Work described in the Specifications, Schedules and Drawings or referred to in the Contract Documents, shall be governed by the General Conditions & Supplementary General Conditions of the Stipulated Price Contract - CCDC 2-2020.

.2 All Work described in Division I includes, but is not restricted to, the following requirements for setting out procedures, administration, standards, approvals, general construction safety/protection of property and people.

.3 Work in these Specifications is divided into descriptive Sections which are not intended to indemnify absolute contractual limits between the Contractor and his Subcontractors, nor between Subcontractors or Suppliers. The Contractor shall be responsible for organizing all division of labour and supply of materials necessary and essential to complete the Project in all its parts, to provide a total enclosure and protection from weather of interior spaces, and as established in the General Conditions of the Contract.

2.1 WORK COVERED BY CONTRACT DOCUMENTS

.1 Work of this Contract comprises the construction of all works required and as shown for a complete project, including but not limited to the following. This is applicable to the Omemee Arena and Community Centre:

Work includes (but not limited to):
- Renovations to public washrooms including wall and fixture reconfiguration, new flooring , partitions, door, ceiling, lights and painting
- Renovations to Dressing Rooms including wall and fixture reconfiguration, new flooring , partitions, benches, hooks, door, ceiling, lights and painting
- Renovation to public spaces including flooring, ceiling, lights, painting
- New entrance doors and vestibule

The following work is provisional, based on funding and Council approval

Provisional Price No. 1
Remove and replace entire ceiling in Lobby 101 with gypsum board

Provisional Price No. 2
Remove and replace Lobby flooring with ceramic tile and athletic flooring

Provisional Price No. 3
Remove and replace athletic flooring in Dressing Rooms 102, 103, 104, 105 and 106 with new

Provisional Price No. 4
Remove and replace water closets in Dressing Rooms 102, 103, 104, 105 and 106 with new as shown on drawings

Provisional Price No. 5
Remove and replace light fixtures in second floor main hall 201 and Men’s and Women’s

washrooms 204 and 203

Provisional Price No. 6
Construct new entrance canopy

Provisional Price No. 7
Remove and replace doors to Dressing Room 1 (106) and 2 (107) with wider door.

3.1 CODES REFERENCE STANDARDS, REGULATORY AGENCIES AND SPECIFICATIONS

.1 Perform all Work in accordance with all requirements of the Construction Safety Act, latest edition, of the Province of Ontario, as well as all other applicable regulations of jurisdictional authorities.

.2 Meet or exceed requirements of contract documents, specified standards, codes and referenced documents.

.3 Remedial Work required to review and/or correct Work installed, covered, buried and not inspected shall be carried out at the Contractors expense.

.4 Unless the edition date is 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 this Specification.

.5 Reference standards and specifications are quoted in this Specification to establish minimum standards. Work which in quality exceeds these minimum standards shall be considered to conform.

.6 Should the Contract Documents conflict with quoted reference standards or specifications, the General Conditions of the Contract shall govern.

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

4.1 DOCUMENTS REQUIRED

.1 Maintain at job site, one copy each of the following:-

.1 Contract Drawings/Specifications/Addenda.
.2 Copy of Approved Current Work Schedule.
.3 Building Permit/Drawings. Construction Record Drawings.
.4 Field Instructions and Site Inspection Reports.
.5 Notices of Change and Change Orders.
.6 Reviewed, Stamped Shop Drawings and Schedule.
.7 Independent Inspection and Field Test Reports.
.8 Authority Inspection Permits, Reports and Certificates.

5.1 WORK SCHEDULE

.1 Provide to the Consultant, within five (5) working days after Contract award, a construction schedule showing anticipated progress stages, sequencing, milestone dates, delivery dates and final completion of Work within time period required by Contract Documents.

.2 Provide to the Consultant, prior to the first Project Site Meeting a shop drawing schedule showing the discipline, received date, schedule required date, and status of each shop drawing to be provided.

.3 Provide updated schedules on a monthly basis to permit the Consultant to evaluate and communicate to the Owner the status of Work for future Progress Billing purposes. Payments will not be approved until schedules are received and approved. Should there be slippage of schedule, a plan to reacquire schedule must be submitted to the Consultant.

6.1 SITE MEETINGS/PROGRESS RECORDS

.1 Interim monthly reviews of Work Progress, based on the current Work Schedule, will be conducted by the City, Consultant, and Contractor and any necessary corrections to the schedule shall be noted and updated by Contractor in conjunction with all subtrades and suppliers to the satisfaction of the Consultant at least once every thirty (30) working days. Copies of the updated schedule shall be submitted to the Consultant, Project Manager for their review and comments.

7.1 APPROVAL OF WORK

.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 Where reference is made in these Specifications that Work is to proceed or to meet the approval of jurisdictional authorities, Consultant or others, such approval shall be in writing.

8.1 WORK DURING NON-BUSINESS HOURS

.1 The Contractor is cautioned that the Consultant and/or Sub-Consultants, cannot be committed to site attendance at the site except for normal working hours i.e., Monday to Friday 7:00 am to 6:00 p.m. excluding holidays. All and any Work performed during such times, requiring either the presence of the Consultants, Owner or other Authorities, and carried out without their specific written prior approval, shall be performed solely at the General Contractor's responsibility.

.2 Notify the Consultant at least ninety-six (96) hours in advance of Work at night (7:00 p.m. to 6:00 a.m.) on weekdays, Saturdays, Sundays and Statutory or declared holidays. Undertake no work during the foregoing times without the Consultant's written approval.

.3 Any work that results in a disruption of the facility must be coordinated at least two weeks in advance with the Owner and Consultant. Disruptions must occur when

there are no events scheduled in the facility or may occur outside regular working hours. The owner will not entertain requests for extra as a result of such events. Contractor must plan and account for such events in base bid.

9.1 PROJECT COORDINATION

.1 Assume full responsibility for the coordination and cooperation of all trades.

.2 Employ a qualified superintendent who shall:

.1 Be on the site at all times and control all Work throughout.
.2 Have full authority to act on the Consultant's instructions.
.3 Have full knowledge of Construction and this Project in particular.
.4 Not be changed without prior approval of the Consultant.

.3 Coordinate all service terminations with appropriate Authorities.

10.1 WORKMEN, SUPPLIERS AND SUBCONTRACTORS

.1 Assign Work only to workmen, suppliers and Subcontractors who have complete knowledge, not only of the conditions of this Specification, but of jurisdictional requirements, reference standards and specifications.

.2 Give preference to use of local workmen, suppliers and Subcontractors wherever possible.

11.1 COOPERATION AND COORDINATION OF SUBCONTRACTOR'S WORK

.1 Coordinate all construction components in each area and on which subsequent Work depends to facilitate mutual progress, and to prevent conflict between parts of the Work performed by all trades.

.2 The Contractor shall ensure that each of his Subcontractors make known to him, and to other Subcontractors, the environmental and surface conditions required for the execution of the Subcontractor's Work, and the sequence of other's Work required for installation of the Subcontractor's Work.

.3 The Contractor shall ensure that each Subcontractor, before he commences his Work, fully understands the site requirements and conditions preceding and subsequent to his Work, and that each Subcontractor execute his preparatory Work properly as required by the Subcontractors whose Work depends upon it.

.4 Subcontractors/Suppliers who give installation information in error, or too late to incorporate in the Work, shall be responsible for having any and all Work carried out which was thereby additionally made necessary to correct the situation.

.5 Remove Work which has been installed in error, incorrectly or substituted without approval and which is unsatisfactory for subsequent Work immediately at no additional expense to the Owner.

.6 The Contractor shall 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 Subcontractor whose Work requires cooperative location and installation by other Subcontractors.

.7 Schedule delivery of materials, supplied by one Subcontractor to be installed by another, well in advance of commencement of the installation.

12.1 CONTRACTOR'S USE OF SITE

.1 Do not unreasonably encumber site with materials or equipment. Remove all materials from site as they accumulate daily.

.2 Use of site is limited and restricted to the areas for work and storage as shown on the drawings and as designated by the Consultant and as approved by the Owner.

.3 Restore, at completion of Work, all adjacent property, surfaces, sidewalks, etc. to original condition of commencement of work to satisfaction of the Consultant.

13.1 ACCESS TO SITE

.1 The Contractor shall direct and control access and delivery of all construction materials and equipment onto and within the site. He shall provide flagmen and guards as required.

.2 The Contractor shall be completely responsible for delivery vehicles, and materials and equipment while they are on the site, and shall pay all costs for their immediate removal or relocation should they impede the access of others.

.3 City staff will require access to the refrigeration room for daily operation of facility. Accommodations must be made to allow access to staff and possibly external contractors in order to maintain operation to the rest of the facility. In emergency situations the Contractor may need to relinquish control of this area until the facility is back to normal operation.

14.1 PARKING

.1 Parking shall be allowed only with the prior approval and in authorized areas as agreed to and directed by the Consultant.

.2 Construction vehicles must not disrupt daily activities without prior approval.

15.1 ACCESS FOR EQUIPMENT

.1 Fitments and other equipment shall be made up in sections of such size as can be easily transported in and through the building to the final location without alteration or damage to the building.

.2 Should it become necessary at any time during the execution of the Work to move materials and/or equipment which have been temporarily placed, when so directed by the, make arrangements with those who are furnishing such materials and equipment to move them or cause them to be moved to a different location as directed without additional charge.

16.1 SETTING OUT OF WORK

.1 The Contractor shall establish necessary lines, levels, and provide batter boards or other means to control the accurate positioning of all elements of work.

.2 The Contractor shall verify all existing grades, property lines and levels shown on the Drawings.

.3 Before commencing installation of Work, verify that it is laid out accurately in accordance with intent of Drawings and that positions, levels and clearances to adjacent Work are maintained. If Work is installed in wrong location, rectify it before construction continues.

.4 The Contractor shall furnish to the Consultant, certification from a licensed Ontario Land Surveyor that the Building and other parts of the work are located in accordance with the Contract requirements. Setting out of Work shall be in conformity with the Municipal Setback requirements. The Surveyor's Certification shall represent an independent and disinterested verification of the Contractor's layout work. The Surveyor shall promptly verify and certify the lines and levels of any part of the work at any time it may be deemed necessary by the Consultant. Any deviation from the drawings shall be reported to the Consultant in writing within twenty-four (24) hours of discovery.

17.1 EXAMINATION OF SITE BEFORE EXECUTION OF WORK

.1 Examine site, and ensure that each Subcontractor whose Work is related to site conditions has examined it, so that all are fully informed on all particulars, which affect Work thereon and at the place of building, and in order that construction proceeds competently and expeditiously.

.2 Examine completed Work, Work in progress, and Work yet to be carried out by others under other Sections of the Specifications.

.3 Verify dimensions of completed Work in place before fabrication of Work to be incorporated with it.

.4 Verify that previously executed Work and surfaces are satisfactory for installation or application, or both, and that performance of subsequent Work will not be affected. Commencement of Work shall constitute acceptance of site conditions and surfaces as satisfactory.

.5 The Contractor is responsible for a pre-construction survey of the existing facility and surrounding site to limit liability. This survey must be provided to the Owner.

.6 Report to Consultant any and all defects in previously completed Work which will affect the scheduling and quality of all subsequent Work.

.7 No allowance will be made for difficulties encountered in the Work which were in existence or could have been anticipated at the time the Work was tendered.

.8 No allowance will be made for difficulties encountered in the Work which are a result of the lack of cooperation/coordination on the part of the Contractor of any of

his Trades or Suppliers.

18.1 PROTECTION OF WORK, PROPERTY AND PERSONS

.1 Work shall include 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. Temporary facilities relating to protection are specified in Section 01500. Schedule the work so that security and safety is maintained at all times.

.2 Keep excavations Work free of water at all times. Pump dry as required.

.3 Remove snow and ice immediately from building. Carefully remove snow and ice from all finished roof areas.

.4 Keep surfaces on which finish materials will be applied free from grease, oil and other contamination which would be detrimental in any way to the application of finish materials.

.5 Protect finish surfaces of completed Work from damage by restriction of access or by use of physical means suitable to the material and surface location. Establish with each Subcontractor the suitability of such protection in each case.

.6 Give constant close supervision to roofing following installation, during the time they are temporarily protected or exposed to ensure that no damage occurs to them before completion of building. Provide protection especially against damage from traffic or Work performed on top of completed roofing when temperature is over 80^{o}F.

.7 Locate, identify and protect existing services from damages. If necessary, relocate active services to ensure that they function continuously in safety and without risk of damage. Any damage caused to existing services and/or property shall be made good at the Contractor's expense.

.8 Do not damage landscaped areas by piling of surplus soil over them, by dumping of debris over them or compacting the soil within the drip line of the trees/shrubs.

.9 Special precautions to be taken to protect all existing planting on the site. Do not damage or cut root systems of existing trees; stockpile any surplus material over them or use trees for anchorage. Remove only those trees or shrubs which are designated to be removed and/or replanted. Protect, and if damaged make good, adjacent property.

.10 Assume full responsibility for the provision of all protection against rain, wind, snow, ice, storms, frost, heat and vandalism so as to maintain work area free from injury or damage.

.11 Notify the Consultant should the job be closed down for any reason and assume full responsibility, for providing adequate protection, security, etc. during the shutdown.

.12 The Contractor is cautioned to use appropriate demolition methods in order to fully

protect all existing structure. Do not carry out any work in a manner that will endanger any structural members, services.

.13 Take all necessary precautions to protect the occupants, the public, passersby and adjoining property against flying dust and debris.

19.1 FIRE PREVENTION AND SAFETY

.1 The Contractor shall enforce fire protection methods of good housekeeping, and adherence to local and underwriter's fire regulations. Provide ULC approved fire extinguishers, and other fire fighting services and equipment except where more explicit requirements are specified as the responsibility of individual Subcontractors.

.2 Erection of hoarding must be in compliance with the building code, fire code. Ensure that sprinklers, fire alarms, exiting, etc for the facility are not compromised. Contractor will be responsible for applying for any permits or meeting the requirements of the applicable codes.

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

.4 Use only fire-resistant tarpaulins and similar protective covering on site.

.5 Ensure that each Subcontractor stores his volatile waste in approved closed containers and removes them from premises daily.

20.1 PUBLIC PROTECTION

.1 When necessary, the Contractor must post a flagman who will be responsible for safety and direction of pedestrian traffic past the site.

.2 Maintain existing exiting routes and access from the existing premises.

21.1 PROVISIONS FOR TRAFFIC

.1 Particular effort shall be applied to the safety of pedestrian flow past the site. Any activity which has potential for interference with pedestrian flow shall first be approved by the Consultant. Provide temporary guide barriers, signage and flagmen as required for safe and efficient control of pedestrian flow.

22.1 MUD TRACKING

.1 The Contractor shall take all steps necessary to prevent the tracking of mud beyond the site and assume all responsibilities for the tracking of mud, dirt and debris resulting from his operations, beyond the site and shall pay all costs necessary for the clean-up resulting from this operation.

.2 Clean up must happen daily to the satisfaction of the City.

23.1 DUST CONTROL

.1 The Contractor shall take such steps as may be required to prevent dust nuisance

resulting from his operations from spreading beyond the site.

.2 Where the work requires the sawing or grinding of concrete, blades and grinders of the wet type shall be used together with sufficient water to prevent the incidence of dust. The cost of all such preventative measures shall be borne by the Contractor.

.3 The contractor shall complete a full cleaning of the facility at project completion.

24.1 SECURITY

.1 The contractor shall provide secure, solid closures to any opening which will not be able to be closed in with the new construction due to any circumstances which may arise.

.2 Ensure that the site security is operating at all times construction is proceeding and that the temporary site enclosure is secured at the end of each day's work.

25.1 SALVAGE AND DISPOSAL

.1 Items of antiquity, including coin, art, anthropology, etc. which are on the site at the time of signing of Contract, which are uncovered or unearthed during the construction, shall remain the property of the Owner and shall be turned over to him immediately and without prejudice.

.2 Unless otherwise specified, salvaged material which will not to be reused within the new construction, surplus materials and construction debris shall become property of Contractor. The Contractor shall pay all associated costs and arrange for the safe removal and disposal away from site.

26.1 FASTENINGS

.1 Work of each Subcontractor shall include necessary fastenings, anchors, inserts, attachment accessories and adhesives. Where installation part of Work of other Subcontractor, locate devices and cooperate with them as required.

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

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

.4 Repair of existing surfaces as a result of temporary fastening are the responsibility of the contractor.

27.1 CONCEALMENT OF PIPES, DUCTS AND WIRING

.1 Conceal all pipes, ducts and wiring in floor, wall and ceiling construction of finished areas wherever possible. If any doubt arises as to the means of concealment, or the intention of the Contract Documents in this connection, request clarification from the Consultant before proceeding with that portion of the Work.

.2 Where necessary, mechanical and electrical Work shall be laid out well in advance of concrete pouring and furring erection so that provision may be made for proper concealment. All such Work shall be tested, inspected and pipe covering applied where applicable before being concealed.

28.1 CUTTING, FITTING, PATCHING AND REPLACEMENT

.1 Before cutting, drilling or sleeving of any structural load-bearing elements within the project, obtain the Consultant's approval. Do not endanger Work or property by cutting, digging or similar activities. Do not cut or alter the Work of others unless approved by the Consultant, Sub-Consultant or Sub-Contractor whose Work is being altered.

.2 Cutting, drilling, sleeving and patching of Work shall be done by the Subcontractor whose trade Section corresponds to the Work requiring cutting, and where located by Subcontractor who requires the Work performed for his installations; all under the direct supervision of the Contractor.

.3 Replacement of damaged Work shall be done by the Subcontractor whose trade Section corresponds to the Work requiring patching or replacement, at the expense of the Subcontractor who causes the damage. Cut and drill with true smooth edges, and to minimal, suitable tolerances.

.4 Patching of damaged Work shall be done by the General Contractor and it shall be his responsibility to ensure the remedial Work is carried out expeditiously, and at no expense to the Owner and to the satisfaction of the Consultant. Make patches invisible in final assembly.

.5 Fit construction tightly to ducts, pipes and conduits to stop air movement completely. The Subcontractor whose Work penetrates an element of the building shall ensure that no movement will affect his Work, the joint is sealed and is the element is a fire separation he shall be responsible for maintaining the separation in an approved manner.

29.1 EXISTING SERVICES

.1 Where Work involves capping/cutting or relocation of existing services, carry out work at times directed by governing authorities.

.2 Before commencing Work, establish location and extent of service lines in area of Work and notify the Consultant of findings.

.3 Submit schedule to and obtain approval from the Consultant and Owner and for any shutdown or closure of active service or facility. Adhere to approved schedule and provide notice to affected parties.

.4 Where unknown services are encountered, immediately advise Consultant and confirm findings in writing.

.5 Record location of all new, capped or abandoned site services accurately on "Construction Record Drawings".

.6 All rough-in to point of equipment connection is to be carried out by the Mechanical and Electrical Contractors as part of the General Contract for the Work. This Contractor shall be responsible for setting of the equipment in place and ensuring that all electrical and mechanical connections to this equipment is carried out correctly and as required by the equipment manufacturer.

.7 Final connection to equipment will be carried out under the Work of the General Contract for the Building Alteration and Addition.

.8 Do not interrupt existing services except as approved by the Consultant. Give the Consultant or governing authority seven (7) days clear notice of intention to interrupt existing services.

.9 In the event existing services are uncovered or disrupted accidentally, make complete restoration on a priority basis and provide adequate protection to avoid further disruption until diversion or alternative arrangements are made.

30.1 CLEANING

.1 Each Subcontractor shall clean and remove from his finished Work all stains, soiling, markings, labels, scratches, spatters, droppings, and debris. He shall leave his Work and adjacent finished Work in new condition.

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

.3 No debris, waste or excess material shall be burned or buried at site. Ensure that volatile fluid wastes are not disposed of in storm or sanitary sewers or in open drain courses. Do not allow waste material and debris to accumulate in an unsightly or hazardous manner. Provide containers in which to collect waste material and debris. Sprinkle dusty accumulations with water.

.4 Ensure that cleaning operations are scheduled to prevent dust or other foreign matter affecting surfaces which are wet or tacky.

.5 Each Subcontractor shall supply the Contractor with instructions for final cleaning of his Work, and for inclusion in Project Data Book as more exactly specified in each trade Section and in Section 01 30 00.

.6 Ensure that cleanup is carried out daily to provide a neat, orderly and safe site for all personnel working on the site.

.7 The final project cleanup and cleaning of all components shall be carried out by the Contractor in accordance with Section 01 70 00 - Project Closeout.

END OF SECTION 01 26 36

1.1 ADMINISTRATIVE DOCUMENTATION

.1 The Contractor shall be responsible for arranging, collecting, compiling and maintaining on the site all current documents, reports, minutes and affidavits etc. as specified and required by the Consultant and jurisdictional authorities for their review and use.

2.1 PRECONSTRUCTION MEETING

.1 Immediately after award of Contract attend a meeting, arranged by the Consultant, with the Owner, Sub-consultants, Contractor and Refrigerant Sub-contractors to document the responsibilities and necessary activities of the Contractor, Subcontractor and Suppliers during construction, establish procedures for co-operation and co-ordination of all participants during construction and to set forth the lines of communication for all correspondence for the Project.

3.1 PROJECT SITE MEETINGS

.1 Arrange for the Consultant, Owner and Subcontractors to attend Project Site Meetings to discuss project scheduling, document interpretation and contemplated revisions to the project.

.2 Provide physical space and make arrangements for bi-weekly Project Site Meetings at times and dates mutually agreed to with the Consultant, Sub-consultants and Owner.

.3 The Consultant shall record all minutes of meetings and forward to the Contractor for distribution to all parties involved within 48 hours of the meeting.

.4 Arrange for Sub-Contractors representatives to attend the site meetings approximately one (1) hour after the Project Site Meeting to discuss specific items of Work which require the interpretation or clarification of the documents with the Consultant and Consultants. Provide a proposed agenda listing information, problems and concerns requiring resolution with the Consultant and/or Sub-consultants.

4.1 SITE PROGRESS RECORDS

.1 Maintain on the site a permanent record, in a format acceptable to the Consultant, of the progress of construction, site conditions, inspections and schedule of the Work. The record shall include:-
- .1 Commencement and completion dates of each trades Work.
- .2 Daily weather conditions
- .3 Scheduling, inspections and approvals
- .4 Status of materials, deliveries etc.
- .5 Site conditions encountered.

5.1 CONSTRUCTION SCHEDULE

.1 The Contractor shall be responsible for maintaining the completion date as set out in Construction Schedule prepared, submitted and approved and shall advise the Consultant immediately if any changes to deliveries or conditions will cause delays which would affect the completion date.

.2 The Contractor shall review the current Project Schedule with all Subcontractors and Suppliers and note any variances which have occurred since the last meeting which may affect the scheduled completion of the project.

.3 The Contractor shall correct, revise, update and otherwise maintain the schedule during progress of construction. Provide a revised and updated schedule to the Consultant, Owner, and Subcontractors.

.4 Contractor must maintain a Contemplated Change Orders, Change Orders, Change Directives, Site Instruction, Shop Drawings and Requests for Information log identifying status, reason, costs etc. This list must be issued with site meeting minutes.

END OF SECTION 01 32 00

1.1 GENERALLY

.1 The Contractor shall be responsible for preparing, for the first project site meeting, a schedule of all requested and required submittals listing all shop drawings, samples, reports, manuals, drawings intended for submission to the Consultant.

.2 The Contractor shall co-ordinate and distribute all submissions, to the Consultant as well as Subtrades and suppliers, to ensure that the flow of documents is performed in a timely manner to maintain the construction schedule.

.3 All submittals specified and requested in all Sections of these Specifications shall be made by the General Contractor, directly to the Consultant. Submit copies to the Sub-Consultants and jurisdictional authorities only on the instructions or in agreement with the Consultant.

.4 Submissions containing substitutions or alternates will be returned immediately by the Consultant or Sub-Consultants.

1.2 CONSTRUCTION SCHEDULES

.1 Submit in accordance with Section 01 00 5.

1.3 SHOP DRAWINGS

.1 The Consultant shall review, stamp and return the digital copy of all shop drawings marked "No Comments", "Comments as Noted" or "Revise and Resubmit". A copy of all shop drawings marked "No Comments or Comments as Noted" shall be retained at the site for the Consultant, Consultants and trades to review. Only drawings stamped "Revise and Resubmit" need be resubmitted. The Contractor shall be responsible for printing the reviewed shop drawings.

.2 Submit to the Consultant one (1) digital (PDF) copy of all shop drawings for the items of Work noted throughout this Specification, and in accordance with GC 3.11 of the Agreement.

.3 Submit shop drawings for signs, hoardings, fences, barricades, shoring and bracing, hoists, temporary supports, enclosures, stairs and similar Work specified in Division 1 when requested by the Consultant or jurisdictional authorities in accordance with their requirements.

.4 The Owner is to be given the opportunity to review all shop drawings. Only the Consultant will provide acceptance.

.5 The Contractor shall check, stamp, sign and make notations he considers necessary on shop drawings before each submission. Shop drawings not checked and signed will be returned without review.

.6 Do not proceed with Work dependent on shop drawing information until Consultant's and Contractor's review is finalized. Shop drawings marked, "No Comments" shall not relieve the Contractor of his responsibility for execution of

Work in accordance with Contract Documents.

.7 The following information shall be shown on shop drawings:-

- title, project name, date, scale, manufacturer, fabricator and installer.
- materials, finishes, fabrication and erection dimensions.
- clear and obvious deviations or proposed changes from drawings or specifications.

Project specific details to indicate construction arrangement of parts, connections, anchorage, fastener type, and interconnections with other Work.

- mechanical and electrical requirements and characteristics when applicable.
- information to verify that superimposed loads will not affect function, appearance and safety of this or related Work.
- assumed design loadings, material specifications for load-bearing members.
- dimensions and dimensioned locations of proposed chases, sleeves, cuts and holes in structural members.
- Engineer's seals, calculations and notations as required.

.8 Submit only digital (PDF) copies of shop drawings. Digital copies (only) will be returned.

.9 Fabricate Work exactly as shown on shop drawings. If shop practice dictates revisions, revise drawings and resubmit.

1.4 SAMPLES AND MOCK-UPS

.1 Submit to Consultant samples and mock-ups for the materials noted throughout these specifications and in accordance with GC 3.11 of the Agreement.

.2 Samples labelled to show title, project, Contractor, Manufacturer and date. Submit samples of adequate size to show the colour, texture, thickness, shape, jointing, fastening and otherwise represent the material in its intended use on this specific Project. Submit the manufacturers complete range of samples unless the Consultant has selected one (1) or more specific types to be used.

.3 The Materials used on this Project shall match approved samples in all aspects including quality, colour, texture and finish. Materials installed without approval of samples shall be removed and replaced at the Contractors expense.

1.5 AFFIDAVITS

.1 Submit to the Consultant affidavits, in duplicate signed and notarized by a responsible officer of the certifying company for the specified products noted in other Sections of the Specification.

1.6 GUARANTEES AND WARRANTIES

.1 Provide the extended guarantees as specified in each applicable Section of this Specification.

.2 Extended guarantees shall commence on termination of the standard one-year guarantee granted in this Contract as specified in Article GC 12.3 - Warranty of the General Conditions, and shall be an extension of these same provisions.

.3 Each extended guarantee shall be submitted in a format, identical to the other and as approved by Consultant.

1.7 MAINTENANCE MANUAL AND OPERATING INSTRUCTIONS

.1 Submit Maintenance Manuals to the Consultant at completion of Project prior to application for Certificate of Substantial Performance. Maintenance Manual shall consist of shop drawings, extended guarantees and Project Data Book.

.2 The Project Data Book Shall

- consist of two (2) USB (digital) copy.
- have a title sheet, or sheets preceding data on which shall be recorded Project name, date, list of contents and Contractor's and Subcontractors' names
- be organized into applicable Sections of Work with each section separation by hard paper dividers with plastic covered tabs marked by Section
- contain only typed or printed information and notes, and neatly drafted drawings
- contain Warranties/Guarantees including extended Warranties/Guarantees with the names, addresses and phone numbers for servicing.
- contain maintenance and operating instructions on all building, and mechanical and electrical equipment
- contain maintenance instructions as specified in various Sections and as referenced in Section 01 15 00
- contain brochures and parts listed on all equipment sources of supply for all proprietary products used in the Work
- contain lists of supply sources for maintenance of all equipment in Project of which more detailed information is not included above
- contain finished hardware schedule
- contain charts, diagrams and reports specified in Divisions 15 and 16.
- contain one (1) copy of final reviewed, stamped and signed shop drawing issued for Project, on which have been recorded changes made during fabrication and installation caused by unforeseen conditions.

1.8 EXTRA STOCK

.1 Supply extra stock at completion of Project as specified in other Sections of this Specification.

1.9 INSPECTION LABORATORY REPORTS

.1 Submit reports in duplicate unless specified otherwise, signed by a responsible officer of the inspection and testing laboratory, for the items as specified in other Sections of the Specifications in Articles entitled, "Source Quality Control" and "Field Quality Control".

1.10 APPLICATION FOR PAYMENT

.1 Applications for Payment must be accompanied by:

.1 The Contractor's Statement of Payment.
.2 Progress Draw showing a schedule of values of various trades and for various parts of the work in a format acceptable to the Consultant.
.3 A Statutory Declaration, duly signed by the Contractor and all Subcontractors, stating that all Subcontractors and suppliers have been paid to date and that there are no liens outstanding or filed.
.4 Letter of Good Standing from Workers' Compensation Board.

1.11 CONSTRUCTION RECORD DRAWINGS

.1 The Contractor will be provided with two sets of prints to be used as Record Drawings on which he shall mark clearly "IN RED, IN A NEAT AND LEGIBLE MANNER", all deviations from the Contract Documents in the Work as constructed, caused by site conditions and including Consultant originated changes, Contractor/Sub-Contractor originated changes, Site Instructions, Supplementary Instructions, Addenda, instructions by correspondence and Jurisdiction authority approvals. Carefully record location of concealed elements which are required for maintenance, alteration work, and building additions, including elements of foundation, horizontal and vertical location of utilities and appurtenances, location of internal utilities concealed in construction, and all field changes of dimension and detail. Eradicate all obsolete information.

.2 Maintain record drawings in good condition, available at all times for inspection by Consultant's site representatives, and do not use for construction purposes.

END OF SECTION 01 33 00

1.1 GENERAL REQUIREMENTS

.1 Division 1, General Requirements, is a part of this Section and shall apply as if repeated here.

2.1 INSPECTION

.1 The materials furnished by the Contractor shall be inspected by the Contractor and Inspection/Testing Agency at the source, time of delivery and at such other times as requested by the Consultants.

.2 The review of the information covering materials and equipment by the Consultants shall in no way release the Contractor or Inspection/Testing Agency from his responsibility for the proper design, installation and performance of any material, equipment or arrangement or from the liability to replace same should it prove defective or deficient.

3.1 INSPECTIONS BY OWNER

.1 The Owner shall pay all costs associated with the testing/inspections carried out by their own forces (under cash allowance).

.2 The Contractor shall ensure that the testing/inspection is carried out in conformance with these specifications including samples, reporting, etc.

4.1 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies will be engaged by the Consultant for the purpose of inspecting and/or testing portions of Work as outlined in the specifications.

.2 Cost of such services for each portion of the Work noted, shall be paid for by the Contractor as part of the Cash Allowance specified under Section 01 05 00. Do not expend such allowances without approval of the Consultant.

.3 The Contractor shall ensure that the inspection/testing is carried out in conformance with these specifications, including sampling and reports.

.4 Equipment required for executing inspection and testing by the appointed agencies shall be provided by them for their specific use.

.5 Employment of Inspection/Testing Agencies does not relax the responsibility of the Contractor to perform the Work in accordance with the Contract Documents.

.6 If defects are revealed during inspection and/or testing, the appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defects and irregularities as advised by the Consultant at no cost to the Owner.

.7 Allow Inspection/Testing Agencies access to the Work, offsite manufacturing and

fabrication plants. Cooperate to provide reasonable facilities for such access.

5.1 PROCEDURES

.1 Prepare schedule of testing to be given to testing company. Notify the appropriate agency and Consultant a minimum of two (2) working days in advance of the requirement for tests, in order that attendance arrangements can be made.

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

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

6.1 REJECTED WORK

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

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

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

7.1 REPORTS

.1 Reports shall contain the following information:
- .1 Date and time of inspection or test.
- .2 Weather conditions and ambient air temperatures during the inspection.
- .3 Testing method employed by proper standard reference and specific paragraph or other detailed information as applicable.
- .4 Inspection description and details and other relevant information.
- .5 Test results in detail, complete with applicable graphs and other clarifying documents and information.
- .6 Printed name and signature of person having conducted inspection or test, and name, title and signature of Supervisor having verified the report.

.2 Inspection and Testing Agency shall provide written report for each inspection and test made, one (1) copy to the Consultants; two (2) copies to the Contractor direct, who shall forward one (1) copy to the Sub-Contractor, supplier or manufacturer concerned and two (2) copies for the data books.

8.1 TESTS AND MIX DESIGNS

.1 Furnish test results and mix designs as requested and required.

9.1 PRE-POUR MEETING

.1 The contractor to schedule a meeting with all relevant trades, consultants and owner's representatives prior to placing the concrete for the ice pad. This meeting shall review all procedures, material, backup plans, testing, quality control, line testing and schedule.

END OF SECTION 01 40 00

1.1 GENERALLY

.1 Work shall include temporary facilities and controls required as construction aids or by jurisdictional authorities, or as otherwise specified. Install to meet needs of construction as Work progresses. Maintain during use, remove at completion of need and make good adjacent Work and property affected by their installation.

.2 Work shall include fixed or portable structures as shown and as required for storage, offices, washrooms, etc. as required for safety, security and to meet the needs of the construction project and the Owner as otherwise specified. Access/use of the facility washrooms is not permitted.

.3 Temporary facilities shall include provisions for construction safety as required by the Construction Safety Act of the Province of Ontario, as well as all other applicable regulations of jurisdictional authorities.

.4 Construct temporary Work of new materials unless use of second-hand materials is approved by the Consultant.

.5 Ensure that structural, mechanical and electrical characteristics of temporary facilities are suitable and adequate for use intended. Be responsible that no harm is caused to persons and property by failure of temporary facilities because of placing, location, stability, protection, structural sufficiency, removal or any other cause.

.6 Prepare shop drawings and specifications of temporary Work, and submit for approval if required by jurisdictional authorities and to the Consultant in accordance with Section 01 33 00.

.7 Pay all costs for any and all temporary facilities and controls including, but not limited to, permits, transportation, set-up, maintenance and leases.

2.1 CONSTRUCTION AIDS

.1 Erect scaffolding independent of building walls, and remove promptly when no longer required. Do not allow scaffolds to interfere with continuing "Work".

.2 Each user of scaffolding which is not his own shall be responsible for its examination and testing before using it. He shall make it secure if necessary, or shall notify the Contractor in writing that he will not commence Work until it is made secure; otherwise, he will be held responsible for accidents and acceptance of the scaffolding.

.3 Work shall include temporary enclosure for building as required to protect it, in its entirety or in its parts, against the elements, to maintain environmental conditions required for Work within the enclosure, and to prevent damage to materials stored within. Design enclosures to withstand wind pressures required for the building by jurisdictional authorities. Use structural framing of building for support of temporary enclosure framing only upon verification that the load limits of the

building frame will not be exceeded, and upon approval of the Consultant. Keep surfaces of enclosures free of snow and ice to avoid overloading of building structure. Erect enclosures to allow complete accessibility for installation of materials during the time enclosures remain in place.

3.1 PROTECTIVE FENCES, DEVICES, BARRICADES

.1 Install temporary constructions to ensure protection to the public, premises and all personnel as specified other Sections of this Specification and the General Conditions of the Contract.

.2 Work shall include barricades for traffic control, and to prevent damaging traffic over finished areas, sidewalk and curb protection, as well as safety barricades, hoardings and otherwise as may be required.

.3 Erect protective hoarding/enclosure around the work area and as depicted on the drawings to protect the adjacent area from debris, dust and noise. The enclosure shall be dust tight and maintained as such for the duration of construction. Access to City staff (to refrigeration room etc) must be accommodated. Additional, access to all required exit must be maintained. Verify all items to be protected with the Consultant prior to commencement of work.

4.1 SECURITY

.1 Maintain security of construction site by control of access through enclosing fences during times Work is in progress, and by locking hardware otherwise.

.2 Maintain security at all times construction is shut down because of a strike or a lockout, or for whatever reason the project is unoccupied.

5.1 TEMPORARY WATER, ELECTRICITY, HEAT, LIGHTING

.1 The provision of water, electricity, heat and lighting required for construction of the facilities, for the duration of the project with be available from the building.

.2 The Contractor shall supply electric power for all construction purposes. Make connections available to any part of the Work within distance of a 100'-0" extension. Provide power at temporary storage sheds and field office and classroom facility.

.3 Make connections for electric power for construction purposes (not heating or welding) at only the main switchboard, after it is installed. Feed from a separate sub-feed switch.

.4 Temporary electric service shall include distribution conductors and necessary components. Provide a power centre for miscellaneous tools and equipment with weatherproof distribution box, a minimum of four 20 Amp grounded outlets, and circuit breaker protection for each outlet.

.5 The Contractor shall heat building during construction to maintain temperature for working surface, and during conditions required by all specified materials. Use only heating methods approved by the Consultant and jurisdictional authorities. Salamanders will not be permitted.

.6 Provide lighting for:

- emergency evacuation, safety and security throughout the Project at intensity levels required for jurisdictional authorities
- performance of Work throughout areas as required, evenly distributed, and at intensities to ensure that proper installations and applications are achieved
- performance of finishing Work in areas as required, evenly distributed and of an intensity of at least 15 foot candles.

.7 Make arrangements for connections to water, sewer, gas, electric and telephone utilities as required for temporary use during construction. Pay connection and disconnection charges, and for use of services required by construction.

.8 Temporary office or lunch location for the contractor shall be in a trailer outside and is the contractor's responsibility to maintain.

6.1 DUST CONTROL

.1 Prevent spread of dust beyond the construction site by wetting or by other means approved by the Consultant. Provide coverings for bleachers to protect from dust. A thorough cleaning of all areas including roof structure, where dust may collect shall be completed at the end of the project.

END OF SECTION 01 50 00

1.1 CONSTRUCTION SAFETY MEASURES

.1 Observe and enforce construction safety measures required by National Building Code 1985, Part 8, Provincial Government, Workers' Compensation Board and municipal statutes and authorities.

.2 In event of conflict between any provisions of above authorities, the most stringent provision governs.

2.1 FIRE PROTECTION

.1 Eliminate fire hazards and prevent damage to work, materials, equipment and other property, both public and private.

.2 Provide and maintain in working order, adequate temporary Underwriters' labelled fire extinguishers and locate in prominent positions, to the approval of authorities having jurisdiction.

3.1 FIRST AID

.1 Provide and maintain on the site in a clean, orderly condition, completely equipped first aid facilities which shall be readily accessible at all times to all employees.

.2 Designate certain employees who are properly instructed to be in charge of first aid. At least one such employee shall always be available on the site while work is being carried on.

.3 A telephone call list for summoning aid, such as doctors, ambulances, Pulmotors, and rescue squads from outside sources shall be conspicuously posted.

4.1 OVERLOADING

.1 Ensure no part of Work is subjected to a load which will endanger its safety or will cause deformation.

5.1 FALSEWORK

.1 Design and construct falsework in accordance with CSA S269.1-16 (R2021).

6.1 DISPOSAL OF WASTES

.1 Do not bury rubbish and waste materials on site.

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

.3 Fires and burning of rubbish on the site shall not be permitted.

7.1 POLLUTION CONTROL

.1 Control emissions from equipment and plant to local authorities' emission requirements.

.2 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

.3 The contractor shall take appropriate precaution for activities generating excessive levels of noise. These works are to be scheduled outside of facility operating hours as directed by City staff.

8.1 TOXIC AND HAZARDOUS WASTE

.1 Prior to commencement of Work, ensure that all reasonable precautions have been taken to determine if toxic or hazardous substances are present on the site.

.2 Address unforeseen conditions expeditiously and report to the Consultant, jurisdiction having authority, immediately, any conditions found on the site.

.3 Do not bury any waste material on the site which could be deemed to be considered toxic or hazardous.

END OF SECTION 01 51 00

1.1 GENERALLY

.1 Reference to material and equipment includes all products to be incorporated into the Work as specified in these Specifications, and which may otherwise referred to as materials, equipment, components and similar terms or more broadly as products. Obtain specified products from suppliers in the same locality as the Project insofar as possible without prejudice to the scheduling of the project.

.2 Products for use in the Project and on which the tender was based shall be in production at that time, with a precise model and shop drawings available for viewing.

.3 Where equivalent products are specified, or where alternatives are proposed, these products claimed by the Contractor as equivalent shall be listed on the tender form and be comparable in construction, type, function, quality, performance and appearance, as determined by the Consultant. Where specified equivalents noted in the base tendered price, are accepted for incorporation into the Work, they shall be subject to final approval by the Consultant for suitability on this project.

.4 Products delivered to the Project site for incorporation into the Work, shall be considered the property of the Owner and shall not be removed from the site without written authorization from the Owner.

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

2.1 SPECIFIED PRODUCTS

.1 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 substitution as specified. Where several proprietary products are specified, any one of the several shall be acceptable.

.2 For products specified by reference standards, the onus shall be on the supplier to establish that such products meet reference standard requirements. The Consultant may require affidavits from the supplier, as specified, 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 Work with which they are incorporated.

3.1 APPROVAL OF PRODUCTS

.1 Wherever in this Specification it is specified that products shall meet approval of jurisdictional authorities, Underwriters, Consultants or others, such approval shall be in writing.

4.1 SUBSTITUTION OF PRODUCTS DURING PROGRESS OF WORK

.1 No substitution for products shall be permitted. If the specified product cannot be delivered to maintain construction schedule and if the delay is caused by conditions beyond the Contractor's, Sub-Contractors or Suppliers control, the Contractor shall notify the Consultant immediately that alternate materials are requested to be reviewed.

.2 Substituted materials installed, without the approval of the Consultant, shall be removed and all costs associated with the correction of the Work, including all Costs incurred by the Owner, Consultant and Sub-Consultants, shall be the responsibility of the Contractor.

.3 Obtain approval for substitutions from the Consultant. Application for approval of substitutions shall be made only by Contractor. Process proposals for substituted Work in accordance with procedures established for changes in the Work.

.4 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 each product.

.5 It shall be the responsibility of the Contractor to ensure that substituted products can be both physically and dimensionally incorporated in the Work with no loss of intended function, performance or space. The Contractor shall be responsible for additional installation costs required by incorporation of substituted products and for adaptations made otherwise necessary to ensure that above requirements are satisfied.

5.1 PRODUCT HANDLING

.1 Manufacture, pack, ship, deliver and store products so that no damage occurs to structural qualities and finish appearance, not in any other way detrimental to their function or appearance, or both.

.2 Ensure that products, while transported, stored or installed, are not exposed to an environment which would increase their moisture content beyond the maximum specified.

.3 Schedule early delivery of products to enable Work to be executed without delay. Before delivery, arrange for receiving at site.

.4 Deliver package products, and store until use, with manufacturer's seals and labels intact.

.5 Label packaged products to describe contents, quantity and other information as specified.

.6 Product handling requirements may be repeated, and additional requirements specified, in other Sections.

6.1 STORAGE AND PROTECTION

.1 Store products on site or in storage sheds with secure protection against all harmful environmental conditions. Prevent damage, adulteration, staining and soiling of materials while stored.

.2 Store manufactured products in accordance with manufacturer's instructions, when such instructions are attached to products or submitted by him.

.3 Store steel, lumber, masonry units, and similar products on platforms raised clear of ground. Store finished products under cover at all times.

.4 All damaged products will be rejected for use, and thereupon shall be immediately removed from site.

.5 Store and handle flammable liquids and other hazardous materials in approved safety containers and as otherwise prescribed by safety authorities. Store no flammable liquids or other hazardous materials in bulk within the Project.

.6 All damaged products will be rejected for use and thereupon shall be immediately removed from site.

.7 Storage and special protection requirements may be repeated and additional requirements specified, in other Sections.

7.1 DEFECTIVE PRODUCTS AND WORK

.1 Products and Work found defective; not in accordance with the Specifications; or defaced or injured through negligence of the Contractor, his employees or Subcontractors, or by fire, weather or any other cause shall be rejected.

.2 Remove rejected products and Work from the premises immediately.

.3 Replace rejected products and Work with satisfactory products with no delay after rejection. Previous inspection and payments shall not relieve the Contractor from the obligation of providing sound and satisfactory Work in compliance with this Specification.

.4 Costs for replacement of defective material installed shall be the responsibility of the Contractor.

END OF SECTION 01 60 20

1.1 GENERAL CONDITIONS

.1 Work specified, shown on the Drawings or referred to in the Contract Documents, is governed by the General Conditions and Supplementary General Conditions.

.2 The Owner supplied equipment and items of Work, noted in these specifications and/or shown on the drawings, shall be incorporated into the Work of this Contract. This contractor shall be responsible for, as part of his contract, the co-ordination of rough-in and completion of these items of Work as they affect his Contract and scheduling. The Owner shall be responsible for approvals, payment and delivery of this portion of the Work and shall notify the Contractor of any changes in status which may affect his scheduling for the entire project.

2.1 WORK PERFORMED BY OWNER

.1 Material testing during construction (paid under Cash Allowance)

.2 Chemical testing of existing sub-surface soil for contaminants (paid under Cash Allowance).

.3 Paper towel and toilet paper dispensers

.4 Building Permit

.5 Canteen equipment – existing to be reinstalled

.6 Trophy Cases – existing to be located as shown on drawings

.7 Exterior and interior signage

END OF SECTION 01 64 00

1.1 FINAL CLEANING

.1 Before final inspection, replace all material damaged during construction or which is otherwise defective, marred or deficient.

.2 In addition to requirements for cleaning-up specified in the General Conditions of the Contract and as specified in the various sections of the Specifications, the Work by the Contractor shall include one (1) final cleaning by skilled cleaning specialists prior to Substantial Completion of the project and Occupancy by the Owner.

.3 Final cleaning shall remove dust, stains, paint spots, soil, grease, fingerprints and accumulations of construction materials in accordance with manufacturer's instructions for each material. This Work shall include but not be limited to:

: remove temporary protections and make good defects before commencement of final cleaning.
: washing of exterior and interior concrete floors.
: cleaning and polishing of glass.
: wiping, dusting and washing as necessary of floors, walls and ceilings.

.4 Maintain final cleaned state of the project, or portions thereof, until Owner has taken possession of project.

.5 Cleaning shall include all areas of the facility affected by construction including top of beams and roof structure where dust raised during construction may have settled.

2.1 DEMONSTRATION OF SYSTEMS

.1 Each Subcontractor shall give a complete demonstration in the presence of the Owner of the operation of all systems and equipment installations once they are complete and when the Consultant is advised that the building is to be handed over to the Owner. Responsible personnel from the Subcontractors whose Work is being demonstrated shall be present as required at these demonstrations.

3.1 CONSTRUCTION RECORD DRAWINGS

.1 Record, on white prints, Work constructed differently than shown on Contract Documents. Record all changes in the Work caused by site conditions; by Owner, Consultant, Sub-Consultants, Contractor and Sub-contractors originated changes; and by site instructions, supplementary instructions, field orders, change orders, addenda, correspondence and directions of jurisdictional authorities. Accurately record location of concealed structure and mechanical and electrical services, piping, 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 Make records in a neat and legibly printed manner with a non-smudging medium.

.3 Identify each record drawing as "Project Record Copy", maintain drawings in good condition, do not use them for construction purposes and make available to the Consultant at all times.

.4 Provide one hard copy of construction record drawings plus one (1) USB (digital) copy.

4.1 SUBSTANTIAL COMPLETION CERTIFICATE

.1 The following articles, in addition to those set forth under the General Conditions of the Contract, are to be submitted to the Consultant before issuance of the Substantial Performance Certificate.

.2 General

.1 Building Permit Copy of Drawings and Specifications, Building Permit, and all other permits/inspection approvals/documentation received during the course of construction from all Authorities.
.2 Verification of Fire Alarm, Emergency Lighting and Sprinkler System
.3 Copies of all Independent inspection reports as specified.
.4 Construction Record Drawings.
.5 Maintenance Manuals and Operating Instructions.
.6 Copies of all Warranties and Manufacturers inspection reports.
.7 Preliminary Deficiency List prepared by the Contractor for review by all trades and the Consultant and Sub-Consultants.

5.1 FINAL DOCUMENTATION

.1 Provide the following documentation as applicable before completion will be declared:
.1 Adjusted and reconciled cash allowances.
.2 Written statement of completion from Contractor and all other declarations as requested by the Consultant.
.3 Original copy of newspaper listing, as required under the Construction Act.
.4 Abstract of title from Registrar of Land Registration and/or Certificate of Encumbrances at termination of lien period.

6.1 FINAL INSPECTION AND CLOSE-OUT

.1 Arrange for, conduct and document final inspections, close-out and take-over at completion of Work of this Specification in accordance with procedures described in OAA/OGCA TAKE-OVER PROCEDURES, OAA/OGCA Document No. 100, December 12, 2007.

END OF SECTION 01 70 00

1 General

1.1 GENERAL REQUIREMENTS

.1 Division 1, General Requirements is a part of this Section and shall apply as if repeated here.

1.2 WORK IN OTHER SECTIONS

.1 Related Work Specified in Other Sections:

Section 01 03 00	:	Work in Existing Building
Section 01 50 00	:	Temporary Facilities and Controls
Division 22	:	Plumbing
Division 23	:	Heating, Ventilation and Air-Condition
Division 26	:	Electrical

1.3 QUALIFICATIONS

.1 Execute work of this Section only by a firm who specializes in such work, has adequate equipment and skilled tradesmen to perform it expeditiously, and is known to have been responsible for demolition work similar to that specified, during a period of at least the last five years.

1.4 REQUIREMENTS OF REGULATORY AGENCIES

.1 Perform demolition work in accordance with latest edition requirements of CSA S350-M1980 (latest edition), the Fire Protection Act and the Occupational Health and Safety Act and Regulations for Construction Projects of the Province of Ontario, Section 01 00 50 General Instructions of the specifications and as otherwise required by jurisdictional authorities to save persons and property from harm resulting from work of this Section.

1.5 SALVAGE AND DISPOSAL OF MATERIALS

.1 Assume responsibility for demolition and removal of elements noted to be removed or altered in the condition they are at time notified of award of demolition contract.

.2 All excess materials resulting from the demolition necessary for the project, except as specified or noted on the drawings, shall become the property of the Contractor who shall remove the same as quickly as possible to his designated disposal area. The retention of materials on the site for sale or salvage purposes is forbidden. Burning of materials and/or debris on the site is strictly forbidden.

.3 Remove, clean, store, and protect all specified salvage items until required to be built into the project.

.4 Remove debris daily, immediately as it accumulates. Do not overload trucks and otherwise take means to prevent spillage during travel.

.5 The Owner will undertake testing of existing services and subsoil below the ice pad. The Contractor shall make arrangement in his schedule to accommodate this time. Testing shall include but not limited to pressure testing of heat system piping, sampling of piping and chemical testing for contaminants.

1.6 ACCESS TO SITE

.1 Provide for complete and safe access at all times to the building for the Owner and the public to the areas designated for continuous operations by the Owner.

.2 Do not impede pedestrian or vehicular traffic on public ways within or adjacent to the premises by Work in progress or stored materials.

2 Products

Not Applicable

3 Execution

3.1 EXAMINATION

.1 Before commencing any demolition Work, ensure in examination of the site that all possible factors concerning the demolition have been investigated, and in particular the following are known:-

.1 Methods and means available for material handling, disposal, storage and transportation.
.2 Method of construction of structures, fixtures and services to be demolished.
.3 Disconnection of services to all fixtures completed.
.4 Hoarding and temporary barriers installation completed.

.2 Review demolition Work to be performed in its entirety with the Consultant. Do not proceed without his approval of demolition methods which will be used.

3.2 SPECIAL PROTECTION

.1 Ensure that adjacent private and public properties, both within and without the premises, are protected from damage resulting from work of this Section. Protection shall consist of fences, barricades, signs, and substantial constructions to provide physical protection. Property shall include, but not be limited by, structures and their finishes and appurtenances; site improvements; trees, planting and landscaping; furnishings, fixtures, hardware and equipment.

.2 Protect existing items designated to remain and materials designated for salvage. In event of damage, immediately replace such items or make repairs to approval of Consultant and at no additional cost to the Owner.

.3 Post danger signs in conspicuous locations to warn persons that demolition is in progress. Barricade all access by unauthorized persons to areas in which demolition is in progress.

3.3 EXISTING SERVICES

.1 Verify the location of all existing services within the project boundary prior to commencing work. Arrange and pay for the disconnection, capping and plugging of all gas, water, sewer, hydro, telephone and other services to the buildings at the property line. In each case, the utility company involved shall be notified in advance, and its approval obtained before commencing that portion of the work.

.2 Do not interrupt existing services except as approved by the Consultant. Give the Consultant seven (7) days clear notice of intention to interrupt existing services. In the event existing services are uncovered or disrupted accidentally, make complete restoration on a priority basis and provide adequate protection to avoid further disruption until diversion or alternative arrangements are made.

3.4 SCHEDULE OF SALVAGE & RELOCATION

.1 Ensure that the specifications and drawings are referred to for the complete extent of this Work. Carry out all salvage under the supervision of the applicable Subcontractor whose Work includes the reinstallation of that specific product.

.2 Elements noted to be removed, relocated and reinstalled shall include but not be limited to the following:-

3.5 RESTORATION

.1 Remove hoarding, barricades and other temporary construction on completion of demolition.

.2 Reinstate areas immediately adjacent to the work to match the condition of adjacent undisturbed work. Backfill all excavations and compact to provide uniform, even surface.

END OF SECTION 02 41 10

1 General

1.1 GENERAL REQUIREMENTS

.1 Division 1, General Requirements, is a part of this Section and shall apply as if repeated here.

1.2 WORK IN OTHER SECTIONS

.1 Related Work Specified in Other Sections

Section 05 50 00 : Metal Fabrications
Section 07 60 00 : Flashing and Sheet Metal
Section 07 90 00 : Joint Protection
Section 08 10 00 : Doors and Frames

.2 Products Supplied Under Work of Other Sections

and Installed Under Work of This Sections

Section 08 10 00: Doors and Frames

1.3 QUALIFICATIONS

.1 Execute work of this section only by a contractor who has adequate equipment and skilled tradesmen to perform it expeditiously and is known to have been responsible for satisfactory installations similar to that specified during a period of at least five years.

1.4 REFERENCE STANDARDS

CAN/CSA-A5/A8/A362-93 - Blended Hydraulic Cement
CAN/CSA-A165 SERIES-14 (R2019) - Concrete Block Masonry Units
CAN/CSA A82:14 (R2018), ASTM C216-10 – Fired Masonry Brick Made from Clay or Shale
CSA A371-14 (R2019) – Masonry Construction for Buildings
CSA S304.14 (R2019) – Design of Masonry Structures
CSA-A23.1:19 - Concrete Materials and Methods of Concrete Construction

.1 Install flashings in masonry as follows:

.1 Install flashings under exterior masonry bearing on foundation wall.

1.5 SUPERVISION

.1 Work of this Section shall be executed under the continuous supervision and direction of a competent foreman for each class of work.

.2 One thoroughly experienced, reliable and competent tradesman shall be in charge of mortar mixing.

.3 Ensure that all items required to be built into masonry walls by all other trades are known and co-ordinated prior to commencement of work.

.4 Consult the approved shop drawings for all sections of the specifications to determine the exact location of items to be built into masonry.

1.6 SUBMITTALS

.1 Submit for approval clearly labelled samples of masonry materials to be used in the work. Submit for approval any alternative materials if requested by the Consultant.

.2 Provide a mock-up sample, 1200mm HIGH by 1800mm LONG, for each of the following items, prior to commencing work:-
(Not required)

1.7 DEFECTS DEFINED

.1 In addition to non-compliance with specified requirements or other contract requirements, the following will be considered defect:

.1 Shrinkage in individual units and erected walls.

.2 Spalling, efflorescence, cracking or chipping of units.

.3 Poor colour or texture blending of units.

.4 Surface deterioration dusting.

.5 Discolouration, crumbling and similar deterioration of mortar, grout.

.6 Failure of built in items to remain anchored.

1.8 STORAGE OF MATERIALS

.1 Store cementitious material in accordance with CAN/CSA-A5/A8/A362. Store aggregates in accordance with CSA-A23.1. Stack masonry units to avoid chipping. Manufacturer's seals and labels shall be intact. Refer to cold weather protection Article 3.6 for requirements of preheating masonry materials prior to building in.

1.9 WIND BRACING

.1 Brace walls during construction until the structure provides sufficient lateral support. This is a mandatory requirement.

1.10 PROTECTION

.1 Cover top of completed and partially completed masonry walls not protected by permanent work. Use waterproof coverings draped 600 mm (min.) down each side

of wall and securely anchored.

2 Products

2.1 MATERIALS

.1 General: Use only materials specified herein.

.2 Water: Verify that water used contains no salts to cause efflorescence.

.3 Concrete Masonry Units:

.1 Bubble cured units or Autoclaved units to meet requirements of CSA-A165 Series 14.

.2 Type H/15 A/M normal weight block.

.3 Size Metric

.4 Special Shapes - Supply corner block, "L" shape block, bullnose block, header block, lintel block and the like as shown on the drawings, or as required.

.4 Acoustical Concrete Masonry Units to CSA-A165-14, purpose made with slots to provide the acoustical characteristics specified:

.1 Size and extent as shown on the drawings.

.2 Reinforcing patterns as shown on the structural drawings.

.3 Type H/15.0 A/M normal weight block.

.4 Incombustible fibrous cavity filler.

.5 Type "R" sound block as manufactured by TCG Materials, or Acousta-Wall as manufactured by Day & Campbell Ltd.

.5 Glass Fibre Board: Glass fibre insulation, semi-rigid board, density of 20.8 kg/m^3 (1.3 lbs./cu.ft.).

.6 Bellows for Control and Expansion Joint: Bituminous membrane type compatible with wall membrane.

.7 Dampproof/Thru-Wall Flashing: Fibre reinforced membrane, coated one side with 0.61 kg/m^2 (2 oz./sq.ft.) copper, to meet quality standard of Copper-Bar by Gummed Papers Limited or Bituminous reinforced membrane manufactured by Monsey Bakor Inc.

.8 Asphalt Emulsions: As specified in CGSB 37-GP-2M.

.9 Brick Vents: Flexible PVC offset "T" shape with vertical leg slotted to allow passage of air, for installation in vertical joints, to meet quality standard of GOODCO brick vent.

.10 Wall Reinforcing: As shown on Structural drawings.

.11 Cavity Wallbonding Box Tie: 4.76mm (3/16") galvanized high tensile steel wire, truss type reinforcing with box ties @ 400 o/c in two sections to form a hook and eye, Blok-Lok Limited or equivalent by Dur-O-Wal Limited.

.12 Flexible Anchor: To suit conditions and to allow for differential movement between the structure and masonry work. Typically: 4.76 mm (3/16") diameter steel, galvanized, bent into an equilateral triangular shape with its apex flexibly secured to structure, and with its two legs terminating in 25 mm (1") inward bent hooks extending a minimum of 100 mm (4") into masonry anchored.

.13 Wall Ties: 22 gauge galvanized corrugated steel.

.14 Stud Anchors: 14 gauge, hot-dipped galvanized steel plate anchors with 4.76mm (3/16") diameter galvanized steel wire ties for cavity wall.

.15 Bond Anchor: 4.76 mm (3/16") diameter steel galvanized with 50 mm (2") end bent 90^{o}.

.16 Galvanizing: To specified requirements of ASTM Specification A153, Class B.3 coatings, for all bolts and hardware, ASTM Specification A116, Class 3 coating, for masonry ties other than above.

.17 Cleaner: Vanatrol as manufactured by C.P.D., Ratio 6:1 unless otherwise noted by brick/mortar/grout manufacturer. (MURIATIC ACID NOT ACCEPTED).

3 Execution

3.1 GENERAL WORKMANSHIP

.1 Employ properly qualified masons for laying up masonry units.

.2 Distribute exposed masonry units of varying colours, tones and textures evenly over wall surface to avoid patches and streaks and to produce a pleasing appearance.

.3 Gaining to meet spandrels, etc., leaving courses uneven or with visibly thicker mortar joints will not be acceptable. Any such work must be removed and rebuilt to approval of Consultant.

.4 Construct masonry evenly in maximum lifts of 1200 mm per working day. Rake back ends of unfinished walls; do not tooth and bond new masonry.

.5 Chases, fixtures, outlets must be built - not cut. Co-ordinate with Mechanical and Electrical.

.6 Install aluminium and hollow metal door frames by building in lugs and filling voids with mortar. Keep frames free of mortar stains. Protect as required.

.7 Chipped or blemished units may be used where concealed. Chipped, cracked or broken units are considered deficiencies where exposed to file and shall be removed and replaced.

.8 Build masonry with accurately plumbed faces, truly horizontal bed joints and accurately aligned vertical joints.

.9 Notwithstanding current trade practices in this regard, fill all vertical collar and bed joints through the entire wall thickness solidly with mortar.

.10 Cut masonry neatly with a carborundum saw where it comes in contact with the structure and where else required and build tightly against the structure except where expansion control and deflection joints are required. Build masonry up and neatly fit to all openings, and all anchors for frames for such openings shall be built securely into joints.

.11 Do all cutting, fitting and patching in masonry work to receive work of other trades. Install items supplied by other trades to be built into masonry walls, plumb, level, rigid and secure. Build in all miscellaneous metal work, loose lintels, bearing plates, sleeves, anchor bolts, wood nailer and all other items which require building into the masonry. Set access doors with front face flush with final wall finish. Locate such fittings precisely as directed.

3.2 LINTELS

.1 Set loose lintels supplied under Section 05100 for bridging openings in masonry.

.2 Bridge openings not exceeding 450 mm in width with 6 mm mild steel plate lintels bearing 100 mm on each side of opening. Width of plate shall be wall thickness less 25 mm. Joint at lintel to be dry packed. Provide minimum brick vents per lintel at 800 o/c.

.3 Install concrete block lintels where indicated on drawings. Fill with 25 MPa concrete and reinforce as shown. Temporarily support until concrete is cured.

3.3 STRUCTURAL BEARING

.1 Install bearing pads in all load bearing walls to receive structural components by:

: Two courses of solid masonry units at least 400mm (16") in upper course and 800mm (32") long in lower course or by lintel blocks at least 800mm (32") long filled with 25MPa (3600 psi) concrete and reinforced with two 10mm (3/8") diameter bars, in bearing course only.

: Co-ordinate this work with fixing devices provided under the work of Section 05100.

3.4 DAMPPROOF COURSE/THRU-WALL FLASHINGS

.1 Install bituminous membrane on walls and partitions rising from footings below grade and in locations indicated on Drawings. Lap and seal all joints. Install thru-wall flashings at all lintels, grade junctions and roof junctions and in locations indicated on the drawings. Lap and seal all joints.

3.5 CONTROL JOINTS

.1 Control joints shall be located at maximum spacings of 4800 to 6000 centres and be located as shown on the drawings.

3.6 COLD WEATHER PROTECTION

.1 Refer to the Ontario Masonry Contractor's Association's provision and publications. Include for tarped heated enclosures, heated mortar mixing pans - no non-freeze additives such as calcium will be tolerated on this project.

3.7 BONDING

.1 Lay face brick and concrete block units coursing in running bond pattern. Lay soldier and header coursing. Corbel brick piers and friezes as shown on drawings.

.2 Lay brick coursing to course every second block course. Course soldier coursing to course on three stretcher courses.

.3 Construct quoins, header courses and soldier and corbelling to protrude 25mm.

.4 Anchor brick to back-up at 400 o/c vertical and horizontal maximum with ties.

3.8 JOINTS

.1 Ensure cavity width is maintained and keep free of droppings. Back trowel to prevent build-up of mortar.

.2 Rake brick joints to size and depth in accordance with recommended trade practices.

.3 Keep control joints, expansion joints and air spaces free from mortar and droppings.

.4 Construct Control Joints in locations shown. DO NOT SAW CUT. Sealing to be carried out in conformance with Section 07900. Install bellows to maintain membrane air barrier integrity. Keep joints free of mortar droppings.

.5 Make joints of uniform thickness with vertical joints plumbed over each other. Do not butter corners of units, allow mortar scrapings in joints excessively or shift and

tap units after mortar has initially set.

.6 For solid masonry units completely fill with mortar both bed and vertical joints.

.7 For hollow masonry units ensure that mortar covers all available bearing surfaces fully and fills vertical joints, except for weep and vent holes.

.8 When work is resumed on walls previously laid with mortar either partially or totally set, remove loose masonry and mortar from top and adjoining surfaces. Remove mortar completely when masonry is removed and replaced with new.

.9 Form tooled concave joints for concrete block walls wherever exposed to view, whether behind cabinets, fitments, and wall accessories, or not. When mortar has become "thumbprint" hard by a tool having a minimum 500mm long bearing surface to avoid uneven depressions. Clean off burrs with trowel or burlap.

.10 Rake out joints at juncture of interior and exterior walls with columns, at intersections of walls and partitions where joint reinforcement is installed, and at other caulked joints.

.11 Form reglets required for metal flashing in masonry.

.12 Flush-in solidly with mortar between cavity filler strips and interior face of brick veneer.

.13 Cut joints off flush where treatment is not otherwise specified. No mortar shall protrude from joints on wall surfaces to which insulation will be applied.

.14 Install insulation using adhesive recommended by the manufacturer. Insulation is to be tight fitting with no joints.

3.9 LAYING MASONRY

.1 Stop off horizontal runs of walls by racking back a half unit in each horizontal course: do not tooth.

.2 Wet clay and shale masonry units before placing. Do not wet concrete units. Wet faces of work in place before laying new work. Units shall not have water adhering to their surfaces when laid; but shall be wet only to ensure that complete hydration takes place, during hot drying weather, and when unit absorption rates are greater than 0.025 oz/sq.in./ minute, so that the initial rate of absorption does not exceed above rate when laid.

.3 Distribute masonry units of varying colours and textures to avoid spotty appearance over wall surfaces exposed to review. Do not use units which contrast too greatly with overall range.

.4 Use chipped and blemished units only where concealed. Do not use defective or broken units. Do not lay concrete units that will appear smooth or slick where exposed to view, whether painted or not.

.5 Brace walls and piers continuously during construction until structure provides support.

.6 Extend all walls to construction above except where otherwise noted on Drawings. Leave deflection space over non-load bearing walls as specified later.

.7 Cope, cut and split concrete masonry units with power-driven abrasive discs. Cut units wherever electrical outlets, grilles, and pipes occur. Allow 4 mm minimum clearance around items which are incorporated in walls.

.8 Lay hollow concrete masonry units so that effective shells rest and align one over the other. If they do not in bond courses, use solid bonding units.

.9 Install solid masonry units at all locations required for fixing of handrails, metal partitions and accessories of all description.

.10 Flush smooth with mortar masonry surfaces that flashings rest against to ensure that they are not punctured.

.11 Install brick vents at 600 mm (24") o.c. in vertical joints of masonry courses that rest on dampproofing and thruwall flashing and at top of masonry wall at steel lintels.

.12 Locate bearings and piers as indicated on Drawings; provide solid masonry units at bearings. Grout under bearing plates installed on masonry with non-shrink grout.

.13 Cooperate at all times with persons carrying out the work.

.14 Keep cavity spaces free of mortar in cavity walls.

.15 Build, do not cut, chases. Do not incorporate chases in walls of 200mm (8") thick or less, nor locate them within 500mm (20") of lateral support provided for wall, nor exceed one-third of wall thickness for chase depth. Provide lintels over chases that exceed 500mm (20") in width and that are more than one-third of wall thickness in depth. Locate adjoining chases with a minimum clear distance between them of four times wall thickness.

3.10 MASONRY REINFORCING

.1 Reinforce all masonry walls using joint reinforcement in horizontal joints.

.2 Place joint reinforcement continuously in horizontal joints. Lap a minimum of 150mm (6") at splices.

.3 Reinforcing Schedule

: Inner Wythe of Cavity Walls (Non Load Bearing): Heavy duty joint reinforcement every second course between bonding ties.

: Load-Bearing Exterior and Interior Walls: Heavy duty joint reinforcement every block course.

: Non-Load-Bearing Partitions: Standard joint reinforcement every second course with additional course over all openings carried at least 800 mm (32") beyond jambs.

: Refer to Structural Drawings for size and placement of vertical reinforcing steel.

.4 Do not reinforce face veneers.

.5 Where changes in wall thicknesses occur extend horizontal reinforcement 500 mm (20") beyond on each side. Carry reinforcement all around every course in masonry cover to structural steel.

.6 Do not carry reinforcement through control or expansion joints.

.7 Wherever walls and partitions intersect one another, or each other, continue reinforcement through. Do not carry it through where lateral support anchors are installed, or intersection occurs at a solid pier.

3.11 MASONRY ANCHORAGE AND SUPPORT

.1 Anchor masonry construction to ensure its stability and to withstand loads imposed by intended use and by natural elements.

.2 Anchor masonry construction at structural steel work with flexible anchor every 400mm (16") in height. Weld flexible tab section of anchor to structural steel.

.3 Unless indicated or specified otherwise, space anchors at a maximum of 600mm (24") vertically and 800mm (32") horizontally.

.4 Wall Anchorage:

: For Non-Load-Bearing Partitions: Anchor partitions that abut or intersect other walls or partitions by corrugated galvanized wall ties spaced at not more than every third course apart vertically or by joint reinforcement.

: For Load-Bearing Exterior and Interior Walls: Anchor walls that face or abut other load-bearing walls or solid masonry piers by toothing, or blocking, with 100 mm (4") minimum and 200 mm (8") maximum offsets into which strap anchors are set at a maximum spacing of 800 mm (32") vertically. Use lateral support anchors, but with 75 mm (3") hooks. Extend anchors a minimum of 450 mm (18") into masonry at both sides of intersection. Where this is not possible, install cross pins in lieu of hooks to provide equivalent anchorage. At corners, provide true bonding of at least 50% of the units of one wall imbedded in the other. Provide for caulked joints at intersecting walls as part of the work of Section 07 90 00.

.5 Lateral Support: shall be provided for masonry walls and partitions as indicated on Drawings, specified, and required by jurisdictional authorities; perpendicular to wall faces; and either horizontally or vertically to wall panel edges. Provide lateral support for interior walls and partitions.

: Horizontally: by wedging masonry against structure, by clips or dowel plates specified in Section 05 50 00 at a maximum spacing of 1800mm (6'-0") o.c. where concealed in the final work or by continuous cover angles where exposed.

: Vertically: at junction with poured-in-place concrete by corrugated metal veneer anchors spaced at not more than every third course apart, one for every 4" or part thereof of masonry wall thickness, securely fastened to concrete by an approved method.

.6 Deflection Space:

: Provide a deflection space between tops of non-load-bearing walls and partitions and structures to prevent transference of structural loads to masonry.

: Fill deflection space with Type AF100 glass fibre board compressed to 50% of original thickness to completely fill space.

: Deflection space shall be 1" unless otherwise designated on Drawings.

: Co-ordinate work with installation of lateral support specified in Section 05 50 00.

3.12 DAMPPROOF FLASHING

.1 Install dampproof flashing continuously through exterior masonry walls, under sills and elsewhere as indicated on Drawings. Lap joints 150 mm (6").

.2 Flush up surfaces to receive dampproof flashing with mortar, and install flashing. Ensure that no coarse aggregate or other protrusions will pierce flashing, and protect it until work resumes.

.3 Through-wall flashings shall be dressed through full thickness of exterior wythe, across airspace and turn-up at least 150 mm (6") against inner wythe applied with approved adhesive. Install flashings prior to application of cavity wall insulation to details as shown on Drawings.

.4 When mortar bed for flashing has set resume laying of masonry.

.5 Where flashing is exposed to view or must bridge air-space without support, use sheet metal flashings provided and installed as part of the work of Section 07560. Install sheet metal flashings after dampproof flashings but prior to others.

3.13 MECHANICAL LOUVRES, GRILLES, UNIT VENTILATORS

.1 Construct openings in wall to accommodate sizes and details required by mechanical trades.

.2 Seal completely around penetrations to prevent air infiltration.

3.14 PATCHING

.1 Patch masonry walls damaged by installation of work specified under other Sections, and which have been rejected as defective or otherwise damaged.

3.15 POINTING AND CLEANING

.1 Point all holes in mortar joints and in concrete masonry unit faces.

.2 Cut out defective mortar joints and repoint.

.3 Wash down and brush brick and grout/mortar to remove mortar laitance and stains. Use specified cleaners only. Consult with brick/block/grout and mortar supplier for solution strength and recommendations.

.4 Clean concrete masonry units with brushes and as otherwise recommended by the supplier to remove mortar and stains.

.5 Do not use wire brushes for cleaning.

.6 Should specified cleaning methods be insufficient, proceed with other methods only with approval of the Consultant.

.7 Protect adjacent materials and work from damage while cleaning

END OF SECTION 04 20 00

1 General

1.1 GENERAL REQUIREMENTS

.1 Division 1, General Requirements, is a part of this Section and shall apply as if repeated here.

1.2 WORK IN OTHER SECTIONS

.1 Related Work Specified in Other Sections

Section 06 10 00 : Rough Carpentry

.2 Products Supplied Under Work of This Section and Installed Under Work of Other Sections

None

1.3 REFERENCE STANDARDS

CSA S16-19: Design of Steel Structures
CSA W59-18: Welded Steel Construction (Metal Arc Welding)
G40.20-13: General Requirements for Rolled or Welded Structural Quality Steel
CSA G40.21-13: Structural Quality Steel
CSA W47.1-19: Certification of Companies for Fusion Welding of Steel
CSA W48-18: Filler Metals and Allied Materials for Metal Arc Welding
CAN/CSA G164-18: Hot Dip Galvanizing of Irregularly Shaped Articles
The Ontario Building Code, (O. Reg. 350/12)

1.4 QUALIFICATIONS

.1 Execute the work of this Section only by a Subcontractor who has adequate plant, equipment and skilled tradesmen, and is known to have been responsible for satisfactory work similar to that specified during a period of at least five years.

1.5 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 01 33 00 - Submittals.
.2 Indicate connections, details, dimensions, and all other data as required to accommodate installation.

1.6 PRODUCT HANDLING

.1 Deliver materials as required for erection. If storage becomes necessary stack materials on wood blocking clear of ground and tilted slightly so as to avoid water lying on the material. Storage area to be as close to the building as is practical. Protect finished surfaces from damage or rust.

.2 Damaged materials shall be replaced by this Contractor without extra cost to the Owner.

2 Products

2.1 MATERIALS

.1 Steel Sections and Plates: to CAN/CSA-G40.21, Grade 350W.

.2 Hollow Structural Sections: to CAN/CSA-G40.21 Grade 350W.

.3 Welded Wire Fabric: WWF 50 x 50 x MW11.1 x MW11.1.

.4 Welding Materials: to CSA W48 Series.

.5 Hot rolled structural steel shapes: to CAN/CSA-G40.21, Grade 350W.

.6 Galvanizing: hot dipped galvanizing with zinc coating 600 g/m^2 to CAN/CSA-G164-18 or latest edition.

.7 Stainless Steel: bars and rods to ASI Type 316, No. 4 finish.

.8 Anchors: strap type or approved self drilling type minimum 3 per member.

.9 Fasteners: as shown on drawings and as required for secure anchorage.

3 Execution

3.1 FABRICATION

.1 The jointing in built-up sections shall be made with hairline joints in the least conspicuous location and manner. All work shall be assembled in the most substantial manner and reinforced where necessary with similar fastenings. All screws shall be countersunk unless otherwise noted.

.2 Provide positive anchorage to the building structure by means of through bolts, welding, or approved inserts cast into the building structure.

.3 Apply a coat of primer to all interior ferrous metals before leaving the factory unless noted otherwise. Touch up any galvanized surfaces damaged after erection with galvafroid paint as approved by the Consultant.

.4 All items shall be fabricated, finished and assembled in the shop as much as possible, consistent with the size and shipping problems. Assembly on the job shall be kept to a minimum.

.5 All welds, unless noted specifically otherwise, are to be continuous where exposed and ground smooth.

3.2 SCHEDULE OF FABRICATION

.1 Generally: Ensure that all Drawings and Specification Sections, including those

for architectural, structural, mechanical and electrical work, are consulted to establish the limits of work included in this Section.

.2 Miscellaneous Channels and Clip Angles:
: Provide all miscellaneous fastenings required, including supports, anchor bolts and other items as required and indicated to complete all work as part of this project.

.3 Sump Pit Covers, Frames and Ladders
: As detailed on drawings.
: Finish: galvanized.

.4 Railing and Guards:
: Railings and guards as sized and detailed on the drawings.
: Painted.

.5 Bench Brackets:
: Bench support brackets as sized and detailed on the drawings.
: Painted.

3.3 ERECTION

.1 Erect work in accordance with shop drawings and in coordination with trades whose work relates to this Section.

.2 Erect work plumb, straight, square and accurately fitted with tight joints at intersections.

.3 Where possible install work in one continuous piece.

.4 Anchor all components to structure, walls and floors as required with weld or other methods of anchorage approved by the Consultant.

3.4 TOUCH-UP AND REPLACEMENT

.1 Touch up adjacent primed surfaces burned, scratched or otherwise damaged during erection with prime paint, to match shopcoat, or galvafroid for galvanized when erection is completed.

.2 Paint over bare areas on galvanized surfaces and welds with zinc rich paint.

.3 Replace damaged or unacceptable materials indicated by the Consultants.

END OF SECTION 05 50 00

1 General

1.1 GENERAL REQUIREMENTS

.1 Division 1, General Requirements, is a part of this Section and shall apply as if repeated here.

1.2 WORK IN OTHER SECTIONS

.1 Related Work Specified in Other Sections
Section 03 30 00 : Cast-in-Place Concrete

1.3 REFERENCES

CSA O121-17 (r2022): Douglas Fir Plywood
CSA O141-23: Softwood Lumber
CSA O151-17 (R2022): Canadian Softwood Plywood
ASTM A325M - 14 Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength
CAN/CSA G164-M92 (R2023): Hot Dip Galvanizing of Irregularly Shaped Articles

1.4 SOURCE QUALITY

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

.2 Plywood identification: by grade mark in accordance with applicable CSA standards.

1.5 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 01 33 00 Submittals.

.2 Submit one PDF copy of checked Shop Drawings to the Engineer for examination, giving complete information necessary for the fabrication of the various members and components of the structure, including material specifications and the location, type and size of all connections.

.3 Erection Drawings shall show sizes and locations of all members and give complete location and details for setting anchor bolts and levelling plates. The elevations of all bearing plates shall be clearly shown.

2 Products

2.1 LUMBER MATERIAL

.1 General: Lumber shall be spruce/pine/fir number 1 and 2 grades, unless specified otherwise, softwood, S4S, moisture content 19% or less in accordance with following standards in the ratio of 67% and 33% respectively: -

.1 CSA 0141-1970.
.2 NLGA Standard Grading Rules for Canadian Lumber, 1980 edition revised according to Supplement No. 1, 1981.

.2 Plywood: Douglas Fir (DF), spruce plywood conforming to CSA 0121-M1978, standard construction, tongue and groove to thickness shown on drawings. Minimum thickness 15 mm unless noted otherwise.

.3 Fasteners: Proprietary fasteners toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, explosive actuated fastening devices, recommended for purpose by manufacture. Use stainless steel or galvanized to CSA G164-M1981 fasteners for all exterior fastening and for any damp or moist areas.

.4 Wood Preservative: Surface-applied wood preservative: clear copper napthenate or 5% pentachlorophenol solution, water repellant preservative.

.5 Furring, blocking, nailing strips, grounds, rough bucks: Spruce, pine, douglas fir, S25 type, standard grade, nominal sizes unless noted. All material shall be pressure treated where concealed or installed exterior to the building or built into masonry, concrete or roofs.
.1 S2S is acceptable.
.2 Board sizes: "Standard" or better grade.
.3 Dimension sizes: "Standard" light framing or better grade.

.6 Floor/Roof Sheathing: Tongue and groove spruce or fir plywood to thickness shown on drawings, minimum 15mm unless noted otherwise.

.7 Material shall be straight, sawn square, true, dressed four sides properly sized, shaped to correct dimensions from nominal sizes noted on Drawings.

3 Execution

3.1 FURRING AND BLOCKING

.1 Install furring and blocking as required to all space-out and support as required for the project.

.2 Align and plumb faces of furring and blocking to tolerance of 1:600.

3.2 NAILING STRIPS, GROUNDS AND ROUGH BUCKS

.1 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work.

.2 Install rough bucks, nailers, framing and linings to wall supports, openings as noted for support of lockers, shelving, chalkboards, tackboards, chair rail, cabinets, millwork, washroom accessories and other accessories to be mounted on drywall partitions.

3.3 FASTENERS

.1 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.

.2 Countersink bolts where necessary to provide clearance for other work.

3.4 SURFACE-APPLIED WOOD PRESERVATIVE

.1 Treat all surfaces including cut ends of material with wood preservative before installation.

.2 Apply preservative by dipping, or by brush to completely saturate and maintain wet film on surface, for minimum 3 minute soak on lumber and one minute soak on plywood.

.3 Re-treat surfaces exposed by cutting, trimming or boring with liberal brush application of preservative before installation.

3.5 INSTALLATION

.1 Lay out work carefully and to accommodate work of others. Cut and fit accurately. Erect in position indicated by drawings. Align, level, square, plumb, and secure work permanently in place. Brace work temporarily as required. Join work only over solid bracing.

.2 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.

.3 Co-operate with work of other Sections to ensure that unity of actions will ensure orderly progress to meet construction schedule.

.4 Provide anchors, bolts and inserts, required for attachment of the work of this Section, to those performing the work of other Sections and who are responsible for their installation.

.5 Work shall include rough hardware such as nails, bolts, nuts, washers, screws, clips, hangers, connectors, and strap iron required for installation of work and all operating hardware required on work of this Section for temporary use.

.6 Do not attach work by wood plugs or blocking in concrete or masonry. Use lead shields, expansion shields, concrete nails, or similar methods only as approved by the Consultant.

.7 Do not regard grounds, blocking, furring, and such other fastening provisions as shown on Drawings as exact or complete. Provide required provisions for

fastening, located and secured to suit site conditions, and adequate for intended support.

.8 Cut fastening work into lengths as long as practicable and with square ends. Erect work plumb, in true planes, and fastened rigidly in place.

.9 Grounds around openings in cavity wall systems, under sills and thresholds to provide continuous support shall be 50 mm (2") minimum thickness, preservative treated.

.10 All members shall be accurately cut to length, angle and be true to line to assure tight joints.

.11 Correct alignment and plumb must be maintained until specified lateral bracing is installed. Cutting and altering of trusses is not permitted except by approval by the Engineer. Heavy concentrated loads must not be placed on top of trusses until permanent bracing and decking have been installed. In any event, these temporary loads must not exceed the truss design loads.

3.6 SPECIAL PROTECTION

.1 When it is required that wood maintain dimensional stability and tolerances to ensure accurate installation of later work, store and install it only in dry areas, and where no further installation of moist materials is contemplated.

END OF SECTION 06 10 00

1 General

1.1 GENERAL REQUIREMENTS

.1 Division 1, General Requirements, is a part of this Section and shall apply as if repeated here.

1.2 WORK IN OTHER SECTIONS

.1 Related Work Specified in Other Section

Section 05 50 00	:	Miscellaneous Metal
Section 06 10 00	:	Rough Carpentry
Section 09 90 00	:	Painting
Division 20	:	Mechanical
Division 26	:	Electrical

.2 Products Supplied Under Work of OtherSections and Installed Under Work of This Section

Section 08 10 00	:	Metal Doors & Frames
Section 08 71 00	:	Door Hardware
Section 10 28 00	:	Toilet, Bath and Laundry Accessories

1.3 REFERENCE STANDARDS

CSA O121-17 (R2022): Douglas Fir Plywood
CSA O141-23: Softwood Lumber

1.4 PRODUCT HANDLING

.1 Protect materials from damage during handling, delivery, and storage.

.2 Materials shall not be delivered until required for erection and until moisture from other work has been out of the area for at least 10 days.

.3 Millwork items shall be placed in clean dry areas where not exposed to extreme changes in temperature and humidity. During shipment and storage all materials shall have protective covering.

.4 Cover plastic laminate items with heavy kraft paper.

1.5 ENVIRONMENTAL CONDITIONS

.1 Ensure that relative humidity in areas where work is stored and installed does not exceed 55%.

1.6 EXAMINATION

.1 Before commencing installation ensure that grounds, strapping and other constructions and surfaces to which work is installed are satisfactory for fitting and adequate for securing of work.

.2 Take site measurements of construction to which work of this Section must conform, and through which access must be made, before work is delivered to site, to ensure that adaptation is not required which would result in construction delay.

2 Products

2.1 MATERIALS

.1 General: No substitution or deviation from materials shall be approved unless approval by Consultant has been obtained prior to tender closing. Work of Section shall include rough hardware required for its execution. Use non-corrosive hardware at exterior locations. 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 Softwood lumber: to CAN/CIA-0141 or latest revision and National Lumber Grades Authority requirements, with maximum moisture content of 6% for interior work, yard lumber selected for natural finish, Oak and Red Cedar species, to AWMAC premium grade.

.3 Nails and staples: to CIA B111-1974; galvanized for exterior work, interior highly humid areas and for treated lumber; plain finish elsewhere.

.4 Douglas Fir Plywood (DFP): to CIA 0121-M1978, standard construction.

.5 Birch Veneer Plywood: to CIA 0115-M1982.

.6 Particle Board: to CAN3-0188.0-M78, CAN3-0188.1-M78 and CAN3-0188.3-M82. Smooth, dense and free from loose particles.

.7 Decorative Laminate: to CAN3-A172-M79 and ENMA LD3-1980 selected from manufacturer's standard range. Arborite, Formica, Wilsonart. Plastic laminate colours to be selected by Consultant by manufacturer's decorative range.

Arborite GP(FR) for cabinets.
Arborite Solid Grade GP-SS.

.8 Solid surfacing counter tops: to be Corian or approved equal; colours selected from manufacturer's standard range.

.9 Cabinet Hardware: Shall be supplied under Section 0870 00 and installed under this Section.
- .1 : Door Hinges: semi-concealed, pivot.
- .2 : Door Catches: magnetic type.
- .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.

.10 Hardwood Adhesives: One part trowel applied, elastomeric waterproof setting adhesive containing no chlorinated solvents.

.11 Contact Adhesives: to CGSB 71-GP19 or CGSB 71-GP-20.

.12 Clear Urethane Finish: in accordance with Section 0990 00 shop-controlled spray painting meeting this finish is acceptable.

.13 Plastic Laminate colours to be selected from manufacturer's standard range by Consultant.

.14 Melamine composite panels: NEMA LD 3, Grade VGL decorative laminate thermofused to both sides of particle board; premium grade, maximum 2 colours as selected by Consultant.

3 Execution

3.1 FABRICATION

.1 All millwork shall be shipped assembled as far as it is practical. Assembled units shall be of such size as will not present difficulty of entry into the building and rooms where required. Where this is not possible, they shall be shipped in knock-down form with clear instructions for assembly.

.2 Shop assemblies shall be glued and nailed where possible and shall be glue blocked at concealed locations.

.3 Millwork shall comply with the requirements for Custom Grade work as specified in Quality Standards of the Architectural Woodwork Industry, published by the Architectural Woodwork Institute, Chicago, Illinois.

.4 Properly prime all parts of the work, cut all members accurately to size, closely fit, well nailed, plumb, level, square and true to dimensions. Do not prime if clear or stained finish.

.5 Exposed edges of plywood are not permitted. Edges shall be veneered with same materials as plywood face or hardwood edged, where required for hardware securement.

.6 Set and fill nailheads, countersink and fill screw on bolt head.

.7 Millwork shall be finished in one piece whenever possible, running members in largest length obtainable. Where jointed, splice or mitre to accurate fit and alignment. Match veneered surfaces for grain and general colour.

.8 Sand and remove machine marks or other scrapes from exposed or partially exposed surfaces.

.9 Thickness of all members shall be in accordance with the maximum possible dressed size from standard lumber.

.10 Millwork items shall have all surfaces sealed before leaving the mill or fabricating shop.

.11 Sealer on surfaces to be painted or concealed shall be tinted; for exposed locations, it shall be clear.

.12 Cut holes for fittings as required, seal edges with black asphalt compound. Edges around cutouts shall be chamfered.

.13 All work shall be true, level, square, smooth and without core ghosting.

.14 Arrange adjacent parts of continuous laminate work to match in colour and pattern.

.15 All joints shall be accurately fitted to provide tight, flush hairline appearance.

.16 Trim members shall be of sizes and profiles as detailed for their respective location and use. Trim members shall be slow-fed work, free from chatter and other machine faults.

.17 Trim over 75 mm (2-1/2") wide shall have backs ploughed or kerfed.

.18 Construct cabinets with 18 mm (3/4") plywood gables, shelves and doors and 12mm (1/2") drawer boxes.

3.2 INSTALLATION

.1 Fasten work 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 Install work plumb, level and straight and fasten it securely to backing to support itself and anticipated superimposed loads.

.3 Provide cut-outs for electrical fixtures, inserts, cables, outlet boxes, reglets for glazing.

.4 Sand wood flooring after installation to provide uniform, smooth, unmarked surface. Vacuum thoroughly prior to finishing. Do not permit traffic over floor once finished. All protection shall be the responsibility of the Contractor.

3.3 SCHEDULE OF FINISH CARPENTRY

.1 Generally: This schedule does not list all finished carpentry items incidental to work of this Section, but only those items which required specific description. Ensure that all Drawings and Specification Sections, including those for architectural, mechanical and electrical work, are consulted to establish the limits of work included in this Section.

.2 Installation of Doors, Frames and Screens

: All frames and screens which occur in masonry walls will be set up and installed as part of the work of Section 0420 00. Verify that frames and set plumb true.

: Install wood doors supplied under work of Section 0820 00 after finishing of walls. Ensure that top and bottom edges are primed under work of Section

0990 00 after they are cut to fit.
: Install all hollow metal doors, supplied under work of Section 0810 00.
: Provide clearance for intended finish flooring.
: Install all aluminum sliding doors as supplied under Section 08 42 29.
: Install all exterior hollow metal doors and frames.
: Provide clearance for intended finish flooring.

.3 Installation of Finishing Hardware: Install finishing hardware supplied under work of Section 0870 00 including but not limited to:

: Hardware for millwork includes wood cabinet, shelving and cupboards.
: Accurately locate and adjust hardware to meet manufacturer's instructions.
: Locate door stops to strike door 76.2mm (3") from latch edge.

.4 Wood Back Board for Electrical Panel: 19.0mm (3/4") D.F. GIS plywood securely anchored to wall with nylon shields and screws. Install as required by Division 16.

3.4 SCHEDULE OF MILLWORK

.1 Generally: This schedule does not list all millwork items incidental to work of this Section, but only those items which required specific description. Ensure that all Drawings and Specifications Sections, including those for architectural, mechanical and electrical work, are consulted to establish the limits of work included in this Section.

.2 Washroom Vanities: Construct from 25 mm plywood and 50 x 100 wood framing. Install steel plate brackets along front edge and provide 25 mm plywood gables at ±800 mm o/c. Finish plastic laminate.

3.5 ADJUSTING AND CLEANING

.1 Adjust hinged doors 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 are closed with moderate force.

.2 Adjust hardware so that latches and locks operate smoothly and without binding, and closers act positively with the least possible resistance in use.

END OF SECTION 0620 00

PART 1 - GENERAL

1.1 General Requirements

.1 Division 1, General Requirements, is part of this Section and shall apply as if repeated here.

1.2 Work in Other Sections

.1 Related Work Specified in Other Sections

Section 04 20 00	:	Unit Masonry
Section 05 50 00	:	Metal Fabrication
Section 06 10 00	:	Rough Carpentry
Section 07 90 00	:	Joint Protection

1.3 Scope of Work

.1 Work of this Section shall include but not be limited to all sheet metal flashings where noted on drawings.

1.4 Field Quality Control

.1 The Owner will appoint an independent inspection company to review materials, methods and installation.

.2 The costs of inspections and testing will be paid from the Cash Allowance covering this work as set forth in Section 01 21 00.

1.5 Submittals

.1 Submit samples of materials and profiles to Consultant for approval prior to fabrication.

PART 2 - PRODUCTS

2.1 Materials

.1 Sheet Metal: 26 gauge zinc-coated steel to ASTM A-446 Grade "A" with G90 zinc coating. Prefinished metal to be used for all flashings exposed to view. Colours as specified in Section 07310 selected from Stelcolour 5000 series.

.2 Aluminum Sheets: AA-C22-AA4 anodized aluminum, 5005 alloy, prefinished.

.3 Locking strips: 22 gauge galvanized steel continuous concealed strips.

.4 Fasteners: weatherguard hex head screws with ½" dome and neoprene washers. Nails - non-ferrous compatible with materials being installed. Colour to match flashings.

.5 Special Hook Strips and Cleats: Two gauges heavier of matching materials of flashing being employed. Galvanized.

.6 Solder: Block solder 50% tin, 50% lead.

.7 Fasteners: galvanized, or stainless steel nails or screws, compatible with materials being employed. Suitable to Consultant's approval.

.8 Nails: Ardox of length to penetrate bases ½" (13mm).

.9 Exposed Fasteners: #10 hex head cadmium plated with neoprene and solid washers by Atlas Bolt or approved equal. Consult manufacturer for screw type and sizing for materials being secured. Provide caps for screw heads to match colour of flashing as specified or shown.

.10 Masonry Fasteners: Tapcon sized to penetrate concrete 38mm (1-1/2") minimum unless otherwise shown.

.11 Wedges: Rolled plumber sheet lead.

.12 Masonry Anchors: Rawl lead lags and screws as approved by Consultant.

.13 Caulking: Polysulphide compound for concealed horizontal metal joints. Polyurethane to CAN/CGSB Standard CAN/CGSB 1924 M80 for reglet and exterior applications. Use colour to match materials as approved by Consultant.

.14 Joint Filler: Extruded polyethylene, closed cell Shore A Hardness 20, tensile strength 20 to 30 psi (140 to 210 Kilopascals).

.15 Bitumen Paint: Gilsonite asphalt 910-02 by Bakelite.

.16 Fascia and Soffits: Fabricate from minimum 20 ga. prefinished aluminum sheet conforming to CGSB 93.GP-1M. Provide continuous units as required. Colour to match existing Stelcolour QC-317 - White.

.17 Eavestrough and Downspouts: Fabricate from min. 20 ga. prefinished aluminum sheet. Minimum 125m x 125m (5" x 5") for eavestrough and 100mm x 100mm (4" x 4") for downspout. Provide hangers, ferrules, spikes, end caps, outlet drops and wire strainers. Colour to match existing.

.18 Splash Pad: 600mm x 600mm x 38mm precast concrete slabs.

PART 3 - EXECUTION

3.1 Fabrication

.1 Fabricate all possible work in shop in min. 2400mm lengths by brake forming, bench cutting, drilling and shaping.

.2 Form bends with straight sharp lines and angles into true planes, free from twists, buckles, dents and other visual distortions. Double-back exposed metal edges at least 12mm. Raw edges will not be permitted.

.3 Supply all accessories required for installation of sheet metal work of this Section. Fabricate accessories of same material as work with which they will be used.

3.2 Installation

.1 Install sheet metal work in accordance with CRCA specifications and standards and as detailed.

.2 Use concealed fastenings except where approved before installation.

.3 Install sheet metal flashings at copings, walls, expansion joints and curbs as shown on the drawings, or as otherwise required, for building components which penetrate roofs, and for which flashings are not specified in the work of other sections.

.4 Sheet metal work shall be installed to properly cover the area to be protected and be watertight under all service and weather conditions. Install in a uniform manner, level, true to line, free of dents, warping and distortion.

.5 Back-paint at the rate of 2.25 litres per 9.29 square metres with bituminous paint, sheet metal that comes into contact with another kind of metal, masonry or concrete.

.6 Install sheet metal with concealed fasteners at lock joints. **Exposed fastening will be permitted only with the approval of the Consultant.** Space all fasteners evenly in an approved manner. Use lead plugs and screws with rubber washers where metal flashings are installed over concrete or masonry.

.7 Install membrane flashing under sheet metal, installed directly over concrete, wood or masonry surfaces. Overlap joints 50mm and turn up 75mm at edges where horizontal surfaces intersect vertical planes.

.8 Join sheet metal by "S" lock seams, to permit thermal movement. Fill all

joints with caulking as flashing is being installed. Clean off all excessive material visible subsequent to installation. Space joints evenly where exposed. Make corners by means of raised seams. Lock seam and caulk. Do not use pop rivets.

.9 Slope all metal to interior to maintain minimum 4% slope for positive drainage. Do not form open joints or pockets that fail to drain water.

.10 Caulk all open sheet metal joints.

.11 Wedge flashings into reglet joints with lead wedges at 225mm o.c. At reglets wider than 9mm and deeper than 20mm provide polyethylene rod, 25% wider than joint width. Prime and caulk all joints to ensure positive waterproof seal. Use colours to match materials as approved by Consultant. Conform to manufacturer's latest printed recommendations for use of products being employed.

3.3 Touch-up and Repair

.1 Prepare and touch up all scratches on prepainted finish with matching paint to the satisfaction of the Consultant.

.2 Remove flux residue completely from surfaces and crevices. Remove other deposits or protections, and wash metals left unpainted and exposed to view as specified by metal manufacturer.

END OF SECTION 07 60 00

1 General

1.1 GENERAL REQUIREMENTS

.1 Division 1, General Requirements, is a part of this Section and shall apply as if repeated here.

1.2 WORK IN OTHER SECTIONS

.1 Related Work Specified in Other Sections

Division 23 : Heating, Ventilation and Air conditioning

1.3 ENVIRONMENTAL CONDITIONS

.1 Apply sealants only to completely dry surfaces. Sealant and substrate materials to be minimum 5°C surface temperature. Should it become necessary to apply sealants below 5°C, consult sealant manufacturer and follow their recommendations.

1.4 SUBMITTALS

.1 Submit samples to the Consultant for approval of each specified type of compound to be used together with the recommended primers and joint filler or fillers proposed to be used. Provide samples of available colours for selection by the Consultant.

1.5 PROTECTION

.1 Mask adjacent surfaces with masking tape prior to priming and caulking. Remove tape after joint has been tooled.

1.6 WARRANTY

.1 Contractor hereby warrants that the work of this Section will not leak, crack, crumble, melt, shrink, run, lose adhesion or stain adjacent surfaces, and remain free from defects in material and workmanship for a period of three years from the date of the Work Certificate of Total Performance.

2 Products

2.1 MATERIALS

.1 Primers: type recommended by sealant manufacturer for the appropriate sealant and corresponding substrate.

.2 Joint fillers: Polyethylene, urethane, neoprene or vinyl: extruded closed cell foam, Shore A hardness 20, tensile strength 140 to 200 kPa.

.3 Bond breaker: pressure sensitive plastic tape, which will not bond to sealants.

.4 Joint cleaners: non-corrosive, non-staining type, recommended by sealant manufacturer and compatible with joint forming materials.

.5 Sealants: Colour of sealant as selected by Consultant.

.6 Sealants:

Type A: Multi-component, chemical cured to meet specified requirements of CAN2 192-M80, such as Dymeric, as manufactured by Tremco (Canada) Ltd. Use at all exterior building joints, floor, wall and masonry joint locations, except where another type is specified.

Type B: Acrylic solvent release, one part sealant. To meet specified requirements of CGSB 19-GP-5M, such as Mono, by Tremco (Canada) Ltd. Use at interior joints between windows, door frames and screen frames.

Type C: Silicone sealant. One part sealant; to meet specified requirements of CGSB 19-GP-9Ma, such as Proglaze, by Tremco (Canada) Ltd. Sealant for fixtures, vanity tops, and where mildew resistant is required.

3 Execution

3.1 PREPARATION

.1 Remove dust, paint, loose mortar and other foreign matter. Dry joint surfaces.

.2 Remove rust, mill scale and coatings from ferrous metals by wire brush, grinding or sandblasting.

.3 Remove oil, grease and other coatings from non-ferrous metals with joint cleaner.

.4 Prepare concrete, masonry, glazed and vitreous surfaces to sealant manufacturer's instructions.

.5 Examine joint sizes and correct to achieve depth ratio 1/2 of joint width with minimum width and depth of 6 mm, maximum width 25 mm.

.6 Install joint filler to achieve correct joint depth. Install joint backing in joints. Joint backing shall be oversized to remain under 28% compression within the joint, 15 - 6°C (20°F) and set back from the surface 9mm (3/8") to 12.5mm (1/2") to facilitate sealant bead thickness specified.

.7 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.

.8 Apply bond breaker tape where required to manufacturer's instructions.

.9 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

3.2 APPLICATION

.1 Apply sealants, primers, joint fillers and bond breakers to manufacturer's instructions. Apply sealant using gun with proper size nozzle. Use sufficient pressure to fill voids and joints solid. Superficial pointing with skin bead is not acceptable.

.2 All caulking shall be completed before adjacent surfaces, required to be painted, are painted.

.3 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities. Neatly tool surface to a slight concave joint.

.4 Apply sealant to joints between window or door frames to adjacent building components, around perimeter of every external opening, to control joints in masonry walls and between masonry and structural steel, to fixtures and millwork and walls, and as required exterior and interior to ensure a tight building.

.5 Ensure that caulking is finished between structural members to be painted and all adjacent surfaces prior to painting.

.6 Exposed caulking compound shall be smooth, free from ridges, wrinkles, air pockets and embedded impurities.

.7 Clean adjacent surfaces immediately and leave work neat and clean. Remove excess sealant and droppings using recommended cleaners as work progresses. Remove masking after tooling of joints. Finished surfaces damaged due to this work shall be replaced to the satisfaction of the Consultant without extra cost to the Owner.

END OF SECTION 07 90 00

1 General

1.1 GENERAL REQUIREMENTS

.1 Division 1, General Requirements, is a part of this Section and shall apply as if repeated here.

1.2 WORK IN OTHER SECTIONS

.1 Related Work Specified in Other Sections

Section 04 20 00 : Unit Masonry
Section 05 50 00 : Miscellaneous Metal
Section 07 90 00 : Sealants
Section 08 70 00 : Finish Hardware
Section 09 90 00 : Painting

.2 Products Supplied Under Work of this Section and Installed Under Work of Other Sections

Section 04 20 00 : To Install Frames, Anchors, Bolts, Inserts at Masonry
Section 04 20 00 : To Grout Frames

.1 Products Supplied and Installed Under Work of Other Sections

Section 06 20 00 : To install Finish Hardware
Section 08 71 00 : To supply Finish Hardware

1.3 QUALIFICATIONS

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

1.4 SHOP DRAWINGS

.1 Submit one PDF digital copy of shop drawings to the Consultant for examination.

.2 Show full size profiles, reinforcing for hardware, anchorage details and complete schedule of all doors, frames, screens and hardware.

1.5 REQUIREMENTS OF REGULATORY AGENCIES

.1 Construct fire-rated doors and frames of ratings indicated in accordance with CAN 4-5104, CAN4-5105, NFPA-80 and NFPA-101 as otherwise required by jurisdictional authorities.

.2 Ensure that hardware and installation meet requirements of standards.

.3 Doors and frames, indicated as labelled, shall meet all conditions of standards, and

shall have attached labels.

1.6 PRODUCT HANDLING

.1 Package or crate, and brace products to prevent distortion in shipment and handling. Label packages and crates and protect surfaces by sturdy wrappings.

2 Products

2.1 MATERIALS

.1 General: All doors and frames shall be fabricated from wipe coat galvanized steel. All doors shall have welded edge seams on hinge and lock edges only and all seams shall be sealed. All frames are to be welded type throughout.

.2 Hollow Metal Doors

Face	:	16 gauge
Top and Bottom End :	:	16 gauge
Channels	:	16 gauge
Vertical Stiffeners	:	18 gauge
Insulation (ext. doors and to rink)	:	Loose fibreglass minimum density 1.5 lb/cu.ft.
Steel Top Cap (ext. Doors)	:	20 gauge
Core	:	"Honeycomb" core material, pressure laminated to face sheets
Reinforcing	:	For locks, closers, lites
Hinges	:	min. 3 templated hinges per door

.3 Hollow Metal Frames and Screens: Welded Type

Frames	:	16 U.S. gauge
Spreaders and Anchors	:	18 U.S. gauge
Guard Boxes	:	22 U.S. gauge
Reinforcements	:	12 U.S. gauge

.4 Glazing Stops: Minimum 1mm base thickness steel, screw fixed tamperproof.

.5 Reinforcing Channel: 18 gauge bent sections 115mm wide with 38mm return lip.

.6 Corner Post Reinforcing: C4 x 7.25 galvanized steel channel or 75 x 75 x .125 HSS tubular steel sections.

.7 Door Bumpers: Black neoprene single stud, eight (8) per frame.

.8 Hardware: as specified in Section 08710.

.9 Labels: Conforming to ULC Standards and where noted on the drawings.

3 Execution

3.1 FABRICATION METAL DOOR FRAMES AND SCREENS

.1 Form profiles accurately to approved Shop Drawings; neat, sharp, free from kinks, twists and warps. Fabricate profiles to details shown on drawings.

.2 Blank, reinforce, drill and tap frames to receive all hardware as specified.

.3 Spot weld reinforcing plates to the inside construction to accommodate hardware cut-outs, door closers and check to ensure rigid construction. Check hardware list for requirements.

.4 Weld guard boxes to frame at all strikes, hinges and concealed closers to completely enclose same. Include conduit for electric strikes and wiring devices.

.5 Install stiffener plates or spreaders between frame trim where required to prevent bending of trim and to maintain alignment when setting and during adjacent construction work.

.6 Mitre head and jamb joints, accurately and weld continuously and grind smooth. Where site welding or splicing is required due to size of unit, the location of field joints shall be shown on the Shop Drawings and strictly adhered to. Avoid field welding where possible.

.7 Welds shall be ground smooth, filled with paste filler and sanded to a smooth, uniform finish.

.8 Provide two welded-in channel or angle spreaders per door frame at bottom to ensure proper frame alignment.

.9 Provide adjustable 'T' anchors or 'L' type anchors for each jamb at approximately 50mm centres (minimum 4 per jamb).

.10 Provide floor anchors on frames that terminate at finished floor. Provide jamb extension anchorage on frames that terminate at slab.

.11 Provide reinforcing channels for anchorage of frames in drywall partitions to floor and structure where frames are longer than 2400mm and where required to meet labelling requirements. Channels are to be anchored to the floor, tack welded to the frame and welded or clip angled to the structure above.

.12 Provide corner post reinforcing where required to maintain labelling or stability to frames which turn corners. Anchor securely to the floor, frame and structure above.

3.2 FABRICATION HOLLOW METAL DOORS

.1 Fabricate doors to conform to details and schedules. Doors shall be flush face,

seamless type. Edges of doors shall have seams filled and ground smooth. Door thickness shall be 45mm unless specifically noted.

.2 Reinforce, stiffen, sound deaden and insulate interior doors with pre expanded small cell honeycomb core. Laminate core to both faces of the panels.

.3 Doors shall be templated, mortised, reinforced, drilled and tapped to receive either surface mounted or mortised hardware.

.4 Cut out neatly for louvres where shown and as specified. Frame opening with stiffeners. Install louvres square and centred on the width of the door.

.5 Assemble all components by means of adequate spot welding or arc welding in accordance with C.S.A. Standard Specification W50 to provide a finished door, square and true and free of all distortion.

.6 Doors shall be cleaned and sanded, given a coat of air drying paste filler, and sanded to eliminate all unevenness or irregularities.

3.3 INSTALLATION OF DOORS

.1 Install hollow metal doors complete with all hardware as supplied under the work of Section 08 70 00.

.2 Install doors only when work has progressed to a stage when no damage will occur to them in place.

.3 Hang doors to swing easily and freely on their hinges, to remain stationary in any position and to close tightly and evenly on frames without binding.

.4 Provide 1.5mm clearance at head and jambs, and no more than 9mm at floor. Provide clearance for intended finish flooring.

3.4 FINISHING

.1 Doors manufactured from C.R.S. shall be chemically treated for good paint adhesion and all visible surfaces shall be finished with a corrosion resistant steel primer. Doors manufactured from wipe coated galvanized steel shall be supplied without a prime coat.

.2 All doors, frames and screens to be finish painted to match existing colours.

3.5 ADJUSTING AND CLEANING

.1 Adjust doors to move freely, without excessive play and to fit accurately.

.2 Refinish damaged and defective work before completion of project. Refinishing of exposed surfaces shall show no discernible variation in appearance.

.3 Clean work at completion of installation as specified in Section 01 70 00.

END OF SECTION 08 10 00

1 General

1.1 SUMMARY OF WORK

.1 This Section specifies aluminum swing doors, thermally broken aluminum swing doors and accessories.
.1 Section does not include framing of door opening.

1.2 RELATED REQUIREMENTS

.1 Section: 08 80 00 – Glazing: Insulating glass units.

1.3 REFERENCE STANDARDS

.1 Aluminum Association (AA)
.1 DAF 45 2003, Designation System for Aluminum Finishes.

.3 ASTM International (ASTM).
.1 ASTM B209-2010, Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
.2 ASTM B221-2013, Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
.3 ASTM C612-2014, Standard Specification for Mineral Fiber Block and Board Thermal Insulation.
.4 ASTM E283-2012, Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
.5 ASTM E33 -00, Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform Static Air Pressure Difference.
.6 ASTM E1105 – 2008, Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference.
.7 ASTM D2240 – 201], Standard Test Method for Rubber Property—Durometer Hardness.

.4 Canada Green Building Council (CaGBC).
.1 LEED® Canada-NC Version 1.0-2004, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package for New Construction and Major Renovations including Addendum 2007.

.5 Canadian General Standards Board (CGSB).
.1 CAN/CGSB-12.8-97, Insulating Glass Units.
.2 CAN/CGSB-12.20-M89, Structural Design of Glass for Buildings.
.3 CAN/CGSB-19.13-M87, Sealing Compound, One-Component, Elastomeric, Chemical Curing.

.6 CSA International (CSA)
.1 CAN/CSA-S157-2005, Strength Design in Aluminum.

.2 CAN/CSA W59.2-M1991(R2003), Welded Aluminum Construction.

.7 Environmental Choice Program (ECP)
.1 CCD-45-1995, Sealants and Caulking Compounds.

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Co-ordination: Co-ordinate work of this Section with work of other trades for proper time and sequence to avoid construction delays.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data: Submit product data including manufacturer's literature for aluminum, panels, styles, rails , components and accessories, indicating compliance with specified requirements and material characteristics.
.1 Submit list on aluminum door manufacturer's letterhead of materials, components and accessories to be incorporated into Work.
.2 Include product names, types and series numbers.
.3 Include contact information for manufacturer and their representative for this Project.

.3 Shop Drawings: Submit drawings stamped and signed by Professional Engineer registered or licensed in Province of Ontario, Canada. Include on shop drawings:
.1 Indicate materials and profiles and provide full-size, scaled details of components for each type of door. Indicate:
.1 Core thicknesses of components.
.2 Type and location of exposed finishes.
.3 Size of door opening and tolerances.
.4 Arrangement of hardware and required clearances.
.2 Include catalogue details for each type of door illustrating profiles, dimensions and methods of assembly.

.4 Samples:
.1 Submit duplicate 300 x 300 mm sample sections showing prefinished aluminum surface, finish, colour and texture, and including section of infill panel.
.1 Include corner sample of each type of door.
.2 Submit duplicate 300 x 300 mm sample sections of insulating glass unit showing glazing materials and edge and corner details.

.5 Test Reports:
.1 Submit test reports showing compliance with specified performance characteristics and physical properties including air infiltration, water infiltration and structural performance.

.6 Field Reports: Submit manufacturer's field reports within 3 days of manufacturer representatives site visit and inspection.

.7 Installer Qualifications:
.1 Submit letter verifying installer's experience with work similar to work of this Section.

1.6 CLOSEOUT SUBMITTALS

.1 Operation and Maintenance Data: Supply maintenance data for curtain wall for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.**7** DELIVERY STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements:
.1 Deliver material in accordance with Section 01 60 20 – Material and Equipment.
.2 Deliver aluminum door materials and components in manufacturer=s original packaging with identification labels intact and in sizes to suit project.

.2 Material Handling: To AAMA CW-10.

.3 Storage and Handling Requirements: Store materials off ground and protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.
.1 Material storage: To AAMA CW-10.

1.**8** WARRANTY

.1 Project Warranty: Refer to Contract Conditions for project warranty provisions.

.2 Manufacturer's warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to and not intended to limit other rights Owner may have under Contract Conditions.

.3 Warranty period: 2 years commencing on Date of Substantial Performance of Work.
.1 Insulating glass units: 10 years, on Date of Substantial Performance of Work.

2 Products

2.1 MANUFACTURER

.1 Manufacturer: Alumicor Limited, 290 Humberline Drive, Toronto, Ontario, Canada M9W 5S2, Phone: (416) 745-4222 or (877) ALUMICOR, e-mail: info@Alumicor.com, URL: www.Alumicor.com.

2.2 DESCRIPTION

.1 Aluminum-framed swing door with glass insert suitable for inclusion in curtain wall or storefront system.

2.3 DESIGN CRITERIA

.1 Design aluminum components to CAN/CSA S157.
.2 Vision glass areas: Insulating Glass Unit R10.
.3 Air infiltration: 0.3 L/s/m^2 maximum of wall area to ASTM E283 at differential pressure across assembly of 300 Pa.

2.4 MATERIALS

.1 Aluminum Door Components:
  .1 Extruded aluminum: To ASTM B221, 6063 alloy with T6 temper.
  .2 Sheet aluminum: To ASTM B209, utility grade for unexposed surfaces, anodizing quality for exposed surfaces.
  .3 Fasteners, screws and bolts: Cadmium plated stainless steel 400 series to meet curtain wall requirements and as recommended by manufacturer.
  .4 Vision glass for interior single glazed door: 6 mm clear tempered glass.
  .5 Insulating glass units for exterior glazed door: To CAN/CGSB-12.8, double glazed, hermetically sealed, argon filled insulating glass units with low conductance stainless steel warm edge spacer.
    .1 Outer lite: 6 clear tempered glass with low-E coating on surface two.
    .3 Inner lite: 6mm clear tempered glass
  .6 Aluminum panels: 25.4 mm thick shop fabricated panels.
    .1 Finish to match doors.

2.5 DOOR FABRICATION

.1 Do aluminum welding to CAN/CSA W59.2.

.2 Fabricate aluminum assemblies of extruded sections to sizes and profiles indicated.
  .1 Ensure stiles and rails are tubular extrusions designed for mechanical shear block fastening in combination with SIGMA deep penetration plug welds and fillet welds at all stile/rail connections.

.3 Door Thickness: 51 mm.

.4 Construct doors square, plumb and free from distortion, waves, twists, buckles or other defects detrimental to performance or appearance.

.5 Fabricate infill panels of aluminum sheet laminated to marine grade plywood.
  .1 Aluminum sheet minimum thickness 3mm.
  .2 Marine grade plywood thickness 19mm.

.6 Accurately fit and secure joints and corners.
  .1 Ensure joints are flush and hairline

.7 Use only concealed or semi-concealed fasteners
  .1 Where fasteners cannot be concealed, countersunk screws finished to match adjacent material may be used.

.8 Install door hardware.

.9 Locate manufacturer's labels on exterior side of door bottom rail.

.10 Acceptable Material: Alumicor Limited, Canadiana HD.
- .1 Stile width: 101.6 mm.
- .2 Top rail: 142.9
- .3 Centre rail: 152 mm.
- .4 Bottom rail: 304.8 mm.

2.6 FINISHES

.1 Exposed aluminum surfaces: To [AAMA 2604, 2-coat, thermal setting enamel consisting of primer and topcoat] [AAMA 2605, 3-coat, thermal setting enamel consisting of primer, colour coat and clear coat] with [70] % minimum fluoropolymer resin and polvinyldiene fluoride (PVDF),0.03 mm minimum total thickness coloured clear.
- .1 Acceptable material; PPG Industries Inc., Duranar XL.

.2 Exposed aluminum surfaces: To AA DAF-45-M10C21A44], Architectural Class I, anodized 18 µm minimum thickness coloured clear.
- .1 Acceptable material: Alumicor Ltd., Class I Anodic Finish.

.3 Exposed aluminum surfaces: To AA DAF-45-M10C21A31, Architectural Class II, clear anodized 10 µm minimum thickness.
- .1 Acceptable material: Alumicor Ltd., Class II Anodic Finish.

.4 Exposed aluminum surfaces: To AAMA 2604, 2-coat, thermal setting enamel consisting of primer and topcoat with [70] % minimum fluoropolymer resin and polvinyldiene fluoride (PVDF)], 0.025 mm minimum total thickness coloured [clear].
- .1 Acceptable material; PPG Industries Inc., Duranar.

2.7 HARDWARE

.1 Hardware: In accordance with Section 08 71 00 – Door Hardware.
- .1 Ensure hardware is supplied and factory-installed by door manufacturer.

.2 Hardware: Supply and factory-install hardware as follows:
- .1 Weatherstripping: Manufacturers standard pile weatherstripping.
- .2 Sill Sweeps: Manufacturers standard pile sill sweeps.
- .3 Threshold: One piece per door opening, extruded aluminum.
- .4 Butt hinges: one and one half pair.
- .7 Push:
- .8 Pull handle:
- .9 Exit Device:
- .10 Closer:
- .11 Lock:
- .12 Cylinder:

2.8 ACCESSORIES

.1 Gasketing: To CCD-45 EPDM gaskets.

.2 Setting Blocks: To CCD-45 and ASTM D2240, neoprene 80 - 90 Shore A Durometer hardness.

.3 Spacers: To CCD-45 and ASTM D2240, neoprene, 50 - 60 Shore A Durometer hardness.

.4 Sealant: To CAN/CGSB-19.13, Class 40, one-component, cold-applied, non-sagging silicone.
.1 Acceptable material: Dow Corning 795.

.5 Sealant Bond Breaker: Open cell foam backer rod sized to suit project requirements.

2.9 PRODUCT SUBSTITUTIONS

.1 Substitutions: No substitutions permitted.

.2 Ensure components come from one manufacturer.

3 Execution

3.1 INSTALLERS
.1 Use only Alumicor authorized installers for work of this Section.

3.2 EXAMINATION

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

3.3 INSTALLATION

.1 Install aluminum swing doors in accordance with manufacturer's written instructions.

3.4 ADJUSTING

.1 Adjust operable parts for correct function.

.2 Ensure doors do not bind while opening and closing.

3.5 FIELD QUALITY CONTROL

.1 Field Inspection: Coordinate field inspection in accordance with Section 01 40 00 - Quality Control.
.2 Manufacturer's Services:
.1 Coordinate manufacturer's services with Section 01 40 00 - Quality Control.

.2 Submit to Consultant a written agreement from the manufacturer to perform the manufacturer's services.

.3 Schedule manufacturer's review of work procedures at stages listed:
1. Product Application: 1 off site review.
2. Fabrication and Handling: 1 review at authorized installers fabrication facilities.
3. Installation: 1site reviews upon completion of Work.

.4 Submit manufacturer's written reports to Consultant describing:
.1 The scope of work requested.
.2 Date, time and location.
.3 Procedures performed.
.4 Observed or detected non-compliances or inconsistencies with manufacturers' recommended instructions.
.5 Limitations or disclaimers regarding the procedures performed.
.6 Obtain reports within seven days of review and submit immediately to Consultant.

3.6 CLEANING

.1 Progress Cleaning: Perform cleanup as work progresses [in accordance with Section 01 70 00 – Project Closeout].
.1 Leave work area clean end of each day.

.2 Final leaning: Upon completion, remove surplus materials, rubbish, tools, and equipment.

.3 Waste Management:
.1 Collect recyclable waste and dispose of or recycle field generated construction waste created during construction or final cleaning related to work of this Section.
.2 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.7 PROTECTION

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

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

END OF SECTION 08 11 17

1 General

1.1 GENERAL REQUIREMENTS

.1 Division 1, General Requirements, is a part of this Section and shall apply as if repeated here.

1.2 WORK IN OTHER SECTIONS

.1 Related Work Specified in Other Sections

Section 08 10 00 : Doors & Frames

.2 Products Supplied Under Work of This Section

and Installed Under Work of Other Sections
Section 06 20 00 : To install all Finishing Hardware

1.3 REFERENCE STANDARDS

.1 All hardware herein specified is the Owner's standard quality for the project. No substitution or deviation will be considered unless approval has been obtained from the Consultant. The Consultant will have final decision on equality.

1.4 SCOPE OF WORK

.1 Furnish all finish hardware items as detailed in schedule herewith. Comply with all additional functions and duties as indicated and dictated by this specification. Install all hardware under this contract. Prepare doors and frames accordingly.

.2 The Hardware Consultant shall act on the behalf of the Consultant to make numerous site visits upon receipt of the finishing hardware and shall notify the Consultant in writing that all goods have been supplied exactly as per this specification.

Any deviation from the hardware schedule shall be replaced with the scheduled hardware at no additional cost to the Owner. Samples will be retained until the completion of the project.

1.5 COORDINATION

.1 The hardware supplier shall coordinate all hardware supply and installations with related trades.

.2 Immediately after awarding the finish hardware contract, it shall be the responsibility of hardware supplier to request reviewed shop drawings from related trades for coordinating.

1.6 QUALIFICATIONS

.1 Personnel who will be responsible for scheduling, detailing, ordering, and co-ordinating hardware for this project, shall be experienced Architectural Hardware Consultants. Regular membership in the Door and Hardware Institute is acceptable evidence of such experience.

.2 Upon award of this contract, the successful tenderer shall submit to the Consultant the name of the individual who shall be responsible for this project.

1.7 SUBMITTALS

.1 Hardware supplier shall prepare and submit to the Consultant for approval, one (1) PDF copy of complete detailed hardware schedule.

.3 Supply a sample of each hardware item as listed herein, to be retained by the Consultant for comparison with hardware furnished.

.4 The hardware supplier shall transmit copies of the hardware schedule and relative template information to any other contractors requiring same for fabrication of doors, frames and etc.

.5 Hardware shall be delivered to the job site in manufacturer's original packages. Each item shall be marked with the opening to identify correct location.

1.8 PRODUCT HANDLING

.1 A locked storage space shall be furnished by the General Contractor for the storage of all finishing hardware.

.2 If doors are field painted or finished, hardware shall be installed after or protected by masking, covers, etc.

1.9 GUARANTEE

.1 All products supplied will bear a manufacturer's warranty of two years in general and ten years on door closers. This warranty shall cover material, workmanship, function of, and finish. Any product which fails to fulfil these requirements will be exchanged by the hardware supplier at no cost to the Owner.

2 Products

2.1 GENERAL

.1 The work of this Section shall include the supply of all finish hardware, including but not be limited to:-

: Hardware for all hinged doors.
: Door silencers for metal door frames.

: Door stops, floor or wall types as required.
: All hardware for millwork.
: Metal thresholds, sweeps, weatherstripping.
: Electric door hold open devices.
: Electric door operators.

.2 All materials to be of first quality workmanship, material and finish. Any product which is not acceptable will be removed from job site and replaced at no cost to the Owner.

2.2 MANUFACTURERS

Butts :	Monthard Ltd.
Locksets, Latchsets :	Schlage Lock Co.
Pulls, Pushes, Floor and Wall Stops, Kickplates	Canadian Builders Hardware
Door Closers :	L.C.N. Door Closers
Overhead Door Holders :	Glynn-Johnson Ltd.
Panic Bolts :	Von Duprin Ltd.
Thresholds, Sweeps :	K. N. Crowder Mfg. Co.
Key Cabinet :	Telkee Mfg.

2.3 MATERIALS

.1 Only items listed as allowable substitutions will be accepted.

.2 Hinges shall be Monthard type, size and weight as listed in the hardware schedule. Paint grade hinges are not acceptable. Substitution of standard weight hinges on doors specified with heavy weight hinges will not be accepted. Equivalent Stanley or Hager hinges in size, type, weight and finish will be accepted. NO SUBSTITUTIONS ALLOWED FOR DOORS SPECIFIED WITH ZERO CONTINUOUS HINGES.

.3 Locks and latches shall be Schlage L series mortise with 03B (lever) and 42B (Orbit) trim 626 finish. NO SUBSTITUTIONS ALLOWED.

.4 Exit devices shall be Von Duprin 55 and 88 series 626 finish. The hollow metal supplier shall ensure that the centre rails on all doors with lites shall be located at height which allows the installation of exit devices according to Von Duprin's templating. If a conflict occurs, it shall be the hollow metal supplier's responsibility to notify the Consultant for approval of all changes. NO SUBSTITUTIONS ALLOWED.

.5 Door closers shall be LCN 4010, 4110, 4020, 4820 and 4041 series. "Cush" series is not acceptable for any doors specified with door closers and overhead stops. 1461 series is not acceptable for doors specified for the 4041 series. NO SUBSTITUTIONS ALLOWED.

.6 "Carpentry Note" - All doors specified with 4∅41 closers shall be installed with either regular (REG), parallel (PA) or top jamb (TJ) mounting. Refer to the

finishing hardware schedule and LCN template information for proper installation requirements and procedures.

.7 Kick and Push Plates shall be CBH type 304 stainless steel, 0.050 inches thick. Sizes shall be specified in the hardware schedule. Hager equivalents will be accepted.

.8 Door pulls shall be CBH 7000 series, one inch diameter stainless steel. Horizontal push bars shall be CBH 7000 series, one inch diameter stainless steel mounted back-to-back with door pulls. Hager equivalents will be accepted.

.9 Overhead stops shall be Glynn-Johnson 90 series Heavy-Duty, as listed in the hardware schedule. NO SUBSTITUTIONS ALLOWED.

.10 Automatic door operators shall be Horton 7000 series. Supply and installation shall be by the hardware supplier.

2.4 MILLWORK

.1 Material listed below shall be used for this project.

Hinges :	Grass
Pulls :	CBH
Locks :	National
Catches :	Ives
Drawer Guides :	Knape & Vogt
Pilasters & Clips :	Knape & Vogt

2.5 KEYING

.1 All lock cylinders shall be subject to a new Schlage Master Key System and Construction Master Keyed. Upon building completion it shall be the responsibility of the General Contractor to remove construction key inserts.

.2 All locks to be supplied with ten keys per cylinder.

2.6 ADJUSTING TOOLS

.1 After installation, at least four (4) each of special adjusting tools furnished with hardware shall be turned over to Owner by the General Contractor.

3 Execution

3.1 PRODUCT LOCATION

.1 All mounting height locations shall conform to the Canadian Steel Door Manufacturers' Association recommended installation heights and Ontario Building Code barrier-free requirements.

3.2 EXAMINATION

.1 Before supplying materials, ensure by a check of drawings, shop drawings and details prepared for the project, that listed hardware is suitable by dimension and function for intended purposes.

3.3 INSTALLATION

.1 Provide templates required for preparation of doors and frames to the appropriate fabricators.

.2 Work of this Section shall include assistance and supervision of installation when requested, and as otherwise provided by the supplier, to ensure correct installation.

3.4 ADJUSTING

.1 Verify under Work of this Section that installed hardware functions properly, and adjust accordingly to ensure satisfactory operation.

.2 Upon occupancy of building arrange an appointment with the Owner's designated representative to instruct this person in the proper use, servicing, adjusting and maintenance of hardware.

3.5 INSPECTION

.1 Hardware supplied will be inspected after completed installation by manufacturer's representative and a written report shall be made to the Owner. Should a manufacturer's representative not be available, the Consultant will carry out the final inspection and the findings will be binding to the hardware suppliers.

END OF SECTION 08 71 00

1 General

1.1 GENERAL REQUIREMENTS

.1 Division 1, General Requirements, is a part of this Section and shall apply as if repeated here.

1.2 WORK IN OTHER SECTIONS

.1 Related Work Specified in Other Sections

Section 07 90 00	:	Sealants
Section 08 10 00	:	Metal Doors & Frames

1.3 SUBMITTALS

.1 Affidavits: In lieu of samples and inspection procedures when required by CGSB Specifications, submit affidavits that materials supplied under these requirements meet CGSB Specifications, if requested by Consultant.

1.4 ENVIRONMENTAL CONDITIONS

.1 Glaze with compounds, sealants, or tapes only when glazing surfaces are at temperatures over 5°C (40°F) and when positive that no moisture is accumulating on them from rain, mist or condensation.

2 Products

2.1 MATERIALS

.1 Clear Float Glass: to CAN2-12.1-M76min. 6mm thickness.

.2 Tempered safety glass: to CAN2-12.1-M79 Type 2, Class B 6mm thickness.

.3 Clear Wired Glass: polished Georgian wired pattern to CAN2-12.11 M76 6.4mm (1/4").

.4 Insulating Glass: to CAN2-12.10-M76 Type 2 Class A, Style 2, Garde B, Level 1 with 12.5 min. air space. 6mm Solar bronze tempered exterior lite and 6mm clear float glass interior lite.

.5 Glazing compound: oil base, to CGSB 19-GP-6M.

.6 Butt glazing sealant: silicone to CGSB 19-GP-9Ma gun grade.

.7 Sealant compound: one component acrylic base, to CGSB 19-GP-5M+Amdt-Nov.79, gun grade.

.8 Sealant compound: one component silicone rubber, to CAN2-19.13-M82, gun grade.

.9 Glazing tape: preformed butyl tape, 10-15 durometer hardness.

.10 Setting blocks: neoprene, Shore "A" durometer hardness 70 to 90 size to suit glass thickness.

.11 Spacer shims: neoprene, Shore "A" durometer hardness 40 to 50.

.12 Primer-sealers and cleaners: to glass manufacturer's standard.

.13 Laminated Glass: 14 mil, heat strengthened glass, tinted green, consisting of one (1) lite of 6mm clear, one (1) lite of 6mm tinted and 1.5mm vinyl interlayer.

3 Execution

3.1 INSTALLATION

.1 Generally: Install materials in accordance with manufacturer's specifications, and ensure that each material in a glazing system is compatible with the others. Do not set any glass without glazing beds of gaskets.

.2 Glass: Install sheet glass in thickness to comply with CGSB Specification 12-GP-2, and other specified glass as indicated in this Specification or on drawings.

.3 Glazing Preparation and Methods: Use glazing compounds and sealants without addition of thinners and from only containers with seals unbroken until opened for use. Prime all glass rebates except for aluminum, unless specified otherwise. Primer shall be suitable for materials affected.

3.2 GLAZING SCHEDULE

.1 Exterior Windows: Insulating units set with glazing gaskets, tapes and snap-on covers. Setting blocks as required.

.2 Hollow Metal Doors and Screens: Safety glass, polished plate or clear wired glass single glazing as noted in Door Schedule. Fixed stop bedding and heel head, glazing compound, removable metal stops, glazing compound. Spacer shims and setting blocks as required.

.3 Tempered Safety Glass: Install for all lights in entrance and vestibule lights (at doors and sidelights) as indicated on drawings.

.4 Clear Wired Glass: Georgian polished, for all glazing shown for rated doors and frames in fire separations.

3.3 REPLACEMENT AND CLEANING

.1 Replace scratched, etched, or defective glazing resulting from manufacture, setting, handling or storage before or during installation.

.2 Final cleaning of glass is specified as a part of the Work of Section 01 70 00.

.3 Remove stains, deposits, marks or blemishes caused by the Work of this Section from surfaces of all materials exposed to view. Replace materials that cannot be cleaned to appear as new.

END OF SECTION 08 80 00

1 General

1.1 GENERAL REQUIREMENTS

.1 Division 1, General Requirements, is a part of this Section and shall apply as if repeated here.

1.2 WORK IN OTHER SECTIONS

.1 Related Work Specified in Other Sections

Section 09 90 00 : Painting

1.3 QUALIFICATIONS

.1 Execute Work of this Section only by a Subcontractor who has adequate plant, equipment and skilled tradesmen to perform it expeditiously and is known to have been responsible for satisfactory applications similar to that specified during a period of at least five (5) years.

1.4 TOLERANCES

.1 Install work within 3mm (1/8") of dimensioned location unless approved otherwise, and flat to a tolerance of 3mm (1/8") maximum in 3m (10') and 1.5mm (1/16") maximum of any running length of 300mm (1').

.2 Do work in accordance with CSA A82.31-M91 except where specified otherwise.

1.5 PRODUCT HANDLING

.1 Store packaged finish materials in protected dry areas. Store gypsum board flat in piles with edges protected.

.2 Ensure that finish metal members are not bent, dented or otherwise deformed.

.3 Deliver products supplied under the work of this Section only to those who are responsible for installation, to the place they direct, and to meet installation schedules.

1.6 ENVIRONMENTAL CONDITIONS

.1 Install work only in areas closed and protected against weather, and maintained between 10°C and 20°C (50°F and 70°F). In cold weather ensure that heat is introduced in sufficient time, before work commences, to bring surrounding materials up to these temperatures; and maintained until materials installed by this Section have cured.

1.7 EXAMINATION

.1 Before application of drywall commences ensure that services have been installed, tested and approved by relevant jurisdictional authorities; that conduit, pipes,

cables and outlets are plugged, capped or covered; and that fastenings and supports installed by others are in place.

.2 Ensure that environmental conditions and work preceding that of this Section are satisfactory, and will permit compliance with the quality and dimensions required for work specified in this Section. Do not permit work of others to touch the back of wallboard.

2 Products

2.1 MATERIALS

.1 Gypsum Board
- .1 Plain: to CSA A82.27-M91 standard 12mm thick, 1200mm wide x maximum practical length, ends square cut, edges square.
- .2 Fire Code 'C' panels: to CSA A82.27-M91, 19mm thick x 1200mm wide x max. Practical length.
- .3 Rated Partitions: C.G.C. cavity shaft wall for ratings as noted.
- .4 Backing board: to CSA A82.27-M91 plain Type X 12mm thick, square edges.
- .5 Exterior Grade Sheathing: to CSA A82.27-M91 standard Type X 12mm thick, 1200mm wide x maximum practical length suitable for exterior application.
- .6 Cement Board: C.G.C. Durock, 12mm thick for exterior use and washrooms and shower walls where tile to be installed.
- .7 Spray Texture: Coloured jointing compound mix to provide medium splatterdash textured appearance.

.2 Metal Furring and Suspension Systems
- .1 Metal furring runners, hangers, tie wires, inserts, anchors: to CSA A82.30-M1980, galvanized.
- .2 Resilient Channels: Galvanized Steel Channels RC-1.
- .3 Drywall Furring Channels: 0.5mm core thickness galvanized steel channels for screw attachment of gypsum board.
- .4 Resilient clips: 0.5mm base steel thickness galvanized steel for resilient attachment of gypsum board.
- .5 Acceptable manufacturers Bailey Metal Products or Chicago Metal.

.5 Fastenings and Adhesives
- .1 Nails, screws and staples: to CSA A82.31-M91.
- .2 Stud adhesives: to CGSB 71-GP-25M.
- .3 Laminating compound: to CSA A82.31-M91, asbestos-free.

.6 Accessories
- .1 Casing beads, corner beads fill type: 0.5mm base thickness commercial grade sheet steel with Z275 zinc finish to ASTM A525M-80, perforated flanges; one piece length per location.
- .2 Polyethylene: to CAN 2-51.33-M80, Type 2.
- .3 Insulating strip: rubberized, moisture resistant, 3mm thick cork strip, 12mm wide, with self sticking permanent adhesive on one face length as required.
- .4 Joint compound: to CSA A82.31-M91, asbestos-free.

3 Execution

3.1 SUSPENDED AND FURRED CEILINGS

.1 Erect hangers and runner channels for suspended gypsum board ceilings in accordance with CSA A82.31-M91 except where specified otherwise.

.2 Support light fixtures by providing additional ceiling suspension hangers within 150mm of each corner and at maximum 600mm around perimeter of fixture.

.3 Install work level to tolerance of 3mm over 3000mm.

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

.5 Install min. 19x64mm furring channels parallel to, and at exact locations of steel stud bulkheads unless noted.

3.2 WALL AND STRUCTURE FURRING AND BULKHEADS

.1 Install wall furring for gypsum board wall finishes and exterior sheathing in accordance with CSA A82.31-M91, except where specified otherwise.

.2 Furr steel beams, columns, joists, steel deck and exposed services where indicated, including all rated enclosures to meet ULC Standards.

.3 Install rigid acoustic wall insulation specified in Section 07220 to interior walls where noted on drawings.

3.3 GYPSUM BOARD APPLICATION

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

.2 Apply single and double layer gypsum board to metal furring or framing using screw fasteners for first layer, laminating adhesive for second layer. Maximum spacing of screws 300mm oc.

.3 Secure exterior sheathing with tight fitting joints to framing.

3.4 ACCESSORIES

.1 Erect accessories straight, plumb or level, rigid and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners accurately, free from rough edges. Secure at 150mm o.c. using contact adhesive for full length.

.2 Install casing beads around perimeter of suspended ceilings and bulkheads.

.3 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated. Seal joints with sealant.

.4 Install insulating strips continuously at edges of gypsum board or casing beads abutting metal window or exterior door frames, to provide thermal break.

3.5 TAPING AND FILLING

.1 Finish face panel joints and internal angels with joint system consisting of joint compound, joint tape and taping compound installed according to manufacturer's directions and feathered out onto panel faces.

.2 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.

.3 Fill screw head depressions with joint and taping compounds to bring flush with adjacent surface of gypsum board so as to be invisible after painting is completed.

.4 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.

.5 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for painting.

3.6 ACCESS DOORS

.1 Install service access doors supplied by mechanical contractor.

.2 In addition, provide and install 20 - 12 x 12 metal access doors in locations directed by Consultant.

3.7 ACOUSTIC INSULATION/SEALANT

.1 Install acoustic insulation to all walls noted on drawings. Install accurately and uniform to provide a satisfactory sound rated wall.

END OF SECTION 09 21 16

1 General

1.1 RELATED SECTIONS

.1 Section 03 30 00 – Cast-in-Place Concrete.

.2 Section 04 22 00 – Concrete Unit Masonry

.3 Section 07 92 00 – Joint Sealants.

.4 Section 09 21 16 – Gypsum Board Assemblies.

.5 Section 09 65 66 – Resilient Athletic Flooring.

1.2 REFERENCES

.1 ANSI A108.01 -2016: General Requirements: Subsurfaces and Preparations by Other Trades.

.2 ANSI A108.4-2009: Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile-Setting Epoxy Adhesive.

.3 ANSI A108.5-1999: Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar (Reaffirmed 2010).

.4 ANSI A108.10-1999: Installation of Grout in Tilework (Reaffirmed 2010).

.5 ANSI A108.13-2005: Installation of Load Bearing, Bonded, Waterproof Membrane for Thin-Set Ceramic Tile and Dimension Stone (Reaffirmed 2016).

.6 ANSI A118.1-2012: Specifications for Dry-Set Portland Cement Mortar.

.7 ANSI A118.4-2012: Specifications for Modified Dry-Set Cement Mortar.

.8 ANSI A118.7-2010: Specifications for Polymer Modified Cement Grouts for Tile Installation (Reaffirmed 2016).

.9 ANSI A137.1-2012: Specifications for Ceramic Tile.

.10 ASTM C207-18: Standard Specifications for Hydrated Lime for Masonry Purposes.

.11 ASTM C627-18e1: Standard Test Method for Evaluating Ceramic Floor Tile Installation Systems Using the Robinson-Type Floor Tester.

.12 ASTM F3191-23: Standard Practice for Field Determination of Substrate Water Absorption (Porosity) for Substrates to Receive Resilient Flooring.

.13 CAN/CGSB-25.20-95: Surface Sealer for Floors.

.14 CSA A3001-18: Cementitious Materials for Use in Concrete.

.15 TTMAC Specification Guide 09 30 00 – Tile Installation Manual 2019-2021.

1.3 SAMPLES

.1 Submit samples as specified in Section 01 33 00.

.2 Verification Samples: A 300 x 300 mm size panel, complete with selected grout colour; mounted to 19mm thick plywood backer.

1.4 CLOSEOUT SUBMITTALS

.1 Maintenance Data: Latest edition of TTMAC Hard Surface Maintenance Guide; sufficient quantities for inclusion in operation and maintenance manual.

1.5 EXTRA STOCK MATERIALS

.1 Supply extra stock materials as specified in Section 01 78 00.

.2 Extra Stock Materials: Two percent or 4.0m^2, whichever is greater, of each type and colour of installed tile; marked to identify:

.1 Manufacturer's name,
.2 Product name,
.3 Product colour and pattern.

.3 Package tiles neatly in original containers, to prevent damage.

1.6 QUALIFICATIONS

.1 Installers: Skilled workers trained and experienced in tiling and members of TTMAC.

1.7 DELIVERY STORAGE AND HANDLING

.1 Store products in a dry area, protected from freezing, staining and damage.

.2 Store cementitious materials on a dry surface.

1.8 AMBIENT CONDITIONS

.1 Do not install tiles at temperatures less than 12 degrees C.

.2 Maintain temperatures at or above 12 degrees C until cementitious materials have fully cured.

2 Products

2.1 MANUFACTURERS

.1 Manufacturers of mortars, grouts and adhesives having Product considered acceptable for use:
- .1 Custom Building Products.
- .2 Flextile.
- .3 Laticrete.
- .4 Mapei.
- .5 Proma Adhesives, Inc.
- .6 TEC.

.2 Manufacturers of tile-setting accessories having Product considered acceptable for use:
- .1 Bengard.
- .2 Profilitec.
- .3 Schulter Systems (Canada) Inc.

.3 Substitution Procedures: Refer to Section 01 25 00.

2.2 PERFORMANCE CRITERIA

.1 Traffic Level Performance (ASTM C627): Moderate Class.

2.3 TILE MATERIALS

.1 Shower floor tiles to be 50x50x6 - 50x50 - Anthracite Fleck FS Code: OD.QC.ATF.0202.FS

.2 Shower wall tiles to be 300x300x6 - Tender Grey (matte) Code: OD.ON.TGR.O202.MT.N

.3 Vestibule/Lobby floor tile to be 300x600x6 stack bond pattern - Grey (matte) Code: OD.ON.TGR.O202.MT.N

.4 Cut Base Tile: 100 mm high, full-length, site-cut from floor tile, and having at least one factory-formed edge along each tile's length; type, size, colour and texture to match adjacent flooring material.

.5 Tactical Walking Surface Indicator – Porcelain Floor Tile (TWSI-PFT): 297 x 297 mm size, 10 mm thick porcelain floor tile to ANSI A137.1; complete with 4 mm high, 22 mm OD truncated domes spaced at

60 mm OC; Elan Tile as distributed by Kinesik Engineered Products Inc., colour as selected by Consultant.

2.4 MORTAR AND GROUT MATERIALS

.1 Portland Cement: To CSA A3001, Type GU.

.2 Hydrated Lime: To ASTM C207, Type N-Normal.

.3 Sand: To ASTM C144, passing 16 mesh.

.4 Dry-Set Portland Cement Mortar: To ANSI A118.1.

.5 Latex-Portland Cement Mortar: To ANSI A118.4

.6 Floor and Wall Tile Cementitious Grout: To ANSI A118.7; rapid setting type, polymer-modified sanded grout; eg. Ultracolor Plus FA by Mapei, colours as selected by Consultant.

2.5 ACCESSORIES

.1 Crack Isolation Membrane: To ANSI A118.12, High Performance Rating; loadbearing membrane.

.2 Reinforcing Mesh: 50 x 50 mm size; 1.6 mm thick steel wire mesh; welded fabric, galvanized.

.3 Metal Lath: To ASTM C847; 1.4 kg/m^2 galvanized steel lath.

.4 Tape: 50 mm fibra mesh tape, as recommended by backer board manufacturer.

.5 Organic Adhesive: To ANSI A136.1; Type 1 for wet areas and Type 2 for dry areas.

.6 Latex Additive: Formulated for use in Portland cement mortars and grout.

.7 Water: Clean, cold, and potable.

.8 Joint Sealants: As specified in section 07 92 00, Types as follows:
.1 Floor Tiling: Type SEAL-INT-FT.
.2 Wall Tiling: Type SEAL-INT-WT.

.9 Tile Sealer: To CAN/CGSB-25.20, Type 1 – Penetrating.

2.6 MANUFACTURED COMPONENTS AND ACCESSORIES

.1 Edge and Transition Strips: Roll-formed stainless steel edge strops, 3 mm wide at top edge; with integral perforated anchoring leg for setting strip into setting material; height as required; Brushed finish; eg. SCHIENE-EB by Schluter Systems (Canada) Inc.

.2 Tapered Transition Strips – To Other Floor Finishes: Roll-formed stainless steel transition strips; profile and height as indicated; with integral perforated anchoring leg for setting strip into setting material; sloped transition and decorative edge strip for transition from tile to lower finish; height as required; Satin Anodized finish; i.e. RENO-RAMP AE by Schluter Systems (Canada) Inc.

.3 Tapered Transition Strips – To Concrete Floors: Extruded aluminum transition strips; with integral perforated anchoring leg for setting strip into setting material; sloped transition and decorative edge strip for transition from tile to lower finish; height as required; Satin Anodized finish; i.e. RENO-RAMP AE by Schluter Systems (Canada) Inc.

.4 Decorative Edge Trim: Extruded aluminum decorative edge trim with integral perforated anchoring leg for setting strip into setting material; complete with pre-formed corners; Satin Anodized finish; i.e. RONDEC-DB 14 AE by Schluter Systems (Canada) Inc.

.5 Expansion and Control Joints: Roll formed stainless steel profiles joined by soft CPE movement joint material, with integral perforated anchoring legs for setting joint into setting bed; height as required to suit application; insert colour as selected by Consultant; i.e. DILEX-EKSN by Schluter Systems (Canada) Inc.

.6 Uncoupling Membrane: To ANSI A118.10; 3 mm thick high density polyethylene membrane with grid structure of 12 x 12 mm square cavities, each cut back in dovetail configuration, and polypropylene anchoring fleece laminated to underside; i.e. DITRA by Schluter Systems (Canada) Inc.

2.7 MIXES

.1 Scratch Coat (by volume): One part Portland cement, 4 parts sand, and latex additive where required by TTMAC Detail. Premixed mortar may be used per manufacturer’s instructions. Adjust water volume depending on moisture content of sand to obtain consistency and workability.

.2 Slurry Bond Coat: Mix Portland cement and water to a creamy paste consistency. Include latex additive where required by TTMAC Detail.

.3 Levelling Coat (by volume): One part Portland cement, 4 parts sand, and latex additive where required by TTMAC Detail. Premixed mortar may be used per manufacturer’s instructions.

3 Execution

3.1 EXAMINATION

.1 Ensure substrates have been prepared to ANSI A108.01.

.2 Ensure substrate surfaces are clean, dimensionally stable, cured and free of contaminants such as oil, sealers, and curing compounds.

.3 Ensure concrete has cured for a minimum of 28 days.

.4 Ensure concrete slabs have not been treated with proprietary curing compounds.

.5 Ensure concrete slabs are steel trowelled to a fine broom finish.

.6 Ensure concrete slabs have been finished with a maximum permissible variation of 3 mm in 300 mm from the required plane, and not more than 1.5 mm in 305 mm when measured from high points in surface.

.7 Conduct moisture vapour emission rate tests on concrete slabs-on-fill to ASTM F1869. Do not proceed with installation until tests indicate MVER$\leq$ 1.45 kg per 100 m^2 for 24 hours.

.8 Determine absorptive nature of substrates by conducting porosity tests to ASTM F3191.

3.2 PREPARATION

.1 Protect surrounding work from damage or disfiguration.

.2 Thoroughly clean substrates to remove grease, oil and dust film.

.3 Prepare substrate as recommended by manufacturer for absorptive conditions determined by porosity test.

.4 Apply latex modified cementitious levelling coat where concrete slab does not meet specified tolerances for flatness and levelness, and where slight irregularities exist. Limit levelling coat thickness to less than 8 mm.

.5 Install crack isolation membrane as required by TTMAC Details, to ANSI A108.17. If membrane is applied over rough surface, apply 6 mm thick sand-bed under membrane.

.6 Install uncoupling membrane as required by TTMAC Details, to ANSI A108.13.

.7 Cover joints between coated tile backer boards with fibre mesh tape set in latex-Portland cement mortar.

3.3 INSTALLATION

.1 Install Products to TTMAC Specification Guide 09 30 00, as scheduled below.

.2 Apply tile using water-resistant organic adhesives to ANSI A108.4.

.3 Apply tile using dry-set Portland cement mortar or latex-Portland cement mortar beds to ANSI A108.5.

.4 Install tiles with straight, uniform joints, to tile manufacturer’s recommended joint widths.

.5 Fit tile units around corners, fitments, fixtures, drains, and other built-in objects to maintain uniform joint appearance.

.6 Make cut edges smooth, even, and free from chipping. Do not split tile.

.7 Lay out tiles according to patterns indicated on Drawings. Ensure perimeter and cut tiles are minimum half size.

.8 Set tiles in place while bond coat is wet and tacky, prior to skinning over. Slide tile back and forth to ensure proper bond and level surface. Avoid lippage.

.9 Clean backs of tiles and back butter titles to ensure 95 percent bond coverage.

.10 Clean excess mortar from surface prior to final set.

.11 Sound tiles after setting materials have cured and replace hollow sounding tile before grouting.

.12 Exterior Surfaces and Wet Areas (Thin Set Method): Notch adhesive in straight lines, backbutter tile and set on freshly trowelled thin-set mortar. Move tile back and forth perpendicular to notches.

.13 Ungauged Slate, Marble, Stone and Large Ceramics: Immediately prior to setting, backbutter tile through push box or box screed to achieve uniform thickness of tile and mortar.

.14 Install site-cut tiles with site-cut edges concealed within either grouted joint or metal trim. Visually expose only factory-made edges.

.15 Keep two-thirds the depth of grout joints free of setting material.

3.4 MOVEMENT JOINTS

.1 Install control and expansion joints to TTMAC Detail 301MJ.

.2 Keep control joints and expansion joints free of setting materials.

.3 In addition to guidelines outlined in TTMAC Specification Guide 09 30 00, Provide movement joints over cold joints, saw cuts, at columns and at wall plane changes.

3.5 TILE-SETTING ACCESSORIES INSTALLATION

.1 Install tile-setting accessories in continuous lengths, to level straight lines by pressing perforated anchoring leg solidly into tile setting material.

.2 Butt ends of units tightly together with hairline joint. Trowel additional layer of tile setting material over anchored leg prior to placement of tiles.

.3 Unless specified otherwise, solidly embed tiles over anchoring leg of installed trim with surface of tile flush with top of tile-setting accessories.

.4 Leave 3 mm joint between tile and tile-setting accessories for filling with grout.

.5 Install pre-formed corners, end-caps and trim at changes in direction and at terminations. Mitered joints will be rejected.

.6 Expansion and Control Joints: Solidly embed tiles over installed edge strips with joint surface either flush with top of joint or 1 mm below top of tile.

3.6 GROUTING

.1 Allow proper setting time prior to grouting.

.2 Preseal tiles requiring protection from grout staining.

.3 Apply cementitious grout to ANSI 1108.10.

.4 Force grout into joints to ensure dense finish.

.5 Remove excess and polish with clean cloths.

3.7 FIELD QUALITY CONTROL

.1 Inspect completed work and replace broken, cracked or damaged tile.

3.8 TOLERANCES

.1 Level tiles to confirm to a 1 mm tolerance over a 3 mm wide joint.

3.9 CLEANING

.1 Apply tile sealer to floor tiles.

3.10 PROTECTION

.1 Protect finished areas from traffic until setting materials have sufficiently cured.

.2 Protect grouted areas from traffic for 24 hours after grouting.

.3 Protect finished areas with temporary protective coverings.

.4 Protect wall tiles and bases from impact, vibration, heavy hammering on adjacent and opposite walls for at least 14 days after installation.

3.11 SCHEDULE

.1 Tile Installed Over Masonry or Concrete Walls – Thin-Set Method: TTMAC Detail 303W (Interior/Exterior).

.2 Tile Installed Over Gypsum Board – Thin-Set Method: TTMAC Detail 304W.

.3 Tile Bonded to Concrete Slab – Thin-Set Method: TTMAC Detail 311F (A-Interior/Exterior), (C-Crack Concrete Interior/Exterior – Full Coverage) or (D – Uncoupling Over Green/Young Concrete).

END OF SECTION 09 30 00

1 General

1.1 GENERAL REQUIREMENTS

.1 Division 1, General Requirements, is a part of this Section and shall apply as if repeated here.

1.2 WORK IN OTHER SECTIONS

.1 Related Work Specified in Other Sections

Section 05 50 00 : Metal Fabrications

1.3 EXAMINATION

.1 Examine floor surfaces to ensure that they are clean, level and free from cracks, ridges, dusting, scaling and carbonation. Report to the Consultant in writing of any conditions which might preclude a satisfactory installation.

1.4 SUBMITTALS

.1 Samples: Submit samples of each specified flooring, base and accessory material in accordance with Section 01 33 00.

.2 Maintenance Instructions: Submit maintenance instructions in accordance with Section 01 33 00 for incorporation in Project Data Book.

.3 Extra Stock: Deliver to Owner on completion of work, and as they direct, 1% of the quantity of flooring installed (minimum one (1) box), of each material and colour, in labelled packages.

1.5 MAINTENANCE

.1 Submit two copies of a maintenance manual, giving specific warnings of any maintenance practice or materials which may damage or stain the resilient flooring.

2 Products

2.1 MATERIALS

.1 Corridor Covering: Mondo Ramflex tile – 900mm x 900mm x 9.5mm, allow two colours (border and field).

.2 Adhesive: Two part urethane.

3 Execution

3.1 PREPARATION

.1 Clean all surfaces to receive flooring of all grease, oil, paint and other foreign material, before beginning work. Fill all cracks and hollows with materials approved by the Consultant. Remove all existing floor and existing adhesives.

.2 Prior to the installation of the flooring, concrete slabs shall be tested for excessive moisture content by a method acceptable to the Consultant, the manufacturer and the Contractor.

.3 Concrete slabs shall be minimum 28 days old before commencing installation.

.4 Ensure that surfaces and material are at a minimum temperature of between 18^{o}C and 32^{o}C (65^{o}F and 90^{o}F) for 24 hours before, during and for 72 hours after installation.

.5 Thoroughly clean sub-floors of any substance deleterious to the bond of the adhesive.

3.2 INSTALLATION

.1 Apply primer, adhesive, flooring and base materials in accordance with manufacturer's recommendations.

.2 Apply adhesives evenly with notched trowel. Lay flooring to good contact with close, even joints, finish surfaces in true, even plane and perfectly smooth. Roll evenly with 150 lb. roller immediately after laying, in both directions, to ensure uniform adhesion and to remove air pockets.

.3 Accurately scribe around walls, columns, floor outlets and other floor penetrations.

.4 Each type of material used shall be from one manufacturer throughout the work and material in each area shall be of the same production run.

.5 Install edge strips at all unprotected edges of resilient flooring and at junction of other floor finish.

.6 Finish flooring in door openings, if not continuous and where no threshold exists, against the strike side of the door stop unless otherwise noted or directed.

.7 Remove any adhesive from the surface of the flooring as the work progresses and upon completion.

.8 Protect newly laid flooring from construction traffic for a period of four to seven days to allow the flooring to bond firmly. Upon completion, leave floors clean, smooth and free from buckles, cracks and projecting edges.

.9 Colour pattern to match to be provided by Consultant.

END OF SECTION 09 65 19

1 General

1.1 GENERAL REQUIREMENTS

.1 Division 1, General Requirements, is a part of this Section and shall apply as if repeated here.

1.2 QUALITY ASSURANCE

.1 Qualifications: Execute work of this Section only by a Contractor who has adequate equipment and skilled tradesmen to perform work expeditiously, and is known to have been responsible for satisfactory work similar to that specified during a period of at least the immediate past five years.

.2 Requirements of Regulatory Agencies: Coatings shall meet fire hazard classification requirements of jurisdictional authorities for each material in each installation location as applicable.

1.3 SUBMITTALS

.1 Samples

: Submit 216mm x 280mm (8½" x 11") samples at least 30 days before materials are required; labelled to indicate finish, formula, colour name, number, sheen and gloss units.
: Each specified colour in each specified finish coat material.
: Each non-standard colour in each specified coat material.
: Each natural wood finish on each specified wood species.

.2 Extra Stock: Deliver to Owner on completion of work, and as he directs, sealed containers of each finish painting material applied, and in each colour. Label each container as for original including mixing formula. Provide one quart of extra stock when less than 45 litres (10 gallons) are used for project, 4.5 litres (1 gallon) of extra stock when 45 to 182 litres (10 to 40 gallons) are used, and 9 litres (2 gallons) of extra stock when 182 litres (40 gallons) are used.

1.4 PRODUCT 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°C (40°F) 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 9 kg (20 lbs) minimum capacity in each storage area while materials are contained within.

.4 On each container, for materials requiring a fire hazard classification, attach an Underwriter's label verifying that the material is listed under their label service, and giving the hazard classification.

1.5 EXAMINATION

.1 Verify that specified environmental conditions are ensured before commencing work.

.2 Ensure that surfaces to receive finishing materials are satisfactory for specified materials; will not adversely affect execution, permanence or quality of work.

.3 Test all surfaces for moisture content with an electronic moisture meter, and concrete, masonry and plaster surfaces for acid-alkali balance.

.4 Maintain at site at all times until work is completed a moisture meter, hygrometer and thermometer to verify surface and environmental conditions.

.5 Apply finishing materials only when air and surface temperatures exceed 4°C (40°F), except for

7°C for latex paint at interior locations
10°C for latex paint at exterior locations
21°C for lacquers and enamels.

.6 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.

.7 Do not apply finishes when relative humidity is over 85%, when condensation has formed or is likely to form, nor immediately following rain, frost or dew.

.8 Do not paint on plaster, drywall, pipe insulation or masonry surfaces that contain over 12% moisture, nor on wood that contains over 15%.

1.6 PROTECTION

.1 Cover or mask surfaces adjacent to those receiving treatment and finishing to protect work of others from damage and soil. Mask instructions 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 fire hazard, in closed metal containers containing water and remove from building every night.

.4 Coordinate with the appropriate trades for the removal from finished surfaces, storage and reinstallation after finish work is completed for finish hardware, switch and receptacle plates, escutcheons, luminaire frames and similar items.

.5 Post "NO SMOKING" signs and ensure that spark-proof electrical equipment is used in areas where flammable painting materials are being applied.

.6 Post "WET PAINT" signs throughout freshly finished areas and remove when finishes are dry.

2 Products

2.1 MATERIALS

.1 Paint materials listed in latest edition of MPI Approved Products List (APL) are acceptable for use on this project.

Approved Products: Benjamin Moore or Sherwin Williams.

.2 Paint materials for paint systems: to be products of single manufacturer.

.3 Paints, coatings, adhesives, solvents, cleaners, lubricants, and other fluids, to be as follows:

.1 Be water-based, water clean-up.
.2 Be non-flammable biodegradable.
.3 Be manufactured without compounds which contribute to ozone depletion in upper atmosphere.
.4 Be manufactured without compounds which contribute to smog in the lower atmosphere.
.5 Do not contain methylene chloride, chlorinated hydrocarbons, toxic metal pigments.

.4 Water-borne surface coatings must be manufactured and transported in a manner that steps of processes, including disposal of waste products arising therefrom, will meet requirements of applicable governmental acts, by-laws and regulations including, for facilities located in Canada, Fisheries Act and Canadian Environmental Protection Act (CEPA).

.5 Water-borne surface coatings must not be formulated or manufactured with aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavelant chromium or their compounds.

.6 Water-borne surface coatings and recycled water-borne surface coatings must have flash point of 61.0 degrees C or greater.

.7 Recycled water-borne surface coatings must contain 50 % post-consumer

material by volume.

.8 Recycled water-borne surface coatings must not contain:

.1 Lead in excess of 600.0 ppm weight/weight total solids.
.2 Mercury in excess of 50.0ppm weight/weight total product.
.3 Cadmium in excess of 1.0ppm weight/weight total product.
.4 Hexavelant chromium in excess of 3.0 ppm weight/weight total product.
.5 Organochlorines or polychlorinated biphenyls (PCBS) in excess of 1.0 ppm weight/weight total product.

2.2 COLOURS

.1 Consultant will provide Colour Schedule after Contract award.

.2 Colour schedule will be based upon selection of five base colours and three accent colours. No more than eight colours will be selected for entire project and no more than three colours will be selected in each area.

.3 Selection of colours will be from manufacturer’s full range of colours.

.4 Where specific products are available in restricted range of colours, selection will be based on limited range.

.5 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

2.3 MIXING AND TINTING

.1 Perform colour tinting operations prior to delivery of paint to site. On-site tinting of painting materials is allowed only with Consultant's written permission.

.2 Mix paste, powder or catalyzed paint mixes in accordance with manufacturer's written instructions.

.3 Add thinner to paint manufacturer's recommendations. Do not use kerosene or organic solvents to thin water-based paints.

.4 Thin paint for spraying according in accordance with paint manufacturer's instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to Consultant.

.5 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity.

2.4 MIXING AND TINTING

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

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

.2 Gloss level ratings of painted surfaces as noted by Owner.

2.5 INTERIOR PAINTING SYSTEMS

.1 Wood and Metal: including doors, door and window frames, casings, mouldings, etc.

.1 High performance architectural latex semi-gloss finish.

.2 Plaster and Gypsum Board: gypsum wallboard, drywall, "sheet rock type material", etc., and textured finishes

.1 Latex eggshell finish (over latex sealer).

.3 Plaster and Gypsum Board, Concrete ceilings

.1 Latex Flat finish

.2 Mix specified paste or powder coatings or those that are field-catalysed at job, to meet specified requirements of manufacturer.

3 Execution

3.1 PREPARATION

.1 <u>Generally</u>

: Remove from surfaces grease, oil, dirt, dust, ridges and other soil and materials that would adversely affect the adhesion or appearance of finish coatings.
: Finish, patch and smooth surfaces to remove cracks, holes, ridges and similar blemishes.
: Touch-up damaged prime coats on shop primed metals with same priming material.
: Neutralize highly alkaline surfaces with a neutralizing wash of 4% solution of zinc sulphate. Substitute 4% solution of tetrapotassium

pyrophosphate for surfaces to receive latex paints. Brush off residue before painting.

: Scrub mildewed surfaces with a solution of tri-sodium phosphate, bleach with a solution of one part sodium hyopchlorite (Javex) to three parts of water and rinse with clear water.

: Remove finishing hardware, electrical plates, accessories and similar removable fittings on surfaces to be finished. Mask any other work that is not removable.

.2 Metal Surfaces

: 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 weld flux alkali contamination with phosphoric acid solution. Wash with solvent.

: 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.

: Galvanized Steel: Wash thoroughly with mineral spirits and wipe dry with completely clean cloths. Phosphatize surfaces in accordance with CGSB Specification 31-GP-116, or apply one coat of etch specified.

.3 Concrete and Masonry

: Remove residue of form oil from concrete with xylol.

: Fill minor holes and cracks in concrete, cement plaster and concrete masonry with Portland cement grout. Match patches to texture of adjacent surfaces.

: Remove dirt, scale, loose mortar and similar foreign matter by brushing.

: Remove oil and grease with a washing of tri-sodium phosphate solution followed by a thorough rinsing with water.

: Remove efflorescence by dry brushing; or, if required, by washing with dilute muriatic solution of one part commercial muriatic acid to 20 parts water, followed by a commercial rinse with a drenching by clear water.

: Wire brush concrete generally. Etch very smooth concrete, such as floors, with application of a solution of one part commercial muriatic acid (31.45%) to three parts of water by volume. Apply at rate of one gallon solution for each 4.5 to 9.0 square metres (50 to 100 square feet) of surface. When foaming action is finished, flush surfaces clean of cement laitance with high pressure water.

.4 Wood

: Sand finish surfaces smooth with No. 00 sandpaper.

: Clean soiled surfaces with an alcohol wash.

: Wipe off dust and other loose dirt, or vacuum clean before application of coatings.
: Seal knots, pitch and sapwood with two coats of orange shellac, or an application of special sealer.
: After prime coat is dry and sanded, fill nail and screw holes and cracks with wood filler or with putty for interior work and caulking compound for exterior work. Colour fillers to match wood or stain if surfaces are given clear final coatings. Smooth, sand and prime fillers when set.
: Wash down glue-laminated members that have been sealed, with solvent.

.5 Drywall

: Fill minor holes and depressions, caused by accidental damage, with drywall joint cement and sand smooth when it is set, taking care not to raise nap of paper cover.

3.2 APPLICATION

.1 Generally

: Before commencing work, 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.
: Do not paint caulked joints.
: Remove spatters of finish materials from adjacent surfaces including glass, before they set up.

.2 Priming and Back priming

: Back prime exterior and interior woodwork, frames, fitments and similar work as soon as it is delivered and before installed. Use exterior primer compatible to finish coat for exterior work and enamel undercoat for interior work to receive paint or enamel finishes. Prevent primer from running over faces.
: Back prime exterior and interior woodwork receiving clear finishes with gloss varnish reduced 25% by mineral spirits.
: Prime tops and bottoms of painted wood doors with enamel undercoat. Remove doors to prime finish.
: Prime alkaline surfaces with alkali resistant primer.
: Brush out and force primers into grain of wood, and into crevices, cracks and joints in all materials.

.3 Painting

: Apply paint by brush or rollers. Spray paint only when requested or approved by Consultant, and in areas restricted and approved by him.
: Use only brushes for enamels and varnishes, and for painting wood.
: Touch up visible suction spots on dried primer and ensure that they are sealed before application of second coat. Repeat on second coat if still visible.
: Vary colour of intermediate coats by 10% to 25% from succeeding coat shades.

.4 Pipes, Equipment, Conduits and Ducts

: Finish all exposed pipes including insulation to match exposed piping in existing building. Provide identification/directional stickers for all pipes in sufficient quantities.
: Finish all exposed ductwork and electrical conduit to match the wall or ceiling surface to which it is installed.
: Refer to mechanical and electrical drawings for extent of work.
: Finish all pumps and all equipment which is not prefinished. Finish all equipment bases, isolators, etc.

3.3 FIELD QUALITY CONTROL

.1 Arrange for periodic visits to site by paint manufacturer's representatives while work is in progress. On each visit he shall verify that specified materials and methods are used, and that procedures agreed upon at the initial site meeting are followed.

3.4 ADJUSTMENT AND CLEANING

.1 Touch up and finish minor defective work. Refinish entire wall, ceiling or similar surfaces where finish is damaged or not acceptable.

.2 Leave storage and mixing areas clean and in same condition as equivalent spaces in project.

3.5 PAINTING AND FINISHING SCHEDULE

.1 Generally

: Work of this Section shall include finishing all surfaces for which a finish formula is specified and as called for in the Room Finish Schedule.
: Unless otherwise specified or indicated on Drawings and Schedules, finish pipes, ducts, conduit, equipment, panels, fitments, services, structure, attachments, accessories, prime coated hardware or similar appurtenances on or near finished surfaces to match finish of the surface.

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

: Finish interiors of alcoves, recesses, closets, cupboards, fitments and similar spaces to match adjacent surfaces unless otherwise indicated.

3.6 RESTORATION

.1 Clean and re-install all hardware items removed before undertaking painting operations.

.2 Remove protective coverings and warning signs as soon as practical after operations cease.

.3 Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.

.4 Protect freshly completed surfaces from paint droppings and dust to approval of Consultant. Avoid scuffing newly applied paint.

.5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Consultant.

END OF SECTION 09 90 00

1 General

1.1 GENERAL REQUIREMENTS

Division 1, General Requirements, is a part of this Section and shall apply as if repeated here.

1.2 WORK IN OTHER SECTIONS

Related Work Specified in Other Sections

Section 04 20 00	:	Unit Masonry
Section 05 50 00	:	Miscellaneous Metals
Section 06 20 00	:	Finish Carpentry
Section 07 90 00	:	Sealants
Section 08 71 00	:	Finish Hardware
Section 09 90 00	:	Painting
Section 10 28 00	:	Toilet, Bath and Laundry Accessories

1.3 QUALIFICATIONS

Execute the work of this Section only by a Contractor who has adequate plant, equipment and skilled tradesmen to perform it expeditiously and is known to have been responsible for satisfactory installations similar to that specified.

1.4 SUBMITTALS

Shop Drawings: Submit shop drawings for Consultant's approval for all items specified in this Section in accordance with Section 01 33 00, Submittals.

2 Products

2.1 MATERIALS

.1 Steel toilet partitions shall be floor-mounted, headrail, braced toilet compartments as manufactured by Hadrian Manufacturing Inc., Burlington.

.2 Partitions shall be finished in colour selected by Consultant from manufacturers standard range. Two (2) colours will be selected from the 14 standard colours in the manufacturer's standard range.

.3 Sheet steel: Zinc coated steel, A446 Grade A.

.4 Stainless Steel: A1S1 Type 302 or 304, No. 4 Finish.

.5 Honeycomb Core: Kraft paper, uniformly expanded to maximum cell size of 25.4m (1").

.6 Hinges: Bright finished chromium plated brass or stainless steel.

.7 Latches: Exposed handle of bright finished chromium plated brass or stainless steel. Latch bolt of stainless steel. Face plates, keepers, stops and housings of brass or non-ferrous alloy chrome plated where exposed or stainless steel. Rubber bumpers on stops.

.8 Coat Hook and Bumper: Bright finished chromium plated brass or stainless steel, with rubber bumper.

.9 Pilaster Cap: Stainless steel.

.10 Brackets: Stainless steel.

.11 Fastenings: Theft-proof chromium plated or stainless steel where exposed.

.12 Pilaster Anchor Devices and Bolts: Steel, galvanized, zinc coated.

.13 Prime Paint: Alkyd primer for baking to meet or exceed quality specified in CGSB specification 1-GP-81, or phosphate treatment.

.14 Baked Enamel: Alkyd enamel for baking to meet or exceed quality specified in CGSB specification 1-GP-88.

3 Execution

3.1 FABRICATION

.1 Panels, Doors and Pilasters

: Fabricate panels, doors and pilasters with two faces of steel, wipe coated galvanized, cemented under pressure to honeycomb core. Close all edges with minimum 0.914mm (20 ga.) steel, oval crown, locking strips with corners mitred and welded.
: Reinforce panels for attachment of grab bars, and toilet tissue dispensers.
: Panels and doors shall be 25.4mm (1") thick minimum, with minimum 0.711mm (22 ga.) steel facings.
: Pilasters shall be 31.8mm (1-1/4") thick with minimum 0.914mm (20 ga.) steel facings.

.2 Pilaster Anchorage and Cap

: Welded zinc coated steel anchor brackets to face plates of pilasters. Clean welds and prime paint.
: Provide for anchorage of pilaster to steel channels above ceiling by two 9.5mm (3/8") diameter zinc coated bolts or as recommended by the manufacturer.
: Provide for levelling and plumbing by anchor bolts and for their permanent securing in place by locked nuts to prevent subsequent movement.

: Fabricate anchorage assembly to transfer lateral and withdrawal forces directly to structure.
: Conceal pilaster and anchorage with 76mm (3") high stainless steel cap secured by concealed fastening.

.3 Hardware

: Toilet Compartments: hinges, non-gravity and with adjustable positioning stop for holding door partially open when unlatched, operating mechanism concealed within door, nylon or oil-less metal bearings and no vertical movement when door is operated. Latches, with mechanism concealed within door.

.4 Finishing

: Scrape and clean surfaces to remove rust, mill scale, grease or other surface deposits. Finish work by methods standard to supplier with one prime coat and one finish coat of minimum 1 mil thickness.

1.2 EXAMINATION

Take field dimensions of work upon which work of this Section depends before fabrication.

1.3 INSTALLATION

.1 Erect work straight, plumb, level and secured to prevent distortion or displacement or both.

.2 Clearance between panels and pilasters and walls shall not exceed 19mm (3/4").

.3 Clearance at vertical door edges shall be uniform and no greater than 4.8mm (3/16").

.4 Fasten panels, pilasters and screens to walls with "U" brackets. Fasten handrails to walls and pilasters with "U" brackets.

.5 Secure brackets to walls with only

: 38.8mm (1-1/2") long expansion shields in solid masonry.
: Toggle bolts in cells of hollow masonry units.

.6 Seal flange connection to ceiling.

1.4 ADJUSTING, REFINISHING, CLEANING

Adjust operating hardware to work smoothly and without force. Adjust hinges of toilet compartment doors so that all doors remain open to the same degree when unlatched.

END OF SECTION 10 21 13

1 General

1.1 GENERAL REQUIREMENTS

.1 Division 1, General Requirements, is a part of this Section and shall apply as if repeated here.

1.2 WORK IN OTHER SECTIONS

.1 Related Work Specified in Other Sections

Section 06 10 00	:	Rough Carpentry
Section 04 20 00	:	Unit Masonry
Section 09 90 00	:	Painting and Coating

1.3 SHOP DRAWINGS

.1 Submit shop drawings and catalogue illustrations in accordance with Section 01 33 00.

.2 Clearly indicate size and description of components, base material, surface finish, inside and out, hardware and locks, attachment devices, description of rough-in-frame, building-in details of anchors for grab bars.

2 Products

2.1 MATERIALS

.1 Specified manufacturer's catalogue references are based on products manufactured by Twin-Cee to establish minimum acceptable standards for Work of this Section. Products of equal quality by Bobrick & Watrous will be acceptable on approval of Consultant.

3 Execution

3.1 FABRICATION

.1 Provide reinforcing, anchorage and mounting devices required for the installation of each product.

.2 Fit joints and junctions between components tightly and in true planes, conceal and weld joints where possible.

3.2 INSTALLATION

.1 Contractor to install of washroom accessories, including those noted as supplied by the owner. Supplier shall provide standard barrier-free mounting heights and locations, handling instructions, anchorage information, roughing-in dimensions,

and templates for installation of work of this Section.

.2 Verify location and mounting heights of products with Manufacturer before roughing-in or installation.

.3 Install work plumb, level, straight, tight and secure to mounting surfaces. Provide solid wood blocking in drywall partition for anchorage purposes.

.4 Attach accessories to walls with only

: 38mm (1-1/2") long expansion shields in solid masonry or concrete
: toggle bolts in cells to hollow masonry units.

3.3 ADJUSTING, REFINISHING

.1 Adjust operating units to provide free-acting, tightly closing and properly functioning operation. Lubricate as required.

3.4 SCHEDULE OF ACCESSORIES

The following schedule is supplied for your information only. Verify actual quantity and location of each washroom accessory with the drawing.

.1 Sanitary Napkin Vendor: Watrous Model W-0468 recess equipped to dispense napkins and tampons. 25 cent coin mechanism with surface mounted stainless steel finish.

.2 Sanitary Napkin Disposal Units: Watrous Model W-1013-S recessed one .

.3 Recessed Soap Dish: Watrous Model W-7404-S.

.4 Soap Dispensers: Watrous Model W-0343. Type 304 #4 finish stainless steel.

.5 Towel Bars: Watrous Model W-0755-SS, satin finish, 760 mm long with concealed mounting hardware.

.6 Folding Shower Seats: Watrous Model W-8203.

.7 Robe Hook: Watrous Model W-7340 stainless steel single robe hook in 2 per dressing room including referee room.

.8 Paper Towel Dispenser: Watrous Model W-1105-5. Stainless steel finish. Supplied by Owner.

.9 Toilet Tissue Dispenser: Watrous Model W-0030, surface mounted, controlled delivery, twin roll type. Second roll shall not be accessible until first roll has been depleted. Frame and cabinet constructed of type 304 #4 finish stainless steel. One for each water closet. Supplied by Owner

.10 Deodorizer: Watrous Model W-1601. One for each washroom.

.11 Hand Dryers: Refer to Electrical Specifications.

.12 Mop and Broom Holder: Watrous Model W-8215. Stainless steel finish type 304 complete with rubber cam holders. One for each custodian sink.

.13 Handicapped Grab Bars – Flip-Up:

.1 Model: Flip-up by Dunleavy Cordun Associates (Tel: 905-470-6685) 18 gauge stainless steel, 32 mm diameter, 800 mm long flip-up grab bar with white wall mounting bracket and automatic locking system.

.14 Handicapped Grab Bars: Watrous Model W-3100 24P (610 mm) and W-3100 30 x 30 P (760 mm x 760 mm). Grab bars stainless steel with concealed mounting hardware and peened surface. All bars installed in conformance with OBC requirements capable of withstanding horizontal and vertical pull of 2.2 kN. W-3100 24P and W-3100 30 x 30P
Refer to drawings for location and orientation.

.15 Mirrors (Tile Angle): Watrous Model W-0600TA, stainless steel finish, 6 mm polished float glass.
Size: 410 mm x 760 mm

.16 Mirrors (Standard): Watrous Model W-0620, stainless steel finish, 6 mm polished glass, concealed tamperproof fasteners.
Size: 460 mm x 610 mm

END OF SECTION 10 28 00

Division 26 Common Requirements for Electrical

Division 28 Electronic Safety and Security

END OF SECTION

Part 1 General

1.1 GENERAL

.1 This Section covers items common to Electrical Division 26, as well as Division 27 and Division 28.

.2 This section supplements requirements of Division 1.

.3 Furnish labour, materials, and equipment necessary for completion of work as described in contract documents.

1.2 INTENT

.1 Mention herein or indication on Drawings of articles, materials, operations, or methods requires: supply of each item mentioned or indicated, of quality, or subject to qualifications noted; installation according to conditions stated: and, performance of each operation prescribed with furnishing of necessary labour, equipment, and incidentals for electrical work.

.2 Where used, words “Section” and “Division” shall also include other Subcontractors engaged on site to perform work to make building and site complete in all respects.

.3 Where used, word “supply” shall mean furnishing to site in location required or directed complete with accessory parts.

.4 Where used, word “install” shall mean secured in place and connected up for operation as noted or directed.

.5 Where used, word “provide” shall mean supply and install as each is described above.

1.3 TENDERS

.1 Submit tender based on specified described equipment or Alternates listed.

.2 State in Tender, names of all Subcontractors proposed for work under this Division.

1.4 LIABILITY INSURANCE

.1 This contractor must maintain and produce at the request of the consultant proof of proper insurance to fully protect the owner, the consultant and the contractor from any and all claims due to accidents, misfortunes, acts of God, etc.

1.5 ELECTRICAL SAFETY AUTHORITY

.1 The contractor is to determine general inspection fees with Electrical Safety Authority and include as part of tender.

1.6 DRAWINGS

.1 Electrical Drawings do not show structural and related details. Take information involving accurate measurement of building from building drawings, or at building. Make, without additional charge, any necessary changes or additions to runs of conduits and ducts to accommodate structural conditions. Location of conduits and other

equipment may be altered by the consultant without extra charge provided change is made before installation and does not necessitate major additional material.

.2 As work progresses and before installing fixtures and other fittings and equipment which may interfere with interior treatment and use of building, provide detail drawings or obtain directions for exact location of such equipment and fitments.

.3 Electrical drawings are diagrammatic. Where required work is not shown or only shown diagrammatically, install same at maximum height in space to conserve head room (minimum 2200 mm (88") clear) and interfere as little as possible with free use of space through which they can pass. Conceal wiring, conduits and ducts in furred spaces, ceilings and walls unless specifically shown otherwise. Install work close to structure so furring will be small as practical.

.4 Before commencing work, check and verify all sizes, locations, grades, elevations, levels and dimensions to ensure proper and correct installation. Verify existing/municipal services.

.5 Locate all electrical equipment in such a manner as to facilitate easy and safe access to and maintenance and replacement of any part.

.6 In every place where there is indicated space reserved for future or other equipment, leave such space clear, and install services so that necessary installation and connections can be made for any such apparatus. Obtain instructions whenever necessary for this purpose.

.7 Relocate equipment and/or material installed but not co-ordinated with work of other Sections as directed, without extra charge.

.8 Where drawings are done in metric and product not available in metric, the corresponding imperial trade size shall be utilized.

1.7 INTERFERENCE AND CO-ORDINATION DRAWINGS

.1 Prepare interference and equipment placing drawings to ensure that all components will be properly accommodated within the constructed spaces provided.

.2 Prepare drawings to indicate co-ordination and methods of installation of a system with other systems where their relationship is critical. Ensure that all details of equipment apparatus, and connections are co-ordinated.

.3 Ensure that clearances required by jurisdictional authorities and clearances for proper maintenance are indicated on drawings.

.4 Upon consultant’s request submit copies of interference drawings to the consultant.

.5 Due to the nature of the building and the complexity of the building systems provide the following:

.1 Interference drawings, showing coordination of architectural, structural, mechanical, and electrical systems for the consultant’s review prior to fabrication.

.2 Detailed equipment room drawings clearly showing all distribution equipment.

.3 Detailed layout drawings clearly showing conduit/feeder runs 78mm diameter or larger, including hangers or tray.

.6 Provide CAD drawings (minimum file version AutoCAD 2013) in addition to hard copies.

1.8 QUALITY ASSURANCE

.1 The installations of the division must conform to the latest edition of the Electrical Safety Code as well as its supplemental bulletins and instructions. Provide materials and labour necessary to comply with rules, regulations, and ordinances.

.2 Complete underground systems in accordance with CSA C22.3 No. 7-94 except where specified otherwise.

.3 Abbreviations for electrical terms: to CSA Z85-1983.

.4 In case of differences between building codes, provincial laws, local ordinances, utility company regulations, and Contract Documents, the most stringent shall govern. Promptly notify consultant in writing of such differences.

1.9 ALTERNATES AND SUBSTITUTIONS

.1 Throughout these sections are lists of “Alternate Equipment” manufacturers acceptable to consultant if their product meets characteristics of specified described equipment.

.2 Each bidder may elect to use “Alternate Equipment” from lists of Alternates where listed. Include for any additional costs to suit Alternated used. Prices are not required in Tender for Alternates listed.

.3 When two or more suppliers/manufacturers are named in the Bid Documents, only one supplier/manufacturer of the products named will be acceptable; however, it is the responsibility of this Division to ensure “Alternate Equipment” fits space allocated and gives performance specified. If an “Alternate Equipment” unit is proposed and does not fit space allotted nor equal specified product in consultant’s opinion, supply of specified described equipment will be required without change in Contract amount. Only manufacturers listed will be accepted for their product listing. All other manufacturers shall be quoted as substitution stating conditions and credit amount.

.4 If item of material specified is unobtainable, state in Tender proposed substitute and amount added or deducted for its use. Extra monies will not be paid for substitutions after Contract has been awarded.

1.10 EXAMINATION

.1 Site Reviews

.1 Examine premises to understand conditions, which may affect performance of work of this Division before submitting proposals for this work.

.2 No subsequent allowance for time or money will be considered for any consequence related to failure to examine site conditions.

.2 Drawings:

.1 Electrical Drawings show general arrangement of fixtures, power devices, equipment, etc. Follow as closely as actual building construction and work of other trades will permit.

.2 Consider Architectural, Mechanical, and Structural Drawings part of this work insofar as these drawings furnish information relating to design and construction of building. These drawings take precedence over Electrical Drawings.

.3 Because of small scale of Drawings, it is not possible to indicate all offsets, fittings, and accessories, which may be required. Investigate structural and finish conditions affecting this work and arrange work accordingly, providing such fittings, valves, and accessories required to meet conditions.

.3 Ensure that items to be furnished fit space available. Make necessary field measurements to ascertain space requirements including those for connections and furnish and install equipment of size and shape so final installation shall suit true intent and meaning of Contract Documents. If approval is received by Addendum or Change Order to use other than originally specified items, be responsible for specified capacities and for ensuring that items to be furnished will fit space available.

1.11 SEQUENCING AND SCHEDULING

.1 It is understood that while Drawings are to be followed as closely as circumstances permit, this Division will be held responsible for installation of systems according to the true intent and meaning of Contract Documents. Anything not clear or in conflict will be explained by making application to consultant. Should conditions arise where certain changes would be advisable, secure consultant's approval of these changes before proceeding with work.

.2 Coordinate work of various trades in installing interrelated work. Before installation of electrical items, make proper provision to avoid interferences in a manner approved by consultant. Changes required in work specified in these sections caused by neglect to do so shall be made at no cost to owner.

.3 Arrange fixtures, conduit, ducts, and equipment to permit ready access to junction boxes, starters, motors, control components, and to clear openings of doors and access panels.

.4 Furnish and install inserts and supports required by these sections unless otherwise noted. Furnish sleeves, inserts, supports, and equipment that are an integral part of other Divisions of the Work to Sections involved in sufficient time to be built into construction as the Work proceeds. Locate these items and see that they are properly installed. Expense resulting from improper location or installation of items above shall be borne by the electrical trade.

.5 Adjust locations of ducts, conduits, equipment, fixtures, etc, to accommodate work from interferences anticipated and encountered. Determine exact route and location of each conduit and duct prior to installation.

.1 Make offsets, transitions, and changes in direction of ducts, and electrical raceways as required to maintain proper head room and pitch of sloping lines whether or not indicated on Drawings.

.2 Supply and install pull boxes, etc, as required to effect these offsets, transitions, and changes in direction.

1.12 REQUEST FOR INFORMATION (RFI) PROCEDURES

.1 RFIs shall be submitted to the consultant minimum two (2) weeks prior to answer being required. Failure to submit and RFI in a timely manner will forfeit delay claims and schedule extension requests by the contractor.

.2 All RFIs will be submitted with the following information:

.1 RFI number
.2 Name of project
.3 Date of initiation
.4 Date response required by (minimum two (2) weeks)
.5 Subject
.6 Submitter's name
.7 Drawing/specification reference
.8 Photograph of the issue (if applicable)
.9 Description of the issue
.10 Contractor's proposed resolution

1.13 DRAW BREAKDOWN

.1 This contractor MUST submit a breakdown of the tender price into classifications to the satisfaction of the consultant, with the aggregate of the breakdown totaling the total contract amount. **Each item must be broken out into material and labour costs.** Progress claims, when submitted are to be itemized against each item of the draw breakdown. This shall be done in table form showing contract amount, amount this draw, total to date, % complete and balance.

.2 Breakdown shall be as follows:

.1 Permits and fees
.2 Mobilization (maximum 1%)
.3 Demolition
.4 Branch conduits
.5 Branch wiring
.6 Lighting fixtures (interior)
.7 Emergency lighting
.8 Fire alarm system
.9 Voice/Data system Rough in
.10 Electric heating
.11 Electrical contractor closeout requirements (minimum of 3% but not less than $5,000.00)

.3 The breakdown must be approved by the consultant prior to submission of the first draw.

.4 Breakdowns not complying to the above will not be approved.

.5 Breakdown must indicate total contract amount.

.6 Mobilization amount may only be drawn when all required shop drawings have been reviewed by the consultant.

1.14 SHOP DRAWINGS AND PRODUCT DATA

.1 General

.1 Furnish complete catalog data for manufactured items of equipment to be used in the work to consultant for review within 14 days after award of Contract.

.2 Upon receipt of reviewed shop drawing, product is to be ordered immediately.

.3 Provide a complete list of shop drawings to be submitted prior to first submission.

.4 Before submitting to the consultant, review all shop drawings to verify that the products illustrated therein conform to the Contract Documents. By this review, the contractor agrees that it has determined and verified all field dimensions, field construction criteria, materials, catalogue numbers, and similar data and that it has checked and coordinated each shop drawing with the requirements of the work and of the Contract Documents. The contractor's review of each shop drawings shall be indicated by stamp, date and signature of a qualified and responsible person possessing by the appropriate authorization.

.5 If material or equipment is not as specified or submittal is not complete, it will be rejected by consultant.

.6 Additional shop drawings required by the contractor for maintenance manuals, site copies etc., shall be photocopies of the "reviewed" shop drawings. All costs to provide additional copies of shop drawings shall be borne by the contractor.

.7 **Submit all shop drawings for the project as a package. Partial submittals will not be accepted**.

.8 Catalog data or shop drawings for equipment, which are noted as being reviewed by consultant or his engineer shall not supersede Contract Documents.

.9 Review comments of consultant shall not relieve this Division from responsibility for deviations from Contract Documents unless consultant's attention has been called to such deviations in writing at time of submission, nor shall they relieve this Division from responsibility for errors in items submitted.

.10 Check work described by catalog data with Contract Documents for deviations and errors.

.11 Shop drawings and product data shall show:

.1 Mounting arrangements.

.2 Operating and maintenance clearances. e.g. access door swing spaces.

.12 Shop drawings and product data shall be accompanied by:

.1 Detailed drawings of bases, supports, and anchor bolts.

.2 Manufacturer test data where requested.

.3 Manufacturer to certify as to current model production.

.4 Certification of compliance to applicable codes.

.13 State sizes, capacities, brand names, motor HP, accessories, materials, gauges, dimensions, and other pertinent information. List on catalog covers page numbers of submitted items. Underline applicable data.

.14 If a shop drawing is returned "reviewed as noted" this contractor must provide written indication that the comments have been complied with.

.15 A partial list of shop drawings includes:

.1 Fire alarm system
.2 Luminaires and drivers
.3 Emergency battery units, exit signs, and fixtures
.4 Electrical heaters
.5 Firestopping materials
.6 Wiring devices
.7 Lighting controls
.8 Fuses

.2 Submissions shall be submitted electronically as per the following directions:

.1 Electronic Submissions:

.1 Electronically submitted shop drawings shall be prepared as follows:

.1 Use latest software to generate PDF files of submission sheets.
.2 Scanned legible PDF sheets are acceptable. Image files are not acceptable.
.3 PDF format shall be of sufficient resolution to clearly show the finest detail.
.4 PDF page size shall be standardized for printing to letter size (8.5"x11"), portrait with no additional formatting required by the consultant. Submissions requiring larger detail sheets shall not exceed 11"x17".
.5 Submissions shall contain multiple files according to section names as they appear in Specification.
.6 File names shall include consultant project number and description of shop drawing section submitted.
.7 Each submission shall contain an index sheet listing the products submitted, indexed in the same order as they appear in the Specification. Include associated PDF file name for each section.
.8 On the shop drawing use an “electronic mark” to indicate what is being provided.
.9 **Each file shall bear an electronic representation of the “company stamp” of the contractor. If not stamped the file submission will not be reviewed.**

.2 Email submissions shall include subject line to clearly identify the consultants’ project number and the description of the shop drawings submitted.
.3 Electronic attachments via email shall not exceed 10MB. For submissions larger than 10MB, multiple email messages shall be used. Denote related email messages by indicating “1 of 2” and “2 of 2” in email subject line for the case of two messages.
.4 Electronic attachments via web links (URL) shall directly reference PDF files. Provide necessary access credentials within link or as username/password clearly identified within body of email message.

.5 On site provide one copy of the “reviewed” shop drawings in a binder as noted above.

.6 Contractor to print copies of “reviewed” shop drawings and compile into maintenance manuals in accordance with requirements detailed in this section.

1.15 CARE, OPERATION AND START-UP

.1 Instruct consultant and operating personnel in the operation, care and maintenance of equipment.

.2 Arrange and pay for services of manufacturer's factory service engineer to supervise start-up of installation, check, adjust, balance and calibrate components.

.3 Provide these services for such period, and for as many visits as necessary to put equipment in operation, and ensure that operating personnel are conversant with all aspects of its care and operation.

1.16 VOLTAGE RATINGS

.1 Operating voltages: to CAN3-C235-83.

.2 Motors, electric heating, control and distribution devices and equipment to operate satisfactorily at 60 Hz within normal operating limits established by above standard. Equipment to operate in extreme operating conditions established in above standard without damage to equipment.

1.17 PERMITS, FEES AND INSPECTION

.1 The contractor is required to include in his tender all required inspection costs by the Electrical Safety Authority. Permit application is the responsibility of the contractor.

.2 Reproduce drawings and specifications required by Electrical Safety Authority at no cost.

.3 Notify consultant of changes required by Electrical Safety Authority prior to making changes.

.4 Furnish Certificates of Acceptance to consultant from Electrical Safety Authority and other authorities having jurisdiction upon completion of work.

.5 This contractor must furnish any certificates required to indicate that the work completed conforms with laws and regulations of authorities having jurisdiction.

1.18 ADDITIONAL INSTALLED EQUIPMENT

.1 The electrical contractor is to review all specification sections forming part of the electrical bid documents and include additional equipment or components, as well as all associated installation costs and testing costs as noted, in the electrical bid price.

1.19 MATERIALS AND EQUIPMENT

.1 Equipment and material to be CSA certified. Where there is no alternative to supplying equipment which is not CSA certified, obtain special approval from Electrical Safety Authority.

.2 Factory assemble control panels and component assemblies.

1.20 ELECTRIC MOTORS, EQUIPMENT, AND CONTROLS

.1 Supplier and installer responsibility is indicated in the Equipment Wiring Schedule on electrical drawings.

.2 Control wiring and conduit is specified in the Electrical specifications except for conduit, wiring and connections below 50 V, which are related to control systems specified in the Mechanical specifications.

1.21 FINISHES

.1 Shop finish metal enclosure surfaces by application of rust resistant primer inside and outside, and at least two coats of finish enamel.

.1 Paint indoor switchgear and distribution enclosures light grey.

.2 Clean and touch up surfaces of shop-painted equipment scratched or marred during shipment or installation, to match original paint.

.3 Clean and prime exposed non-galvanized hangers, racks, fastenings, and conduits etc. to prevent rusting.

1.22 EQUIPMENT IDENTIFICATION

.1 Identify electrical equipment with nameplates as follows:

.2 Nameplates:

.1 Lamicoid 3 mm (1/8") thick plastic engraving sheet, black face, white core, mechanically attached with self tapping screws.

NAMEPLATE SIZES

Size 1	9 mm x 50 mm (3/8" x 2")	1 line	3 mm (1/8") high letters
Size 2	12 mm x 70 mm (1/2" x 2 1/2")	1 line	5 mm (3/16”) high letters
Size 3	12 mm x 70 mm (1/2" x 2 1/2")	2 lines	3 mm (1/8") high letters
Size 4	20 mm x 90 mm (3/4" x 3 1/2")	1 line	9 mm (3/8") high letters
Size 5	20 mm x 90 mm (3/4" x 3 1/2")	2 lines	5 mm (3/16") high letters
Size 6	25 mm x 100 mm (1" x 4")	1 line	12 mm (1/2") high letters
Size 7	25 mm x 100 mm (1" x 4")	2 lines	6 mm (1/4”) high letters

.3 Wording on nameplates labels to be approved by consultant prior to manufacture.

.4 Allow for average of twenty-five (25) letters per nameplate.

.5 Identification to be English.

.6 Nameplates for terminal cabinets and junction boxes to indicate system and/or voltage characteristics.

1.23 WIRING IDENTIFICATION

.1 Identify wiring with permanent indelible identifying markings, either numbered or coloured plastic tapes, on both ends of phase conductors of feeders and branch circuit wiring.

.2 Maintain phase sequence and colour coding throughout.

.3 Colour code: to CSA C22.1.

.4 Use colour coded wires in communication cables, matched throughout system.

1.24 CONDUIT AND CABLE IDENTIFICATION

.1 Colour code conduits, boxes and metallic sheathed cables.
.2 Code with plastic tape or paint at points where conduit or cable enters wall, ceiling, or floor, and at 15 m (45') intervals.
.3 Colour bands must be 25 mm (1") wide.

	Prime
up to 208 V	yellow
209 to 600 V	white
Fire alarm	red
Emergency lighting	pink

.4 This contractor must paint all system junction boxes and covers in conformance with the above schedule.

1.25 PROTECTION OF OPENINGS

.1 Protect equipment and systems openings from dirt, dust, and other foreign materials with materials appropriate to system.

1.26 WIRING TERMINATIONS

.1 Lugs, terminals, screws used for termination of wiring to be suitable for either copper or aluminum conductors.

1.27 MANUFACTURERS AND CSA LABELS

.1 All labels must be visible and legible after equipment is installed.

1.28 WARNING SIGNS

.1 To meet requirements of Electrical Safety Authority and consultant.
.2 Provide porcelain enamel signs, with a minimum size of 175 mm x 250 mm (7" x 10").

1.29 LOCATION OF OUTLETS

.1 Do not install outlets back-to-back in wall; allow minimum 150 mm (6") horizontal clearance between boxes.
.2 Change location of outlets at no extra cost or credit, providing distance does not exceed 3 m (10'), and information is given before installation.
.3 Locate light switches on latch side of doors.

1.30 MOUNTING HEIGHTS

.1 Mounting height of equipment is from finished floor to centreline of equipment unless specified or indicated otherwise. Coordinate with block coursing (if applicable).
.2 If mounting height of equipment is not specified or indicated, verify before proceeding with installation.
.3 Install electrical equipment at following heights unless indicated otherwise.

.1 Local switches: 1100 mm (43.3").

.2 Wall receptacles:

.1 General: 400 mm (16").
.2 Above top of continuous baseboard heater: 200 mm (8").
.3 Above top of counters or counter splash backs: 100 mm (4").
.4 In mechanical rooms: 1200 mm (48").

.3 Fire alarm stations: 1200 mm (3' - 11").
.4 Fire alarm visual and signal devices: 2250 mm (88 ½").
.5 Thermostat: 1200 mm (3’-11").
.6 Heaters: 200 mm (8" AFF) to bottom of heater.
.7 Emergency call switches and/or pushbuttons: 900 mm (36").

1.31 LOAD BALANCE

.1 Measure phase current to panelboards with normal loads (lighting) operating at time of acceptance. Adjust branch circuit connections as required to obtain best balance of current between phases and record changes.
.2 Measure phase voltages at loads and adjust transformer taps to within 2% of rated voltage of equipment.
.3 Submit, at completion of work, report listing phase and neutral currents on panelboards, dry-core transformers and motor control centres, operating under normal load. State hour and date on which each load was measured, and voltage at time of test.

1.32 CONDUIT AND CABLE INSTALLATION

.1 Install conduit and sleeves prior to pouring of concrete. Sleeves through concrete shall be schedule 40 steel pipe, sized for free passage of conduit, and protruding 50 mm (2") beyond either side.
.2 Install cables, conduits and fittings to be embedded or plastered over, neatly and close to building structure so furring can be kept to minimum.

1.33 FIELD QUALITY CONTROL

.1 Conduct and pay for following tests:

.1 Power distribution system including phasing, voltage, grounding, and load balancing.
.2 Circuits originating from branch distribution panels.
.3 Lighting and its control.
.4 Motors, heaters and associated control equipment including sequenced operation of systems where applicable.
.5 Systems: fire alarm system, communications, security.

.2 Furnish manufacturer's certificate or letter confirming that entire installation as it pertains to each system has been installed to manufacturer's instructions.

.3 Insulation resistance testing.

.1 Megger circuits, feeders and equipment up to 350 V with a 500 V instrument.
.2 Megger 350-600 V circuits, feeders and equipment with a 1000 V instrument.
.3 Check resistance to ground before energizing.

.4 Carry out tests in presence of consultant.
.5 Provide instruments, meters, equipment and personnel required to conduct tests during and at conclusion of project.
.6 Submit test results for consultant's review.

1.34 CO-ORDINATION OF PROTECTIVE DEVICES

.1 Ensure circuit protective devices such as overcurrent trips, relays and fuses are installed to required values and settings as indicated on drawings or as determined from co-ordination study.
.2 Electrical connections to all equipment requiring connection to the electrical distribution system as part of this electrical tender have been specified according to the anticipated equipment manufacturer electrical requirements and the applicable sections of the OESC. This contractor must coordinate electrical connections to all equipment specified to be connected as part of this electrical tender.
.3 Prior to submitting electrical distribution shop drawings to the consultant, review all shop drawings for all equipment specified for connection to the electrical distribution system to verify that the product electrical connection requirements listed by the manufacturer conform to the equipment electrical connections specified on the electrical design drawings and specifications. Make necessary revisions to breaker ratings associated with the review of all product shop drawings and identify such changes as part of the electrical distribution equipment shop drawing submission.
.4 Prior to making final equipment connections, this electrical contractor shall examine equipment nameplates at the project site to confirm voltage and phase requirements, minimum circuit ampacity and maximum overcurrent protection values, and bring to the attention of the consultant in writing any connection requirements which may vary from the designed connections or approved electrical distribution shop drawings. No subsequent allowance for time or money for changes to breaker or wire and conduit sizes will be considered for any consequence related to failure to examine site conditions.

1.35 GUARANTEE AND WARRANTY

.1 At ready for takeover of this project this Contractor must provide a written guarantee indicating that any defects, not due to ordinary wear and tear or improper use which occur within the first year from the date of ready for takeover will be corrected at the contractors expense.
.2 If the electrical sub-contractor’s office is 50 kilometers (30 miles) or more from the project site, the sub-contractor is to provide a service/warranty work agreement for warranty period with a local electrical sub-contractor approved by consultant. Include copy of service/warranty agreement in warranty section of operation and maintenance manual.

.3 Warranty period shall start from date of ready for takeover completion.
.4 Refer to individual specification sections for information on any special manufacturer's equipment warranties.

1.36 SYSTEM START UP

.1 Provide consultant with written notice verifying all equipment operation and installation is complete prior to scheduled start-up period.
.2 Start up shall be in presence of the following: owner or representative, contractor, and manufacturer's representative. Each person shall witness and sign off each piece of equipment. Consultant's attendance will be determined by consultant.
.3 Arrange with all parties and provide 72 hours notice for start up procedure.
.4 Simulate system start up and shut down and verify operation of each piece of equipment.
.5 These tests are to demonstrate that the systems and equipment installed are operational as specified.
.6 The contractor must describe during the start up session the required maintenance for each piece of equipment according to the manufacturer.
.7 The contractor must provide all necessary tools (including a digital multimeter) to successfully complete the start up procedure.

1.37 OPERATION AND MAINTENANCE MANUAL

.1 Provide operation and maintenance data for incorporation into manual as specified in other Sections of this Division.
.2 Operation and maintenance manual to be approved by, and final copies deposited with, consultant before final inspection.

.1 Submit 1 copy of Operation and Maintenance Manual to consultant for approval. Submission of individual data will not be accepted unless so directed by consultant. Submission can be done electronically in pdf format or as a hardcopy.

.1 Electronic submission/pdf file is required to be bookmarked. Any submission received without bookmarking will be immediately returned as unacceptable.
.2 Hardcopy submission shall be in a three-ring binder (minimum 50 mm (2") ring) and labelled as 'Operation and Maintenance Manual' with project name and location. Dividers are to be used for binder organization.

.2 Make changes as required and re-submit as directed by consultant.

.3 Each manual must include (in "tabbed" sections) the following:

.1 Index
.2 List of General, Mechanical, Electrical Contractors and all associated sub-contractor names, addresses and contact numbers.
.3 List of suppliers and equipment wholesalers local to the project.

.4 Letter of contractor's warranty and guarantee for all parts, equipment and workmanship.
.5 List of manufacturers, spare parts list and source.
.6 Copy of typewritten schedules for all new and renovated panels.
.7 Copy of all substantial performance final certificates.
.8 Copy of electrical shop drawings which have been stamped and reviewed by consultant.
.9 Electrical As-built drawings including contractor company's as built stamp.
.10 Any special warranties on equipment required (i.e. LED lighting, digital lighting control).
.11 System commissioning certificate and report.

.4 Final Submittals:

.1 Upon acceptance of Operation and Maintenance Manual by the consultant provide the following:

.1 Provide one (1) copy of final operation maintenance manual, as well as a PDF file of the entire approved manual on a USB stick. Only one USB stick is to be provided containing both the approved manual and as-built drawings.

1.38 AS-BUILT DRAWINGS

.1 Site records:

.1 Contractor shall provide 2 sets of reproducible electrical drawings. Provide sets of white prints as required for each phase of the work. Mark thereon all changes as work progresses and as changes occur. This shall include field and contract changes to electrical systems.
.2 On a weekly basis, transfer information to reproducibles, revising reproducibles to show all work as actually installed.
.3 Use different colour waterproof ink for each service.
.4 Make available for reference purposes and inspection at all times.

.2 As-built drawings:

.1 Identify each drawing in lower right hand corner in letters at least 3 mm (1/8") high as follows: - "AS-BUILT DRAWINGS: THIS DRAWING HAS BEEN REVISED TO SHOW ELECTRICAL SYSTEMS AS INSTALLED" (Signature of Contractor) (date).
.2 Submit hard copy to consultant for approval. When returned, make corrections (if any) as directed.
.3 Once approved, submit completed reproducible paper as-built drawings as well as a scanned pdf file copy on USB stick with Operating and Maintenance Manuals.

1.39 DEMONSTRATION AND OPERATING AND MAINTENANCE INSTRUCTIONS

.1 Supply tools, equipment and personnel to demonstrate and instruct operating and maintenance personnel in operating, controlling, adjusting, trouble-shooting and servicing of all systems and equipment during regular work hours, prior to acceptance.
.2 Manufacturers or their representatives are to provide demonstrations and instructions.
.3 Use operation and maintenance manual, As-built drawings, audio visual aids, etc. as part of instruction materials.
.4 Instruction duration time requirements as specified in appropriate sections.
.5 Where deemed necessary, consultants may record these demonstrations on video tape for future reference.

1.40 OCCUPANCY REQUIREMENTS

.1 The contractor shall provide the following documentation to the consultant's satisfaction prior to receiving occupancy. Failure to provide the proper documentation will result in the occupancy not being granted. List of required documentation:

.1 Final Certificates (required prior to consultant's release of conformance letter).

.1 Electrical Safety Authority.
.2 Emergency Lighting.
.3 Fire Alarm Verification Certificate.

1.41 READY FOR TAKEOVER

.1 Complete the following to the satisfaction of the consultant prior to request for ready for takeover.

.1 As-built Drawings.
.2 Maintenance Manuals.
.3 System Start up.
.4 Instructions to Owners.
.5 Lighting Control System.
.6 Outlet cover circuit labels.

1.42 TRIAL USAGE

.1 Consultant or owner may use equipment and systems for test purposes prior to acceptance. Supply labour, material, and instruments required for testing.

1.43 REVISION TO CONTRACT

.1 Provide the following for each item in a given change notice:

.1 Itemized list of material with associated costs.
.2 Labour rate and itemized list of labour for each item.
.3 Copy of manufacturers/suppliers invoice if requested.

1.44 EQUIPMENT SUPPORTS

.1 Equipment supports supplied by equipment manufacturer: shall be installed by the electrical contractor.

.2 Equipment supports not supplied by equipment manufacturer: fabricate from structural grade steel meeting requirements of - Structural Steel Section. Submit structural calculations with shop drawings if necessary.

.3 Mount base mounted equipment on chamfered edge housekeeping pads, minimum of 100 mm (4") high and 150 mm (6") larger than equipment dimensions all around. This installation of this pad shall be the responsibility of the electrical contractor.

1.45 FIRESTOPPING

.1 Firestopping material and installation within annular space between conduits, ducts, and adjacent fire separation.

.2 Provide materials and systems capable of maintaining effective barrier against flame, smoke, and gases.

.3 Comply with the requirements of CAN4-S115-M35, and do not exceed opening sized for which they have been tested.

.4 Systems to have an F or FT rating (as applicable) not less than the fire protection rating required for closures in a fire separation.

.5 The firestopping materials are not to shrink, slump or sag and be free of asbestos, halogens and volatile solvents.

.6 Firestopping materials are to consist of a component sealant applied with a conventional caulking gun and trowel.

.7 Firestop materials are to be capable of receiving finish materials in those areas, which are exposed and scheduled to receive finishes.

.8 Firestopping shall be inspected and approved by local authority prior to concealment or enclosure.

.9 Install material and components in accordance with ULC certification, manufacturers instructions and local authority.

.10 Submit product literature and installation material on firestopping in shop drawing and product data manual.

.11 Acceptable manufacturers:

.1 Rectorseal Corporation (Metacaulk)
.2 Proset Systems
.3 3M
.4 Hilti
.5 STI Firestop

Note: Fire stop material must conform to requirements of local authorities having jurisdiction. Contractor to confirm prior to application and ensure material used is compatible with that used by other trades on site.

.12 Ensure firestop manufacturer representative performs on site inspections and certifies installation. Submit inspection reports/certification at time of ready for takeover.

1.46 PAINTING

.1 Refer to Section Interior Painting and specified elsewhere.
.2 Apply at least one coat of corrosion resistant primer paint to ferrous supports and site fabricated work.
.3 Prime and touch up marred finished paintwork to match original.
.4 Restore to new condition, or replace equipment at discretion of consultant, finishes which have been damaged too extensively to be merely primed and touched up.

1.47 ACCESS DOORS

.1 Supply access doors to concealed electrical equipment for operating, inspecting, adjusting and servicing.
.2 Flush mounted 600 mm x 600 mm (24" x 24") for body entry and 300 mm x 300 mm (12" x 12") for hand entry unless otherwise noted. Doors to open 180º, have rounded safety corners, concealed hinges, screwdriver latches and anchor straps.
.3 Material:

.1 Special areas such as tiled or marble surfaces: use stainless steel with brushed satin or polished finish as directed by consultant.
.2 Remaining areas: use prime coated steel.
.3 Fire rated areas: provide ULC listed access doors

.4 Installation:

.1 Locate so that concealed items are accessible.
.2 Locate so that hand or body entry (as applicable) is achieved.
.3 Installation is specified in applicable sections.

.5 Acceptable materials:

.1 Le Hage
.2 Zurn
.3 Acudor
.4 Nailor Industries Inc.

1.48 DELIVERY STORAGE & HANDLING

.1 Follow Manufacturer's directions in delivery, storage, and protection, of equipment and materials. Contractor to include all costs associated with delivery storage and handling in tender price.
.2 Deliver equipment and material to site and tightly cover and protect against dirt, water, and chemical or mechanical injury, but have readily accessible for inspection. Store items subject to moisture damage (such as controls) in dry, heated space.

1.49 REPAIR, CUTTING, CORING AND RESTORATION

.1 Be responsible for required digging, cutting, and patching incident to work of this Division and make required repairs afterwards to satisfaction of consultant. Cut carefully to minimize necessity for repairs to existing work. Do not cut beams, columns, or trusses.

.2 Patch and repair walls, floors, ceilings, and roofs with materials of same quality and appearance as adjacent surfaces unless otherwise shown. Surface finishes shall exactly match existing finishes of same materials.

.3 Each Section of this Division shall bear expense of cutting, patching, repairing, and replacing of work of other Sections required because of its fault, error, tardiness, or because of damage done by it.

.4 Slots, cores and openings through floors, walls, ceilings, and roofs shall be provided by this contractor but performed by a trade specializing in this type of work. This Division shall see that they are properly located and do any cutting and patching caused by its neglect to do so.

1.50 EXISTING SYSTEMS

.1 Connections into existing systems to be made at time approved by consultant. Request written approval of time when connections can be made.

.2 Be responsible for damage to existing plant by this work.

1.51 CLEANING

.1 Clean interior and exterior of all electrical equipment provided including light fixture lenses.

.2 In preparation for final acceptance, clean and refurbish all equipment and leave in operating condition.

1.52 ASBESTOS

.1 If asbestos is suspected or identified cease all work in the immediate area in accordance with OHSA and notify consultant.

.2 Each contractor and on site employee of the contractor shall have “asbestos awareness training”.

.3 The contractor shall ensure that employees who may come into contact with asbestos due to the nature of the work that they perform, have received training that enables them to recognize asbestos and that enables them to react in accordance with the Occupational Health and Safety Act and regulations thereto should contact with asbestos occur during the course of their work.

.4 It is the responsibility of the contractor to review the asbestos book in the building prior to starting any work.

.5 Existing occupied buildings (depending upon their age) may contain asbestos in thermal insulating materials and some manufactured products, such as vinyl asbestos floor tile. Any insulating materials, on pipes, fittings, boilers, tanks, ductwork, etc. may contain asbestos and shall not be disturbed.

.6 **A survey of each building documenting the location and condition of asbestos-containing materials is available for your mandatory review prior to commencing any work on premises.**

1.53 DISCONNECTION AND REMOVAL

.1 Disconnect and/or remove equipment as indicated.
.2 Cap and conceal all redundant and obsolete connections.
.3 Provide a list of equipment to be removed to the owner, for his acceptance of same. Remove all equipment from site, which the owner does not retain.
.4 Store equipment to be retained by owner on site where directed by consultant.

1.54 ENCLOSURES

.1 This contractor must ensure that all electrical equipment mounted in sprinklered areas is provided with an enclosure in conformance with the Electrical Safety Code.

1.55 PHASING OF WORK

This work for this project shall be constructed in phases. Refer to the architectural drawings for phasing information and details. Misinterpretation of the drawings with respect to the extent of the phasing of the work shall not relieve the contractor of the work required to complete the entire contract.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 CSA C22.2 No.0.3-92, Test Methods for Electrical Wires and Cables.

1.2 PRODUCT DATA

.1 Submit product data in accordance with Electrical General Requirements Section.

Part 2 Products

2.1 BUILDING WIRES

.1 Conductors: stranded for 10 AWG and larger.
.2 Minimum size: 12 AWG.
.3 Copper conductors: size as indicated, with 600 V insulation of chemically cross-linked thermosetting polyethylene material 90°C (194ºF) rated T90 for indoor above grade installations and RW90 for below grade installations.

2.2 ARMOURED CABLES

.1 Conductors: insulated, copper minimum size as indicated above.
.2 Type: AC90 (minimum size 12 AWG).
.3 Armour: interlocking type fabricated from aluminum strip.
.4 Connectors must be suitable for installed environment and approved for use with armoured cable.

Part 3 Execution

3.1 INSTALLATION OF BUILDING WIRES

.1 Install wiring from source to load through raceways as specified.
.2 Provide separate neutral conductors for all lighting circuits and circuits originating from surge protected panels. Size raceways accordingly.

3.2 INSTALLATION OF ARMOURED CABLES

.1 Group cables wherever possible.
.2 Terminate cables in accordance with Wire and Box Connectors - 0 - 1000 V Section.
.3 These cables are to be installed in concealed locations only. These concealed locations are considered to be stud walls and “drops” to stud walls, lighting fixtures, and ceiling mounted devices.
.4 These “drops’ shall not be permitted to exceed 2.4 m (8'-0"). To limit these “drops” to lengths noted above provide additional branch wiring in conduit.

END OF SECTION

Part 1 General

1.1 SHOP DRAWINGS AND PRODUCT DATA

.1 Submit shop drawings and product data for cabinets in accordance with Electrical General Requirements Section.

Part 2 Products

2.1 MATERIALS

.1 Junction and pull boxes must conform to CSA C22.2 No. 40 (latest edition)

2.2 JUNCTION AND PULL BOXES

.1 Welded steel construction with screw-on flat covers for surface mounting.
.2 Covers with 25 mm (1") minimum extension all around, for flush-mounted pull and junction boxes.

Part 3 Execution

3.1 JUNCTION AND PULL BOXES INSTALLATION

.1 Install pull boxes in inconspicuous but accessible locations.
.2 Install junction and pull boxes so as not to exceed 30 m (100') of conduit run between pull boxes and in conformance with the Electrical Safety Code.

3.2 IDENTIFICATION

.1 Provide equipment identification in accordance with General Electrical Requirements Section.
.2 Install size 2 identification labels indicating system name, voltage and phase.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Outlet boxes, conduit boxes, and fittings must conform to CSA C22.2 No. 18 (latest edition).

Part 2 Products

2.1 OUTLET AND CONDUIT BOXES GENERAL

.1 Size boxes in accordance with CSA C22.1.
.2 102 mm (4") square or larger outlet boxes as required for special devices.
.3 Gang boxes where wiring devices are grouped.
.4 Blank cover plates for boxes without wiring devices.
.5 Combination boxes with barriers where outlets for more than one system are grouped.

2.2 SHEET STEEL OUTLET BOXES

.1 Electro-galvanized steel single and multi gang flush device boxes for flush installation, minimum size 76 mm x 50 mm x 64 mm (3" x 2" x 2½") or as indicated. 102 mm (4") square outlet boxes when more than one conduit enters one side with extension and plaster rings as required. Iberville 1104 Series.
.2 Electro-galvanized steel utility boxes for outlets connected to surface-mounted EMT conduit **in utility rooms**, minimum size 102 mm x 57 mm x 38 mm (4" x 2¼" x 1½"). Iberville 1110 Series.
.3 102 mm (4") square or octagonal outlet boxes for lighting fixture outlets.
.4 102 mm (4") square outlet boxes with extension and plaster rings for flush mounting devices in finished tile walls.

2.3 MASONRY BOXES

.1 Electro-galvanized steel masonry single and multi gang boxes for devices flush mounted in exposed block walls.

2.4 CONCRETE BOXES

.1 Electro-galvanized sheet steel concrete type boxes for flush mount in concrete with matching extension and plaster rings as required.

2.5 CONDUIT BOXES

.1 Cast FS or FD feraloy boxes with factory-threaded hubs and mounting feet for surface wiring of switches and receptacle **in areas (other than utility rooms) where surface conduit is used.**

2.6 FITTINGS- GENERAL

.1 Bushing and connectors with nylon insulated throats.
.2 Knock-out fillers to prevent entry of debris.
.3 Conduit outlet bodies for conduit up to 32 mm (1- 1/4") and pull boxes for larger conduits.
.4 Double locknuts and insulated bushings on sheet metal boxes.

Part 3 Execution

3.1 INSTALLATION

.1 Support boxes independently of connecting conduits.
.2 Fill boxes with paper, sponges or foam or similar approved material to prevent entry of debris during construction. Remove upon completion of work.
.3 For flush installations mount outlets flush with finished wall using plaster rings to permit wall finish to come within 6 mm (1/4") of opening.
.4 Provide correct size of openings in boxes for conduit, mineral insulated and armoured cable connections. Reducing washers are not allowed.
.5 Outlets if unwired are to be provided with blank coverplates to suit related sections of this specification.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 CSA C22.2 No.65-1956(R1965) Wire Connectors.

Part 2 Products

2.1 MATERIALS

.1 Pressure type wire connectors: with current carrying parts of copper sized to fit copper conductors as indicated.

.2 Fixture type splicing connectors: with current carrying parts of copper sized to fit copper conductors 10 AWG or less.

.3 Clamps or connectors for armoured cable, mineral insulated cable, and flexible conduit, as required.

Part 3 Execution

3.1 INSTALLATION

.1 Remove insulation carefully from ends of conductors and:

.1 Apply coat of zinc joint compound on aluminum conductors prior to installation of connectors.

.2 Install mechanical pressure type connectors and tighten screws with appropriate compression tool recommended by manufacturer. Installation shall meet secureness tests in accordance with CSA C22.2 No.65.

.3 Install fixture type connectors and tighten. Replace insulating cap.

END OF SECTION

Part 1 General

Not Applicable.

Part 2 Products

2.1 MATERIALS

.1 Grounding equipment must conform to CSA C22.2 No 41 (latest edition).

2.2 EQUIPMENT

.1 Clamps for grounding of conductor: size as required to electrically conductive underground water pipe and electrically conductive metal gas piping.

.2 Insulated grounding conductors: green with insulation type that matches specified phase conductors. Gauge shall be in conformance with the latest edition of the Electrical Safety Code to suit required installation conditions.

.3 Ground bus: copper, size as indicated, complete with insulated supports, fastenings, connectors.

.4 Non-corroding accessories necessary for grounding system, type, size, material as indicated, including but not necessarily limited to:

- .1 Grounding and bonding bushings.
- .2 Protective type clamps.
- .3 Bolted type conductor connectors.
- .4 Thermit welded type conductor connectors.
- .5 Bonding jumpers, straps.
- .6 Pressure wire connectors.

Part 3 Execution

3.1 INSTALLATION GENERAL

.1 Install complete permanent, continuous grounding system including, electrodes, conductors, connectors, accessories. **Where EMT is used, run ground wire in conduit.**

.2 Install connectors in accordance with manufacturer's instructions.

.3 Protect exposed grounding conductors from mechanical injury.

.4 Use mechanical connectors for grounding connections to equipment provided with lugs.

.5 Soldered joints not permitted.

.6 Install bonding wire for flexible conduit, connected at both ends to grounding bushing, solderless lug, clamp or cup washer and screw. Neatly cleat bonding wire to exterior of flexible conduit.

3.2 EQUIPMENT GROUNDING

.1 Install grounding connections to typical equipment included in, but not necessarily limited to following list. Service equipment, frames of motors, building steel work, and distribution panels.

3.3 COMMUNICATION SYSTEMS

.1 Install grounding connections for telephone, sound, fire alarm, computer network systems as follows:

.1 Telephones: make telephone grounding system in accordance with telephone company's requirements.
.2 Sound, fire alarm, computer network systems as indicated.

3.4 FIELD QUALITY CONTROL

.1 Perform tests in accordance with Electrical General Requirements Section.
.2 Perform ground continuity and resistance tests using method appropriate to site conditions and to approval of local authority having jurisdiction over installation.
.3 Perform tests before energizing electrical system.
.4 Disconnect ground fault indicator during tests.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Canadian Standards Association (CSA)

- .1 CAN/CSA C22.2 No.18-92, Outlet Boxes, Conduit Boxes, and Fittings.
- .2 CSA C22.2 No.45-M1981(R1992), Rigid Metal Conduit.
- .3 CSA C22.2 No.56-1977(R1977), Flexible Metal Conduit and Liquid-Tight Flexible Metal Conduit.
- .4 CSA C22.2 No.83-M1985(R1992), Electrical Metallic Tubing.
- .5 CSA C22.2 No.211.2-M1984(R1992), Rigid PVC (Unplasticized) Conduit.

Part 2 Products

2.1 CONDUITS

.1 Rigid metal conduit: to CSA C22.2 No.45, aluminum threaded.
.2 Epoxy coated conduit: to CSA C22.2 No.45, with zinc coating and corrosion resistant epoxy finish inside and outside.
.3 Electrical metallic tubing (EMT) with couplings: to CSA C22.2 No.83.
.4 Flexible metal conduit: to CSA C22.2 No.56, aluminum and liquid-tight flexible metal.

2.2 CONDUIT FASTENINGS

.1 One hole steel straps to secure surface conduits 53 mm (2") and smaller. Two hole steel straps for conduits larger than 53 mm (2").
.2 Beam clamps to secure conduits to exposed steel work.
.3 Channel type supports for two or more conduits at 1.5 m (5'0") oc.
.4 Threaded rods, 6 mm (1/4") diameter, to support suspended channels.

2.3 CONDUIT FITTINGS

.1 EMT fittings shall be set screw style (zinc alloy).
.2 Flexible metal conduit fittings shall be screw-in type.
.3 Liquid type flexible metal conduit fittings shall be sealtite type.
.4 PVC fittings shall be PVC type complete with PVC adaptors at all boxes.
.5 Coating: same as conduit.
.6 Factory "ells" where 90° bends are required for 27 mm (1") and larger conduits.
.7 Where bushings are noted to be provided they must be “screwed” type fastened to a conduit connector. Push-fit or glued in place bushings will NOT be accepted.

2.4 FISH CORD

.1 Nylon twine.

Part 3 Execution

3.1 INSTALLATION

.1 Install conduits to conserve headroom in exposed locations and cause minimum interference in spaces through which they pass.

.2 Conceal conduits except in mechanical/ electrical service rooms and in unfinished areas. Where devices are to be installed on existing walls in finished area, which cannot be “fished”, install feeds in a surface metal raceway equal to Wiremold V700 series. Co-ordinate surface installations with consultant prior to rough-in.

.3 Use electrical metallic tubing (EMT) for all branch circuits unless specified otherwise.

.4 Use rigid aluminum threaded conduit where specified and up to 2.1 m (7'0") above finish floor where exposed to mechanical injury.

.5 Use rigid PVC conduit underground and in kitchen areas.

.6 Use flexible metal conduit for connection to motors in dry areas, connection to recessed fixtures without a prewired outlet box, connection to surface or recessed fixtures, work in movable metal partitions.

.7 Use liquid tight flexible metal conduit for connection to motors or vibrating equipment in damp, wet or corrosive locations and for connections to kitchen equipment.

.8 Conduits terminating at electrical equipment in sprinklered areas are to be provided with insulated compression style connectors equal to Thomas & Betts Cat. #TC8XXSC or approved equal.

.9 **Minimum conduit size for branch circuits shall be 21 mm (3/4").** Single drops from ceiling mounted junction boxes down to a light switch or duplex receptacle may be reduced to 16 mm (½").

.10 Bend conduit cold. Replace conduit if kinked or flattened more than 1/10th of its original diameter.

.11 Mechanically bend steel conduit over 27 mm (1") diameter.

.12 Field threads on rigid conduit must be of sufficient length to draw conduits up tight.

.13 Install fish cord in empty conduits.

.14 Remove and replace blocked conduit sections. Do not use liquids to clean out conduits.

.15 Dry conduits out before installing wire.

3.2 SURFACE CONDUITS

.1 Run parallel or perpendicular to building lines.
.2 Locate conduits behind infrared or gas fired heaters with 1.5 m (5') clearance.
.3 Run conduits in flanged portion of structural steel.
.4 Group conduits wherever possible on suspended or surface channels.
.5 Do not pass conduits through structural members except as indicated.
.6 Do not locate conduits less than 75 mm (3") parallel to steam or hot water lines with minimum of 25 mm (1") at crossovers.
.7 Do not fasten surface conduit to roof deck. Provide standoffs or supports as manufactured by Caddy or use unistrut trapeze fastened to structure.

END OF SECTION

Part 1 General

1.1 SHOP DRAWINGS

.1 Submit shop drawings for each system in Conformance with The Electrical General Requirements Section.

1.2 PRODUCT/MAINTENANCE DATA

.1 Submit product/maintenance data for each system for inclusion in maintenance manual conforming to The General Electrical Requirements Section.

1.3 SCOPE

.1 The scope of this Section will include the following systems.

- .1 Hand dryers.
- .2 Line voltage power packs and low voltage occupancy sensors.

Part 2 Products

2.1 HAND DRYERS

.1 Hand dryers where noted on the drawings are to be supplied and installed by this Division with the following features:

- .1 Surface mounting.
- .2 Fixed nozzle.
- .3 White finish with automatic activation.
  Final finish selection by owner/architect.
- .4 Rating of 1800 W at 120 V.
- .5 Cat. #NOVA 5-0212
  - .1 World Dryer Cat. #XA5-2-974.

2.2 LINE VOLTAGE POWER PACKS AND LOW VOLTAGE OCCUPANCY SENSORS

.1 Line voltage power packs and occupancy sensors shall be one manufacturer throughout the project.

.2 Line Voltage Power packs shall be provided to match the room lighting load, control requirements, and lighting voltage. Power packs shall have the following features:

- .1 Mount to standard junction box.
- .2 Simple replacement. It shall be capable to replace the unit without requiring any configuration or set-up.
- .3 Plenum rated
- .4 120VAC or 347V, 60HZ operation.
- .5 Acceptable materials:
  - .1 Sensorswitch Cat. #PP20 Series

.2 Legrand Cat. #BZ-250 Series
.3 Greengate Cat. #SP15 Series

.3 Low voltage / analog occupancy sensors shall be complete with the following features:

.1 Coverage pattern to suit room ceiling height.
.2 Suitable to detect minor and medium motion patterns within rooms less than 2000 sq. ft.
.3 Mount to standard junction box.
.4 Simple replacement. It shall be capable to replace the unit without requiring any configuration or set-up.
.5 Relays shall not be integrated within the occupancy sensor. Relays shall be provided within separate power pack.
.6 Acceptable materials

.1 Sensorswitch Cat. #CM-PDT Series
.2 Legrand Cat. #CI-205
.3 Greengate Cat. #OAC-DT-2000

Part 3 Execution

3.1 HAND DRYERS

.1 Install and connect hand dryers in conformance with manufacturer's recommendations.
.2 Hand dryers are to be mounted at a height to suit age of expected users. Unless otherwise noted confirm height with manufacturer, owner, Architect, and/or consultant prior to rough-in.
.3 Once installed this contractor is to caulk the joint between dryer and wall surface with a bead of clear silicone.

3.2 LINE VOLTAGE POWER PACKS AND LOW VOLTAGE OCCUPANCY SENSORS

.1 Install power packs in accessible maintenance areas.
.2 Provide access doors if power packs are installed above drywall ceilings.
.3 Sensors installed in areas of high abuse shall be complete with wire guards.
.4 It shall be the contractor's responsibility to locate and aim sensors in the correct location required for complete and proper coverage within the range of coverage as per the manufacturer's recommendations. The locations and quantities of sensors shown on the drawings are diagrammatic and indicate only the rooms which are to be provided with sensors. The contractor shall provide additional sensors if required to properly and completely cover the respective rooms.
.5 It is the contractor's responsibility to arrange a pre-installation meeting with the manufacturer's factory authorized representative, at the facility, to verify placement to sensors and installation criteria.
.6 The contractor shall also provide the on-site training necessary to familiarize the owner's personnel with the operation, use, adjustment and problem-solving diagnosis of the occupancy sensing devices systems.

.7 Upon completion of the installation, the system shall be completely commissioned by the manufacturer's factory authorized technician who will verify all adjustments and sensor placement to ensure a trouble-free occupancy-based lighting control. Submit commissioning report with closeout documents.

.8 **All lighting controls shall be provided with functional testing and documentation conforming to Ashrae 90.1, latest adoption. This cost shall be included in the Tender Price.**

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Heaters must conform to CSA 22.2 No.46 (latest edition).

1.2 PRODUCT DATA

.1 Submit product data in accordance with the Electrical General Requirements Section.
.2 Product data to include:

- .1 Suspension of heating element.
- .2 Physical size.
- .3 Thermostat control if integral.
- .4 Finish.
- .5 kW rating, voltage, phase.
- .6 Cabinet thickness.
- .7 Cabinet surface temperature.
- .8 Mounting methods.
- .9 Auxiliary controls.
- .10 Replacement data for motor element, thermostat, and switch.

1.3 OPERATION AND MAINTENANCE DATA

.1 Provide operation and maintenance data for all heating system components for incorporation into manual as specified in the Electrical General Requirements Section.

Part 2 Products

2.1 UNIT HEATERS

.1 Unit heater shall be horizontal discharge complete with adjustable louvers finished to match cabinet.
.2 Fan type unit heaters must be provided with built-in high-heat limit protection.
.3 Fan motor must be permanently lubricated ball bearing type with resilient mount. Built-in fan motor thermal overload protection.
.4 Hangers shall be as indicated on drawings.
.5 Elements shall be mineral insulated copper coated steel sheath with aluminum brazed fins.
.6 Cabinet shall be steel fitted with brackets for rod or wall mounting. Phosphatized and finished with baked enamel finish to suit architect.
.7 Controls shall be (as indicated) either wall mounted remote thermostats or integral 2 pole thermostats to control load of heater specified. Integral magnetic contactors (if specified) are to be provided to suit load.

2.2 FORCED AIR WALL HEATERS

.1 Forced air wall heaters, wall or ceiling mounted as noted complete with T-bar mounting frame. Heater shall be commercial type as follows:

.1 Enclosure:

.1 Steel: 18 gauge.
.2 Knockouts for 19 mm (3/4") diameter conduit left, right, bottom and rear.
.3 Grill and frame finished to suit architect.

.2 Elements and Fan:

.1 Mineral insulated.
.2 Motor: totally enclosed, shaded pole, impedance protected motor.

.2 Controls:

.1 Built-in tamperproof controls. 'On-Off-Fan Only' selector switch and temperature control knob.

2.3 THERMOSTATS

.1 Line voltage thermostats in finished areas as indicated shall be complete with the following features:

.1 Full load rating of maximum 18 A at 208 V
.2 Temperature range: 10ºC to 27ºC (50ºF to 80.6ºF)
.3 Temperature range shall be marked on face of thermostat in 5 degree increments.

2.4 APPROVED MANUFACTURERS

.1 Approved manufacturers shall be:

.1 Ouellet
.2 Stelpro
.3 Westcan

Part 3 Execution

3.1 INSTALLATION

.1 Suspend unit heaters from ceiling or mount on wall as indicated.
.2 Install force flow heaters as indicated.

3.2 FIELD QUALITY CONTROL

.1 Perform tests in accordance with Electrical General Requirements Section.
.2 Ensure that heaters and controls operate correctly.
.3 On fan powered units:

.1 Test cut-out protection when air movement is obstructed.
.2 Test fan delay switch to assure dissipation of heat after element shut down.
.3 Test unit cut-off when fan motor overload protection has operated.

END OF SECTION

Part 1 General

1.1 PRODUCT DATA

.1 Submit product data in accordance with Electrical General Requirements Section.

Part 2 Products

2.1 BREAKERS GENERAL

.1 Moulded case circuit breakers must conform to CSA C22.1 No.5.1-M91 (latest edition.)
.2 Bolt-on moulded case circuit breaker quick-make, quick-break type, for manual and automatic operation.
.3 Common-trip breakers: with single handle for multi-pole applications.
.4 Unless otherwise indicated moulded case circuit breaker to operate automatically by means of thermal and magnetic tripping devices to provide inverse time current tripping and instantaneous tripping for short circuit protection.

Part 3 Execution

3.1 INSTALLATION

.1 Install circuit breakers as indicated complete with all necessary mounting hardware and filler panels if necessary.
.2 Provie lamicoid labels for series rating breakers. Lamicoid label to state “Series Rating Breaker.” Lamicoid to be size 2.

END OF SECTION

Part 1 General

1.1 SHOP DRAWINGS AND PRODUCT DATA

.1 Submit shop drawings and product data in accordance with Electrical General Requirements Section.

Part 2 Products

2.1 RECEPTACLES

.1 Receptacles, plugs, and other similar wiring devices must conform to CSA 22.2 No 42 (latest edition).

.2 Duplex receptacles, CSA type 5-15 R, 125 V, 15 A, U ground, with following features (20A where noted):

- .1 Urea molded housing (Colour by architect).
- .2 Suitable for No. 10 AWG for back and side wiring.
- .3 Break-off links for use as split receptacles.
- .4 Eight back wired entrances, four side wiring screws.
- .5 Triple wipe contacts and rivetted grounding contacts.

.3 Other receptacles with ampacity and voltage as indicated.

.4 Receptacles of one manufacturer throughout project.

.5 Acceptable materials:

- .1 Standard Devices
  - .1 Standard duplex receptacle: Hubbell Cat # HBL5252CN
  - .2 T-slot receptacles: Hubbell Cat. #HBL5352
  - .3 Tamper resistant receptacle: Hubbell Cat # BR15TR
  - .4 Tamper resistant T-slot receptacle: Hubbell Cat. #BR20TR

.6 Acceptable alternate manufacturers include:

- .1 Pass & Seymour
- .2 Leviton

2.2 COVER PLATES

.1 Cover plates from one manufacturer throughout project.

.2 Sheet steel utility box cover for wiring devices installed in surface-mounted utility boxes.

.3 Stainless steel, brushed, 1 mm (1/32") thick cover plates for wiring devices mounted in flush-mounted outlet box.

.4 Sheet metal cover plates for wiring devices mounted in surface-mounted FS or FD type conduit boxes.

.5 Weatherproof cover plates complete with gaskets and “heavy-duty in use” covers in conformance with the Electrical Safety Authority. Provide product equal to Intermatic Cat. #WP5100C.

.6 Provide p-touch labels on cover plates for all receptacles. Labels shall include source panel and branch circuit, including switch leg indicator as applicable for automatically controlled receptacles.

Part 3 Execution

3.1 INSTALLATION

.1 Receptacles:

.1 Install receptacles in gang type outlet box when more than one receptacle is required in one location.

.2 Mount receptacles at height specified in Electrical General Requirements Section or as indicated.

.2 Cover plates:

.1 Protect stainless steel cover plate finish with paper or plastic film until painting and other work is finished.

.2 Install suitable common cover plates where wiring devices are grouped.

.3 Do not use cover plates meant for flush outlet boxes on surface-mounted boxes.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Canadian Standards Association (CSA)

.1 CSA C22.2 No.248.12/94, Low Voltage Fuses Part 12: Class R (Bi-National Standard with, UL 248-12 (1st Edition).
.2 CSA C22.2 No. 106-M92 (latest edition).

1.2 MAINTENANCE MATERIAL

.1 Three spare fuses of each type and size installed.

1.3 DELIVERY AND STORAGE

.1 Ship fuses in original containers.
.2 Store fuses in original containers in moisture free location.

Part 2 Products

2.1 FUSES GENERAL

.1 Fuses: product of one manufacturer for entire project .
.2 Fuses specified below must conform to CSA C22.2 No. 106 (latest edition). Fuses conforming to standard C22.2 No. 106-1953 will be rejected.
.3 Fuses must provide a fully co-ordinated system for both overload and fault conditions.

2.2 FUSE TYPES

.1 Class L fuses (formerly HRC-L) for ratings 601-6000 A..

.1 Time delay, capable of carrying 500% of its rated current for 10 s minimum.
.2 Fast acting as noted.

.2 Class J fuses (formerly HRCI- J).

.1 Time delay, capable of carrying 500% of its rated current for 10 s minimum.
.2 Fast acting as noted.

.3 Class R fuses (formerly HRCI- R). For UL Class RK1 fuses, peak let-through current and I^2t values not to exceed limits of UL 198E-1982, table 10.2.

2.3 ACCEPTABLE PRODUCTS

.1 Motor Protection:
1-600 A: Mersen Type AJT
601-2000 A: Mersen Type A4BT

.2 Other acceptable manufacturers:

.1 GEC

.2 Little Fuse

Part 3 Execution

3.1 INSTALLATION

.1 Install fuses in mounting devices immediately before energizing circuit.

.2 Ensure correct fuses fitted to physically matched mounting devices.

.1 Install Class R rejection clips for HRCI-R fuses.

.3 Ensure correct fuses fitted to assigned electrical circuit.

END OF SECTION

Part 1 General

1.1 PRODUCT DATA

.1 Submit product data in accordance with Electrical General Requirements Section.

Part 2 Products

2.1 DISCONNECT SWITCHES

.1 Enclosed manual air break switches must conform to CSA C22.1 No.4 (latest edition).
.2 Fuseholder assemblies must conform to CSA C22.2 No.39 (latest edition).
.3 Fusible, and/or non-fusible, horsepower rated disconnect switches, size as indicated.
.4 Provision for padlocking in off switch position by three locks.
.5 Mechanically interlocked door to prevent opening when handle in ON position.
.6 Fuses: size as indicated, to Fuses - Low Voltage Section.
.7 Fuseholders: relocatable and suitable without adaptors, for type and size of fuse indicated.
.8 Quick-make, quick-break action.
.9 ON-OFF switch position indication on switch enclosure cover.

2.2 EQUIPMENT IDENTIFICATION

.1 Provide equipment identification in accordance with Electrical General Requirements Section.
.2 Indicate name of load controlled on size 4 nameplate.

2.3 ACCEPTABLE MANUFACTURERS

Manufacturer	General Purpose	Weather Proof
Eaton	IHD Series	3HD Series
Schneider Electric	Type A Series	Type R Series
Siemens	ID Series	NFR/FR Series

Part 3 Execution

3.1 INSTALLATION

.1 Install disconnect switches complete with fuses if applicable.

END OF SECTION

Part 1 General

1.1 SHOP DRAWINGS AND PRODUCT DATA

.1 Submit shop drawings in accordance with Electrical General Requirements Section.
.2 Indicate:

.1 Mounting method and dimensions.
.2 Starter/contactor size and type.
.3 Layout of identified internal and front panel components.
.4 Enclosure types.
.5 Wiring diagram for each type of starter.
.6 Interconnection diagrams.

1.2 OPERATION AND MAINTENANCE DATA

.1 Provide operation and maintenance data for incorporation into manual specified in Electrical General Requirements Section.
.2 Include operation and maintenance data for each type and style of starter/contactor.

1.3 MAINTENANCE MATERIALS

.1 Provide maintenance materials in accordance with Electrical General Requirements Section.
.2 Provide listed spare parts for each different size and type of starter:

.1 1 operating coil.
.2 3 fuses.
.3 10% indicating lamp bulbs used.

Part 2 Products

2.1 MATERIALS

.1 Starters: must conform to CSAC22.2 No. 14 (latest edition) and EEMAC E14-1.
.2 Control transformers must conform to CSAC22.2 No. 66 (latest edition).
.3 Auto-transformers must conform to CSAC22.2 No 47 (latest edition).
.4 Contactors must conform to CSA C22.2 No. 14 (latest edition).
.5 Half size starters will not be accepted. NEMA and IEC rated starters are acceptable.

2.2 MANUAL MOTOR STARTERS

.1 Single and Three phase manual motor starters of size, type, rating, and enclosure type as indicated, with components as follows:

.1 Switching mechanism, quick make and break.
.2 One or Three overload heaters, manual reset, trip indicating handle.

.3 Toggle switch: standard duty labeled “on”/”off”.
.4 Indicating light: standard duty type and red colour.
.5 Locking tab to permit padlocking in "ON" or "OFF" position.

2.3 FULL VOLTAGE MAGNETIC STARTERS

.1 Magnetic and combination magnetic starters of size, type, rating and enclosure type as indicated with components as follows:

.1 Contactor solenoid operated, rapid action type.
.2 Motor overload protective device in each phase, manually reset from outside enclosure.
.3 Wiring and schematic diagram inside starter enclosure in visible location.
.4 Identify each wire and terminal for external connections, within starter, with permanent number marking identical to diagram.

.2 Combination type starters to include fused disconnect switch with operating lever on outside of enclosure to control disconnect, and provision for:

.1 Locking in "OFF" position with up to 3 padlocks.
.2 Independent locking of enclosure door.
.3 Provision for preventing switching to "ON" position while enclosure door open.

.3 Accessories:

.1 Pushbuttons Selector switches standard duty labeled as indicated.
.2 Indicating lights: standard duty type and color as indicated.
.3 1-N/O and 1-N/C spare auxiliary contacts unless otherwise indicated.
.4 1 red pilot light for “stop” or “off” and 1 green light for “start” or “on”.

2.4 CONTROL TRANSFORMER

.1 Single phase, dry type, control transformer with primary voltage as indicated and secondary voltage to suit remote control device, complete with secondary fuse, installed in with starter as indicated.
.2 Size control transformer for control circuit load plus 20% spare capacity.

2.5 CONTACTORS

.1 Electrically held and controlled by pilot devices as indicated and rated for type of load controlled.
.2 Complete with 2 normally open and 2 normally closed auxiliary contacts unless indicated otherwise.
.3 Mount in CSA Enclosure 1 unless otherwise indicated.
.4 Include following options in cover:

.1 Red indicating lamp.
.2 Hand - Off - Auto selector switch.

.5 Control transformer: mounted in contactor enclosure.

.6 Contactors must be definite purpose.

2.6 FINISHES

.1 Apply finishes to enclosure in accordance with Electrical General Requirements Section.

2.7 EQUIPMENT IDENTIFICATION

.1 Provide equipment identification in accordance with Electrical General Requirements Section.
.2 Manual starter designation label: black plate, white letters, size 1, engraved as indicated.
.3 Magnetic starter designation label: black plate, white letters, size 2, engraved as indicated.
.4 Contactor designation label:
black plate, white letters, size 4, indicating name of load controlled.

2.8 ACCEPTABLE MANUFACTURERS

.1 The acceptable manufacturers are as follows:

.1 Allen Bradley
.2 Eaton
.3 Siemens
.4 Group Schneider
.5 Klockner Moeller

Part 3 Execution

3.1 INSTALLATION

.1 Install starters, connect power and control as indicated.
.2 Ensure correct fuses and overload devices elements installed.

3.2 FIELD QUALITY CONTROL

.1 Perform tests in accordance with Electrical General Requirements Section.
.2 Operate switches, contactors to verify correct functioning.
.3 Perform starting and stopping sequences of contactors and relays.
.4 Check that sequence controls, interlocking with other separate related starters, equipment, control devices, operate as indicated.
.5 Install contactors and connect auxiliary control devices.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 American National Standards Institute/Institute of Electrical and Electronics Engineers (ANSI/IEEE)

.1 ANSI/IEEE C62.41- 1991, Recommended Practices for Surge Voltages in Low-Voltage AC Power Circuits.

.2 American Society for Testing and Materials (ASTM)

.1 ASTM F1137- 88 (1993), Specification for Phosphate/Oil and Phosphate/Organic Corrosion Protective Coatings for Fasteners.

.3 United States of America, Federal Communications Commission (FCC)

.1 FCC (CFR47) EM and RF Interference Suppression.

.4 IESNA LM-79-08, IES Electrical Method for the Electrical and Photometric Measurements of Solid State Lighting Products.

1.2 SHOP DRAWINGS AND PRODUCT DATA

.1 Submit shop drawings in accordance with Electrical General Requirements Section for all light fixtures supplied under this contract.

.2 Submit complete photometric data prepared by independent testing laboratory for luminaires where specified, for review by Consultant.

.3 Photometric data to include: VCP Table spacing criterion.

1.3 SCOPE

.1 This contractor is responsible to supply and install all lighting fixtures as scheduled and/or indicated including lamp and those accessories required for a complete lighting system. This contractor must coordinate lighting installations with all other Divisions of this project.

.2 All fixtures must be CSA approved or approved at this contractor's expense by the Special Inspection Division of the Electrical Safety Authority.

1.4 GUARANTEE

.1 Guarantees for materials replacement shall be as follows from date of ready for takeover.

.1 LED fixtures, and driver: 5 years.

.2 The labour required to replace these drivers must be included in the above guarantee, however only for the extent of the contract guarantee and warranty period as noted in Electrical General Requirements.

Part 2 Products

2.1 FIXTURE CONSTRUCTION

.1 Fixtures must be constructed of 20 gauge (minimum) cold rolled steel. All metal edges require smooth finish.
.2 Light leaks must be prevented by providing gasketting, stops, and barriers.
.3 Fixtures must be finished in high reflective baked white enamel. This surface must have a reflectance of not less than 85%.
.4 All fixtures operating on 347 Volts must be provided with an integral disconnecting means.

2.2 FIXTURE LENS

.1 Unless otherwise noted fixture lenses shall be as follows:

.1 Lens thickness: 3.2 mm (1/8")
.2 Material: injection moulded clear prismatic virgin acrylic
.3 Frame: hinged, latched, steel.

2.3 LED FIXTURES

.1 Fixture LED's must be tested in conformance with IESNA LM80 standard.
.2 LED's must be selected using a binning algorithm to ensure colour and lumen output of a given fixture are consistent, as well as meet or surpass ANSI C78.377 specification for the rated lifetime of the fixture. Colour accuracy between products must be within a 2-step MacAdam ellipse.
.3 Luminaires must be tested to IESNA LM79 by an independent approved laboratory.
.4 Luminaires must be tested prior to shipping.
.5 Luminaires must be ULC certified and approved for use in Canada.
.6 Fixtures must maintain a minimum of 90% of their initial light output for 60,000 hours. Submit test results upon request.
.7 Lumen values indicated for fixtures in the project documents are to be considered as "absolute" or "delivered" values.
.8 Other than for specialty fixtures, and unless otherwise indicated, the maximum driver current is to be 750 mA.

2.4 STANDARD EXIT LIGHTING UNITS

.1 Exit lighting units must conform to CSA C860, CSA 22.2 No. 141 (latest edition).
.2 Housing: extruded aluminum housing, white finish.
.3 Face and back plates: extruded aluminum.
.4 Lamps: 2W LED.
.5 Operation: 25 year.

.6 Units are to be provided with three (3) pictogram legends indicating “left from here”, “straight from here”, and “right from here”.
.7 Face plate to remain captive for relamping.

2.5 SELF-POWERED COMBINATION EXIT/EMERGENCY LIGHTING UNITS

.1 Exit lighting units must conform to CSA C860, CSA 22.2 No. 141 (latest edition).
.2 Housing: extruded aluminum housing. White Finish.
.3 Face and back plates: extruded aluminum.
.4 Lamps 2W LED (EXIT).
.5 Operation: 25 year life.
.6 Units are to be provided with three (3) pictogram legends indicating “left from here”, “straight from here”, and “right from here”.
.7 Face plate to remain captive for relamping.
.8 Supply voltage: as noted on drawings.
.9 Output voltage: 12 V DC.
.10 Battery: sealed maintenance free 10 year life.

Note: Battery must be capable of supplying the wattage indicated for a minimum of 30 minutes.

.11 Charger: solid state, voltage/current regulated, inverse temperature compensated, short circuit protected, with regulated output of plus or minus 0.01 V for plus or minus 10% V input variation.
.12 Solid state transfer circuit.
.13 Signal lights: “AC Power On” condition and “charging” condition.
.14 Lamp heads: integral on unit, 345º horizontal and 180º vertical adjustment. Lamp type: minimum 4 watt LED.
.15 Mounting: suitable for universal mounting directly on junction box and complete with knockouts for conduit. Removable or hinged front panel for easy access to batteries.
.16 Cabinet: finish: white.
.17 Auxiliary equipment:

.1 Test switch.

2.6 EMERGENCY LIGHTING UNITS

.1 Emergency lighting units must conform to CSA C22.2 No 141 (latest edition).
.2 Supply voltage: as noted on drawings.
.3 Output voltage: 12 V DC.
.4 Battery: sealed, maintenance free, 10 year life.
Note: Battery units must be capable of supplying the wattage indicated for a minimum of 30 minutes.

.5 Charger: solid state, multi rate, voltage/current regulated, inverse temperature compensated, short circuit protected with regulated output of plus or minus 0.01 V for plus or minus 10% input variations.
.6 Solid state transfer circuit.
.7 Low voltage disconnect: solid state, modular, operates at 80% battery output voltage.
.8 Signal lights: “AC Power ON” condition and “charging” condition.
.9 Lamp heads: integral on unit, 345º horizontal and 180º vertical adjustment. Lamp type: minimum 4 watt LED.
.10 Cabinet suitable for direct of shelf mounting to wall and complete with knockouts for conduit. Removable or hinged front panel for easy access to batteries.
.11 Auxiliary equipment:

.1 Test switch.
.2 Ac input and DC output terminal blocks inside cabinet.
.3 Shelf.
.4 Cord and plug connection for AC.

2.7 REMOTE EMERGENCY LIGHTING FIXTURES

.1 Remote emergency lighting fixtures must conform to CSA C22.2 No141 (latest edition).
.2 Fixtures shall be small “micro” size or recessed style as indicated in the Light Fixture Schedule.
.3 Fixtures must be adjustable type heads with canopy.
.4 Fixtures are to be provided with protective lexan cube when specified in the Light Fixture Schedule.
.5 Unless otherwise indicated surface mounted fixtures in washrooms, locker rooms, changerooms, and gymnasiums must be provided with wire guard.

2.8 ACCEPTABLE LIGHTING MANUFACTURERS

.1 Refer to the light fixture schedule as indicated on drawings.

Part 3 Execution

3.1 INSTALLATION

.1 Locate and install luminaires as indicated. Luminaires are not to be supported from the roof deck. Provide additional unistrut support channel and/or support from structure. Co-ordinate with consultant on site.
.2 Ball align hangers must be provided for rod suspended fixtures.
.3 Fixtures surface mounted to suspended ceilings must be secured through ceiling assembly to cross member supports. These supports are to be steel channels or angles independently secured **to structure** using # 12 “jack” chain. Each chain must be secured so no fixture weight is added to the ceiling assembly.

.4 Plaster frames/flange kits must be provided by this Division for fixtures recessed in plaster and/or drywall ceilings.

.5 Where specified, fixtures to be chain hung shall be hung using “jack” chain with a capacity to suit the fixture weight. Branch circuit wiring feeding these fixtures shall be AC90 cable “ty-wrapped” at 900mm (36") intervals along length of drop. Final appearance must be neat and professional.

.6 Install exit lighting units with illuminated faces and chevrons/arrows indicating path(s) of exit as indicated. Unless otherwise noted install exit fixtures at 2400 mm (8' 0") above finished floor.

.7 Install emergency lighting units and associated remote mounted fixtures as indicated.

.8 Direct “heads” on units and remote mounted fixtures to illuminate path(s) of exit.

.9 Install emergency lighting units and remote fixtures at 300mm (12") below finished ceiling, unless indicated otherwise.

.10 Provide a 15 A 120 V duplex receptacle (connected to circuit indicated) adjacent to unit. **This receptacle connection is to be no lower than 8' 0" (2400 mm) AFF.**

.11 Special installation: Secure fixtures to structure to conform to the Electrical Safety Code using “jack chain” NOT ceiling suspension wire. Where coreslab is used, suspension point must be independent of the one used for suspension of the ceiling assembly. As an alternate to jack chain the contractor may use a pre-manufactured aircraft cable suspension and fastening system as manufactured by Gripple (Gripple Cat. #HF02-10F2). Provide minimum 2 per fixture.

.12 All battery units are to be provided with a visible lamicoid label indicating the unit number as per drawings.

3.2 WIRING

.1 Connect luminaires to lighting circuits as indicated.

.2 Connect exit fixtures to exit lighting circuits and unit equipment (if applicable).

.3 Connect unit equipment to circuits as indicated.

.4 All wiring of remote emergency fixtures shall be minimum #10 T90 for each circuit and run in conduit. Wiring must be sized in conformance with manufacturer’s recommendations for distances required.

3.3 LUMINAIRE ALIGNMENT

.1 Align luminaires mounted in continuous rows to form straight uninterrupted line.

.2 Align luminaires mounted individually parallel or perpendicular to building grid lines.

3.4 DELIVERIES

.1 Fixtures are to be completely assembled at the manufacturer’s plant and delivered to the project site in original unitized containers. Ensure that a dry, protected and secure space is available for proper storage before scheduling delivery of fixtures.

3.5 TESTING/CERTIFICATION

.1 At the completion of the project and in the presence of the consultant, test all exit and emergency fixtures. On company letterhead, the contractor is to prepare a chart indicating:

- .1 Project
- .2 Date
- .3 Equipment type
- .4 Certification of correct connection
- .5 Certification of correct operation
- .6 Duration of test in minutes (minimum 30)
- .7 Actual period of testing (time of day)

3.6 ADDITIONAL INSTALLED EXIT SIGNS

.1 The electrical contractor is to include in their bid the cost to add two (2) additional standard exit lighting units to be installed and tested in locations as directed by the consultant. Note: This installation and test will be occurring after the initial testing/certification testing is complete.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 CAN/ULC-S524 (latest edition), Installation of Fire Alarm Systems.
.2 ULC-S525-1978, Audible Signal Appliances for Fire Alarm Systems.
.3 CAN/ULC-S526-M87, Visual Signal Appliances, Fire Alarm.
.4 CAN/ULC-S527-M87Control Units, Fire Alarm.
.5 CAN/ULC-S528 (latest edition), Manual Pull Stations.
.6 CAN/ULC-S529 (latest edition), Smoke Detectors.
.7 CAN/ULC-S530 (latest edition), Heat Actuated Fire Detectors, Fire Alarm.
.8 CAN/ULC-S536 (latest edition), Inspection and Testing of Fire Alarm Systems.
.9 CAN/ULC-S537-(latest edition), Verification of Fire Alarm Systems.
.10 OBC-2012, Ontario Building Code.

1.2 DESCRIPTION OF SYSTEM

.1 Existing System includes:

.1 Control panel to carry out fire alarm and protection functions including receiving alarm signals, initiating general alarm, supervising system continuously, actuating zone annunciators, and initiating trouble signals.
.2 Trouble signal devices.
.3 Power supply facilities.
.4 Manual alarm stations.
.5 Automatic alarm initiating devices.
.6 Audible signal devices.
.7 End-of-line devices.

1.3 REQUIREMENTS OF REGULATORY AGENCIES

.1 This system is subject to review by: local building department officials, local fire department officials. **Therefore, submission of verification certificate and field technician device verification sheets is required prior to inspection by these officials. Schedule accordingly.**

Part 2 Products

2.1 EXISTING SCOPE

.1 The existing control panel is Pyrene Fire and is a Class B, Single stage operation. The intent is to remove and reinstall devices to suit the construction schedule and provide verification upon completion.

Part 3 Execution

3.1 INSTALLATION

.1 Install systems in accordance with CAN/ULC-S524 (latest edition).

.2 Locate and install detectors and connect to alarm circuit wiring**. Do not mount detectors within 1 m (39") of air outlets.** Maintain at least 600 mm (24") radius clear space on ceiling, below and around detectors. Locate duct type detectors in straight portions of ducts.

.3 Connect alarm circuits to main control panel.

3.2 PROTECTION

.1 Contractor is to ensure all fire protection system detectors are protected from dust, dirt, humidity, and water at all times during construction. This applies to detectors installed, stored on site or stored in storage containers. Any detectors that are damaged or dirty shall be replaced at the contractor's expense.

3.3 FIELD QUALITY CONTROL

.1 Perform tests in accordance with Electrical General Requirements Section and CAN/ULC-S537 (latest edition).
NOTE: Entire fire alarm system and components are to be tested as per the noted code.

.2 Fire alarm system:

- .1 Test each device and alarm circuit to ensure noted devices transmit alarm to control panel and actuate general alarm and ancillary devices.
- .2 Simulate grounds and breaks on alarm and signaling circuits to ensure proper operation of system.
- .3 Class B circuits.
  - .1 Test each conductor on all circuits for capability of providing alarm signal on line side of single open-circuit fault condition imposed at electrically most remote device on circuit. Reset control unit after each alarm function and correct imposed fault after completion of each test.
  - .2 Test each conductor on all circuits for capability of providing alarm signal during ground-fault condition imposed at electrically most remote device on circuit. Reset control unit after each alarm function and correct imposed fault after completion of each test.

.3 Qualifications:

- .1 Persons performing any work on this fire alarm system must be CFAA certified. Submit certification upon request.

END OF SECTION